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Mulsant, E. and A. Rey. 1844a. *Histoire Naturelle des Coléoptères de France*. Maison, Paris. vii+196 pp., pl. 1.

Lawrence, J.F. 1982. *Coleoptera*, pp. 482-553. *In*: S. P. Parker (ed.). *Synopsis and Classification of Living Organisms*. Vol. 2, McGraw-Hill, New York.

Ponomarenko, A.G. 1985. [Beetles from the Jurassic of Siberia and western Mongolia]. *Trudy Paleontologicheskogo Instituta*, 211: 47-87 (in Russian).

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SALTICIDAE (ARANEAE) OF THE LEVANT

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Abstract.— A taxonomic study of 108 species of Salticidae (Araneae) occurring in Israel and neighbouring countries, including 4 species described as new (*Aelurillus bokerinus*, *A. nabataeus*, *Evarcha praeclara* and *Plexippus tectonicus*), another 42 species were described as new by the author in 1998, 1999 and 2000.



Key words.— Israel, jumping spiders, Levant, Salticidae, taxonomy, zoogeography.

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PREFACE

The family Salticidae contains over 4800 nominal species world-wide, placed in over 526 genera (Platnick 2001). They are reasonably well known in a few geographical areas (Europe and USA), and very poorly in the remaining parts of the World, including Mediterranean Region. There is no generally accepted, comprehensive system of systematic division of Salticidae into subfamilies, and for this reason genera, and species within genera, are listed alphabetically. There are however, several Catalogues to Spiders (Bonnet 1945–1961, Roewer 1942–1954, Brignoli 1983, Platnick 1989, 1993, 2001).

A recent development is availability of a current version of the monograph “Salticidae (Araneae) of the World” by Prószyński, containing (in the 2002 version) diagnostic drawings of over 4000 species of Salticidae, hyperlinked with entries of the current “Catalogue of Salticidae”, both available in the Internet at: <http://www.miiz.waw.pl/salticid/main.htm> and <http://spiders.arizona.edu/salticid/MAIN.HTM>.

The Salticidae (Araneae) fauna of the Levant dealt with in this volume contains 108 species belonging to 36 genera, additional 4 relevant genera are expected to be found.

The main difficulty in studying Salticidae of the Levant was lack of any keys or modern taxonomic revisions, not only for the Levant, but also for the whole Mediterranean area. The existing keys for various European countries were of little help, due to very different contents of faunae covered. The only way to study the Levantine Salticidae was to revise the descriptive types and other authoritatively identified specimens scattered in a number of European and some American Museums, a research task, which took me 38 years. The research summarised in this book were carried out in years 1988–1993, for reason beyond my control the publication was delayed; partial results – descriptions of new species were published in Prószyński 1998, 1999 and 2000. The unpublished results were, however, made available on printouts and disk copies to the persons interested since 1991, and in the Internet since 1997.

The knowledge of Salticidae improved in recent years, also with publication of Metzner 1999 on Salticidae of Greece, and a number of publications by Logunov –1992, 1995a, 1995b, 1996, 1998 and others).

The main facility in studying the Salticidae in this area is the existence of a source of material unique in the whole Mediterranean area, i.e. – the Israel National Arachnid Collection, kept in the Department of Evolution, Systematics and Ecology of the Hebrew University of Jerusalem (Curator and one of the founders – Dr. Gershom Levy), containing over 600 vials of mainly unidentified Salticidae, and the Salticidae collection from the current ecological research by Dr. Yael Lubin, of the Mitrani Ecological Research Centre of the

Blaustein Institute for Desert Research, Ben Gurion University of Be'er Sheva, at Sede Boqer.

A special property of the Levantine Salticidae fauna is speciation (radiation of new species) occurring in a number of genera. Such genera consist of clusters of similar species, differing in small details of characters, difficult to separate and simultaneously sufficiently different to suspect them of being discrete biological entities. Their ranges are usually small, or very small, often overlapping, the species presumably making use of different microhabitats, not discernible to human eyes. The methods of species identification serving well in other areas (for instance Central and North Europe, where genital organs and colour pattern differences are clear-cut) are of limited use in the Levant and special research approaches are called for: morphological studies should be complemented by biological observations and experiments, including observation of recognition dances and mating experiments. Such methods are not yet employed in the Levant, and it is not certain whether or when we may use their results for taxonomic consideration. Until such results will become available, some identifications and taxonomic descriptions of the Levantine species (as well as species proliferating in other speciation zones) must be considered preliminary.

The research I have carried out on this material was limited to the preserved specimens and the only geographical and environmental information available was that which could be read from labels. Only in some cases was I able to observe the studied species in the field. The continuation of intensive biological and ecological research by future arachnologists, is most desirable and I hope will be facilitated by the present publication.

Apart from Salticidae actually reported and collected to date in the Levant, I mention, and sometimes also illustrate, species which are expected ultimately to be found there, or which bear some importance for arachnologists studying the Levantine fauna. These are marked in the text as “relevant genera” and “relevant species”.

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Work on this Monograph carried out between 1988 and 2001, was sponsored by a number of institutions in several countries. While the studies were initiated by a grant received from the Frizzel-Exline Fund for Arachnological Research of the California Academy of Sciences in San Francisco, USA, the most important financing came from my former College (Wyższa Szkoła Rolniczo-Pedagogiczna, now: Akademia Podlaska) in Siedlce, Poland, which provided my employment, air tickets for travel and research funds, the latter cosponsored also by the Research Project CPBP 0.3.04. 01 of the Polish Academy of Sciences, Warsaw, Poland. Later, travel to Israel in 1993 was financed by the Polish Academy

of Sciences within framework of exchange of scientists with the Israel Academy of Sciences and Humanities. The research in Jerusalem in 1988 and 1989 was founded by the Fauna and Flora Palaestina Committee of the Israel Academy of Sciences and Humanities, Jerusalem, Israel. Research in Sede Boqer was aided by grants (1988 and 1993) from the Blaustein Institute for Desert Research, Ben Gurion University, Be'er Sheva. I also used research facilities provided by the Department of Evolution, Systematics and Ecology, the Hebrew University, Jerusalem and by the Mitrani Ecological Research Center of the Blaustein Institute for Desert Research, Ben Gurion University at Sede Boqer Campus. Other major sponsors were Eastern Illinois University at Charleston, Il., USA, which supported me and offered generous research conditions at its campus over 10 months in 1989–90; and the Museum of Comparative Zoology, Harvard University, USA, which contributed the Ernst-Mayr-Grant allowing one month of research at their collection. My research stay in Sede Boker in 2001 was sponsored by the Access to Research Infrastructure grant from the European Commission. Other contributing institutions, which had earlier allowed me to study the Salticidae kept in their collections, including both types, comparative specimens, and unidentified samples, were: Hope Entomological Collections, University Museum, Oxford, U.K.; Museum National d'Histoire Naturelle, Laboratoire de Zoologie in Paris; American Museum of Natural History, Dept. of Entomology, New York; Natural History Museum Arachnid Section, London, U.K.; Smithsonian Institution, Dept. of Entomology, Washington, DC. I am also very grateful to my present employer, the Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw.

I am very much obliged and grateful to a number of scientists for their kind attitude and friendly assistance at various stages of my research. The research were possible, first of all, due to the very friendly and most helpful attitude of Professor F. D. Por and his collaborators: Drs Gershom Levy, Chanan Dimentman, Heather Bromley-Schnur, Nehama Ben Eliyahu, and several others in Jerusalem, including Miss Ilana Ferber at the Israel Academy of Sciences and Humanities, and in Sede Boker of Professor Yael Lubin and her collaborators, including Dr. Linda Olsvig Whittaker. I am also obliged to Ms. Zofia Lasman at the Israel Academy of Sciences and Humanities. At various stages I used also help of: in Cambridge, Mass. – Dr. H.W. Levi, Dr. W. Maddison, Ms. L. Leibensperger, Dr. A. Johnson; in Charleston, Ill. – Dr. R. Funk, Dr. M. Goodrich and numerous other Faculty and Administrative Staff Members; in Florence – Mrs. S. Mascherini; in London – Mr. P. D. Hillyard, Mr. F. R. Wanless; in New York – Dr. N.I. Platnick, Mr. L. Sorkin; in Oxford – Dr. I. Lansbury; in Paris – the late Dr. J. Heurtault, Dr. Ch. Rollard; in San Francisco – Dr. W. Pulawski, Mr. D. Ubick; in Siedlee –

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I have complemented this study with additional specimens from numerous other collections studied over the last 40 years, which are listed in my previous publications.

The comparative data on the Salticidae of Saudi Arabia came from my publications in the "Fauna of Saudi Arabia" (Prószyński 1989, 1993) and from some additional collections sent to me for identification by Dr. A.A. Faragalla of King Abdulaziz University in Saudi Arabia. Algerian Salticidae were sent by Dr. R. Bosmans, then of the Institute de la Science de la Nature, Universite des Sciences, Bab Ezzoure, Algiers, Algeria. I wish to express my gratitude to all individuals and institutions which contributed to this research.

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Describing morphology and functions of the body of the Salticid spider I used extensively descriptions given by excellent textbook by Foelix (1982). The descriptions of Salticide behavior are based on series of pioneer papers of R.R. Jackson and his collaborators (Jackson 1985a, 1985b, 1986, 1990, Jackson and Blest 1982, Jackson and Hallas 1986, Jackson and MacNab 1989, Jackson and Willey 1994).

I am also grateful to Wyższa Szkoła Rolniczo-Pedagogiczna (now: Akademia Podlaska) in Siedlee and to the Muzeum i Instytut Zoologii PAN in Warsaw, for permission to use some drawings from my papers of 1968, 1984 and 1987.

NAMES OF COLLECTIONS AND THEIR ABBREVIATIONS

AMNH – American Museum of Natural History, New York;
 HEC – Hope Entomological Collections, Coll. O. Pickard-Cambridge, University Museum, Oxford;
 HUI – Israel National Collections, Department of Evolution, Systematics and Ecology, Hebrew University, Jerusalem;

ISE – Zoological Museum, Institute for Systematics and Ecology of Animals, Siberian Division of the Russian Academy of Sciences, Novosibirsk;

IZ – Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw;

Museo Civico di Storia Naturale, Genoa;

NHM-Basel – Naturhistorisches Museum, Basel;

NHM-London – Natural History Museum, Arachnid Section, London;

NHM-Vienna – Naturhistorisches Museum, Wien;

MNHN – Coll. Simon, Museum National d'Histoire Naturelle, Laboratoire de Zoologie, Paris;

SB – Mitrani Ecological Research Center, Ben Gurion University, Sede Boqer;

SI – Smithsonian Institution, Dept. of Entomology, Washington, DC;

ZMMU – Zoological Museum, Moscow University.

INTRODUCTION

External morphology and anatomy of Salticidae

The general structure of Salticidae does not differ significantly from the structure of other spiders (see Levy 1985). The body of a spider is divided into two parts: the cephalothorax (prosoma), specialised for nervous, sensory, locomotion and food taking functions; and the abdomen (opisthosoma) with digestive, reproductive, respiratory and circulatory organs and spinning glands.

The following description of the general biology of Salticidae is largely based on the book "Biology of Spiders" (Foelix 1982).

The cephalothorax bears the appendages and eyes, and a variety of other sense organs; and houses the central nervous system, the pumping part of the stomach and a large mass of different muscles; it is covered dorsally by a hard, sclerotized shield called the carapace and ventrally by the sternum; the legs protrude through a slit between both shields, each segment of the leg being covered by its own tubular shield. Narrow pedicel connects the cephalothorax and the abdomen. The appendages consist of a pair of chelicerae, specialised for prey capture; a pair of the pedipalps, sensory and specialised for communication with other spiders, and, in males, having reproductive functions; and four pairs of locomotory appendages, the legs. The chelicerae consist of a robust basal segment and a movable fang bearing the terminal opening of the venom gland; the fang rests in a groove armoured on one or both edges with a tooth or teeth, which assist in grasping prey. The legs consist of 7 segments of different shapes and function: coxa, trochanter, femur, patella, tibia, metatarsus, and tarsus. The pedipalps have no metatarsus and in males the tarsus (or cymbium) is specialised for reproductive

functions and houses the male copulatory organ (palpal organ); the coxae of the pedipalps bear large maxillary plates (or endites), which constitute part of the mouth parts. The appendages are bent and stretched at the joints by muscles, sometimes extended by tendons. Stretching at two important joints: between the femur-patella and tibia-metatarsus, where there are no extensor muscles, is effected by a rise in the hydraulic pressure of the haemolymph, produced by the pumping contraction of huge muscles inside the cephalothorax. This mechanism is used during jumps, executed by either third or fourth pairs of legs, which are developed accordingly. Legs I and II are used during landing, walking and catching the prey, the latter activity being assisted by an adhesive brush of setae (scopula) on the tarsi, occurring in some genera. The legs and pedipalps, as well as various areas of the cephalothorax, have a large number of various sensory hairs, slits and pits, serving as receptors of touch, vibration (air and silk threads) and as chemoreceptors, the latter consisting of thin membranes, always humid, on which particles from the air stimulate sensory cells. The location of sensory organs on movable parts of the body provides a better reception of weak stimuli in the air, probing of the ground and probing of closely approached insects and specimens of the same species. Intraspecific communication may occur by exchange of chemical and vibration stimuli, but in the Salticidae it is predominantly visual signals: movement of contrasting coloured parts of the body in a specific rhythm and timing of these movements.

Spiders digest caught prey externally, pumping digestive enzymes inside its body and sucking out the liquidified soft tissues of the prey. The liquid food is drawn through special filters into the digestive section of midgut, which gives off numerous diverticula entangled around the internal organs of the abdomen and cephalothorax, penetrating even into the coxae of the legs.

Internal transport of digested food takes place through the walls of the midgut diverticula. Haemolymph flushing the surfaces of the diverticula, dilutes and takes up nutritive substances and carries them to cells throughout the body; part of nutritive substances are also stored in various cells for periods of food deprivation. The haemolymph also carries oxygen, taken up in thin membranous lamellae of the book lungs and bound to the copper containing respiratory pigment haemocyanin. The haemolymph then flows through pulmonary veins into the pericardial chamber, from which it is sucked into the elongate heart along the dorsal wall of the abdomen and subsequently pumped out through various arteries into the open body cavity in the proximity of the major organs, where the exchange of oxygen and food substances with the cells and the removal of metabolic wastes from the cells takes place. The necessity of direct access of haemolymph to each cell to enable such exchanges influences the structure of organs; they are either built of a

single layer of cells, or a few layers only, or of loose tissues allowing the seepage of haemolymph between cells, as in bundles of muscles. A second respiratory system consists of tubular tracheae carrying atmospheric air from a pair of stigmata on the ventral surface of the abdomen into the proximity of the tissues; in Salticidae the tracheae are well developed, branched, and penetrate from the abdomen into the cephalothorax and appendages.

The removal of the metabolic wastes carried by the haemolymph takes place using two excretory systems. The extracellular one, consisting here mainly of endodermal malpighian tubules, open to the stercular pocket where dehydration of wastes takes place and dry wastes are pushed through the anus; there are also vestigial coxal glands in cephalothorax. The intracellular excretory system deposits wastes in some specialised cells, thus removing them from the general circulation in the body.

In spiders the central nervous system consists of about 30000 neurones and is highly condensed into two compact ganglia in the cephalothorax, the supraoesophageal (called also the brain) and the suboesophageal, while vestiges of the abdominal ganglia appearing only during embryonic development. The brain of active hunting spiders differs from the web spinning ones in the much stronger development of visual centres.

Special features of the Salticidae

The anterior end of the cephalothorax in the Salticidae is very characteristic: broadly truncated, almost rectangular, with large Anterior Median Eyes (AME) and smaller Anterior Lateral Eyes (ALE), usually about half the size of the first, arranged in a single row; Posterior Median Eyes (PME or eyes of the III row), also relatively large, are located far behind along the dorsal edges of the cephalothorax; and the much reduced Posterior Lateral Eyes (PLE or eyes of the II row), positioned between ALE and PME. The space between all eight eyes is called the eye field and its outline can be rectangular or trapezoidal, narrowing or broadening posteriorly, and is often a useful key character. The specialisation of eyes in Salticidae goes far beyond mere geometrical arrangement. The prey is spotted from long distance, often 40 cm or more, by secondary eyes (PME, PLE, ALE) which have broader field of vision and serve as movement detectors, but do not make a sharp image of the object. When the moving object approaches to within 4–10 cm, the spider turns in its direction and catches it in the narrow angle of vision of the Anterior Median Eyes whose large lenses permit telescopic sighting. The retina of the AME is “boomerang shaped”, and consists of about 1000 visual cells arranged into four differently specialised layers, most dense at the fovea. It is screened posteriorly by a dark pigment layer and can be moved by special muscles, which permit change of focus. The AME can form a high-resolution picture of the prey

from a distance of 10 cm or closer; when the prey moves the muscles shift the retina to maintain its picture at the foveal area. During the “recognition” process the retina is in constant motion, the shape of the object is quickly scanned horizontally and at the same time the main eye is rotated along its main axis, a procedure apparently necessary for identification of moving objects. The spider begins pursuit of the prey from a distance of about 10 cm, stalking it from 4 cm and leaping at it from 2 to 1 cm when the prey image is most precise (Foelix 1982). It is supposed that Salticidae have colour vision. The acuity of vision of the AME is apparently even higher than in the compound eyes of insects and is comparable with the eyes of higher vertebrates.

The variety of shape and proportion of the cephalothorax is usually due to length of the eye field and height at eyes III relative to length of cephalothorax, but this is partially illusory. Actually such parameters as the relative length of the eye field vary in the majority of Salticidae from about 40 to 50%, rarely less than 30% or more than 60%, and the variation in height of the cephalothorax is rarely less than 40% or more than 60%. The illusion is caused by the shape of cephalothorax: a long posterior slope hidden under the bulging anterior part of the abdomen makes the cephalothorax appear short and the eye field relatively long; the impression of height is influenced by the presence of a contrasting belt along the ventral margin of the carapace.

The height of the cephalothorax may possibly be partially correlated with the location of the main locomotory muscles. If the muscles moving particular pairs of legs are developed predominantly within the legs themselves, the cephalothorax may be lower. If, however, the major movements of a pair of legs are mainly executed by muscles in the cephalothorax (acting by pressuring the haemolymph) the bulk of these muscles is larger and hence the cephalothorax higher.

The variety in length of legs I–IV has a functional correlation. Good, rapid runners among the Salticidae have robust legs of equal length; jumpers have legs III–IV more strongly developed. This pattern may be modified in some genera by a strong development of legs I, which may be strikingly longer and more robust, fulfilling important tactile and catching functions; in some genera the development of legs I may be sex linked, with legs I longest in males, while legs IV may be distinctly longer in females.

The shape of the abdomen varies within the Salticidae from long to round, narrow to broad, tapering to truncate and high to low. The dorsal integument in some genera may be strongly sclerotized, forming a hard, light-reflecting, protective shield, called the scutum, usually occurring only in males.

The coloration of the body and its parts varies among genera and species from dull to strikingly contrasting or colourful iridescent patterns. It is assumed



Figures 1–7. *Cyrba algerina* (male from Greece), lateral (1), and dorsal (2) views. (Phot. Aart P. Noordam, with permission). *Cyrba algerina* (female from Israel) (Phot. R. R. Jackson, with permission) (3–4). Comparison of faces in females of *Cyrba algerina* (5) and *Aelurillus* sp. (6), both from Israel and *Pellenes tripunctatus* (7) from Netherlands. Note particularly important taxonomic characters: location and relative size of eyes anterior median and lateral, height of clypeus [space beneath eyes], and occurrence of colour setae. (Phot. R. R. Jackson [5 and 6] and Aart P. Noordam [7], with permission).

that the contrasting colour pattern serves as recognition characters to other spiders. Dull coloured species presumably rely more on chemical signals. A contrasting pattern on the dorsal surface may have a cryptic camouflaging function by breaking the outline of the spider into pieces as seen by predators. The colour pattern is due either to pigmentation, distribution of coloured or iridescent setae and scales, or both.

A special sort of protective adaptation, developed in some 400 species of Salticidae world wide (and some other families of spiders as well) is ant mimicking; this presumably would not deceive ants, which rely mainly on chemical signals, but may deter some visual predators among the vertebrates.

Reproduction

The genital openings in both sexes are located anteriorly on the ventral surface of the abdomen, near the epigastric furrow, and open after the final moult. In female Salticidae the opening is surrounded by a heavily sclerotized plate called the epigynum, which often has complicated, species-specific relief sculpture. The epigynum contains a pair of copulatory openings connected by copulatory channels, usually sclerotized, to sperm storing spermathecae, from which spermatozoa are extruded through a soft-walled channel into the uterus to fertilise the eggs. Sperm may be stored alive for as long as one year (Wild 1969a) (but in ants, stored spermatozoa were found alive after 19 years). There are two kinds of openings in the walls of the spermathecae, provisionally called accessory gland openings: the distal nutritive pores are supposedly used for nutrition of stored spermatozoa, and the proximal scent openings exude sex pheromones to the outside. The eggs are laid through the prominent opening in the middle of the epigynum, or through the soft-walled opening beneath it.

To inseminate the female, the male must first transfer a droplet of seminal fluid from the genital opening into the copulatory organ located on the apical segments of the pedipalps. That organ develops during the last moult. It operates as a pump by changing the pressure of the haemolymph: a rise in pressure inflates the organ and squeezes its internal sperm reservoir; by a partial reduction of pressure the seminal fluid is sucked into the reservoir through a thin spine-like inserting tube called the embolus; a further reduction of pressure contracts the copulatory organ to its normal resting size and position. During copulation, the rising pressure of haemolymph inflates the organ and when the embolus is introduced into the copulatory opening of the female, it squeezes the reservoir and injects seminal fluid into the spermathecae of female. The male copulatory organ contains various sclerotized structures which engage corresponding structures of the female's epigynum during copulation. In some Salticidae, the distal part of the embolus may break off

after copulation and remain in the copulatory opening of the female, blocking it. A hardening waxy secretion, presumably preventing copulation with other males may also seal the female opening. The males die shortly after copulation; however the proverbial post-mating cannibalism by the female has been found only exceptionally in Salticidae. Females build cocoons and lay eggs a few weeks after mating, often guarding the eggs and sometimes the young spiderlings, also possibly feeding them as well. Like other arthropods, growing spiders have to shed their sclerotized integument several times before they reach adulthood. The life cycle lasts from one to several years. The most common pattern found in temperate zones is: egg laying in late spring; hatching of young a few weeks later; growing during the summer and autumn; overwintering; reaching maturity and reproducing the following spring, after which females may survive for another year. There is considerable variation in this pattern; in many species of Salticidae the adults of one or both sexes are also found in autumn and winter. There is much to be learned still about the life cycle of many species.

Behaviour

The behaviour of the Salticidae is still insufficiently known, although the past two decades have brought about considerable progress in this area. The following description of the behaviour of Salticidae is largely based on the papers of R.R. Jackson and his collaborators (see references). With the exception of a single tropical genus *Portia*, Salticidae do not spin webs but catch prey by stalking, chasing or ambushing. A special adaptation of the Salticidae is the acquisition of superior vision as their leading sense, with the senses of smell and vibration being accessory; the opposite is the case in other families.

The majority of advanced Salticidae are cursorial predators of insects; they are agile and fast moving, using stalking and chasing behaviour to capture insects. This is facilitated by the acute vision of their main eyes, with secondary eyes functioning as movement detectors in a large peripheral area (Blest 1983). They have lost the ability to build webs, but have retained nest spinning, which is appropriate to a more nomadic life.

Their usual walking is characterised by a special stepping pattern; of their 8 legs, two sets always move alternately. Left legs I and III move together with right II and IV, and the remaining legs are at rest. During slow walking there may be a small delay in the movement of each leg, but during fast running all the legs of a set move more synchronously. When jumping spiders stop, they draw their legs symmetrically around the body, which allows for a sudden leap.

The legs are anatomically equal, but may differ in length; equal length facilitates faster running. Legs II and I are usually directed forward and pull, whereas legs III and IV point backward and push. The moving of a leg

consists of a lifting phase (forward motion without touching the ground) and a pushing or pulling phases. When the animal moves ahead the joints of the anterior pairs of legs must bend and the posterior pairs stretch. Precise co-ordination of movements of the legs is necessary for turning the body; jumping spiders can also move sideways and backwards. The quick extension and torsion of the third or fourth pair of legs (or both) perform jumps. Foelix (1982) describes the ability of Salticidae to jump a distance from a few centimetres to about 25 body lengths during escape (i. e. 1 cm spiders may jump up to 25 cm). However I have observed repeated jumps of about 1.5–2.0 m (about 150 to 200 body lengths) by *Asianellus festivus* while collecting it in Poland.

We might expect that the behaviour of over 4000 species of Salticidae would be as different as their niches, ways of life and morphology. Until now only a few species have been studied, including two occurring in the Mediterranean: *Cyrrba algerina* and *Plexippus paykulli* (see Jackson and Hallas 1986c, Jackson and MacNab 1989). Apart from these there are only scattered observations on a few other species, so this is a broad field for further research.

It was suggested (Jackson and Blest 1982) that ancestral Salticidae were web builders, but also web-invaders, both as kleptoparasitic predators of insects on alien webs and on other spiders and their eggs. They may have used web vibration signals to communicate with specimens of the opposite sex and may have also mimicked vibration of ensnared prey to lure the spider host. Special adaptations for that way of life have been lost in the majority of Salticidae and retained only by the tropical genus *Portia*, a relatively slow moving, cryptic spider, which feeds predominantly on other spiders on their webs. Similar araneophagic vibrator web-invasion behaviour has been documented in only three genera belonging to primitive subfamily Spartaetinae, represented throughout the Mediterranean by *Cyrrba algerina*. *Cyrrba* is behaviourally intermediate; like *Portia* it is an araneophagic web-invader that uses vibratory stimuli and can pursue web spiders for up to several hours to catch and eat them; but simultaneously it is also similar in many ways to typical Salticidae: building only a rudimentary nest; using visual displays and active, agile movements during intraspecific interactions (dancing is performed by *Cyrrba*, which *Portia* is unable to do); and requiring most of the motor and sensory abilities of effective cursorial predators of insects as in typical Salticidae (Jackson 1986).

Cyrrba algerina moves on firm substratum in a rapid, stop-and-go walking, suddenly running several centimetres and then resumes walking, jumping over gaps. *Cyrrba* does not build its own webs, but walks with apparent ease on any type of alien web, and does not stick, even when dropped on its back. On webs with widely spaced threads, *Cyrrba* uses its forelegs as

probes. However, movements on an alien web are very different from those on firm substratum: they include very slow walking or shifting position of the legs; it may take 4–10 seconds to lift a leg, move it forward 2 mm and place it down; then it pauses for several minutes, and then completes the step by retracting the leg and easing forward, again taking 4–10 seconds. Often the spider moves forward one leg at a time in succession, until all or most legs have been shifted, before easing the body forward. Finding an alien web with some prey on it (a host, its eggs, or ensnared insects) *Cyrrba* readily invades it, but in a very complicated and careful manner. It approaches the web slowly, ready to run away if attacked by a stronger host spider, moving increasingly slowly as it gets closer. It does not readily move completely onto the web, often remaining for prolonged period (2–7 hours) at the edge of the web, keeping at least the fourth pair of legs on a non-silk substratum. It touches the silk very slowly, usually with the anterior pairs of legs only, and remains inactive there for several minutes before beginning to pluck with its palps. Plucking causes the web to vibrate as if an ensnared insect is trying to liberate itself and this lures the host spider. The palps move up and down, forward and backward, also with rotary twists forward and backward, with some difference in the velocity and amplitude of movements. Bouts of plucking usually last 2–4 seconds, but sometimes for 10 min., followed by a pause of variable length. If the lured host spider begins to approach, plucking becomes more stereotyped. When the spider comes within a few millimetres of the “vibrating” predator, *Cyrrba* slowly lifts legs I and II, extends them forward over the prey and stabs it with its fangs, piercing the cuticle and injecting venom, after which the fangs are immediately withdrawn. The prey becomes paralysed within about 20 seconds. If stabbed spiders try to run away, *Cyrrba* slowly approaches and retrieve its paralysed victim. If the web host spider fails to approach, *Cyrrba* sometimes moves slowly further out onto the web, advancing very slowly, eventually coming to within a few millimetres of its victim where it then makes an attack. Sometimes *Cyrrba* leaps into webs onto prey, usually no more than a few body lengths anyway. At the end of the leap, the web spider was usually been grasped, but if the predator missed or contacted but failed to secure the prey, it moves slowly back to the edge of the web. Leaps are most common when a web spider becomes inactive after being lured within 10–30 mm following a long period (1 h.) of intermittent plucking. The predator slowly raises and extends legs I and II, and then leaps. Pursuit times with web spiders as prey are usually about 1 h. *Cyrrba* occasionally feeds on insects in the sticky webs of other spiders, usually walking upto them as slowly as it does to the spider; they occasionally eat eggs of theridiid and amaurobiid spiders in the web. Under experimental conditions it did not respond to the eggs of cursorial spiders.

In other families of spiders even more complicated behaviour has been observed: *Ero furcata* (Mimetidae) has been observed in Poland to mimic sexual vibration signals of male *Meta segmentata* (Araneidae), which deceived the female of that species (Czajka 1963). In Florida, the nocturnal *Dinopis* (Dinopidae) lured male moths by emitting sex pheromones of their females (Mark Stowe, personal communication).

On the other hand *Cyrba* has been observed readily stalking cursorial insects, like typical cursorial Salticidae, approaching them rapidly from 50–150 mm, then slowing down as it got to within 20 mm. Legs are raised, a drag line usually fastened, and *Cyrba* attacks, either after a short pause (2–10 sec.), or immediately. The spider leaps from 1–3 body lengths away or approaches within a few mm and attacks by stabbing. If the spider misses, it never chases the insect. Pursuit times during cursorial predation on insects were usually 1 min. or less. Cursorial spiders were readily stalked and occasionally captured, but other Salticidae usually detected approaching *Cyrba* and decamped. *Cyrba* did not respond to the nests of cursorial spiders.

Males of *Cyrba algerina* detect the presence of females by scent. Aerial and contact pheromones (for instance scented silk of a drag line on the substratum), which are detected by sensory organs on the pedipalps and legs, stimulates pronounced palpating (palps touching) and “quiver swim waving” of the legs. Facing the female from about 100 mm away, the male lifts his legs and begins to approach. Then in rapid succession he twitches the abdomen (.25 s.), flutters palps (.25 s.) waves erect legs (.25 s.), and steps to the side and dances briefly. There is an interval of 1–2 seconds of erect posturing while standing, before the sequence of display is repeated. The female usually simply watches the male leaving intermittently, the male following with legs raised. Occasionally, the female advances quickly toward the male which then usually backs away, the female running away about 7 cm, then turns and faces the male. If female persists in leaving, the male usually stops approaching and the interaction ends. While the female remains stationary, the male advances toward her, stepping in a special way, either posturing, or waving his erect legs. There are five types of different dances performed by male *Cyrba* (zigzag, linear, semi-circular, elliptical and complex dance). In the most forward position of a dance the male brings his erect legs over the female. If she remains inactive, the male mounts her and copulates. Male-female interactions usually last 1–5 minutes, the copulation itself only a few seconds (in other Salticidae it may take several hours).

The meeting of two males results in displaying erect leg posture when they are distant and crunched legs posture when they are close, ending finally in an embrace – both specimens facing each other with legs I–II erect, contacting each other with tarsi touching.

Finally they separate and run away; the interaction usually lasting 1–30 sec. The meeting of two females is shorter (usually only 5–15 sec.) with the display of erect legs when they are distant, and crunched ones when closer, with propulsive advances intermittently. Generally, the display in *Cyrba* consists of over 30 different movements and postures.

Under natural conditions, the oviposition sites of *Cyrba* are presumably on surfaces of rocks; in laboratory conditions it spins a thick sheet of silk against the wall of the cage, oviposite in the centre and covers the eggs with a flimsy layer of silk. Occasionally it encloses the nest with crudely woven external silk layers, tubular in shape and open at both ends. Moulting is completed on a small platform of spun silk (the diameter being twice the body length), with the spider hanging upside down from the platform while moulting, often sliding down 10–20 mm on a drag line before completing the moult.

Plexippus paykulli is a large, cursorial salticid spider, belonging to the hoppers group (as opposed to the runners), which frequently leap about during normal locomotion and move in a characteristic stop-go fashion: rapidly advancing a few steps, pausing briefly to reorient, then advancing again. It is a fierce predator, attacking and capturing large and dangerous prey, overcoming them by bold attack and brute strength rather than by their relatively weak venom. Like *Cyrba*, it may also feed on insects ensnared in alien webs as well as the host spiders, but it gets them in a completely different manner. It leaps onto the prey on the web (unlike the slow, careful movements of *Cyrba*); if it misses the prey, it immediately struggles to free itself from the web.

The nests built by *Plexippus*, similar in both males and females, is a complex structure. It consists of large (30 × 20 cm to 50 × 30 cm) tube with a natural elastic opening at each end; the tube is surrounded by a dense tangled array of silk forming a thick layer (up to 20 mm) over the tube. Apart from making a safe resting place and protecting the eggs, the nest also helps in capturing insects if these become entangled in the silk. Nests play an important part in the behaviour of the spider, the males developing a special way of communicating with females, which they “smell” inside the nest, by vibrating the silk walls. In some instances, copulation takes place inside the nest; if the female is subadult, the male builds a contiguous nest and waits until the female matures, and then copulates with her.

When meeting females outside the nest, male *Plexippus* resort to a visual display, as rich as that of *Cyrba* consisting of a number of postures and dances, including a zigzag dance. Thirty five elements of behaviour (movements and postures) have been described by Jackson and MacNab (1989). Copulation may be accomplished in several ways, depending on the situation in which the mates meet, whether in a nest or outside. Sometimes spiders mate suspending themselves on the

female's drag line, away from the substratum. Meeting a specimen of the same sex produces visual displays of a rich variety.

The way *Plexippus* responds to active insects is presumably typical for the majority of Salticidae. After spotting an insect, the spider orients itself towards the prey from as far away as 10 cm, then walks rapidly towards the insect. On coming close it slows down, lowers the body, pulls its legs towards the body (crouched posture) and, after a brief pause, leaps 1–5 cm onto the prey, readily attacking and capturing mobile insects, even those twice its own size. Locusts and hornets often jumped or flew away with *P. paykulli* hanging on until its venom took effect, which sometimes took several minutes. If an insect coming into contact with nests of *P. paykulli* becomes stuck for several minutes or even seconds, *P. paykulli* responds by coming out of the nest and either leaps onto prey from 1–3 cm away or walks across the nest over to the insect and attacks it; *P. paykulli* can capture ensnared insects twice its own size.

Whilst we can draw some conclusions about other Salticidae from the above observations, there are many problems awaiting behavioural study. What is the functional significance of structures like the hardened integument (an abdominal scutum), elongate or overgrown chelicerae, or special setae brushes? What is functional significance of a contrasting colour pattern and to what degree does it assist in recognition of a member of the same species? And finally what degree of morphological variation corresponds with the biological limits of the species?

ZOOGEOGRAPHIC CONCLUSIONS

The present state of zoogeographical knowledge of the Levantine Salticidae allows only preliminary interpretations. While the statistics discussed below may be amended by future research, nonetheless it gives some understanding of the character of the fauna.

Salticidae are represented in the Levant by 36 genera, almost all broadly distributed, with numerous species occurring mainly in the southern part of the Palearctic Region, some in Asia and North Africa, and Western and Central Asia, and some also in tropical Africa. Only 4 of these genera have no European representatives, north of the Mediterranean zone. This gives the Levantine Salticidae a predominantly southern Palearctic character.

The number of Levantine species per genus is usually low, on average, three. Nine genera (out of 35) have a greater number of species: *Phlegra* – 15 species, *Aelurillus* – 10 species, *Heliophanus* – 8 species, *Pseudicius* – 8 species, *Pellenes* – 6 species, *Evarcha* – 5 species, *Menemerus* – 5 species, *Rafalus* – 5 species, *Euophrys* – 4 species. A higher number of species in a genus may indicate more extensive local speciation

(particularly important in the case of *Phlegra*, *Aelurillus* and *Rafalus*, where morphological differences between species are less pronounced and sometimes confusing). However, genera having only a single species, are sometimes also represented by species unknown elsewhere. In a few cases, single species are so similar to species occurring elsewhere, that future research will have to confirm their separate status.

The total number of species known from the Levant (Israel and neighbouring countries) presently amounts to 108 (without considering some uncertain cases).

Out of these, 63 species are known only from Levant: *Aelurillus angularis*, *Aelurillus bokerinus*, *Aelurillus catherinae*, *Aelurillus cognatus*, *Aelurillus conveniens*, *Aelurillus gershomi*, *Aelurillus jerusalemicus*, *Aelurillus nabataeus*, *Aelurillus politiventris*, *Aelurillus sinaicus*, *Chalcoscirtus catherinae*, *Chalcoscirtus jerusalemicus*, *Euophrys catherinae*, *Euophrys pseudogambosa*, *Evarcha negevensis*, *Evarcha nepos*, *Evarcha patagiata*, *Evarcha pileckii*, *Habrocestum shulovi*, *Heliophanus malus*, *Langona oreni*, *Langona redivi*, *Leptorchestes sikorskii*, *Mendoza memorabilis*, *Menemerus davidi*, *Modunda staintoni*, *Mogrus logunovi*, *Mogrus sinaicus*, *Napoca insignis*, *Neaetha murphyorum*, *Pellenes negevensis*, *Phlegra amitai*, *Phlegra dimentmani*, *Phlegra ferberorum*, *Phlegra fulvastra*, *Phlegra jacksoni*, *Phlegra levyi*, *Phlegra palestinensis*, *Phlegra particeps*, *Phlegra pori*, *Phlegra rothi*, *Phlegra shulovi*, *Phlegra stephaniae*, *Phlegra tillyae*, *Phlegra v-epigymalis*, *Phlegra yaelae*, *Plexippus clemens*, *Plexippus tectonicus*, *Pseudophrys pascualis*, *Pseudicius amicis*, *Pseudicius asoroticus*, *Pseudicius miriae*, *Pseudicius palaestinensis*, *Pseudicius mikhailovi*, *Rafalus christophori*, *Rafalus feliksi*, *Rafalus karskii*, *Rafalus stanislawi*, *Rafalus* sp. uncertain 1, *Rafalus* sp. uncertain 2, *Rafalus* sp. uncertain 3, *Salticus amitaii*.

This figure is particularly unreliable since almost all these species are poorly known, and as many as 46 species were described as new, or just recently described; we know nothing about their possible distribution outside the Levant. For this reason I hesitate to call them endemic.

Eight species of Levantine Salticidae are known to occur in Saudi Arabia and/or Yemen (in reality that number will grow, with more studies on these areas): *Evarcha praeclara*, *Heliophanillus fulgens*, *Myrmarachne tristis*, *Mogrus sinaicus*, *Plexippoides arabicus*, *Pseudicius asoroticus*, *Pseudicius tamariensis* (also in N Africa), *Pseudicius wadis*. Some broadly distributed and cosmopolitan species also occur in these countries, but they cannot be considered particularly eremic (i.e. *Plexippus paykulli*, *Thyene imperialis*).

Thirty four Levantine species have a Mediterranean distribution, some occurring only in certain, limited parts of the Mediterranean, other extending beyond that area

in various direction; two species are cosmopolitan in warm areas. The list of Mediterranean species runs as follows: *Aelurillus aeruginosus*, *Aelurillus kochi*, *Bianor albobimaculatus*, *Chalcoscirtus infimus*, *Cyrrba algerina*, *Euophrys gambosa*, *Habrocestum latifasciatum* *Heliophanus curvidens*, *Heliophanus edentulus*, *Heliophanus encifer*, *Heliophanus equester*, *Heliophanus kochi*, *Heliophanus mordax*, *Macaroeris nidicolens*, *Menemerus illigeri*, *Menemerus semilimbatus*, *Menemerus taeniatus*, *Mogrus neglectus*, *Pellenes epularis*, *Pellenes maderianus*, *Pellenes nigrociliatus*, *Pellenes ostrinus*, *Pellenes simoni*, *Phlegra bresnieri* (also Europe), *Plexippoides arabicus*, *Plexippoides flavescens*, *Plexippus devorans*, *Pseudicius kulczynskii*, *Salticus olivaceus*, *Salticus propinquus*, *Synageles dalmaticus*, *Thyene imperialis* (also southern Europe, Africa and Oriental Region), *Yllenus salsicola*, *Yllenus squamifer*.

Out of these, nine species have areas extended to the east – some of them reaching Iran, Caucasus and Central Asia, these are: *Bianor albobimaculatus*, *Heliophanus curvidens*, *Heliophanus mordax*, *Menemerus semilimbatus*, *Mogrus neglectus*, *Pellenes simoni*, *Plexippoides arabicus*, *Plexippoides flavescens*, *Plexippus devorans*.

A smaller group of only six species, occurs throughout the Mediterranean: *Chalcoscirtus infimus*, *Heliophanus edentulus*, *Heliophanus encifer*, *Menemerus taeniatus*, *Salticus olivaceus*, *Synageles dalmaticus*.

Five Levantine species are limited to the eastern Mediterranean: *Habrocestum latifasciatum*, *Heliophanus equester*, *Pellenes epularis*, *Pellenes ostrinus*, *Pseudicius kulczynskii*.

Four Levantine species extend to the western Mediterranean: *Aelurillus aeruginosus*, *Menemerus illigeri*, *Yllenus salsicola*, *Yllenus squamifer*.

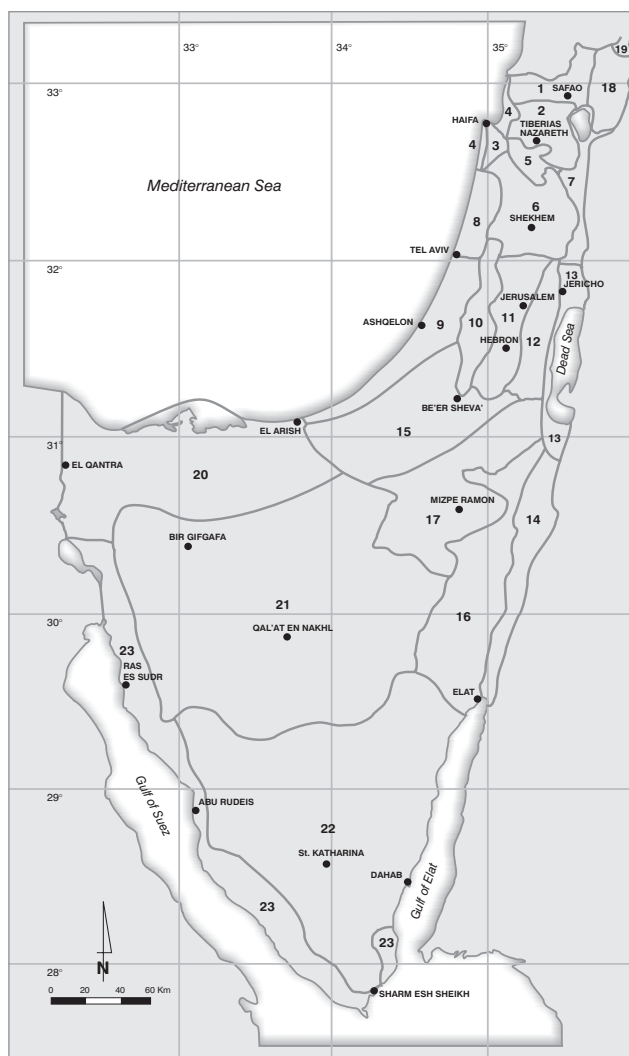
Beyond the Mediterranean, two species occurs also in tropical West Africa: *Festucula vermiformis* and *Menemerus fagei*; four Levantine species extend into Europe: *Heliophanus kochi*, *Macaroeris nidicolens*, *Pellenes nigrociliatus*, *Phlegra bresnieri*.

Four Levantine species have a broader distribution (parts of Europe, of Africa and of Asia): *Cyrrba algerina*, *Pellenes maderianus*, *Philaeus chrysops*, *Thyene imperialis*.

Finally, two Levantine species have a very broad cosmopolitan distribution in warm areas: *Hasarius adansoni*, *Plexippus paykulli*.

Geographical distribution data alone cannot be precisely interpreted. For instance, two species of *Yllenus* have a general Mediterranean distribution, while in the Levant they occur in rather eremic environments. However, their eremic character becomes more convincing when we realise that in France, Portugal and Spain they occur in sandy environments.

Attempting an environmental interpretation, we obtain a somewhat different picture, also very prelimi-



Physiographic areas of Israel, the Palestinian Authority and Sinai (numbers used in the text as references). 1. Upper Galilee; 2. Lower Galilee; 3. Carmel Ridge; 4. Northern Coastal Plain; 5. Valley of Yizre'el; 6. Samaria; 7. Jordan Vley and Southern Golan; 8. Central Coastal Plain; 9. Southern Coastal Plain; 10. Foothills of Judea; 11. Judean Hills; 12. Judean Desert; 13. Dead Sea Area; 14. 'Arava Valley; 15. Northern Negev; 16. Southern Negev; 17. Central Negev; 18. Golan Heights; 19. Mount Hermon; 20. Northern Sinai; 21. Central Sinai Foothills; 22. Sinai Mountains; 23. Southwestern Sinai. (By permission of the Flora et Fauna Palaestina Committee of the Israel Academy of Sciences and Humanities)

nary, because the environmental preferences of species cannot yet be precisely defined. A species occurring in a number localities in the Negev, as well as in Elat and Sinai, is apparently eremic. On the other hand, a species occurring around Jerusalem, Tel Aviv and the Golan Heights is more Mediterranean. The difficulty lies in classifying a species known to occur in both areas, when we do not know its micro-environment. In addition species may select a special microhabitat which differs from the general appearance of the landscape – an example of this may be *Heliophanus edentulus*, occurring in the very dry upper Wadi Zin, but a few centimetres from water of

a permanent pool. Apparently more studies of the microhabitats of particular species are needed.

There are two basic types of environment in the Levant: the eremic (desert) type and the Mediterranean type which is relatively more humid, with richer vegetation.

The assignment of *Salticidae* species to these two types of environments is only tentative.

The eremic fauna in the Levant seems to comprise 43 species: *Aelurillus aeruginosus*, *Aelurillus bokeri-nus*, *Aelurillus catherinae*, *Aelurillus cognatus*, *Aelurillus kochi*, *Aelurillus nabataeus*, *Aelurillus sinaicus*, *Chalcoscirtus catherinae*, *Euophrys catherinae*, *Euophrys gambosa*, *Evarcha negevensis*, *Evarcha pileckii*, *Evarcha praecineta*, *Heliophanus decoratus*, *Langona redii*, *Leptorchestes sikorskii*, *Menemerus illigeri*, *Mogrus logunovi*, *Mogrus sinaicus*, *Mogrus* sp. A, *Myrmarachne tristis*, *Neaetha murphyorum*, *Pellenes negevensis*, *Pellenes simoni*, *Phlegra pori*, *Phlegra yaelae*, *Plexippoides arabicus*, *Plexippoides flavescens*, *Plexippus clemens*, *Plexippus tectonicus*, *Pseudicius asoroticus*, *Pseudicius mikhailovi*, *Pseudicius tamaricis*, *Pseudicius wadis*, *Rafalus christophori*, *Rafalus feliksi*, *Rafalus karskii*, *Rafalus stanislawi*, *Rafalus* sp. uncertain 1, *Rafalus* sp. uncertain 2, *Rafalus* sp. uncertain 3, *Yllenus salsicola*, *Yllenus squamifer*.

The fauna of the Mediterranean environment seems to comprise sixty three species: *Aelurillus angularis*, *Aelurillus conveniens*, *Aelurillus gershomi*, *Aelurillus jerusalemicus*, *Aelurillus politiventris*, *Bianor albomaculatus*, *Bianor insignis*, *Chalcoscirtus infimus*, *Chalcoscirtus jerusalemicus*, *Cyrba algerina*, *Euophrys pseudogambosa*, *Evarcha nepos*, *Evarcha patagiata*, *Festucula vermiformis*, *Habrocestum latifasciatum*, *Habrocestum shulovi*, *Hasarius adansonii*, *Heliophanillus fulgens*, *Heliophanus curvidens*, *Heliophanus edentulus*, *Heliophanus encifer*, *Heliophanus equester*, *Heliophanus kochi*, *Heliophanus malus*, *Heliophanus mordax*, *Langona oreni*, *Macaroeris nidicolens*, *Mendoza canestrini*, *Menemerus davidi*, *Menemerus fagei*, *Menemerus semilimbatus*, *Menemerus taeniatas*, *Modunda staintoni*, *Mogrus neglectus*, *Pellenes epularis*, *Pellenes maderianus*, *Pellenes nigrociliatus*, *Pellenes ostrinus*, *Philaeus chrysops*, *Phlegra amitaii*, *Phlegra bresnieri*, *Phlegra dimentmani*, *Phlegra ferberorum*, *Phlegra fulvastra*, *Phlegra jacksoni*, *Phlegra levyi*, *Phlegra palestinesis*, *Phlegra particeps*, *Phlegra rothi*, *Phlegra shulovi*, *Phlegra stephaniae*, *Phlegra tillyae*, *Phlegra v-epigynalis*, *Plexippus devorans*, *Plexippus paykulli*, *Pseudophrys pascualis*, *Pseudicius miriae*, *Pseudicius palaestinesis*, *Salticus amitaii*, *Salticus propinquus*, *Salticus olivaceus*, *Synageles dalmaticus*, *Thyene imperialis*.

For two species the environment is unknown: *Pseudicius amicus*, *Pseudicius kulczyński*.

The above data correct preliminary information on distribution of Levantine *Salticidae* published previously (Prószyński 1988).

SYSTEMATIC PART

Salticidae Blackwall, 1841

Introductory remarks. *Salticidae* are best recognised by their general appearance, which should be memorised. The key is useful for the first acquaintance with particular genera, and for checking identification in case of doubt. However, particular genera of *Salticidae* are so diversified that characters used in the key may in some cases be insufficiently representative for certain species. It is suggested that genus identification should be confirmed by comparing the specimen with the respective drawings, given in the text of the present monograph.

The following genera, mentioned in the key, have not been discovered yet in the Levant, but are expected there, due to their general distribution and environmental requirements: *Carrhotus*, *Hyllus*, *Icius*, *Neon*, *Pachyballus*, *Phintella*, *Saitis*, *Talavera*. (Diagnostic drawings to these genera and their species can be seen in the Internet monograph: "Salticidae (Araneae) of the World" by Prószyński (2001 version) available in the Internet at: <http://www.miiz.waw.pl/salticid/main.htm> and <http://spiders.arizona.edu/salticid/MAIN.HTM>., or on CD disks.

Diagnosis. Medium size or small spiders (4–12 mm), recognisable by their unique anterior body end, which is broadly truncated, with 2 pairs of eyes on the face (anterior surface): large anterior median eyes (AME), and smaller (often by $\frac{1}{3}$ or $\frac{1}{2}$) anterior lateral eyes (ALE) (Figs 5–12). The remaining two pairs of eyes (of rows II and III) located on dorso-lateral edges of cephalothorax, delimit a quadrangular area between eyes, called eye field (extending to about half of cephalothorax). Body compact, legs short or moderately long. *Salticidae* move by jumping and walking, usually interrupted frequently by resting or ambushing periods; they are active hunters with complex behaviour. Mediterranean and Palaearctic genera spin silky retreats and cocoons but not catching webs.

A key to genera of *Salticidae* of Levant

1. Body shape characters 2
- Genital organ and other structural characters ...
..... (genital organ characters) 11
- Colour pattern characters
..... see separate key (below)
- 2(1). Peculiar shape and behaviour resembling ants:
abdomen constricted, petiolus long, not hidden
beneath edge of abdomen (Figs 325, 446, 694) ... 3

- Abdomen not constricted, petiolus usually hidden 5
- 3(2). Eye field distinctly elevated above thorax, which is constricted; male chelicerae greatly enlarged, often enormous; bulbus round, without protuberance, encircled two or three times by embolus, canal of seminal receptacle runs along lateral margin of bulbus, making to the centre of bulbus a characteristic, small, circular loop, extending over $\frac{1}{3}$ to $\frac{1}{2}$ of bulbus. Epigynum with posterior membranous "window", without distinct posterior rim, bisected by translucent longitudinal channels (Figs 451–452) *Myrmarachne*
- Eye field and thorax on the same level; thorax without constriction; male chelicerae not distinctly enlarged (Figs 325, 694) 4
- 4(3). Legs I comparable in size with legs II–IV; base of embolus located along anterior half of bulbus; embolus fleshy, stretching parallel to bulbus and extending ahead of it; epigynum sclerotized, oval with indistinct posterior oval depression, openings indistinct, spermathecae and channels large and thick walled, arranged longitudinally (Figs 325–329) *Leptorchestes*
- Legs I very long (particularly in M); palpal organ with bag-shaped bulbus, broadened posteriorly: embolus thin and short, slightly bent, arising from a broad antero-lateral stem (in Levantine species from a cavity on the median side of that stem) in apical margin of bulbus; apophysis short, thin, claw-like bent; epigynum is a convex plate, with hole, or slit in posterior edge; spermathecae small, arranged transversally (Figs 694–698) *Synageles*
- 5(2). Cephalothorax appears particularly long and low, abdomen long, narrowing posteriorly; legs I longer and/or more robust than other legs (Figs 241, 338, 594) 6
- Cephalothorax higher, abdomen not particularly long; legs I not distinctly longer than other legs 7
- 6(5). Tibia I swollen, with reduced spines and long trichobothria, a row of stridulatory setae on tubercles under lateral eyes; cephalothorax long, low and flat, abdomen elongate oval (Figs 594–598) *Pseudicius*
- As above, but abdomen enormously long and thin (Fig. 241) *Festucula*
- Tibia I with normal spines, not swollen, without a row of stridulatory setae under lateral eyes (Fig. 338) *Mendoza*
- 7(5). Cephalothorax broader than abdomen, often swollen laterally 8
- Cephalothorax not strikingly broader than abdomen 10
- 8(5). Cephalothorax almost round, swollen (strikingly to indistinctly) on the level of eyes II–III, eye field on top of conical elevation of cephalothorax, thorax sloping (Fig. 701) *Thylene*
- Cephalothorax distinctly broader near or behind eyes III, eye field flattened, trapezium-shaped 9
- 9(7). Cephalothorax swollen behind eyes III, anterior part of thorax flat or gently sloping (Figs 336–337) *Macaroeris* (similar in related genera *Dendryphantas* and *Rhene*)
- Cephalothorax broadest at eyes III, eye field trapezium-shaped, flat area of cephalothorax ends abruptly, posterior slope steep to almost vertical, eye field distinctly broader posteriorly, legs I are the longest (Figs 110–111) *Bianor*
- Like the above, but integument thicker and hardened *Harmochirus*
- Like the above, but abdomen longer (Figs 112, 123, 126, 129) *Modunda*
- Like the above, but legs III distinctly the longest (Fig. 453) *Neaetha*
- 10(7). Thoracic slope begins immediately behind eyes III, usually steep (Figs 564, 706) *Plexippoides* and *Ylenus*
- Cephalothorax in lateral profile rounded, body hairy *Carrhotus*
- Thoracic slope begins some distance from eyes III, after a level area; body appears hairy (Figs 394, 398–402, 501–502) *Mogrus* and *Philaeus*
- Flat area extends over half of thorax or more, legs in proportion to body appear long and robust, usually of similar length (Figs 369, 375, 577–582) *Menemerus* and *Plexippus*
- Abdomen broad, in males hardened (Figs 96–97), tibia I swollen; several separate retrolateral teeth on chelicerae ("pluridentati") *Ballus* and *Pachyballus*
- Spiders not conforming clearly to any of the above – see characters based on genital organs (also key by colour characters – below) 11
- 11(10). Genital organ characters
 - Males 12
 - Females 37
- 12(11). Characters of pedipalpal segments 13
 - Embolus shape characters 16
 - Bulbus shape characters 23
- 13(12). Pedipalpal femur straight, not broadened, without distinct protuberance or apophysis (majority of genera) 15
 - Pedipalpal femur semicrescent shaped and broad, often with small ventral protuberance (Fig. 352) 14
 - Pedipalpal femur with large horn-like apophysis (either single, bifurcated or trifurcated) (Figs 269–270, 297, 304–305 and others) *Heliophanus* (subgenus *Heliophanus*)
- 14(13). Pedipalpal tibia unusually broad, shorter than broad, minute hook on patella in some species (Figs 342, 343, 351–359) *Menemerus*

- Pedipalpal tibia of normal width, its length equal to or longer than width, but shorter than cymbium *Yllenus*
- Pedipalpal tibia thin and long, longer than cymbium, with long mane of white hairs, retrolateral tooth on chelicerae with two cones, fused basally (Figs 257, 260) *Hasarius*
- 15(13). Pedipalpal patella with complicated and large apophysis (Figs 281–282) *Heliophanus* (subgenus *Helafricanus*)
- Pedipalpal patella without apophysis 16
- 16(15). Embolus originating as thin needle-like process 17
- Embolus arising as apical fleshy process from the anterior part of bulbus, usually with various angular protuberances; bulbus opaque, seminal receptacle channels not visible (Figs 262, 269, 273, 281, 287, 292 and others) *Heliophanillus* and *Heliophanus*
- Embolus originating from a robust, fleshy stem, gradually narrowing, either separated from bulbus by a furrow in integument, or fused with it posteriorly, in some cases bulbus covered by harder shield, or membrane originating from stem of embolus 32
- 17(16). Embolus thinner than large fleshy conductor, arising from the same stem, antero-laterally or laterally to bulbus; seminal receptacle channel runs along margin of bulbus; tibial apophysis articulating with a groove, or process, on postero-lateral wall of cymbium (Figs 703–704, 710–711) *Yllenus*
- Embolus not followed by conductor, or only by an inconspicuous and thin conductor 18
- 18(17). Embolus short, making a coil smaller than bulbus, entirely visible, or hidden between bulbus and cymbium, in the latter case only a tip of embolus protruding from under bulbus 19
- Embolus long, either coiled around the whole bulbus, or straight, or gently bent 26
- 19(18). Seminal receptacle channel not visible through tegulum, which is opaque or thick, legs I–II distinctly shorter than III–IV 20
- Seminal receptacle channel translucent through semitransparent tegulum 23
- 20(19). Two tibial apophyses 21
- Single tibial apophysis 22
- 21(20). Tibial apophyses separated by narrow space, slit-like (V-shaped) or rounded (U-shaped) (Figs 511, 512, 513, 541–542, 547–548, 553), cephalothorax low and long, colour pattern usually striped; leg IV distinctly longer than III (by average of 36%) *Phlegra*
- Apophyses separated by broad, triangular space, ventral apophysis sclerotized, dorsal soft and light coloured, cephalothorax higher, dorsally rounded, abdomen broader and shorter (Figs 72, 75); leg IV indistinctly longer than III (average 3%) (Figs 22–27) *Aelurillus*
- 22(20). Apophysis accompanied by a parallel bunch of hard stiff setae, cymbium and tibia with large, hard flattened setae (Figs 309–312); body black with striking stripes, dorsally with large scales, black and white; large species, leg IV almost equal to III *Langona*
- Apophysis not followed by stiff setae ventrally (Figs 643, 646, 662–663), or hard flattened setae on cymbium, scales much less striking, profile of cephalothorax higher and more rounded (Figs 659, 660), coloration cryptic, legs III distinctly longer than IV (average 22%) (Fig. 647) *Rafalus*
- 23(19). Seminal receptacle channel thin, meandering or making large loops across bulbus. Embolus twisted into coil on the surface of bulbus, entirely visible, in some species located inside anterior cavity and then only tip visible 24
- Seminal receptacle channel makes irregular loops across the whole bulbus 25
- 24(23). Embolus makes small coil on ventral surface of oval bulbus, (Figs 136–141), differs from other genera by shiny external appearance *Chalcoscirtus*
- As above, but body not shiny (Figs 174–179) *Euophrys*
- As above, recognisable in males by striking row of black setae on metatarsus III, dorsally and ventrally *Saitis*
- Coil of embolus surrounds anterior depression in bulbus, or hidden inside it (with only tip protruding), bulbus often broadened anteriorly (Figs 198–199) *Pseudophrys*
- Embolus makes tight spiral on anterior surface of bulbus, tegulum divided into two shields; several separate retrolateral teeth on chelicerae, body resembling *Bianor* (Figs 101, 102) *Ballus*
- Spiral of embolus consists of single coil *Pachyballus*
- 25(23). Embolus either makes minute coil anteriorly on bulbus, or in a form of corkscrew or hook atop fleshy stem, spider small, general appearance very similar to *Euophrys* *Talavera*
- Coil of embolus broad and loose, lateral, with a bunch of spikes, spider small, resembling *Euophrys* *Neon*
- Embolus long, gently bent, making a very loose coil, runs along depression in cymbium (Fig. 330), spider does not resemble *Euophrys* *Macaroeris*
- 26(18). Length of embolus equal to $\frac{1}{2}$ diameter of the bulbus or less, bent or straight 27
- Embolus approximately equal to diameter of the bulbus or longer, bent or straight 29

- Embolus long, encircles bulbus once (Fig. 631) (in part) *Pseudicius*
- Embolus encircles entire bulbus two or three times **31**
- 27(26). Embolus hair-thin **28**
 - Embolus broader, often with flattened and split tip. Tibial apophysis arising from broader base, either as a gently narrowing process (Figs 230, 235) or short truncated cone ending with several minute sharp teeth (Figs 211–212, 220); embolus pressed closely to anterior margin of bulbus (in part) *Evarcha*
 - Embolus thin but with white fleshy extension, blade like, along its length; tibial apophysis broadly truncated, with several prominent teeth along edge *Hyllus*
 - Embolus broad apically, often with split apical end, tibial apophysis a thin process, gently bent (Figs 473–474, 476, 482, 484–488) *Pellenes*
- 28(27). Embolus anterior, hair-thin, short; bulbus transversely oval, its anterior edge often flattened (Figs 113, 115, 124, 133) *Bianor*, *Harmochirus* and *Modunda*
 - Embolus arises laterally; short, somewhat thicker; bulbus elongate oval (Figs 454–455, 457–458) *Neaetha*
 - Embolus tightly encircles anterior edge of oval bulbus and runs along half of its retrolateral part, pressed to its edge; tibial apophysis long and complicated (Figs 154–155) *Cyrba*
- 29(26). Postero-lateral angle of cymbium drawn into long thin apophysis, touching claw-shaped tibial apophysis, bulbus round with protuberance, embolus half encircles bulbus (Figs 565–566) *Plexippoides*
 - Postero-lateral surface of cymbium flattened and articulating with tibial apophysis, may be drawn into ventral process, bulbus oval, tibial apophysis blunt, in some species with small process directed dorsally (Figs 339–340) *Mendoza*
 - Postero-lateral surface of cymbium “normal” – without any special flattening, or angular apophysis **30**
- 30(29). Bulbus long, anteriorly oval, posteriorly with large long lateral protuberance, bent under angle; embolus encircles bulbus posteriorly, then runs along its side and extends along anterior elongated tip of cymbium (Fig. 503) *Philaeus*
 - Retrolateral end of cymbium normal, basis of embolus broad, deforming round shape of bulbus (Figs 403, 407) *Mogrus*
- 31(26). Bulbus with a tongue-like flap, cephalothorax broader than abdomen, swollen, spider not ant-like (Fig. 702) *Thylene*
 - Bulbus with robust protuberance (Figs 630–631) (in part) *Pseudicius*
- 32(16). Stem of embolus extends ahead of bulbus **33**
 - Stem of embolus does not extend ahead of bulbus, or only indistinctly, its prolateral edge is usually drawn medially, which gives bulbus broad appearance anteriorly, often with sclerotized and serrated rim; embolus relatively thin, arising diagonally and usually about half of diameter of bulbus, long and narrowing quickly; posterior end of bulbus forming a narrow process, (Figs 583–586) *Plexippus*
 - Embolus long and broad, originating from under tegulum, abdomen with a pair of round white spots (Figs 245–249) *Habrocestum*
- 33(32). Texture of embolus does not differ from its stem; large spider (Figs 341, 351, 354, 357, 360–368) *Menemerus*
 - Tip of embolus claw-like, different from texture of the stem **34**
- 34(33). Embolus short, narrow, or with a tip protruding from a sort of sheath; stem of embolus stretching forwards, covered by a long narrow shield being the extended and narrowing part of tegulum; bulbus bag-shaped; tibial apophysis a long broad plate (Figs 680, 685–688) *Salticus*
 - Embolus not covered by a shield **35**
- 35(34). Embolus stretching forwards, the almost straight, short, stem of embolus slightly longer than bulbus, part of the latter covered diagonally by membrane; pedipalpal tibia long, with mane of long white hairs, retrolateral tooth on chelicerae with two cones, fused basally (Figs 257, 260) *Hasarius*
 - Embolus comparable but pedipalpal tibia short, without mane of white hairs; single retromarginal tooth on chelicerae *Icius subinermis*
 - Embolus bent, stretching transversely; single retromarginal tooth on chelicerae **36**
- 36(35). Medium size, “hairy” spider, tibia dorsally as long and broad as cymbium; apophysis plate-like, broad, truncated *Carrhotus*
 - Small spider, not “hairy”, apophysis small, bent *Phintella*
- 37(11). Surface of epigynum not sclerotized, covered by setae **38**
 - Epigynum strongly sclerotized, at least in part **39**
- 38(37). Epigynum shield-like of unique shape (typical for the subfamily Spartaeinae) with sclerotized posterior edge, with translucent large spherical spermathecae and anterior arches of channels, openings practically invisible, in the median posterior part of epigynum (Figs 156–157) *Cyrba*
 - Openings median anterior; visible because of their sclerotized sharp triangular roofs, followed posteriorly by broad, contiguous channels, which turn anteriorly at the end of epigynum, and in

- the mid-length of epigynum pass into small, cone-shaped spermathecae (Figs 505–506) *Philaeus*
- 39(37). Surface of epigynum almost flat, smooth, its posterior edge is cut into two bays separating a small medial process; copulatory openings hidden under short copulatory channels running anteriorly into coiled sclerotized spermathecae, translucent on epigynum as a pair of dark spots (female of the local species as yet unknown) *Mendoza*
- Epigynum in form of a simple concave sclerotized plate 40
 - Surface of epigynum sculptured 41
- 40(39). Epigynum simple, sclerotized oval plate with anterior median openings, translucent straight channels and transverse spermathecae *Icius*
- Epigynum simple sclerotized depression with translucent spermathecae appearing as two darker spots; since chambers of spermathecae are developed perpendicularly to epigynum, they are poorly visible and look variable on microscope slides (Figs 258–259) *Hasarius*
- 41(39). Epigynum with a pair of sclerotized pockets . . . 42
- Epigynum without sclerotized pockets 43
- 42(41). Large median depression, sometimes divided by thin ridge or broader septum, accompanied by a pair of sclerotized pockets (Figs 599–604) (in part) *Pseudicius*
- Epigynum with anterior groove or a pair of grooves of various sizes, usually with a pair of sclerotized pockets, variously located; internal structures complicated, consist of long channels running from lateral indistinct openings through several bends extending over at least half of epigynum length or longer, spermathecae resembling broader portion of the channel; strikingly long channel of the scent pore (Figs 616–619, 621–622, 626–629) (in part) *Pseudicius* (*tamaricis* group), (in part) *Evarcha*
- 43(41). Epigynum with prominent vaginal roof, opening on its ventral surface 44
- Sclerotized vaginal roof hidden beneath the posterior edge (dorsally to epigynum), translucent through the wall of epigynum 47
 - No visible sclerotized vaginal roof 49
- 44(43). Epigynum with white membranous “window” and prominent vaginal roof in the posterior part of the window. Characteristic appearance of epigynum (Figs 117–122) *Bianor*, *Harmochirus* and *Modunda*
- Epigynum without membranous window(s) . . . 45
- 45(44). General plan of epigynum resembles *Bianor*, however window replaced by a groove (Fig. 456) *Neaetha*
- Epigynum with two grooves and superficial opening of vagina, but not directly resembling *Bianor* 46
- 46(45). Vaginal roof – short anterior swelling surrounded by semilunar groove, copulatory openings on both sides of median groove, in a form of diagonal slits, channels broad, large spherical spermathecae (Figs 587–592) *Plexippus*
- Median ridge (ending with vaginal opening located variably: anteriorly to posteriorly) long and prominent, separates two sclerotized grooves with transverse copulatory openings; spermathecae a complicated body with internal convoluted chambers (Figs 467–472, 478–480, 483) *Pellenes*
 - Epigynum whitish, vaginal roof bell-shaped, indistinctly rising above epigynum, copulatory openings small, indistinct, close to apical end of roof; simple spermathecae and channels translucent through integument (Figs 707–709, 714–716) *Ylenus*
- 47(43). Epigynum with prominent anterior sclerotized “wings”, diagonal or transverse, copulatory openings near junction of “wings”; indistinct, internal structures in a form of compact, spherical body with internal convoluted chambers, or a knot of convoluted channels, (Figs 40–45, 60, 67–69, 73–74, 82–85, 87–90) *Aelurillus*
- Epigynum flat, with large, prominent openings, variably spaced and located, in some species separated by median ridge, channels running from openings anteriorly, spermathecae antero-medial, usually bent, with internally convoluted, very complicated chambers (Figs 508–509, 517–521, 522–529, 530–535, 536–539) *Phlegra*
 - Epigynum flat, with distinct openings postero-medially, channels thin walled, running anteriorly, long, bent in S-shape, passing into very small, horn shaped spermathecae with a few, small, internal chambers (Figs 640–641, 648–649, 650–653, 657–658, 667–672, 673–674) *Rafalus*
 - Epigynum a variable sclerotized plate with two large depressions, often blocked by waxy secretion, heavily sclerotized median channels, as broad as spherical spermathecae (Figs 344, 345–350, 370–374, 377–378, 386–389) *Menemerus*
 - Epigynum a concave sclerotized plate with indistinct openings 48
- 48(47). Epigynum a sclerotized depression, elongate oval, with antero-lateral or median openings; spermathecae long, channel-shaped and bent, vaginal roof rudimentary, atypical (Figs 690–693) *Salticus*
- Epigynum a sclerotized depression transversally oval with antero-lateral spermathecae (Figs 478–480, 483) (in part) *Pellenes*

- 49(43). Epigynum with membranous “window” or “windows” **50**
- Epigynum sclerotized, with groove(s) or flat surface **56**
 - Epigynum with single, median longitudinal slit, narrow or broadened into concave plate **58**
 - Epigynum variable from sclerotized to soft, usually with a pair of longitudinal slits, in some species with a pair of slits joining into single posterior slit; channels broad, usually membranous, running posteriorly, then bending medially and passing into small sclerotized spermathecae (Figs 395–397, 415–420, 433–439) **Mogrus**
- 50(49). Membranous window(s) in anterior or median part of epigynum, or at least delimited from posterior end of epigynum by a distinct sclerotized rim **51**
- Membranous “window” posterior, delimited by robust posterior rim (which passes into vertical wall) and lateral semi-arches, all strongly sclerotized (Figs 313–318, 319–324) (comparable also in *Evarcha jucunda* and *patagiata* Figs 224–228) **Langona**
 - Sclerotized vaginal roof under epigynum small, indistinct. Large transverse oval membranous white “window”, with translucent dark internal structures, very complicated consisting of large channels running anteriorly and then reversing back, passing into two sclerotized chambers connected by soft channels (Figs 250–251, 253–255) **Habrocestum**
- 51(50). Medium size spiders with single “window” ... **52**
- Medium size or small spiders with a pair of “windows” **53**
 - Small or very small spiders **54**
- 52(51). Single white membranous “window” small, narrow or square, anterior, with openings hidden at its sides; remaining part of epigynum yellow, weakly sclerotized, no pockets; internal structures with coiled membranous channels, long scent pore channel (Figs 699–700) **Thyene**
- Membranous “window” large, oval or rectangular, in the anterior half of epigynum, sometimes partially divided postero-medially but not by vaginal roof (Figs 214–216, 222–223); the posterior half of epigynum strongly sclerotized, with pockets, in *E. jucunda* and *E. patagiata* well developed posterior vertical wall (Figs 224–228) **Evarcha**
 - Membraneous “window” posteriorly with semi-circular, broad, sclerotised arches surrounding copulatory openings; large specimen (10–12 mm of length) **Hyllus**
- 53(51). Membranous “windows” extend over the whole length of epigynum, touching its posterior edge, dorsal abdominal pattern consist of dispersed irregular dark dots **Saitis**
- “Windows” large oval (more than half epigynum length or longer), usually a pair of sclerotized pockets (posterior, median or anterior); channels complicated, their anterior part arching close to spermatheca, joining its lateral end, either directly or after making a coil(s); spermathecae transverse, accessory glands opening on anterior wall of spermathecae; body long, flat (Figs 599–604, 608–609) (in part) **Pseudicius**
 - May also be without membranous “windows” (Figs 616–619, 621, 626–629, 632) (in part) **Pseudicius**
 - A pair of oval “windows”, spermathecae oval or bag-shaped, in some species constricted into two chambers, located posteriorly or laterally to “windows”, channels relatively broad, opening at the posterior edge of “windows”; small spider **Pseudophrys**
- 54(51). Single “window”, in some species divided by a septum, channels relatively broad, originating on top of globular spermathecae; integument of the whole cephalothorax and legs light reflecting (but not abdomen) (Figs 142–144, 145–150, 151–152) **Chalcoscirtus**
- Integument not reflecting light **55**
- 55(54). “Window” partially overlaps spermathecae, channels runs beneath “window” membrane, in some cases coiled, openings in the center of window or at its anterior end (Figs 159–162, 165–168, 186–191) **Euophrys**
- Channels very narrow, originating medially from globular spermathecae **Talavera**
- 56(49). Epigynum with two deep anterior grooves, usually with sclerotized black rims **Neon**
- Grooves posterior, with openings hidden inside median ridge, channels run anteriorly, spermathecae S-shaped (Figs 242–243) **Festucula**
 - Epigynum with single depression, sometimes divided by a septum **57**
- 57(56). Depression median, strongly sclerotized (round or transversely oval, sometimes surrounded by an elevated rim), sometimes divided by median ridge, or two separate sclerotized depressions; copulatory openings lateral with simple channels, usually bent, spermathecae small and simple (Figs 267, 271–272, 276–278, 280, 284, 290–291, 297–298, 301–302, 307–308) **Heliophanillus** and **Heliophanus**
- Copulatory openings located anteriorly in a depression, (in related genus *Dendryphantes* in semilunar groove) channels postero-median, chambers complicated (Figs 333–335) **Macaroeris nidicolens**
- 58(49). Epigynum relatively weakly sclerotized, with a prominent anterior pit, surrounded anteriorly by semilunar rim, copulatory openings antero-

- median, channels broad, running posteriorly, coils posterior (Figs 98–100) *Ballus*
- Epigynum resembling *Ballus*, but anterior depression divided into two, copulatory openings lateral *Pachyballus*
 - Pit medially along whole epigynum, spermathecae simple spherical, channels thin, straight, openings anterior *Phintella*
 - Copulatory openings anterior in a small, lighter coloured depression, followed by a slit delimited by antero-lateral ridges; broad channels and elongate spermathecae with internal convoluted chambers (Figs 567–571, 573–576) *Plexippoides*

Simplified key to genera of Salticidae – by colour characters

1. Integument of the whole body in males bald, shiny and light-reflecting like a mirror (in females only cephalothorax and appendages shiny, but not abdomen), v. small spiders *Chalcoscirtus* (cf. also *Harmochirus*)
 - Abdomen covered by black, shiny, light-reflecting scutum; medium-size cursorial spiders (Figs 75–81) *Aelurillus politiventris* group (also N. African *Phlegra nitidiventris*)
 - Integument not polished and not reflecting light; any reflection is due to scales, or setae, and usually is much weaker 2
- 2(1). Abdomen covered by light-reflecting scales 3
 - Abdomen appears more or less matt and “hairy”, if covered by scales then these do not dominate its appearance 7
 - Abdomen dark mosaic on lighter background, with or without contrasting spots or streaks 10
- 3(2). Background of abdomen smooth, unicoloured: (black, iridescent blue, violet or green), with or without white spots or lines 4
 - Abdomen coloured strikingly bright (pink or yellow) (if red but hairy – see *Philaeus*) 5
 - Abdomen silver with darker median streak (Figs 703) *Yllenus*, (in part) *Mogrus*
 - Abdomen with dark spots or lines on light background 6
- 4(3). Abdomen uniformly dark or with striking median pairs of small white spots or single or pair of streaks, but without diagonal, or transverse lines, except a thin anterior marginal line; legs often yellow; slim spiders with narrow cephalothorax, usually small (Figs 275, 279, 289, 306) *Heliophanus*
 - As above, with pairs of white spots, but without femoral/patellar apophyses, very small spiders (Figs 261, 266) *Heliophanillus*
 - Abdomen black with marginal pairs of small white spots; cephalothorax strikingly broad (Figs 110–112, 126, 129) *Bianor* and *Modunda*
- Abdomen dark, with pairs of transverse or diagonal white stripes (“zebra spider”), but no median streak (Figs 677–679) *Salticus*
- Abdomen with striking median white line, continuous or broken, sometime with one or two pairs of diagonal or transverse white lines marginally and thick anterior line; cephalothorax usually with white spots behind eyes III and a median white line (Figs 459–465) *Pellenes*
- 5(3). Body pink or orange, abdomen posteriorly black with white triangle, cephalothorax narrow (Fig. 153) *Cyrrba*
 - Body yellow, with dark spots on abdomen in males, cephalothorax swollen at eyes II–III (Fig. 701) *Thyene*
- 6(3). Abdomen elongated with several pairs of submarginal dark brown spots; a row of stridulatory spines on tubercles beneath lateral eyes (Figs 594–598) *Pseudicinus*
 - Thin marginal dark lines on white backgrounds along the whole, enormously elongated abdomen, a row of stridulatory spines on tubercles beneath lateral eyes (Figs 241) *Festucula*
 - Abdomen long, thin, posteriorly pointed, light reflecting, dark brown with thin blackish median line and four pairs of small white spots; male only (Fig. 338) *Mendoza*
- 7(2). Coloration dull greyish with ill defined lighter spots; hairy appearance *Carrhotus*
 - Body mainly greyish, with indistinct darker pattern *Aelurillus*, (in part) *Phlegra* and *Rafalus*
 - Abdomen light suffused with grey, often with grey median chevrons, small spiders (Figs 158, 163, 164, 172–173, 180–185) *Euophrys*
 - Abdomen with pairs of dark diagonal lines on lighter background (sometimes yellow or pink) usually with white anterior line (Fig. 200) ... (in part) *Evarcha*
 - Body with contrasting pattern 8
- 8(7). Cephalothorax with a pair of contrasting white stripes on black background, abdomen posteriorly pointed with median white stripe, large spider (Fig. 309) *Langona*
 - Cephalothorax with a pair of less contrasting light stripes on dark background, abdomen either with stripes (Figs 507, 515), or pairs of indistinct spots on grey background (Fig. 516), medium size spiders *Phlegra*
 - Abdomen hairy, blackish grey with a pair of white streaks, large spider – females only (Fig. 502) *Philaeus*
 - Abdomen with single, median streak or large white spot 9
- 9(8). Abdomen with single median streak, body hairy ... 10
 - Abdomen black with large white spot anteriorly, male only (Fig. 201) *Evarcha nepos*
 - Body does not appear hairy 11

- 10 Dark median serrated abdominal streak, with lighter contours or on light background (Figs 398–402) *Mogrus*
- Abdomen red with longitudinal black streak contoured by a thin white line (Fig. 501), males only *Philaeus*
- 11(9). Abdomen with light streak on mosaic background but without pair of white spots 12
- Abdomen mosaic with contrasting pair of white spots, usually with median streak (absent or indistinct in *Habrocestum*) 13
- 12(11). Abdomen elongated and thin, with marginal grey spots, medially light but without contrasting streak, male only *Mendoza*
- Abdomen not elongated, with pairs of dark diagonal lines on lighter background (sometimes yellow or pink) usually with white marginal line, no stridulatory spines on tubercles beneath lateral eyes (Figs 200) (in part) *Evarcha*
- Broad but ill-defined light streak along abdomen and cephalothorax, usually broad white areas along lower sides of cephalothorax (Figs 369, 375) *Menemerus*
- 13(11). Abdomen with broad median light longitudinal streak, posteriorly with a pair of lateral spots and a few chevrons, extended anteriorly by light thoracic streak, in some forms reaching eyes I; large or medium size spiders (Figs 577–578, 580, 582) *Plexippus*
- Abdomen with light median streak and a pair of small white spots posteriorly, attached to median light streak; male pedipalpal tibia longer than cymbium, with long mane of white hairs, retrolateral cheliceral tooth bifid (Figs 256) *Hasarius*
- Abdomen with a pair of large white spots posteriorly often fused medially, male cymbium dorsally with round spot of white scales (Fig. 244) *Habrocestum*
- None of listed character gave satisfactory identification – return to the key based on genital organs characters.

Aelurillus Simon, 1884

Type species. *Araneus litera v-insignitus* Clerk, 1758.

Introductory remarks. The genus *Aelurillus* presents considerable difficulties for a taxonomist because of general similarity of external appearance of palpal organs in males, and considerable individual variation in females. While the best characters of the genus seem to be colour and setae patterns on clypeus, cephalothorax, abdomen and legs, these seem to be variable during the life cycle of an individual, due to rubbing off, and are also prone to gradual fading during preservation in alcohol.

Aelurillus contains some 50 species in the Old World, many of them numerous and common in the Mediterranean and Levant. As the specimens are usually collected individually, seldom together, and there are a number of species in any given area, there is little premise for matching sexes of preserved specimens collected in the same locality without biological and/or behavioural research. There is a broad variation in setae and colour pattern between specimens from local populations within Israel and adjacent countries, and it is uncertain whether that is due to individual variation within one species, incipient speciation, or similarity in closely related but discrete species.

Due to the difficulties mentioned above, the present account of species of *Aelurillus* is provisional and requires further studies. Only certain species can be identified now and several species reported from the Levant during the 19th century cannot be recognised.

Body proportions in Levantine *Aelurillus*. Shape of cephalothorax long, narrow, its width is 47–55–60% (lowest, mean and highest of length of the cephalothorax) at eyes I, 62–68–83% at eyes III and 72–76–88% at the broadest part, which is located at about 60% length of cephalothorax; sides of the cephalothorax appear to be rather swollen at this point; height is 43–50–56%. Eye field short extending over 31–38–45% of cephalothorax, trapezoid shaped, narrowing posteriorly by +1–5–9% indistinctly narrower than cephalothorax, and eyes III are located close to dorsal edges of cephalothorax. Eyes I set in a diagonal plane directed down, diameter of AME about twice that of ALE. Highest point of eyes ALE set above dorsal rim of eyes AME (about half to 1/6th of their diameter) which makes anterior edge of eye field depressed between ALE and anterior part of eye field sloping forward. Dorsal profile of cephalothorax: gently rounded without developed distinct flat surface, anterior slope partially hidden behind swelling of eyes ALE, levels about halfway to eyes II, highest at eyes III then very gently sloping down, becomes steeper at 75–82% of length of cephalothorax. Shape of abdomen: somewhat shorter than cephalothorax and as wide, its width is 77% of length of abdomen. Length of legs order (in % of length of 5 segments of leg I, lowest, mean and highest %): IV 113–131–150%, III 111–128–142%, I 100%, II 92–99–106%.

Key to species of *Aelurillus*

1. Males 2
 - Females 9
- 2(1). Highest point of eyes ALE set indistinctly above dorsal rim of eyes AME (about 1/6th of diameter); Entire dorsal surface of abdomen covered by light reflecting scutum *politiventris* group 3
 - Highest point of eyes ALE set distinctly above dorsal rim of eyes AME (about half of diameter or more) *conventiens* group 4

- 3(2). Clypeus covered with white setae, broad belt of white setae along ventral edge of carapace *politiventris*
 – Clypeus dark, no belt of white setae along ventral edge of carapace *gershomi*
- 4(2). “Hairy appearance” owing to white long setae over dorsum and sides of thorax, considerably longer on lower sides and femora I–IV where they form a white mane, bulbous distinctly longer *sinaicus*
 – Not particularly “hairy” appearance 5
- 5(4). Cephalothorax entirely black 6
 – Cephalothorax appear whitish, white or grey, in spite of black tegument, owing to setae coverage; white line along ventral margin [the above set of characters fit also type species of the genus – *Ae. v-insignitus* which, however, has no prominent fur ventrally on femur I] 7
- 6(5). Orbital setae dark, face entirely dark, cephalothorax dark *nabataeus*
 – As above, but there is a triangle of dense and long white setae on clypeus beneath AME *cognatus*
 – White orbital setae along ventral rims of eyes I, absence of black fur on tarsus-tibia I *catherinae*
- 7(5). Cephalothorax dark, covered uniformly with whitish minute and narrow scales on fresh specimens, black fur on tarsus – tibia I; in alcohol sides dark brown with short, colourless scales, single median whitish line on dark anterior slope of eye field; orbital setae of AME prominently white, on ALE ventrally white, dorsally fawn; white setae on clypeus *kochi*
 – Setae coverage differentiated into more whitish on dorsum and less whitish (and darker) on sides 8
- 8(7). Face whitish, anterior slope of eye field whitish with three more whiter lines; tarsus I dark with white setae *aeruginosus*
 – Face dark, anterior slope of eye field black *conveniens*
 – Face dark with striking white setae on clypeus *bokerinus*
 – Face dark with spots of white setae beneath ALE, orbits of eyes I dark; femur I ventrally with striking transverse broad line of black setae near apical end, remaining 2/3rd of femur I ventrally light with white setae (known as yet from Saudi Arabia) *faragallai*
- 9(1). Sclerotized wings of epigynum connect medially, copulatory openings posterior to that connection, not separated by a ridge (type species, unknown yet from the Israel) *v-insignitus*
 – Sclerotized wings of epigynum separated, copulatory openings medial, between tips of “wings” 10
- 10(9). Sclerotized “wings” of epigynum merging with pigmented area; eyes ALE set strikingly above dorsal rim of eyes AME, by about 1/2th of diameter, or more; face, orbital setae and clypeus whitish or white *conveniens* group 11
 – Sclerotized “wings” separated by a narrow lighter space from darker pigmented area; eyes ALE set indistinctly above dorsal rim of eyes AME (about 1/6th of diameter) *politiventris* group 12
- 11(10). Epigynum – see Figs 40–42, anterior slope of eye field with whitish, short setae *aeruginosus*
 – Epigynum – see Figs 43–45, anterior slope of eye field bald and black *bokerinus*
 – Epigynum – see Figs 67–69 *kochi*
 – Epigynum – see Figs 73–74 *conveniens*
- 12(10). Thoracal hind edge with sharp lateral angles (Figs 57–59), sclerotized “wings” almost transverse, thin and short (fig. 60) *angularis*
 – Thoracal hind edge with rounded lateral angles; “wings” set at an angle, broad or sharp, usually long 13
- 13(12). Angle of “wings” broader (Figs 82–83) *politiventris*
 – Angle of “wings” narrower (Figs 84–85) *gershomi*
 – “Wings” almost parallel, leaving median elevated part narrow (Fig. 90) *jerusalemicus*

Aelurillus aeruginosus (Simon)

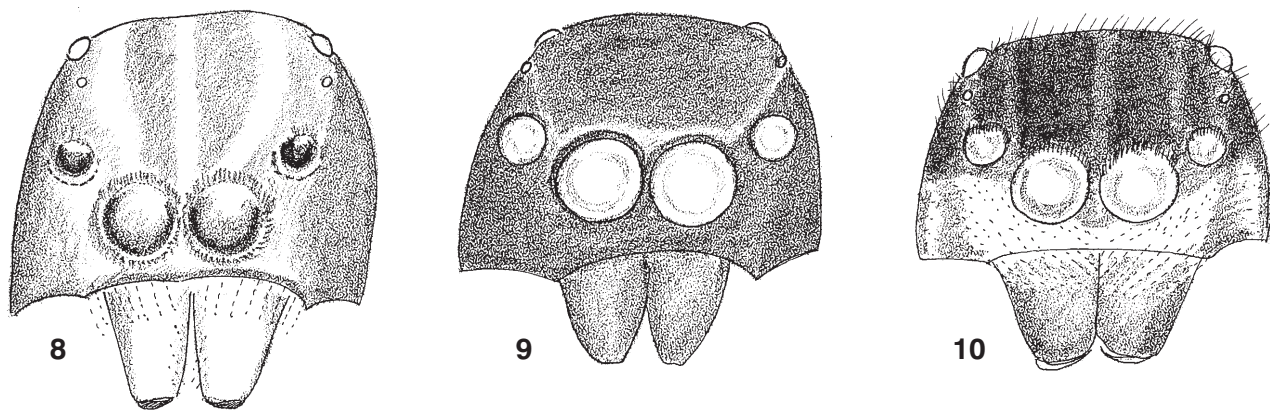
(Figs 8, 13, 14, 21, 27, 33, 39, 40–42, 46–49, 53–56)

Attus mustellatus Simon, 1868b: 530 (preoccupied Nicolet 1849: 376);
Attus arenicolor Simon, 1868b: 723 (preoccupied Grube 1861: 26);
Attus aeruginosus Simon, 1871: 154;
Salticus arenicolor: O. Pickard-Cambridge 1872: 322;
Aelurillus aeruginosus: Hansen 1991: 15, Fig. 16.

Diagnosis. Male cephalothorax covered with light setae on black tegument, yellowish on sides, contrasting white dorsum and a thin line along ventral edge; face white, anterior slope of eye field whitish with three stronger white lines, pedipalps yellow with long yellow setae; legs yellow, femora dorsally uniformly light, tarsus-metatarsus I contrasting dark. Female anterior slope of eye field whitish, clypeus covered with sparse and short white setae, longer white setae, if present, overhang cheliceral bases but leave relatively darker band below AME; abdomen with indistinct dark dots.

Description. Male. Cephalothorax: tegument dark brown covered with short white adpressed setae, making lighter belt on eye field and dorsum and a thin, intensively white line along ventral rim of cephalothorax, setae less dense, yellowish, on sides, which appears darker. Eye field with scales: posteriorly whitish, anteriorly arranged into three longitudinal white lines, lateral of which slightly diagonal and longer. Femora dorsally yellow, with whitish setae.

Abdomen covered densely with adpressed and smooth, elongate, scale like setae, white, with slightly fawn hue, a few dark bristles marginally.



Figures 8–10. Features of *Aelurillus*. Frontal aspect. *Ae. aeruginosus* (8), *Ae. nabataeus* (9), *Ae. politiventris* (10).

Face: tegument dark brown, densely covered with white setae, dense enough to give it whitish appearance, denser than in *Ae. kochi*, AME surrounded by thin intensively white rings, diagonal setae overhanging cheliceral bases, distinct whitish setae on anterior surface of chelicerae; on dorsal rim of ALE a group of light fawn (light orange) setae. Eyes I set in a diagonal plane directed part way down, diameter of AME = 1.8 diameter of ALE. ALE set practically above AME, their ventral rim almost aligned with dorsal rim of AME. Chelicerae light brown with white setae, sparser and thinner on lower parts.

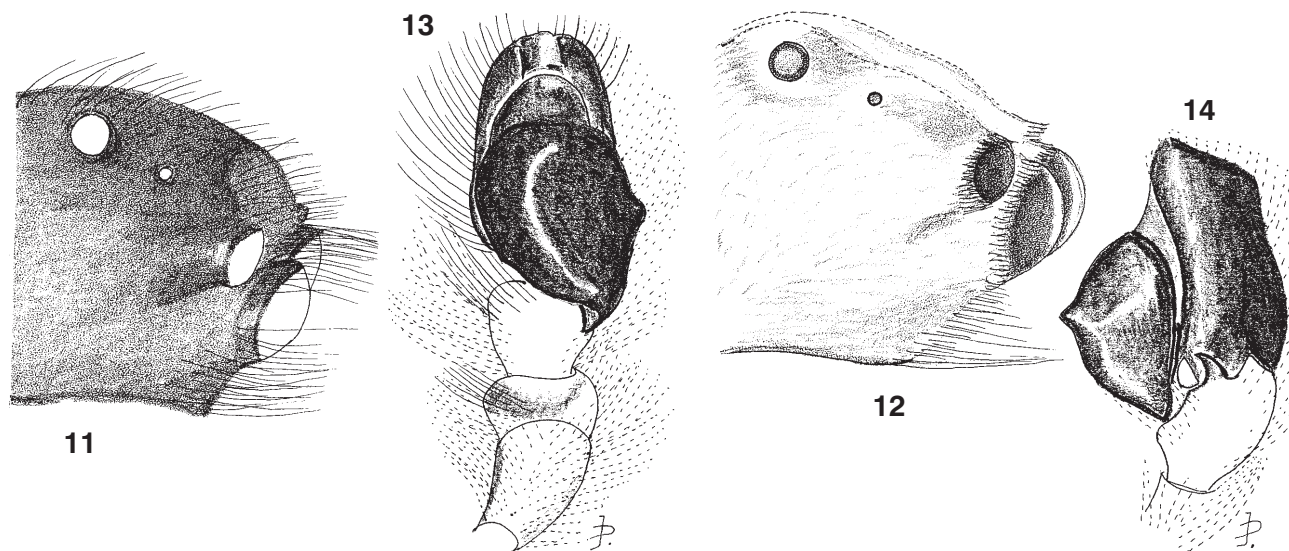
Pedipalps whitish yellow with white setae, cymbium and tibia dorsally dark, covered with white setae; pedipalpal femur whitish yellow with long mane of white setae on prolateral surface and on retrolateral edge.

Palpal organ. Cymbium blackish, with lighter tip, bulbous intensive black; ventral apophysis sclerotized

brown, broadly triangular, with dorsal edge running transversally, ventral edge gently bent; dorsal ramus yellow and fleshy, hidden beneath dense white setae, in a form of much narrower, low triangle.

Ventral view: sternum dark brown, coxae whitish yellow, abdomen light.

Legs I whitish yellow, with prolateral surface of tibia I and dorsal surface of tarsus and metatarsus dark brown, but covered with whitish setae. Femur I yellowish to brown with lighter spots laterally, retrolateral surface with sparse addressed whitish setae, gradually longer ventrally, forming narrow mane along apical half of ventral edge of the segment, longer at apical 1/3rd with two spots of admixed grey setae, in some specimens darker setae are dark brown and harder, their ends may appear to make a kind of sharp blade, coming into contact with retrolateral surface of patella I. Prolateral surface of femur I lighter with addressed whitish setae.



Figures 11–14. Features of *Aelurillus*. Difference in profile of anterior slope of cephalothorax in male of *Ae. conveniens* (11) and in female of *Aelurillus* sp. of the *politiventris* group (12); *Ae. aeruginosus* black coloration of palpal organ ventrally (13) and laterally (14).

Female. Cephalothorax dorsally covered with whitish scales, with groups of slightly darker fawn scales; dorsal surface distinctly more white than sides. Eye field with adpressed greyish fawn scales, without distinct white lines, black bristles over eye field more prominent than in male.

Abdomen dorsally yellow with greyish dots scattered, covered with tiny adpressed scales, more smooth than in female of *Ae. cognatus*.

Face covered with dense small white setae, on black tegument. ALE located $\frac{3}{4}$ of their diameter above rim of AME, surrounding of AME medially pale fawn, ventrally white; setae around ALE pale fawn, ventrally whitish making transverse, slightly diagonal line, stretching from the rim of AME onto sides. Clypeus covered with a belt of pale fawn setae, almost white, but not strikingly so, setae arranged horizontally, under AME turning diagonally ventralwards, on the edge of clypeus more strikingly white; height of the clypeal belt equal to 1/2 diameter of AME.

Ventral aspect: sternum greyish yellow with shorter but denser white setae, abdomen ventrally – light yellow with minute sparse setae. Epigynum transversely narrower than in *Ae. bokerinus*.

Leg lengths in % of leg I (= 100%): II 1.04%; III 153%; IV 154%; legs III and IV longer than in *Ae. cognatus* by about 20%.

Measurements (mm). Male. Length of cephalothorax 2.18; length of abdomen 1.93; length of 5 segments of leg I 3.38. Female. Length of cephalothorax 2.70; length of abdomen 4.05; length of 5 segments of leg I 4.11.

Seasonal appearance of adult specimens. Males – I, III, IV, V, VIII.

Distribution. Sicily, Spain, Syria. Israel: Massada (7), Kalia at Dead Sea shore, En Gedi (sulphur springs), En Tamar (13), Be'er Sheva (15), Sede Boqer (17).

Aelurillus angularis Prószynski
(Figs 57–60)

Aelurillus angularis Prószynski, 2000: 232, Figs 1–4.

Diagnosis. Female characterized by angular thoracic hindmargin, epigynum with thin “wings”, almost transversely oriented, broadly spaced. Abdomen with conspicuous, alternating light and dark dots.

Description. Female. Cephalothorax: profile of cephalothorax long, thoracic hindmargin with sharp lateral angles; tegument brown covered with white adpressed setae, in patches of varying densities producing irregular white and dark mosaic pattern.

Abdomen: shrunken and folded, with dense pale brownish setae, traces of two longitudinal chains of small alternating dark and lighter small spots; a number of short dark brown bristles over the whole dorsal surface.

Frontal aspect: eye field in this position with white, wedge-shaped median spot of adpressed setae, limited posteriorly and laterally by darker lines, these in turn followed by whitish line. Eyes I encircled by white orbital setae. ALE aligned $\frac{1}{4}$ of diameter above dorsal rim of AME, eye field indistinctly depressed above AME, between low protuberances formed by ALE. Diameter of ALE about $\frac{1}{2}$ that of AME, height of clypeus approximately 0.6 of AME. Clypeus covered by white setae set horizontally, a few of them overhanging chelicerae, mixed with a few short white setae located basally on chelicerae. Lateral edges of face broadly rounded. Pedipalps yellow, with long white setae laterally, tarsus brownish yellow.

Legs fawn, with brownish and white annuli.

Epigynum with thin “wings”, transverse and narrow, broadly spaced.

Measurements (mm). Female. Length of cephalothorax 2.34; length of abdomen >2.17.

Material. Female holotype – Jerusalem: Mt. Scop.[us] 4. V. 40. Coll. HUJ.

Remark. Specimen in poor condition: cephalothorax with soft tissues destroyed, abdomen contracted and folded.

Seasonal appearance of adult specimens. Females – V.

Distribution. Israel: Jerusalem – Mt. Scopus (11).

Aelurillus bokerinus sp. nov.

(Figs 20, 26, 32, 38, 43–45, 50–52, 63–64)

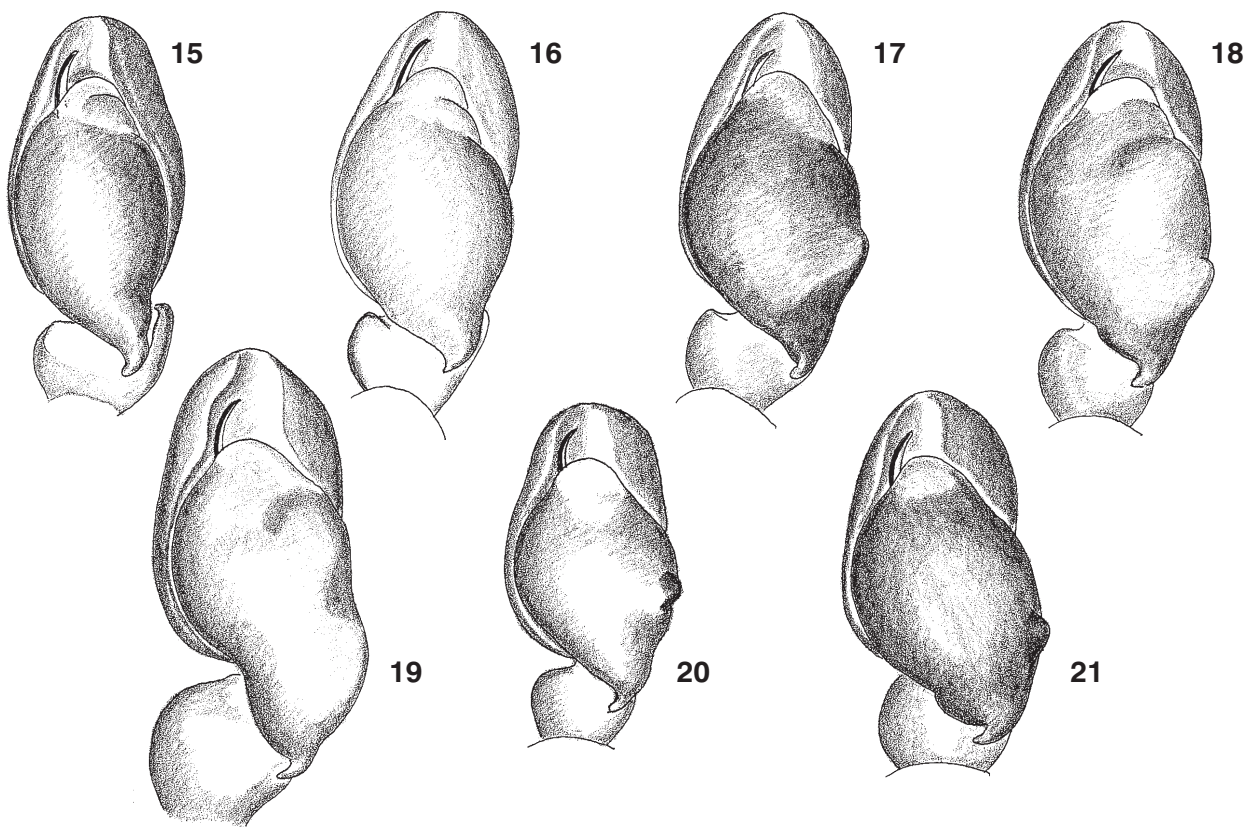
Diagnosis. Preserved specimens have cephalothorax covered by small white scales, contrasting with black or dark brown cephalothorax, with anterior slope of eye field bald and black; it has striking white setae beneath large anterior eyes, above chelicerae in both males and females.

Female abdomen smooth, silver whitish, without any dark dots.

The nearest species is *Ae. kochi*, which is larger and has striking fur of black setae on tarsus I.

Remark. Males and females are by far most numerous species found in Sede Boker area. The conspecificity of both sexes seems probable because similarity in their external appearance, the second common species around Sede Boker – *Ae. aeruginosus* has male distinctly different, and females to some extent different (see description above).

Description. Male. Cephalothorax in preserved specimen: tegument black, covered uniformly with adpressed, small and narrow whitish scales, except anterior slope of eye field which is bald, intensively black and light reflecting. There is a line of intensively white setae beneath ventral edge of carapace. Frontal aspect: face black with intensively white setae on clypeus, dense and long, overhanging cheliceral bases; group of these setae is triangular – narrower dorsally (to the width of



Figures 15–21. Interspecific variation in *Aelurillus conveniens* species group. Palpal organ, ventral view, (semidiagrammatic) in *Ae. conveniens* (15), the same organ in a slightly different position (16), *Ae. kochi* (17), *Ae. catherinae* (18), *Ae. sinaiticus* (19), *Ae. bokerinus* (20), *Ae. aeruginosus* (21).

AME), expanding ventrally. Eyes I – rim of AME consist of intensively white scales ventrally, less intensively whitish laterally, colourless scales dorsally on black background give dark appearance. Rims of ALE whitish, space beneath ALE – intensively black tegument. Chelicerae dark brown covered with sparse, long, black bristles. Abdomen with dark brown tegument, covered uniformly with dense, silver whitish scales, resembling those on cephalothorax, there is anterior median streak of darker bald tegument. Spinnerets yellow.

Ventral aspect. Coxae and mouth parts greyish yellow, sternum blackish brown with white setae. Abdomen ventrally greyish yellow with short white setae.

Pedipalps. Cymbium blackish brown, covered with short whitish setae, apically lighter brown with grey setae. Bulbus brown. Tibia yellow with dark brown apophysis.

Pedipalps. Apical tip of pedipalpal femur, patella and tibia yellow, covered with intensively white long setae, these are particularly long on tibia, making a white fan in front of black cymbium. Legs. Leg I anteriorly yellowish brown, with patella lighter and covered with adpressed whitish setae, tibia and metatarsus gradually darker, tarsus dark brown with black bristles. Femur I with narrow dark brown ring basally, with yellow ventral and posterior 1/3rd of retrolateral surface, which are covered with

dense longer and apparently softer setae, apical half of retrolateral surface brown with longer and stiff darker, greyish brown setae, extending beyond ventral edge of femur. Remaining parts of femur surface covered with short adpressed whitish setae, resembling those on other femora. Apical tip of dorsal surface of femur I light yellow. Femora II–IV light brown to yellow, covered densely with short adpressed whitish setae. Remaining segments of legs II–IV yellow, with tarsus and metatarsus slightly darker.

Measurement of male – holotype (in mm and % of length of cephalothorax): length of cephalothorax 3.10 mm = 100%, length of eye field 1.12 = 36%, width of eye field at eyes I 1.62 = 52%, width of eye field at eyes III 1.50 = 48%, height of cephalothorax 1.50 = 48%, length of abdomen 2.80 = 90%.

Measurement of 5 segments of legs (tarsus to femur, in mm and % of leg I): I 0.81+0.81+1.06+1.00+1.62 = 5.30 – 100%, II 0.87+0.87+1.00+1.00+1.69 = 5.43 – 102%, III 1.08+1.44+1.25+1.25+ 2.12 = 7.23 – 136%, IV 1.00+1.25+1.00+ 1.00+1.87 = 6.12 – 115%. Leg order: III –136%, IV – 115%, II –102%, I – 100%.

Female. Cephalothorax has black tegument, covered with rather uniform, elongated adpressed scales, more whitish on anterior eye field, with blackish, upright bristles on eye field, denser anteriorly.

Abdomen dorsally grey, covered with whitish longer scales, arranged in transverse rows, and with sparse short blackish bristles.

Frontal aspect: blackish tegument entirely hidden under dense white setae which gives almost white appearance; orbitals of AME dorsally and ventrally white, with a few fawn setae laterally being an extension of a somewhat darker spot between the intense white line immediately beneath ALE and clypeal setae under ALE. Orbital setae of ALE dorsally fawn or pale orange, ventrally and laterally white, diagonal line under ALE very prominently white; clypeus under AME strikingly white owing to dense long white setae growing horizontally, partially overhanging cheliceral bases. ALE located $\frac{1}{2}$ of their diameter above rim of AME; pedipalps whitish yellow with whitish setae. Ventral aspect: sternum blackish with lighter margins, sparse but long white setae, coxae yellow, abdomen grey with dense whitish scales.

Epigynum transversely broader than in *Ae. aeruginosus*, short.

Legs: yellow with darker lateral spots instead of annuli on some segments; femora I–IV lighter – whitish-yellow. Femur III and IV – lateral surfaces brown, with lighter area in mid-length, near ventral edge, dorsal surfaces with two yellow longitudinal stripes, separating median narrow darker brown stripe.

Measurement of female – allotype (in mm and % of length of cephalothorax): length of cephalothorax 3.20

mm = 100%, length of eye field 1.19 = 37%, width of eye field at eyes I 1.75 = 55%, width of eye field at eyes III 1.62 = 51%, height of cephalothorax 1.50 = 47%, length of abdomen 3.80 = 119%.

Measurement of 5 segments of legs (tarsus to femur; in mm and in % of leg I): I 0.75+0.62+1.00+1.25+ 1.62 = 5.24 – 100%, II 0.75+0.69+0.94+1.06+1.56 = 5.00 – 95.42%, III 0.87+1.44+1.25+1.25+2.19 = 7.10 – 135.50%, IV 0.87+1.50+1.31+1.00+2.12 = 6.80 – 129.77%. Leg order: III – 135.50%, IV – 129.77%, I – 100%, II – 95.42%.

Material. Male holotype – Israel, Ma'ale Ramon, 17/93, leg. Yael Lubin; female allotype – Israel, Halukim 2 South, 10–12/5/93, leg. Yael Lubin; paratypes – numerous specimens males and females from Israel, Negev: Sede Boker, leg. Yael Lubin, Coll HUIJ and SB, a few also coll. IZ.

Distribution. Israel: Halukim, Sede Boker, Ma'ale Ramon (17).

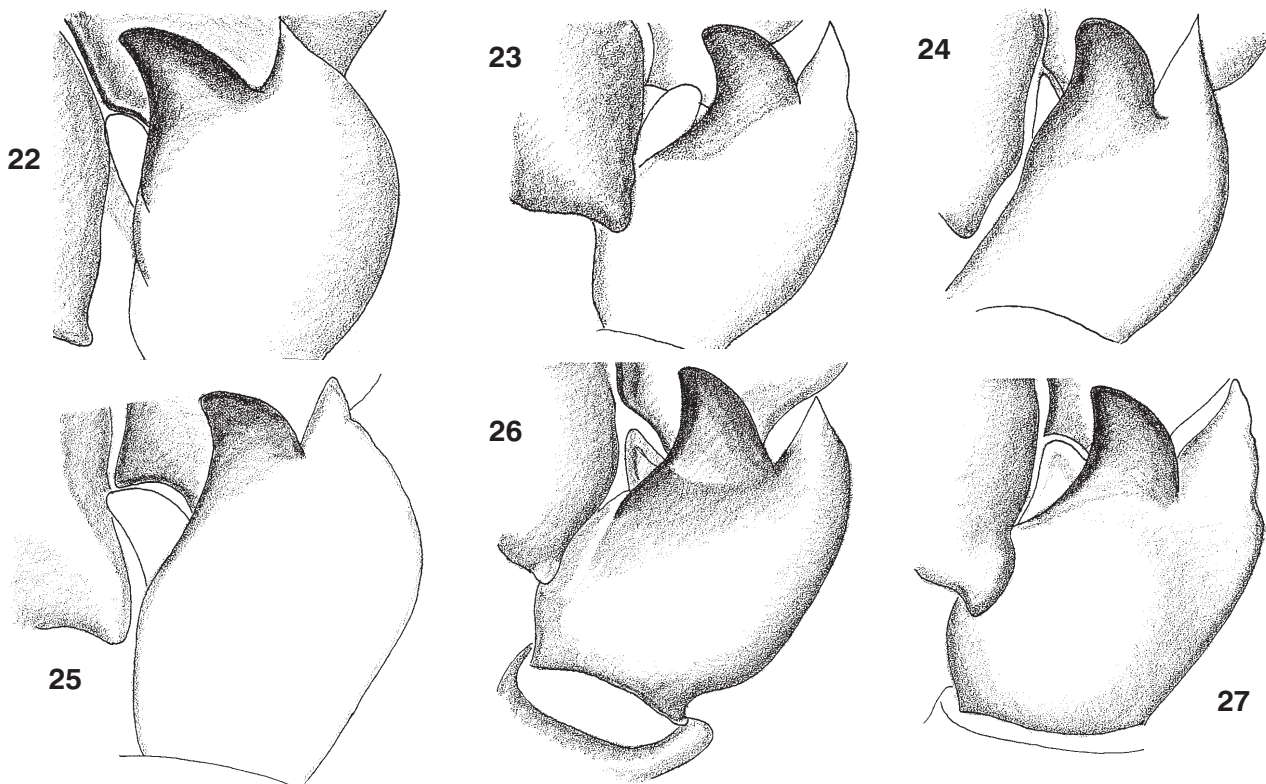
Etymology. Name derived from locality Sede Boker, where collected.

Aelurillus catherinae Prószyński

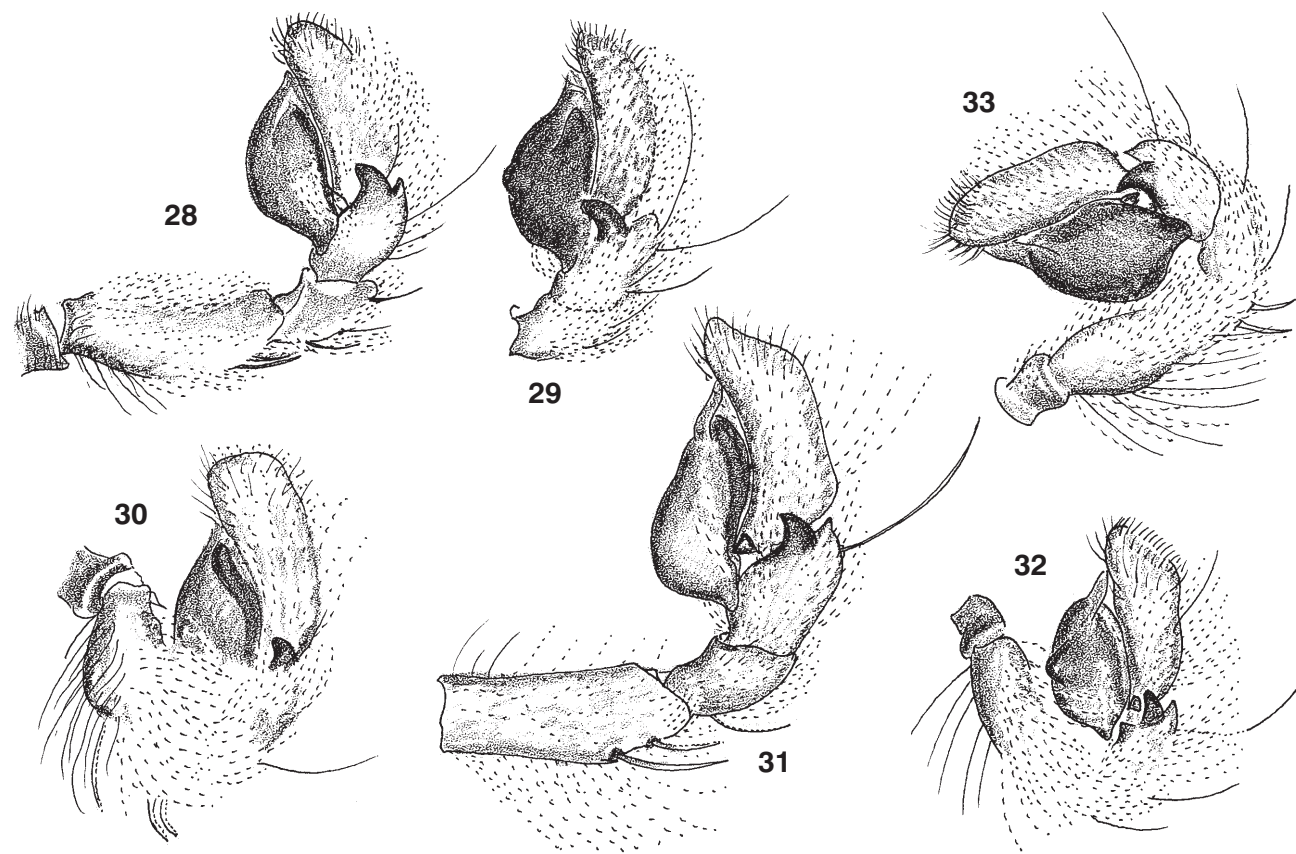
(Figs 18, 24, 30, 36)

Aelurillus catherinae Prószyński, 2000: 232, Figs 5–8.

Diagnosis. Male differs from *Ae. sinaiticus* by uniformly dark cephalothorax, closely resembling *Ae. cognatus* from which can be distinguished by white orbital



Figures 22–27. Interspecific variation in *Aelurillus conveniens* species group. Tibial apophysis (semidiagrammatic) in *Ae. conveniens* (22), *Ae. kochi* (23), *Ae. catherinae* sp. nov. (24), *Ae. sinaiticus* sp. nov. (25), *Ae. bokerinus* (26), *Ae. aeruginosus* (27).



Figures 28–33. Interspecific variation in *Aelurillus conveniens* species group. Setae pattern on male pedipalp, lateral view (semidiagrammatic) in *Ae. conveniens* (28), *Ae. kochi* (29), *Ae. catherinae* sp. nov. (30), *Ae. sinaiticus* sp. nov. (31), *Ae. bokerinus* (32), *Ae. aeruginosus* (33).

setae along ventral rims of eyes I, lack of dark median line along femora I–IV, somewhat larger size; differs from *Ae. kochi* by absence of black fur on tarsus-tibia I.

Remark. Due to incertitude in matching sexes, the description of female is delayed until more material becomes available.

Description. Male. Cephalothorax: entirely dark brown, covered with dark adpressed setae with a small admixture of silver ones – which do not change general appearance, lack of white line along ventral edge. Anterior part of eye field (to the half distance between eyes I and II) sloping anteriorly, bald, and light reflecting.

Abdomen covered uniformly with silver scales, darker rectangular field in anterior half.

Frontal aspect: face dark with slightly lighter brown clypeus, eye field very dark with long bristles; orbital setae along ventral rims of eyes I white and very thin, dark along dorsal rims; light diagonal line under ALE absent; clypeus: light brown with very sparse tiny whitish setae on the space beneath AME.

Pedipalps dorsally (frontal view); cymbium brown with very long and dense white setae.

Legs: generally yellow, without any striking darker spots. Leg I – tarsus + metatarsus I: dark fawn; tibia + patella I: pale yellow; femur I: prolaterally pale fawn

with adpressed setae, setae on retrolateral surface: ventrally long white, no patch of dark setae, some greyish-fawn along middle of femur. Leg III and IV: tibia and tarsus fawn, remaining segments pale yellow.

Measurements (mm). Male. Length of cephalothorax 2.49; length of abdomen 2.44.

Material. Male holotype – Egypt, Sinai: Mt. Catharina, 16. VII. 68, leg. Tsabar; paratypes, 4 males, 1 juv. – Sinai: Mt. Catharina, 16. VII. 68, leg. Shulov. Coll. HUU.

Seasonal appearance of adult specimens. Males – VII.

Distribution. Egypt – Sinai: Mt. Catharina (22).

Etymology. Species named for my wife, an arachnologist E. M. Andreeva (Katarzyna Andrejewa-Prószyńska).

Aelurillus cognatus (O. Pickard-Cambridge)

(Figs 63, 64)

Salticus cognatus O. Pickard-Cambridge, 1872: 337.

Diagnosis. Differs from *Ae. aeruginosus* and *kochi* by lack of white lines on anterior slope of eye field, is larger than *aeruginosus* but smaller than *kochi*, with slightly longer eye field, lower cephalothorax and shorter legs than the latter; from *conveniens* differs by not having black face.

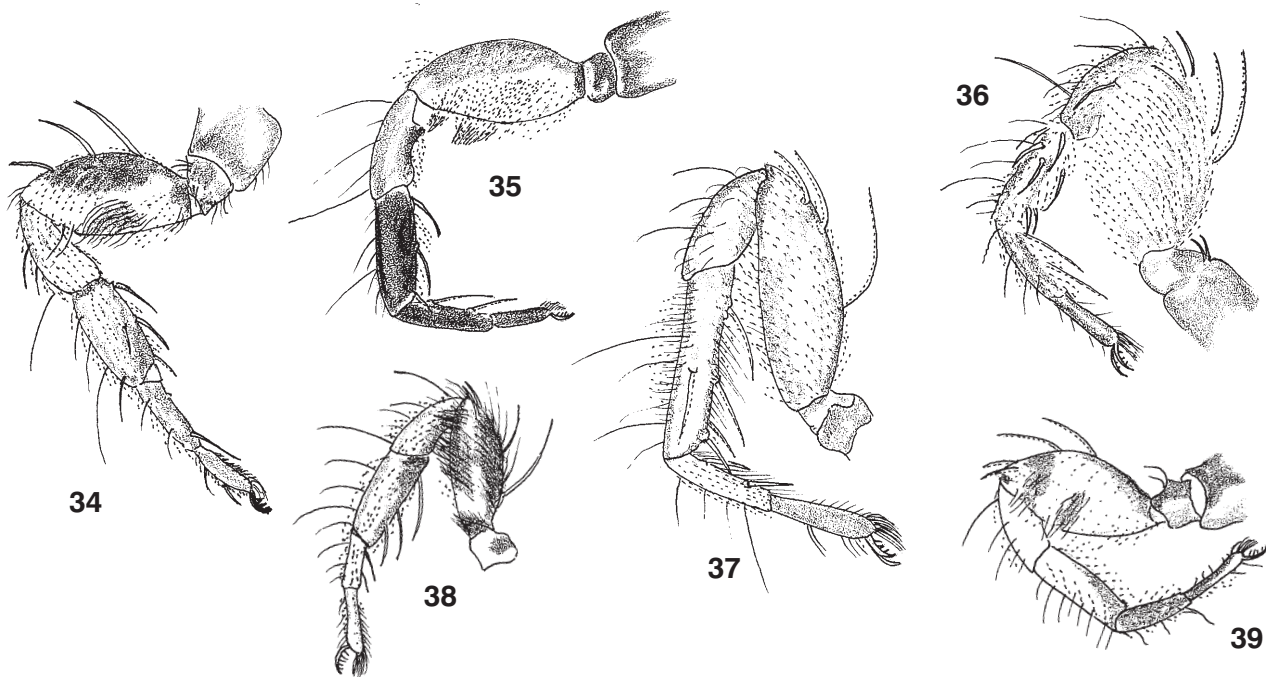
Remark. Miss Galina Azarkina (of Novosibirsk) has communicated me her observation that these specimens have cephalothorax covered by dense dark setae or scales, but have also dense white setae on clypeus. The first character is characteristic also for *Ae. nabataeus* (absent in *Ae. bokerinus*), the second for *Ae. bokerinus* (but absent in *Ae. nabataeus*).

Description. Males (syntypes). Cephalothorax: jet-black when described by O. Pickard-Cambridge (1872: 337) now faded to brown – light brown, with very inconspicuous minute adpressed setae blended into colour of the tegument, without any contrasting setae, no fringe of white setae beneath ventral edge. Abdomen now dark, anteriorly with small stronger sclerotized area not forming scutum, on two specimens preserved remnants of adpressed setae along anterior margin and laterally: white with brown streak medially, which could be considered remnants of median darker streak (according to O. Pickard-Cambridge – op. cit.: “... tegument black covered with reddish yellow pubescence easily rubbing off, but unicolorous – devoid of any traces of lighter or darker spots in the posterior half – like those in *S. conve-niens*...”) without any contrasting setae, no fringe of white setae beneath ventral edge. Abdomen now dark anteriorly with small stronger sclerotized area not forming scutum, on two specimens preserved.

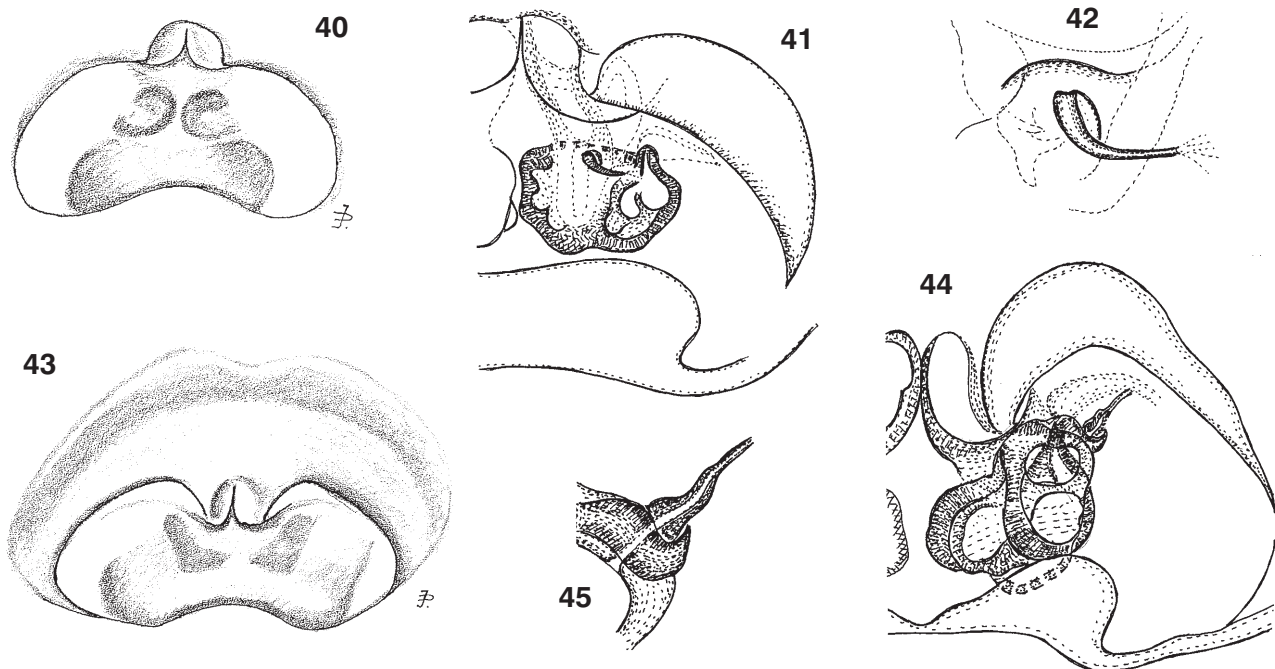
Frontal aspect: face and chelicerae brown, clearly lighter than eye field (which is lacking white line), covered with sparse and very indistinct colourless and whitish setae, setae surrounding eyes I very inconspicuous colour-

less and whitish, slightly better visible on specimens with darker face, on some specimens there is a group of longer and darker setae on dorsal part of rims of AME and in some also on ALE, not a clear character. Sparse colourless or whitish setae basally on chelicerae, very few on apical half of chelicerae, particularly on median surfaces. Fans of long setae on tips of pedipalpal femur; whole patella, tibia and cymbium basally, much less conspicuous than in *kochi* because are colorless, not strikingly white, with an admixture of a fawn ones. Legs: I generally brown with lighter dorsal surface of patella, II–IV gradually lighter with yellow and brown annuli; femora I–IV with dorsal surfaces lighter and thin median longitudinal line. Retrolateral surface of femur I dark with long colourless to whitish hairs.

Ventral aspect: sternum brown to light brown, coxae I–IV brownish, abdomen varies from light greyish brown to greyish brown. Palpal organ (Figs 63, 64), pedipalps light with whitish hairs, tibial apophysis – broad bent sclerotized triangle followed by a whitish triangular protuberance of dorsal edge of tibia; tibia: laterally resembles *Aelurillus conveniens*, but the elements visible are not the best diagnostic characters for these species; dorsally presents a notch between triangularly shaped apical dorsal edge (passing into thin whitish and semitransparent, poorly visible pointed end), this character have not been studied in related species but may be presumably similar. Bulbus laterally broad, patella yellow with thin blackish grey line around apical rim; femur with long whitish setae, apically yellow, basally dark grey, on lateral surface these grey areas stretch nearby apical



Figures 34–39. Interspecific variation in *Aelurillus conveniens* species group. Setae pattern on leg I in male, retro-lateral view (semidiagrammatic) in *Ae. conveniens* (34), *Ae. kochi* (35), *Ae. catherinae* (36), *Ae. simaicus* (37), *Ae. bokerinus* (38), *Ae. aeruginosus* (39).



Figures 40–45. Comparison of epigynum and its internal structures in *Aelurillus aeruginosus* – epigynum (40), right spermatheca (41), accessory gland (42); and *Ae. bokerinus* – epigynum (43), right spermatheca (44), accessory gland (45).

end. Setae dorsally on tibia often sparse enough to show both apophyses on dorsal edge of tibia, of similar length, the external one triangular, sclerotized and brown, the median one separated by a by a wedge shaped furrow.

Measurements (in mm) of 3 males (syntypes). Length of cephalothorax 2.57–2.76; length of abdomen 2.31–2.57.

Length of 5 segments of leg I (tarsus to femur, in mm and in % of leg I): 4.10–4. 44 .

Leg order: III – 122–127%, IV – 113–126% , I – 100%, II – 98–102%.

Material. Syntypes – 10 males *Salticus cognatus* O. Pickard-Cambridge, 1872a: 337; among stones and rocks, on dwarf plants near Ain-Atta on the skirts of Lebanon. Coll. HEC, Oxford.

Distribution. Lebanon: Ain Atta.

Aelurillus conveniens (O. Pickard-Cambridge)

(Figs 11, 15–16, 22, 28, 34, 70–74)

Salticus conveniens O. Pickard-Cambridge, 1872a: 336–337.

Diagnosis. Male cephalothorax covered with light setae on black tegument, anterior slope of eye field black, semi-circularly bald, face dark, femora dorsally uniformly light.

Description. Male. Cephalothorax appears light because of setae (narrow scales) covering black tegument, differentiated (less contrasted than in *Ae. aeruginosus*) into lighter dorsum and more fawn sides, intensive white line along ventral edge; anterior slope of eye field black, making bald semicircular black area.

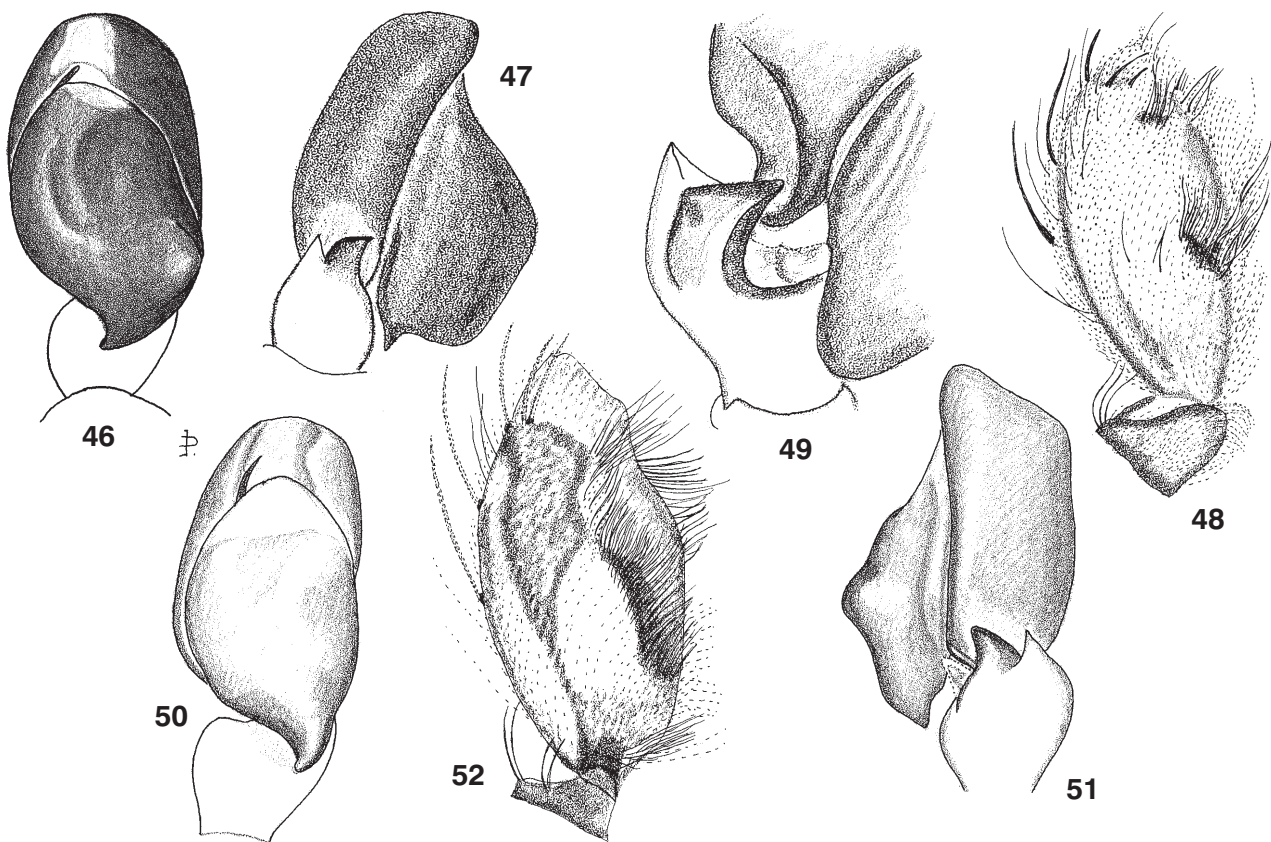
Abdomen covered uniformly with silver adpressed setae on dark tegument, with darker rectangular field in anterior half of abdomen. In the original description O. Pickard-Cambridge mentions “traces of double row of alternating paler yellowish and brown-blackish spots”, visible as traces on Algerian specimen.

Frontal aspect: very dark, practically black, orbital setae around eyes I dorsally black, ventrally colourless, thin and inconspicuous, “cheek” area under ALE brown with minute adpressed setae; clypeus brown, almost bald with a few black bristles but no white setae; pedipalpal cymbium and tibia dorsally light brown, remaining segments whitish yellow, densely covered with long white setae.

Legs generally light fawn and yellow; tibia and patella I: ventral surface white setae, edge of ventral and prolateral surfaces darker brown with brown adpressed setae; femur I: basally with thin dark brown pigmented ring continuous with similarly coloured trochanter and dorsal surface of coxa, remaining prolateral surface yellow with a brown apical ring, covered with adpressed white setae, longer on the ventral surface and forming a fringe of long white setae, dark setae on retrolateral surface form a dark triangle at the mid-length of the segment near ventral edge. Ventral aspect: sternum almost black, remaining parts and areas lighter brown to greyish yellow.

Palpal organ – see Figs 15–16, 22, 70–71.

Type specimen faded, with distinct rectangular whitish area on dorsum of thorax, clypeus almost white, legs and pedipalps entirely white; femur I retrolaterally with long thin whitish setae, longer near ventral margin,



Figures 46–52. Comparison of palpal organ and setae on femur I in two species: *Aelurillus aeruginosus* palpal organ ventrally (46), laterally (47), colour and setae pattern on retrolateral surface of femur I (48), details of tibial apophysis ventro-laterally (49); *Ae. bokerinus* palpal organ ventrally (50) and laterally (51), colour and setae pattern on retrolateral surface of femur I (52).

with loose darker bunch of irregular shape, slightly transverse, in the mid length closer to ventral margin; pedipalpal femur with long mane of white setae.

Female. Cephalothorax uniform brown with sparse white adpressed setae. Abdomen smooth, in some specimens with two longitudinal lines of indistinct alternating darker and lighter spots. Frontal aspect: clypeus intensely white or whitish with denser line of white setae at the ventral edge beneath eyes ALE; orbital setae white. Epigynum shown in Figs 70–74, with tips of “wings” reaching pigmented area and merging with it.

Measurements (mm). Male. Length of cephalothorax 2.27–2.31; length of abdomen 1.93–2.06; length of 5 segments of leg I 3.66.

Seasonal appearance of adult specimens. Males – IV, V, VI, X, XI; females – III, IV, V, VI, VII, XI.

Distribution. Syria, N Africa. Israel: Jerusalem (11), Ma’ale Adumim (12), ‘Ein Duyuk (13); Berosh (15), Arad, Halukim Ridge (17).

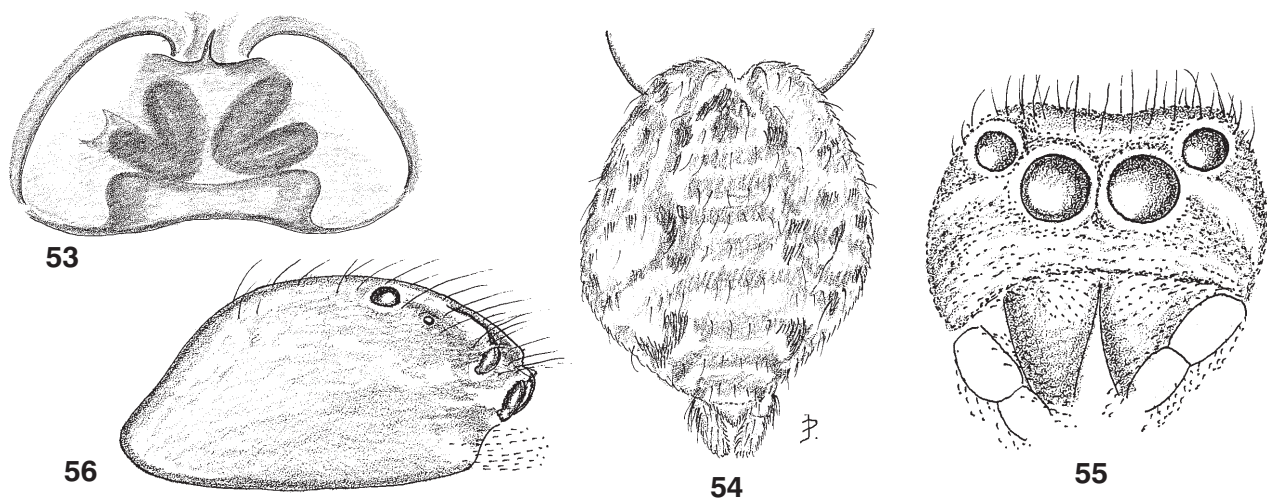
Aelurillus gershomii Prószynski
(Figs 75–78, 84–85)

Diagnosis. Male closely resembling *Ae. politiventris* with abdomen entirely covered by light reflecting scutum, differs by dark clypeus. Female with “wings” of epigynum spread narrower, closer to parallel, separated from pigmented area by lighter space.

Description. Male. Cephalothorax dark brown, eye field black with minute setae and some minute light reflecting scales; whitish setae along posterior half of lower sides sparser and less striking than in *Ae. politiventris*. Dorsal profile of cephalothorax comparable to that in *Ae. politiventris* but higher, the posterior slope steeper.

Abdomen round, flattened and covered on whole surface by hard black or blackish brown scutum which appears polished and reflects light, sides white below scutum.

Frontal aspect: diameter of AME > 150% of ALE, the latter set along upper half of AME – tops of their orbits indistinctly above those of AME, orbital setae stout, dorsally longer, shortening gradually along lateral parts of orbits and very short ventrally, forming a sort of bonnet above each eye; dorsally dark with whitish tips, ventrally white. Clypeus with colourless sparse and poorly visible setae directed medially, with admixture of a few almost invisible thin white setae. Chelicerae yellowish brown, slender. Pedipalps: tip of femur, tibia and patella



Figures 53–56. *Aelurillus aeruginosus*, epigynum (53), abdominal pattern (54), frontal aspect (55) and profile of cephalothorax (56).

yellow with white setae, these are longer on tibia, radiating and forming sparse fan.

Palpal organ: see Figs 75–78.

Legs: tarsus and metatarsus black, remaining segments yellow to yellowish brown; femora dorsally yellow with darker distal ends.

Female. Cephalothorax dark brown – on live specimens presumably black, with sparse whitish adpressed setae, dorsally curved. Abdomen light yellowish brown, cryptically coloured, in studied specimens abdomen macerated without preserved pattern. Frontal aspect: eyes surrounded white, clypeus fawn with longer setae directed medially, somewhat more whitish in appearance; chelicerae brown, tibia and patella I yellow with

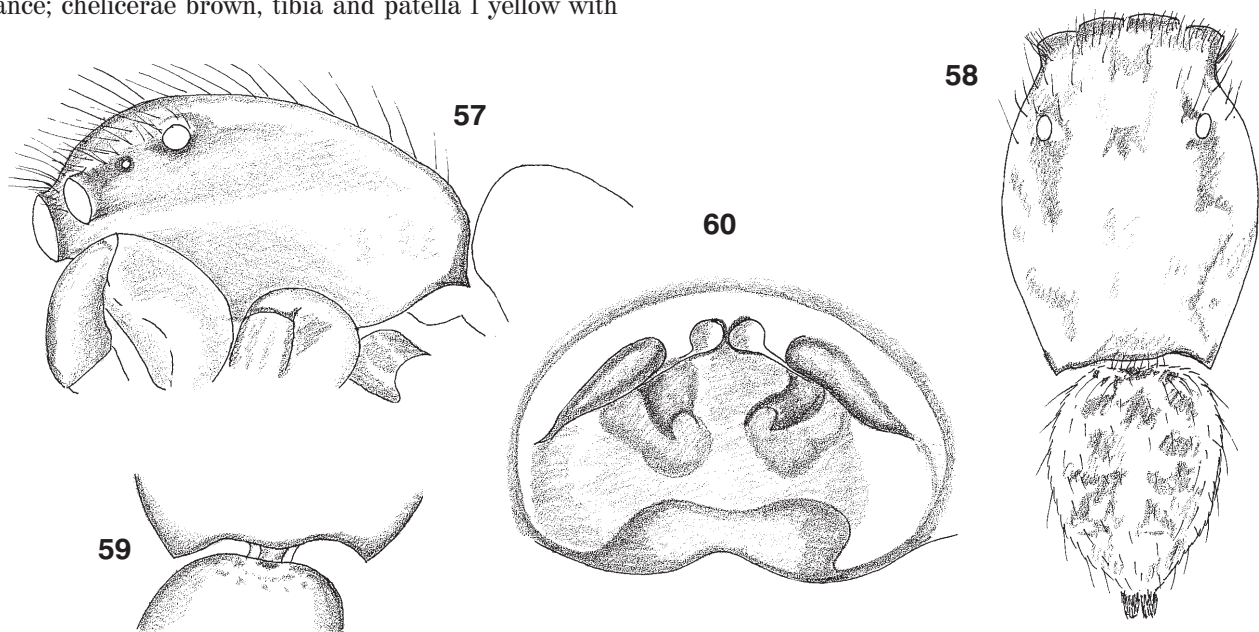
brown rings. Legs light brown, darker ringed; femora lighter yellowish. Epigynum: see Figs 84–85.

Measurements (mm). Male. Length of cephalothorax 2.22; length of abdomen 2.50. Female. Length of cephalothorax 2.95; length of abdomen 4.20.

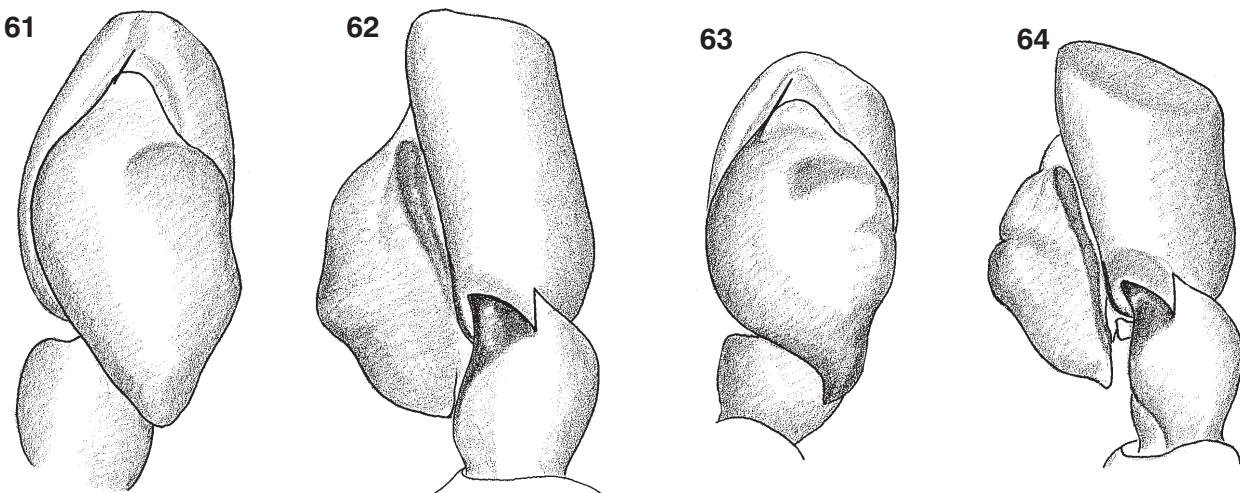
Material. Male holotype, female allotype – Mt. Hermon, 27. IV. 64. 1350 m. coll. M. Broza, No. 14230; paratype – 1 male, Mt. Hermon, 1800 m., 28. X. 68, coll. P. Amitai. Coll. HUJ.

Seasonal appearance of adult specimens. Males – IV, X; females: – IV.

Distribution. Israel: Mt. Hermon, 1350–1800 m. (19); other records require revision.



Figures 57–60. *Aelurillus angularis* sp. nov., cephalothorax laterally (57), dorsal pattern (58), hind edge of thorax postero-dorsally (59) and epigynum (60).



Figures 61–64. *Aelurillus kochi*, palpal organ ventrally (61), laterally (62); *Aelurillus cognatus* palpal organ ventrally (63), laterally (64).

Etymology. Named for prominent arachnologist Dr. Gershon Levy, co-founder and curator of the Israel National Arachnid Collection.

Material. Female holotype, female paratype – Jerusalem, 3. VII. 89. Leg. P. Amitai. Coll. H.UJ.

Distribution. Israel: Jerusalem (11).

Aelurillus jerusalemicus Prószynski, 2000

Figs 90

Aelurillus kochi Roewer

(Figs 17, 23, 29, 35, 61–62, 65–69)

Aelurillus jerusalemicus Prószynski 2000: 235, Fig. 15

Attus capreolus L. Koch, 1867c: 872;

Salticus capreolus: O. Pickard-Cambridge 1872: 322;

Aelurillus kochi Roewer, 1951: 451 (nom. nov.).

Diagnosis. Female epigynum “wings” almost parallel, leaving median elevated part narrow.

Diagnosis. Resembling *Ae. aeruginosus* by setae on face and on anterior slope of eye field, but distinctly larger; striking black fur on tarsus-tibia I; tegument dark covered with light setae making streaks of whitish setae on thoracic dorsum and along ventral margin, sides dark; clypeus brown sparsely covered with short whitish setae, rims of AME white, of ALE white ventrally, dorsally fawn.

Description. Female. Cephalothorax broad, uniformly brown with white adpressed setae, eye field dark with indistinct white and darker streaks – visible in frontal position; posterior slope lighter yellowish, posterior edge of thorax rounded.

Abdomen with two lines of indistinct darker spots surrounding whitish center. Frontal aspect: ALE set 1/5th of their diameter above dorsal rim of AME; clypeus light brown with sparse colourless setae, some overhanging the chelicerae and some basally on chelicerae themselves; orbital setae all white; diagonal line consists of thin whitish setae with tops more intensively white. Legs: tips of tarsi I–II dark brown with broad dark scopula.

Epigynum shape differs by medial swelling, narrow, expanded antero-posteriorly and not transversely along main body axis; also “wings” directed more parallel to main axis, narrow and slightly winding: starting diagonally, then turning posteriorly, expanding again and ending parallel to main axis, the wings being very narrow.

Measurements (mm). Female. Length of cephalothorax 5.19–5.55; length of abdomen 6.82–7.57; length of 5 segments of leg I 8.08–8.83.

Seasonal occurrence of adult specimens. Female – VII.

Description. Male. Cephalothorax: on live and freshly preserved specimens appears dark, uniformly covered with short whitish setae, which gives it uniform, whitish grey appearance. After a few days of preservation, the dorsal coloration differentiates, with whitish area on eye field and extending medially along part of dorsal thorax, its length varying in various specimens; remaining part of cephalothorax and lateral margins of eye field (including lateral eyes) now appearing dark brown with short, colourless setae. There is a thin belt of intensively white setae along ventral rim of cephalothorax, which after longer preservation appear yellowish. Femora dorsally yellow, with blackish setae on prolateral surfaces of femora II–IV, variable in various specimen. Femur I with longer setae on retrolateral surfaces, grey, ventrally white.

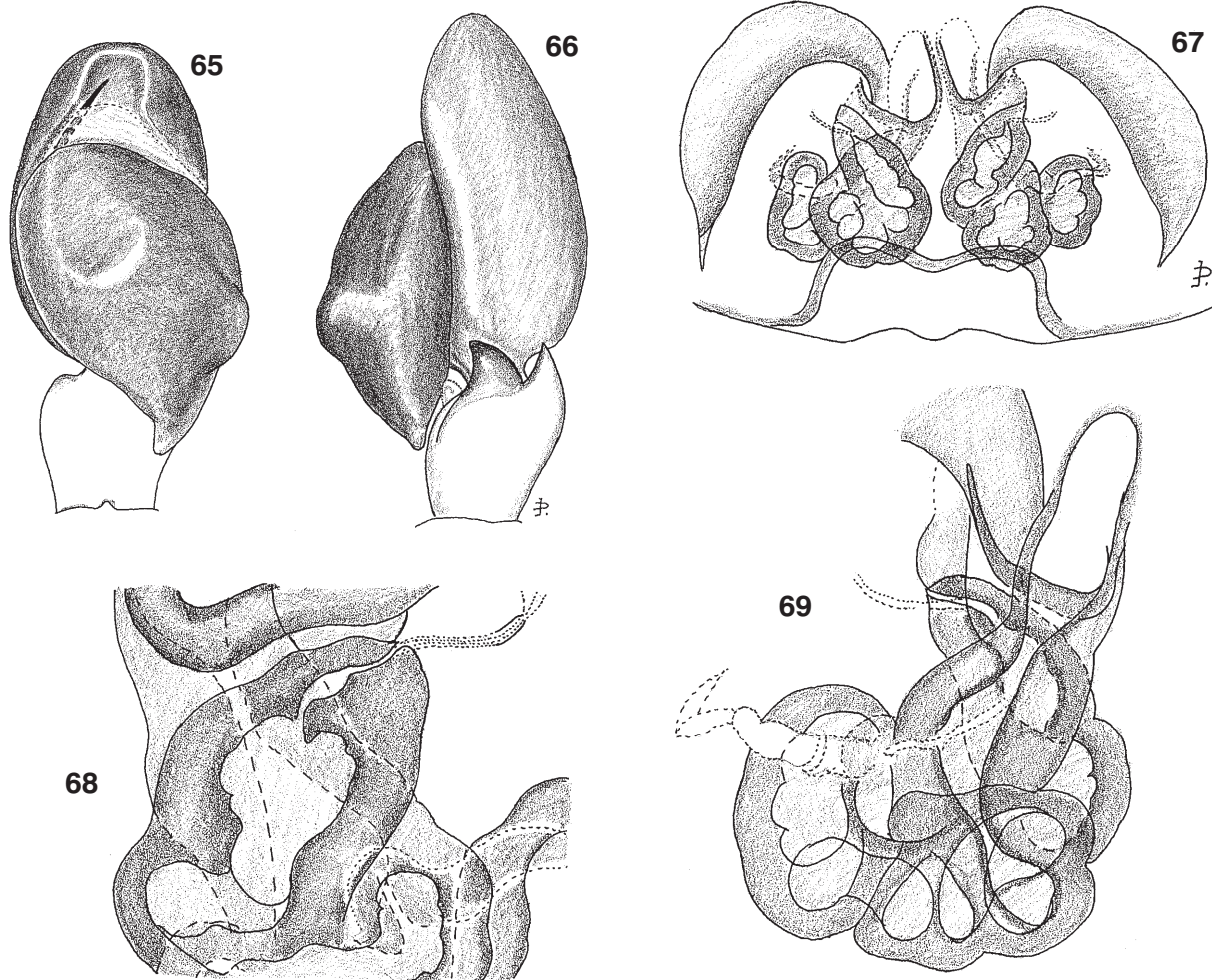
Abdomen indistinctly shorter and narrower than cephalothorax, dorsally flat, no scutum; densely covered with greish adpressed and smooth, elongate, scale like setae, and short, upright bristles, relatively dense. In preserved specimens abdomen appears brown.

Frontal aspect: face and chelicerae brown, covered with whitish setae, but not very densely, clearly lighter than eye field (in this position with clearly visible median white line), diameter of AME about 1.5 diameter of ALE, $\frac{3}{4}$ th of diameter of ALE above dorsal rim of AME; eyes AME surrounded by conspicuous rim of white setae, setae surrounding ALE ventrally white, dorsally fawn. Clypeus with dense whitish setae along the edge, chelicerae with sparse whitish setae basally, brown or colourless apically, particularly on median surfaces. Pedipalps whitish yellow, femur laterally greyish yellow with median half of dorsal surface slightly darker yellow; cymbium and tibia dorsally dark, all covered with white setae forming separate fans of strikingly long whitish setae, on tips of pedipalpal femur, over whole patella,

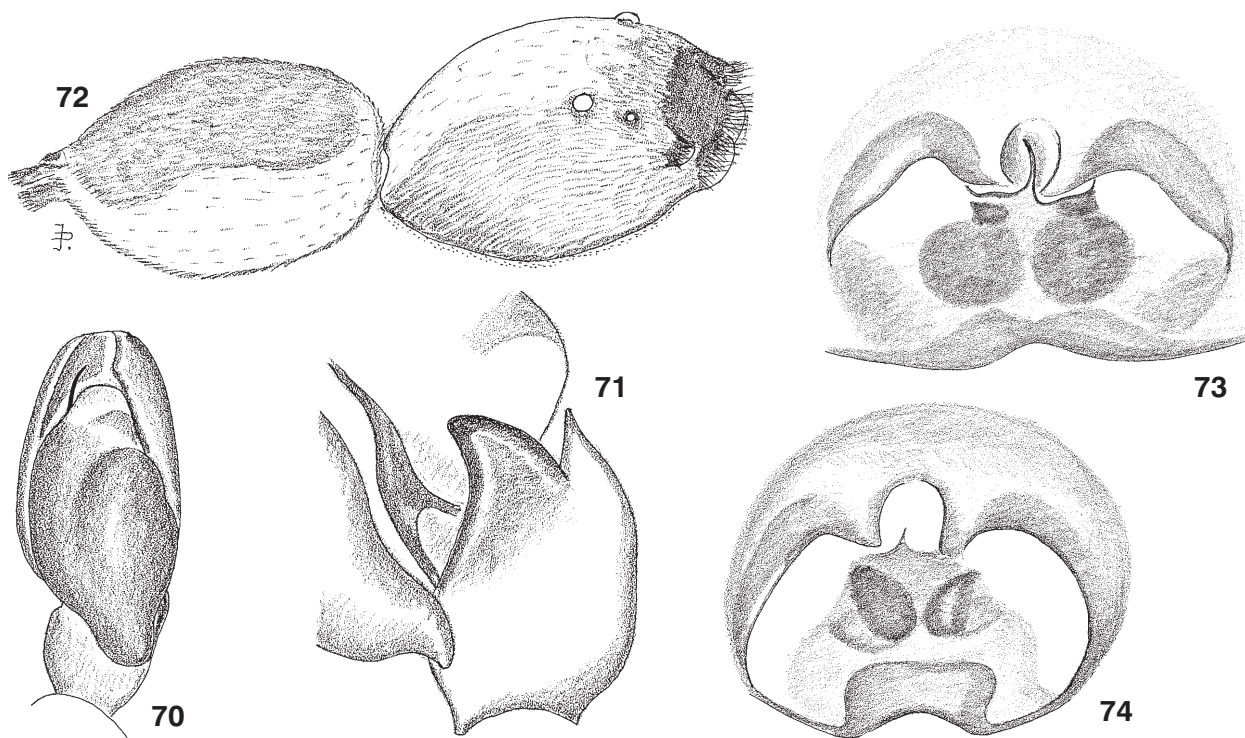
tibia and basally on cymbium, where sparse enough to show both apophyses on dorsal edge of tibia; apophyses triangular and of similar length, the external one sclerotized and brown, separated by a triangle furrow.

Palpal organ: see Figs 61–62, 65–66. Ventral view sternum dark brown, coxae yellow, abdomen light. Legs: I generally brown with lighter dorsal surface of patella, II–IV becoming gradually lighter with yellow and brown annuli. Tibiae – tarsi I–IV generally darker; Ist tarsus and tibia entirely black, with striking black fur of setae, on following legs gradually lightening to dark brown and brown, with median area of segments lighter; femora I–IV with dorsal surfaces lighter and thin median longitudinal line; femur I with retrolateral surface I whitish yellow covered with dense long, soft, white setae basally (in some specimens purely white, in some with inconspicuous admixture of grey setae, in some with prominent admixture of grey and even blackish setae) and stiffer brown setae on apical half.

Female. Cephalothorax broad, broadest between $\frac{1}{2}$ – $\frac{3}{4}$ of its length, gently rounded dorsally, without distinct dor-



Figures 65–69. *Aelurillus kochi* (Dead Sea, En Boqe), male, palpal organ ventrally (65) and laterally (66); female, internal structure of epigynum (67), accessory gland area (68), single spermatheca and channel, dorsal view (69).



Figures 70–74. *Aelurillus conveniens* (male from En Duyuk), palpal organ, ventral (70), tibia in lateral (71) view and general appearance (72), variation in epigynum (73, 74).

sal edges, tegument black, densely covered with fine adpressed setae, whitish, yellowish or fawn, with a small addition of white setae, which does not seem to fall out.

There is no pattern of setal arrangement or colour, except that they are sparser on the posterior slope of thorax and that there is an intensively, thin fringe of setae along ventral edge of carapace; in one F there are three indistinct whiter longitudinal lines along eye field. There are sparse upright black bristles of various densities over eye field; similar bristles much sparser over thorax. Abdomen smooth, densely covered with adpressed setae, like those on the cephalothorax, with short, upright black bristles. Owing to differences in colouration of the setae, one abdomen appears slightly reddish, another with a golden hue, a third rather whitish.

Frontal aspect: ALE set above dorsal rim of AME; like other species of this group, dark face covered with short white setae of various densities, forming white diagonal line under ALE and white rim along edge of clypeus, eyes I surrounded with white setae.

Legs: tegument light with black pigmented rings, sparsely covered with differentiated setae, of which sparse white adpressed setae are striking and appear as sparse white points, colourless setae are almost invisible; a very few short black setae and numerous, sparse, black upright bristles. Pattern of dark rings differs considerably in the three studied specimens.

Epigynum – see Figs 67–69.

Measurements (mm). Male. Length of cephalothorax 2.82–3.37; length of abdomen 2.63–3.15; length of 5 segments of leg I 4.83–5.60. Female. Length of cephalothorax 3.49–3.15; length of abdomen 4.95–4.50; length of 5 segments of leg I 5.26–6.23.

Seasonal appearance of adult specimens. Males – I, III, V, females – V. Observed on salty wet mud and on stones at Dead Sea water, and at “small pond”.

Distribution. Reported (if really conspecific) from Greece, Islands Tinos and Syra; Syria. Israel: Tiberias, Massada (7), Kallia, ‘Ein Gedi sulphur springs, En Boqeq (13).

Aelurillus nabataeus sp. nov.

(Figs 9, 719–720)

Diagnosis. Male cephalothorax mat black, covered with sparse, adpressed black setae, almost invisible on black tegument. Contrasting white fans of setae on white pedipalpal patella and tibia; bulbus without lateral protuberance, cymbium black with sparse white setae. Legs dark, femora dorsally with two longitudinal yellow lines delimiting a median black one. Smaller than *Ae. bokerimus* sp. nov.

Description. Male. Cephalothorax: uniformly mat black, covered densely with short, adpressed black setae, on some specimens with very sparsely scattered white

ones, not influencing general coloration, without any colour or white spots. Anterior slope of eye field without any scales (but with sparse long black bristles), deep black; ventral edge of carapace black, without any white line along ventral edge. Profile of cephalothorax is dorsally rounded, with eyes III located on the highest point. Femora dorsally fawn with dark median line, lateral surfaces darker brown, covered with adpressed whitish setae.

Abdomen covered uniformly with silver adpressed setae on dark tegument, sparser medially in anterior half and only a few apically, making these areas gradually darker; longer upright bristles, sparse and thin but covering the whole surface of abdomen quite regularly.

Ventral appearance. Mouthparts blackish with yellow spots on maxillae. Anterior surfaces of coxae dark grey, posterior surfaces yellow. Sternum black, in some specimens with contrasting, irregular, narrow yellowish margin. Abdomen ventrally dark greyish, with whitish setae.

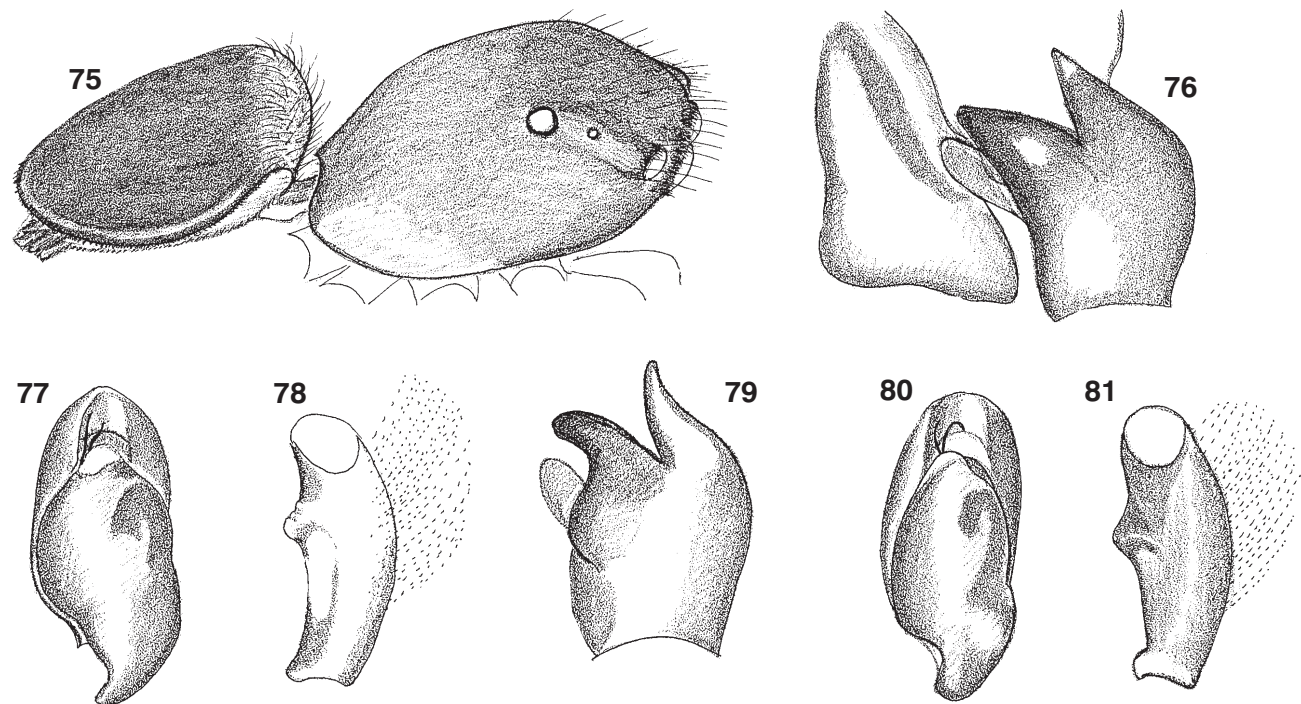
Frontal aspect black, orbital setae around AME dorsally black, ventrally inconspicuous possibly colourless; around ALE dorsally black, "cheek" area under ALE dark brown and bald; clypeus almost bald with inconspicuous sparse longer dark setae overhanging cheliceral bases, crossed with white bristles on pedipalpal femur. Diameter of ALE = $\frac{2}{3}$ of AME, set $\frac{1}{2}$ diameter of ALE above dorsal rim of AME.

Pedipalps: basal half of femur dorsally black, with white antero-dorsal tip and with intensely white setae,

spreading fan-like. Patella and tibia yellow – bearing fans of long yellowish white setae, strikingly contrasting with black face. Cymbium latero-basally blackish, apically yellowish, with dense, white setae.

Tibial apophyses comparable with those in *Ae. aeruginosus*, but the ventral one is slightly more bent (Fig. 720). Ventral apophysis is a broad bent sclerotized triangle, dorsal one is a whitish triangular protuberance of dorsal edge of tibia; dorsally presents a notch between ventral and triangularly shaped apical dorsal edge (passing into thin whitish and semitransparent, poorly visible pointed end); this character has not been studied in related species but presumably may be similar. Bulbus narrower than *Ae. aeruginosus* and devoid of lateral, triangular protuberance (Fig. 719), laterally more extended, patella yellow with thin blackish grey line around apical rim; femur with long whitish setae, apically yellow, basally dark grey, on lateral surface these grey areas stretch near to apical end.

Legs: I generally brown with lighter dorsal surface of patella, II–IV gradually lighter with yellow and brown annuli; femora I–IV with dorsal surfaces lighter and thin median longitudinal line. There is a retrolateral fringe of sparse white setae on brown tarsus and metatarsus I and on fawn tibia and patella I. Femur I variable in various specimens, from blackish to light, in some dorsal fawn surface bisected by a thin darker median longitudinal line, lighter areas expanding onto part of lateral surface but with remaining lower retrolateral surface dark



Figures 75–81. *Aelurillus gershomi* sp. nov., general appearance (note striking dorsal scutum, comparable also in *Ae. politiventris*) (75), tibial apophyses (76), palpal organ ventrally (77) view, pedipalpal femur (broken lines – white setae) (78); *Ae. politiventris* tibial apophyses (79), palpal organ ventrally (80) view, pedipalpal femur (broken lines – white setae) (81).

with two lighter oval spots near ventral edge; there are whitish adpressed setae on prolateral surface changing into mane of longer white setae along ventral edge; setae on retrolateral surface are white in some specimens, in other with a few dark setae arranged transversally in the mid length of femur; there is also a thin dark ring basally with a few adpressed dark setae running transversally, continuous with similarly coloured trochanter.

Measurement (in mm and % of length of cephalothorax): length of cephalothorax 2 mm = 100%, length of eye field 0.84 = 42%, width of eye field at eyes I 1,28 = 64%, height of cephalothorax 0,96 = 48 %, length of abdomen 1.76 = 88%.

Measurement of 5 segments of legs (in mm): I 0.56+0.56+0.68+0.64+0.88 = 3.32 - 100%, II 0.48+0.48+0.64+0.64+1.04 = 3.28 - 99%, III 0.64+0.88+0.72+0.72+1.28 = 4,24 - 128%, IV 0.64+0.92+0.8+0.8+1.28 = 4.45 - 134%. Leg order: IV -134%, III - 128%, I - 100%, II - 99%.

Material. Male holotype - Zin Wadi, 23. III. 2000 leg. Linda Wiener. Coll. HJ; male paratype - Sede Boker # 157 leg Oren Hasson.

Remark. Apparently rare, a few specimens collected near Sede Boker.

Distribution. Israel: Sede Boker, Nahal Zin (17).

Etymology. Named for Nabataeans - ancient inhabitants of this area, ruins of whose town remains at Avdat, a few kilometers from the collecting place.

Aelurillus politiventris (O. Pickard-Cambridge)

(Figs 10, 79-81, 82-83)

Salticus politiventris O. Pickard-Cambridge, 1872a: 337-338;

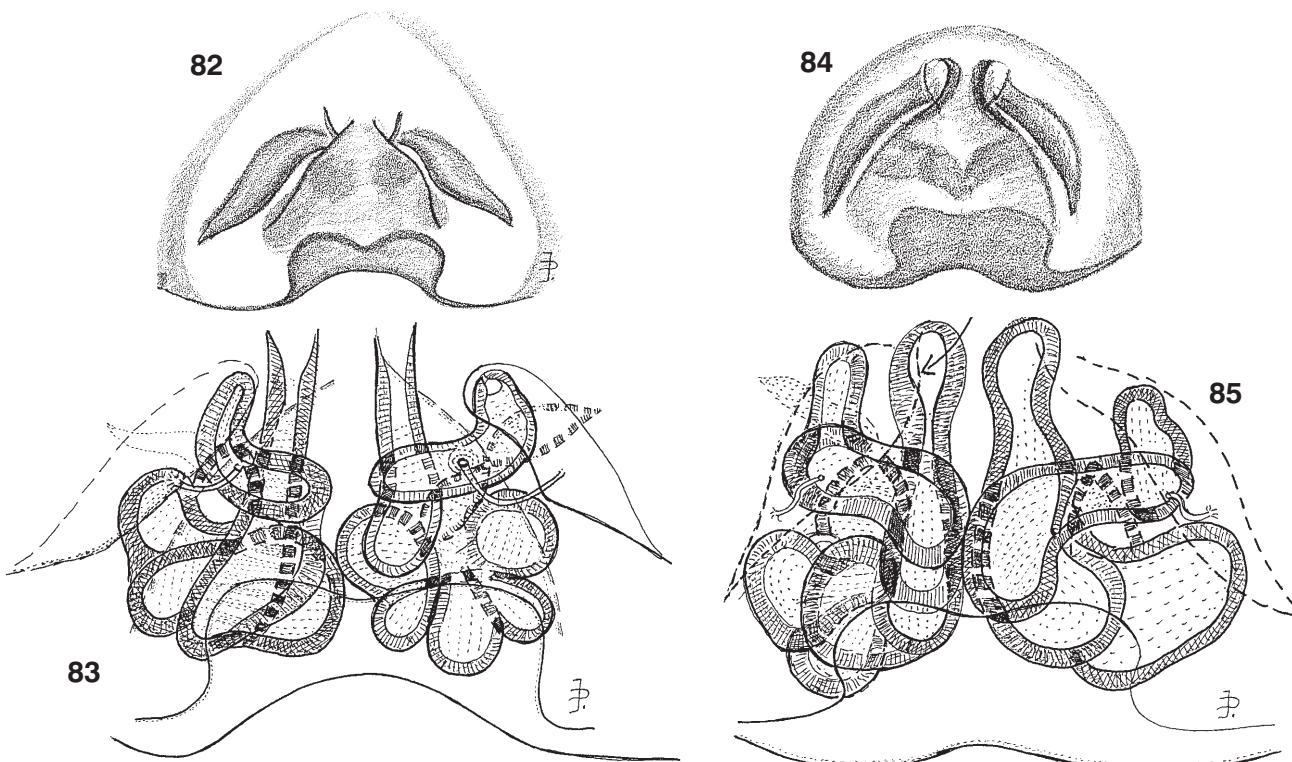
Aelurillus politiventris: Prószynski 1976: Figs 326 (not 327) - both coll. W. Kulczyński; Logunov 1996: 61.

Diagnosis. Male - abdomen entirely covered by light reflecting scutum, no postero-dorsal triangular protuberance on thorax; differs from *Ae. gershomi* by presence of striking white clypeus and white streak on lower sides; female - "wings" of epigynum separated from pigmented area by light surrounding, spreading broader than in *Ae. gershomi*.

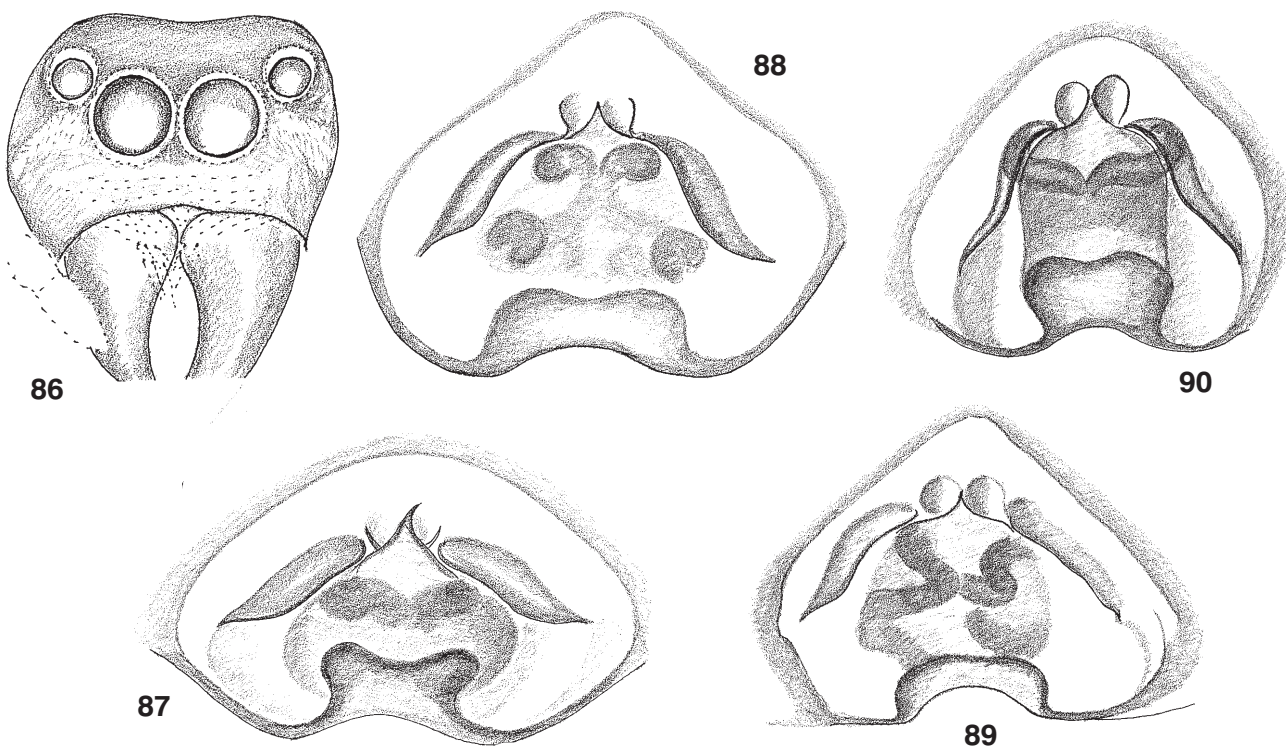
Remark. No clear and unmistakable external difference noticed between females of *Ae. politiventris* and *Ae. gershomi*, apart from epigynum. Matching of males and females tentative.

Description. Male. Cephalothorax dark brown, with lower half of sides with broad whitish streak of adpressed vertical whitish setae, striking on live specimen; eye field black, covered with minute setae but not light reflecting scales; dorsal profile highest at eyes III, there is no flat surface, steep slope of the thorax begins at 65% of cephalothorax length; there is no posterior, horizontal triangular protuberance dorsally on thorax, which provides conspicuous difference with *Phlegra nitidiventris*.

Abdomen: round, flattened and covered on the whole surface by hard black, or blackish brown, scutum which



Figures 82-85. *Aelurillus politiventris*, epigynum (82), its internal structure (83); *Ae. gershomi*, epigynum (84), its internal structure (85).



Figures 86–90. *Aelurillus politiventris* group of species, female, face (86) and epigynum variation (87, 88, 89); *Ae. jerusalemicus*, epigynum (90).

looks like polished mirror and reflects light (similar in *Phlegra nitidiventris*); sides ventrally to scutum white.

Frontal aspect: diameter of AME >150% of ALE, the latter set along upper half of AME – tops of their orbits indistinctly above those of AME; orbital setae stout, dorsally long, gradually shortening along lateral parts of orbits and very short ventrally, forming a sort of bonnet above each eye; dorsally dark with whitish tips, ventrally white. Clypeus densely covered with white horizontal setae, becoming longer medially and making a white dense triangle under AME, a few thinner setae overhanging cheliceral bases. Chelicerae yellowish brown, slender.

Pedipalps: tip of femur, tibia and patella yellow with white setae, longer on tibia, radiating and forming a sparse fan. Palpal organ: see Figs 79–81.

Legs: tarsus and metatarsus black, remaining segments yellow to yellowish brown; femora dorsally yellow with darker distal ends.

Female. Cephalothorax dark brown – on live specimens presumably black, with sparse whitish adpressed setae, dorsal surface curved. Abdomen: light yellowish brown, apparently cryptic coloration; in studied specimens abdomen macerated, without preserved pattern.

Frontal aspect: eyes surrounded white setae, clypeus fawn with colourless setae, a few white; chelicerae brown.

Legs: light brown, darker ringed; femora lighter – yellowish. Epigynum: see Figs 82–83.

Measurements (mm). Male. Length of cephalothorax 2.27; length of abdomen 1.93. Female. Length of cephalothorax 2.73; length of abdomen 3.99.

Seasonal appearance of adult specimens. Males – II, IV, V, VI, VII, VIII, XI; females – III, IV.

Distribution. Israel: Nahal Oren (3), Poriyya, eastern slope (7), Avihayil (8), Gaza (Jabaliya) (9), Wadi Natuf (springs north of Betillu), Jerusalem, 'En Kerem (11), Buq'ata forest, Bab el Hawa (18), near Mas'ada (19).

Aelurillus sinaicus Prószyński

(Figs 19, 25, 31, 37)

Aelurillus sinaicus Prószyński, 2000: 236, Figs 16–19.

Diagnosis. White haired, with longer white mane along ventral edge of cephalothorax, bulbus and palpal tibia longer than in other species.

Description. Male. Specimen large, with ALE set distinctly high in relation to dorsal rim of eyes AME. Cephalothorax covered with dense white setae, longer than in related species, becoming considerably longer at lower sides where in the anterior half they form a sort of white mane with setae stretching horizontally forwards, similar on femora I–IV; partially missing at posterior part of the eye field. Abdomen covered with dense white adpressed setae.

Frontal aspect: anterior slope of eye field covered with whitish adpressed setae, whitish dorsal orbital

setae of eyes I, ventral orbitals of AME strikingly white and conspicuous; diagonal line under ALE absent; clypeus brown with long white setae, some of which overhang cheliceral bases.

Palpal organ: bulbus distinctly longer than in other species (Fig. 19), long pedipalpal tibia which causes apophyses to appear relatively short (Fig. 25), tibial femur with long white setae dorsally (Fig. 31).

Leg I – retrolateral fringe of long but sparse white setae along all segments: segments light fawn to light brown; retrolaterally without dark spots or dark setae (Fig. 37) – this is particularly important for femur I where, in related species cluster of dark setae could be found.

Ventral aspect. Sternum greyish brown with short, sparse, fine brownish setae and fringe of short and sparse white setae along posterior edge; coxae: light brown becoming lighter posteriorly.

Measurements (mm). Male. Length of cephalothorax 2.92; length of abdomen 2.60.

Material. Male holotype – 8 km Ein Duyuk (191–143), 28. V, 71, coll. “faunistics”; male paratype – Sinai, Vatiya Pass, 12. VII. 68, leg. Shulov. Coll. H.U.J.

Seasonal appearance of adult specimens. Male – V, XII.

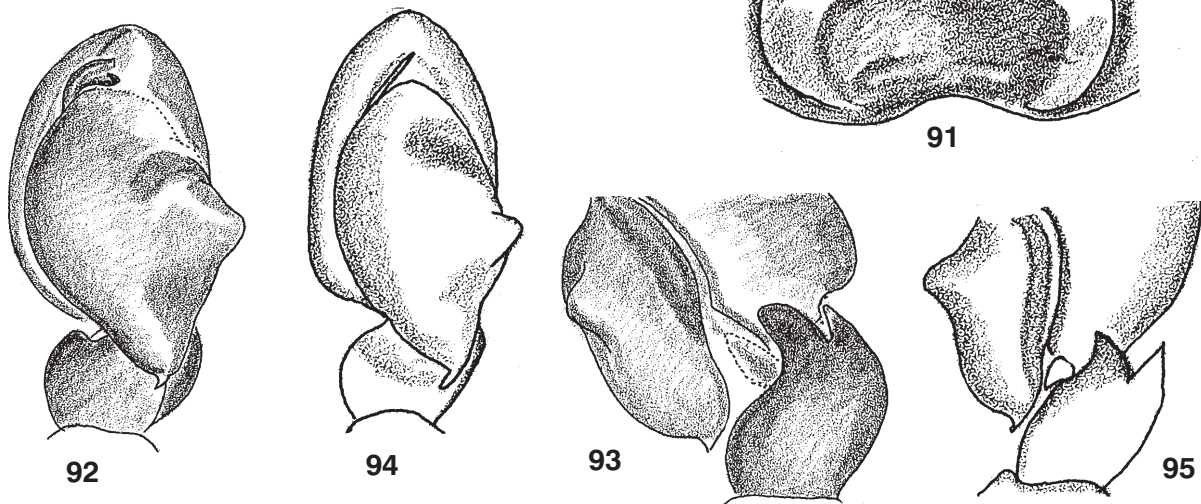
Distribution. Egypt: Sinai – Vatiya Pass. Israel: Ein Duyuk, near Jericho (13).

Relevant species

Aelurillus basseleti (Lucas) (Figs 94, 95)

Salticus basseleti Lucas, 1846b: 158, Tab. 7, Fig. 1.

Remark. Species reported from Northern Africa (Algeria, Tunisia). Apart from the drawings published here, no modern drawings available.



Figures 91–95. Related North African species, not yet found in the Levant. *Aelurillus mayeti*, epigynum (91), palpal organ ventrally (92), palpal tibia laterally (93); *Aelurillus basseleti*, palpal organ ventrally (94), palpal tibia laterally (95).

Aelurillus faragallai Prószynski

Aelurillus faragallai Prószynski, 1993: 29–33, Figs 1–8; Wesolowska and van Harten 1994: 2, Figs 1–2.

Remark. Closely resemble *Ae. aeruginosus*, from which it differs in shape of the dark bunch of setae on femur I, ventrally and retrolaterally, much more strongly developed; also in the internal structure of epigynum.

Distribution. Saudi Arabia

Aelurillus mayeti Simon (Figs 91–93)

Aelurillus mayeti Simon, 1885: 3, 4.

Distribution. Tunisia.

Aelurillus reconditus Wesolowska et van Harten

Aelurillus reconditus Wesolowska et van Harten, 1994: 2–4, Figs 3–5.

Remark. Circular structure near posterior edge of epigynum resemble somewhat epigynum in genus *Habrocestooides* Prószynski, 1992.

Distribution. Yemen.

Nominal species of uncertain identity and species of uncertain occurrence in the Levant

Aelurillus approximans (O. Pickard-Cambridge)

Salticus approximans O. Pickard-Cambridge, 1872: 338.

Remarks. Male described from Syria and/or Israel by O. Pickard-Cambridge, irreconizable from description, no specimens available. Species dubium.

Aelurillus affinis (Lucas)*Salticus affinis* Lucas, 1846.

Remarks. Mediterranean species quoted from Israel only in compilatory faunal inventory of Bodenheimer 1937: 239, occurrence not confirmed by any specimen.

Aelurillus candidus (Simon)*Attus candidus* Simon 1868b: 70.

Remarks. Female described from Spain and Syria (?); I have not seen any specimen, identity uncertain. Species dubium.

Aelurillus concolor Kuleczyński*Aelurillus concolor* Kuleczyński, 1901a: 319, 349, Fig. 18; Nenilin 1984a: 1175 (s. *A. iranus*);*Hemsenattus iranus*: Roewer 1955: 778, Figs 26–27;*Aelurillus iranus*: Prószyński 1966: 464–467, Figs 1–7.

Remarks. Species known from Iran, Caucasus area and Turkey (Erdschias-Nosek 1905: 119), not yet reported from Israel. Identification and synonymy require confirmation.

Aelurillus monardi (Lucas)*Salticus monardi* Lucas, 1846b: 156, Fig. 2; O. Pickard-Cambridge 1872: 322;*Aelurillus monardi*: Cantarella 1982b: 241, Figs 5–9, 19.

Remarks. Mediterranean species, quoted from Israel and Syria by O. Pickard-Cambridge 1872: 322 (as *Salticus monardi*); Pavesi 1895c: 10, Bodenheimer 1937: 239, but no specimen available.

Aelurillus v-insignitus (Clerck)*Araneus v-insignitus* Clerck, 1758;*Salticus quinquepartitus*: O. Pickard-Cambridge, 1872: 322 (sp. dubium);*Aelurillus v-insignitus*: Roewer (wrong synonymization).

Remarks. Material – 1 imm. female, “*Salticus quinquepartitus* Wlk. tube 71, boccal 1833”. Coll. O. Pickard-Cambridge, Oxford [“1 female skirts of Mt. Hermon near Rukleh”] – *Aelurillus* sp., but certainly not *Aelurillus v-insignitus*.

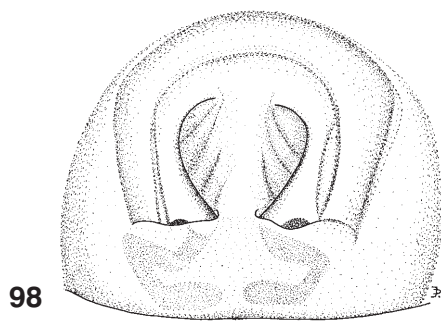
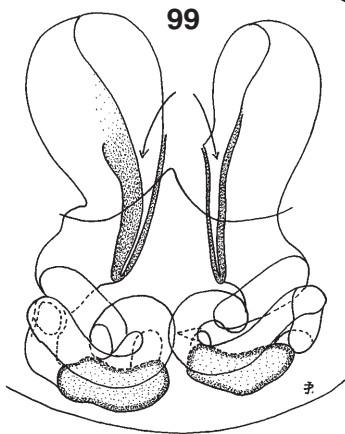
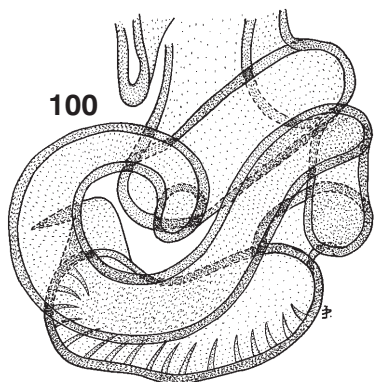
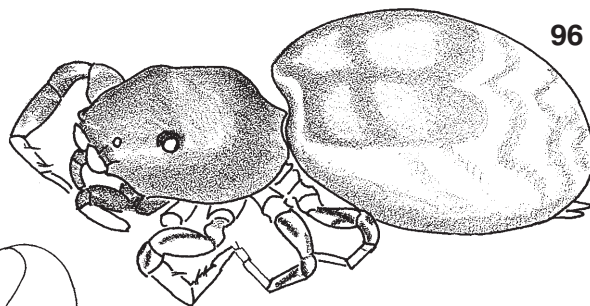
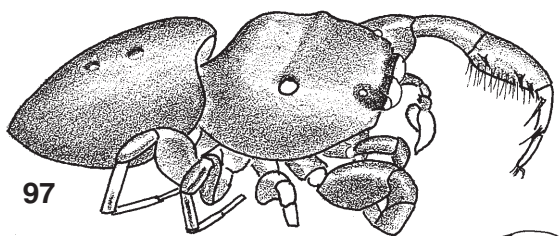
Misinformation on the occurrence of this species in Israel resulted from faulty synonymy by Roewer.

Ballus Koch C.L., 1851**Type species.** *Aranea depressa* Walckenaer, 1802.

Introductory remarks. Classification of the genus uncertain, Simon (1901) has put it into group Balleae (also containing a few genera in Africa), whose inclusion into the subfamily Magoninae seem doubtful. A genus containing 15 nominal species, at least three of which could possibly occur in the Levant; the only specimens known to date from Israel are immature, so identification of the species is impossible. To help in identification of adult *Ballus* specimens, when eventually found in Israel, I include comparative drawings of a European species (Figs 96–100), as well as diagnostic male characters of two unnamed species from the Caucasus and Iran (Figs 101–110).

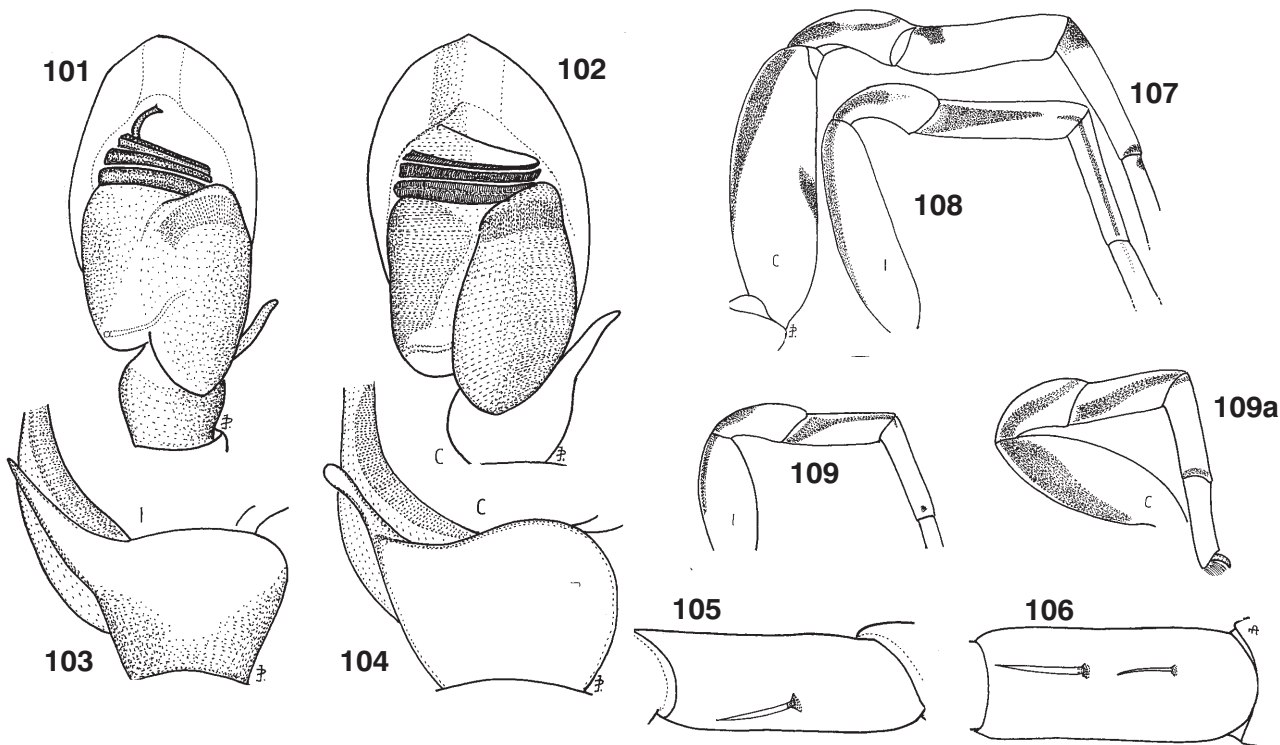
Ballus sp.

Material. Two juvenile specimens, which cannot be identified.

Seasonal occurrence. Juvenile – IX.**Distribution.** Israel: Hal Ceran [?].

Figures 96–100. Relevant European species *Ballus chalybeius*. General appearance of female (96) and male (97), epigynum (98), its internal structure (99), details of spermatheca (100) (from Prószyński, 1991 in Heimer and Nentwig: Figures 1287–1289, 1320.1–4).

Relevant species

Ballus chalybeius (Walckenaer)
(Figs 96–100)*Aranea depressa* Walckenaer, 1802: 242;*Ballus depressus*: Tullgren 1944: 32, Figs 39–40, 41; Locket and Millidge 1951: 220, Figs 108C–E;*Ballus chalybeius*: Flanczewska 1981: 190, Fig. 2; Prószyński 1991: 494, Figs 1320.1–4.**Distribution.** Europe, N Africa, Tadjikistan.*Ballus piger* O. Pickard-Cambridge*Ballus piger* O. Pickard-Cambridge, 1876: 609.**Remark.** No modern redescription or drawings exist.**Distribution.** Egypt.*Ballus rufipes* (Simon)*Attus rufipes* Simon 1868b: 627, Tab. 2, Fig. 10;*Ballus rufipes*: Alicata, Cantarella 1988: 48, Figs 9–11, 18, 28–31.**Remark.** Species reported in XIX century from: Algeria, France, Spain, Sicily, Greece, Turkestan, Sri Lanka, however identification of majority of these specimens uncertain.*Ballus* sp.
(Figs 101–109)**Remark.** Two unnamed species from Caucasus and Iran*Bianor* Peckham et Peckham, 1885**Type species.** *Scythropa maculata* Keyserling, 1883.**Introductory remarks.** The genus presumably belongs to the subfamily Pelleninae Petrunkevitch, 1928 (*sensu novo*) and is recognizable by characteristic external appearance and by rather uniform genital organs in male and female, the latter comparable with several other genera of the subfamily. Cephalothorax is high, usually broad, with steep posterior slope beginning just behind eye field; tegument is heavily sclerotized, usually with minute dense pits of empty sockets of fallen out setae and/or bristles; also chelicerae and legs I are heavily sclerotized. Eye field in *Bianor* is always trapezoid shaped, distinctly broader posteriorly, eyes III usually protruding beyond lateral outlines of cephalothorax, sometimes located at, or very near to it; eye field takes about half cephalothorax length, but its length and width (at eyes I) are about equal. Abdomen broad, oval, almost round, in male usually covered by scutum. Legs I are robust in both sexes, differing from other legs by tibia, patella and femur being twice as broad as in legs II–IV; metatarsus and tarsus I are half the width of tibia I, the latter often swollen, sometimes ovoid, always with strong spines, pro- and retro-laterally. Trochanter I and coxa I twice as long as those of II–IV, and more robust. Length of legs order in males is I 100

Figures 101–109. Diagnostic characters in males of two relevant, unnamed *Ballus* sp. from Iran (upper, marked I, coll. Martens) and Caucasus (lower, marked C, coll. Bubrik). Palpal organ ventrally (101, 102), tibial apophysis dorsally (103, 104), tibia I spination (105, 106); colour pattern on legs IV (longer) (107, 108), and III (shorter) (109, 109a).

%, II 63 %, III 73%, IV 78%; in two specimens of females I 100%, II 80–82%, III 90–97%, IV 95–103%. Genital organs, rather similar within genus and resembling those in a few more closely genera, are shown in drawings below. See also *Modunda staintoni*.

***Bianor albobimaculatus* (Lucas)**

(Figs 110–111, 113–114, 117–118, 120–121)

Salticus albobimaculatus Lucas, 1846: 170 Tab. 8 Fig. 10, O.

Pickard-Cambridge, 1872: 322;

Salticus putus O. Pickard-Cambridge, 1872: 326 (syn. nov.);

Bianor albobimaculatus: Cantarella 1982a: 56, f. 1–2.

Diagnosis. Characteristic broad and short cephalothorax with trapezium-shaped eye field. Male abdomen covered by scutum. Palpal organ and epigynum very characteristic for the genus.

Remarks. *Bianor putus* from Israel are identical with *Bianor albobimaculatus* from Algeria (presumably properly identified because they agree with original description of Lucas, the type of which is lost). On the basis of the above I synonymize both names, the proper name for the species being *Bianor albobimaculatus*.

Description. Male. Cephalothorax: short and broad, brown now (originally black with yellowish scales) with remnants of dense whitish spots of adpressed setae medially on thoracic slope behind eyes III, sparse white setae on sides and along ventral edge in posterior part.

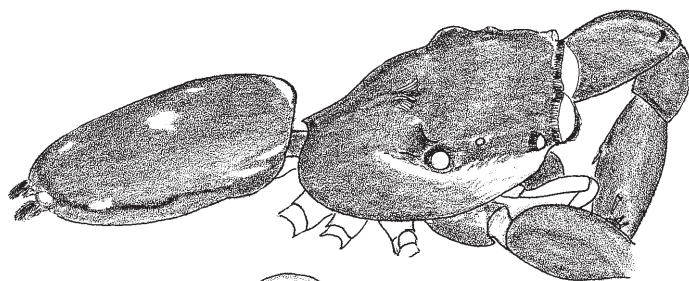
Abdomen: much changed in the studied specimen, now reduced to hard scutum shield with remnants of setae; originally black brown covered with scales, with a white median spot in the anterior part, followed laterally by “a curved white bar”, there was also “round the shoulders of abdomen a small tuft of white hairs at its extremity on either side of spinnerets”. Ventrally whitish.

Frontal aspect: brown, covered with white setae, some overhanging the flat chelicerae; eyes surrounded with white setae ventrally, dorsally with light fawn setae.

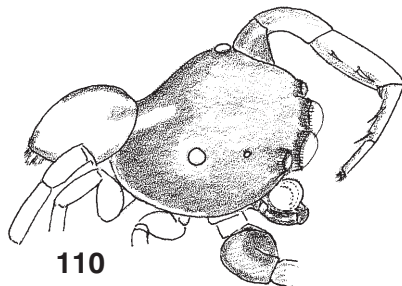
Legs: I originally red-brown, robust and longer than remaining legs, although not as strikingly as in *Modunda staintoni*. Legs II–IV light brown, darker at joints, tarsi and metatarsi paler; all tarsi with tarsal tufts.

Palpal organ: bulbus oval, flattened anteriorly, apophysis almost straight with tip slightly bent.

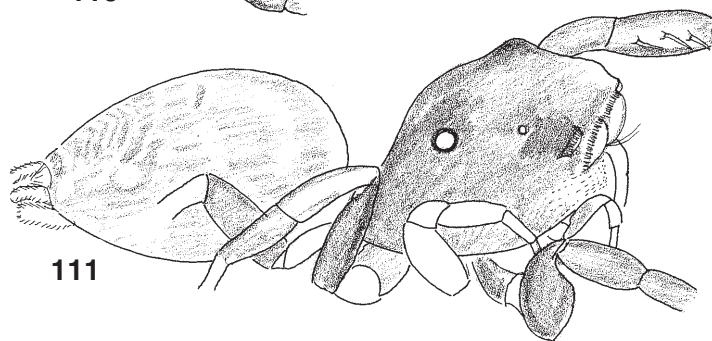
Female. Cephalothorax in fresh specimens (from Algeria) almost black, in longer preserved specimens faded to light brown with eyes III periphery dark,



112



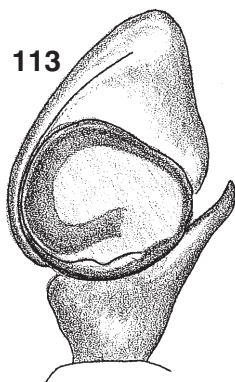
110



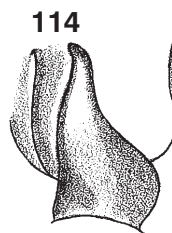
111

Figures 110–112. General appearance of *Bianor albobimaculatus*, male (110) and female (111); *Modunda staintoni* (112).

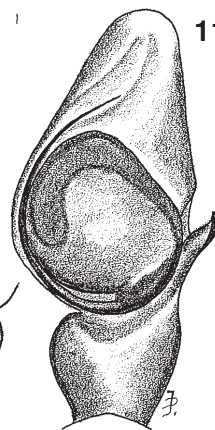
swelling behind eyes ALE also dark, eyes II minute, located just on the edge of dark area, an irregular dark pigmented spot in the centre of eye field, remaining part of cephalothorax brown with thin ventral edge blackish; the surface of eye field microsculptured into dense rows of shallow round pits with short, sometimes minute but always stout, bristles in each pit in one studied specimen,



113



114

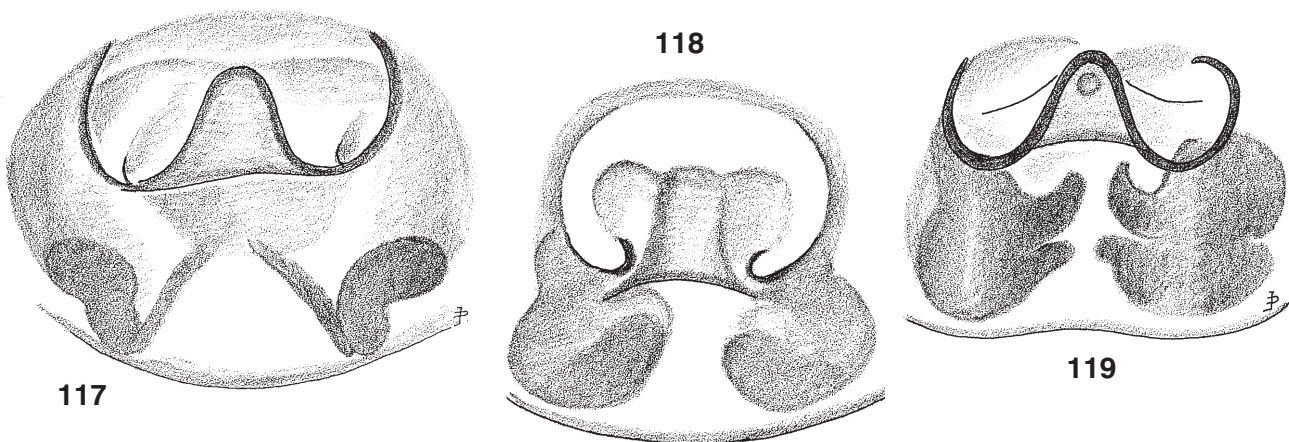


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116

Figures 113–116. *Bianor albobimaculatus* (specimen from Hula), palpal organ ventrally (113) and palpal tibia laterally (114); *Modunda staintoni*, palpal organ ventrally (115), palpal tibia laterally (116).



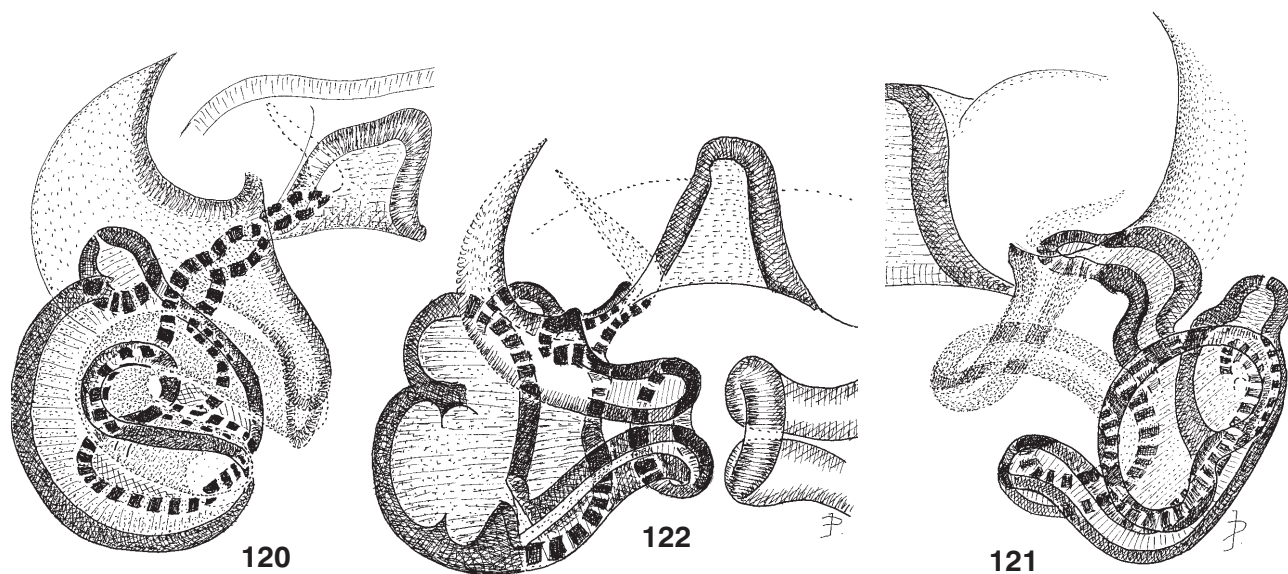
Figures 117–119. Epigynum in *Bianor albobimaculatus*, specimens from Yarqon (117) and from Hula (118), also *Modunda staintoni* (119).

in other specimens there are only empty sockets without bristles, characteristic for *Bianor*; there are also sparse, adpressed, very fine whitish setae, seemingly not related to sockets, particularly noticeable on the posterior thoracic slope; slightly denser white setae behind eyes III may be remnants of white spots; there is a sparse row of white setae along posterior margin of thorax.

Abdomen: broad oval, truncated anteriorly (with slightly depressed edge medially) and pointed posteriorly; light brown, with whitish mosaic of spots in the anterior half; in the posterior half indistinct pattern of four lighter median chevrons and a darker brown diamond in front of spinnerets, two small submarginal spots of intensively white setae surrounded by broad darker rims, diameter of white spots is about $1/10^{\text{th}}$ and location about $7/10^{\text{th}}$ of length of abdomen; sides brown. Frontal aspect: face dark (in old specimen light fawn)

covered densely with adpressed striking white setae arranged in different directions: on sides dorsally, under ALE horizontally, approaching AME the direction of setae turns diagonally ventral and finally along median part of clypeal edge they are directed ventrally overhanging cheliceral bases, mixed with sparser white setae on dark brown chelicerae; the space immediately beneath eyes I remains dark, particularly triangle between AME; on old specimen setae surrounding eyes are colourless and inconspicuous, on fresh specimen there is a very thin line of white setae on ventral rims of AME, remaining setae surrounding eyes I are reddish brown, partially missing; pedipalps yellow with inconspicuous whitish long but sparse setae; legs I dark brown on fresh, light fawn on older specimen.

Ventral aspect: sternum and coxae light fawn on old specimen, dark brown on fresh one; abdomen ventrally



Figures 120–122. Internal structure of epigynum in *Bianor albobimaculatus*, specimens from Yarqon (120) and from Hula (121), also *Modunda staintoni* (122).

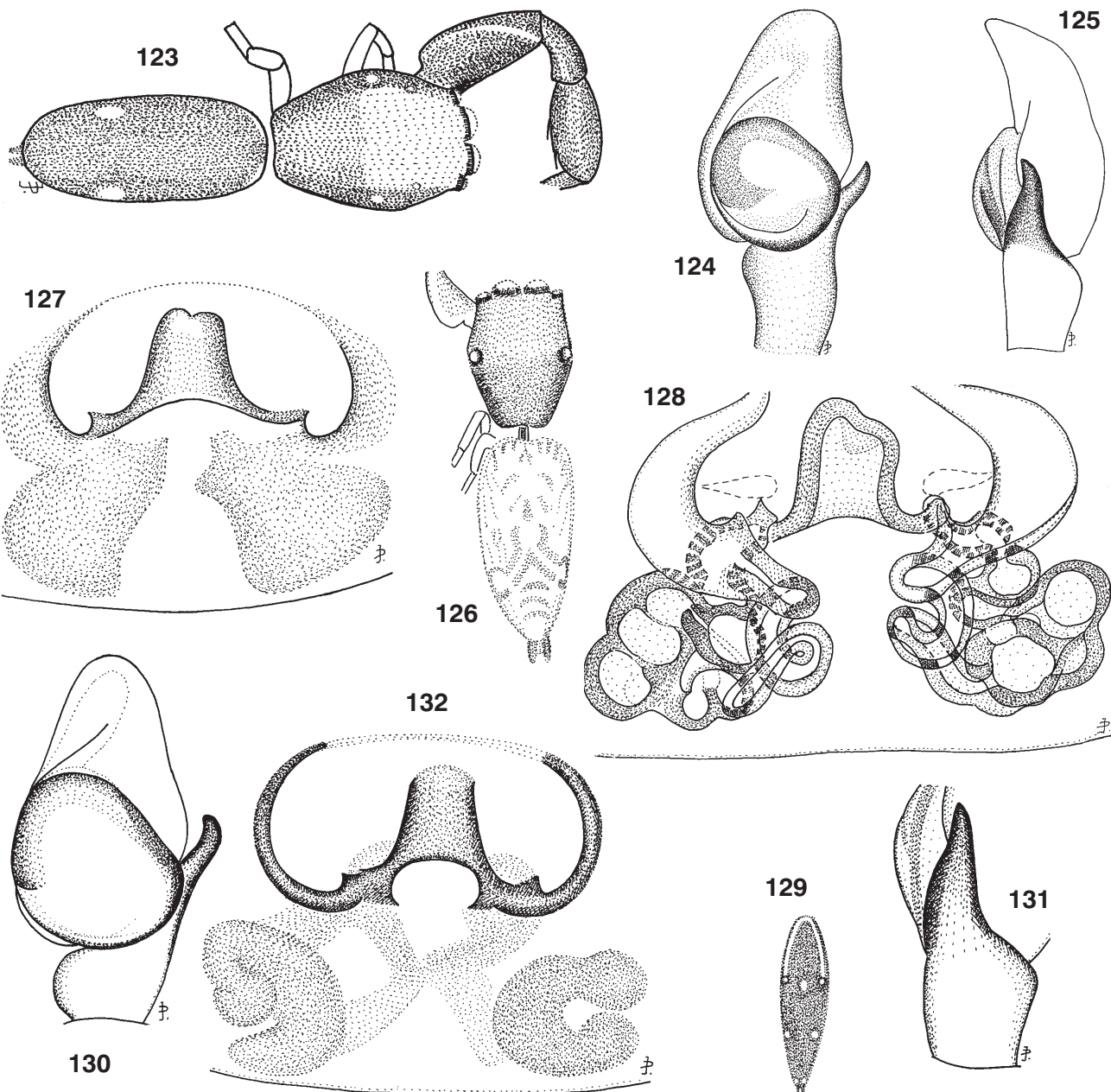
light greyish yellow, with median area behind epigastric fold delimited by two lighter submarginal lines.

Legs uniformly light fawn on old specimen, dark brown on fresh one with lighter tarsus I and tarsi-metatarsi II-IV.

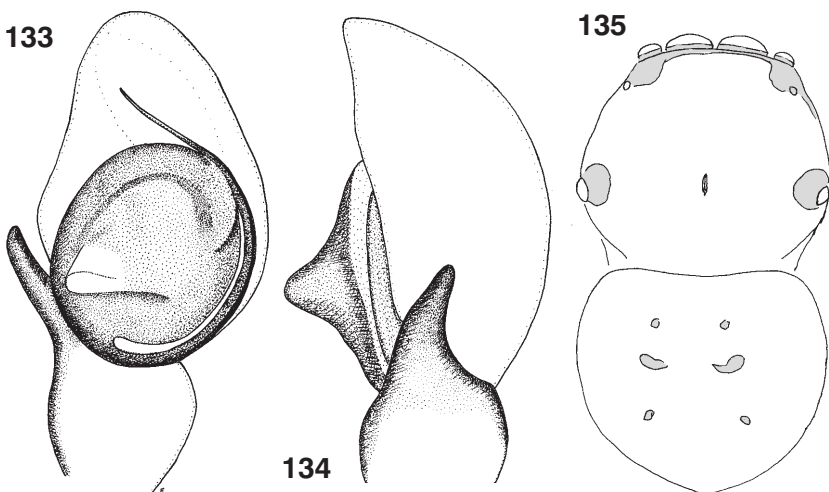
Epigynum typical for *Bianor*, differing by a transverse weakly sclerotized area stretching from the apical part of the vaginal roof but not reaching, and certainly not joining the sclerotized lateral edges of the white

membraneous area; anteriorly it ends by sharp, slightly waving line touching the tip of the vaginal roof and leaving narrow space of white membrane in front of it; that line and weak sclerotization seem to be present in all specimens I assume to be *B. albobimaculatus* (including those from Algeria, Saudi Arabia and India).

Measurements (mm). Female. Length of cephalothorax 2.01-2.16; length of abdomen 2.39-2.73; length of 5 segments of leg I 3.96.



Figures 123-132. (123-125) Variation in *Modunda staintoni*. Specimen identified in the O. P.-C. collection as *Icius angustatus*, general appearance (123), palpal organ ventrally (124) and laterally (125). (126-127) Variation in *Modunda staintoni*, (specimen from Suez, lectotype of *M. phragmitis* Simon, 1901), general appearance (126), epigynum (127) and its internal structure (128). (129-132). Variation in *Modunda* sp. (specimen from Fayum, identified as *Modunda phragmitis* in Reimoser collection, Vienna), general appearance (129), palpal organ ventrally (130) and laterally (131), epigynum (132).



Figures 133-135. *Napoca insignis*, palpal organ, ventral (133) and lateral view (134), dorsal aspect (135) (the latter drawn by D. V. Logunov).

Seasonal appearance of adult specimens. Males – IX; females – VII, IX.

Distribution. Mediterranean (Algeria); W. Africa; Cabo Verde Islands; former USSR: Middle Asia; Saudi Arabia? India? Lebanon: Rasheiya on the skirts of Mt. Hermon. Israel: Lake Hula (1), Yarqon River (8); plains of Jordan near Jericho (13).

Relevant species

Bianor pulchellus Wesolowska et van Harten

Bianor pulchellus Wesolowska et van Harten, 1994: 14, Figs 28–30.

Remark. Described from Yemen.

Bianor scutator Wesolowska et van Harten

Bianor scutator Wesolowska et van Harten, 1994: 16, Figs 31–36.

Remark. Described from Yemen.

Relevant genus *Carrhotus* Thorell, 1891

Type species. *Plexippus viduus* C. L. Koch 1846.

Introductory remarks. Middle size jumping spider with high cephalothorax, rounded in profile; characterized by “hairy” appearance, due to numerous dark bristles scattered sparsely over cephalothorax and abdomen. Palpal organ narrowly oval, with bulbous apically split from broad and fleshy basis of embolus, embolus itself short, thin and bent; tibial apophysis broad, plate-like. Epigynum with two grooves separated by narrow ridge; copulatory openings posterior; channels runs anteriorly, bent in S shape, spermathecae spherical, located anteriorly. The genus contains 14 species, mainly Oriental, with a few Ethiopian and one Palearctic species.

Carrhotus xanthogramma (Latreille)

Aranea bicolor Walckenaer 1802: 247 (preoccup.);

Salticus xanthogramma Latreille, 1819:103;

Carrhotus xanthogramma: Prószyński 1979: 304, Fig. 17; Flanczewska 1981: 192, Fig. 3; Prószyński 1991: 494, Figs 1322.1–4.

Remark. Relevant Palearctic species, found in S Europe and Turkey (Nosek 1905: 119, Roewer 1960: 31).

Chalcoscirtus Bertkau, 1880

Type species. *Caliotherus infimus* Simon, 1868.

Introductory remarks. Minute, about 3 mm long, dull coloured spiders, striking by light reflecting tegument, abdomen covered with scutum in males. Palpal organ of the Euophryinae type, females can be distinguished only by internal structure of epigynum, particularly by structure and location of the accessory gland openings.

Body proportions of male and female similar. Shape of cephalothorax moderately long, narrow, its width varies 54–67% at eyes I, 64–72% at eyes III and 65–73% at the broadest part, which is located at mid-length of thorax; sides of cephalic part appear to be rather parallel; height 41–45%. Eye field short extending over 33–46% of cephalothorax, short in relation to its width at eyes I, and rectangular, indistinctly narrower than cephalothorax, eyes III are located close to the dorsal edges of cephalothorax. Profile of cephalothorax: anterior slope of eye field very gently inclined anteriorly, extending to the highest point at eyes III, from where it gently slopes posteriorly; flat area of cephalothorax prominent, extends over 70% of length of cephalothorax; posterior slope of thorax begins in male by sharp edge, which is originally vertical and only later begins to level, in female more rounded, hidden under abdomen. Shape of abdomen: in male elongate oval, equally narrowing and rounded at both ends, entirely covered with black, light reflecting scutum. Legs: relation of leg lengths in decreasing order: IV 116–120%, III 104–120%, I 100%, II 86–95%.

Chalcoscirtus catherinae Prószyński

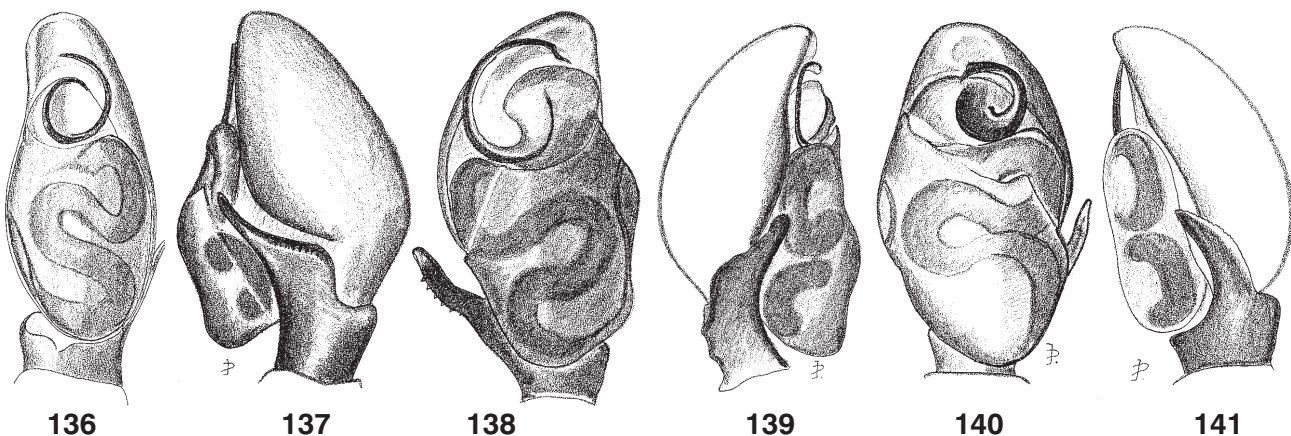
(Figs 138–139, 146–150, 151–152)

Chalcoscirtus catherinae Prószyński, 2000: 236, Figs. 22–31.

Diagnosis. A similar, related species occurs in Central Asia – Tajikistan and also Kyzyl-Kum Desert in the Uzbekistan. There is also resemblance to “*Euophrys nigrita*”: Prószyński 1979: 307, Figs 75–77 from Ukraine (identif. uncertain), in which, however, teeth on apophysis were not noticed.

Description. Male. Cephalothorax: tegument light reflecting, uniformly dark brown, eye field black, a few sparse colourless setae, no contrasting colour pattern.

Abdomen: covered with uniformly blackish, light reflecting scutum, sparse colourless bright setae.



Figures 136–141. *Chalcoscirtus infimus* (from En Gedi), palpal organ ventrally (136), laterally (137). *Ch. catherinae* from Sede Boqer, palpal organ ventrally (138), laterally (139). *Ch. jerusalemicus*, palpal organ ventrally (140), laterally (141).

Frontal aspect: uniformly dark brown without contrasting colour pattern, a few colourless setae on rims of eyes I; clypeus low, chelicerae and pedipalps brown; patella and tibia I with longitudinal median darker line.

Palpal organ: bulb broad, embolus makes a broad coil, basal part of embolus is very broad – embolus itself thin; apophysis inclined ventrally with protuberance on dorsal edge and minute tooth.

Ventral aspect: brown, with sternum darker and coxae lighter; abdomen almost black.

Legs: femora I–IV dark brown with irregular lighter brown spots, there are two lighter marginal lines along their dorsal surfaces delimiting broad dark dorsal area; remaining segments of legs I–IV greyish yellow except tibia and patella I which are darker.

Female. Cephalothorax: tegument light reflecting, uniformly dark greyish brown, eye field black, a few sparse colourless setae, no contrasting colour pattern.

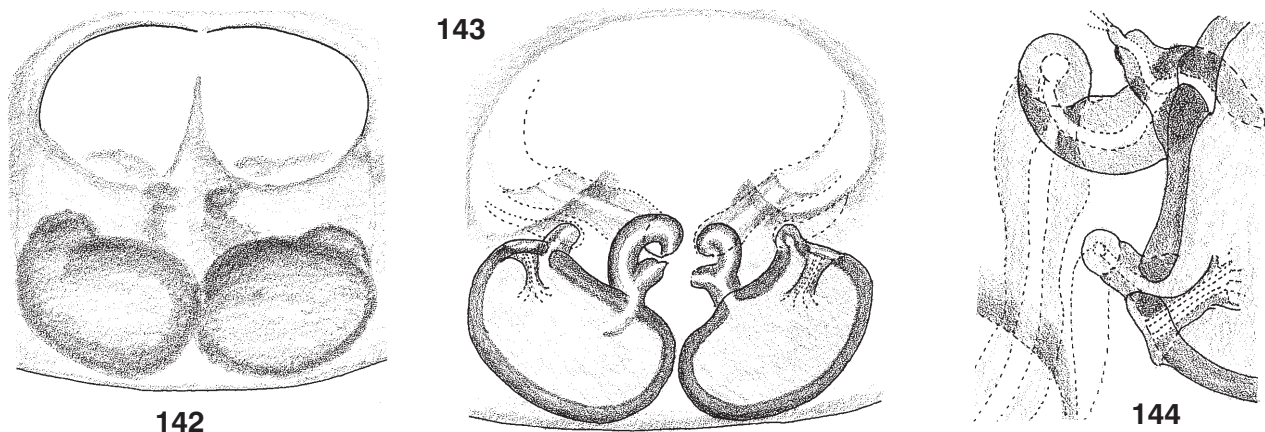
Abdomen: dull dark greyish brown, wrinkled and suffused with lighter greyish colour.

Frontal aspect: face dark brown without contrasting colour pattern, single row of sparse whitish setae around rims of eyes I; a few whitish setae on clypeus, which is very low, overhanging cheliceral bases; chelicerae greyish brown, medially yellowish; pedipalps and patella-tibia I greyish brown (but in Sinai specimen whitish yellow).

Ventral aspect: mouth parts, sternum, dark brown, coxae II–IV and trochanters ventrally light, femora I–IV ventrally dark greyish brown, abdomen ventrally light greyish brown with two, slightly darker longitudinal streaks.

Legs: uniformly yellow with grey setae; in specimen from Elat femora I–IV dark greyish brown with lighter dorsal streak narrowing apically; patellae I–IV greyish yellow, tibiae II–IV greyish brown, dorsally lighter except tibia I which is dark, tarsi and metatarsi I–IV yellow, sparse inconspicuous setae.

Epigynum with two membraneous round windows, narrowly separated; long diagonal copulatory channel



Figures 142–144. *Chalcoscirtus infimus* (from Nahal Nizzana), epigynum (142), its internal structure (143), enlarged copulatory channel and two accessory glands (144).

with the accessory gland opening in the middle and some not yet very clear structure around copulatory opening, under anterior sclerotized rim of the window; spermathecae appear oval, longer than wide, with bent distal channel and porous second accessory gland opening nearby. In specimen from Elat spermathecae appear longer, the striking difference of that specimen with all other *Chalcoscirtus* is the structure of the copulatory opening: although channel ends under anterior sclerotized rim of the window, it is extended, however, by a soft membranous loop turning back and medially and ending by an indistinct slit nearby or under protruding sclerotized structure on the middle of window rim. The significance of these differences is not clear. Likewise, the significance of minor variation in coloration of body and legs among specimens from various localities is not clear.

Measurements (mm). Male. Length of cephalothorax 1.51; length of abdomen 1.27; length of 5 segments of leg I 2.44. Female. Length of cephalothorax 1.51; length of abdomen (missing); length of 5 segments of leg I 2.75.

Seasonal appearance of adult specimens.

Males – I, II, III, IV, VII; females – I, II, IV, VII.

Distribution. Egypt, Sinai: St. Catherine's Monastery (22). Israel: Elat (16), Haluqim Ridge, Hatira Ridge, Ramat Zevira, Sede Boqer (17).

Etymology. Species named for my wife, an arachnologist E. M. Andreeva (Katarzyna Andrejewa-Prószyńska).

***Chalcoscirtus infimus* (Simon)**

(Figs 136–137, 142–144)

Calietherus infimus Simon, 1868b: 661 T. 7. f. 2;

Salticus infimus: O. Pickard-Cambridge 1872: 324;

Chalcoscirtus infimus: Andreeva 1976: 92, f. 130;

Prószyński 1976: Figs 353–358, map 48; Flanczewska

1981: 192, Figs 4–6; Prószyński 1991: 469, Figs 1325.1–4;

Logunov and Marusik 1999: 208–209, figs 1–9, 24, 25,

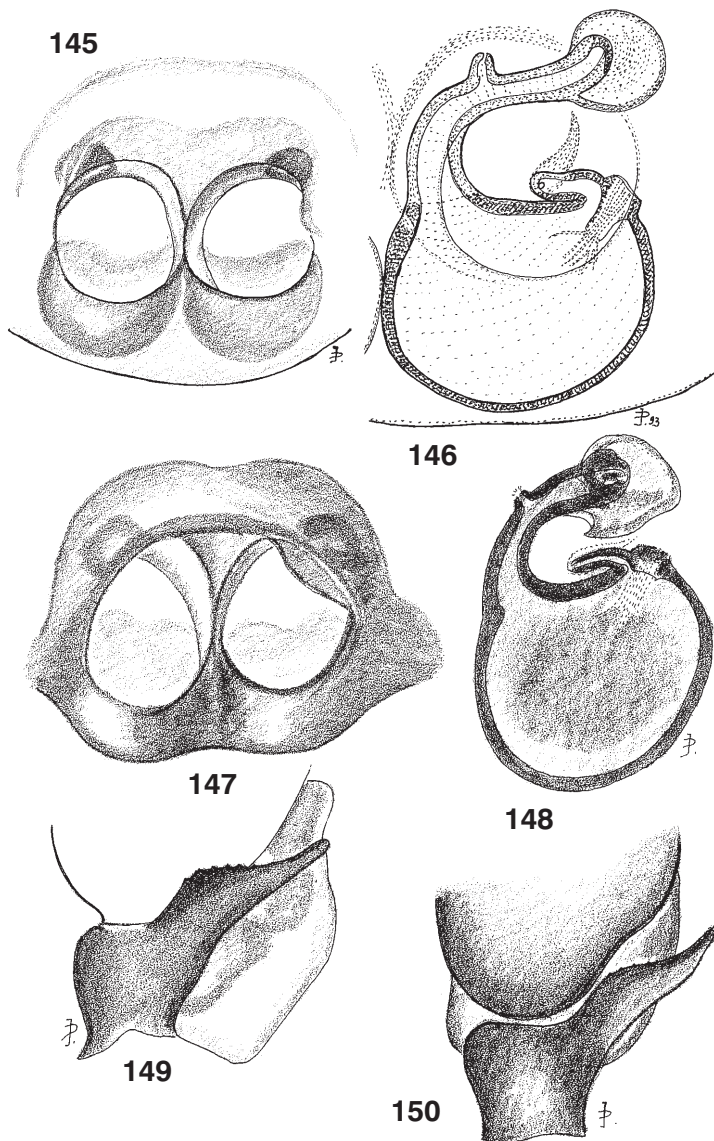
32–35, map 1.

Diagnosis. Bulbus narrow, embolus makes a narrow coil, basal part of embolus is thin; apophysis slightly inclined ventrally, thicker medially, semitransparent along edges, without protuberance on dorsal edge.

Description. Male. Cephalothorax uniformly blackish brown without any contrasting pattern and without noticeable setae; tegument hardened, light reflecting, with sparse minute pits being apparently empty sockets of setae.

Abdomen uniformly shining blackish brown, entirely covered by hard scutum, no noticeable setae.

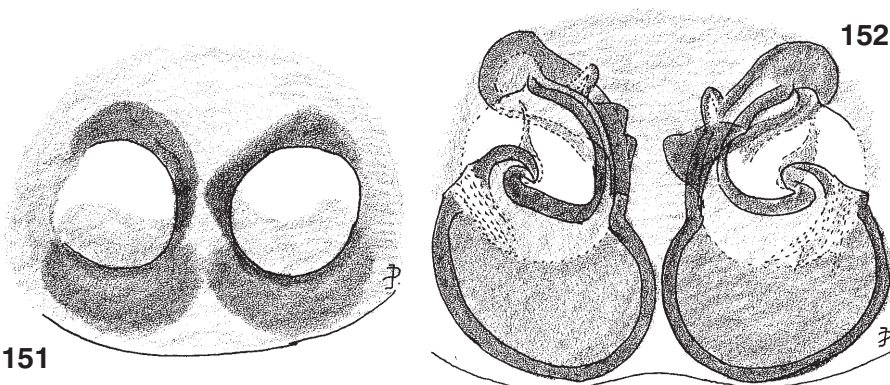
Frontal aspect: almost whole height of face taken by eyes AME, with ALE aligned along their dorsal rims, diameter of ALE about half that of AME, clypeus reduced to about 1/6th of AME diameter, almost bald, like



Figures 145–150. *Chalcoscirtus catherinae*, from Sinai: St. Catherine Monastery and Negev, epigynum (145), single spermatheca (146); and from Sede Boqer, female: epigynum (147), single spermatheca (148); and male: details of tibial apophysis, dorso-lateral (149) and dorsal (150) views.

remaining part of face and brown; eye field and surrounding of eyes I black, no noticeable orbital setae. Chelicerae lighter brown, twice as high as face, with distinct protuberance $\frac{2}{3}$ way along lateral edge; apical half of median margins pushed somewhat diagonally back making anterior surface of both chelicerae somewhat concave; pedipalps dark brown with apex of cymbium light brown, with very sparse, colourless setae.

Ventral aspect: generally uniformly dark brown with coxae and chelicerae slightly lighter; retromargin of chelicerae not developed and there is single median margin of chelicerae bearing two prominent teeth with separated bases. Legs almost uniformly dark brown but tarsi and metatarsi lighter, light reflecting, with sparse



Figures 151–152. *Chalcoscirtus catherinae* (from Elat), epigynum (151) and its internal structures 152.

but relatively long colourless setae, tibia I with a retro-lateral row of 3 ventral spines, I was unable to ascertain the presence of a complementary prolateral row, possibly lacking.

Palpal organ in this species strikingly narrow, bulbus narrow, embolus makes a narrow coil, basal part of embolus is less broad – embolus itself thin; apophysis long, inclined ventrally, with smooth, low protuberance on dorsal edge, devoid of any teeth.

Female. Cephalothorax blackish brown, weakly light reflecting, appearing bald but has sparse upright colourless setae scattered over the whole surface.

Abdomen blackish grey, also weakly light reflecting.

Face: dark brown, sparse colourless setae surrounding eyes I, clypeus extremely reduced, bald; chelicerae brown, lighter brown medially, with median edges bent and making a small chamber between upper halves of both chelicerae.

Ventral aspect: mouth parts brownish grey with white margin, sternum brown with greyish shade, with a few single thin, colourless setae, coxae whitish with part of surface suffused with grey; abdomen dark grey. Epigynum with a pair of brown, oval spermathecae, visible through sclerotized tegument, and a single membranous, oval, white “window”, occupying less than half the length of epigynum, there is a triangular darkening of the membrane, in the centre of the window, possibly not visible in other specimens. The copulatory channel is at first membranous and running transversely, then it changes direction, in that part being sclerotized and with a distinct, relatively thick wall, running longitudinally towards the spermatheca, with the branching of a prominent accessory gland near the junction with the spermatheca. The general plan of channel resembles a coiled channel in Prószyński 1976: fig. 353, which, however, indicates neither thickness and structure of walls nor position and shape of the scent gland; assuming that these structures were overlooked and inadequately drawn in the 1960s, we may further assume that both drawings depict the same species. Nutritive gland pore located near terminal opening of

spermatheca. Epigynum (in the Nahal Nizzana specimen) somewhat resembles *Chalcoscirtus kamchik* Marusik, 1991 (Figs 7–9) from Tadjikistan, as well as *Chalcoscirtus pauper* Wesolowska, 1996 (Fig. 10d), from Turkmenistan, but the significance of this is uncertain.

Legs slender, tarsi-patellae I–IV whitish yellow to yellow, femora I–IV with lateral and ventral surfaces dark grey, except their apical ends which are yellow; dorsal surfaces of femora I–II yellow, III–IV with

thin irregular, yellow longitudinal lines or line.

Measurements (mm, Israeli and Algerian specimen). Male. Length of cephalothorax 1.38–1.60; length of abdomen 1.51–1.69; length of 5 segments of leg I 2.15–2.65. Female. Length of cephalothorax 1.21–1.51; length of abdomen 1.76–1.69; length of 5 segments of leg I 1.70–2.26.

Seasonal appearance of adult specimens. Male – III, female – VI.

Distribution. S Europe (including Corfu), Algeria. Israel: Jerusalem (11), Ein Gedi (13), Nahal Nizzana (17); other records require checking of identification.

Chalcoscirtus jerusalemicus Prószyński
(Figs 140–141)

Chalcoscirtus jerusalemicus Prószyński, 2000: 237, Figs 20–21.

Diagnostic characters. Male. Appearance similar to species described above, from which differs by bulbus broad, embolus making narrow coil, basal part of embolus less broad – embolus itself thin; apophysis semi-transparent with axial thicker part, inclined ventrally without protuberance or teeth. The condition of specimens does not permit to make more detailed description of external appearance of the specimen.

Seasonal appearance of adult specimens. Male – III.

Distribution. Israel: Jerusalem (11), Jericho (13).

Cyrra Simon, 1876

Type species. *Salticus algerinus* Lucas, 1844.

Introductory remarks. The genus contains 11 species distributed in the warm areas of the Old World, in the Mediterranean only one species – *Cyrra algerina* (Lucas, 1846). *Cyrra algerina* displays special, presumably ancestral behaviour of an araneophagic web-invader; uses vibratory stimuli and can pursue web spiders for up to several hours to catch and eat them; on the other hand it behaves as an effective cursorial predator of insects, which

is typical for Salticidae; builds only a rudimentary nest, uses visual displays and active, agile movements during intraspecific interactions ("dancing") (Jackson 1981).

Body proportions. Shape of cephalothorax: width is 67% at eyes I, 69% at eyes III and 69% at the broadest part, sides of cephalothorax appear to be rather parallel; medium high 43%, gently sloping posteriorly. Eye field short, extending over 40% of cephalothorax, also short in relation to its width; trapezoid shaped, narrowing posteriorly; narrower than cephalothorax and eyes III are located some distance from the edges of cephalothorax. Eyes II very small, equidistant from I and III. Abdomen elongate oval, slightly narrowed posteriorly; indistinctly narrower than cephalothorax; dorsally flattened, no scutum. Legs in female almost equal in length, IV slightly longer; II slightly shorter than I.

Cyrrba algerina (Lucas)

(Figs 153–157)

Salticus algerinus Lucas, 1844b: 148 T. 6 F. 6;

Salticus cephalotes: O. Pickard-Cambridge, 1872: 321;

Cyrrba algerina: Andreeva 1969: 90; Andreeva 1976: 78–79;

Wanless 1984a: 452–455, Figs 2, 4A–B, 5A–I, 6A–E, 16A–F, 17A–D; Wanless 1984b: 186, f. 25A–F, 34F, 36A–B.

Diagnosis. Striking by bright coloration: reddish pink cephalothorax and anterior abdomen, contrasting

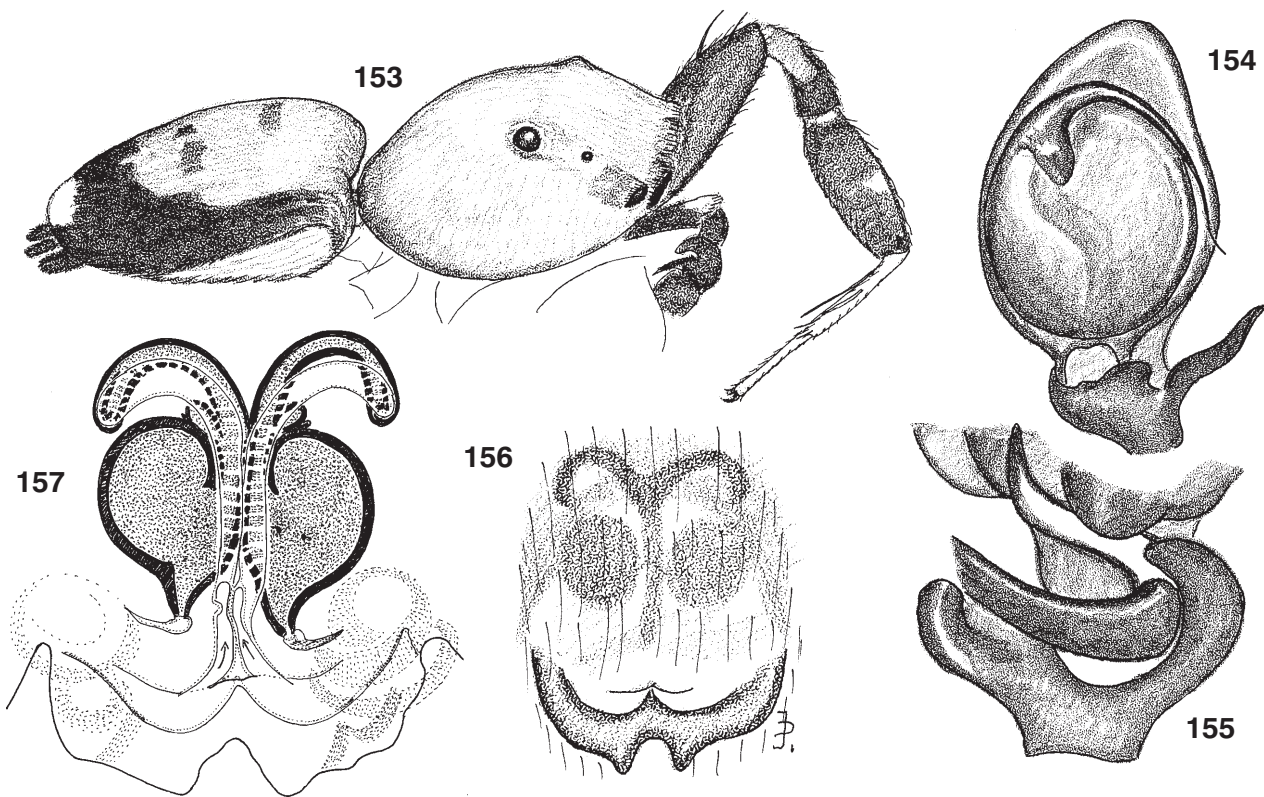
with black posterior part of abdomen with a single white spot terminally. Genital organs very special.

Description. Male. Cephalothorax reddish pink. Abdomen: anterior part reddish pink, contrasting with black posterior part of abdomen and cymbium, and a single white spot terminally on abdomen. Cymbium contrastingly black (O. Pickard-Cambridge 1872: 321). Palpal organ characteristic for the subfamily Spartaeinae with large, oval, flat bulbous, with depression near basis of embolus; embolus arising at 11 o'clock position and encircling anterior, and half of lateral edge of bulbous; large and very special single tibial apophysis which is the best character separating this species from other related ones.

Female. Cephalothorax has three different colour zones: eye field dark brown, anterior thorax and upper sides light yellow, with prominent brown fovea, posterior thorax and lower sides greyish brown; all covered with minute, adpressed, colourless thin scales.

Abdomen: sides and margins brownish grey, the dark marginal areas closing in front of spinnerets but leaving a small white diamond spot just in front of spinnerets, anterior margin and median area of the dorsal surface, narrowing posteriorly, light yellow with small brownish grey dots, submarginally and anteriorly, with a median line of small grey chevrons.

Frontal aspect: face brown, with eyes anterior surrounded by a row of fawn setae; clypeus reduced to nil,



Figures 153–157. *Cyrrba algerina*, male, general appearance (153), palpal organ ventrally (154) and its tibial apophysis laterally (155); female, epigynum (156) and its internal structure (157) (note copulatory opening, soft copulatory channel and accessory gland opening).

with a row of a few colourless and brown bristles, set diagonally-ventrally; chelicerae robust, triangular, slightly diverging, light brown with dark brown rectangular spot on median surfaces. Pedipalps thin, light yellow. Tibia I dark brown with prominent dark hairs; patella marginally brown, medially fawn with an indistinct spot of white setae on prolateral edge; femur I brown with fawn spot apically on dorsal surface; tarsus and metatarsus I yellowish fawn. Remaining legs yellowish fawn, with tibia II and, more weakly, tibia III with two darker rings.

Ventral aspect: mouth parts brown, sternum light brown, coxae fawn with coxae IV lighter, abdomen ventrally light grey, with lighter anterior area and submarginal streak.

Epigynum in a characteristic shield form with typical shape of posterior edge and dark round spots corresponding to globular spermathecae inside; copulatory openings located postero-medially, usually invisible. Internal structures consist of large globular spermathecae with heavily sclerotized copulatory channels running anteriorly and ending by lateral bends, from their endings continue the often overlooked membranous parts of copulatory channels which are thin walled and usually very poorly visible, these converge medially on the background of sclerotized channels and spermathecae and run to the postero-median copulatory openings.

Measurements (mm). Female. Length of cephalothorax 2.70; length of abdomen 3.00; length of 5 segments of leg I 5.44.

Seasonal appearance of adult specimens. Males – I, II, IV, V, VI; females – II, IV, V, VI, VII.

Distribution. Mediterranean, extending to West Africa, Central, East and South Asia. Israel: Mt. Tabor (2), Mt. Carmel, Haar Horshan (3). Poriya eastern slope (7), Nezer Sereni (9), En Hemed, 'Etanim, Jerusalem, Ramat-Rahel, south of Hebron (11), Berosh (15), Hалуqim Ridge (17), Berekhath Ram, Bab el Hawa, near Kuneitra (18).

Euophrys Koch C. L., 1834

Type species. *Aranea frontalis* Walckenaer, 1802.

Introductory remarks. Species of *Euophrys* are difficult to identify, due to their small size, usually cryptic coloration and also to general similarities in their genital organs; in opinion of some authors females of a several species cannot be separated. Matching of sexes uncertain. Anticipating identification problems of Levantine *Euophrys*, I provide data on relevant species, which have not yet been found in Israel or neighbouring countries.

Very small to medium size spiders characterised by shape of genital organs (shared by the whole subfamily Euophryinae) and colour pattern (usually dull). They can be also recognised by general body shape and its proportions; “an impression” of this can be memorised

that after seeing a few specimens; however, efforts to express these in measurements is a futile experience because of overlapping proportions in various genera.

Palpal organs are characterised by embolus twisted into flat coil, seminal receptacle channel meandering and snake-like; tibial apophysis usually thin and inconspicuous, sometimes absent; epigynum usually devoid of distinct sclerotised sculptures (except some poorly visible ridges, possibly of diagnostic value): two membranous “windows” anteriorly with brown spherical or vesicular spermathecae interiorly behind the “windows”, copulatory channels sclerotised and simple, either bent or twisted into a coil; identification usually requires making epigynum preparation of almost every specimen.

Coloration of majority of species generally dull with indistinct pattern of grey and yellow areas or spots, in some cases black. Males of some species have contrasting white, yellow or orange setae on clypeus and/or around rims of eyes I; legs I are sometimes black, often with lighter tarsus, pedipalps often white and with white setae – usually on cymbium, tibia and patella. Basic abdominal pattern for many *Euophrys* consist of median line of dark triangular spots on creamy whitish background, varying in size and number, accompanied laterally by darker spots or streaks, which together make several rows of chevron marks or an irregular mosaic; the abdominal pattern often undergoes considerable post-mortem changes during first 24 hours of preservation.

Body proportions. Size of cephalothorax (smallest, mean and biggest measurement) 1.14-2.00-2.67 mm, cephalothorax narrow, moderately high, with sides almost parallel: width at eyes I is 56-63-83%, at eyes III 66-71-77%, height of cephalothorax 42-48-54%; length of eye field 34-43-53%. Eye field slightly narrowing posteriorly (mean 2%), broader than long; eyes III protrude beyond the dorsal edges of cephalothorax. There is a prominent flat area extending from about the middle of eye field to the posterior $\frac{3}{4}$ of cephalothorax. Anterior slope of eye field somewhat rounded; posterior slope of the thorax abrupt and steep. Abdomen oval, tapering posteriorly; broader than the width of cephalothorax; dorsally flat, no scutum. Length order of legs in males I = IV, II, III, in females IV, III, I, II.

Key to Levantine species of *Euophrys*

1. Flat area prominent, extending over approximately $\frac{3}{4}$ of the cephalothorax (about half of length of thorax) 2
 - . Flat area not developed or ending immediately behind eyes III, entire thorax sloping; eyes I surrounded by flattened conspicuous white setae, only female known *Eu. catherinae*
- 2(1). Males 3
 - . Females 4
- 3(2). Cephalothorax brown, white setae cover light area on anterior thorax and two pairs of vertical or

diagonal lines across sides; two rows of white setae across clypeus; loop of embolus small; tibial apophysis absent *Eu. gambosa*

– Cephalothorax and abdomen black; single line of white setae along edge of clypeus, loop of embolus larger; tibial apophysis thin and long
..... *Eu. pseudogambosa*

4(2). Dense belt of white setae beneath eyes AME, separated by bald space from lower line of white setae along edge of clypeus *Eu. gambosa*

– Only single line of sparse stouter whitish setae along ventral edge, overhanging cheliceral bases; eyes surrounded by thin colourless setae with whitish tops; thin sclerotized ridge on epigynum runs transversely from the side edge of window *Eu. pseudogambosa*

Euophrys catherinae Prószyński

(Figs 158–162)

Euophrys catherinae Prószyński, 2000: 239, Figs 32–36.

Diagnosis. Recognizable by thorax sloping just behind eye field, light coloured abdomen with median row of small dark chevron-like spots; epigynum typical for *Euophrys*.

Description. Female. Colour pattern, particularly of abdomen, fits both *Neon* and *Euophrys*. However, epigynum, legs proportions (with legs IV 35% longer than

legs I) and eye field slightly narrowing posteriorly are typical for *Euophrys*.

Cephalothorax smaller than in *Euophrys pseudogambosa*, eyes III strikingly protruding beyond lateral margin; thoracic slope begins immediately behind eye field, flat area not developed.

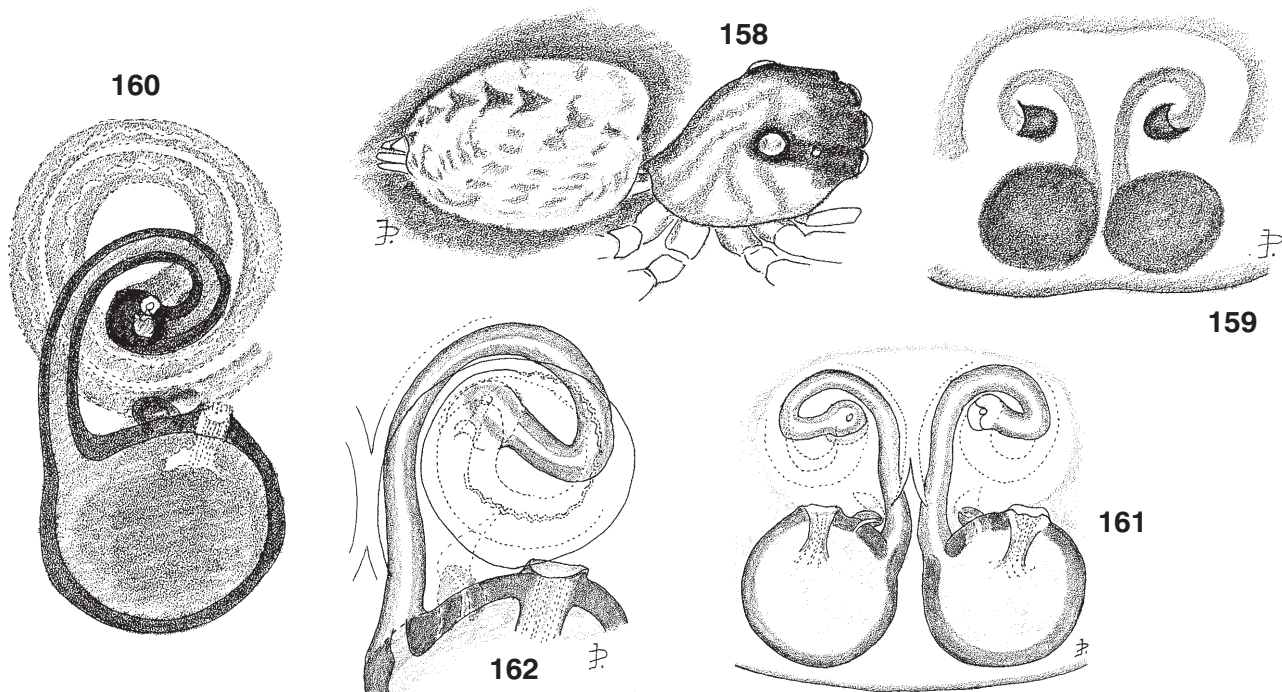
Eye field: dark grey with black lateral edges; thorax greyish yellow with lighter median thoracic line and thin, slightly wavy, darker lines radiating ventrally.

Abdomen: median line of dark spots on white background, of which the three central are large, regular, triangles, three posterior much smaller; anterior spots fused into single narrow dark median line, accompanied laterally by parallel line of less regular dark spots; marginal dark spots extended on sides into dark diagonal stripes.

Frontal aspect: clypeus reduced to about 0.3 of diameter of ALE, greyish brown and bald, single whitish hair on ventral edge, overhanging chelicerae, possibly a remnant of a row of setae, lost in this specimen; eyes I surrounded by flattened and longer white setae, more conspicuous than in *Eu. pseudogambosa*; yellow spot under ALE connected with similarly coloured sides.

Ventral aspect: sternum and coxae yellow, abdomen uniformly whitish. Legs I–II yellow, III–IV whitish yellow; tibia I with 3 pairs of long ventral spines (1/6th to 1/8th of segment length), metatarsus I with two pairs of long ventral spines, almost as long as segment itself.

Epigynum: copulatory channels appear much thinner in proportion to spermathecae diameter than in



Figures 158–162. *Euophrys catherinae*, paratype from Sinai, Wadi Krid, general appearance (note absence of flat part of the thorax) (158); epigynum (159) and single spermatheca with channel and external grooves (dotted) (160); holotype from St. Catherine Monastery, internal structure of epigynum 161 and details of openings and channel 162.

other species studied, external grooves leading to copulatory opening make two tight coils, visible on preparation stained with "Chlorazol Black E".

Measurements (mm). Female. Length of cephalothorax 1.55; length of abdomen 1.96; length of 5 segments of leg I 3.06.

Seasonal appearance of adult specimens. Females – I.

Distribution. Egypt: Sinai – Wadi Kid, Wadi Malkhaq, St. Catherine Monastery (22).

Etymology. Named for my wife, an arachnologist, Ekaterina M. Andreeva (Katarzyna Andrejewa-Prószyńska).

Euophrys gambosa (Simon)

(Figs 163–168, 169–170, 174–176, 182–183, 188–189, 194–195)

Attus gambosus Simon, 1868: 593, Tab. 6, Fig. 7;

Salticus gambosus: O. Pickard-Cambridge, 1872: 323.

Diagnosis. Male and female thorax brown with two white diagonal lines of setae along posterior slope, clypeus with two horizontal rows of white setae separated by bald space. Abdomen dark with two rows of lighter V-shaped spots, leaving median row of darker triangles in between; legs light. Coil of embolus small; tibial apophysis absent.

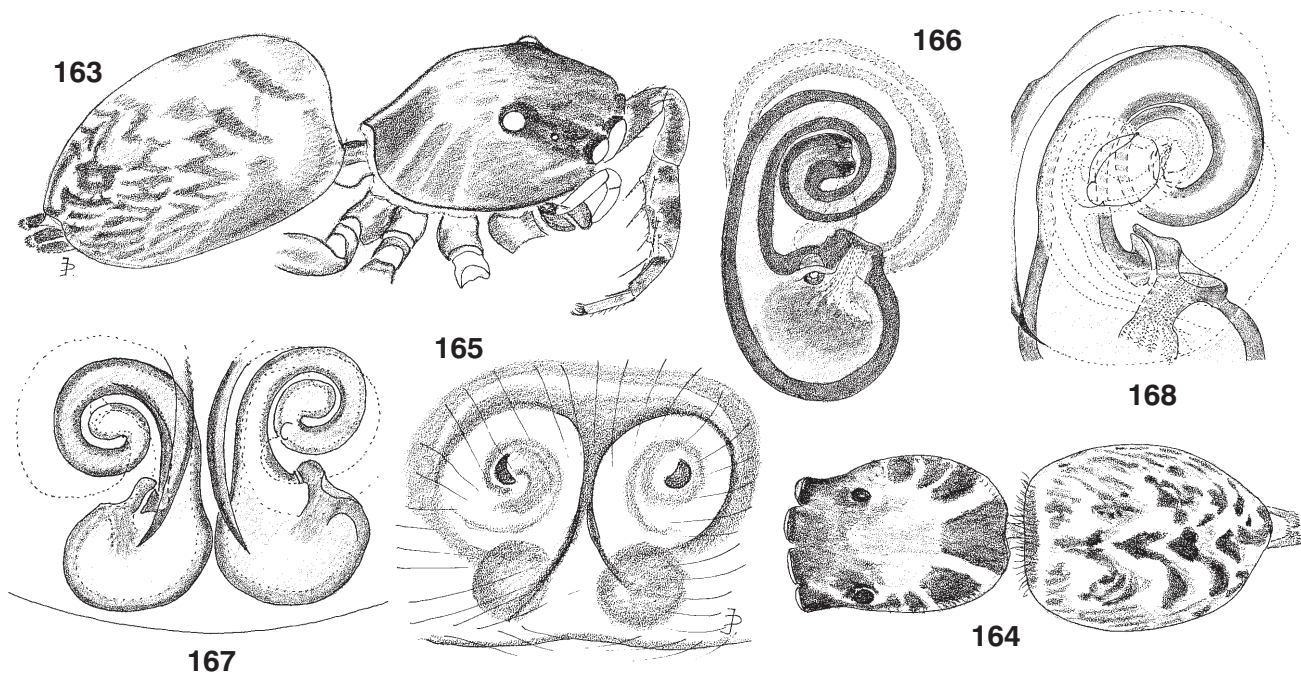
Remark. Conspecificity of females and males from Negev should be confirmed by further studies.

Description. Male. Cephalothorax dark brown, light reflecting; lighter pigmented semicircular area covered with white setae on anterior, flat thorax, from which run two diverging white streaks over posterior slope of tho-

rax and another pair vertically over sides; similar pattern also in female. In some males thin line of indistinct white setae medially along black posterior half of eye field and a faint line of sparse, adpressed white setae along ventral margin of carapace.

Abdomen with mosaic of dark brown spots on creamy white background, arranged in the anterior half into indistinct pattern of three white chevrons separated by three dark brown chevrons, marginal brown spots at the end of each chevron much longer and white spots reduced; posterior half consist of several narrow chevrons, light and dark, appearing compressed. This pattern is comparable in female, in which, however, light background is more extensive, covering half of the surface, leaving only dark chevrons.

Frontal aspect: face black with a striking bald dark line horizontally dividing white setae on clypeus into two horizontal stripes: immediately below eyes I dense, short, adpressed setae, and, below bald space, arising along the edge of clypeus (which itself is black), another line of long, sparse, white setae, stretching below edge; in some specimens these have a sclerotised, tooth-like base for each seta. These two white lines, also occurring in female, seem to be characteristic for the species and do not occur in any other species known to me. Eyes I surrounded with sparse, inconspicuous setae, apically orange, basally either colourless or dark (in female these are whitish). Legs I and II black, light reflecting, with tarsus I slightly lighter, grey, apically yellow, tarsus II greyish fawn, apically yellow; in females legs I and II light greyish yellow. A strong contrast to the black face



Figures 163–168. *Euophrys gambosa* (female from Negev), general appearance (163), dorsal pattern (164), epigynum (165) and single spermatheca with channel and external tegument groove (dotted) (166), internal structure of epigynum in another specimen (167), and details of opening and accessory gland (168).

and legs is provided by light yellow pedipalps with long whitish setae. Chelicerae light brown, with a few indistinct whitish setae basally.

Legs I–II shining black with tarsi lighter, III–IV lighter, with dark and light annuli; leg I is the largest (in smaller male and in female legs IV are longest). Femora dorsally black, basally with lighter marks, increasing from femur I to IV; there are only a few small white setae at the edge of basal, dorsal depression on femur I, on femur II – basal $\frac{1}{3}$ rd of dorsal surface is yellow, III – basal $\frac{1}{2}$ of dorsal surface is yellow, IV – basal $\frac{1}{2}$ of dorsal surface is yellow. Patella III–IV basally light, with dark band apically, tibiae III–IV with two dark and two light annuli, metatarsi III–IV light with darker apical and basal bands, tarsi III–IV light.

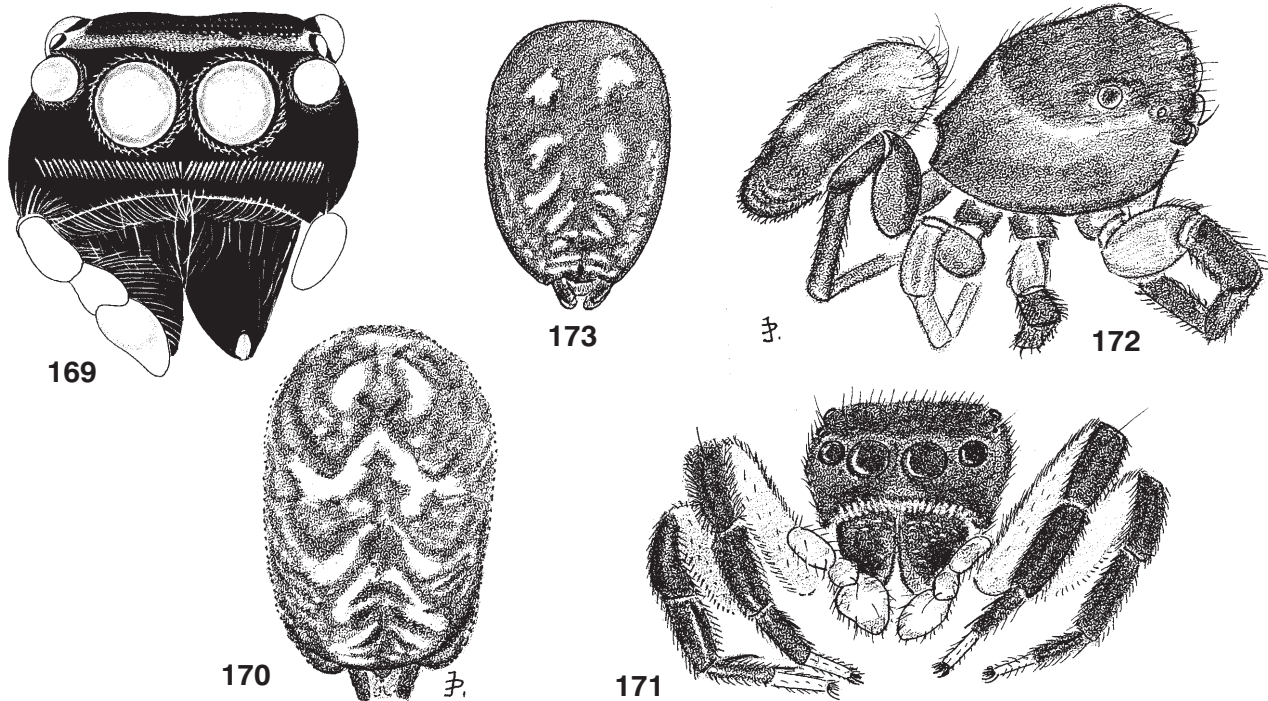
Palpal organ (Figs 174), has smaller and tighter coil of embolus than *Eu. pseudogambosa*, located antero-ventrally; tibial apophysis either absent or indistinguishable.

Female. Cephalothorax in fresh specimens rich brown, contrasting with light pattern of vertical lines across sides and flat area on dorsal surface of thorax, covered with whitish setae over lighter yellow pigmented tegument, in some specimens white setae lost; lower sides lighter in some specimens, with ventral edges blackish brown, no fringe of setae. Eye field darker brown, unequally pigmented, with some whitish setae in the posterior part, also behind eyes III, anterior part bald except some remnants of sparse whitish setae above eyes I.

Abdomen whitish with a chain of five dark brown median triangular spots accompanied on both sides by chains of five similarly coloured broad irregular reverse chevron spots, some of which broken by small lighter dots; about the same proportion of abdomen surface is taken up by light background and by dark spots; small dense spots on sides.

Frontal aspect rather dull, eyes I surrounded with whitish setae, with some fawn dorsally on rims of AME; clypeus with bald, brown line, separating upper, broad subocular line of intensively white setae, from dense fringe of white setae on the ventral edge, overhanging bases of chelicerae. Chelicerae yellow to brown; pedipalps yellow with indistinct long whitish setae; prolateral surface of femur I and dorsal surface of patella and tibia I light yellow, with two darker transverse spots prolaterally on tibia. Ventral aspect: generally yellow, sternum with thin darker margin and dark short hairs, abdomen whitish with a few irregular greyish dots, four whitish grey in some specimens. Legs: yellow with tarsipatellae somewhat darker, brownish yellow, tibia I with three pairs of strong ventral spines.

Epigynum with prominent sclerotised median ridge; each “window” crossed with thin, barely visible ridge running from the edge of “window” to the median dark sclerotised plate in the centre, being the armoured copulatory opening. In this species, a ridge runs directly from the posterior edge of “window”, anteriorly, gently curv-



Figures 169–173. Colour pattern and shape characters in males of *Euophrys gambosa*: face, note two rows of white setae along clypeus (semidiagrammatic) (169), post mortem appearance of abdomen (170); *E. pseudogambosa*: frontal aspect (note single row of white setae along clypeus, contrast between light ventral femur and dark patella-metatarsus I) (171), general appearance (172), post mortem appearance of abdomen (173), which is uniformly black on alive specimen.

ing. Preparation of epigynum explains that the ridge is the margin of an open groove leading to the opening; sclerotised channel makes one and half tight loops then passes into broad bend joining spherical spermatheca; the latter is longitudinally oval, its length and width about half the dimensions of the window, the opening of nutritive pores are located just beneath the external ridge.

Measurements (mm). Male. Length of cephalothorax 1.65–2.25; length of abdomen 1.54–1.98; length of 5 segments of leg I 3.50–5.09. Female. Length of cephalothorax 2.07; length of abdomen 2.97; length of 5 segments of leg I 3.56.

Seasonal appearance of adult specimens. Males – IV, VI; females – IV, VI, IX.

Distribution. S Europe, N Africa. Israel: Jerusalem, Ramat-Rahel, Qiryat Arba' (11); Jericho (13); Arad, Sayeret Shaked Park, Nahal Sekher, Hatira Ridge, Avdat, Nahal Zin, Nahal Nizzana (17).

***Euophrys pseudogambosa* Strand**

(Figs 171–173, 177–179, 180–181, 186–189, 192–193)

Euophrys pseudogambosa Strand, 1915a: 168; Logunov 1996: 55–57, Figs 1–7.

Diagnosis. Male entirely black when alive, with strikingly white pedipalps and single thin line of white setae along edge of clypeus; indistinct abdominal pattern of three to five pairs of lighter spots appears post-mortem.

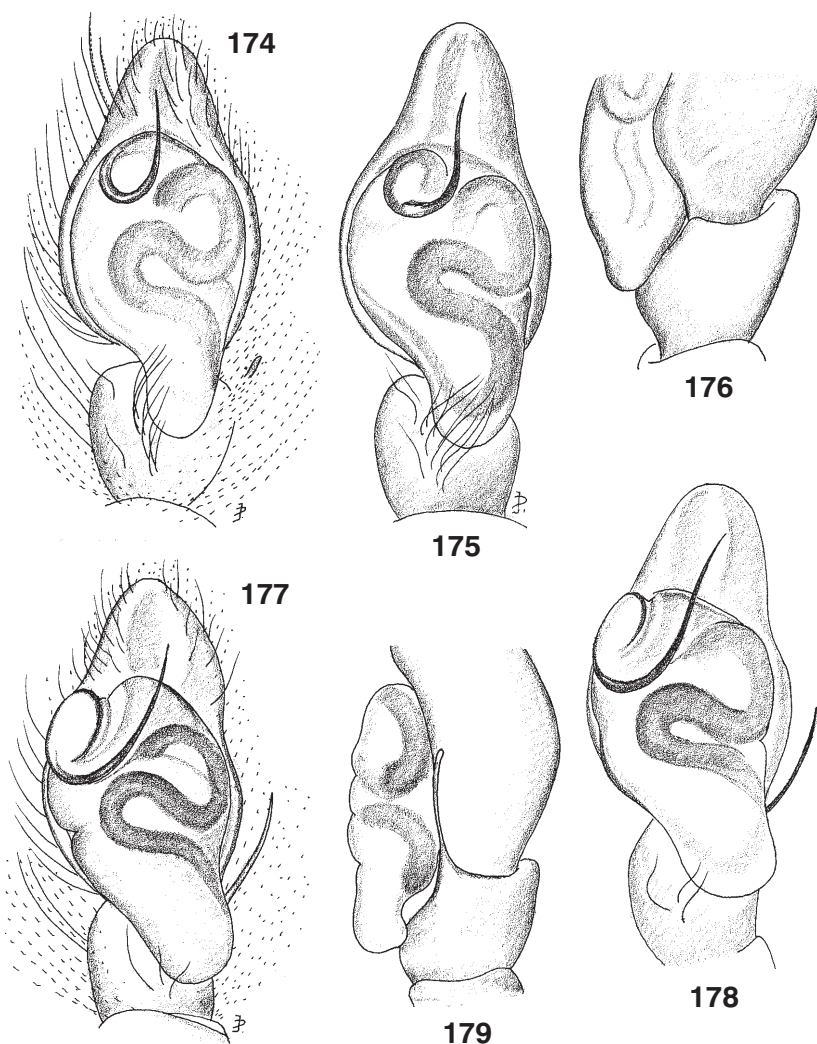
Remarks. Matching of sexes tentative, based on occurrence of male and female on the same wall and at base of wall at the Givat Ram University Campus, and mutual occurrence in several samples of *Euophrys*.

Description. Male. Cephalothorax uniformly black, in long preserved specimens dark brown, no pale areas behind eyes III, neither vertical white lines on thoracic slope nor marginal streak.

Abdomen black when alive, changes post-mortem to dark brown with three to five pairs of small irregular light spots, narrowly spaced.

Frontal aspect: face black to brown; single row of sparse white setae hanging down from the ventral edge of clypeus, slightly diagonally – these may be inconspicuous on preserved specimens, colourless or whitish; eyes I surrounded with remnants of very inconspicuous colourless setae.

Pedipalps whitish yellow with long, sparse, thin white setae, contrasting with dark face and legs I–II.

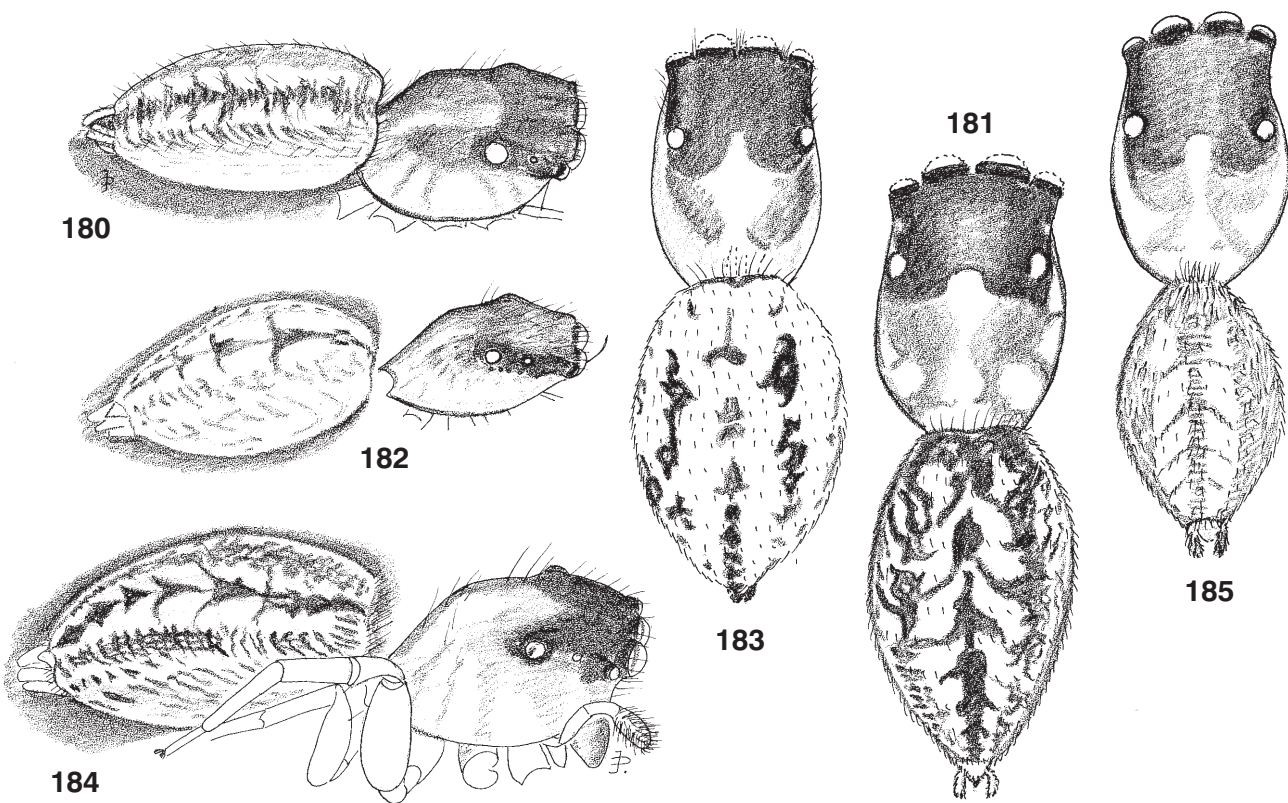


Figures 174–179. Comparison of palpal organ in *Euophrys gambosa* (174–176) (note absence of tibial apophysis) and in *E. pseudogambosa* (177–179).

Legs: I and II uniformly dark (except light tarsi and femora ventrally reddish, in preserved specimens light yellow); ventral mane of dark setae on tibia, patella and femur I; legs III–IV lighter. Striking contrast between light tarsi I–IV and very dark metatarsi, tibiae and patellae I–II, slightly less dark III–IV.

Palpal organ: cymbium and bulbus broader than in *Eu. gambosa*, coil of embolus about two times larger, located more laterally (Figs 226); tibial apophysis long and thin; three median dark bent bristles on ventral surface of tibia, touching the edge of the narrow posterior part of bulbus, less conspicuous than in *Eu. gambosa*. Ventral aspect: sternum brown with darker rim; coxae I brown, II–IV paler; abdomen dark with thin whitish line around edge of the lateral surfaces.

Female. Cephalothorax dorsally brown with inconspicuous light hairs, not concentrated into white spots; lighter pigmented median brown spots immediately behind eye field and on the posterior slope of thorax;



Figures 180–185. Comparison of colour pattern in females of *Euophrys pseudogambosa* (180, 181), *E. gambosa* (182, 183) (post mortem changes), *Euophrys* sp. uncertain (184, 185).

sides yellow to dark yellow, crossed by three vertical dark grey lines; ventral rim dark grey, broader than in *Eu. gambosa*; anterior slope of eye field gently rounded, highest point near eyes III and from there prominent flat surface extends beyond eye field about half the length of thorax, posterior slope steep.

Abdomen: median longitudinal streak of thin dark transverse lines with weak traces of original triangular components; separated from similarly coloured margins and sides by an irregular white streak on each side, in many parts crossed by thin dark lines.

Frontal aspect: area surrounding eyes AME dark pigmented, without dense subocular line of white setae; clypeus yellowish grey, almost bald, less contrasting with dark eye field than in *Eu. gambosa*; narrow white rectangular stripe on lower clypeus, directly beneath AME, expanding laterally, wedge-like under ALE, leaving edge of clypeus black; single line of thicker sparse whitish setae along ventral edge of clypeus beneath AME, part of these setae overhang cheliceral bases but not forming a triangle, their tips end along a straight line; rims of eyes black with distinct thin colourless, whitish tipped setae, longer and set more diagonally than in *Eu. gambosa*, which gives them a different appearance. Height of clypeus under AME reduced to about 0.3 of ALE diameter. Chelicerae yellow, slightly

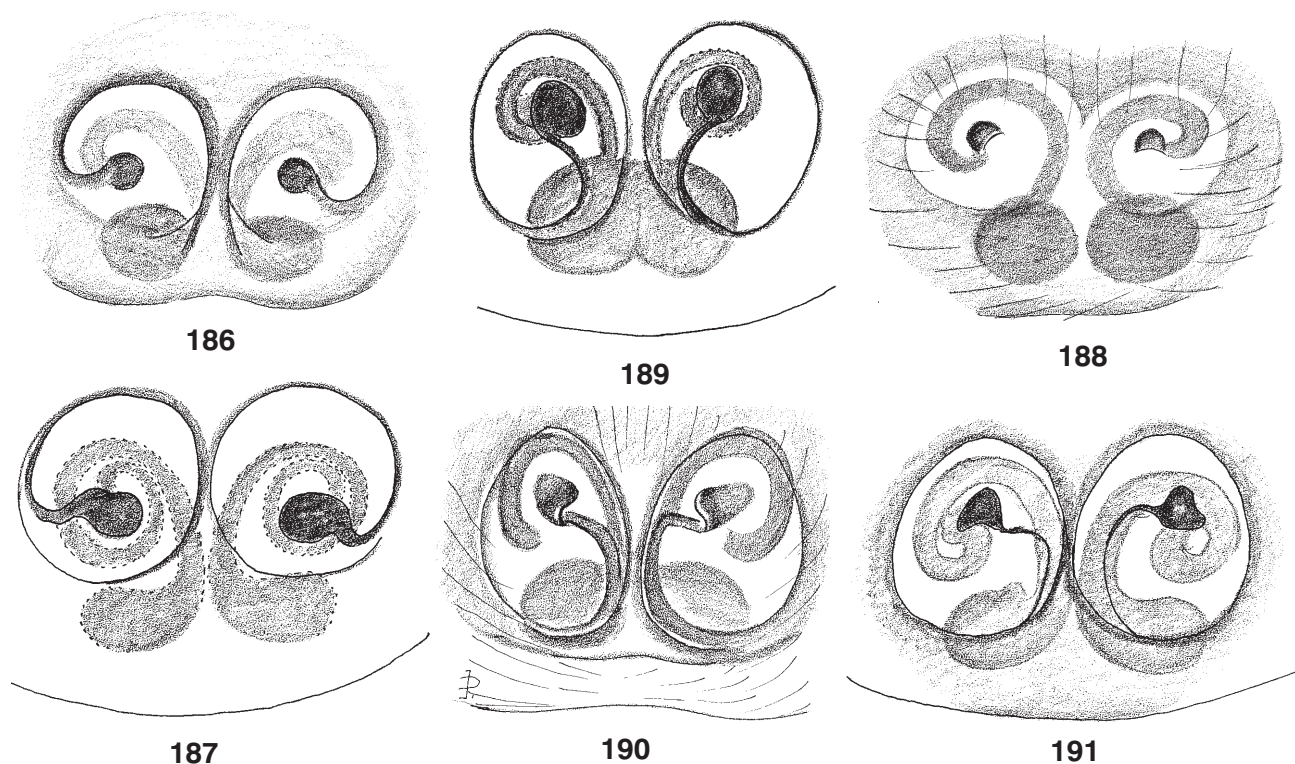
darkened or brown, with median and terminal margins whitish yellow. Legs: yellowish fawn, femora lighter.

Ventral aspect: sternum yellow with a thin dark grey margin; coxae yellow; abdomen whitish, posteriorly two grey areas broadly separated. Epigynum: differs by location and direction of the thin sclerotised ridge, reaching the small sclerotized plate in the middle of the white membranous “window” transversely from outside (Figs 186, 187). In *Eu. gambosa* that ridge arrives directly from the posterior edge of the “window”, gently curving (Figs 188, 189); in the uncertain species from Jerusalem the ridge also arises from the posterior edge, bends first medially but changes direction at mid-length of epigynum to a lateral direction (Figs 196, 197) and reaches the small, central sclerotized plate transversely from the middle. These ridges seems to me the best diagnostic characters, however in related Siberian species were interpreted as just individual variation (Logunov, personal communication), they are also indistinguishable on less sclerotized epigyna.

Measurements (mm). Male. Length of cephalothorax 2.09; length of abdomen 1.60. Female. Length of cephalothorax 2.13; length of abdomen 1.15.

Seasonal appearance of adult specimens. Males – III, V, VI; females: – III, IV, VI.

Distribution. Israel: Nahal Oren (3), ‘En HaMifraz (4), Ma’agan Mikha’el (8), Ben Shemen, Rehovot (9),



Figures 186–191. Comparison of epigynum in *Euophrys pseudogambosa* (186, 187), *E. gambosa* (188, 189), *Euophrys* sp. uncertain (190, 191).

Abu Ghosh, En Karem, Jerusalem, Ramat Rachel (11), Ma'ale Adummim (12), near Mas'ada (18).

Euophrys sp. uncertain

(Figs 184–185, 190–191, 196–197)

Remarks. Interpretation of colour pattern, epigynum and internal structure of these specimens, in comparison with females of *Eu. gambosa* and *Eu. pseudogambosa* from Jerusalem does not give unequivocal conclusion on relationships, but also does not permit to us consider it conspecific with either of these species. The solution to this problem requires more research and, in particulars, finding males which are more differentiated.

Description. Female. Cephalothorax brownish grey, median thoracic streak greyish yellow; eye field blackish brown with sparse, tiny, white hairs, well visible but not striking, concentrated along anterior and lateral edges of eye field; sides yellowish grey, gradually getting lighter, lower parts light yellow, ventral edge light with indistinct thin brownish line.

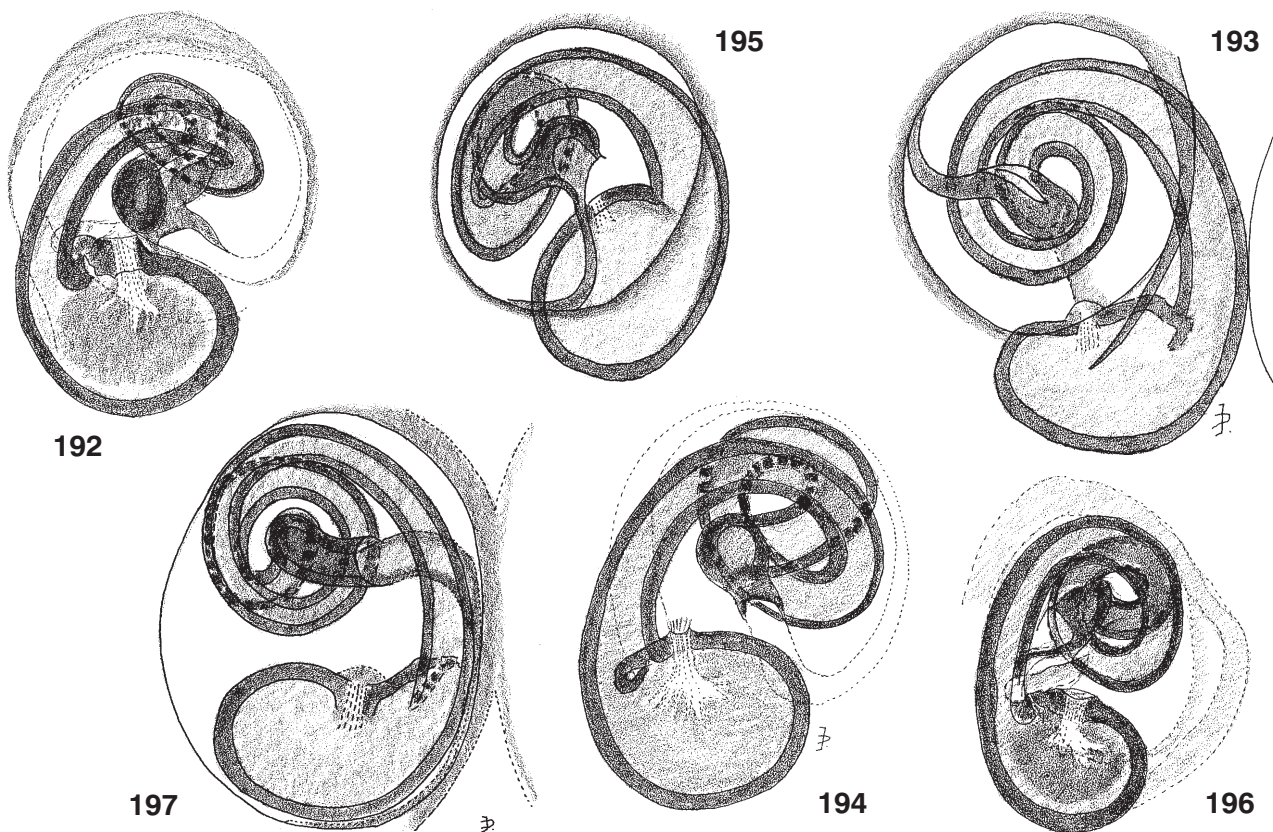
Abdomen: median line of dark spots consists anteriorly and posteriorly of traces of fused triangular components, with three separate central triangles, connected by their apexes; laterally accompanied by irregular narrow white and then broad dark stripes; another thin white streak separates these from dark sides (Figs 184, 185).

Frontal aspect: eyes I located on a narrow, dark brown pigmented stripe, surrounded by inconspicuous setae, colourless, whitish tipped; clypeus divided into lower light yellow belt with dense white setae, and upper bald stripe just beneath eyes AME. Pedipalps uniformly whitish with sparse long blackish setae on tarsus.

Ventral aspect: sternum whitish yellow with light grey margin and short dark hairs; coxae whitish with yellow shading; abdomen whitish with two blackish parallel linear spots in posterior half, widely spaced, a darker spot in front of spinnerets, dark wavy lines of sides of abdomen extend onto margins of ventral surface.

Legs: yellow with femora I–IV whitish; blackish spines; three pairs of ventral spines on tibia I.

Epigynum: closely resembling *Eu. pseudogambosa* and *gambosa*; thin sclerotized ridge arises from the posterior edge of the white window, bending first towards the mid-line of epigynum and at the mid-length of the window, it bends laterally and runs transversely in the opposite direction (Figs 188, 191) reaching small sclerotized plate in middle of window, but from the direction opposite to *Eu. pseudogambosa* and differently than in *Eu. gambosa*. Sclerotized copulatory opening at the end of transverse part of heavily sclerotized channel directed medially, after sharp bend the channel makes one and half tight loops, then becomes a gently bent long channel, somewhat thinner than in *Eu. pseudogambosa*, joining transverse oval spermatheca (Figs 196,



Figures 192–197. Comparison of internal structure of epigynum in *Euophrys pseudogambosa* (192, 193), *E. gambosa* (194, 195), *Euophrys* sp. uncertain (196, 197).

197); both spermatheca and channel are located within limits of membranous window.

Seasonal appearance of adult specimens. Females – III, V.

Distribution. Israel: Jerusalem, Jericho.

Relevant species

Euophrys acripes (Simon)

Attus acripes Simon, 1871: 203.

Distribution. Mediterranean species known from France (Corsica) and Italy.

Euophrys frontalis (Walckenaer)

Aranea frontalis Walckenaer, 1802: 246;

Euophrys frontalis: Flanczewska 1981: 196, Figs 14–17, 28; Prószyński 1983c: 45, Figs 7–8; Prószyński 1991: 498–502.; Figs 1334.1–4.

Distribution. Palaearctics, reported also from Turkey (Nosek 1905: 119).

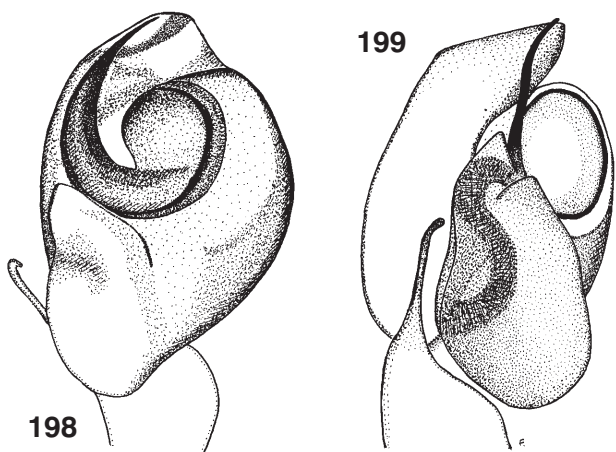
Euophrys rufibarbis (Simon)

Attus rufibarbis Simon, 1868: 602;

Euophrys rufibarbis: Hansen 1986: 102, Figs 55, 11.

Euophrys comptula: Prószyński 1987: 23, Figs 143.

Distribution. Mediterranean species also reported from China.



Figures 198–199. *Pseudeuophrys pascualis*, palpal organ ventrally (198) and laterally (199).

Evarcha Simon, 1902

Type species. *Araneus falcatus* Clerck, 1758: 124

Introductory remarks. Included by Simon in the *Hylleae* group of genera. *Evarcha* species have relatively robust body, with high broad cephalothorax, whose flat area extends half way along the thorax, the remaining pos-

terior slope being steep. Abdomen oval, about as broad and long as cephalothorax. Devoid of striking colour pattern, usually dark with light area or large spots behind eye field; abdomen with anterior edge white, dorsum with intermixed dark and light areas, the latter usually whitish, sometimes yellowish, pink or even reddish, of ill defined shape, devoid of any distinct longitudinal streaks, transverse bands or pairs of round spots. Legs dark, robust, rather short. It is the combination of these characters, as well as a lack of any characteristic pattern, which make the genus instantly recognisable to the experienced eye. Basic key characters are provided by shape and proportions of genital organs, as illustrated on the drawings below.

Body proportions. Cephalothorax moderately short and broad its width is 67–76% at eyes I, 69–80% at eyes III; height 44–65%. Eye field short, extending over 41–50% of cephalothorax, also in relation to its width (57–74% of width at eyes I) and is trapezoid shaped, broadening posteriorly by 0–7%; indistinctly narrower than cephalothorax, its width at eyes III is 84–93% of width of cephalothorax in the same area, eyes III are located close to the edges of cephalothorax. Length of leg order in both males and females III, IV, I, II.

Key to Levantine species of *Evarcha*

1. Males 2
 - Females 9
- 2(1). Distal part of embolus thin, tibial apophysis about 1/3rd of bulbus length, directed anteriorly, sharply pointed, abdomen reddish orange 3
 - Distal part of embolus broadened, tibial apophysis short, set more or less transversally, apically truncated; abdomen dark with large spot of white setae 5
- 3(2). Distal part of embolus directed antero-medially, not bent along anterior edge of bulbus 4
 - Distal part of embolus bent transversally and pressed to anterior edge of bulbus, not exceeding its lateral limit; clypeus reddish brown with dark bristles, abdomen light yellow to reddish, with darker lines, four broad light chevrons, sides dark *E. jucunda*
- 4(2). Embolus arising latero-posteriorly, clypeus reddish orange; abdomen reddish with white anterior edge and scattered small, dark greyish spots *E. patagiata*
- 5(2). Broadened tip of embolus not divided – distal broadened part of embolus extending by thin process posteriorly along prolateral edge of bulbus *E. nepos*
 - Broadened tip of embolus divided, sometimes indistinct 6
- 6(5). Tip of embolus divided into unequal processes ... 7
 - Tip of embolus broad bent plate ending with 2 minute, widely separated teeth like processes *E. nigricans*

- 7(6). Tip of embolus split distinctly into broad, short triangle directed anteriorly and thin, long process directed posteriorly; striking white spot posteriorly on eye field, legs very dark *E. pileckii*
 - Tip of embolus split so indistinctly that appears truncated, wedge shaped spots of white setae on eye field 8
- 8(7). Three wedge shaped spots of white setae on eye field, basal half of femora I–II white, apical half dark *E. negevensis*
 - Two wedge-shaped spots of white setae on eye field, femora I–IV white, thin dark line apically on lateral surface of femur I *E. praeclara*
- 9(1). Posterior wall of epigynum strongly sclerotized, concave, high, partly hidden under sclerotized margin, resembling similar structure in *Langona*, or sclerotized pockets posterior to “windows” 10
 - No posterior wall of epigynum, sclerotized pockets lateral to “windows” 11
- 10(9). Two circular membranous “windows”, incompletely separated *E. jucunda*
 - “Window” single, transverse oval, spermathecae complicated, bent, their distal part transverse, sclerotized pockets large, almost connected (in Ma’agan Mikhael specimen, smaller and well spaced) *E. patagiata*
- 11(9). Membranous white “window” transverse oval, with spermathecae ending at about half of its length, pockets lateral, small, aligned with posterior edge of “window” *E. nepos*
 - Membranous white “window” near square or rectangle, sclerotized pockets aligned anteriorly to posterior edge of “window” 12
- 12(11). Epigynum elongate rectangular, ending close to epigastric fold, spermathecae as broad as long, not narrower than channels, pockets along half of the “window”; face light brown, white adpressed setae overhanging chelicerae and below ALE, continue across sides of cephalothorax; abdomen with complicated leaf pattern of black, brown and white spots *E. negevensis*
 - Membranous white “window” almost square, in the anterior half of epigynum, spermathecae longer than broad, narrower than their channels; pockets prominent in the mid length of epigynum *E. praeclara*

Evarcha negevensis Prószyński
(Figs 202–203, 204, 208–210, 214–215)

Evarcha negevensis Prószyński, 2000: 240, Figs 37–44.

Diagnosis. Male with three white wedge shaped lines along eye field; bulbus round, broader than in *E. nepos*, embolus appears broad, bending tightly along

edge of bulbus, its apical part lying transversely, tip bending dorsally, with minute split.

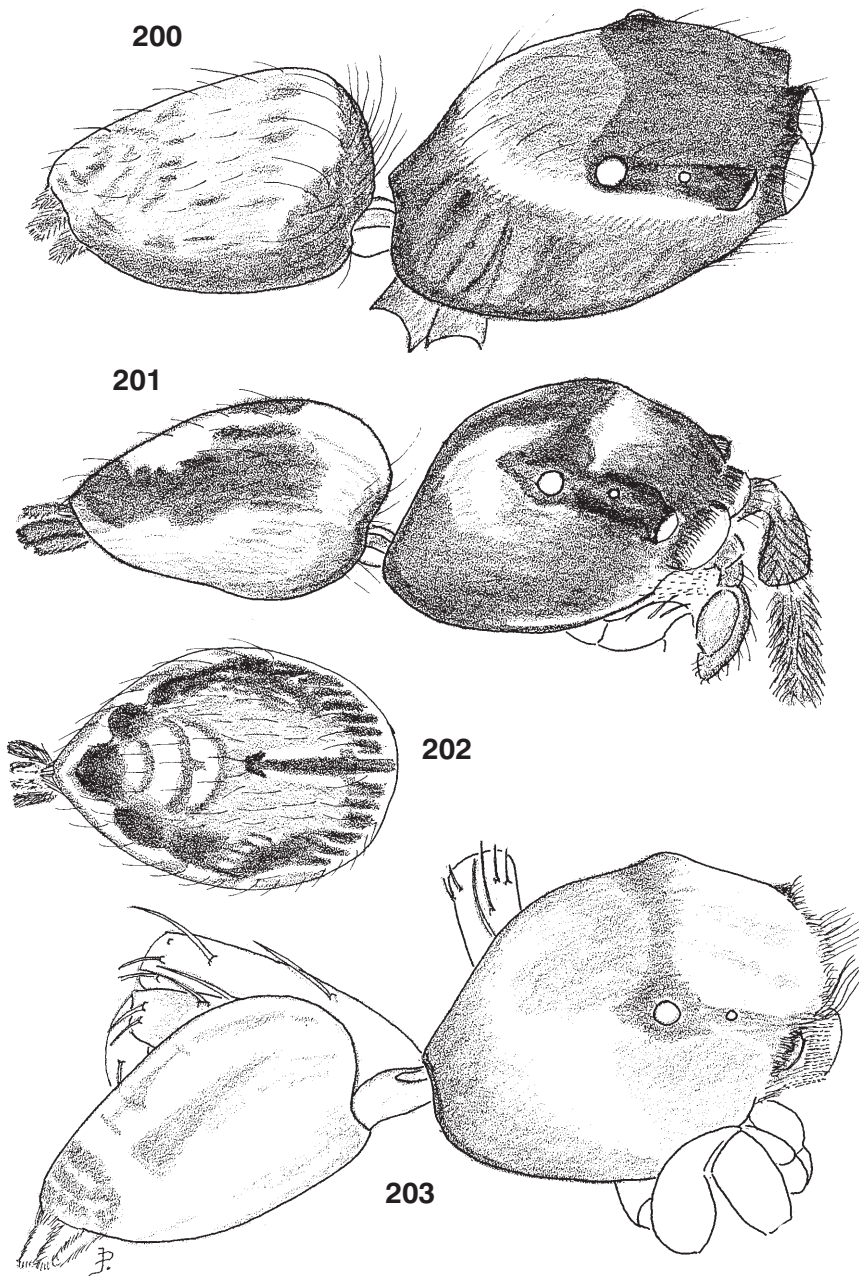
Remarks. There are several related species in the Central Asia and Caucasus, the closest being *Evarcha nenilini*, the diagnostic differences of this species are shown on Figs 721 and 722. *Evarcha armeniaca* has male palp similar to *E. negevensis*, except tip of embolus is not turned anteriorly, and there is huge lateral swelling of cymbium, just above tip of apophysis, dorsal surface of cephalothorax now almost bald, so comparison of setae

pattern is impossible. Female has abdominal pattern similar to that of *E. negevensis*, from which differs by minute details; epigynum however, is entirely different.

Description. Male. Cephalothorax blackish brown, eye field with three wedge-like streaks of white addressed setae, pointed anteriorly, running from near eyes III to between AME and median part of rim of AME; remaining eye field covered by colourless setae appearing dark fawn on blackish tegument. A belt of white setae along edge of flat part of thorax runs to below eyes III, sides with tegument brown, covered by addressed

dark setae; edge of carapace black from under eyes II, with thin line of intensely white setae turning into white belt on clypeus, areas under ALE lighter than remaining sides. A row of stout short brown setae above orbits of eyes I, no *Thyene*-like tufts of longer setae arising below eyes II. Abdomen comparable with *E. praeclara* and *E. nepos* by white median area surrounded by dark area, but differs in details: tegument dorsally dark grey with sparse yellowish dots, with striking large white spot in the middle, consisting of white setae over three unpigmented, whitish, thin short chevrons; marginal dark streaks covered by more delicate setae, colourless with slight yellowish hue, lateral edges appear lighter due to concentration of whitish setae, sides with dense dark and lighter stripes, with three diagonal lighter spots; there are also sparse upright, long and thin bristles over dorsal surface and a few weak whitish setae with dark tips over anterior edge of abdomen; further down on anterior abdomen are dark setae with only basal parts remaining whitish, and along remaining part of abdomen are sparse whitish bristles, mixed with stronger black. Spinnerets greyish brown with long setae.

Frontal aspect: eye field appears light brown with blackish spot behind ALE, with three wedges of white setae, complemented by light yellow, converging at the meeting point of rims of AME and middle areas of rims of AME; upper halves of rims of AME covered with long, strong dark brown setae, intermixed with sparse white setae, lower halves of rims covered with shorter



Figures 200–203. General appearance of *Evarcha patagiata* (when alive abdomen orange-red) (200), *E. nepos* (when alive abdomen black with large white spot) (201), *E. negevensis* abdominal pattern in fresh female specimen (202), general appearance of a faded specimen (203).

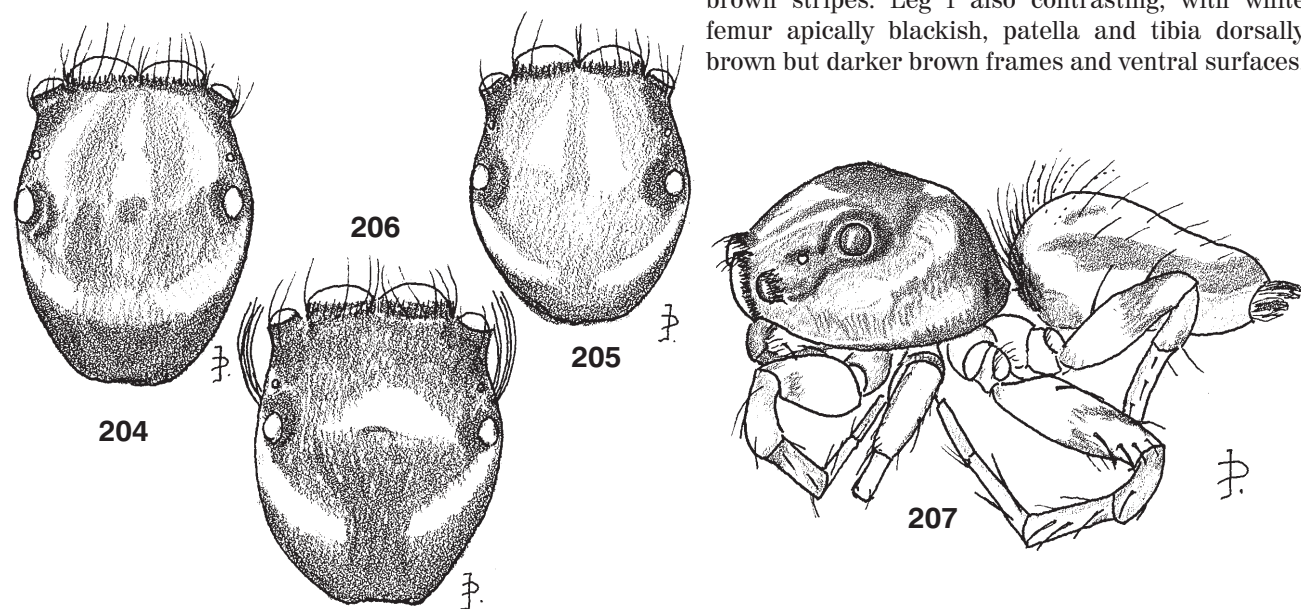
whitish and a few yellow setae; rims of ALE covered externally with dark brown, yellow and whitish setae, medial halves with whitish setae only; space under eyes I light greyish brown, with thin diagonally transverse line beneath ALE lighter brown with sparse whitish setae; edge of clypeus laterally (under ALE and sideways) with two lines of intensely white setae, separated by bald blackish brown line; clypeus under AME with long but sparse "beard" of white setae, overhanging chelicerae. Chelicerae short and slender, light greyish brown, with sparse, long, colourless setae, longer laterally. Pedipalpal femora yellow, lighter dorsally, patella greyish, lighter apically, tibia and cymbium light brown with some whitish setae. Palpal organ similar to *E. praeclara* and *E. nigricans* from Tunisia, differs from other *Evarcha* of Mediterranean in shape: bulbus round, broader than in *E. nepos*, embolus appears broad, bending tightly along edge of bulbus, its apical part transversely and anteriorly to bulbus, tip bending dorsally into anterior depression of cymbium, with minute split.

Ventral aspect: mouth parts brown, coxae I–IV yellowish grey to whitish, femora I–IV ventrally whitish; sternum brownish; abdomen ventrally greyish with lighter dots, with anterior part (in front of epigastric furrow) dark brownish grey; median area brownish grey; broad anteriorly and narrowing posteriorly, spinnerets dark.

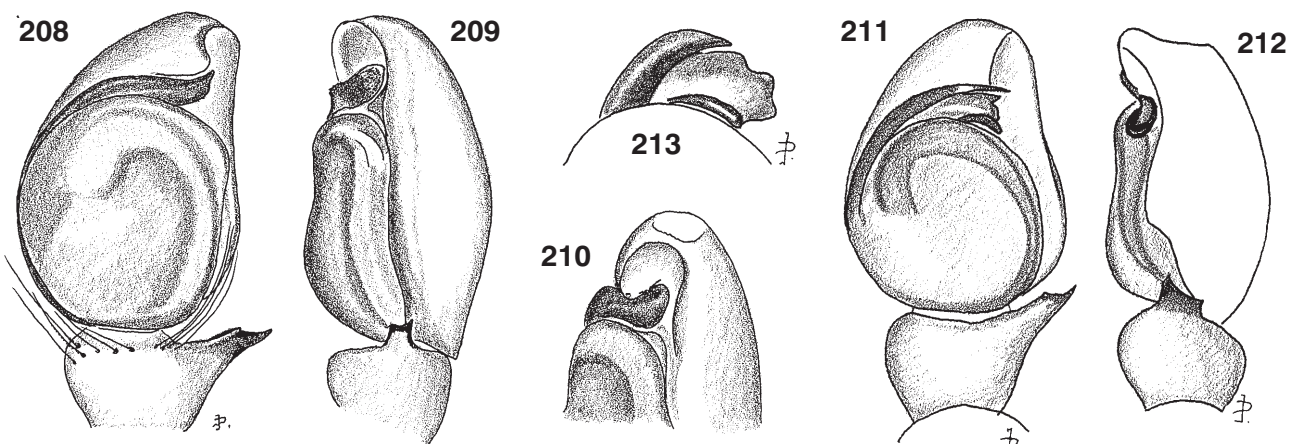
Legs: femur I: apical half blackish brown, basal half white; patella I dorsally light greyish brown with whitish setae, laterally greyish brown; tibia I dark greyish brown, lighter dorsally; tarsus and metatarsus light brown with whitish setae dorsally, dark setae at top of tarsus. Legs II resembling I, legs III–IV similar, with femoral darkening extending over lateral surfaces.

Female. Cephalothorax covered with thin, long, adpressed hairs, predominantly white and more uniform than in male, but also some colourless and even a few greyish, whose varying dispersal (due to falling off) makes a variety of patterns. I have not seen any female specimen with three white lines on eye field, as in male. Tegument brown, on eye field lighter with a copper gleam, and dark lateral edges. A nearly mature paratype has yellow tegument with four longitudinal dark lines of setae along slope of thorax. Abdomen greyish suffused with whitish yellow, with a thin dark brown median line along anterior half of the abdomen, and three white median chevrons, in posterior half, there is an intensely dark spot behind chevrons and in front of spinnerets. Sides with three diagonal dark suffused lines, separated by light diagonal lines in one paratype, whitish grey in holotype, and white and grey dots in the second paratype.

Frontal aspect: more differentiated than in *E. patagiata* with eye field fawn, surrounding of lateral eyes blackish, a belt immediately above eyes I whitish with whitish setae, eyes I surrounded with contrasting white setae, area below and lateral to AME yellowish fawn, but becoming darker fawn from below ALE laterally, ventral edge of carapace dark brown, beginning from under ALE laterally, there are contrasting concentrations of white setae making diagonal line under ALE, with white line of setae above brown edge and white setae hanging below it; area below ALE with horizontal white setae, and longer white setae overhanging cheliceral bases, some longer whitish setae also on chelicerae, which are brownish fawn. Pedipalps striped: transverse white stripes with white setae, and dark brown stripes. Leg I also contrasting, with white femur apically blackish, patella and tibia dorsally brown but darker brown frames and ventral surfaces.



Figures 204–207. Comparison of cephalothorax pattern in males of *Evarcha negevensis* (holotype) (204), *E. praeclara* (205) and *E. pileckii* (206); general appearance of male *E. praeclara* (207).



Figures 208–213. Males of *Evarcha negevensis* (Negev specimen), palpal organ ventrally (208), laterally (209) and tip of embolus (210), *Evarcha praeclara* sp. nov. palpal organ ventrally (211), laterally (212) and tip of embolus anterolaterally (213).

Ventral aspect whitish with indistinct median grey streak, narrowing posteriorly as in M, the anterior area, however, is white.

Legs: femora I–IV white except apical end which is dark, joint with patellae II–IV dark brown, sides of tibiae I–IV dark brown, dorsal surfaces of patellae and tibiae II–IV light brown, metatarsi-tarsi I–IV brownish yellow.

Measurements (mm). Male. Length of cephalothorax 2.05–2.25; length of abdomen 1.80–2.25; length of 5 segments of leg I 3.53–4.19, order of leg lengths III, IV, I, II. Female. Length of cephalothorax 2.47–2.77; length of abdomen 3.15–3.00; length of 5 segments of leg I 4.59–5.61, order of leg lengths III, IV, I, II.

Seasonal appearance of adult specimens. Males – V, IV, VII, VIII; females – VI, VII, VIII, IX.

Distribution. Israel: Negev – Haluqim and Hatira Ridges near Sede Boqer, Nahal Nizzana (17). Uncertain identification: Kallia (13), Sabha and Nahal Shelomo near 'Elat (16).

Comparative material. *Evarcha armeniaca* Logunov, 1993. Holotype male, paratype female. Armenia near Kafan, almond plantation, 31.V. 1989, Leg. V. A. Zakharian.

Evarcha nenilini Rakov 1997: 110–111, Figs 18–21, map 5. holotype male – Tadjikistan: Bukantau, Irlir, Karakund well, 9.V.1976, coll. A.P. Kononenko; paratype female: Tadjikistan, Khovaling 1500 m asl, 11.X. 1987. Coll. S.V. Ovchinnikov. Both species in coll. Zool. Mus. Novosibirsk, Russia.

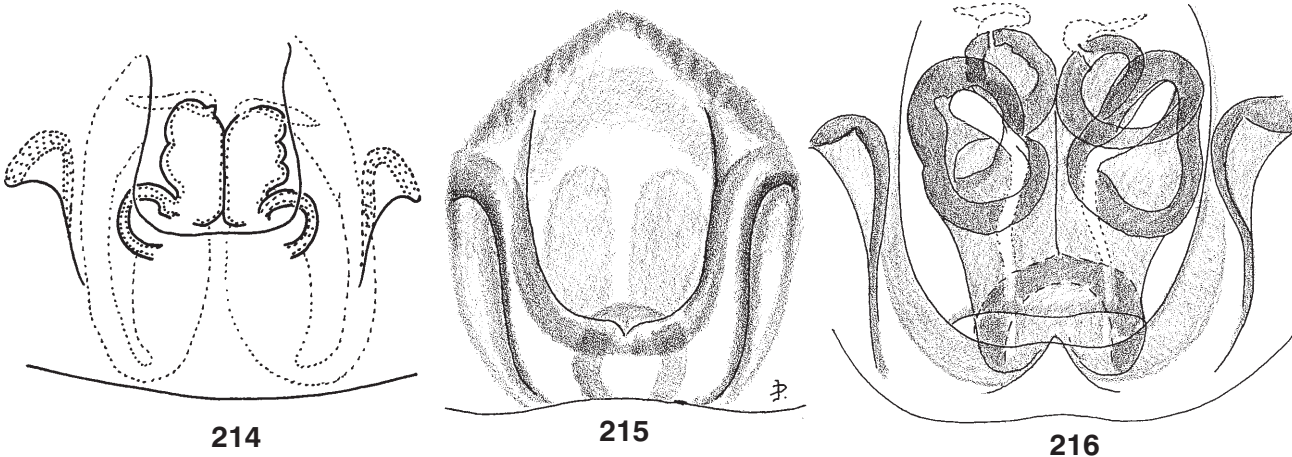
***Evarcha nepos* (O. Pickard-Cambridge)**

(Figs 201, 217–219, 222–223)

Salticus nepos O. Pickard-Cambridge, 1872a: 333–334;

Evarcha nepos: Prószyński 1984b: 101 (transfer from from *Salticus*), Logunov 1996: 61.

Diagnosis. Male very dark with two striking large white spots: one on posterior half of eye field and the



Figures 214–216. Comparison of females of *Evarcha negevensis*, epigynum (215) and its internal structure (216), and *E. praeclara*, diagram of epigynum in the specimen from Yemen (from Wesolowska) (214).

second, oval, on posterior half of abdomen. Bulbus oval, narrower than in *E. praeclara* and *E. negevensis*, embolus thin, broadening only along its anterior bend, encircling anterior edge of bulbus, single (not splitting apically) and continuing posteriorly as thin process.

Description. Male. Cephalothorax: blackish in some areas brown, a prominent spot of white setae on the eye field, high and broad, white areas behind eyes III. Abdomen: blackish brown with intensely white tip and large square white spot in the middle, sides white.

Frontal aspect: brown with long white setae on clypeus.

Legs: femora II–IV light with black apical halves; leg I dark, apical half of femur and tibia ventrally black with white setae on ventral surface of basal part of femur I and on white half of patella dorsally.

Palpal organ: embolus unusual by being flattened anteriorly, plate like, bends around bulbus, its tip narrows abruptly, turning back; tibial apophysis ends with three prominent teeth.

Female. Cephalothorax: blackish brown with white adpressed setae. Abdomen: with complicated leaf pattern of black, brown and white spots.

Frontal aspect light brown, with two lines of white setae: one overhanging chelicerae, the second of adpressed setae runs from below ALE across mid-height of cephalothorax sides; chelicerae brown; pedipalps yellow with thin black rings and white setae. Legs: all femora whitish, apically black, remaining segments brown with blackish rings and sparse white adpressed setae. Epigynum: large median oval window covered with whitish membrane, and two large dark spots; pockets small, located laterally in the mid-height of epigynum.

Behavioral observation. Male encountering female becomes immobile with anterior legs stretched diagonally forward and up, bent at the femoral-patellar joint. Female circles male at distance of some 2–3 cm. Another

male approaching assumed the same posture, but was almost instantly driven out by female making a minute, but very quick, jump towards it; same with other specimens approaching. Captive male (in petri dish) assumed similar display posture towards female many times over several days.

Measurements (mm). Male. Length of cephalothorax 2.10; length of abdomen 2.16. Female. Length of cephalothorax 2.27; length of abdomen 2.73.

Seasonal appearance of adult specimens. Males – III, IV, VI, VIII, X, XI; females – II, IV, V.

Distribution. Israel: Rosh Pinna (1); Beth-Oren, Nahal Oren (3); Athlit, Ma'agan Mikhael (4); Ein Harod (5); Poriyya, eastern slope (7); 'En Kerem, Jerusalem, Ramat Rahel (11), En Duyuk (13).

Evarcha patagiata (O. Pickard-Cambridge)

(Figs 200, 224–226, 229–230)

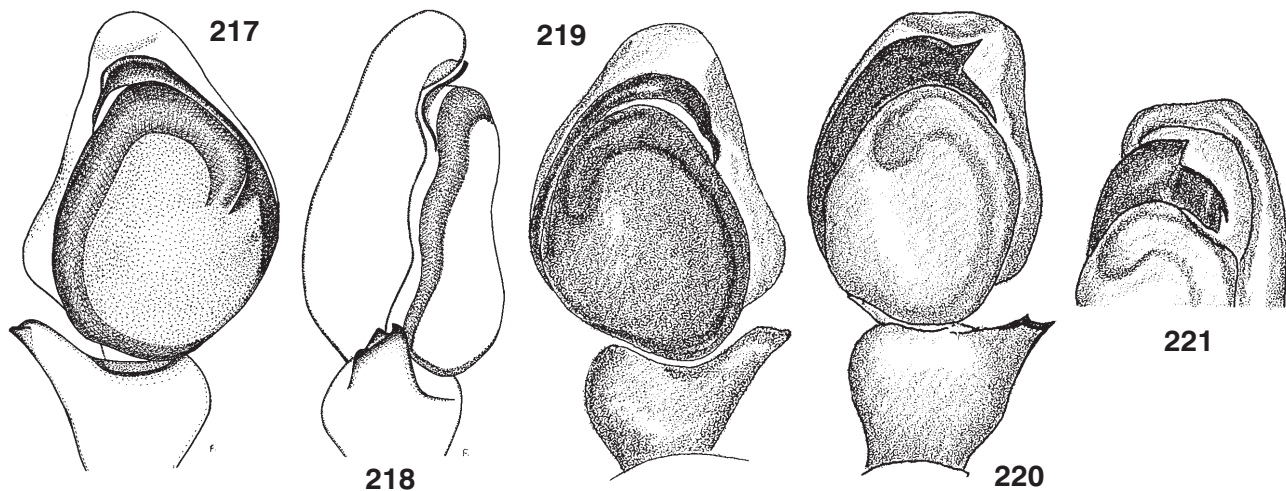
Hasarius patagiatus O. Pickard-Cambridge, 1872a: 332;

Evarcha syriaca Kulczyński, 1911: 52–53, Figs 65–67, presumed new syn.

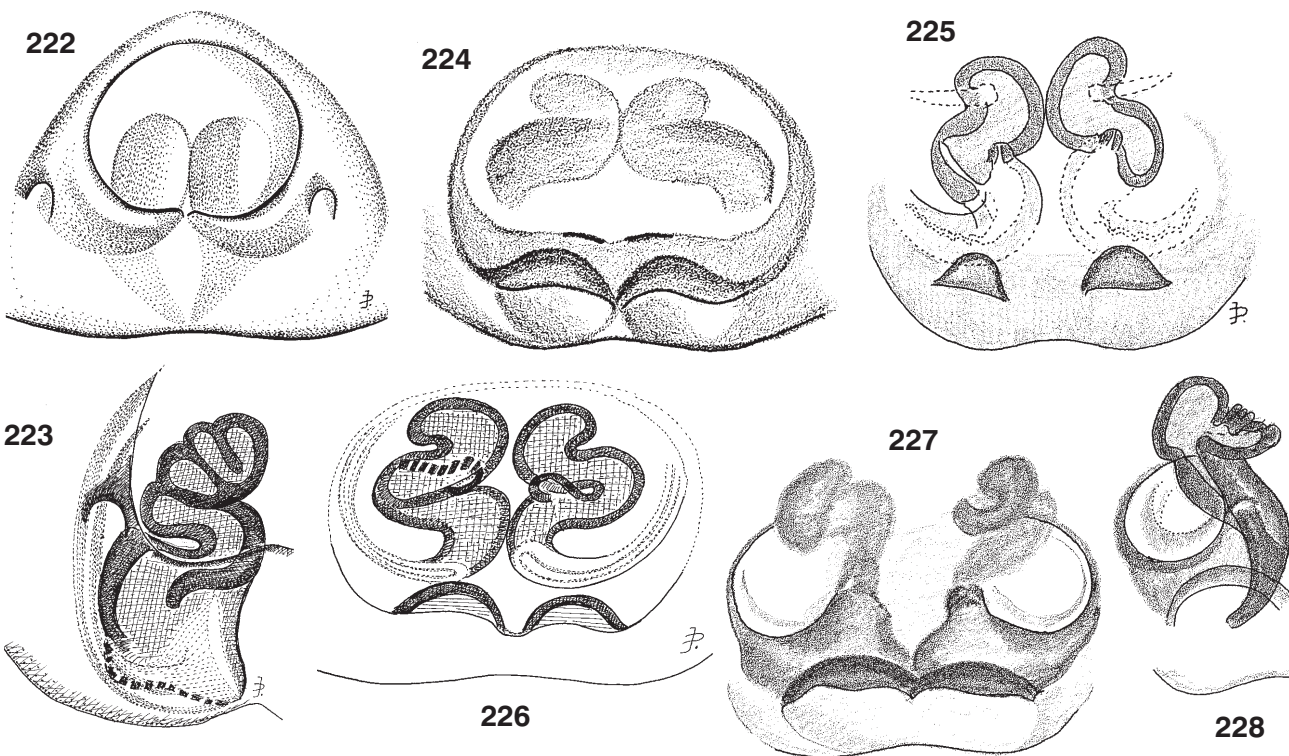
Evarcha patagiata: Prószyński 1984b: 51, 52, Logunov 1996: 61.

Diagnosis. Male abdomen reddish orange with anterior edge white, embolus narrow, not encircling anterior edge of bulbus, tip pointed anteriorly; clypeus reddish orange, in female whitish.

Remark. Description of *E. syriaca* Kulczyński (1911: 52–53), seems to correspond with *E. patagiata* (particularly reddish orange clypeus devoid of white setae) and this confirms my assumption that these species are actually synonyms; Kulczyński mentions white clypeus for male *E. jucunda* which may suggest that he has actually also seen specimen of an uncertain species described below.



Figures 217–221. *Evarcha nepos*, palpal organ ventrally (217), laterally (218), Ma'agan Mikhael specimen, palpal organ ventrally (219); *E. pileckii* from Negev, palpal organ ventrally (220) and tip of its embolus ventro-laterally (221).



Figures 222–228. *Evarcha nepos*, epigynum (222) and its internal structure (223); *E. patagiata*, epigynum (224) and its internal structure (225), same in specimen from Ma'agan Mikhael (226). Relevant Western Mediterranean species *E. jucunda* epigynum (227) and single spermatheca (228).

Description. Male. Cephalothorax: dorsal surface light fawn with a copper gleam, including eye field and narrow area beneath lateral eyes; edges of eye field, slope of posterior cephalothorax and sides darker, blackish brown, in some specimen there is a white belt (unpigmented tegument and remnants of white setae) around thorax at edge of flat dorsal surface, continuing as white narrowing streak under lateral eyes; dorsal surface almost bald, without any distinct pattern of setae on eye field.

Abdomen reddish (in older preserved specimen fading gradually to pink, yellow and finally whitish); strikingly white anterior edge; indistinct darker chevrons posteriorly and equally indistinct dark spots laterally along dorsal margin; sides black anteriorly (beneath white edge) and laterally. Differs from *E. jucunda* which has abdomen light yellow (if not faded) divided by thin brownish grey lines; small contrasting dark triangular spot in centre of dorsal surface; posterior four light chevrons broad; sides almost entirely dark mottled yellow, with four pairs of inconspicuous lighter diagonal spots.

Frontal aspect: face reddish brown, eyes I surrounded with reddish setae (in fresh specimen only ventrally); clypeus fawn with orange setae with irregular dark bristles along ventral edge; chelicerae reddish brown with strong black setae; pedipalps brown with white setae on tip of femur and patella – the only white spot visible

frontally; legs I light brown, with tibia, patella and apical femur slightly darker brown. *E. jucunda* differs by having face brown, with short adpressed and sparse blackish setae without any striking character; dark orange on rims of eyes I, presence of a few small inconspicuous whitish setae on the very edge of clypeus; cymbium and tibia of pedipalps dark yellow with blackish setae; pedipalpal patella and femur dorsally light with whitish setae.

Palpal organ: bulbus anteriorly angular, embolus narrow from the posterior end of bulbus, running parallel to side of bulbus with the tip pointed anteriorly, tibia slightly shorter; differs strikingly from *E. jucunda* with its broadly truncated bulbus, embolus arising in the mid length of bulbus, with the tip pressed to anterior edge of bulbus.

Ventral aspect: generally light brown, abdomen darker brown to black.

Legs blackish brown, femora I–IV proximally dark grey (these are white in *E. nepos*, an important difference, easy to spot); tarsi-metatarsi yellow except I, which is darker.

Female. Cephalothorax brown to fawn, with a copper gleam, traces of light belt around the dorsal edge of thorax and under lateral eyes (in *E. jucunda* to eyes II only); in a studied specimen dorsal surface almost bald, with traces of minute adpressed colourless setae which do not make any distinct pattern.

Abdomen in the studied specimen now light yellow with anterior edge white, followed by a belt of dark grey dots and then by yellow transverse belt, there is a median streak of widely spaced grey dots up to the end of abdomen, one pair of diagonally transverse dots in the middle and one pair of lateral streaks of grey dots along posterior half of the abdomen.

Frontal aspect: eye field up to dorsal rims of eyes I appears dark, face yellow, eyes I surrounded by white setae, clypeus fawn with dense white flattened setae, sides below ALE and laterally brownish, chelicerae fawn with a few longer white setae, pedipalps light brown with darker faint lines and long whitish setae, legs I light brown, with femora whitish.

Ventral aspect: mouth parts fawn, sternum and coxae light fawn, abdomen greyish with lighter margins of median rectangular area and three longitudinal whitish streaks.

Epigynum with vertical posterior sclerotized wall resembling *Langona*, possibly being a pair of huge, modified pockets, while in all remaining *Evarcha* pockets are lateral and small; single whitish membranous “window” in the anterior half of epigynum, with sclerotized internal structures visible in an s-shaped bend, with largest median part transverse; copulatory opening not visible externally – apparently located postero-laterally, along sclerotized edge of the window. Some differences in epigynum of specimen from Ma’agan Mikhael, particularly spacing of pockets and slightly different shape of spermathecae (Fig. 226), may suggest a different species, but the material for such a conclusion is, however, insufficient. The epigynum closely resembles *E. jucunda* in which, however, whitish membranous part is divided into two round windows incompletely separated by two indistinct sclerotized streaks corresponding with underlying copulatory channels (in less sclerotized epigynum that partition may be not discernible and window may appear single); copulatory opening were found in semicircular slits along edge of membranous areas; sclerotized internal spermathecae channels run straight anteriorly through the middle of the epigynum.

Seasonal appearance of adult specimens. Males – II, IV, V, VI, VII, VIII, X, XII; females – II, V, VIII, IX.

Distribution. Israel: Dafna, Hanita, Lahavot-HaBashan, Nahal Bezet, Nahal Keziv near Avdon, Mt Meron (1); Nahal Oren (3); Tiberias (7); Qiryat ‘Anavim, ‘En Kerem, ‘Ein Husan (north of Husan) (11).

Evarcha pileckii Prószyński

(Figs 206, 220–221)

Evarcha pileckii Prószyński, 2000: 243, Figs 45–47.

Diagnosis. Body very dark with two striking white oval spots: one on posterior half of eye field and the second on posterior half of dark abdomen. Bulbus oval, narrower than in *E. praeclara* and *E. negevensis*, embolus

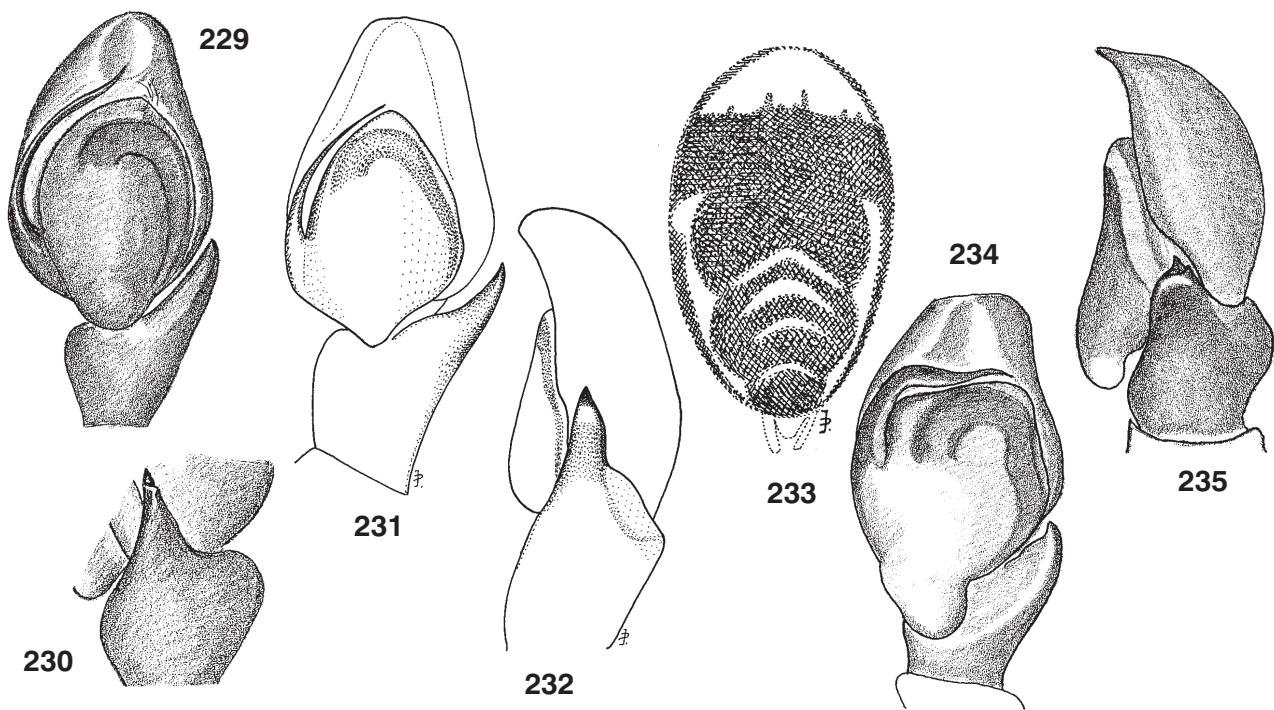
gradually broadening, encircling anterior edge of bulbus, splitting apically into short triangular needle directed anteriorly and a thin, longer process directed posteriorly.

Description. Male. Cephalothorax: integument blackish brown, including eye field and anterior thorax, covered with long adpressed colourless setae, appearing greyish, except large spot of striking white setae on posterior half of eye field, anterior half of eye field with adpressed colourless setae, less dense than in other species and without any wedge shaped spots; there are slightly lighter spots behind eyes III; a belt of white setae along edge of flat part of thorax runs to below eyes III, sides with tegument dark brown; edge of carapace black, from under eyes II with thin line of intensely white setae turning into white belt on clypeus, lighter diagonal line runs from under ALE. There is a pair of tufts of longer strong bent setae arising below eyes II, resembling that in *Thyene*.

Abdomen: integument uniformly dark grey, covered with adpressed and long whitish setae, more whitish medially, concentrating into a striking white oval spot on posterior half of abdomen, anteriorly setae are divided by bald lines into thin, short streaks; lateral edge appear light due to concentration of whitish setae, sides in dense stripes of dark and light; long, sparse thin upright bristles over dorsal surface, whitish with dark tips over anterior edge of abdomen, further on anterior abdomen darker part of setae extends, only basal parts remaining whitish; along remaining part of abdomen bristles along medial part of dorsal surface whitish, more marginally black and stronger. Spinnerets blackish brown with long lighter setae.

Frontal aspect: eye field appears blackish brown with lighter brown line above eyes I, sparse colourless setae; tufts of long bent black bristles appearing like “horns” below eyes II; face below eyes I brown, separated from blackish sides by diagonal lighter line with sparse whitish setae; upper halves of rims of AME covered with long and strong dark greyish brown setae, sparsely intermixed with white, lower halves of rims covered with shorter, slightly lighter setae; rims of ALE covered externally with dark brown, yellow and whitish setae, medial halves only with whitish setae; edge of clypeus laterally (under ALE and sideways) with two lines of intensely white setae, separated by bald blackish brown line; clypeus under AME sparse “beard” of long, white setae, overhanging chelicerae. Chelicerae short and slender, light brown, with sparse, whitish setae. Pedipalpal femur and patella brown with whitish setae apically, tibia and cymbium blackish brown with whitish setae. Palpal organ: bulbus oval, narrower than in *E. praeclara*, embolus gradually broadening along its length, encircling anterior edge of bulbus, splitting apically into short triangular needle directed anteriorly and thin, longer process (in antero-lateral view broader, concave and plate shaped) directed posteriorly.

Ventral aspect: mouth parts dark brown, coxae I–IV dark brownish grey, posterior gradually lighter; sternum



Figures 229–235. *Evarcha patagiata*, palpal organ ventrally (229), tibial apophysis laterally (230); *Evarcha* sp. uncertain cf. *patagiata*, palpal organ ventrally (231) and laterally (232), dark abdominal pattern (233). Relevant Western Mediterranean species *E. jucunda*, palpal organ ventrally (234), laterally (235).

dark brownish grey; abdomen ventrally grey with lighter margins, anterior part (in front of the epigastric furrow) darker, blackish brown with sparse whitish setae; spinnerets black. Legs I strikingly dark, including basal half of metatarsus and femur, with dorsal surfaces of tibia and patella I lighter brown, femora I–IV blackish with small, inconspicuous lighter area basally on femur I, gradually expanding on following femora, extending over half of femur IV and 3/4th of femur III. Legs III the longest.

Measurements (mm). Male. Length of cephalothorax 2.37; length of 5 segments of leg I 5.53.

Seasonal appearance of adult specimens. Males – V.

Distribution. Israel: Ma'agurat Loz, Sede Boqer (17).

Etymology. Named in honor of the late Witold Pilecki (1901–1948), who, during the Nazi German occupation of Poland, volunteered for Polish Resistance (Armia Krajowa) in an almost suicidal mission of penetrating Auschwitz Concentration camp and provided the first detailed report.

Evarcha praeclara Prószynski et Wesolowska, sp. nov.
(Figs 205, 207, 211–214, 216)

Evarcha praeclara Wesolowska et van Harten, 1994: 25–28, Figs 52–58 (preoccupied by *Mogrus praeclinctus* Simon, 1890).

Diagnosis. Two wedge-shaped streaks of white adpressed setae on the eye field; bulbous round, embolus broad, bending tightly along edge of bulbous, its anterior

half split indistinctly into narrowing anterior needle, tightly press to posterior plate with raised edges.

Description. Male. Cephalothorax fawn, eye field with two wedge-like streaks of white adpressed setae, pointed anteriorly, running from near eyes III to medial part of rim of AME; remaining eye field covered by colourless setae appearing fawn on fawn tegument; a belt of white setae along edge of flat part of thorax runs to below eyes III, sides with tegument yellow, covered by adpressed dark setae making irregular dark areas; edge of carapace black, from under eyes II with thin line of intensely white setae turning into white belt on clypeus, areas under ALE lighter than remaining sides. No *Thyene*-like tufts of longer setae arising below eyes II.

Abdomen: differentiated with contrasting darker marginal area, consisting of dark blackish grey ridges separating chains of yellowish dots of the same diameter, covered with yellowish setae with some almost black anteriorly, these margins surrounds intense white central spot on white tegument covered with white adpressed setae, thin streaks of whitish setae separated by bald lines cover anterior median grey tegument streaks, an almost black spot in front of spinnerets with are dark grey and yellow; lateral edge and sides below it clean whitish; anterior vertical wall of abdomen, below edge blackish grey, extending down to the lung-box area.

Frontal aspect: eye field appears light fawn, darker greyish fawn along sides, with two thin wedges of white setae converging at touching point of rims of AME; upper

halves of rims of AME covered with longer and stronger dark brown setae, sparsely intermixed with white, lower halves of rims covered with shorter yellow and whitish setae, rims of ALE covered with short yellow and whitish setae, externally slightly darker; space under AME and ALE yellowish fawn, edge of clypeus covered with narrow line of short intensely white setae, below AME setae longer and overhanging cheliceral bases, from under ALE sideways that line of setae is split into two, leaving dark brown narrow bald line. Chelicerae short and slender, light yellow with whitish setae, long laterally, short and sparse medially. Pedipalps white with white setae, cymbium darker yellow to brown.

Ventral aspect: mouth parts yellow, coxae I–II yellowish, III–IV whitish; sternum yellowish grey with margins and anterior part darker; abdomen ventrally whitish with anterior part (in front of the epigastric furrow) dark grey, median area greyish, broad anteriorly and narrowing posteriorly; spinnerets grey.

Legs. Femur I white with small black spot and a few black scales prolatero-apically; patella I dorsally whitish, laterally greyish yellow; tibia I dark greyish yellow laterally and at both ends of dorsal surface, median part of dorsal surface whitish; tarsus and metatarsus greyish yellow, dark setae at top of tarsus. Legs II–IV similarly light, with apical darkening on femora more pronounced.

Female. According to Wesolowska and van Harten (1994) coloration of females of this species from Yemen are similar to males. Their epigynum resembles *E. negevensis*, differing in having shorter "window" in anterior half, ending in mid length of epigynum, at the level of pockets, narrower spermathecae with larger number of septa, longer channels.

Measurements (mm). Male. Length of cephalothorax 1.87; length of abdomen 1.75; length of 5 segments of leg I 3.62.

Material. Holotype male – Israel: Arava Valley (approx. 50 km N of Eilat), Kibbutz Qetura, citrus orchards, in leaf litter under trees, 17 March 1994, leg. Y. Lubin. Coll. HUJ 155226.

Seasonal appearance of adult specimens. Male – III.

Distribution. Yemen: Aden. Israel: Arava Valley (14).

Evarcha sp. uncertain

(Figs 231–232)

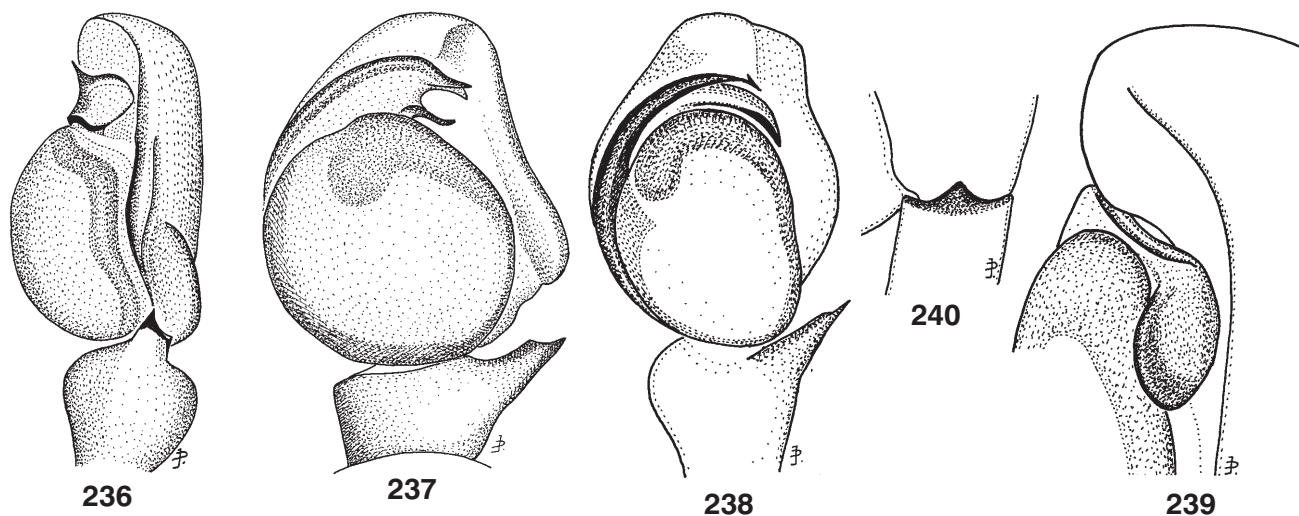
Evarcha sp. n. Prószyński 1984: 52.

Diagnosis. Seems to differ (if not secondarily changed) from *E. patagiata* by striking white setae on clypeus under AME; abdomen dark brown with yellow dots, with white anterior edge and four thin white chevrons posteriorly.

Description. Male. Cephalothorax: yellow (presumably faded) with brown eye field, lateral eyes encircled with black; light belt just behind eye field has wavy outline and consists of whitish semicircular spots behind eyes III, connected narrowly in front of fovea, anteriorly stretching only to eyes II; differs from both *E. jucunda* and *E. patagiata* by a row of short, thin white setae along anterior edge of eye field, on dorsal parts of rims of eyes I, slightly denser triangular concentration of white setae between eyes AME.

Abdomen: dorsum and sides dark brown mottled yellow; very prominent white semilunar spot at the anterior edge of abdomen; four thin white chevrons in the posterior half of the abdomen, much narrower than in *Evarcha jucunda*; broad white marginal streak along posterior half of abdomen, with a pair of isolated white marginal spots along anterior half.

Frontal aspect: striking white setae on clypeus under AME, forming white triangle between AME ventrally; on rims of AME setae whitish, on rims of ALE whitish ventrally and medially but dark dorsally and laterally; setae



Figures 236–240. Related species *Evarcha nigricans* (Dalmas, 1920) comb. nov., from Tunisia, palpal organ laterally (236), ventrally (237); *Evarcha* sp. aff. *praeclara* from Sudan (Khor Atta), palpal organ ventrally (238), tip of embolus laterally (239), tibial apophysis laterally (240).

under ALE whitish, sparse and inconspicuous; tegument dark pigmented in the immediate narrow surrounding of eyes I, yellow on clypeus and beneath ALE in an area merging with sides of cephalothorax; edge of clypeus dark pigmented, under AME almost black; chelicerae yellow, basally with triangular frontal bulge.

Legs on studied, long preserved specimen, almost uniformly light yellow, without traces of distinct pattern, ventral setae on tibia and patella I whitish; shorter sparse whitish setae ventrally on femur I. Ventral aspect: coxae, mouth parts and sternum whitish yellow, ventral surface of abdomen whitish with three darker indistinct lines in the posterior part, sides contrasting dark; in *E. patagiata* the whole ventral surface of abdomen was black.

Palpal organ very similar to *E. patagiata*, from which it differs by shorter embolus, arising near the mid-length of bulb, tibial apophysis slightly longer.

Measurements (mm). Male. Length of cephalothorax 2.05; length of abdomen 1.93.

Material. 1 male, "25623 *Ev.* s. n. Syria (C.Br.)", Coll. MNHN-Paris.

Distribution. "Syria" (?)

Relevant species

Evarcha jucunda (Lucas)

(Figs 227-228, 234-235)

Salticus jucundus Lucas, 1846: 146;

Evarcha jucunda: Cantarella 1982a: 57, Fig. 3; Deltshv C.D., Paraschi L. 1990: 4.

Remark. For diagnostic characters see description of *Evarcha patagiata* (above).

Distribution. W and N Mediterranean species, also reported from Turkey (Nosek 1905: 119).

Evarcha nigricans (Dalmas) comb. nov.

(Figs 236-237)

Habrocestum nigricans Dalmas, 1920d: 65, 67; Prószyński 1987: 38.

Distribution. Tunisia.

Evarcha aff. *praeclara*

(Figs 238-240)

Pellenes praecinctus: Prószyński 1984b: 104 (name following misidentification by Simon as *Mogrus praecinctus* in NHM Vienna collection, name preoccupied by *Mogrus praecinctus*).

Material. Male, "*Mogrus praecinctus*" [Sudan:] Khor Attar, Werner, 1905, det. Simon" in Coll. Reimoser, NHM, Vienna (not congeneric with lectotype of *Mogrus praecinctus* Simon, 1890 from Aden, in Simon collection MNHN, designated by M.E. Galiano).

Remark. Specimen deserving attention because of close relationship with *Evarcha praeclara*.

Present information include published drawings, but no other data. Description as a new species is delayed until more specimens become available.

Distribution. Africa – Sudan.

Festucula Simon, 1901

Type species. *Festucula vermiformis* Simon, 1901.

Introductory remarks. The genus contains six species distributed mainly over tropical Africa. Unique in having unusually long and thin abdomen; cephalothorax resembles *Pseudicius* in its proportions and in typical row of stridulatory spines on tubercles under eyes lateral. Tibia I swollen medially with three unpaired spines in the apical half. Differs from *Pseudicius* by structure of epigynum, which has different plan and no pockets, however relationship of *Festucula* with *Pseudicus cinctus* group deserves further studies. Males known in two species only, their palpal organ has large, broadly biramous tibial apophysis, broad bulb with short embolus located anteriorly.

Festucula vermiformis Simon

(Figs 241-243)

Festucula vermiformis Simon, 1901c: 155; Prószyński 1987a: 27; Wesolowska 1992: 50-52, Figs 28-31.

Remark. Description of female *Festucula monticola* Berland et Millot (1941: 345 Fig. 48) from W Africa (Guinea) suggests these forms are very similar and may be actually conspecific.

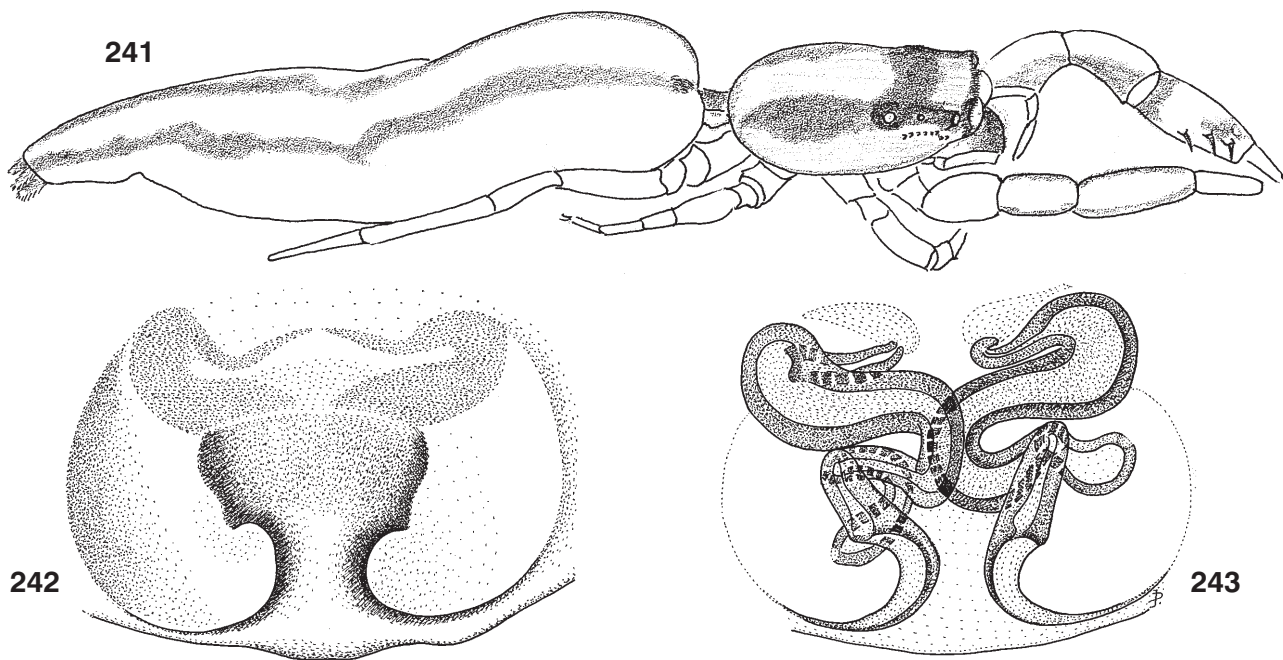
Description. Female. Cephalothorax low (its height is 30% of length of cephalothorax), flat, long and narrow, its width is 50% at eyes I, 52% at eyes III, not broadening along its whole length, with eight characteristic dark protuberances bearing stridulatory setae under lateral eyes – just as in *Pseudicius*. Eye field extending over 37% of cephalothorax, its length equal to 74% of width at eyes I; almost rectangular, broadening posteriorly by 4%; eye field indistinctly narrower than cephalothorax, eyes III are located closely to the edges of cephalothorax; its width at eyes III is 87% of width of cephalothorax in the same area.

Cephalothorax blackish brown with transversal light brown spot behind eyes I. Broad dorsal area of thorax yellow, margins of dorsum brown, sides light yellow. Abdomen appears enormously elongated, actually 155% of length of cephalothorax, and thin, with two marginal dark streaks. Frontal aspect: clypeus white. Legs I robust and long, as in *Pseudicius*, with tibia I armoured with three prolateral ventral spines in the anterior half of the segment, none retro-laterally. Metatarsus I darker than other segments. Legs II-IV slender and short, yellow. Epigynum: Identical with Simon's specimen from Suez-Alexandria, different from *Pseudicius* but showing some resemblances to the *Pseudicus cinctus* group in the general outline of channels (which are, however, located anteriorly to the openings).

Male unknown.

Measurements (mm). Female. Length of cephalothorax 2.27; length of abdomen 4.20.

Seasonal appearance of adult specimens. Female – I.



Figures 241–243. *Festucula vermiformis*: general appearance (specimen from Israel) (241); epigynum (242) and its internal structure (specimen from Egypt) (243).

Distribution. Egypt: Suez, Alexandria; Sudan. Israel: Nahal Alexander (valley of stream near Tel Aviv) (8).

Habrocestum Simon, 1876

Type species. *Attus agilis* Simon, 1876 = *Habrocestum pullatum* (Simon, 1876)

Introductory remarks. A genus containing some 39 nominal species in the Mediterranean area and Africa, occurring also in E Palaearctic and Oriental Regions; species described from C and N America and Australia may not be congeneric and require revision.

Body proportions. Cephalothorax high (57% in female, 67–72% in males) and broad, its width is 65–73–72% at eyes I, broadest behind eyes III, flat area extending over 74–87–83% of cephalothorax length, posterior thoracic slope almost vertical. Eye field long, extending over 40–47–45% of cephalothorax but short in relation to its width (65% of width at eyes I in F, almost rectangular narrowing posteriorly by 2%, indistinctly narrower than cephalothorax at eyes III (79% of width of cephalothorax in the same area); eyes III are located on the edges of cephalothorax. Length of abdomen is 148% in female, 70–80% in male, width of abdomen in male 72–76%.

Habrocestum latifasciatum (Simon)

(Figs 244–251)

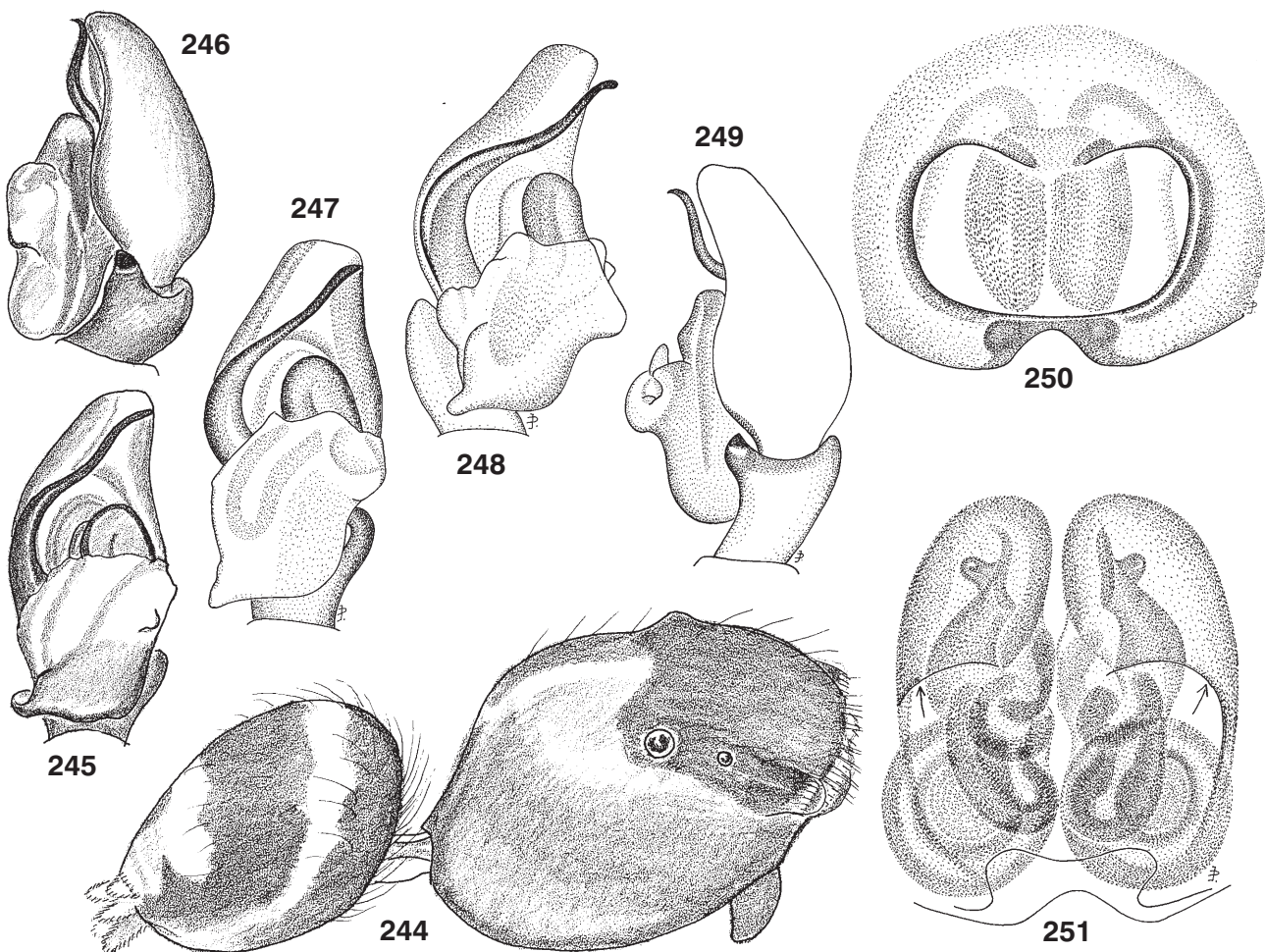
Attus latifasciatum Simon, 1868: 536;

Salticus latifasciatus: O. Pickard-Cambridge, 1872: 322;

Habrocestum latifasciatum: Prószyński, 1987: 30, 32–34;

Habrocestum latifasciatum: Metzner 1999: 61, Tab. 26, map 28.

Description. Male. Cephalothorax high, with prominent flat dorsal surface making it appear indistinctly longer than high, and very steep posterior thoracic slope; brown with dark brown eye field and black surrounding lateral eyes; there is a striking median line of white setae along flat part of the thorax, extending in some specimens onto posterior eye field; an indistinct line of whitish setae along lateral and anterior margins of eye field, eyes AME with white dorsal orbital setae. Abdomen with large white transverse postero-median area, consisting of a fused pair of spots; anterior white line merging with whitish lower sides; remaining abdomen dark brown apart from posterior whitish chevrons and whitish terminal spot; spinnerets white. Frontal aspect: dorsal hairs surrounding eyes I white, ventral ones colourless; clypeus light brown in some specimens with dark edge, almost bald; chelicerae slender, brown; pedipalps yellow with striking dense white mane prolaterally on tibia, dorsally on femur and patella; no dorsal spot of white hairs on cymbium, which is exceptional in this genus. Legs robust, of similar length in decreasing order I–III–IV–II, leg III only very indistinctly shorter than leg I, but femur III strikingly longer than all remaining; light yellow apart from striking black spot prolatero-apically on femur I and brown ventral surfaces of patella, tibia and metatarsus I, quite remarkable in comparison with remaining light yellow surfaces of these segments. Ventral aspect greyish yellow, coxae III–IV and abdomen lighter. Palpal organ: bulbus elongate and somewhat irregular, divided (as is



Figures 244–251. *Habrocestum latifasciatum* (Israeli specimen), general appearance (244), palpal organ ventrally (245) and laterally (246); Simon's specimen, palpal organ ventrally (247), prolaterally (248) and retrolaterally (249); *H. egaeum* (specimen from Crete), epigynum (250) and its internal structure (251).

usual in *Habrocestum*) into two unequal parts: smaller antero-lateral with anterior part of bent sperm receptacle channel, disappearing under white membranous margin of larger postero-medial part, later becoming darker and thicker, with embolus arising from its antero-medial part, in a 10 o'clock position; embolus long and slightly wavy, which is rather unusual in this genus; tibial apophysis short (shorter than in related species), thick and irregularly triangular; there is striking prolateral dense white mane on tibia, being extension of white dorsal mane on patella and apical femur.

Measurements (mm). Male. Length of cephalothorax 2.46–2.55; length of abdomen 1.78–1.95; length of 5 segments of leg I 6.03–6.71.

Seasonal appearance of adult specimens. Males – IV, V.

Distribution. E Mediterranean: Greece, Corfu, Aegean Isl., Crete; Turkey; Lebanon (Hasbeiya); reported occurrence in Libya requires confirmation. Israel: Nahal Oren (3), Rosh Haniqra (4).

Habrocestum shulovi Prószyński
(Figs 252–255)

Habrocestum shulovi Prószyński, 2000: 245, Figs 48–51.

Diagnosis. Relatively large spider with high, flat cephalothorax, almost vertical posterior thoracic slope, instantly recognisable by unique external and internal structure of epigynum in general outline resembling *Habrocestum arabicum* Prószyński (1989: 33–34, Figs 3–4), and related to other species of *Habrocestum*.

Description. Female. Cephalothorax light brown with darker eye field; covered with inconspicuous adpressed whitish setae whose weak concentrations may suggest previous existence of a white median dorsal line along cephalothorax and some white pattern on the eye field, but this requires confirmation from fresh specimens; patches of white setae on dorsal rim tips of eyes I; there are quite prominent short dark upright bristles, scattered over dorsal surface, lower posterior part of

sides lighter yellowish, with thin dark edge. Abdomen large and round, now poorly preserved, with tegument separated from soft tissues; very indistinct traces of two white and dark chevrons in the anterior half of abdomen; traces of posterior median white area, anteriorly limited by a narrow chevron of darker setae. Frontal aspect: dark eye field contrasts with yellowish fawn clypeus, almost bald, with three prominent bent bristles between and somewhat beneath eyes AME, and a few indistinct colourless setae overhanging cheliceral bases; orbital setae on rims of eyes I white except laterally on ALE where brown; chelicerae yellowish fawn. Diameter of ALE equal to half of AME, eyes ALE aligned along dorsalmost point of rims of AME. No contrasting or striking characters visible. Legs robust and short, length of legs order IV, III, I, II, difference in length between I and II insignificant; patellae-metatarsi I-IV yellow with darker annulation. Tibia I with three ventral spines retro-laterally, prolaterally two lateral and two ventral spines, the latter in the apical half of the segment. Ventral aspect: sternum light brown, coxae pale yellow.

Epigynum with anterior sclerotized transverse slit and curved posterior edge (Figs. 253); membranous and transparent copulatory channels originate at ends of slit

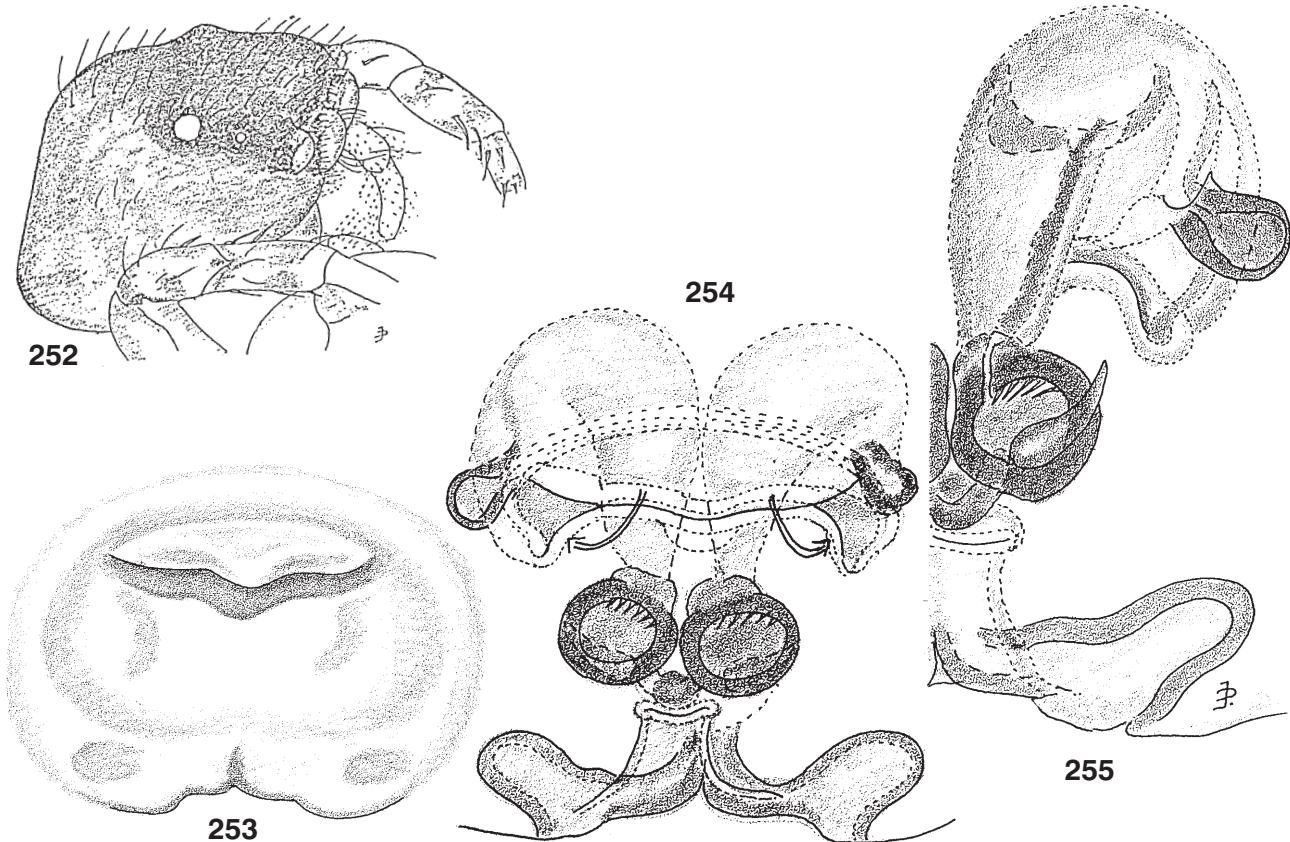
and run a short way anteriorly, producing small sclerotized lateral chamber (accessory gland structure?), then make prominent 180 degrees turn and run posteriorly along median line of epigynum, entering small, spherical, heavily sclerotized spermathecal chambers, with a few prominent internal spines; terminal fertilization channels run off from these chambers dorsally; vaginal roof extends from the posterior edge of epigynum to the spermathecae, its heavily sclerotized postero-lateral transverse extensions may actually be sclerotized pockets (Figs. 254-255). There is some resemblance in the general layout to the internal structure of epigynum of *Habrocestum arabicum* Prószyński (1989: 33-34, Figs 3-4) from Saudi Arabia, although actual shape is rather different.

Measurements (mm). Female. Length of cephalothorax 2.99; length of abdomen 4.42.

Material. Holotype female, *Habrocestum shulovi* sp. n., misidentified and labelled as "*Salticus capreolus* Koch t. 49, B. 1833", presumably from "Palestine"; Coll. HEC.

Distribution. Israel: Jerusalem (labelled as "Palaestina" in HEC),

Etymology. Named for Dr. A. Shulov, a pioneer of zoology in Israel and prominent contributor to the Israel National Arachnid Collection.



Figures 252-255. *Habrocestum shulovi*, cephalothorax laterally (252), epigynum (253), its internal structure ventrally (254) and single spermatheca and channel, dorsally (255).

Relevant species

Habrocestum arabicum Prószyński

Habrocestum arabicum Prószyński, 1989: 33–34, Figs. 3–4.

Distribution. Saudi Arabia.

Habrocestum egaem Metzner (Figs 250–251)

Habrocestum cf. graecum: Prószyński 1987: 31–33;

Habrocestum egaem Metzner, 1999: 63, Tab. 28, map 30.

Material. Male, Kreta IV. 54, Kurhas (Myrt); female, Crete IV. Both. coll. J. Wunderlich

Remark. Species closely resembling *Habrocestum graecum*, but differs from it by wavy tip of broad embolus and lighter body coloration.

Habrocestum graecum Dalmas

Habrocestum graecum Dalmas, 1920;

Habrocestum graecum: Prószyński 1987: 30–31 (male; female = *Aelurillus* sp.); Deltshv C.D., Paraschi L. 1990: 4; Metzner 1999: 60, Tab. 25, map 27.

Distribution. Greece: Volo.

Habrocestum papilionaceum (L. Koch)

Habrocestum papilionaceum (L. Koch, 1867);

Habrocestum papilionaceum: Prószyński 1984c: 54; Prószyński 1987: 34, 39; Deltshv C.D. and Paraschi L. 1990: 4; Metzner 1999: 62, Tab. 27, map 29.

Distribution. Greece: Cyclades; Aegean Is.; Asia Minor.

Harmochirus Simon, 1885

Type species. *Ballus brachiatus* Thorell, 1877.

Introductory remarks. The genus is very similar and apparently related to *Bianor*, contains 8 species in tropical Africa and tropical and subtropical Asia.

There is no species of *Harmochirus* known from Mediterranean or Europe, the nearest occurrence of the genus are Ethiopia and Somalia.

Harmochirus sp.

Remarks. Identification of immature specimen provisional, the final identification requires adult specimen.

The only specimen found in Jerusalem has single retrolateral tooth on chelicerae, cephalothorax broad with eyes III protruding beyond edges of cephalothorax, eye field trapezoidal, thorax very steep – almost vertical, tegument of abdomen hardened.

Seasonal appearance. Immature male – XII.

Distribution. Israel: Jerusalem.

Hasarius Simon, 1871

Type species. *Attus adansonii* Savigny et Audouin, 1827.

Introductory remarks. A “waste bucket” genus into which large number of nominal species was previously placed and which still contains 36 nominal species, not yet revised and often irre recognizable. The only sure and well known species of the genus is at present only its type species *Hasarius adansonii* (Savigny et Audouin, 1827); since it is cosmopolitan in warm climates we do not know its geographical origin and do not know where its relatives may occur. For characteristics of the genus see description of *H. adansonii* below.

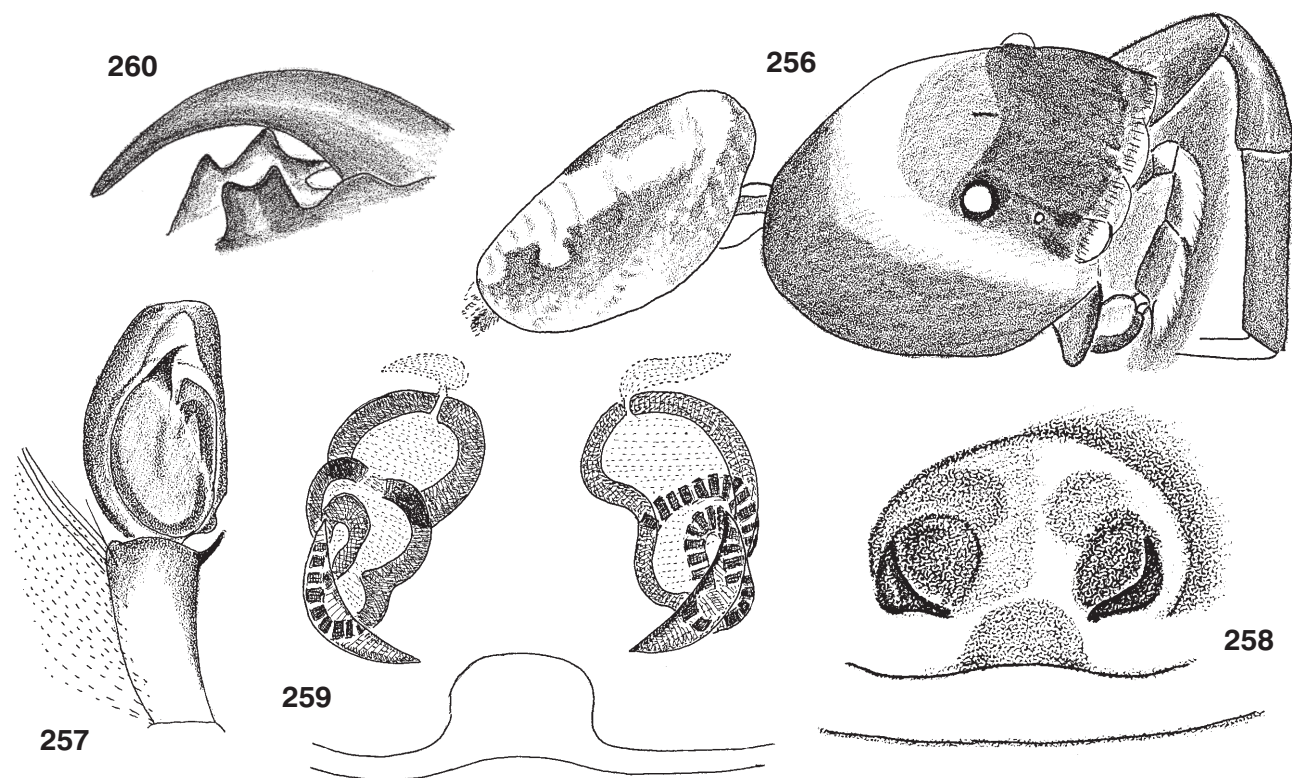
Hasarius adansonii (Savigny et Audouin) (Figs 256–260)

Attus adansonii Savigny and Audouin 1827: 404;

Hasarius adansonii: Kaston 1948: 493; Locket and Millidge 1951: 242; Prószyński 1984c: 58 (male from Jaffa-Rehovot); Prószyński 1987a: 14.

Diagnosis. Retro-lateral cheliceral tooth bifid-fissidentati (Fig. 260) which is rare among Palaearctic Salticidae and could be considered a conclusive character in a spider resembling *Hasarius* in general shape, colour pattern (a pair of abdominal white spots), long pedipalpal tibia with white mane in males and simple epigynum in a form of shallow, poorly sclerotized depression with 2 darker dots in females. Shape of cephalothorax: moderately long and broad, its width (expressed in % of length of cephalothorax) is = 64–68% at eyes I, = 62–64% at eyes III; height 39–52% of length of cephalothorax. Eye field: fairly long extending over 30–40% of cephalothorax, also long in relation to its width (% of width at eyes I 48–59), almost rectangular, narrowing posteriorly by 2–5%. Eye field is indistinctly narrower than cephalothorax, being 79–80% of cephalothorax width at eyes III, eyes III are located on dorsal edges of cephalothorax. Posterior slope of thorax gently inclined. Shape of abdomen: oval, indistinctly narrower than cephalothorax, dorsally flat, without scutum; 2 white abdominal spots, not always separate from median white streak.

Description. Male. Cephalothorax broad and high, black with broad white belt around eye field. Abdomen with characteristic pair of small round white spots on both sides of a median light streak extending for 2/3^{rds} of abdomen length, usually separate although on the studied specimens connected with the median light streak, the latter limited laterally by two dark lateral streaks; anterior edge white. Frontal aspect: face blackish with brown areas beneath eyes ALE, eyes I surrounded ventrally with white, dorsally with reddish setae; clypeus dark brown, almost bald, chelicerae and legs I dark brown, pedipalps dark brown but with long white dorsal mane extending from the tip of femur, along patella and tibia (the latter characteristically long). Legs robust, of similar length, the 1st ones strongest and darkest, the remaining legs gradu-



Figures 256–260. *Hasarius adansoni*. General appearance of male (256); palpal organ (dotted lines indicate white setae) (257), epigynum (258) and its internal structure (259), bifid retro-marginal tooth (260).

ally lighter, to light brown. Ventral aspect light brown, abdomen whitish grey with darker dots. Palpal organ: easily recognized by unusually long pedipalpal tibia with a prolateral (median) fringe of long white setae and a short, thin apophysis; bulbus divided diagonally by white membranous edge of postero-median part and antero-lateral darker part with visible sclerotized internal seminal receptacle channel; whilst general outline of bulbus may somewhat resemble *Habrocestum*, the embolus is entirely different – apical, short, abruptly narrowing (Figs. 257).

Female. Externally, resembling male. Cephalothorax: light brown (specimen presumably faded). Frontal aspect: face fawn, clypeus with sparse colourless setae, chelicerae brown, pedipalps yellowish white. Abdomen grey with whitish median streak broadened posteriorly. Legs I – brown with lighter femur, II–IV light. Epigynum: shallowly depressed sclerotized oval plate, usually devoid of any characteristic colour spots or sculptures, internal structures consist of three sclerotized chambers arranged perpendicularly to epigynum (dorsally), hence poorly visible and often distorted by pressure during mounting of preparation.

Measurements (mm). Male. Length of cephalothorax 2.84; length of abdomen 2.39. Female. Length of cephalothorax 3.75; length of abdomen 4.09.

Seasonal appearance of adult specimens. Males – II, IV, VIII, X; females – IX.

Distribution. Cosmopolitan in warm climates, including Mediterranean; in green-houses of cooler areas of W and C Europe. Israel: Nahal Poleg, Tel Aviv (8), Rehovot (9), Sede Boqer (17).

Key to species of *Heliophanillus* and *Heliophanus*

1. Males 2
 - Females 8
- 2(1). Both femoral and patellar apophyses absent (*Heliophanillus*) 3
 - Simple patellar apophysis present (subgenus *Helafricanus*); palpal organ as in Figs 350–353; thin median white line along abdomen and thorax *Heliophanus edentulus*
 - Large femoral apophysis present (subgenus *Heliophanus* s. str.) 4
- 3(2). Ventral tibial apophysis broad and plate-like; bulbus triangular, tapering apically into a short embolus; four pairs of unusually regular, small, round, white abdominal spots; very small spider *Heliophanillus fulgens*
- 4(2). Femoral apophysis single, not branched 5
 - Femoral apophysis bifurcate 7
- 5(4). Femoral apophysis strongly bent posteriorly; a triangular protuberance near apophysis on femur ventrally *Heliophanus decoratus*

- . Femoral apophysis straight, if bent then only apically **6**
- 6(4). Bulbus apically with a triangular ventral protuberance; embolus arising medially, anterolaterally directed, bending anteromedially *Heliophanus curvidens*
- . Bulbus apically rounded, without protuberance; embolus arising from a broad base and bending laterally in hook-shape ... *Heliophanus encifer*
- 7(4). Femoral apophysis with a small apical fork *Heliophanus mordax*
- . Femoral apophysis with unequal rami: a large apical branch and a small, triangular, basal branch *Heliophanus equester*
- 8(1). Epigynum a slightly depressed sclerotized plate, with rims not curving upward **9**
- . Epigynum a more depressed sclerotized plate, with rim raised anteriorly but not posteriorly **10**
- . Epigynum in form of deeply depressed sclerotized plate, with rims curving upward, turning it into a chamber with a sclerotized opening .. **14**
- 9(8). Epigynal plate with two impressed grooves separated by indistinct edges; copulatory openings at mid length, broadly spaced, channels short and thick; spermathecae run transversally, similar in appearance to *Icius* *Heliophanillus fulgens*
- . Epigynal plate flat, weakly sclerotized, with a pair of small circular grooves with sclerotized edges, located posteriorly; spermathecae run anteriorly along the entire length of the epigynum and turn into single tight twist of spermathecae (Fig. 285) *Heliophanus edentulus*
- 10(8). Entrance to the copulatory openings in form of large lateral pockets under raised rims of epigynal plate **11**
- . No pocket-like entrance to the copulatory openings, the latter in the anterior part of epigynal plate **12**
- 11(10). Copulatory openings in posterior half of epigynum, at the posterior angle of prominent antero-lateral pockets; channels narrow, running along sides of epigynum and bent medially, posterior edge of epigynum not curved *Heliophanus malus*
- . Copulatory openings in anteromedian angle of anterolateral pockets, the latter separated by a raised median portion of the plate; channels run parallel and medially almost to the posterior end of epigynum, where they turn into spherical spermathecae *Heliophanus equester*
- 12(10). Copulatory openings located anteromedially; channels running parallel almost to the posterior rim of the plate and turn into short oval spermathecae directed transversely; posterior rim gently curved, but without prominent flaps; abdomen black with two striking white streaks *Heliophanus mordax*
- . Copulatory openings as above; channels more spaced, run parallel only to the middle of the epigynum, then turning into longer oval spermathecae directed transversely; posterior rim prominently curved with two peculiar semitransparent flaps; abdomen black with two pairs of white spots *Heliophanus decoratus*
- 13(8). Opening to the epigynal chamber triangular; margins of opening depressed; copulatory openings hidden laterally under rims in the middle of epigynum; copulatory channels running anteriorly, then bending medially and slightly backward *Heliophanus curvidens*
- . Opening to the epigynal chamber relatively small, transversally oval, in the anterior half of epigynum; margins of opening not depressed; copulatory openings hidden inside posterior pocket; two pairs of abdominal dots *Heliophanus encifer*
- . Opening to the epigynal chamber relatively large, almost the size of the entire epigynum, transversely oval; copulatory openings hidden under the rims latero-posteriorly in a form of large funnels, spermathecae run transversely *Heliophanus kochi*

Heliophanillus Prószyński, 1989

Type species. *Salticus fulgens* O. Pickard-Cambridge, 1772.

Introductory remarks. External appearance closely resembling *Heliophanus* in proportions (see below) and colour pattern, often mistaken for that genus. The main and most striking difference lies in the male pedipalps – absence of both femoral and patellar apophyses, with only minute tibial apophyses, presence of a dorsal abdominal scutum; species of this genus are much smaller than the majority of *Heliophanus* species. Colour pattern resembling *Heliophanus*: cephalothorax dark with spots of white, whitish or colourless scales; eye field rugose; rugosity under lateral eyes; abdomen brown to black, with colourless light-reflecting scales over a brown scutum, a few pairs of small round spots of white scales; legs yellow. Four micro-stridulatory spines arranged in a half bent transverse row sub-apically on femur I.

Palpal organ resembling *Heliophanus* but differing in the lack of femoral and patellar apophyses; bulbus bag shaped, triangular, tapering apically and passing into a short embolus, tibial apophysis consisting of two separate, widely spaced prongs. Epigynum resembling both *Heliophanus* and *Icius*. The genus contains four species occurring in the arid and semiarid parts of the SE Mediterranean, NE Africa and the Arabian Peninsula.

Heliophanillus fulgens (O. Pickard-Cambridge)

(Figs 261–268)

Salticus fulgens O. Pickard-Cambridge, 1872a: 340–341;
Icius fulgens Wesolowska, 1988: 399–400, Figs 1, 10–17;
Heliophanillus arabicus Prószyński, 1989: 35–37, Figs 9–11;
Heliophanillus fulgens: Prószyński 1989: 35 (transferred from
Icius); Wesolowska and van Harten 1994: 30–32, Figs 64–67
 (syn. *H. arabicus*); Metzner 1999: 97, 216, Table 62a–i, map 68.

Diagnosis. Recognizable by small size, two minute tibial apophyses, and shape of epigynum, usually four pairs of white spots on abdomen, but fallen-off scales may cause loss of some, or even all of these spots.

Description. Male. Cephalothorax dark with traces of white scales at the ventral posterior edge of cephalothorax; eye field rugose, with colourless scales in one specimen; a small white dot of scales behind eyes III; a rugosity under lateral eyes.

Abdomen brown to black, four pairs of small white spots consisting of white scales (Fig. 261), missing in some specimens; remaining surface of abdomen covered with colourless light reflecting scales; a brown scutum

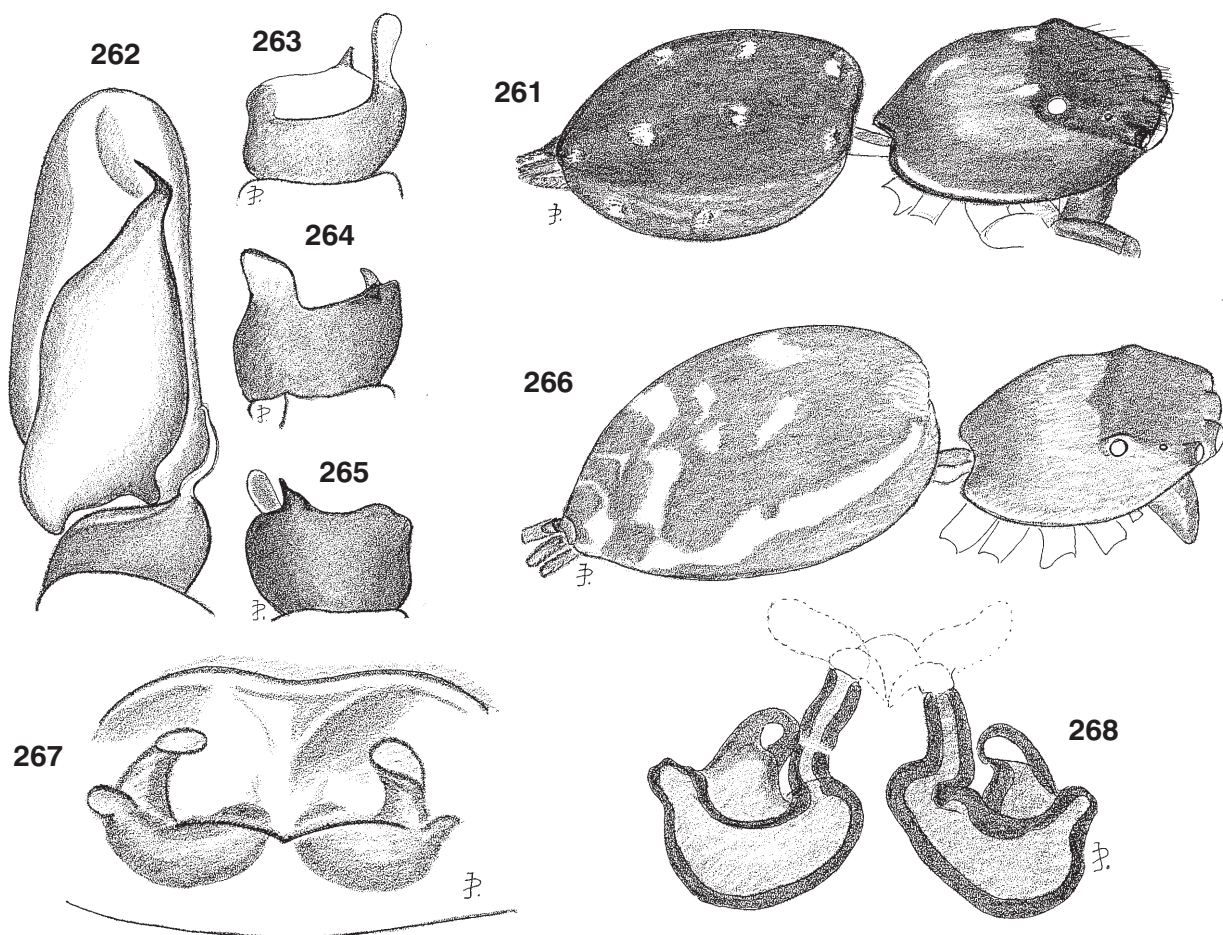
covering anterior half of abdomen, visible when scales are rubbed off.

Frontal aspect brown to black, contrasting with yellow legs. Legs yellow, femur I apically with 4 stridulatory spines in a half bent transverse row.

Palpal organ: bulbus and embolus resemble *Heliophanus* but without protuberances, triangular; tibial apophysis consists of two separate widely spaced prongs: the ventral plate-like, the dorsal one a small, narrow cone; patella and femur lacking apophyses.

Ventral aspect: sternum black; coxae yellow to whitish; abdomen brownish with two small white dots in front of spinnerets.

Female. Cephalothorax light brown, with greyish colour shading on the lower sides and on thorax, bearing whitish scales, slightly denser above the ventral margins of carapace. Eye field blackish brown, rugose, with remnants of whitish setae and very sparse reddish hairs. Abdomen black faded to grey during storage; first and third pairs of large whitish spots dorsally (irregular in the studied specimen), and two pairs of smaller spots,



Figures 261–268. *Heliophanillus fulgens*, male, general appearance (261), palpal organ ventrally (262), tibial apophyses ventrally (263), laterally (264), dorsally (265); female, general appearance (266), epigynum (267) and its internal structure (268).

the second at mid-length and the fourth in front of spinnerets; marginal whitish band. Frontal aspect dark brown; eyes surrounded with whitish scales, clypeus reduced to nil; under eyes AME a diagonal row of long white scales overhanging cheliceral bases; chelicerae fawn. Pedipalps light yellow. Legs uniformly yellow. Ventral aspect: sternum brown; coxae whitish; abdomen light greyish with colourless scales.

Epigynum very small with barely visible sculpture; spermatheca and channels resembling *Icius*, but with a transverse median edge, which may possibly belong to the vaginal roof.

Measurements (mm). Male. Length of cephalothorax 1.19–1.59; length of abdomen 1.36–1.70. Female. Length of cephalothorax 1.46; length of abdomen 2.59.

Seasonal appearance of adult specimens. Males – III, VII, XII; females – III, VII, VI, IX.

Distribution. Egypt, Saudi Arabia, Yemen, Crete. Israel: Tel Dan, Lahavot-HaBashan (1); Ma'agan Mikha'el (4); Biq'at Bet Zayda, Beth Yoseph, Ginnosar, Tiberias (7); near Palmahim (9); 'En Gedi (13); Qetura, Yahel (14).

Relevant species

Heliophanillus suedicola (Simon, 1901)

Heliophanus suedicola Simon 1890: 60, Fig. 14;
Heliophanillus suedicola: Prószyński 1989: 34; Wesolowska and van Harten 1994: 33, Figs 68–74.

Remark. Known from Yemen, Socotra.

Heliophanus Koch C.L., 1833

Type species. *Aranea cuprea* Walckenaer, 1802: 245.

Introductory remarks. The majority of species are instantly recognizable as *Heliophanus* by their general appearance. Identification of males confirmed by presence of femoral or patellar apophyses.

Body proportions close to the average for Salticidae. Cephalothorax length (smallest-mean-biggest specimen) 1.46-1.80-2.27 mm: width 51-61-67% at eyes I, 66-75-85 % at eyes III; height 41-46-52%. Eye field: length 36-42-46%, width at at eyes III 56-66-73%; slightly narrower than cephalothorax at eyes III; trapezoid in shape, broadening posteriorly by 5% (mean). Flat area of dorsal cephalothorax prominent, extending over 70% of cephalothorax length. Diameter of anterior median eyes (AME) about twice diameter of anterior lateral eyes (ALE), the latter located along upper half of AME. Abdomen oval, comparable in size to cephalothorax, except when swollen with eggs in female. Legs thin and moderately long, pairs I–IV almost equal in length.

Body usually dark coloured, black, often iridescent; contrasting in many species with light legs, the latter

usually being yellow, providing an immediate recognition character; in some species legs are dark or black. In many species a distinct abdominal colour pattern of contrasting white scales forming pairs of spots; less frequently a streak or streaks; a marginal white line around the whole abdomen or its anterior edge. Cephalothorax sometimes with lines or spots of white scales, especially diagnostic on clypeus.

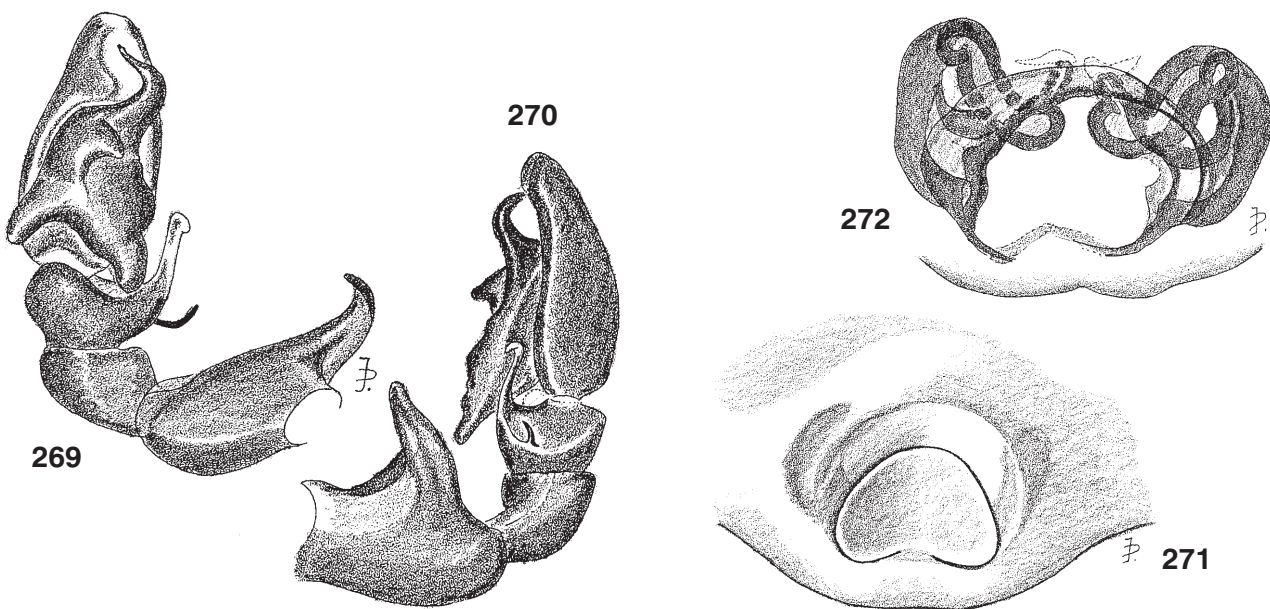
Male palpal organ very distinctive, differing from most other genera of Salticidae. In the subgenus *Heliophanus* a prominent femoral apophysis: long, robust, single or bifurcate terminally, rarely trifurcate. In the subgenus *Helafricanus* apophysis developed on patella. Both subgenera with two tibial apophyses, rarely three. Bulbus usually with protuberances, especially on its posterior edge, which give an angular aspect, very rare in other genera. Embolus very distinctive, arising on anterior edge of bulbus, usually from a broad base and narrowing abruptly, almost always short bent and hook-like.

Epigynum relatively simple, consisting either of a single sclerotized depression, sometimes partitioned longitudinally by a median ridge, or, more rarely, divided into two separate depressions. In some species, the depression surrounded by raised edges, which may even curve over, making a sclerotized chamber. Copulatory openings separate, along edges of depression, sometimes medial, their position differs in various species from anterior to median, to posterior. Copulatory channels heavily sclerotized, straight or bent, their course correlated with the location of openings: from posterior openings usually they run anteriorly; from lateral, medially; from anterior, posteriorly. Spermathecae simple, vesicular in shape, often appearing as terminal extensions of channels; accessory gland openings usually prominent, tubercle shaped, often located near passage of channels into spermathecae. Appearance of copulatory channels on microslides often distorted: shifted and/or shortened, due to their more or less perpendicular arrangement to the surface of epigynum.

Heliophanus curvidens O. Pickard-Cambridge (Figs 269–272)

Salticus curvidens O. Pickard-Cambridge, 1872: 345;
Heliophanus berlandi Schenkel, 1963: 399, Figs 229a–c;
Prószyński and Zochowska 1981: 18, Figs 7–14;
Heliophanus curvidens: Prószyński 1982: 280–283, Figs 33, 36;
Wesolowska 1986: 45, Figs 538–548, 884 map.

Diagnosis. Legs dark; abdomen black, with anterior white line and two pairs of small white spots. Male bulbus apically with a triangular ventral protuberance; embolus arising medially, broad, sinuated. Female opening to the epigynal chamber triangular, located in a depression, copulatory openings hidden laterally under rims at the mid-length of epigynum; copulatory channels lateral to chamber, bent “c” shaped anteriorly.



Figures 269–272. *Heliophanus curvidens*, palpal organ and femoral apophysis, ventrally (269) and laterally (270); epigynum (271) and its internal structure (272).

Description. Male. Cephalothorax black bearing minute setae, almost unnoticeable but light reflecting; surface rugose. Abdomen black, with thick anterior white line of setae, two pairs of small abdominal white spots. Frontal aspect: face black; chelicerae dark brown; pedipalps black with a broad streak of white scales along patella-tibia-cymbium; weaker white streak along black part of patella-tibia I. Legs: metatarsi, tibiae and patellae black with single thin white streak along segments; tarsi I–II brown, III–IV yellow; femora dorsally black, laterally covered with white setae. Ventral aspect black. Palpal organ: large single femoral apophysis; the ventral tibial apophysis long, straight and bent apically, bulbus resembles broad triangular bag; triangular protuberance ventrally directed near embolus, embolus located apically, broad and bent.

Female. Cephalothorax entirely black, without contrasting pattern. Abdomen elongate oval, dorsally flattened, blackish, covered with colourless light-reflecting scales in addition to dark scales. A pair of slightly elongated spots of white setae posteriorly near spinnerets and a second pair of very small spots located medially, apparently variable; a thin white marginal line around almost whole of abdomen. Frontal aspect uniformly blackish brown without any contrasting pattern (pedipalps missing in the studied specimen); eyes I surrounded by indistinct whitish scales. Legs blackish, with light yellow tarsi; also lighter, olive coloured dorsal surface of patellae, tibiae and metatarsi. Ventral aspect blackish brown, sternum black; abdomen ventrally blackish with some whitish scales; a pair of small whitish spots in front of spinnerets. Epigynum opening

to the epigynal chamber triangular-oval, with depressed margins; copulatory openings lateral, hidden under rims of chamber; channels lateral, relatively broad loops bent forward, then posteriorly, their distal part transverse.

Measurements (mm). Male. Length of cephalothorax 1.59; length of abdomen 2.05.

Seasonal appearance of adult specimens. Males – II, III, IV, V; females – III.

Distribution. E Mediterranean to C Asia. Israel: Mt. Meron (1); Abu Gosh, 'En Karem, Jerusalem (11); "plains of Jordan", Wadi Qilt near Jericho (13); 'En Gedi (13).

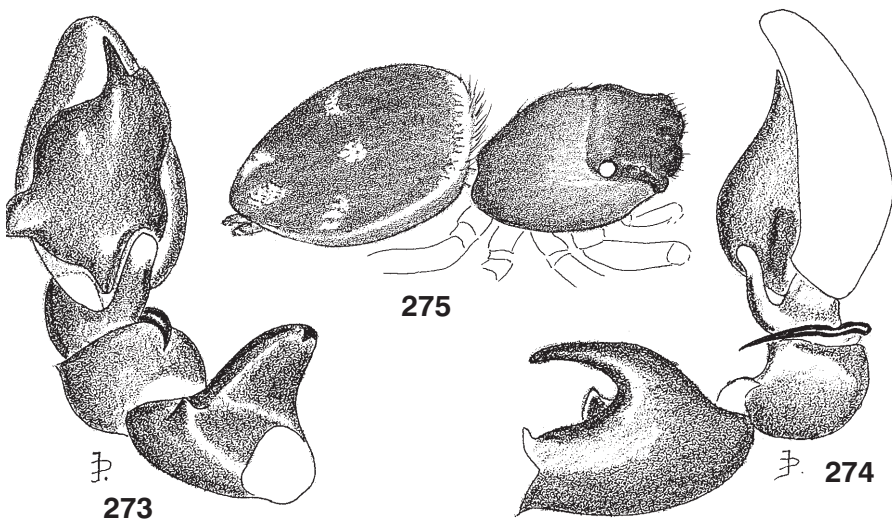
Heliophanus decoratus L. Koch

(Figs 273–280)

Heliophanus decoratus L. Koch, 1875b: 58, 87, Tab. 7, Fig. 8; Wesolowska 1986: 10, 208–209, Figs 549–557, 559–566, 570–584, map 905.

Diagnosis. Legs yellow, abdomen dark with 2 pairs of white spots. male femoral apophysis strongly bent posteriorly accompanied by a small triangular protuberance; female posterior rim of epigynum with two peculiar semitransparent flaps.

Description. Male. Cephalothorax distinctly broader in mid length; brown; lateral eyes dark encircled; white scales along posterior edge of carapace. Abdomen dark, in preserved specimen brown and contracted, with hardened tegument (presumably less distinct in fresh specimens); two pairs of contrasting lateral tufts of white scales and an anterior marginal line. Frontal aspect dark brown; pedipalps light brown, with white scales on cymbium and

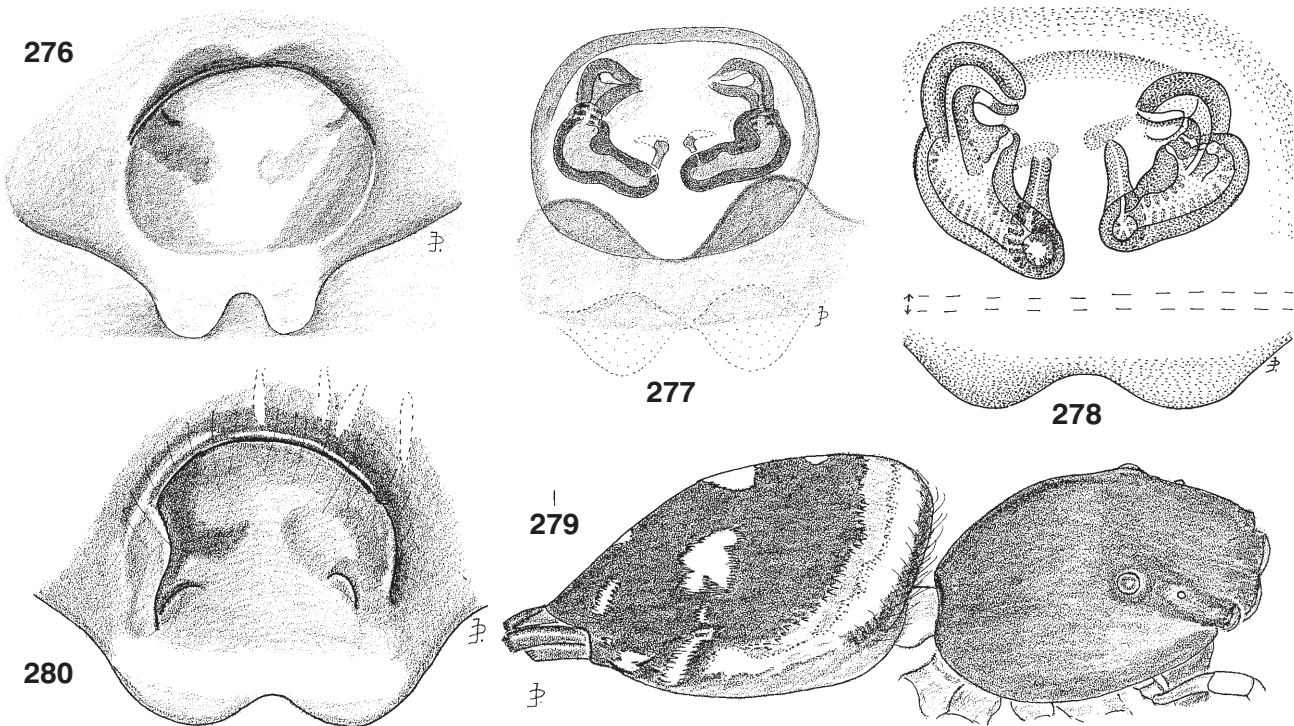


Figures 273–275. *Heliophamus decoratus*, male, palpal organ ventrally (273) and laterally (274); female, general appearance (275).

tibia, less numerous on patella. Legs yellow, with indistinct white scales; prolateral surfaces of femur I brown. Palpal organ: femoral apophysis single, long, prominently bent posteriorly, accompanied laterally by a low conical protuberance; two tibial apophyses: ventral one broad and straight, dorsal one thin, long, bent and directed ventrally and perpendicularly to the ventral apophysis, and posteriorly to its base.

pedipalps. Face blackish brown, eyes black surrounded by colourless setae with striking whitish tips; clypeus reduced to nil but extended ventrally by blackish membrane, with a few longer scales, arranged diagonally downwards. Chelicerae blackish brown, without scales. Pedipalps much lighter than legs, whitish with a slight greenish hue, except femur which is brown; patella and tibia dorsally with whitish, light reflecting scales, light

Female. Cephalothorax dark brown, covered with small adpressed whitish, light-reflecting scales, somewhat larger on anterior part of eye field; sides with median belt bald, submarginal thin line of denser whitish scales, marginal line bald, black. Abdomen: integument dark greyish black, covered with whitish scales, light-reflecting, locally falling out, leaving dark spots of naked integument, concentration of these scales make white anterior marginal line, two pairs of white spots followed by two white marginal spots more posteriorly, at the level of dorsal pairs of spots; spinnerets dark. Frontal aspect without contrasting pattern, except light yellow



Figures 276–280. *Heliophamus decoratus*, morphological variation in females, epigynum (276) and its internal structure (277), internal structure of epigynum (the Egypt-Siwa specimen, identified as *Mogrus bonneti*, British Museum coll.) (278); possibly related species from Sede Boqer, general appearance (279), epigynum (280).

tarsus with sparse black setae apically. Legs uniform, yellowish fawn with short, dark, sparse setae dorsally and with sparse whitish, light-reflecting scales. Ventral aspect: chelicerae dark brown, mouth parts brown with lighter rims, sternum dark brown with a rim of larger whitish, light reflecting scales. Coxae greyish fawn, coxa IV with 2 rows of light-reflecting scales, abdomen dark greyish brown with colourless scales, two indistinct whitish spots in front of spinnerets. Epigynum dark brown depressed, sclerotized plate with anterior and lateral rise encircling central depression, posterior edge lighter, almost whitish, with two peculiar semitransparent whitish flaps; copulatory openings anterior; channels short running posteriorly and turning medially, spermathecae transverse; comparable posterior edge of epigynum occurs in *Heliophanus equester* but is more sclerotized and spermathecae are strikingly different.

Measurements (mm). Male. Length of cephalothorax 1.59; length of abdomen 1.25. Female. Length of cephalothorax 1.62; length of abdomen 2.34.

Seasonal appearance of adult specimens. Males – IV, IX; females – III, IV.

Distribution. N and E Africa: Egypt, Oasis Siwah; Sudan, Ethiopia. Israel: Kalia at Dead Sea shore (13); Ze'elim (15); Halukim, Sede Boqer, Yeroham (17).

Heliophanus edentulus Simon

(Figs 281–286)

Heliophanus edentulus Simon, 1871: 342; Wesolowska 1986: 8, 17; Figs 96–104, 896 map;

Salticus delectus O. Pickard-Cambridge, 1872: 326;

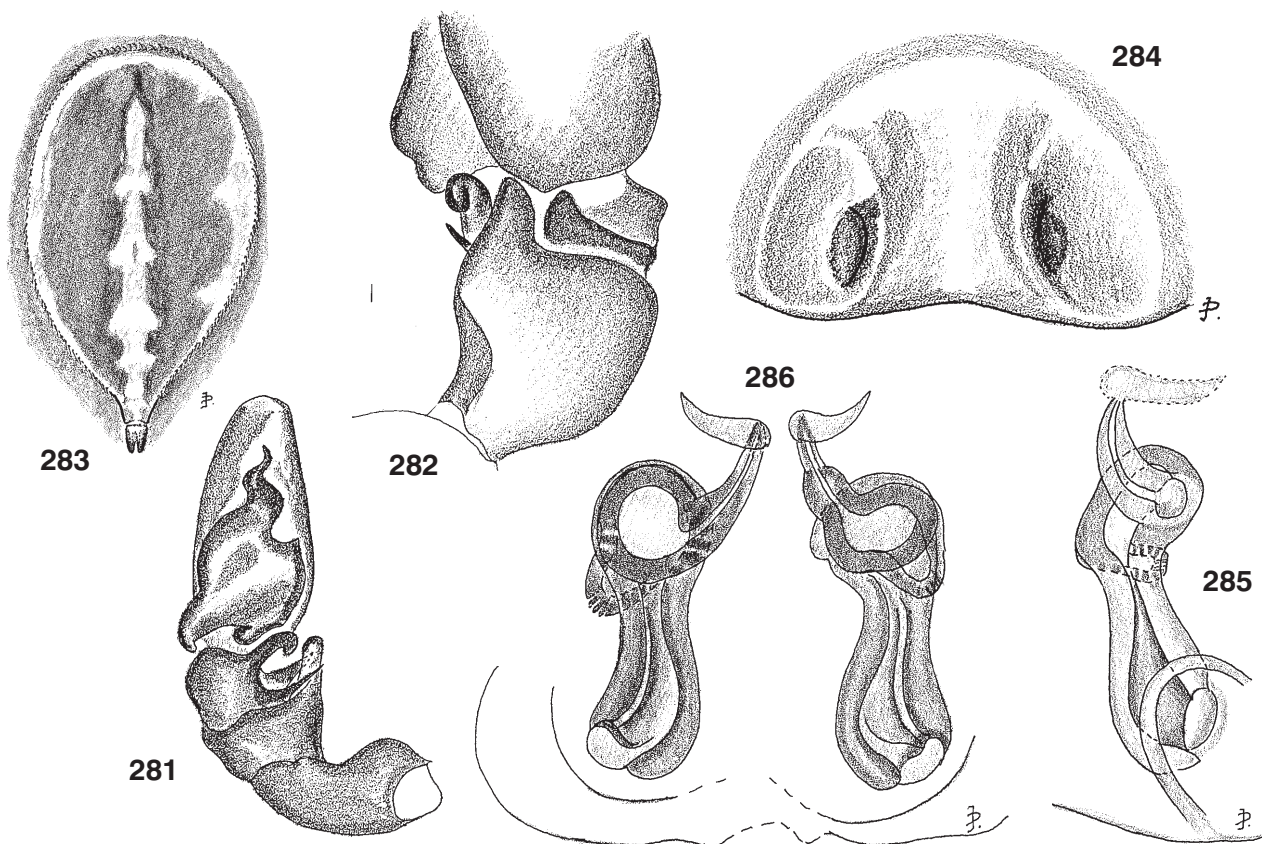
Salticus heliophanoides O. Pickard-Cambridge, 1872: 328–329;

Salticus aeratus O. Pickard-Cambridge, 1872: 339, **syn. nov.**

Attus delectus: O. Pickard-Cambridge 1876: 610, Tab. 60, Fig. 88.

Diagnosis. Median white streak along black abdomen and thorax, ending between eyes III. Male patellar apophysis present; female copulatory openings posterior, channels run straight anteriorly, extended by small, round spermathecae.

Description. Male. Cephalothorax brown, thin white median line along dorsal flat surface of the thorax; white spots of setae behind eyes AME; remnants of white marginal streak. Abdomen: brown; thin median white line along the whole abdomen, interrupting white marginal line. Frontal aspect: face brown; clypeus under AME reduced to nil; pedipalps dark brown. Legs yellow; femur I with subapical transverse row of three stridulatory spines on protuberances and a prolateral darker spot. Palpal organ narrower than in other species; femur without apophysis; patella with huge apophysis, being an extension of the apical wall, complicated in shape



Figures 281–286. *Heliophanus edentulus*, palpal organ ventrally (281) and laterally (282), note presence of patellar apophyses; female (Negev specimen), abdominal pattern (283), epigynum (284), and right spermatheca (285); “*Attus aeratus*” (O. P.-Cambridge coll.), internal structure of epigynum (286).

and articulating with three tibial apophyses: 1) large and apically bent ventro-anterior apophysis, 2) needle shaped and long ventro-posterior apophysis, almost perpendicular to tibia and articulating with ventral surface of patellar apophysis, 3) dorsal apophysis, also perpendicular to tibia and also articulating with dorsal surface of patellar apophysis, visible in lateral position.

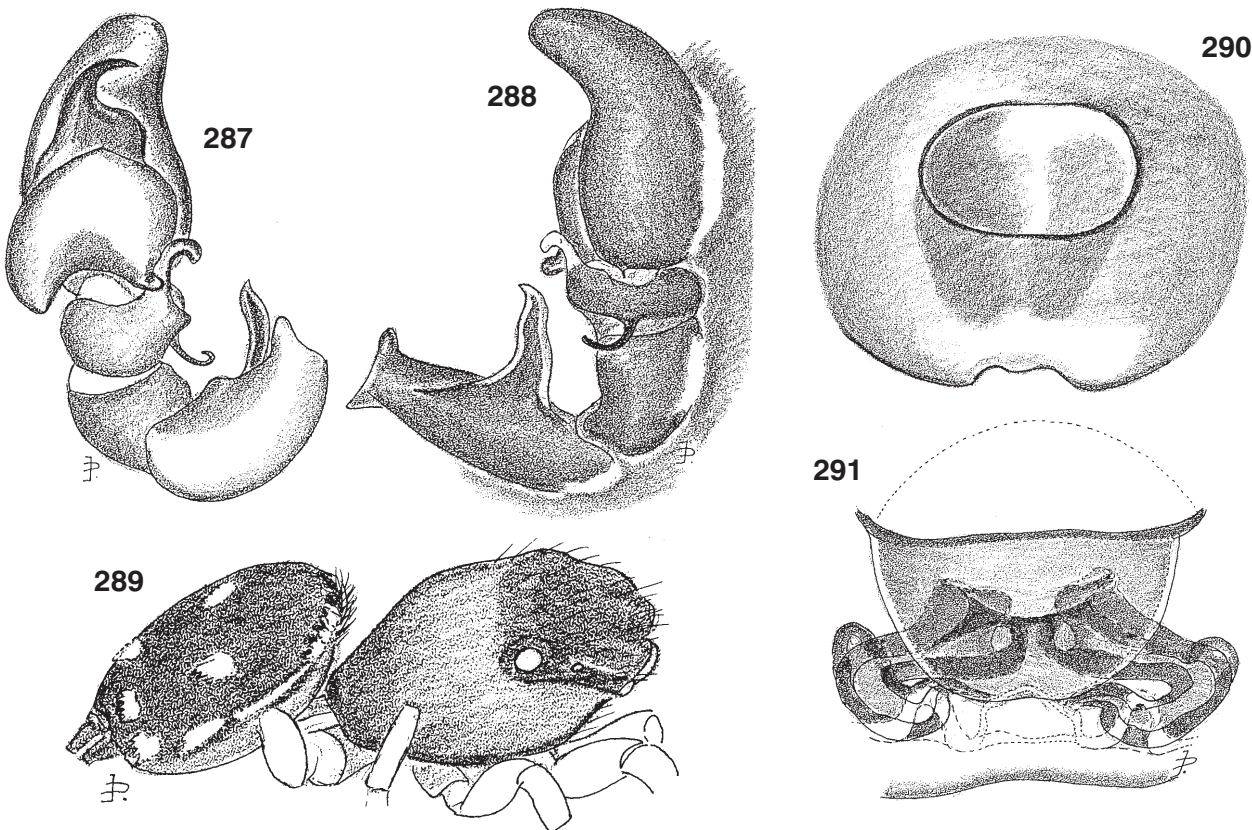
Female. Cephalothorax black with median white streak from between eyes III, extending onto thorax and running along the whole abdomen. There are small spots of white scales behind eyes III, three spots of a few sparse white scales behind touching spots of anterior eyes, a thin line of white scales along ventral margin of cephalothorax, the edge itself black and bald, followed by a fringe of white setae hanging down. Groups of white scales on bald dark lateral sides of cephalothorax suggest gradual falling out of white setae. Flat area stretches over almost three quarter of cephalothorax length. Abdomen brownish black, dorsal surface covered by adpressed dark scales, prominently dissected by median white streak of scales, the streak narrowing on both ends and having 5 small triangular enlargements or chevrons, margins of abdomen also covered with white scales, somewhat less dense.

Frontal aspect: face below eyes I covered by striking white setae, upper rims of eyes I surrounded with

colourless scales with fawn tips. Diameter of AME about 180 % of that of ALE, the latter located along upper half of AME; clypeus reduced to vestigial narrow band, light yellow with remnants of whitish setae; chelicerae yellow, slender and short. Pedipalps and legs greyish yellow. Pedipalps with longer whitish setae and small dark triangular spot on cymbium and tibia. Ventral aspect: sternum blackish brown, posteriorly with a rim of upright white setae, gradually shortening anteriorly. Abdomen ventrally greyish fawn, covered with short whitish setae.

Epigynum weakly sclerotized and indistinct; with two relatively large round depressions at the posterior margin, spaced by about their diameter, near the median edge of each depression a black sclerotized point, possibly of rim of copulatory opening, copulatory channels run straight anteriorly, extended in the same direction by small spermathecae.

Legs with sparse inconspicuous white setae and a few, small white scales; legs I and, less distinctly, II, with darker brown dorsal apical end of femur and lateral surfaces of patella, tibia and metatarsus. Tibia I with two pairs of ventral spines: median and basal but no apical pair; prolaterally an additional single lateral spine diagonally above and anteriorly to the ventral median one, but not in the apical position; legs II-IV pale.



Figures 287-291. *Heliophanus encifer*, male, palpal organ ventrally (287) and laterally (288); female, general appearance (289), epigynum (290) and its internal structure (291).

Measurements (mm). Male. Length of cephalothorax 1.70; length of abdomen 1.59. Female. Length of cephalothorax 1.90–2.14; length of abdomen 2.20–3.60; length of 5 segments of leg I 3.41.

Seasonal appearance of adult specimens. Males – III, IV, V, VI, X; females: – III, unknown.

Distribution. Mediterranean, including Turkey. Israel: Lake Hula (on crowns of papyrus); (1), Biq'at Bet Zayda (Bet HaBek) (7); near Palmahim, Rehovot (9); En Avdat (a few cm above surface of water of a permanent pool) (17); Ma'agan Mikha'el (8); Berekhat Ram (18).

Heliophanus encifer Simon

(Figs 287–291)

Heliophanus encifer Simon, 1871: 342; Wesolowska 1986: 10, 40, Figs 456–466, map 900;
Salticus facetus O. Pickard-Cambridge, 1872: 344.

Diagnosis. Abdomen with 2 pairs of spots of white scales with raised ends, legs brown. Male bulbus apically rounded, without protuberance; embolus short, arising from a broad base and bending, hook-like. Female opening to the epigynal chamber transverse oval, in the anterior half of epigynum; margins of opening not depressed; copulatory openings inside posterior pocket.

Description. Male and female. Cephalothorax brown. Abdomen dark brown with reddish adpressed scales; two pairs of spots of intensely white scales with ends raised above surface of abdomen, followed by two

pairs of marginal spots at the same level; thin white marginal line around anterior half of abdomen. Frontal aspect: face light brown, eyes surrounded with indistinct whitish scales; pedipalps olive. Legs uniformly brown with paler yellow tarsi. Ventral aspect: sternum brown; coxae yellow; abdomen greyish brown, two lines of white scales in front of spinnerets.

Palpal organ: femoral apophysis large, slightly wavy but not bent; bulbus anteriorly rounded; embolus bent and hook-like, arising medially from the anterior extension of the bulbus.

Epigynum: opening of the chamber (created by curved upward edges of epigynum) in anterior half of epigynum, transverse oval, leading to posterior semicircular pocket; copulatory openings median, hidden inside pocket; copulatory channels radiating diagonally postero-laterally, bending outside the pocket and turning medially; accessory gland opening at bend of channels.

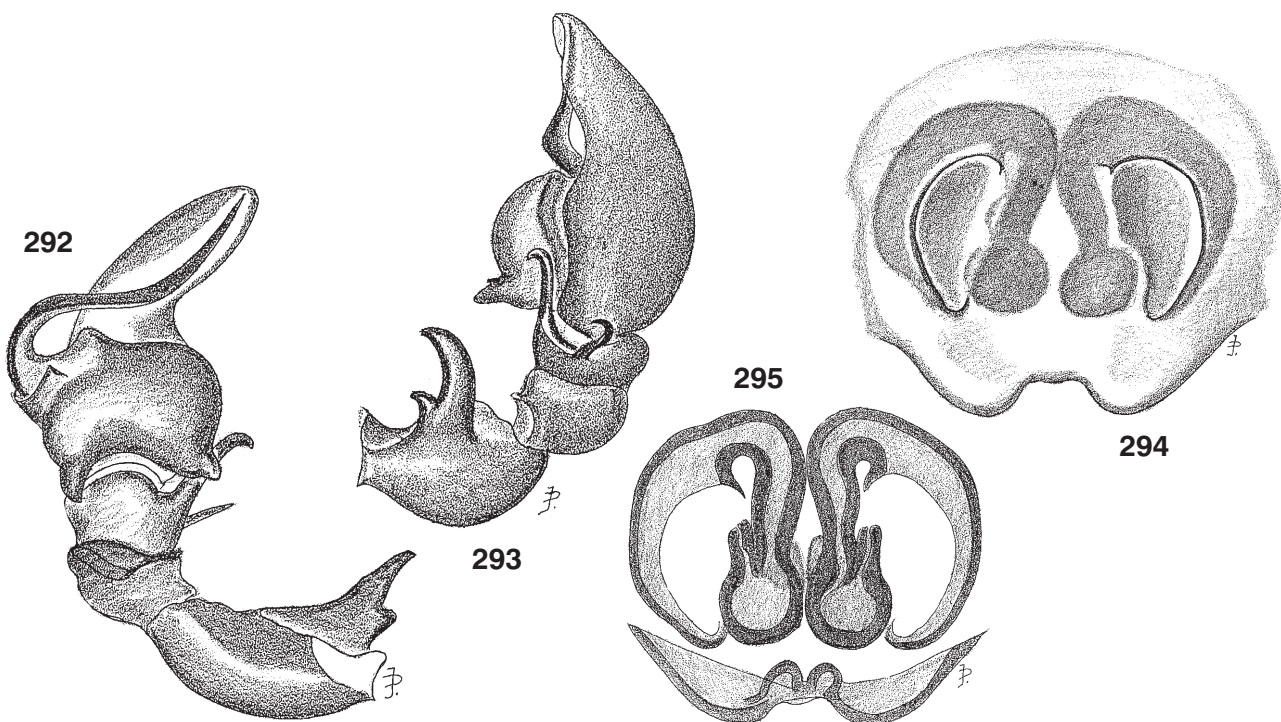
Seasonal appearance of adult specimens. Males – II, III, IV, V; females – III, IV.

Distribution. Mediterranean. Israel: Ma'agan Mikhael; En HaHoresh (8); Jerusalem, Qiryat-Anavim (11); Haluqim Ridge (17).

Heliophanus equester L. Koch

(Figs 292–295)

Heliophanus equester L. Koch, 1867: 869; Wesolowska 1986: 10, 213, Figs 652–660, map 901.



Figures 292–295. *Heliophanus equester*, palpal organ ventrally (292) and laterally (293); epigynum (294) and its internal structure (295).

Diagnosis. Females differ from *Heliophanus curvidens* by yellow legs, abdomen dark with two white lines posteriorly, epigynum with two grooves passing laterally into pockets, channel and spermathecae runs medially into the posterior end of epigynum, where they join spherical spermathecae.

Description. Male. Palpal organ: outline of bulbus almost rectangular; embolus arises at anterior angle and bends parallelly to anterior edge of bulbus, unusually long for the genus; cymbium elongate; femoral apophysis bifurcate with posterior prong short and conical, the anterior one long and bent. Female. Studied specimen is partly macerated with colours faded. Cephalothorax brown with sparse and indistinct whitish scales; eye field darker brown; lower sides lighter; thin white line of somewhat denser scales along the black ventral edge of carapace. Abdomen: dark, in preserved specimen brownish, with traces of two white lines along posterior half of abdomen, covered with minute whitish scales; white marginal line around the whole abdomen, thick and regular, much more distinct than in other species. Frontal aspect: clypeus and surroundings of eyes I covered with whitish scales, relatively large; chelicerae brown, pedipalps whitish yellow. Legs uniform yellow with indistinct brown setae. Ventral aspect brownish grey with small colourless scales; a pair of white spots in front of spinnerets. Epigynum divided into two prominent pockets

separated by a broad elevated ridge; the pockets pass anteriorly into funnel-shaped entrance to the copulatory channels which, narrowing and turning back, run medially to the posterior end of epigynum, where they join spherical spermathecae.

Seasonal appearance of adult specimens. Males – III, IV, V; females – IV, VI.

Distribution. SE Europe; Turkey; Armenia; Caucasus Mts. Israel: Athlit; Ma'agan Mikhael (4); Poriya eastern slope (7); (10); Bet Guvrin, Nashon (10); Jerusalem (11).

Heliophanus kochi Simon

(Figs 296–299)

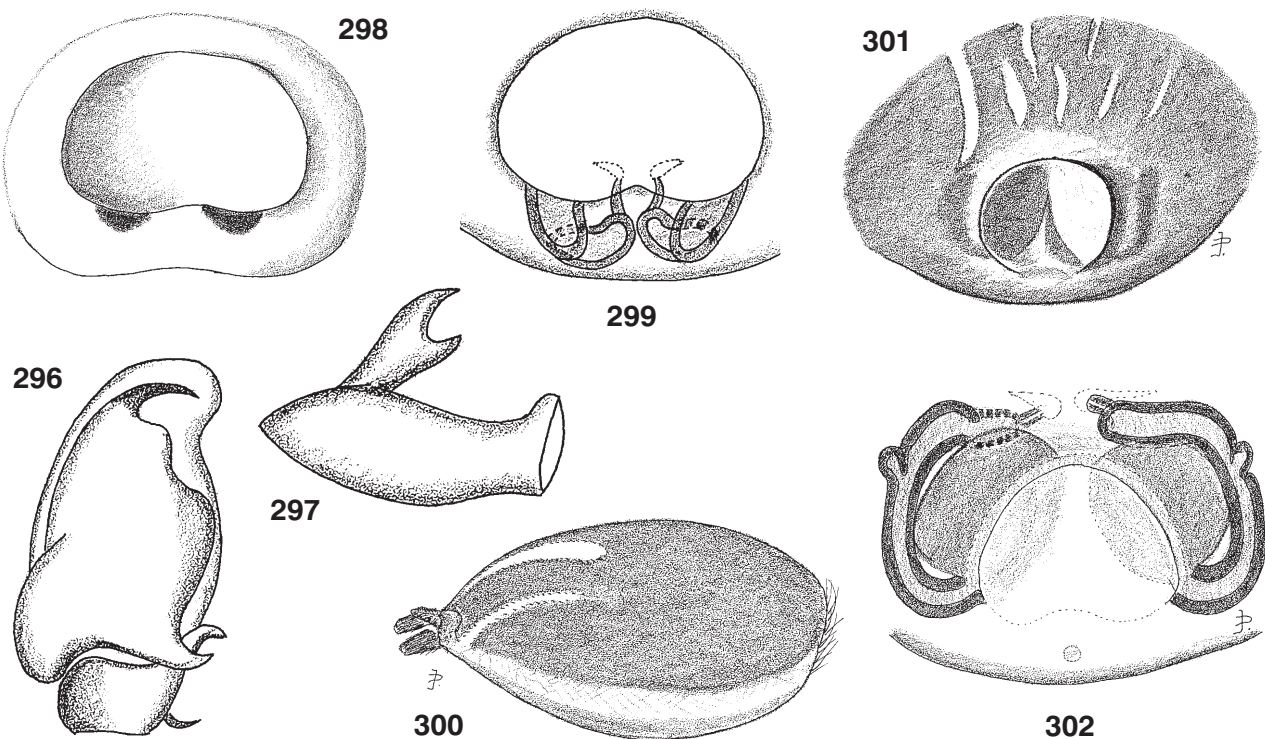
Heliophanus kochi Simon, 1868: 699, T. 7, Fig. 13; Wesolowska 1986: 11, 217, Figs 702–717, map 892;

Salticus furcatus O. Pickard-Cambridge, 1872: 346;

Heliophanus calcarifer: Prószynski, 1979: 309, Figs. 104–106; Flanczewska 1981: 200, 204, Figs 36–40.

Diagnosis. Genital organs as shown in Figs 386–389.

Description. Male and female. The only specimen of this species known from the Israel was described as *Salticus furcatus* by O. Pickard-Cambridge (1872: 346), revised by Wesolowska (1986: 218). According to original description "The spider is entirely black except narrow



Figures 296–302. *Heliophanus kochi*, palpal organ ventrally (296), femoral apophysis (297), epigynum (298) and its internal structure (299) (semi-diagrammatic drawings based on Wesolowska 1986: 217, Figures 702–717, modified). *H. malus*, appearance of abdomen (now apparently faded) (300), epigynum (301) and its internal structure (302).

marginal border of white hairs on cephalothorax and remnants of anterior white line on abdomen, other white setae possibly rubbed off". Palpal organ: bulbus anteriorly indistinctly narrower; embolus very short and bent, femoral apophysis with short apical fork. Epigynum: epigynal chamber opening large, transverse oval, with posterior short channels and spermathecae.

Distribution. S Europe and Mediterranean. Israel: Nein (2).

Heliophanus malus Wesolowska

(Figs 300–302)

Heliophanus malus Wesolowska, 1986: 223, Figs 787–788.

Diagnosis. Dark with two white lines on posterior half of abdomen, legs light. Opening of epigynal chamber oval, copulatory openings latero-posterior, channels lateral.

Description. Female. Cephalothorax dark brown with almost invisible, colourless scales; ventral margin pigmented black. Eye field blackish with colourless, poorly visible but relatively large scales; longer whitish scales along lateral margins and above eyes I. Abdomen in preserved specimen, faded to light greyish, previously apparently much darker; indistinct minute, colourless, light-reflecting scales; two parallel median lines of white setae along posterior half of abdomen; continuous marginal white line. Frontal aspect brown, eyes I surrounded with whitish scales, a few scales beneath eyes ALE and AME. Legs yellow; coxa IV dorsally brown, coxae I–III with thin brown horizontal streaks. Ventral aspect: sternum blackish brown; coxae light yellow; abdomen greyish, two indistinct whitish spots in front of spinnerets. Epigynum oval depression expanded antero-laterally by large pockets; copulatory openings at posterior angles of pockets, hidden under rims; channels much narrower than in *Heliophanus curvidens*, run anteriorly, bend transversely reaching anterior edge of pockets; prominent accessory glands in mid-length of channels.

Measurements (mm). Female. Length of cephalothorax 1.70; length of abdomen 1.70.

Seasonal appearance of adult specimens. Females – II, III, IV, V.

Distribution. Syria. Israel: Mt. Meron (1); Zihron Ya'aqov (3); 'En Karem (11); Hamakhtesh Hagadol (15).

Heliophanus mordax (O. Pickard-Cambridge)

(Figs 303–308)

Salticus mordax O. Pickard-Cambridge, 1872: 344–345;

Salticus dentatidens O. Pickard-Cambridge, 1872: 346;

Heliophanus mordax: Kulczyński 1911a: 53–55, Figs 68–70 (partim – males; females = *H. encifer* – cf. Wesolowska 1986: 40); Wesolowska 1986: 10, 41, Figs 476–486, map 895; Wesolowska 1996: 30 (syn. *H. ignorabilis*);

Heliophanus ignorabilis Wesolowska, 1986: 10, 214, Figs 661–666, map 897.

Diagnosis. Male: body dark, 2 pairs of white spots on abdomen, legs brown except for yellow tarsi and metatarsi. Palpal organ: femoral apophysis with small terminal fork and a small basal protuberance; tibial apophyses unequal – dorsal large, ventral minute, embolus short, slightly bent.

Female: two strikingly white abdominal streaks. Epigynum differs from *Heliophanus equester* by absence of lateral pockets and antero-median copulatory openings.

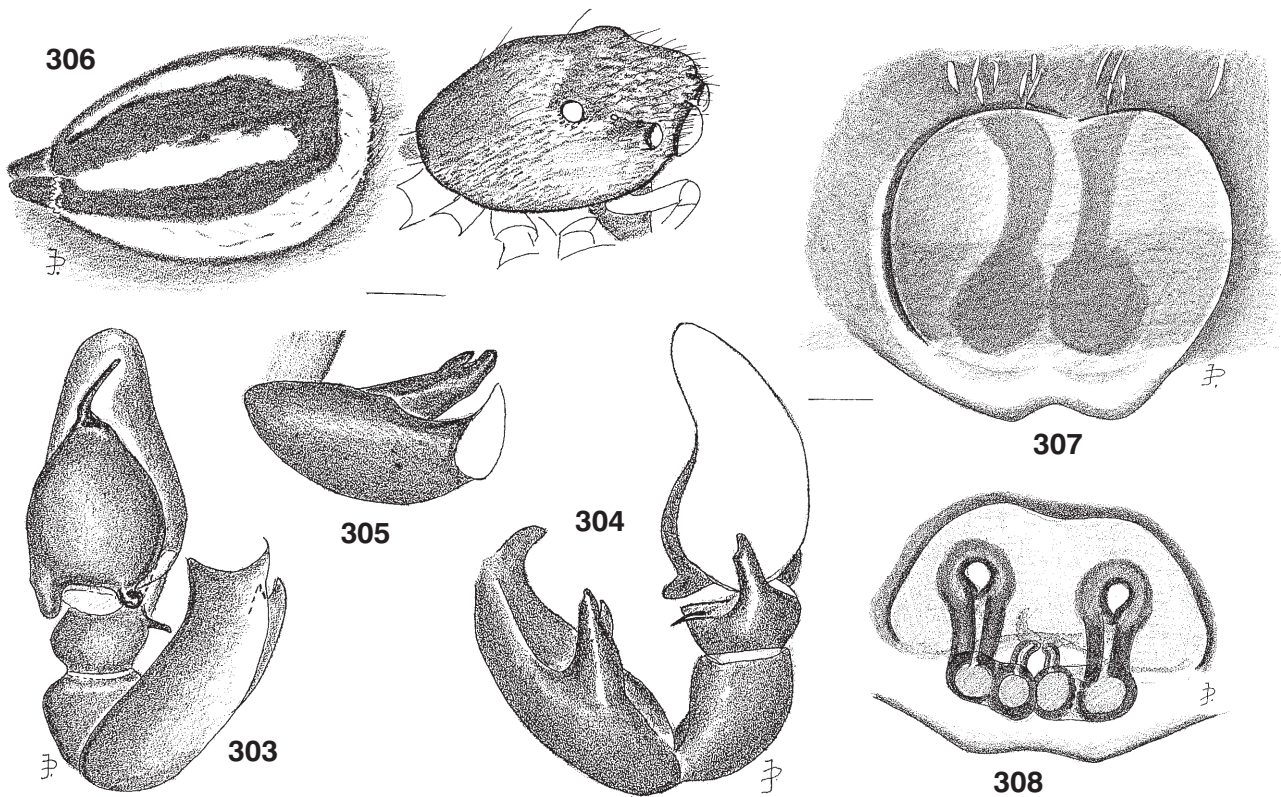
Description. Male. Cephalothorax dark brown, traces of white scales at postero-ventral margin. Abdomen black, two pairs of white spots, white anterior margin. Frontal aspect dark brown; pedipalps dark with a few whitish scales on elongate cymbium. Legs: tarsi-metatarsi I–IV yellow; tibia-patella I–IV brownish grey; femora I–II dark, III–IV – lighter, brownish grey. Palpal organ: femoral apophysis with small terminal bifurcation and a small basal protuberance; tibia with unequal apophyses: large dorsal one directed straight anteriorly and minute ventral, directed transversally; bulbus oval, narrowing anteriorly, slightly resembling *Heliophanus cupreus*; embolus apical, short and only slightly bent. Ventral aspect dark.

Female. Cephalothorax black with sparse whitish scales, more dense on sides and anterior part of eye field, where larger; rugose area under lateral eyes without scales. Abdomen covered with dense scales; dorsally black with two parallel broad white lines, anterior and lateral margins white, passing into white sides and ventral surface. Frontal aspect covered densely with white setae, also surrounding eyes and overhanging dark brown chelicerae; pedipalps yellowish white, apical halves of tarsi fawn. Legs yellow; transverse row of three stridulatory micro-setae subterminally on femur I. Ventral aspect: sternum dark brown with sparse long white hairs; coxae yellow; abdomen very densely covered with whitish scales. Epigynum: plate depressed anteriorly and laterally, posteriorly elevated, posterior edge curved; copulatory openings antero-medial; channels run parallel but not contiguously, at a space, spermathecae located posteriorly.

Measurements (mm). Male. Length of cephalothorax 2.05; length of abdomen 2.27. Female. Length of cephalothorax 2.16; length of abdomen 2.70.

Seasonal appearance of adult specimens. Males – V; females – IV–VIII.

Distribution. Egypt: Sinai near Wadi Isla; Lebanon, Syria, Turkey, Afghanistan, Iran, Georgia. Israel: road to Nazareth, Mt. Tabor (2); Har Horshan, Mt. Carmel (3); Bet Shemesh, 'En Matta (10); Mt. Scopus, Jerusalem, 'En Kerem, 'En Hemed, Etanim, Hirbet Se'adim, Ramat-Rahel (11); Plain of Jordan (13); Mt. Hermon (1800–2000 m.), near Mas'ada (19).



Figures 303–308. *Heliophanus mordax*. Palpal organ ventrally (303), laterally (304) and femoral apophysis (305), general appearance (306), epigynum (307) and its internal structure (308).

Relevant species

Heliophanus auratus C. L. Koch

Heliophanus auratus C. L. Koch, 1835;

Heliophanus auratus: Prószyński 1979: 308, Figs 89–97; Flanczewska 1981: 200, Figs 33–34; Wesolowska 1986: 10, 212, Figs 629–639, 885 map; Prószyński 1991: 504–508, Figs 1351.1–4.

Distribution. Palaearctic including Turkey.

Heliophanus creticus Giltay

Heliophanus creticus Giltay 1932: 36, Fig. 22; Wesolowska 1986: 10, 40–41, Figs 467–475, map 896.

Distribution. Crete.

Heliophanus dux Wesolowska et van Harten

Heliophanus dux Wesolowska et van Harten, 1994: 35–37, Figs 75–83.

Distribution. Yemen.

Heliophanus flavipes Hahn

Heliophanus flavipes Hahn, 1831;

Heliophanus flavipes: Wesolowska 1986: 10, 213, Figs 640–651, map 886; Prószyński 1991: 504–508, Figs 1348.1–4.

Distribution. Palaearctic, including Turkey.

Heliophanus melinus L. Koch

Heliophanus melinus L. Koch, 1867;

Salticus melinus: O. Pickard-Cambridge 1872: 324;

Heliophanus viriatus: Flanczewska 1981: 209, Figs 56–64.

Heliophanus melinus: Wesolowska 1986: 11, 220, Figs 741–751, map 893; Prószyński 1991: 504–508, Figs 1350.1–4.

Distribution. S Palaearctic, including Turkey. Israel: reported by O. Pickard-Cambridge (1872a: 324) as *Salticus melinus*, specimens not seen, identification not checked.

Heliophanus saudis Prószyński

Heliophanus saudis Prószyński, 1989: 37, Figs 5–8; Wesolowska and van Harten 1994: 40–43, Figs 86–92.

Distribution. Saudi Arabia and Yemen.

Heliophanus tribulosus Simon

Heliophanus tribulosus Simon, 1868;

Heliophanus tribulosus: Prószyński 1976: Figs 383–385, map 88; Prószyński 1979: 309–310, Figs 117–118; Flanczewska 1981: 204, Figs 53–55; Wesolowska 1986: 10, 42, Figs 492–502, map 898; Thaler 1987: 399 (s. *H. cognatus*); Prószyński 1991: 504–508, Figs 1346.1–4.

Distribution. Europe, Asia Minor and Middle Asia.

Relevant genus *Hyllus* Koch C.L., 1848

Type species. *Hyllus giganteus* C. L. Koch, 1846.

Introductory remarks. Tropical genus containing 80 species, distributed mainly from Africa to New Guinea. Two species relevant to Israel.

Hyllus corniger Wesolowska et van Harten

Hyllus corniger Wesolowska et van Harten, 1994: 43–44, Figs 93–96.

Remarks. Species described from Yemen. Seasonal appearance of adult males – III.

Hyllus insularis Metzner, 1999

Hyllus insularis Metzner, 1999: 150, tab. 115, map 121.

Remarks. Species described from Lesbos (Greece). Seasonal appearance of adult female – V.

Relevant genus *Icius* Simon, 1876

Type species. *Icelus notabilis* C.L. Koch 1846 [nec *Icius notabilis* Simon, 1871] = *Icius hamatus* (C. L. Koch, 1846).

Introductory remarks. An important genus, containing numerous nominal species described from the Mediterranean, all requiring revision. One species seems relevant to fauna of the Levant. Other Mediterranean species are described in a paper by Alicata and Cantarella (1993).

Icius hamatus (C. L. Koch)

Marpissa hamata C. L. Koch, 1846: 67.

Icius hamatus: Prószyński 1976: Figs 403–406, 233, map 97; Prószyński 1983: 46–47, Figs 9–11; Andreeva, Hęciak and Prószyński 1984: 350, Figs 1–5; Alicata and Cantarella 1993: 116–120, Figs 18–36.

Remark. Relevant Mediterranean species.

Langona Simon, 1901

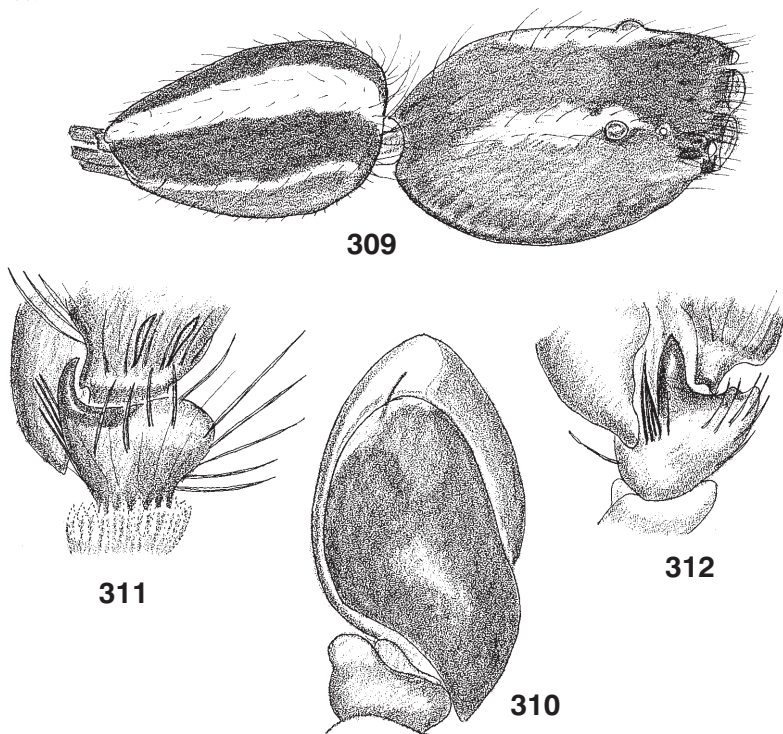
Type species. *Attus redii* Savigny et Audouin, 1825.

Introductory remarks. Typical Aelurillinae, large, long spider recognisable at first sight by coloration: blackish brown with two striking white streaks along cephalothorax, separated by broad black area and single white streak medially along abdomen followed by marginal white areas. Legs robust, leg IVth being the longest (126–134–142% of length of leg I) (shortest, mean, the largest), almost equal to III (120–132–142%), leg II being the shortest (91–96–106%).

Palpal organ: striking, unique character is single tibial apophysis with accompanying bunch of long, stiff setae, of unknown function; there are usually other diversified stout setae and bristles dorsally and laterally on tibia, some of them broadened and flattened, in some species there are also light reflecting scales. Bulbus typical for the sub-

family: broad, flattened, with posterior end produced triangularly, entering space on tibial surface between triangular protuberance and stiff setae near apophysis. Embolus located dorsally to bulbus, invisible externally except for the tip emerging anteriorly from beneath bulbus, thin and inconspicuous, often indistinguishable among the setae on edge of cymbium. Shape of tibial apophysis seems to correspond with sclerotized edge of a lateral notch on cymbium. There are diversified stout setae and bristles dorsally and laterally on tibia, some of them broadened and flattened, in some species there are also light-reflecting scales. Patella and femur dorsally with dense white setae. Epigynum very special, with heavily sclerotized high posterior wall, somewhat concave, anteriorly limiting a sclerotized depression extending over posterior half of epigynum (comparable with that in *Evarcha jucunda*). The wall is supported by a pair of sclerotized vesicles, spherical or oval, visible in preparations of epigynum; these were previously not noticed and are not marked on earlier published drawings. Anterior half of epigynum covered with white membranous area limited laterally by sclerotized dark “wings”, with copulatory openings hidden under their outer angles; shape and proportions of membranous area and wings seems to be good specific character; an indistinct channel from the copulatory opening passes into heavily sclerotized spermathecae.

Body proportions: length of cephalothorax is 3.06–3.79–4.27 mm, it is narrow, its width (as % of cephalothorax



Figures 309–312. *Langona redii*, male, general appearance (309), palpal organ ventrally (310), and tibial apophysis dorsally (311) and laterally (312).

length) is 45-48-53% at eyes I, 61-63-64% at eyes III and 68-72-74% at the broadest part, sides of cephalothorax being gently swollen; cephalothorax is moderately low 45-46-47%. Eye field short, extending over 28-31-32% of cephalothorax, also appears short in relation to its width at eyes I, rectangular in shape, indistinctly narrower than cephalothorax, eyes III are located close to the edges of cephalothorax. Profile of cephalothorax: anterior slope of eye field extends almost to eyes III and is gently rounded; flat area prominent, gently rounded but extends from gradually flattening eye field to 53-65-78% of cephalothorax length, following posterior slope of thorax is steep. Shape of abdomen: long oval, tapering over posterior half; indistinctly narrower than width of cephalothorax, dorsally flat, no scutum visible under dense scales.

Langona oreni Prószynski
(Figs 315-317, 319-321)

Langona oreni Prószynski, 2000: 245-246, Figs 52-55.

Diagnosis. Posterior wall of epigynum with sharp spur, its supporting sclerotized skeletal vesicles elongate oval.

Description. Female. Cephalothorax blackish brown, with dark black scales, two striking, broad streaks of white scales, running from behind touching point of eyes ALE/AME medially to eyes III and then continuing along dorso-lateral edges of thorax, ending shortly before tho-

racic hindmargin. Eye field covered with brown, adpressed white scales, intermixed between bristles and grouped into three indistinct spots, arranged into triangle on anterior part of the eye field. Upright bristles more prominent, denser. Sides dark brown, there is a striking marginal belt of white setae along ventral edge.

Abdomen dorsally resembles *L. redii*, the white line encircling abdomen is broader.

Legs: resemble *L. redii*.

Epigynum: posterior wall with a sclerotized median septum, needle-shaped from above, dividing the posterior cavity into two halves, supporting sclerotized skeletal vesicles elongate oval; spermatheca forms tighter, compact body, apparently different from *L. redii*, with different scent pores.

Seasonal appearance of adult specimens. Females - III.

Distribution. Israel: Givat Hamoreh (2), Kinneret (7).

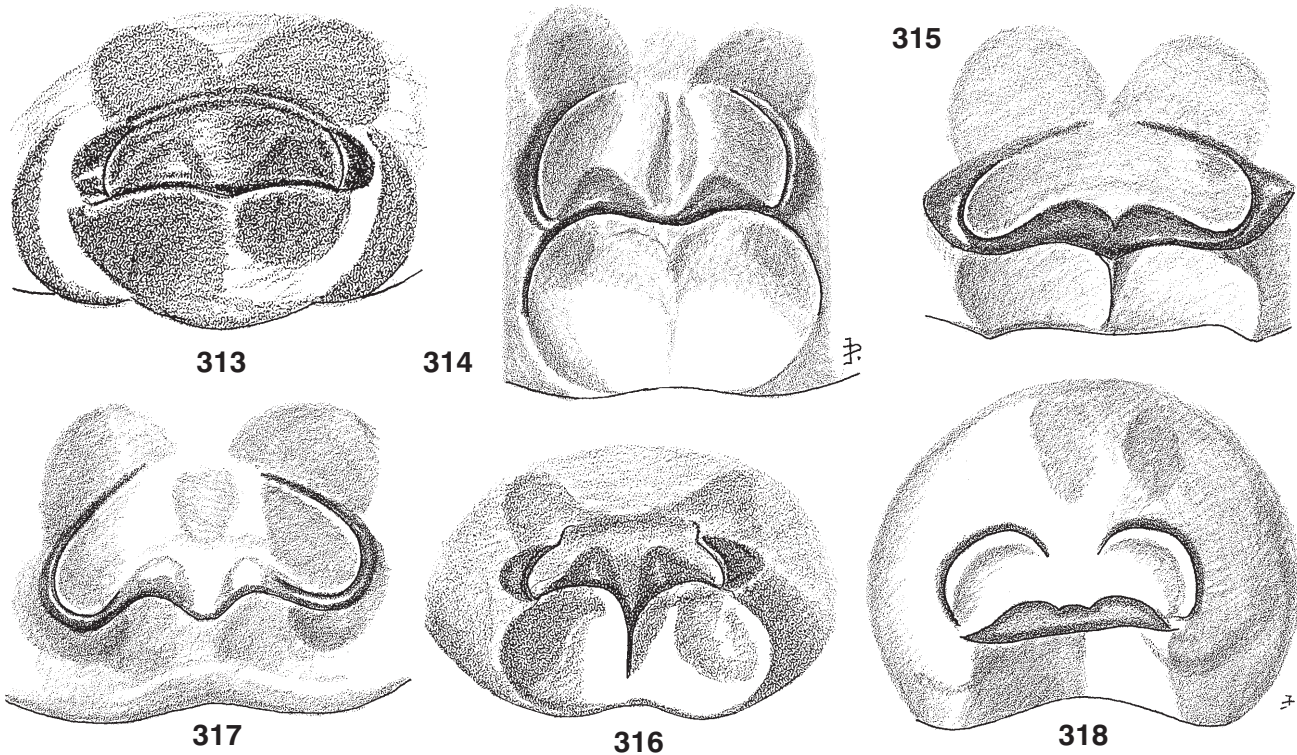
Etymology. Named in honour of Dr. Oren Hasson, then of Dept. of Entomology, Faculty of Agriculture, Hebrew University at Rehovot, Israel.

Langona redii (Savigny et Audouin)
(Figs 309-314, 322-324)

Attus redii Savigny et Audouin 1825: 172, 408 T. 7 Fig. 21;

Attus mendax O. Pickard-Cambridge, 1876b: 615, **syn. nov.**

Langona redii: Hęciak and Prószynski 1983: 209-211, Figs 1-2, 4-5, 12, 25, 37.



Figures 313-318. Epigynum in *Langona redii* (313, 314) and *L. oreni* (315, 316), with spur not developed (317); epigynum in relevant species *L. mallezi* (type specimen, from Siwa Oasis) (318).

Diagnosis. Large spider (body 9–11 mm), black with striking white stripes. Males can be identified by single apophysis followed by a bunch of stiff setae; cymbium with large scales. Posterior wall of epigynum vertical or slightly concave, without spur. Adult specimens sit immobile on ground and stones awaiting passing prey.

Remark. I could not find any convincing differences between specimens of *Langona redii* from “Syria C.B.” in the collection of Simon, NMHN-Paris and syntypes (apparently) of *Langona mendax* (O. Pickard-Cambridge, 1876) from “Egypt, Bottle 1732, tube 112” (in the Hope Ent. Coll. Oxford). I assume that these are synonyms.

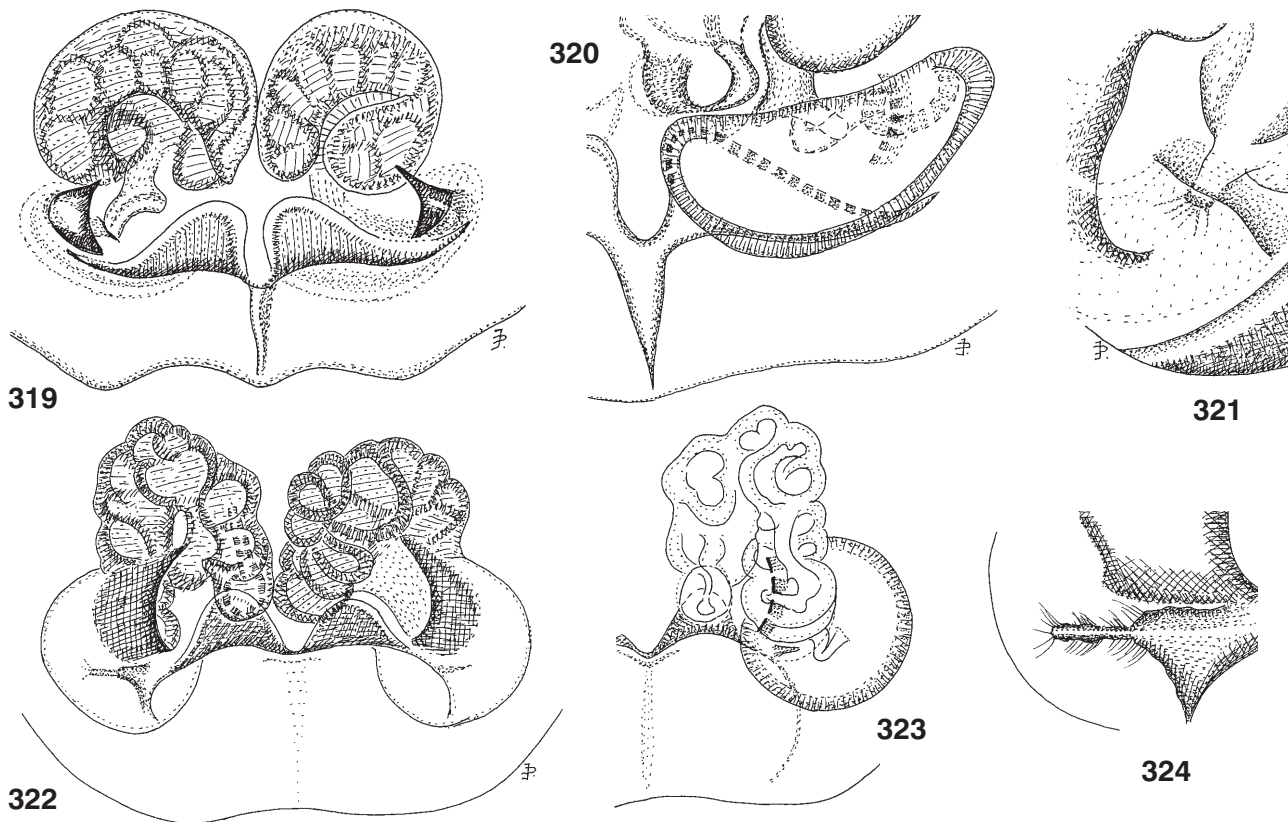
Description. Male. Cephalothorax dark brown with striking streaks of white setae along dorsal eyes of thorax, in some specimens extending anteriorly along lateral edges of eye field, slightly medially to them, posteriorly in some specimens to thoracic hindmargin; there is usually a whitish streak of setae along ventral edge of carapace.

Abdomen striped dark brown and white, with thick median white streak and either thin white marginal lines or two broad white lateral streaks, separated from the median one by dark brown areas; marginal white areas merge with light greyish to white sides of abdomen. I assume that width of marginal white stripes is due to individual variation. Frontal aspect: there are

stiff light brown setae stretching horizontally forward above anterior eyes, particularly noticeable above AME, eyes I encircled dorsally with fawn, ventrally and laterally with white setae, which are longer on lateral sides of AME and continue as prominent diagonal line of white setae from between AME and ALE to the ventral edge of carapace near coxa I, gradually getting shorter and less striking; the area above that diagonal white line is darker, particularly posteriorly to eyes ALE, area between diagonal lines on both sides, which corresponds with clypeus is light fawn with almost invisible colourless setae; when seen from profile the setae appear much more conspicuous, whitish, dense and long, particularly just above central edge of clypeus – for “*redii*” specimens the clypeus was described as “covered densely with white setae”.

Chelicerae light brown covered with long whitish, inconspicuous setae, medially some stronger short brown bristles.

Pedipalps light yellow. Ventral aspect generally light. Legs robust, dorsal surfaces yellowish fawn, with darker areas laterally near both ends of some segments, basal half of femora lighter, metatarsus I and apical part of tibia darker also dorsally, tarsi I–II with scopulae of whitish setae. Palpal organ – see Figs 436–438.



Figures 319–324. *Langona oreni*, internal structure of epigynum (319), spermatheca dorsally (note elongate oval supporting vesicle) (320), supposed accessory gland's opening (321); *L. redii*, internal structure of epigynum (322), spermatheca dorsally (note globular supporting vesicle) (323), supposed accessory gland's opening (324).

Female. Similar in coloration and body shape to male. Cephalothorax dark brown with sparse, black scales, two distinct streaks of white scales on brown background, running from behind eyes ALE/AME medially to eyes III and then continuing along dorso-lateral edges of thorax, ending shortly before thoracic hindmargin. Eye field covered with adpressed brown scales, a few lighter scales anteriorly, long anterior, horizontal bristles above eyes I, weak upright dark bristles scattered over eye field. Sides brown, ventral edge black, white marginal belt absent.

Epigynum heavily sclerotized edge of posterior wall almost straight, slightly bent medially, without vertical spur, its supporting sclerotized skeletal vesicles spherical; in comparison with *L. oreni* the anterior white membranous area is larger, reverse "U" shaped spermathecae narrower.

Remarks. In the Negev occurs in areas with rainfall annually 90–100 mm, pitfall traps and incidental collecting on rocky slopes and wadis, out of these 18 males and 2 females were collected in spring/early summer (III–VI), 13 males in late summer/autumn (VII–X) in 1990–1993 (Y. Lubin).

Seasonal appearance of adult specimens. Males – III, IV, V, VI, VII, IX, X; females – I, II, IV, V, VI.

Distribution. Egypt. Israel: Ginnegar (2); Bethlehem, 'En Kerem, Jerusalem, (11); Anata (12); 'Enot Samar, Jericho (13); Halukim Ridge, Hatira Ridge, Nahal Nizzana (17),

Relevant species

Langona mallezi (Denis) comb. nov.
(Fig. 318)

Aelurillus mallezi Denis, 1947: 75 T. 6 Figs 11; Prószyński 1976: Fig. 302.

Remark. Judging from the drawing of epigynum of the type specimen (Prószyński 1976: Fig. 302), which I made in 1964, having then little experience, the species should be classified as *Langona*; confirmation of the specific status will require examination of type and/or fresh specimens.

Distribution. Egypt: Siwa.

Langona pallida Prószyński

Langona pallida Prószyński, 1993: 33–35, Figs 9–11.

Remark. Species differing by light coloration. Collected in pitfalls in an alfalfa field.

Distribution. Saudi Arabia – Hada Alsham.

Leptorchestes Thorell, 1870

Type species. *Salticus berolinensis* C.L. Koch, 1846: 34.

Introductory remarks. Ant-like genus containing 5 nominal species in the Old World; as species limits and synonymy are uncertain, I quote below 3 species possibly relevant to the fauna of Levant.

Cephalothorax without constriction, low, long and flat; eye field on the same level as thorax, bald, with surface finely pitted, light-reflecting; posterior slope beginning just behind eyes III, gently rounded. Legs I comparable in size with remaining, Male chelicerae of proportional, normal size. Palpal organ with embolus broad, parallel to bulbus, tibial apophysis set transversally. Epigynum with indistinct openings, copulatory channels straight, thick walled, spermathecae transverse oval. Body proportions (first figure – male, second – female): cephalothorax length 2.05–1.21 mm; length of eye field 50–64%, height of cephalothorax 38–41%, width of cephalothorax at eyes III 64–59%, width of eye field at eyes I 49–55%, width of eye field at eyes III 56–59%, length of abdomen 122–164%. Length of legs order in female: IV 105%, I 100% (2.24 mm), II 83%, III 80%.

Leptorchestes sikorskii Prószyński
(Figs 325–329)

Leptorchestes sikorskii Prószyński, 2000: 246–248, Figs 57–61;
Leptorchestes berolinensis: Prószyński 1992a: 98, Figs 41–43.

Diagnosis. Small; male embolus larger than in other species, apical white part of bulbus is rectangular; epigynum with posterior openings and anterior spermathecae.

Description. Male. Cephalothorax fawn with eye field blackish brown, eyes surrounded by black. Abdomen distinctly constricted, with white ring at bottom of constriction; anteriorly grey, posteriorly (behind the constriction) shining black.

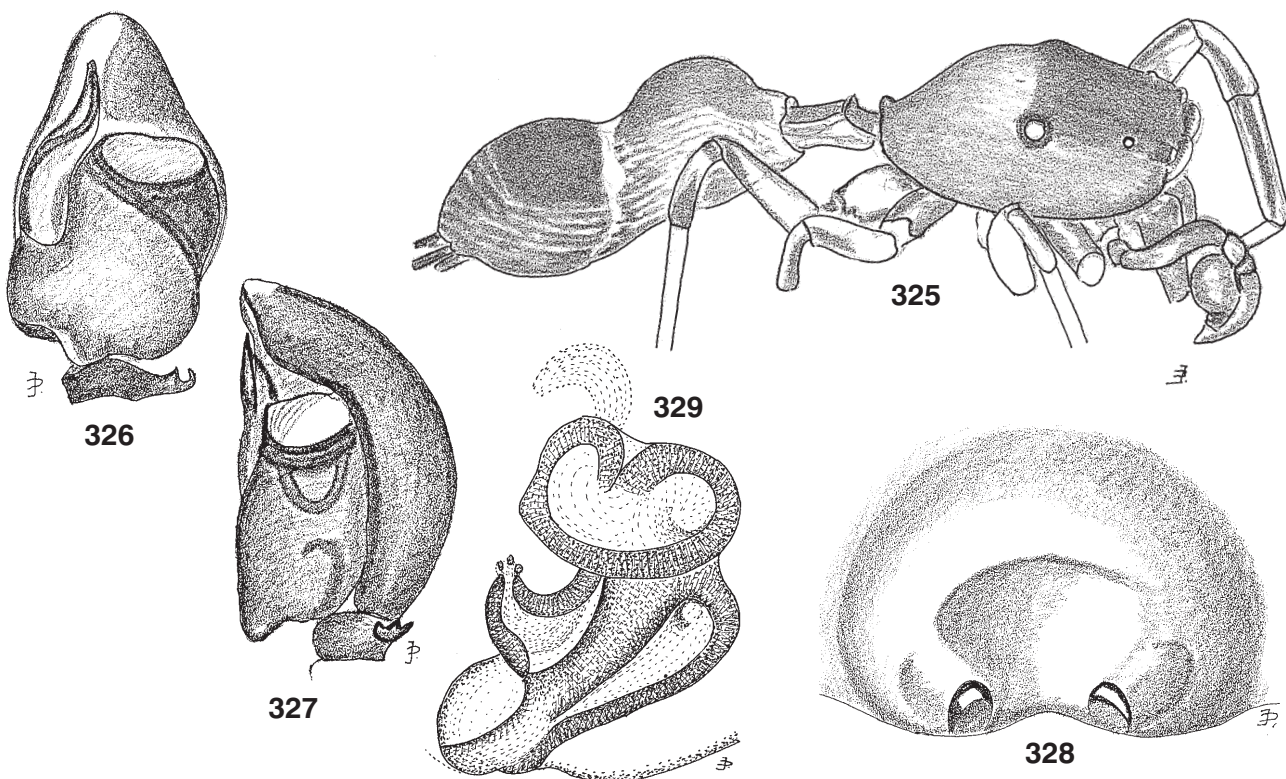
Ventral aspect brown with coxa II and IV white, abdomen anteriorly light brown, remaining black with a large white spot behind epigastric fold.

Frontal aspect: clypeus reduced with sparse, colourless setae, devoid of any contrasting pattern, eyes I surrounded by thin, inconspicuous, greyish white tipped setae; chelicerae of normal size, flattened anteriorly, fawn; palpal organ dark brown with broad cymbium and spherical bulbus.

Legs: I dorsally yellow, patella and tibia with black line prolaterally, metatarsus and tarsus dark brown; tibia I thin and long, without spines but with numerous sensory hairs ventrally; metatarsus I with two pairs of ventral spines; femur I dorsally dark brown, prolaterally light brown, apically whitish. Legs II–III whitish with blackish line prolaterally along femur-patella-tibia. Leg IV with dark grey apical point on femur, half of patella, tibia and metatarsus; trochanter III–IV and basal part of patella IV white.

Palpal organ differs by embolus larger than in other species, broad up to the end and extends beyond bulbus, apical white part of bulbus is rectangular; tibial apophysis has indistinct terminal forking (Figs 326–327).

Female. Cephalothorax low and long, flat, with posterior slope beginning just behind eyes III; bald, uniformly dark brown, dorsally slightly lighter brown, with surface pitted into small grooves, light-reflecting. Pedicel



Figures 325–329. *Leptorchestes sikorskii* (male from El Husan, SW to Jerusalem), general appearance (325), palpal organ ventrally (326), laterally (327); female from Negev, Hatira Ridge, epigynum (328) and single spermatheca (329).

covered with two sclerites of about equal length, brown, the anterior one with pale spot.

Abdomen blackish brown, indistinct constriction marked with whitish line and two spots of strikingly white scales laterally.

Face bald, eyes I aligned along their dorsal rims, surrounded by single row of minute and inconspicuous whitish setae. Diameter of ALE $\frac{1}{2}$ that of AME. Clypeus bald and narrow, about $\frac{1}{4}$ th diameter of AME. Pedipalps whitish, bald; there is triangular brown sclerite below clypeus. Chelicere brown, apically paler, with median surface bent making a small chamber.

Legs bald, slender: I slightly more robust dark brown except thinner metatarsus and tarsus which are light yellow, metatarsus laterally suffused with brown; II–IV with dorsal surfaces whitish with brown lateral surfaces of femur II and IV, thin brown lines along lateral surfaces of tibia and metatarsus IV, dark suffused areas laterally on patella II and area of joint on tibia-metatarsus II, remaining segments and surfaces whitish. Coxae and trochanters I dark, II white with brown spots, III and IV white.

Epigynum oval plate with oval depression posteriorly and at the posterior edge two indistinct sclerotised “wart”-like protuberances, hiding inside copulatory openings, invisible from outside; internal structures heavily sclerotized and almost black, consist of a broad

channel with protuberance of the accessory gland just in front of the opening, and anterior, transverse oval vesicle of spermatheca; in *L. berolinensis* the opening is anterior and spermatheca posterior.

Measurements (mm). Male. Length of cephalothorax 2.05; length of abdomen 2.50. Female. Length of cephalothorax 1.21; length of abdomen 1.98; length of 5 segments of leg I 2.24. Length of legs order in female: IV 105%, I 100% (2.24 mm), II 83%, III 80%.

Seasonal appearance of adult specimens. Males – III, V; female – II.

Distribution. Lebanon. Israel: Bet Haemek (4); ‘Ein Husan (11), Be’er Mash’abbim (15); Hatira Ridge, Ma’ale Ramon (17).

Etymology. Named in honour of General Władysław Sikorski, Prime Minister of the Polish Government in Exile (London) during World War II (1939–1943).

Relevant species

Leptorchestes berolinensis (C. L. Koch)

Salticus berolinensis C.L. Koch, 1846: 34;
Leptorchestes berolinensis: Wiehle 1967: 21, Figs 91–98; Miller 1971: 131, Tab. 18, Figs 26–27; Prószyński 1976: 194; Flanczewska 1981: 211, Fig. 65; Prószyński 1991: 508, Figs 1357.1–5; Żabka 1997: 61–62, Figs 182–188.

Distribution. C and S Europe.

Leptorchestes peresi Simon

Salticus Peresii Simon, 1868: 709;
Leptorchestes peresi: Prószyński 1987: 61.

Distribution. Spain.

Macaroeris Wunderlich, 1991

Type species. *Attus marginatus* Walckenaer, 1837 (sensu Kaston 1973).

Introductory remarks. A genus closely related to better known genus *Dendryphantus* Koch C. L., 1837, from which it differs by shape of palpal organ and epigynum. Contains 6 species distributed in Southern Europe and Mediterranean (mainly Canary Islands and Madeira).

Body proportions. Cephalothorax shape long and broad, its width is 55% at eyes I, 60% at eyes III and 76% at mid-length of cephalothorax, sides of cephalothorax appear to be rather swollen; low 43% of length of cephalothorax. Eye field short, extending over 38% of cephalothorax, also short in relation to its width 69%; trapezoid shaped, broadening posteriorly by 9%; narrower than cephalothorax and eyes III are located at a distance from the edges of cephalothorax; its width at eyes III is 81% of width of cephalothorax in the same area and 78% of its maximal width. Eyes II very small, somewhat closer to ALE than to eyes III, diameter of AME twice that of ALE. Profile of cephalothorax: anterior slope of eye field extends to eyes II, gently inclined; flat area of cephalothorax prominent, extending from eyes II to 52% of length of cephalothorax, posterior slope of thorax gently inclined at about 45 degree. Shape of abdomen long and broad, truncated anteriorly, tapering posteriorly; indistinctly broader than cephalothorax; dorsally flat, no scutum. Legs I strikingly broader but only slightly longer than II and III, almost equal to leg IV; relation of length of five segments of legs in % is as follows: I = 100%, II = 81%, III = 82%, IV = 98%.

Macaroeris nidicolens (Walckenaer)

(Figs 330–337)

Aranea nidicolens Walckenaer, 1802: 246;
Dendryphantus castaneus: O. Pickard-Cambridge 1872: 321;
Dendryphantus nidicolens: Miller 1971: 147, t. 22, Figs 24–25;
Eris nidicolens: Prószyński 1976: 51, Figs 336–337, 341, map 47;
Flanczewska 1981: 192, Figs 7–8; Prószyński 1991: Figs 1328.1–4;
Macaroeris nidicolens: Wunderlich 1991: 519–520, Figs 848–853;
Logunov 1996: 61.

Diagnosis. Cephalothorax swollen at level of eyes III, high; abdomen narrowing posteriorly, with pattern of several lateral pairs of brown and white transverse spots, light median streak.

Description. Male. Characterized by long bent embolus and absence of conductor, apophysis longer than in *Dendryphantus*.

Female. Cephalothorax uniformly light brown with sparse fine white setae; eye field much lighter owing to concentration of light-reflecting tissues beneath tegument, spots of white setae between and slightly behind eyes I, lateral eyes surrounded by black; ventral edge of carapace with thin brown line beneath narrow belt of whitish adpressed setae; a prominent bunch of long stout brown bent setae arise beneath eyes II and reaches above eye field.

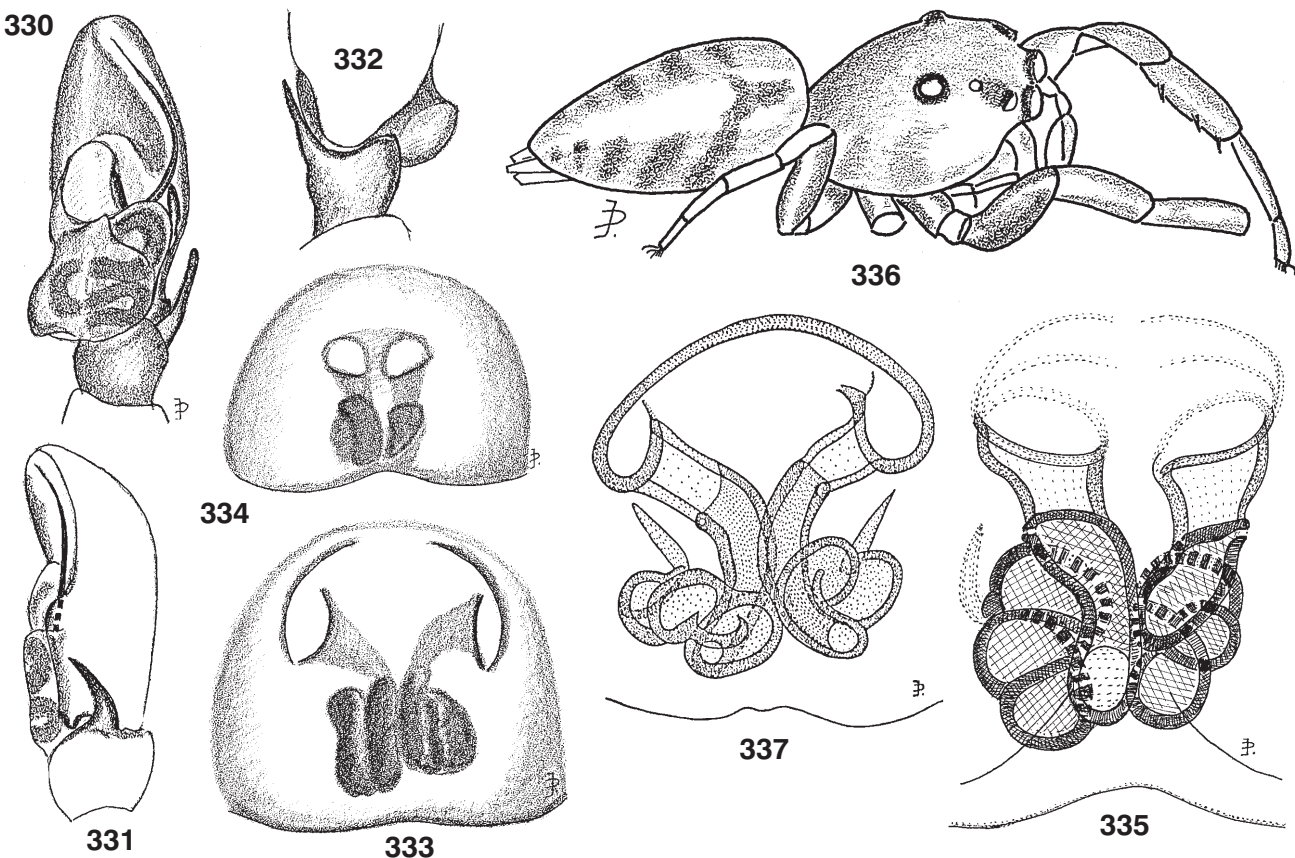
Abdomen silvery whitish (due to tissues under the tegument) with adpressed white setae, better visible on dry specimen; remnants of pairs brown lateral spots.

Frontal aspect: a lateral streak of intensely white setae along the middle of anterior part of cephalothorax sides, coming under ALE, which are on brown with sparse whitish setae, and completely surrounding AME from sides, above and below, these white setae entirely cover clypeus, where they are somewhat longer and directed diagonally and overhang median part of the edge of clypeus and cheliceral bases, mixed with small white scales on cheliceral bases; there are two brown lines due to missing white setae anteriorly on sides of cephalothorax, along the edge of clypeus and beneath eyes ALE. Chelicerae brown with indistinct transverse 'stridulatory' (?) lines; pedipalps very thin, light yellow, patella and tibia I broad, fawn.

Ventral aspect light yellow; abdomen marginally with mosaic of whitish silver dots on colourless background, with uniform grey median streak. Legs II–IV yellow with femora lighter, I somewhat darker, fawn. Epigynum whitish, usually weakly sclerotized, copulatory openings antero-lateral, usually at the ends of horse shoe-shaped groove, not always visible; copulatory channels diverging diagonally, spermathecae three-chambered, drawn to the sides, position of the accessory gland (scent gland) opening near the beginning of copulatory channel, in the contact area of sclerotized and less sclerotized area. One of specimens studied has weaker sclerotized epigynum resembling that illustrated in Kulczyński (1911: 71–72, Fig. 92), with narrowly spaced copulatory openings, shorter copulatory channels running straight forward, spermathecae forming a more compact body; I assume it is a slightly aberrant, less developed form of the same species.

Measurements (mm). Female. Length of cephalothorax 2.70; length of abdomen 3.79; length of 5 segments of leg I 4.56.

Remarks. An aberrant female from the same locality (Figs 334–335) has more narrowly spaced copulatory openings and straight channels, somewhat resembling *Dendryphantus nitellinus* Simon in Kulczyński (1911: 71–72, Fig. 92) from Portugal and also *Macaroeris flavicomis* (Simon, 1884b) quoted recently from Greece and Rhodes by Metzner (1999: 42, tab 9). As the specimen is poorly preserved with faded colours and epigynum weakly sclerotized, there are no arguments to consider it a separate species.



Figures 330–337. *Macaroeris nidicolens* (Israeli specimen), male palpal organ ventrally (330), laterally (331) and palpal tibia dorsally (332), epigynum (333), also epigynum of an aberrant specimen from the same locality (334), and its internal structure (335); European specimen, external appearance (336), internal structure of epigynum (337).

Seasonal appearance of adult specimens. Females – II, III, IV, V, VI.

Distribution. South and South East Europe; Lebanon: Beirut. Israel: Miqwe Yisra'el (on leaves of citrus trees) (8); 'En Gedi (13).

Mendoza Peckham, 1894

Type species. *Attus memorabilis* O. Pickard-Cambridge, 1876: 618.

Introductory remarks. Genus considered to be part of *Marpissa* and closely related to it, but recently revived by Logunov (1999: 46). Contains several species, of which *Mendoza canestrini* Ninni (in Canestrini and Pavesi 1868) occurs in Mediterranean and Southern Europe, several closely related species also in Central and East Asia. Recognisable by long, narrow abdomen, in male ventro-retrolateral edge of cymbium, opposite apophysis, characteristically flattened, in female epigynum flat with curved posterior edge, and simple short channels, anteriorly topped with a knot of a few chambers of spermathecae. Leg I overgrown and robust, tibia with well developed four pairs of ventral spines and single latero-basal

prolaterally; legs II–IV shorter and thinner. There is no row of stridulatory spines below eyes lateral.

Mendoza canestrini (Ninni)

(Figs 338–340)

Mithion canestrini Ninni, in Canestrini and Pavesi 1868: 817, 866;

Attus memorabilis O. Pickard-Cambridge, 1876: 618;

Mendoza memorabilis: Peckham 1894: 105;

Mithion memorabilis: Caporiacco 1936a: 96, 106 (misidentification, in fact an immature *Menemerus* sp. – det. J. Prószyński);

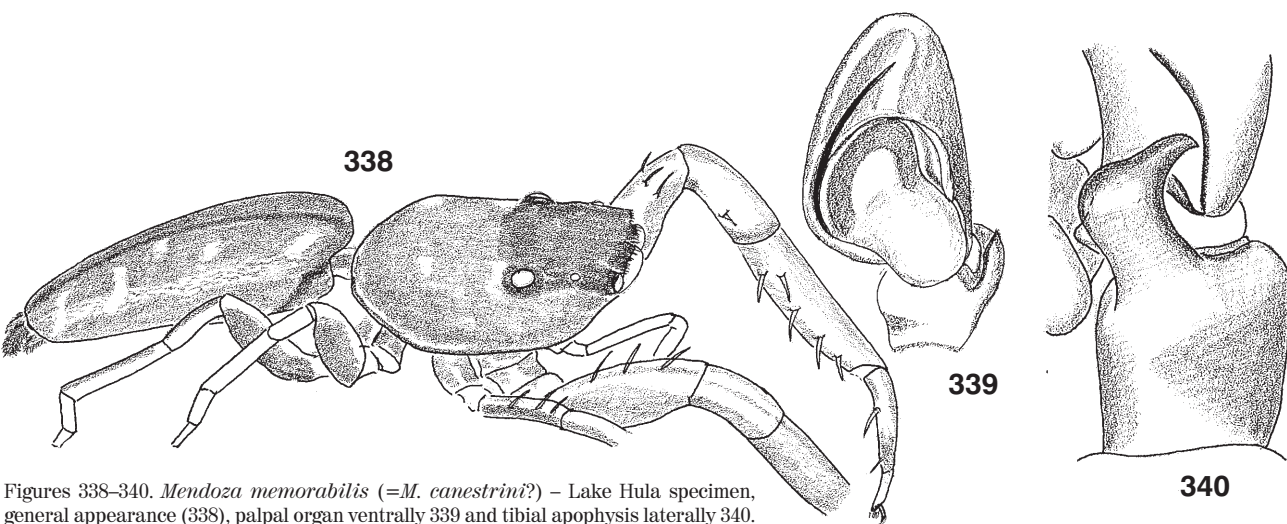
Mithion canestrini: Nemetz 1967: 132–137, Fig. 1;

Marpissa canestrini: Prószyński 1976: 51, Figs 251, 258, map 116; Hansen 1985: 205, Figs 1–15 (synonym *Mithion gridellii*); Prószyński 1991: 508–510, Figs 1359.1–4;

Mendoza canestrini: Logunov 1999: 49, Figs 78–79. (revival of *Mendoza*, syn. nov. *memorabilis*).

Diagnosis. Body almost 7 mm long, with narrow abdomen, tibial apophysis hook-like. Seems to differ from *M. canestrini* from Austria and Ukraine by posterior half of bulbus stronger bent. Determination of status of the species depends from the study of unknown yet female specimen from Israel.

Remark. Note on synonymy. D. V. Logunov (1999) has synonymized with *M. canestrini* a number of forms,



Figures 338-340. *Mendoza memorabilis* (= *M. canestrini*?) – Lake Hula specimen, general appearance (338), palpal organ ventrally 339 and tibial apophysis laterally 340.

occurring from Mediterranean to E and SE Asia, including *M. memorabilis*. It is too early to evaluate these changes, especially that the species described by O. Pickard-Cambridge was not collected since 1941, and it is not certain whether it is still extant in Israel.

Description. Male. Cephalothorax flat, low and long; gradually broadening from eyes II onwards, broadest in the mid-length of thorax; brown with dark brown eye field; traces of two pairs of indistinct small white spots on thorax and darker radiating lines posteriorly, some colourless light-reflecting scales.

Abdomen elongated and thin, with somewhat hardened surface, reflecting light owing to tiny colourless scales; dark brown with thin blackish median line and four pairs of small white spots.

Frontal aspect brown without contrasting pattern, clypeus low and almost bald.

Ventral aspect: sternum whitish yellow with brownish grey margin; coxae light, abdomen light with median grey line well developed at both ends (behind epigastric furrow and in front of spinnerets) but lacking in the middle.

Legs: I – overgrown and robust, tibia with well-developed four pairs of ventral spines and single latero-basal spine prolaterally; II-IV shorter and thinner.

Palpal organ typical, with flattened lateral surface of cymbium, tibial apophysis with particularly well developed hook like process.

Measurements (mm). Male. Length of cephalothorax 2.89; length of abdomen 3.67.

Remark. Comparative specimen. *Marpissa canestrini* det Logunov. “Caucasus, near Mingechaur, sedge moor. 17. IV. 1982. Leg Shatrovskij”. Male specimen black, smaller than specimen from Israel.

Seasonal appearance of adult specimens. Male – IX.

Distribution. Mediterranean species, according to Logunov distributed East to China and SE Asia. Egypt; data from Libya based on misidentification. Israel: Lake Hula (collected in 1941, before draining of the Lake in late 1950ties) (11).

Menemerus Simon, 1868

Type species. *Attus semilimbatus* Hahn, 1827.

Introductory remarks. A genus distributed worldwide, containing at present some 44 nominal species, several of them cosmopolitan in warm climates; a number presumably misclassified and requiring taxonomic revision.

General appearance of the genus is characteristic, although particular characters differ quite broadly. There are two groups of species: *fagei-semilimbatus* and *animatus-davidi*, differing slightly in body proportions, male palp, epigynum and its internal structure. From the material which was available to me I was unable to decide whether they should be separated into different genera.

The cephalothorax makes an impression of being very low (increased by a broad contrasting white band of setae along ventral margin), broad and flat, with a broad shallow depression in the foveal area; the broadest part extends from eyes III to $\frac{3}{4}$ of length, then narrows very indistinctly with the posterior margin still as broad as width of eyes III. Eye field is shorter than broad, slightly narrowing posteriorly.

The cephalothorax length varies from 2.28 to 3.60 mm, its proportions are as follows (% in length of cephalothorax, smallest, mean and longest specimen).

Relative measurements of cephalothorax used to distinguish two groups of *Menemerus* spp.:

	<i>fagei</i> group	<i>illigeri</i> group
length of cephalothorax	100%	100%
height of cephalothorax	32-39-42%	43-47-50%
width of cephalothorax at eyes I	46-54-66%	58-62-67%
width of cephalothorax at eyes III	60-67-79%	70-75-82%
maximum width of cephalothorax	64-74-84%	73-78-82%
length of eye field	32-37-47%	40-44-50%

Abdomen elongate oval and tapering posteriorly, rather flat, usually with dark dorsal surface with indis-

tinct lighter pattern, but in some species with median light streak or light area; its length varies between 75–181% in both groups, its width 57–121%. Eyes I aligned along their dorsal rims, diameter of ALE about 1/2 of AME; AME take almost whole height of face, with clypeus reduced to almost nil. Palpal organ is the best recognition character of the genus, anterior part of the bulb split from fleshy stem of embolus; pedipalpal tibia very characteristic and transversely developed in some species; pedipalpal femur broad, bent and semi-crescent shaped. Epigynum characteristic for a number of species but only with difficulty comparable in *animatus-davidi* group.

Order of length of legs is different in both groups, with significant difference between males and females only in the *illigeri* group.

Relative length of legs (5 segments) used to distinguish two groups of *Menemerus* spp.:

	<i>fagei</i> group		<i>illigeri</i> group	
	MM	FF	MM	F
leg I	100%	100%	100%	100%
leg II	88–91%	90–104%	79–97%	90%
leg III	97–113%	95–105%	71–82%	94%
leg IV	120–121%	117–132%	79–99%	123%

Key for identification of species of *Menemerus*

1. Males 2
 - Females 9
- 2(1). Tip of embolus bent prolaterally (out from bulb), split into forceps-shape 8
 - Tip of embolus bent retrolaterally (towards bulb) or straight 33
- 3(2). Pedipalpal tibia (as seen dorsally) of normal length, not transversely expanded, single, conical apophysis of moderate length, directed laterally *M. bivittatus*
 - Pedipalpal tibia (as seen dorsally) shorter than wide, transversely expanded 4
- 4(3). Transverse expansion of tibia moderate, single ramus of apophysis directed ventrally, dorsal ramus absent or changed into a rounded plate 5
 - Transverse expansion of tibia striking, single ramus of apophysis as large as remaining part of tibia, or larger 6
 - Transverse expansion of tibia striking, apophysis with two rami 7
- 5(4). Dorsal part of tibial apophysis forms a plate with three lobes, ventral ramus long and tapering *M. davidi*
 - Dorsal part of tibial apophysis forms a small single plate not divided into lobes, ventral ramus shorter *M. animatus*

- Tibial apophysis in form of thin, rectangular plate directed postero-ventrally *M. illigeri*
- 6(4). Width of tibia about equal to width of cymbium, cephalothorax dark with broad white margin along edge of carapace *M. taeniatus*
 - Width of tibia about equal to width of cymbium, cephalothorax dark without white margin along edge of carapace *M. falsificus*
 - Width of tibia about twice the width of cymbium, the latter situated on one end of tibia, expanded tibial apophysis on opposite end *M. arabicus*
- 7(4). Dorsal ramus of pedipalpal tibial apophysis similar in size to ventral one *M. fagei*
 - Dorsal ramus of pedipalpal tibial apophysis much larger than ventral one an aberrant form of *M. fagei*
- 8(2). Embolus gently bent; tibial apophysis single, triangular; tibia short and indistinctly transversely expanded, joint with cymbium moved slightly out of main axis of segment (Fig. 369) *M. semilimbatus*
 - Embolus pronouncedly bent and angular; tibial apophysis double, both dorsal and ventral rami long and thin; tibia narrow, not transversely expanded (Figs 376–379) *M. soldani*
- 9(1). Sclerotized pockets under posterior third of epigynum, form a prominent “circle”; copulatory openings hidden under sclerotized “hood” anteriorly *M. illigeri*
 - Sclerotized pockets at the posterior edge of epigynum, narrow and broadly spaced; copulatory openings on the surface of epigynum, at its mid-length 10
 - No “pockets” visible, even when posterior edge of epigynum sclerotized; copulatory openings on the surface of epigynum 11
- 10(9). Copulatory openings located marginally, in small, broadly separated grooves, channels transverse, bent medially and run anteriorly, spermathecae at anterior end of epigynum *M. animatus*
 - Copulatory openings located more medially, in small diagonal, narrowly separated grooves ... *M. soldani*
- 11(9). Copulatory openings in grooves limited anteriorly by prominent semicircular, heavily sclerotized roof *M. semilimbatus*
 - Copulatory openings without heavily sclerotized roof 12
- 12(11). Grooves prominent over anterior half of epigynum, separated posteriorly by triangular elevation, copulatory openings at posterior edge of grooves, slightly posteriorly to mid-length of epigynum *M. bivittatus*
 - Grooves indistinct, narrowly separated (about 1/3 of epigynum width), copulatory openings in ante-

rior half of epigynum but distant from its anterior edge *M. taeniatus*

- Grooves indistinct, broadly separated ($\frac{1}{3}$ of epigynum width, or more) copulatory openings near the anterior edge of epigynum 13

13(12). Spermathecae extend along almost whole length of epigynum (Figs 364, 366) *M. fagei*

- Spermathecae extend along half length of epigynum (Figs 365, 367)
..... an aberrant form of *M. fagei*

Menemerus davidi Prószyński et Wesolowska
(Figs 345–346, 351–353)

Menemerus davidi Prószyński et Wesolowska in Wesolowska, 1999: 279–281, Figs 79–89; Prószyński 2000: 248–250, Figs 62–66.

Diagnosis. Similar to *M. animatus* in external appearance, but general plan of palpal organ and epigynum are different from any other *Menemerus* I have seen. The differences with *M. animatus* are: lack of white ventral margin on carapace, far less distinct light triangle in the foveal area, different abdominal pattern, brown surfaces of femur I (prolateral darker; in *M. animatus* these surfaces are light yellow), remaining segments and legs light yellow, presence of two spots of short white setae on edge of clypeus (in *M. animatus* dense white line of setae, continuous with marginal white streak but interrupted medially by small dark bald spot); ventral ramus of tibial apophysis directed diagonally back, long, tapering and pointed apically, the dorsal ramus three-lobed plate. Female epigynum differs by anterior connecting groove, and arrangement of channels and spermathecae.

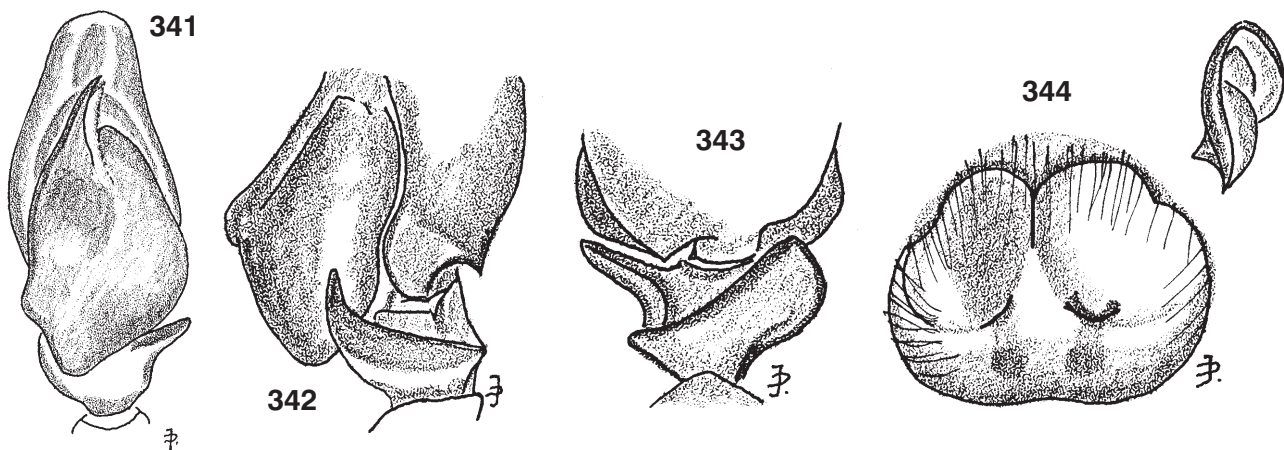
Description. Male. Cephalothorax almost uniformly dark brown, covered by inconspicuous adpressed setae, colourless, or dark, except white setae on posterior half of eye field and whitish triangular patch in lighter pigmented foveal area which extends narrowing onto poste-

rior slope of thorax; lower sides dark without ventral margin of white setae. Anterior slope of the eye field is gently inclined; flat surface of cephalothorax limited to space between eyes II and III; beyond eyes III height of cephalothorax is reduced as much as eyes III, then follows short flattening of cephalothorax, the posterior slope begins at 81% of length of cephalothorax. Abdomen: tegument of median area transparent with silver white spots of internal guanine cells, bisected along anterior $\frac{1}{3}$ by a thin, darker median streak, corresponding to heart location; broad marginal, dark greyish, zigzagging bands with four triangular apexes pointing medially and four light triangular spots at the margin of lateral surfaces.

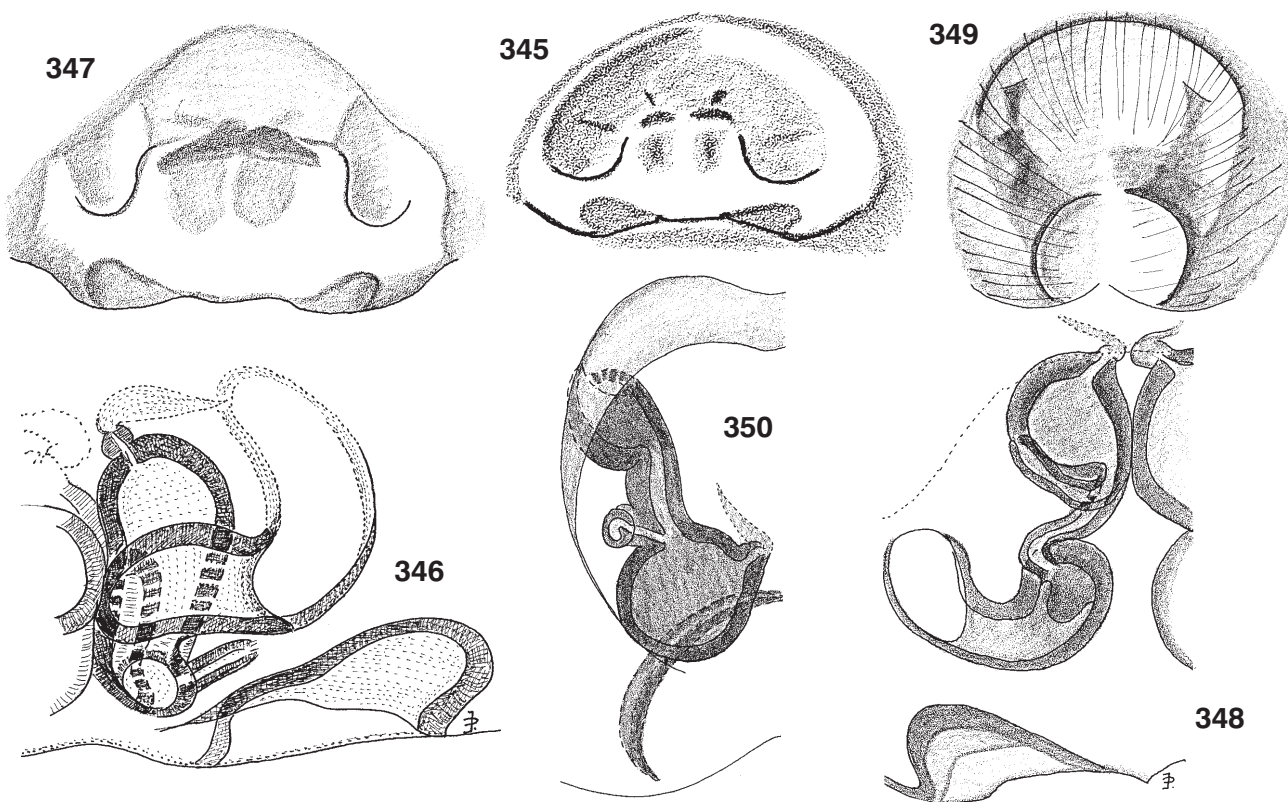
Frontal aspect: face dark brown with a thin row of short setae ventrally along edge of clypeus, consisting of two spots of short white setae beneath AME, separated in the middle and limited laterally by indistinct brown setae; eyes I surrounded by sparse indistinct whitish setae, yellowish along lateral rims of ALE. Chelicerae dark brown; cymbium light brown, dorsal surface of remaining segments of pedipalps dark yellow with white setae, very prominent triangle of white setae apically on femur, however larger specimen from Bet Shemesh devoid of white setae; no triangular apophysis on patella; leg I with prolateral surface of femur dark brown, all remaining segments light yellow.

Ventral aspect: external angle of maxillary plate prominently expanded triangularly; mouth parts brown; sternum brown to light brown, anterior coxae light brown, rest yellowish; abdomen light with greyish streak between two lines of dot-like depressions.

Legs I–IV light yellow, (except brown lateral surfaces of femur I mentioned above). Larger specimen from Bet Shemesh has legs distinctly darker: legs I are light brown with darker brown lateral surfaces of femur I, also darkened lateral surfaces of femur II, femur III–IV with two lateral brown annuli, less distinct lateral annuli on tibia and metatarsus III–IV.



Figures 341–344. Relevant, cosmopolitan species *Menemerus bivittatus*, palpal organ ventrally (341), laterally (342) and pedipalpal tibia dorsally (343), epigynum and a waxy stopper removed from the right groove, in profile (344).



Figures 345–350. Comparison of females in *Menemerus davidi*, epigynum (345), its internal structure (346); relevant species *Menemerus animatus* (Algerian specimen), epigynum (347), its internal structure (348); *Menemerus illigeri* (specimen from Cairo), epigynum (349), its internal structure (350).

Palpal organ: ventral ramus of tibial apophysis directed diagonally back, long, tapering and pointed apically; dorsal ramus developed into prominent plate, thin with edge divided into three small lobes. *Menemerus soldani* has similar ventral ramus, but differs by well developed dorsal ramus, narrow, long, directed anteriorly and slightly bent terminally.

Female. Epigynum resembles *M. animatus* in general shape of epigynum, transverse oval with prominent sclerotized pockets at posterior edge, and copulatory opening located near marginal grooves at the mid-length of epigynum; it differs by less delimited and not separated grooves, connected by semicircular depression. Broad copulatory opening leads to transverse channel, located at mid-length of epigynum, across mid-length of spermatheca; short narrower channel running posteriorly joins elongate medial spermatheca, with prominent scent pore at posterior end, and fertilisation channel at anterior end. In *M. animatus* transverse anterior channel has comparable location, but the short, narrower, “S”-bent channel runs anteriorly; spermatheca is spherical and located anteriorly. External appearance of epigynum in *M. soldani* shows some similarity with both *M. animatus* and *M. davidi*, its internal structure, however, was not studied.

Measurements (mm). Male. Length of cephalothorax 2.28–2.96; length of abdomen 2.38–2.89; length of 5 segments

of leg I 5.93–7.48, length of legs order I, IV, II, III. Female. Length of cephalothorax 2.96; length of abdomen 4.76; length of 5 segments of leg I 5.84, length of legs order IV, III, I, II.

Material. Male holotype: Libya, Tripolitania, 2220–2400 m., 28.IX. – 2. X. 1948, leg. B. Malkin Coll. AMNH. Paratypes: male, En Fawwar 26. III. 1975. No. 14303. Leg. M. Tintpulver; male, Bet Shemesh, 15. VI. 1957, Y. Werner. No. 14304 (distinctly larger specimen); 2 females, 1 juv., “*Menemerus semilimbatus*” A. 2411 [no data]; female, 1 juv. “*Menemerus semilimbatus*” A.3204 [no data]; male “*Menemerus semilimbatus* det. Shulov Paris 1947”. Coll. HUIJ; male, “*Menemerus animatus* Palestine, Bottle 1833, tube 39” Coll. HEC.

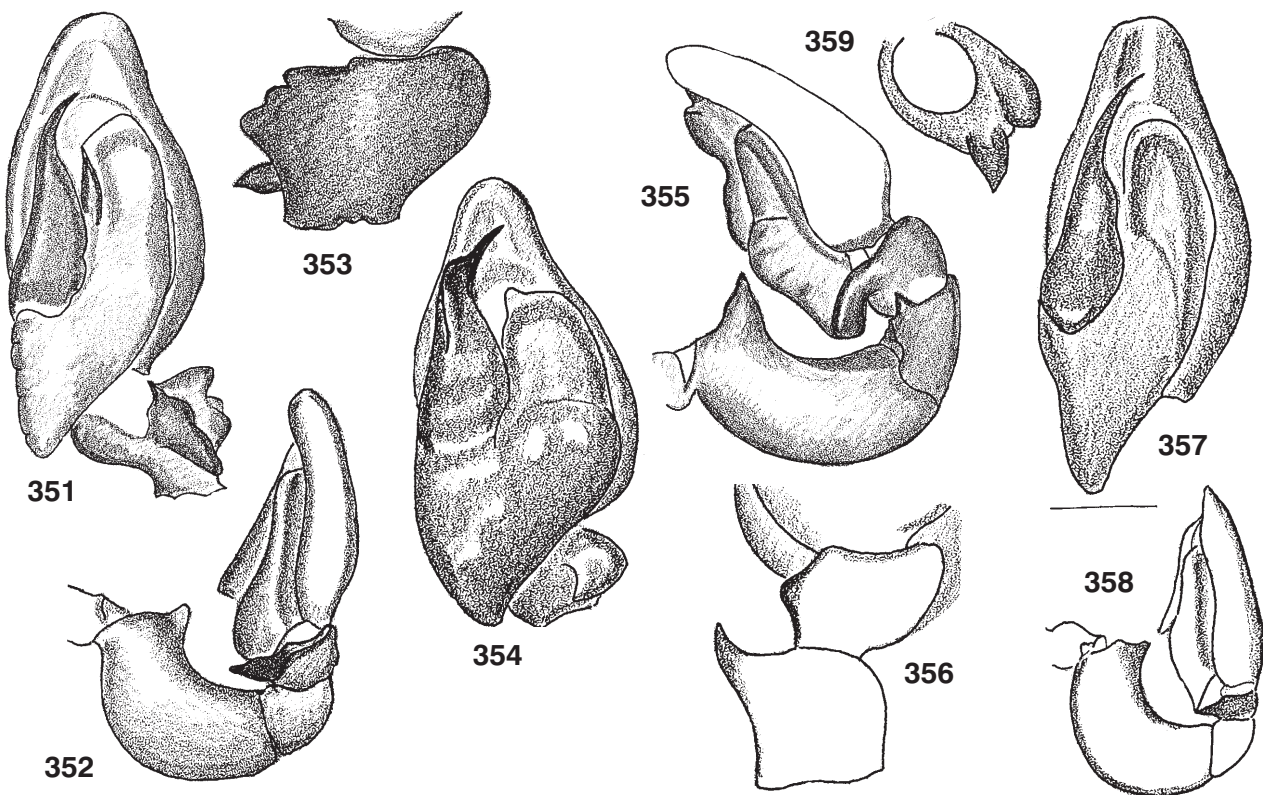
Seasonal appearance of adult specimens. Males – III, VI.

Distribution. Libya, Algeria, Egypt. Israel: Bet Shemesh, ‘Ein el Fawwar (11).

***Menemerus fagei* Berland et Millot**
(Figs 360–368, 369–374)

Menemerus fagei Berland et Millot, 1941: 350, Fig. 53;
Menemerus cf. bivittatus: Prószyński 1989: 37, Figs 12–17.

Description. Male. Cephalothorax integument dark brown, anteriorly blackish, with variable setae pattern:



Figures 351–359. Comparison of palpal organ in *Menemerus davidi*, ventrally (351), laterally (352), palpal tibia dorsally (353); *Menemerus illigeri*, ventrally (354), laterally (355), palpal tibia and patella, note hook like process (356); *Menemerus animatus* (Algerian specimen), ventrally (357), laterally (358) and palpal tibia antero-laterally (359).

darker areas on upper sides, marginally on dorsal surface of thorax and marginally on eye field covered by colourless setae with small addition of light brownish setae; remaining areas light covered with dense, long whitish, adpressed setae; intense white setae on lancet shaped median spot, behind postero-dorsal rim of eyes III, beneath eyes II and on broad marginal white band along ventral edge of carapace.

Abdomen densely covered with white, whitish and less numerous colourless setae; there is an indistinct pattern of lighter spots and darker areas due to different pigmentation of tegument: darker median streak along anterior half, delimited anteriorly by more intense white lateral streaks, a pair of transverse light spots in posterior half and median lighter streak along posterior third of abdomen; remaining parts of dorsal surface pigmented greyish beneath whitish setae; sides intensely white, forming wavy limit of greyish dorsal surface. Spinnerets blackish brown.

Frontal aspect: integument brown, anterior eye field in this position appears covered by adpressed yellowish setae, with a larger patch of white setae further on in the central area of the field; AME surrounded by yellowish setae, ALE dorsally by yellowish and white, ventrally by white setae, facial surface beneath ALE with thin adpressed yellowish setae extending from sides; ventral

edge of clypeus with single row of long white setae directed diagonally ventrally, continuous with lateral marginal band, under AME much longer and arranged into a triangle. Chelicerae blackish brown; cymbium blackish brown with short colourless and inconspicuous setae.

Palpal tibia with prolateral part rounded, dark yellow, retrolateral part is heavily sclerotized and blackish brown, surrounding large cavity between cymbium and apophysis; there is a row of long colourless setae prolaterally on cymbium and tibia; patella dorsally light brown with blackish median spur, becoming gradually darker basally; femur semicrescent shaped, swollen apically, but without spine-like protuberance, dark with long and dense, intensely white setae. Ventral halves of prolateral surfaces of femur and tibia I black, remaining part dark brown, dorsally lighter brown, incomplete darker rings apically on tibia and metatarsus. Legs dark yellow with contrasting dark brown annulation, lateral surfaces of femora grey, legs I much darker brown, small irregular spots on dorsal surfaces. Ventral aspect: sternum light with margins surrounded by a row of setae; coxae I–IV light yellow suffused with grey; labium and maxillary plates dark brown; abdomen whitish with darker grey median streak, brown spot corresponding to epigynum in females.

Palpal organ: pedipalpal femur without basal ventral protuberance, resembles *M. bivittatus* by presence of

large cavity between cymbium and apophyses of pedipalpal tibia postero-retrolaterally, surrounded by heavily sclerotized and blackish brown tegument. Differs from *M. bivittatus* by tibia shorter and broader, cymbium situated prolaterally on a broad process, narrow double apophyses of equal length, extending along main axis of segment and pointing anteriorly, their apexes appearing rounded in lateral view, but pointed in ventral and dorsal views. Bet Shemesh (Har Tuv) specimen has dorsal ramus of apophysis longer, broader and rounded, while the ventral one is slightly bent and pointed; triangular fleshy stem of embolus is longer and narrower, white plate under embolus longer, its tip triangular.

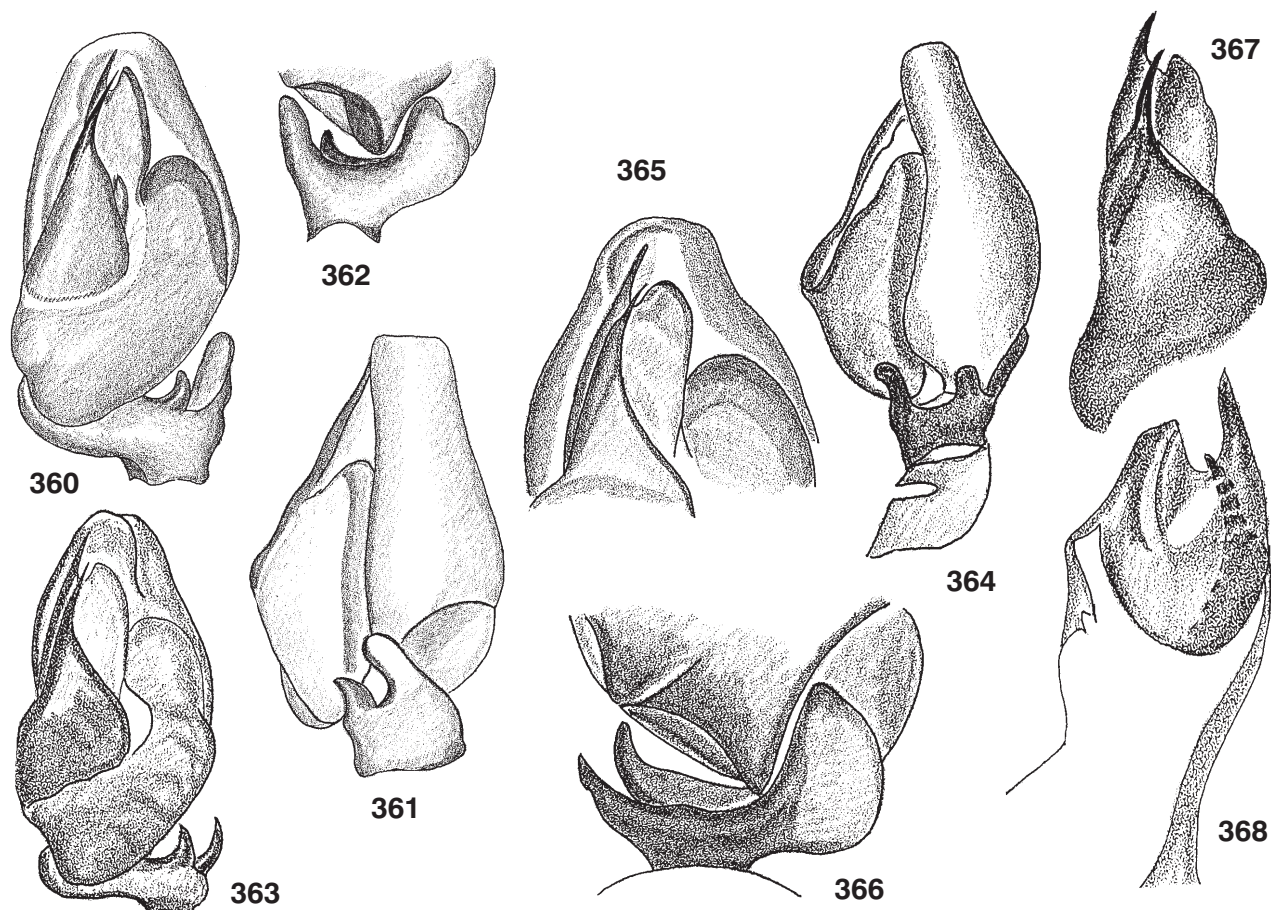
Female. Cephalothorax: tegument blackish, covered with striking white adpressed setae, most dense on eye field, particularly between eyes III, along median line of thorax and on ventral marginal bands; thinner, sparser and less intensely white setae on upper sides and dorsal edges of thorax makes these parts appear somewhat darker.

Abdomen: elongate oval, narrowing at both ends; thin white margin encircling grey dorsal surface with darker brown thin borders, light median longitudinal

streak connected with a pair of light submarginal spots at $\frac{3}{5}$ of length (somewhat resembling *Hasarius adansoni*) and a thin whitish chevron, broadly opened and with long arms; sides and ventral surface whitish; spinnerets blackish brown.

Frontal aspect: anterior eye field appears in this position densely covered by adpressed white setae, with a few yellowish ones; eyes I surrounded with long white setae, ALE laterally with small addition of a few yellowish setae, facial surface beneath ALE covered entirely by dense white setae extending from sides; ventral edge of clypeus with long white setae, directed diagonally and ventrally, a few anteriorly, these under AME arranged into a triangle and much longer. Chelicerae blackish brown; pedipalpal segments distally yellow, basally light brown, tarsus entirely light brown, all covered with long white setae laterally. Leg I light brown with darker brown incomplete annulation on patella, tibia and metatarsus; prolateral surface of femur brown, densely covered with short adpressed whitish setae.

Legs: whitish yellow with contrasting dark annulation, lateral surfaces of femora light. Ventral aspect: sternum blackish brown, posteriorly lighter brown, its mar-



Figures 360–368. *Menemerus fagei*, variation in male, specimen from Har Tuv, palpal organ ventrally (360), dorsal view of tibia (361), laterally (362); specimen from Jerusalem, palpal organ ventrally (363), laterally (364), anterior part of palpal organ (365), tibia dorsally (366); specimen from Rehovot, tip of embolus laterally (367), tip of embolus dorsally (368).

gins surrounded by a row of dense horizontal white setae, a few on the surface of sternum; coxae I–II whitish yellow, III–IV still more whitish; labium and maxillary plates blackish brown; abdomen whitish grey, central rectangle separated from sides by a thin, lighter line.

Epigynum with sclerotized posterior edge, without "pockets" visible; grooves indistinct, broadly separated ($\frac{1}{3}$ of epigynum width, or more); copulatory openings on the surface, near the anterior edge of epigynum, without sclerotized roof: spermathecae extend along almost whole length of epigynum in Jerusalem specimens; however, they are shorter, stretching along half epigynum length in the aberrant specimen from Daphna.

Biological observation. A male in a Petri dish changed behaviour when smellig female hidden in an open glass tube. Display of male at encounter consisted of raising anterior part of cephalothorax with legs drawn back, first pair raised above ground and bent at patellar joint – a "crab like" posture, pedipalps (cymbium dark, tibia and patella striking white) kept close to chelicerae. Advancing towards female, male raises first pair of legs "V"-like, diagonally high above the head, forwards and laterally; female responds by a few quick short jumps (5 mm) towards male, then runs away. All this was repeated after several minutes. In one instant male and female were facing one another very closely, their first legs stretched diagonally above and touching, but they sepa-

rated. Kept in a closed Petri dish for a few days the pair performed such encounters many times each day, then after some time separating and taking hours of rest. Finally I found female devouring male, but I do not know whether they had already copulated. Repetitions of such encounters and display indicate their mutual interest, so presumably they are conspecific.

Seasonal appearance of adult specimens. Males – IV, V, VI; females – III, IV, V, VI, VII.

Distribution. West Africa. Israel: Dafna (1); Ginosar (7); Ma'agan Mikhael (8); Rehovot, Kefar Warburg (9); Jerusalem, Bet Shemesh (11); Nahal Be'er Sheva (15).

Menemerus illigeri (Savigny et Audouin)

(Figs 349–350, 354–356)

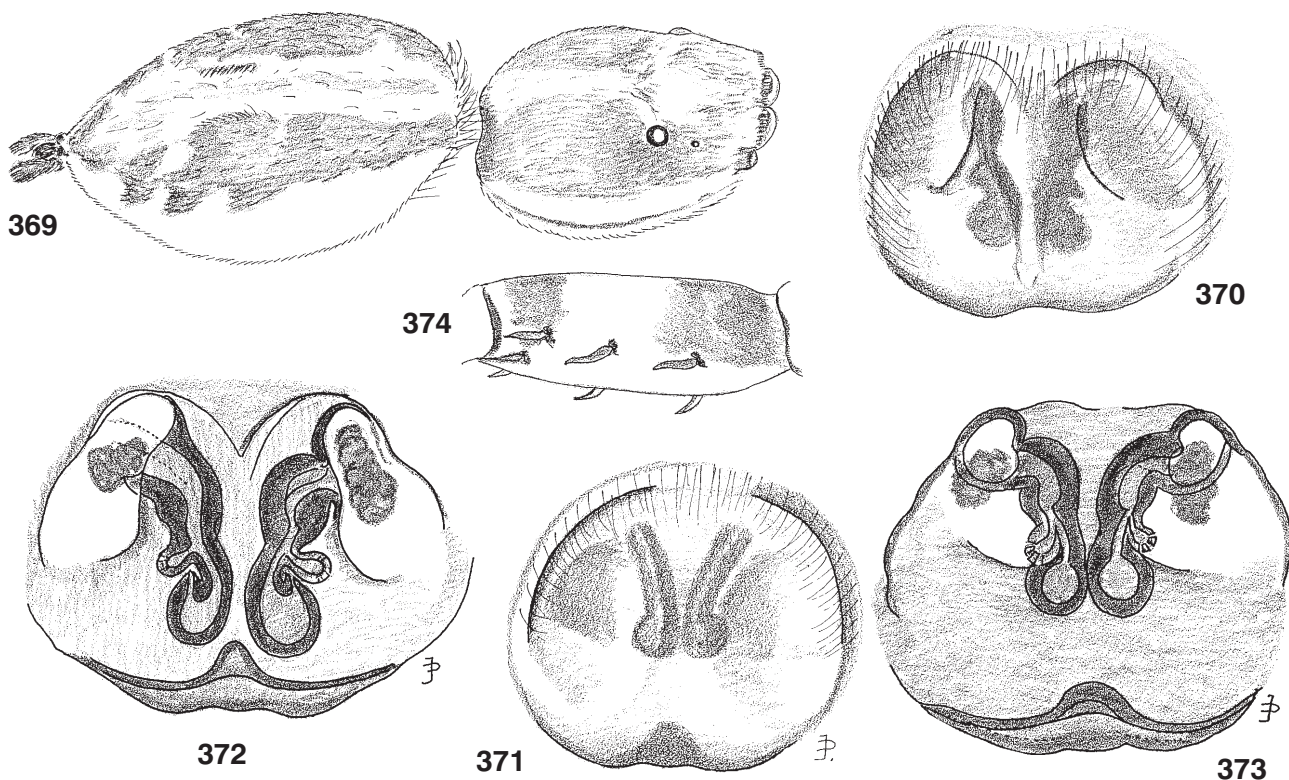
Attus illigeri Savigny et Audouin, 1825: 172;

Menemerus interremptor O. Pickard-Cambridge 1876: 623;

Prószyński 1984b: 86;

Menemerus illigeri: Prószyński 1976: Figs 333–335, map 11.

Diagnosis. Male pedipalpal femur with long ventral hook basally, tibial apophysis forms characteristic thin, broad plate, directed ventrally and turning posteriorly; patella of pedipalps with small but distinct lateral apical hook; embolus looks "broken" – bent apically at almost



Figures 369–374. *Menemerus fagei*, female, general appearance (369), epigynum variation (370, 371), internal structure of epigynum variation (372, 373), tibia I (374); (371) and (373) – aberrant Daphna specimen.

90 degrees; Female copulatory openings hidden under sclerotized "hood", sclerotized pockets under posterior part of epigynum, form a prominent circle.

Description. Male. Profile of cephalothorax resembles *M. davidi*. Cephalothorax brown with slightly darker eye field, covered with minute adpressed whitish and colourless setae and sparse upright and inconspicuous dark bristles, remnants of sparse thin adpressed whitish setae over remaining parts of thorax; broad ventral margin of whitish setae, the ventral edge itself is black; no contrasting pattern. Abdomen divided longitudinally into median light area, actually light greyish delimited by two thin white lines, and two lateral darker brownish grey streaks with chains of yellow dots, these lateral streaks are limited by thin wavy whitish line of upper sides, lower sides grey.

Frontal aspect: dense line of short intensely white setae along ventral edge of clypeus, slightly longer under AME; remaining setae colourless, face appears brown, chelicerae brown; cymbium light brown with colourless and brown setae, dorsal parts of pedipalpal tibia, patella and femur dark yellowish, the latter with distinct but not striking white setae; prolateral surface of femora I brown, remaining parts of leg I light brown, tarsus yellowish.

Legs: I light brown with slightly lighter median areas of tibia and metatarsus, and dorsal surfaces, tarsus lighter brownish yellow, lateral surfaces of femur I darker; II brownish yellow with darker spots on lateral surfaces; III–IV yellow with two darker brown rings on femur, tibia and metatarsus, one on patella.

Ventral aspect: mouth parts light greyish brown, external angle of maxillary plates expanded prominently into triangle with a rounded apex; sternum dark yellow with indistinct whitish setae, mainly marginally; coxae dark yellow, abdomen light.

Palpal organ: embolus appears "broken", bent apically at almost 90 degrees; tibial apophysis forms characteristic thin broad plate, directed ventrally and turning posteriorly; patella of pedipalps with small but distinct lateral apical hook; long ventral hook basally on pedipalpal femur (Fig. 356).

Female. Epigynum: copulatory openings hidden under sclerotized "hood", sclerotized pockets under posterior part of epigynum, form a prominent circle (Figs 349–350).

Measurements (mm). Male. Length of cephalothorax 2.72; length of abdomen 2.79; length of 5 segments of leg I 5.84, leg length order I, IV, II, III. Female. Length of cephalothorax 2.96; length of abdomen

4.76; length of 5 segments of leg I 5.84, leg length order IV (123%), I, III, II.

Seasonal appearance of adult specimens. Males – III, V, VI, VII; females – VII, VIII, IX.

Distribution. Portugal, Tunisia, Libya, Egypt, Sudan, Syria, St. Helena. Israel: Deganya (7); Hulda (10); Kalia at Dead Sea shore, 'En Tamar (13); Be'er Mash'abbim; Be'er Sheva (15); Mishor Yamin (17).

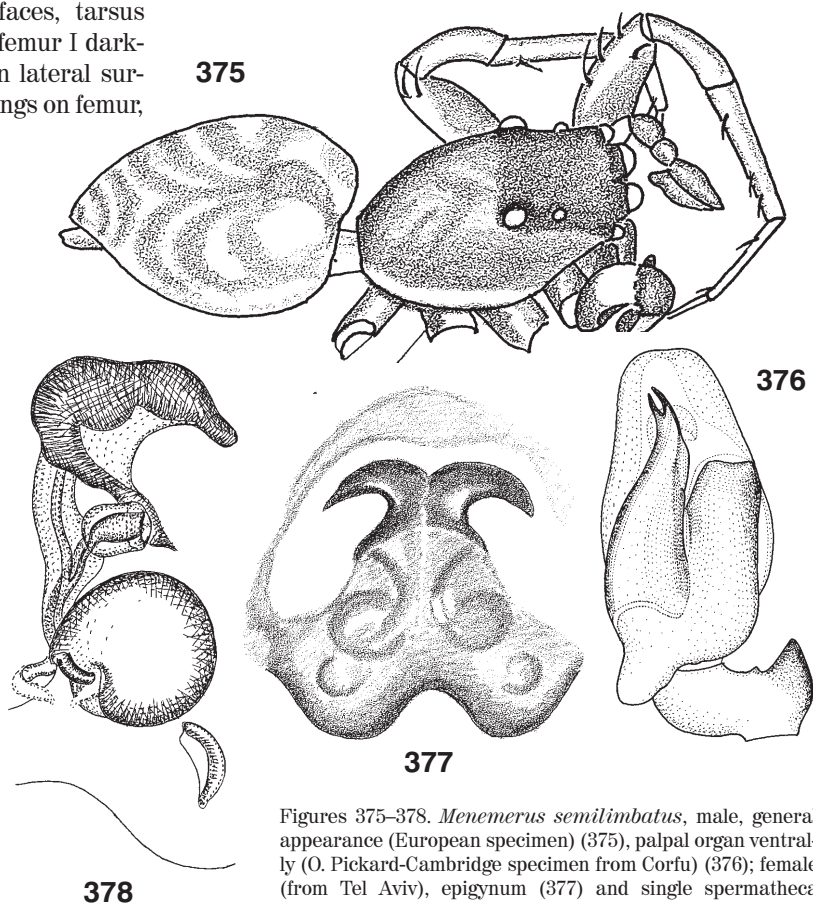
Menemerus semilimbatus (Hahn)

(Figs 375–378, 379–385)

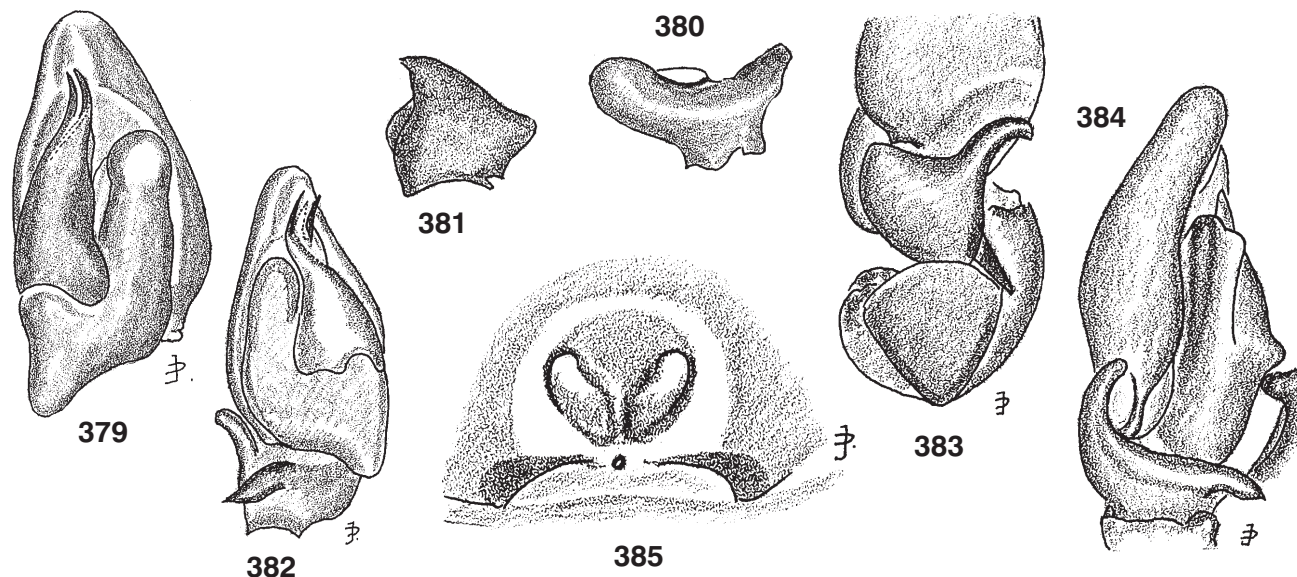
Attus semilimbatus Hahn, 1827: 5, Tab. 18 Fig. B;
Salticus vigoratus O. Pickard-Cambridge, 1872: 324;
Menemerus semilimbatus: Galiano 1965: 130–132 (specimens introduced to Argentina); Prószyński 1979: 313, Figs 207–208; Prószyński 1984b: 85 (male, synonym *Salticus vigoratus*).

Description. Male. Characterized by embolus split into forceps shape, bent prolaterally, single, short tibial apophysis triangular; tibia short, and indistinctly transversely expanded; cymbium situated slightly out of main axis of segment.

Female. Cephalothorax: integument blackish brown with lines and spots of whitish, fawn and brown setae, with sparse admixture of more strikingly whitish setae.



Figures 375–378. *Menemerus semilimbatus*, male, general appearance (European specimen) (375), palpal organ ventrally (O. Pickard-Cambridge specimen from Corfu) (376); female (from Tel Aviv), epigynum (377) and single spermatheca dorsally (378).

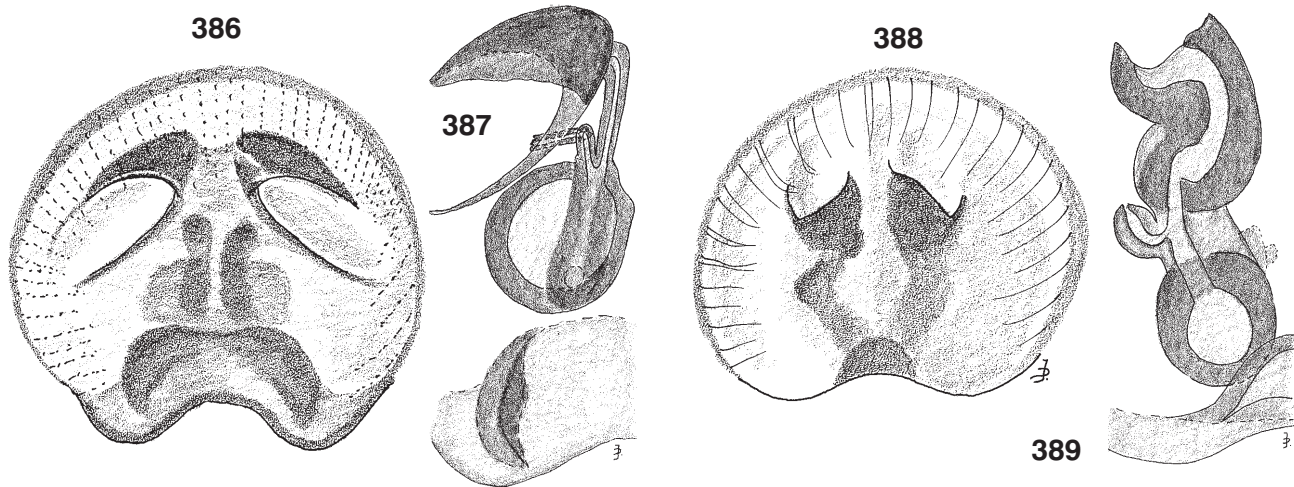


Figures 379–385. *Menemerus semilimbatus* (male, Algerian specimen), palpal organ ventrally (379), palpal tibia ventrally (380) and laterally (381); relevant species *M. soldani*, palpal organ ventrally (382), dorsally (383) and laterally (384), epigynum (385).

Eye field covered with short, adpressed setae, fawn with copper gleam, there are four spots of whitish adpressed setae – three elongated spots behind touching points of anterior eyes and a single median spot between eyes III, extending with weaker and thinner line along anterior thorax. Both sides and thorax with longer adpressed setae, upper part of marginal white belt strikingly white with long dense setae; below that, and visible only in lateral position, lower part of the belt, broad and whitish with sparser adpressed setae.

Abdomen with brownish grey leaf pattern of large spots on yellow background, consisting of at least five pairs of darker spots located along margins and separated medially by 4 indistinct yellow chevrons, anteriorly with pairs of

yellow spots. The posterior pairs of dark spots covered with dense black, adpressed scales, similar scales scattered sparsely over remaining darker spots; posterior, short median row of grey rectangles, reaching spinnerets. Sides of abdomen yellow. Face: anterior eyes surrounded with white setae, dorsally with a few admixed fawn setae; diameter of ALE $\frac{3}{5}$ of AME. Clypeus under AME with long dense white setae, under ALE shorter and sparser adpressed whitish setae with blackish brown tegument visible between. Chelicerae brown, palps thin, yellow, with dense upright white setae. Legs brownish yellow, with indistinct brown marking laterally. Epigynum without “pockets”, copulatory openings in grooves, each limited anteriorly by prominent semicircular, heavily sclerotized roof.



Figures 386–389. Comparison of females, *Menemerus semilimbatus* (Algerian specimens), epigynum (386), its internal structure (387) and *M. taeniatus*, epigynum (388), its internal structure (389).

Measurements (mm). Female. Length of cephalothorax 2.85; length of abdomen 4.72; length of 5 segments of leg I 6.00, length of legs order IV, I, III, II.

Seasonal appearance of adult specimens. Female – IV.

Distribution. Mediterranean to Uzbekistan; Argentina (introduced). Israel: Tel Aviv (8).

Menemerus taeniatus (L. Koch)

(Figs 388–389)

Attus taeniatus L. Koch, 1867: 875;

Menemerus taeniatus: Simon 1937: 1210, 1262, Figs 1934–1936;

Prószyński 1976: Figs 329–332; Prószyński 1979: 313, Figs 209–216 (syn. *M. parietinus*); Flanczewska 1981: 212, Fig. 97.

Description. Male. Cephalothorax dark with broad white margin along edge of carapace. Palpal organ: striking transverse expansion of tibia, single ramus of apophysis as large as remaining part of tibia, width of tibia about equal to width of cymbium.

Female. Epigynum without “pockets”; copulatory openings on the surface of epigynum and in anterior half but distant from anterior edge, narrowly separated (about $\frac{1}{5}$ of epigynum width), without heavily sclerotized roof, grooves indistinct. Internal structures stretched medially: entrance chamber heavily sclerotized, intermediate channel straight and short, spermathecae spherical, scent pore prominent.

Seasonal appearance of adult specimens. Females – IX.

Distribution. Mediterranean: France, Balkans, Greece; brought to Argentina. Israel: Be'er Mash'abbim (15).

Relevant species

Menemerus animatus (O. Pickard-Cambridge)

(Figs 347–348, 357–359)

Euophrys animatus O. Pickard-Cambridge, 1876: 622, T. 60, Fig. 89;

Menemerus animatus: Denis 1947: 71, Tab. 4, Fig. 16; Prószyński 1976: map 10.

Remarks. Sister species to Israeli *Menemerus davidi*, characterized by striking white marginal band and central light thoracic spot, palpal organ has shorter apophysis with less developed dorsal plate, and slightly different shape of fleshy embolus stem. Algerian specimens of *M. animatus* differ from Egyptian ones by tibial apophysis much shorter, triangular, directed transversely; comparable with Berland and Millot (1941 Figs 54 g, j) from which differs by abdominal pattern.

Distribution. Egypt, Libya and Algeria.

Menemerus arabicus Prószyński

Menemerus arabicus Prószyński, 1993: 33–35, Figs 16–19.

Distribution. Saudi Arabia.

Menemerus bivittatus (Dufour)

(Figs 341–344)

Salticus bivittatus Dufour, 1831: 369;

Menemerus bivittatus: Barnes 1958: 44–47, Figs 71–74; Wanless 1983: 78, Figs 26a–f; Žabka 1985: 240, Figs 283–292; Wesolowska 1989: Figs 14–29.

Remarks. Male palpus with narrow tibia and single apophysis directed laterally, embolus followed dorsally by thin, white membranous process. Epigynum with two grooves in anterior half, separated by thin septum anteriorly and triangular protuberance posteriorly; copulatory openings slightly behind mid-length of epigynum.

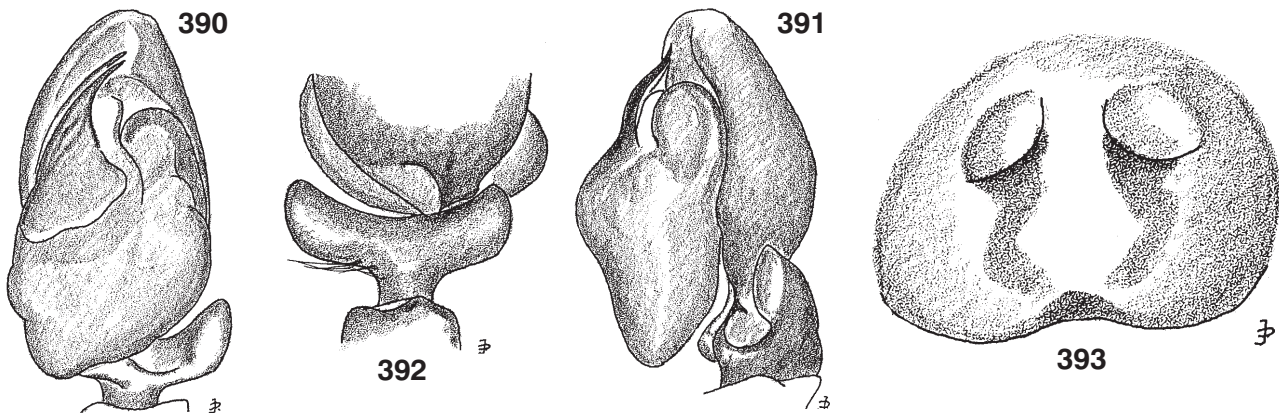
Distribution. Cosmopolitan in warm areas, including Mediterranean.

Menemerus falsificus Simon

(Figs 390–393)

Menemerus falsificus Simon, 1868: 664.

Remarks. A form with genital organs identical to *Menemerus taeniatus*, but devoid of white margin along edge of carapace was considered by Simon (1937: 1210, 1262) a separate species. It is known from France to Crete, but may be variety of *Menemerus taeniatus*.



Figures 390–393. Relevant species *Menemerus falsificus* (differing from *M. taeniatus* by absence of white cephalothoracal margin, according to Simon 1937), palpal organ ventrally (390), palpal organ laterally (391), palpal tibia dorsally (392) and epigynum (399).

Menemerus paradoxus Wesolowska et van Harten

Menemerus paradoxus Wesolowska et van Harten, 1994: 47, Figs 99–100.

Distribution. Yemen.

Menemerus plenus Wesolowska et van Harten

Menemerus plenus Wesolowska et van Harten, 1994: 49, Figs 101–104.

Distribution. Yemen.

Menemerus soldani (Savigny et Audouin)
(Figs 382–385)

Attus soldani Savigny et Audouin, 1825: 171.

Distribution. N Africa: Algeria, Tunisia and Egypt.

Modunda Simon, 1901

Type species. *Modunda phragmitis* Simon, 1901.

Introductory remarks. The genus is very closely related to *Bianor*, from which differs by longer and lower body and less strongly sclerotized tegument. Poorly known, also occurs in Africa, and unidentified species known from India.

Cephalothorax appears long, its width is 62–70% (of the cephalothorax length) at eyes I, 82–87% at eyes III and 82–87% at the broadest part, which is located at 50% length of cephalothorax; sides of cephalothorax appear to be rather parallel; low 36–50%. Eye field long, extending over 47–60% of cephalothorax, also long in relation to its width at eyes I (76–86%), trapezoid shaped, broadening posteriorly by 19–20%, indistinctly narrower than cephalothorax, and eyes III are located very closely to the dorsal edges of cephalothorax, giving it somewhat “angular” appearance; its width at eyes III is 91–96% of width of cephalothorax in the same area and also 96% of maximal cephalothorax width.

Profile of cephalothorax: anterior slope of eye field extends half-way between eyes I and II and is very gently inclined; flat area of cephalothorax very prominent extends over 70% of length of cephalothorax; posterior slope of thorax is steep in the upper half, becoming gradually gentler and more level lower down. Abdomen long with rounded ends, narrower than width of cephalothorax; dorsally flat, in males scutum over almost whole length of abdomen (discoloured and barely visible on O. Pickard-Cambridge’s specimen). The genital organs resembles *Bianor*. There is a superficial resemblance to *Pseudicicus* in long robust shape of legs I, but possibility of closer relationship between these two genera is excluded by spination of tibia I and “angular” location of eyes III, also absence of a row of stridulatory setae under latera eyes 1.

Modunda staintoni (O. Pickard-Cambridge)

(Figs 113, 116–117, 120, 123–129)

Salticus staintoni O. Pickard-Cambridge, 1872: 331–332;

Salticus congener O. Pickard-Cambridge, 1872: 332;

Salticus staintoni O. Pickard-Cambridge, 1876: 610 (syn. *S. congener*);

Modunda phragmitis Simon, 1901c: 160; Prószyński 1987: 63–64, syn. nov.

Modunda staintoni: Logunov 2001 [2000]: 277–280, Figs 347–366.

Diagnosis. General outlook of body resembling *Pseudicicus*, but differs by spination on swollen tibia I and lack of stridulatory bristles beneath eyes lateral, also “angular” location of eyes III. Genital organs resembling *Bianor*.

Description. Male. Cephalothorax black, surface of eye field pitted, white setae below lateral eyes, a few whitish scales in the foveal area. O. Pickard-Cambridge (1872: 331–332) describes it as follows: “... deep rich brown on the sides with a black margin, the caput is black and encircled by a band of white hairs running round in front immediately beneath the eyes and ending beneath on either side behind the eyes of the hinder row; at the centre of the back of the caput is a white spot”. Abdomen elongate oval, flattened, covered with brown scutum (almost not visible on O. Pickard-Cambridge’s specimen, abdomen discoloured) with traces of pairs of marginal white spots anteriorly and at the $\frac{3}{4}$ length, also single median spot. According to the original description “... dark brown tingled with yellow, its fore half is encircled with a marginal band or stripe of white hairs; and there are six small bright white spots (also formed by white hairs) on its upper surface: two of these spots are placed longitudinally on the centre of its fore half, the foremost of these spots is sometimes obsolete, the other four are on the margins of the hinder half and form a huge trapezoid ... the underside is paler than the upper side, and has an indistinct marginal line of white hairs on either side”.

Frontal aspect: integument blackish brown covered with white setae, long white setae overhanging cheliceral bases; eyes I surrounded ventrally with white setae, light fawn dorsally. Transversal section of chelicerae triangular with peculiar huge fang and huge prolateral tooth, with an irregular cavity between fang and cheliceral edge. Pedipalps short, brown with cymbium fawn.

Legs I robust, dark brown, distinctly different from II–IV which are shorter, slender and light yellow; relation of length of legs in decreasing order I – 100%, IV – 81%, III – 63%, II – 54%; leg I (5 segments only) being 248% of length of cephalothorax (additionally trochanter and coxa I are unusually elongated); striking differences in width: tibia and femur I about twice as wide as tibia and femur of either II, III or IV. Female

Resembles male very much, but integument of abdomen soft, without scutum, with greyish mottled darker linear pattern. Cephalothorax like male “... dark brown uniformly clothed with short greyish white hairs ...”

Frontal aspect like male but chelicerae slender, yellowish brown, fang slender.

Abdomen with “... a series of angular lines or chevrons (of which the first is much stronger and more pointed than the rest) are indistinctly visible on the hin-

der half of the upper side, and also some pale blotches corresponding to the white spots in male ...”.

Legs I robust, like male. Epigynum resembling *Bianor* (Figs 120, 123).

Measurements (mm). Male. Length of cephalothorax 1.70; length of abdomen 2.50; length of 5 segments of leg I 5.14. leg length order I, IV, III, II. Female. Length of cephalothorax 1.93; length of abdomen 2.96.

Seasonal appearance of adult specimens. Males – VI; females – VI.

Distribution. Egypt. Israel: Bet Habek, Nahal Samak (7).

Mogrus Simon, 1882

Type species. *Mogrus fulvovittatus* Simon, 1882.

Introductory remarks. The genus contains some 18 species occurring in warm and rather dry environments in the Mediterranean area, Africa, W and C Asia. Insufficiently known, are characterized by “hairy” appearance, due to numerous dark bristles scattered sparsely over cephalothorax and abdomen. The coloration of cephalothorax, depending on preservation of setae, often white, but where fallen off reveals dark integument. Abdomen usually with a median dark streak, often serrated, on white background or white delimited. Eyes I are distantly spaced, ALE distant from AME by ALE diameter; ALE located high.

Easy identification of genus is possible owing to characteristic appearance of genital organs. Palpal organ has round, flattened bulbus with conspicuous protuberance, encircled by thin embolus; tibial apophysis long and strong. Epigynum is a broad plate, in some species sclerotized with characteristic furrows leading to posteriorly located openings, in other species soft and without furrows, in which case opening are located more anteriorly. Copulatory channels membranous, very broad, running to the end of epigynum and turning there into narrower transverse channels, leading to medially located, small but heavily sclerotized spermathecae, usually bean- or cone-shaped, with prominent accessory gland.

Body proportions. Cephalothorax: width 65–70–75% at eyes I, 75–79–84 % at eyes III, maximum width is 77–81–84%, height is 52–56–63%. Eye field extending over 38–39–47% of cephalothorax, short in relation to its width at eyes I, trapezium shaped, broadening posteriorly by 4 to 8% (but in some specimens narrowing by 2%); indistinctly narrower than cephalothorax, eyes III are located close to the edges of cephalothorax. Abdomen: elongate, 95–112–131% of cephalothorax length oval, tapering posteriorly, its width varying 46–65–83% in studied specimens. Legs robust, length order in males is I, III (87–91%), IV (82–83%), II (79–80%); in females legs III=IV and are 10% longer than the first one; legs II shorter than I.

The females of this genus (at least two species: *Mogrus logunovi* and *M. neglectus*) build conspicuous

white silky nests of 1–2 cm diameter, on top of shrubs, and on twigs of thorny shrubs, where they guard their cocoons in late April and May, so at that time can be easily collected in considerable numbers. At other times females, as well as males appear rare and are seldom collected, however a couple of specimens of both sexes were collected in pitfall traps in the Negev Desert in February, males also until April and in November, which suggests that the ground is possibly their primary environment and where mating presumably takes place. It would be interesting to find out, whether other species of *Mogrus*, described from the Mediterranean, the Sinai and the Arabian Peninsula build similar nests and at the same periods of the year.

Mogrus logunovi Prószyński

(Figs 398–399, 403–406, 411–412, 415–418, 421–424, 427–432)

Mogrus neglectus [nec Simon 1868]: Prószyński and Lubin 1994: 286; *Mogrus logunovi* Prószyński, 2000: 250–255, Figs 67–68.

Diagnosis. Face covered with dense setae, orange to whitish yellow. Male abdomen silvery white with dark median streak, female abdomen dark with white delimited black median streak with prominent angular extensions. Bulbus protuberance at 1 o'clock position, apophysis bent. Epigynum sclerotized, with posterior ends of semicircular groove broadly spaced; spermatheca half the size of that of *M. neglectus*, on top of prominently bent anterior channel.

Remarks. Resembles *Mogrus frontosus* (Simon, 1871) from Corsica (Andreeva, Kononenko and Prószyński, 1981, Figs. 12–14), from which it differs by tibial apophysis broader and posteriorly bent, slightly different proportions of epigynum and longer channels.

One male and female collected in March or April 1996 in the Negev cohabited and mated (personal communication from Dr R. R. Jackson). Females easily found during breeding season (IV–VI) in white silk retreats (about 1.5 cm in diameter) on twigs of small thorny shrubs, occurring together with *M. neglectus* on the same shrubs, in a border zone between Mediterranean and desert vegetation; males dwell on the ground.

Description. Male. Colour pattern of cephalothorax variable, due to setae easily falling off, in better preserved specimen covered with long whitish setae which easily fall out leaving bald, blackish brown tegument; there are remnants of orange setae on median streak of thoracic slope. When cephalothorax bald, the tegument of eye field is almost black (in long preserved specimens faded to light brown with dark encircled lateral eyes), darker pigmentation along posterior eye field followed by slightly lighter belt; dorsal thoracic area darker with still darker lines radiating from fovea to ventral margin, posteriorly and laterally; sides lighter brown with indistinct whitish setae, passing into yellow, lightest near dark-pigmented, thin,

ventral margin. Abdomen dorsally covered with silvery white setae with scattered darker spots; there is a broad dark median streak, smooth, finely serrated (in Jordanian specimens more complicated Fig. 430), sides appear darker due to sparser whitish and yellowish setae.

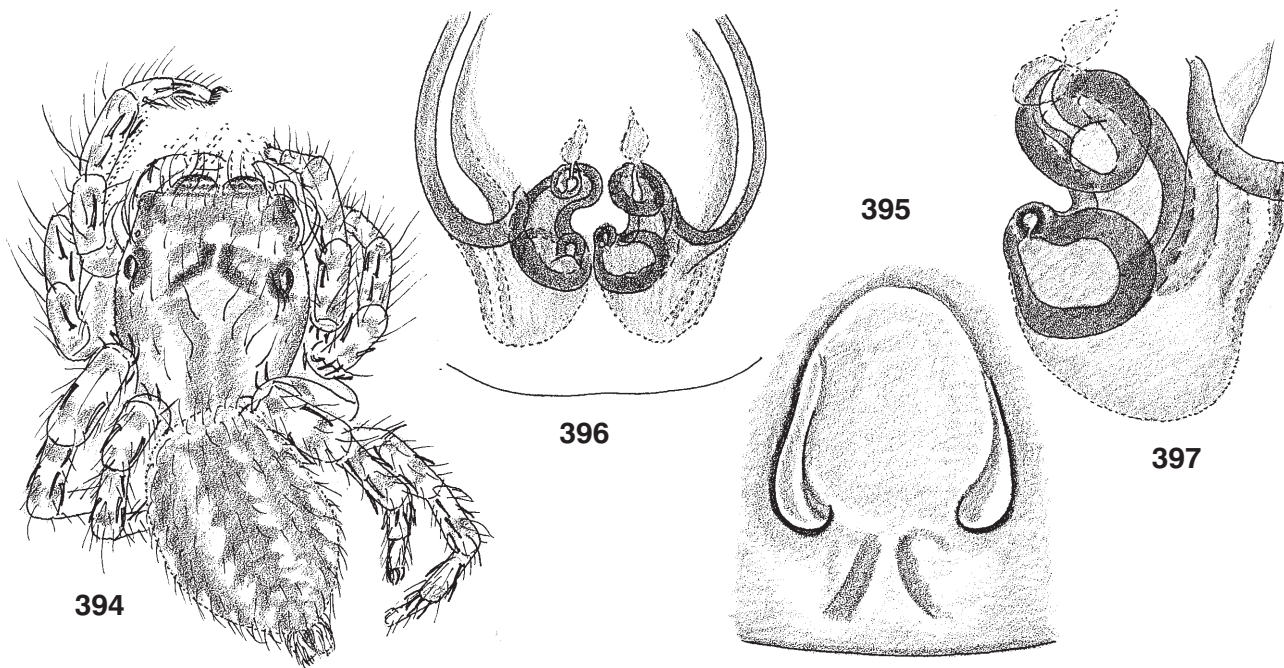
Ventral aspect: sternum dark brown with long colourless setae; coxae whitish or yellowish; abdomen whitish with median area dark grey, with two lines of grey dots narrowly spaced.

Frontal aspect: entire face orange, including setae surrounding eyes I; there are a few longer brownish setae in upper half of face, in some specimens clypeus has admixture of colourless setae, longer near its ventral edge; chelicerae black, arising vertically, in plane of face, forming indistinct, median space between them, their antero-median walls with transverse (stridulatory?) ridges. Pedipalps and patella – tibia I light brown, darker annulated. Legs distinctly lighter than in *M. neglectus*: ventral and lateral surfaces of majority of segments whitish or yellowish, dorsal surfaces light with darker annuli on tarsi-metatarsi III–IV; femora I–IV dorsally light brown with median longitudinal darker line, laterally light greyish; patellae and tibiae I–IV brown lighter in the middle of dorsal surface; metatarsi I–IV brown annulated. Palpal organ: bulbus bean-shaped, set slightly diagonally across posterior half of cymbium, protuberance at 1 o'clock position, broad basis of embolus stretches from roughly 3 to 6 o'clock position, more distally embolus thin; tibial apophysis thin, long, in apical half slightly bent dorsally, then half way along bent very slightly in the opposite direction. In

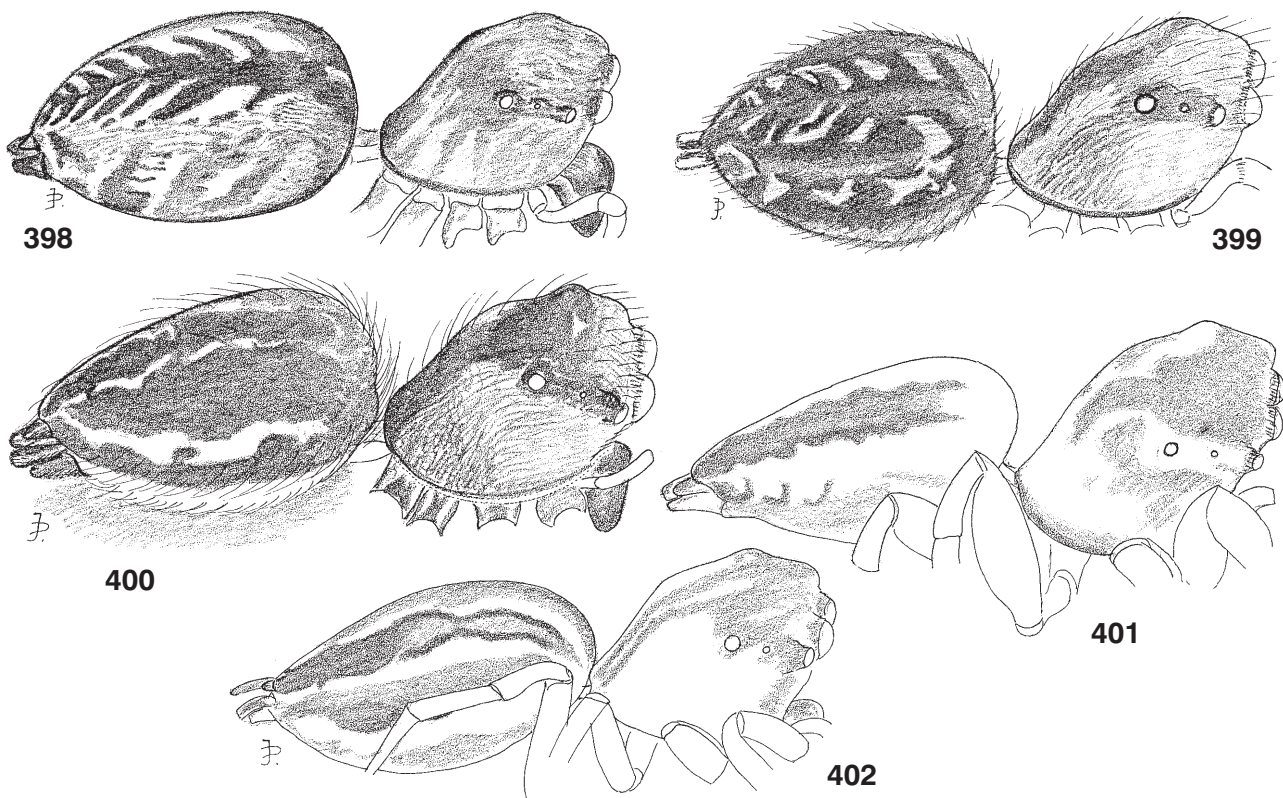
some specimens minute apical bifurcation of embolus, also shown in Hadjissarantos (1940: Fig. 35).

Female. Cephalothorax covered by mixture of black (on relatively fresh specimens) and light scales, denser concentration of light scales form small median spot between eyes III and two thoracic streaks delimiting black median one – all these neither sharp nor contrasting; also some irregular small light spots; sides somewhat lighter mosaic, ventral margin of carapace black pigmented. Abdomen dark grey with black median streak of fused chevrons, with their posterior angles gradually becoming longer in the posterior part of abdomen, delimited on each side, often strikingly, by whitish setae, gradually passing into grey marginal area; whenever the white setae are lost, the pattern disappears partially or totally. The presence of three anterior angles of the streak is a species indicator, these are absent in *M. neglectus* where narrow, anterior part of the streak is delimited by thin, white parallel lines. Margins of dorsal surface covered by brownish and whitish setae; across posterior half of sides of abdomen two diagonal white lines, which may be broken into several pairs of dots.

Frontal aspect: face reddish brown, contrasting with intensely black chelicerae, which are thick; a few whitish setae laterally on clypeus and beneath AME but absent on the mid-length of clypeus; eyes I surrounded with whitish setae, there are a number of black bristles entering broad space between ALE and AME, long sparse white setae above chelicerae, some entering surface of chelicerae as well. Pedipalps yellow with brown bases of segments and brownish yellow tarsus; numerous black



Figures 394–397. *Mogrus neglectus* (identified as *M. canescens* in O. Pickard-Cambridge collection), general appearance (394), epigynum (395), internal structure of epigynum (396), and details of single spermatheca and channel (397).



Figures 398–402. External appearance of females, *Mogrus logunovi* (398, 399), *M. neglectus*, note almost parallel white lines in anterior half of abdomen (400), *M. sinaiicus* (401), *Mogrus* sp. A. (402).

bristles intermixed with long whitish setae; tibia and patella I yellow, dark annulated. In some specimens eyes I surrounded with dense light fawn setae, lighter under ALE and near ventral edge of clypeus; clypeus light fawn, variable with density of horizontal white setae and colour intensity; explanation of these differences require further studies. Legs: dark yellow with blackish brown annuli; femora I–II with apical dark annuli, femora III–IV with both basal and apical dark annuli as well as ventral half of lower lateral surfaces, but dorsal surfaces yellow; hairy appearance. In some specimens darker dorsal median line. Ventral aspect: sternum light brown with dark margin; coxae yellow, abdomen like male, with median area dark and marginal areas light, the lines of spots located on dark area (in contrast to male).

Epigynum: median sclerotized plate broadly truncated posteriorly; copulatory openings in the posterior half of epigynum, broadly spaced, sclerotized folds outside slits posteriorly straight, or slightly constricted posteriorly, but not as much as in *M. neglectus*.

Membranous copulatory channel narrower than in *M. neglectus*, passes posteriorly into bent channel, running first anteriorly and only later bending transversely, with a prominent accessory gland at the top of the bend, then appears either to turn back and in a tight, more sclerotized coil entering narrow spermatheca, half way

along length of copulatory channel, or it passes directly into sclerotized spherical spermatheca; the difference presumably due to imprecise observation.

Epigynum sclerotized, with posterior ends of semi-circular groove broadly spaced, or only indistinctly narrowed. Final identification by anteriorly bent, soft transverse channels with scent pore in the middle, median spherical spermathecae.

Measurements (mm). Female. Length of cephalothorax 2.92; length of abdomen 3.82; length of 5 segments of leg I 5.50.

Seasonal appearance of adult specimens. Males – II, III, IV, XI, XII; females – II, III, IV, V, VII, VIII, IX, X, XII.

Distribution. Jordan (Wadi Ram). Israel: Jerusalem (11); Nahal Sekhar (sands); (15) Arad, Avdat, Be'er Mash'abbim, Haluqim, Hatira, Revivim, Sede Boqer, Sede Zin, Shivta, Yerocham (17)

Remark. Specimens from Jordan differ from Negev by abdominal pattern: in female lighter, with shorter angles protruding from median streak, in male by slightly different shape of median streak. However, genital organs do not seem to be different (Figs 427–432).

Etymology. Named for Dr. D.V. Logunov, formerly of the Zoological Museum, Institute of Systematics and Ecology of Animals, Novosibirsk, Russia, in gratitude for his valuable co-operation and useful suggestions.

Remark. Dr. D.V. Logunov has called my attention to the specific identity of syntypes of *Mogrus neglectus* and *Mogrus dumicola*, illustrated in my paper of 1991 (Andreeva, Kononenko and Prószyński, 1981), which forces me to retain the name *Mogrus neglectus* for the species previously called *M. dumicola* and to change all identification of "*Mogrus neglectus*" (prior to December 1996) to the new name *Mogrus logunovi*. At the same time, I received new specimens from Dr. R.R. Jackson, which allowed me to define the differences between these species.

***Mogrus neglectus* (Simon)**

(Figs 394–397, 400, 407–410, 413–414, 419–420, 425–426, 723–725)

Dendryphantès neglectus Simon 1868: 639;

Salticus canescens: O. Pickard-Cambridge, 1872: 323 (nec *Dendryphantès canescens* C. L. Koch 1846);

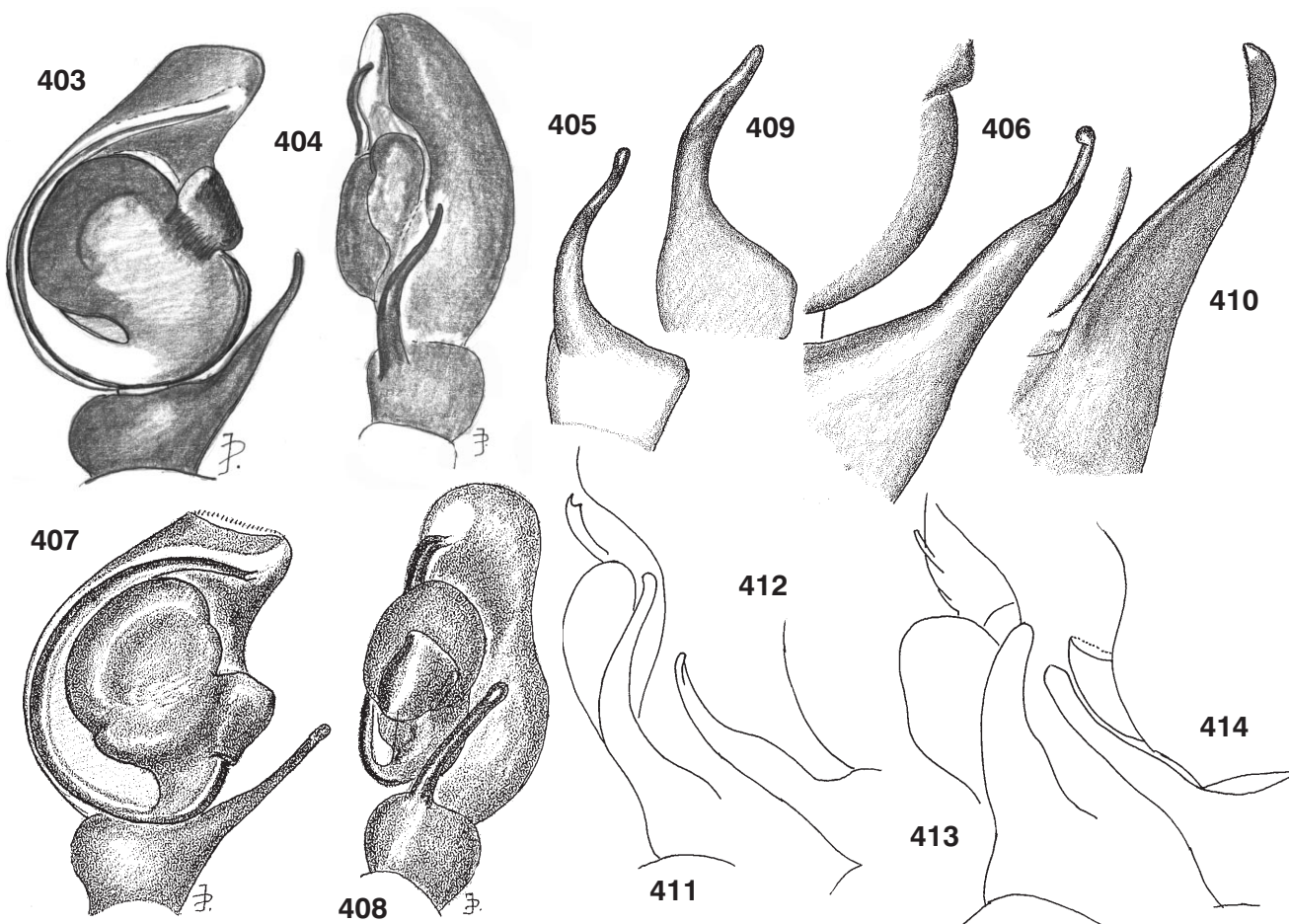
Salticus dumicolus O. Pickard-Cambridge, 1872: 341–342, **syn. nov.** *Salticus indistinctus* O. Pickard-Cambridge 1872: 342–343 (synonym uncertain);

Mogrus neglectus: Hadjissarantos 1940: 103, Fig. 35; Andreeva, Kononenko and Prószyński 1981: 91, Figs 18–21; Logunov 1995: 600–601, Figs 32–40;

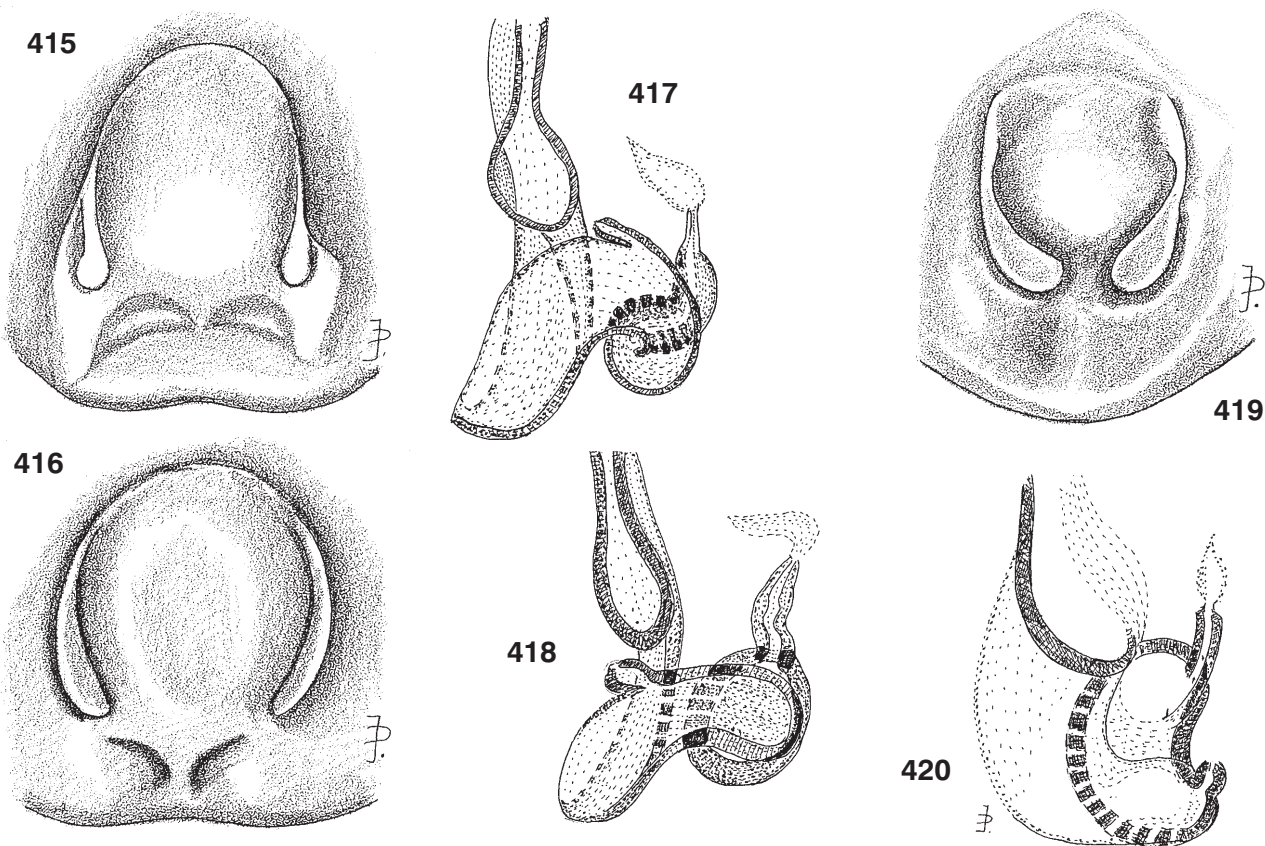
Mogrus dumicola: Andreeva, Kononenko and Prószyński 1981: 91, Figs 15–17.

Diagnosis. Males – blackish, with white setae on clypeus; bulbus protuberance larger than in *M. logunovi*, located at 3 o'clock position, shape of tibial apophysis shown in Figs 407–410. Females with abdomen blackish, median streak delimited by narrow white lines and spots. Epigynum sclerotized, furrows semicircularly bent, with posterior ends narrowly spaced, spermatheca bean shaped, copulatory channel reach spermatheca by posterior bend, the scent pore posterior median; abdominal pattern darker, pairs of white lines on anterior abdomen thin, almost parallel, serrated dark streak begins near mid-length of abdomen.

Remarks. The epigynum of syntype specimen of *Salticus dumicolus* O. Pickard-Cambridge, 1872, shown in Andreeva et al., (1981, Fig. 15), appears conspecific with *Mogrus neglectus* (Simon, 1868) shown in Figs 18–19 (ibid.) and with males shown in Figs. 16–17, 20–21 (ibid.), as well as other illustrations of *Mogrus neglectus*, published elsewhere. We have, therefore to recognise the name *Mogrus neglectus* (Simon, 1868) as the



Figures 403–414. *Mogrus logunovi*, palpal organ ventrally (403), laterally (404), tibial apophysis laterally (405) and ventrally (406); *M. neglectus*, palpal organ ventrally (407), laterally (408), tibial apophysis laterally (409) and ventrally (410) (tibial apophyses drawn from different specimens than palpal organs). Comparison of shape of tibial apophysis of *M. logunovi* laterally (411) and dorsally (412) and *M. neglectus* laterally (413) and dorsally (414).



Figures 415–420. *Mogrus logunovi*, epigynum (415, 416), spermathecae (417, 418); *M. neglectus*, epigynum (419), spermathecae (420).

valid name of this species (O. Pickard-Cambridge 1872), and the name *Mogrus dumicolus* (O. Pickard-Cambridge, 1872) becomes a junior synonym. Specimens in the Israeli collections identified by myself until the end of 1996 as *M. neglectus* should be renamed *Mogrus logunovi* – see description above.

Single female of *Mogrus canescens* mentioned by O. Pickard-Cambridge (1872: 323) from “plains of Jordan”, (Figs 394–397) resembles specimens of *Mogrus neglectus* from Israel. It is not certain whether O. Pickard-Cambridge correctly interpreted C.L. Koch’s description (1846: 80 TF. 1144).

Identification by Wesolowska and van Harten (1994) is uncertain; there is no reason given for identification and unless the type specimen was checked, which is not indicated, it cannot be accepted.

Females found during breeding season (IV–VI) in white silk retreats (about 1.5 cm in diameter) on branches of small thorny shrubs, occurring together with *M. logunovi* on the same shrubs, in a border zone between Mediterranean and desert vegetation. Strikingly different coloured female with two striking white streaks along abdomen of *M. neglectus* in the same area showed no difference in epigynum (Figs 723–725), with normal, dark female. This variability may be connected with the mode of living of female *Mogrus*, which are presumably safe

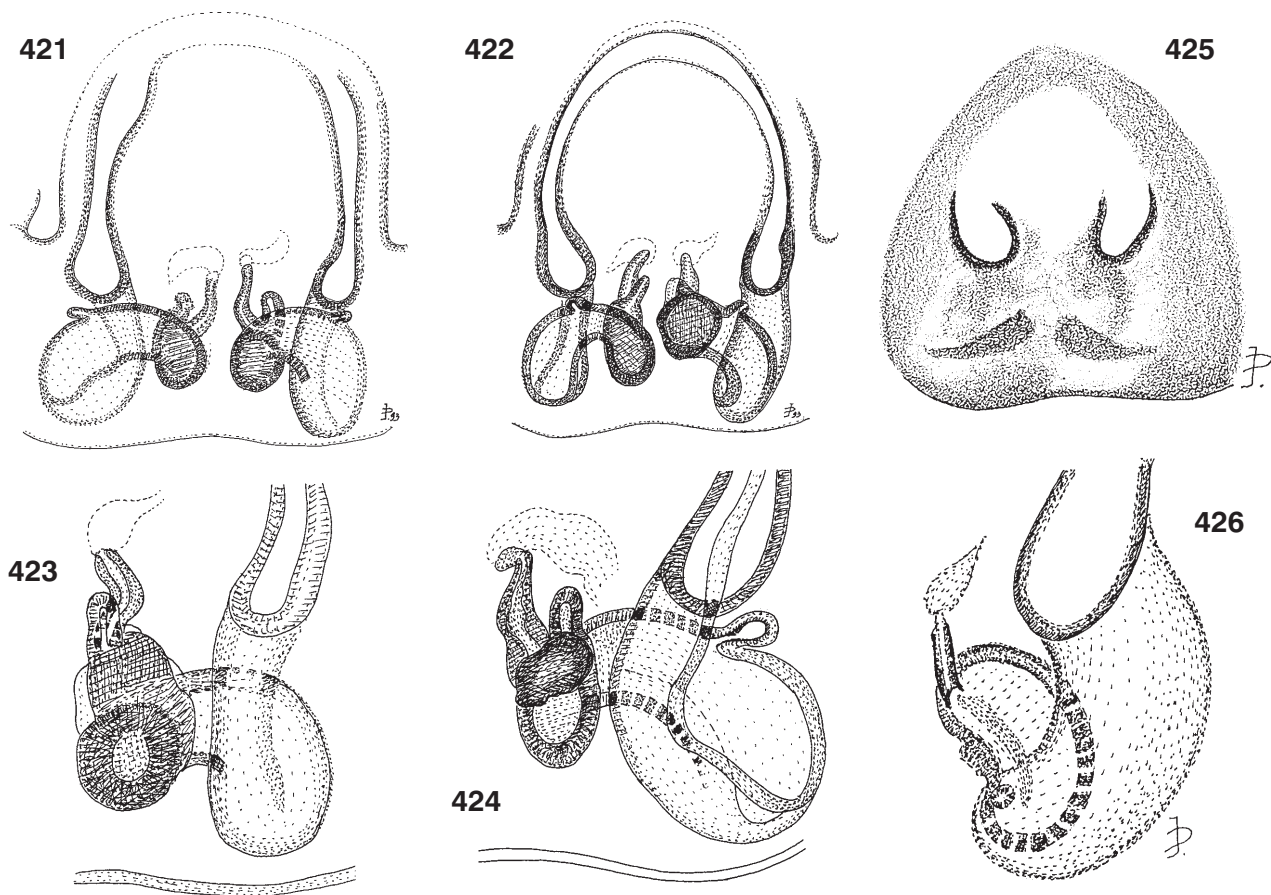
from detection by predators in their silky retreats, atop shrubs in the semidesert environment. In spring males live on the ground, when females are already in the nest, so visual stimuli may also be less important for the recognition of the sexes. And so external coloration may be not as important biologically, as in other genera of Salticidae.

Description. Male (specimen from Mt. Gilboa). Coloration almost black. Cephalothorax dark brown, on thoracic slopes suffused black, eye field black; almost entirely bald (which may be an artefact), with a few colourless setae, almost invisible. Abdomen appears black, integument dark grey with scattered clusters of adpressed blackish brown setae, no white setae preserved. Face: upper part black, eyes surrounded with black, clypeus brown with adpressed white setae and longer white setae overhanging cheliceral bases and forming triangular “beard” in the median part of clypeus; chelicerae dark brown

Palpal organ: characteristic for the genus, bulbus protuberance larger than in *M. logunovi*, located at 3 o’clock position, shape of tibial apophysis shown in Figs 407–410.

Legs I–IV appear dark, with blackish lateral surfaces, dorsal surfaces of femora, patellae and tibiae I–IV with darker median line, tarsi – metatarsi I–IV black with lighter rings near both ends.

Ventral aspect: labium, maxillary plates and sternum black, coxae black with large, oval, yellowish grey spots.



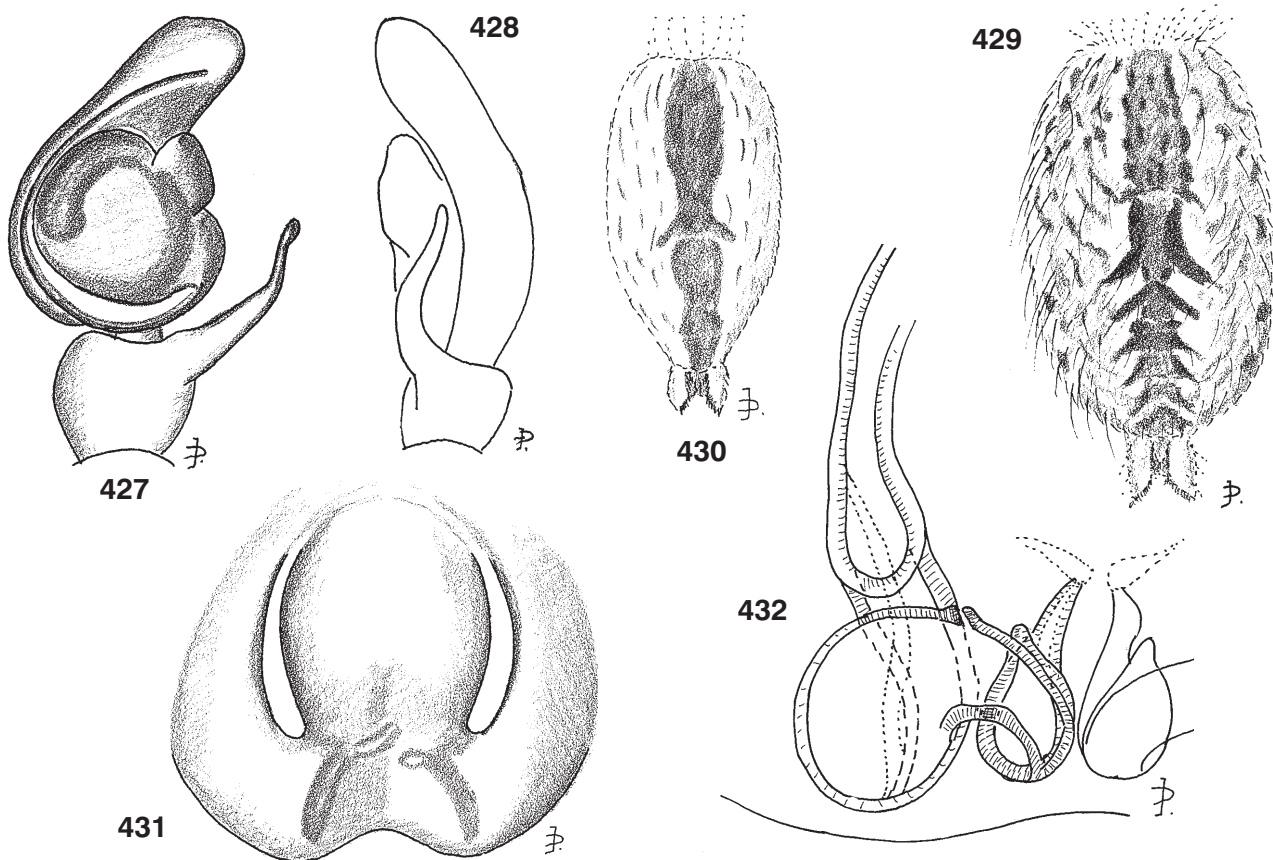
Figures 421–426. *Mogrus logunovi* (variation in specimens from Negev), internal structure of epigynum (421, 422) and details of spermatheca dorsally (423, 424); *M. neglectus*, specimen (from uncertain locality) with weakly sclerotized epigynum (425), but fully developed internal structures, spermathecae (426).

Abdomen ventrally: lung book covers light olive grey, separated by dark space, median area of remaining abdomen blackish, delimited marginally by two rows of light dots. Spinnerets blackish brown.

Female. Cephalothorax light fawn, with an indistinct pattern of adpressed white and, in a smaller quantity, brown setae. Eye field with broad white areas along anterior and lateral margins (medially to lateral eyes), median area light fawn with central round white spot (diameter about 22% of eye field length); limited posteriorly by a narrow chevron-shaped dark brown mark, followed on thorax by a median dorsal streak, lighter brown with central white setae; this brown streak becomes much darker brown on the posterior slope of thorax owing to occurrence of dark brown adpressed setae; remaining dorsal surface of thorax covered with whitish adpressed setae. Sides of cephalothorax light fawn changing gradually to whitish near the ventral edge.

Abdominal pattern: dark grey with black median streak delimited in the anterior half of abdomen by thin, white, parallel lines; the streak in the posterior half consists of small fused chevrons delimited by pairs of small spots of white setae, separating angular posterior edges of

chevrons; there is some variation in the size of the white spots; when setae have fallen out, these simply disappear. The abdomen sides are dark grey, similar to dorsal surface, from which it is separated by a thin, slightly wavy white line, possibly consisting of fused thin, elongate spots. Ventral surface of abdomen white. Frontal aspect: the whole face white, densely covered with adpressed and flattened white setae, some white setae overhanging cheliceral bases, long white bristles arising horizontally from clypeus and directed diagonally, white setae surrounding eyes I and making a thin line just above eyes, below edge of eye field. Chelicerae yellow, bulging basally, with sparse thin white setae scattered over their anterior surface. Pedipalps yellow with long white setae. Legs: pale yellow with remnants of darker indistinct annuli or spots of darker setae on some segments; covered with white setae and dark bristles, hairy in appearance; tarsal tufts and claws dark. Ventral aspect: sternum brownish yellow with blackish margins, coxae yellow suffused with grey, anterior ones darker; abdomen with sharply delimited broad median blackish brown streak and two light yellow marginal areas, thin dark lines along their posterior halves. Epigynum sclerotized, oval, with central plate delimited



Figures 427–432. *Mogrus logunovi* (different coloured specimens from Jordan), palpal organ (427), tibial apophysis (428), general appearance of female (429), general appearance of male (430), epigynum (431) and its internal structure (432).

by horseshoe-shaped furrow, ending slightly behind mid-length of plate by small oval broadening on each side, being copulatory openings. These lead to the bag-shaped entrance of copulatory channel, from end of which begins sclerotized bent vesicle of spermatheca, with opening of accessory gland located in its posterior median part. A diagnostic character is posterior constriction of the central plate and copulatory openings located close to each other. In *M. logunovi* these openings are widely spaced and the central plate is not constricted posteriorly, or only indistinctly constricted; instead of large, bean-shaped spermatheca there is a broad, bent soft walled channel running antero-medially, with sclerotized spermatheca, about half the size, at the end.

Measurements (mm). Male. Length of cephalothorax 2.60; length of abdomen 2.80; length of 5 segments of leg I 6.86. Female. Length of cephalothorax 2.92; length of abdomen 3.08; length of 5 segments of leg I 5.50.

Seasonal appearance of adult specimens. Males – IV; females – IV, V, IX.

Distribution. Greece, Turkey, Azerbaijan. Israel: Givat Hamore (2); Gilboa (6); Jerusalem (11); Ma'ale Adumim (12); Be'er Sheva, Park Sayret Shaked (15); Ma'agarat Loz, Nahal Sekher.

Mogrus sinaicus Prószyński

(Figs. 401, 433–435)

Mogrus sp. 1: Prószyński 1989: 42, Fig. 23, 26, 29–31;
Mogrus sinaicus Prószyński, 2000: 255, Figs 89–91.

Diagnosis. Epigynum closely resembling *M. fulvovittatus*, from which it differs by spermatheca folded only at its distal, posterior end, and prominent accessory gland at the anterior end. Median abdominal streak white contoured.

Remarks. Conspecificity of Saudi Arabian and Sinai specimens tentative, based on similarities in spermatheca and some resemblance in colour pattern, assuming that they have changed differently in both specimens.

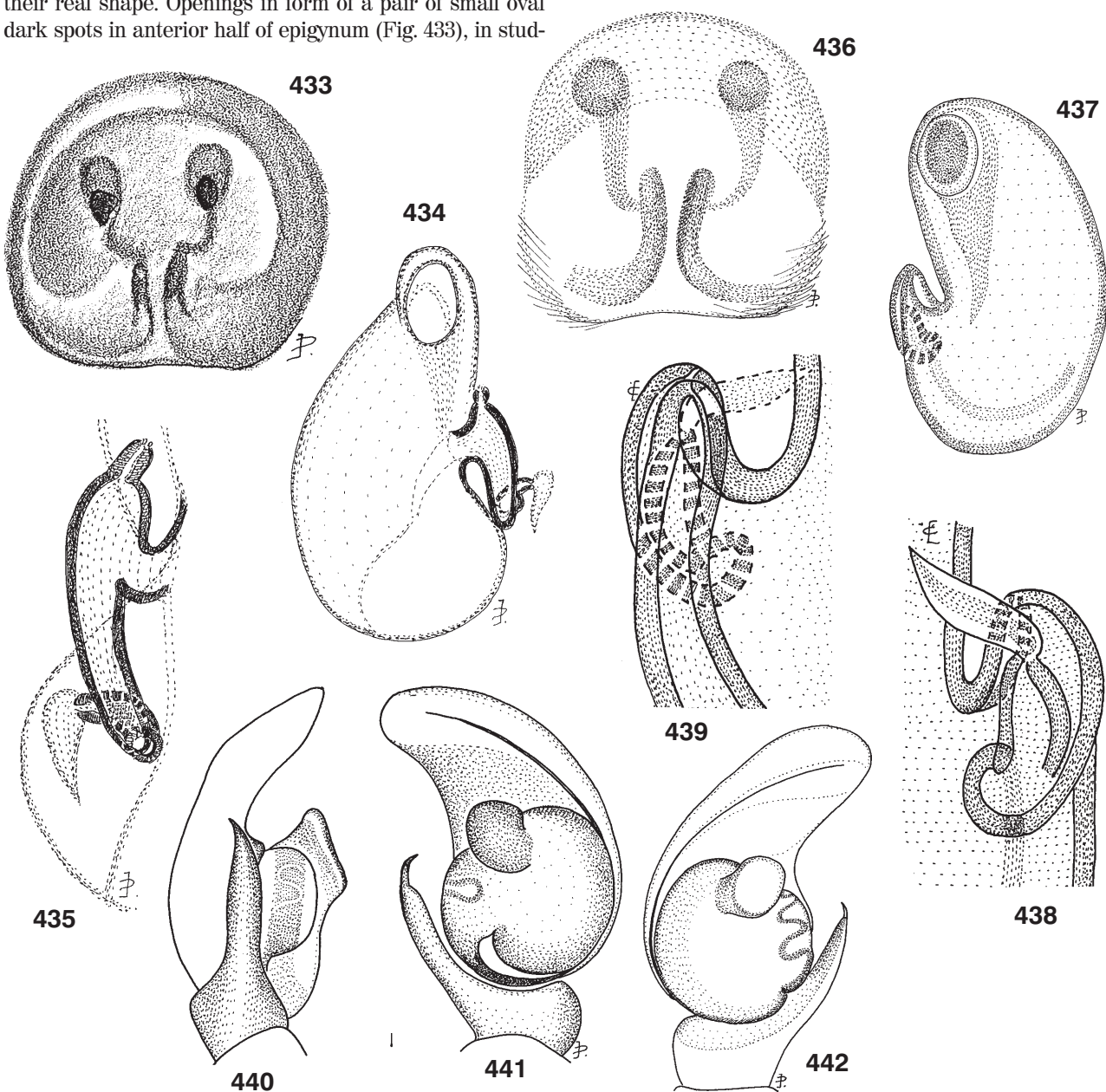
Description. Female (holotype). Cephalothorax brown with dense adpressed whitish setae, posterior and lateral borders of eye field with more conspicuously whitish setae; getting lighter ventrally, lower sides light yellow; light brownish median thoracic streak ending at the posterior border of the eye field. Abdomen: white with darker, light brownish yellow median serrated streak (apparently black on alive specimen) not delimited by any contour; that streak ends before reaching the anterior edge of adomen. White dorsal surface passes into greyish-white sides, with-

out any delimiting darker lines or spots. Frontal aspect: eyes I surrounded with white setae, clypeus very densely covered with long adpressed white setae, some of them overhanging blackish brown chelicerae; pedipalps and legs I yellow. Legs: yellow with femora lighter, spines darker. Ventral aspect: light yellow to whitish.

Epigynum weakly sclerotized, without distinct furrows with sclerotized edges, characterized by pattern of pigmented areas and shadows of internal structures in form of a pair of dark parallel lines, bent and more closely spaced in the posterior half of epigynum, corresponding with various parts of internal structures, but bear little relation to their real shape. Openings in form of a pair of small oval dark spots in anterior half of epigynum (Fig. 433), in stud-

ied specimens plugged by waxy stoppers, which fell out after maceration in KOH. The internal structures consist of membranous and almost transparent copulatory channels, usually very broad, often balloon-shaped, with a small, bent and poorly visible channel on their median surfaces, passing into very small sclerotized spermathecae; all these details are apparently similar in several species of this group, which I have seen. The specific differences are minute terminal parts of spermatheca, especially position and shape of accessory gland openings.

Measurements (mm). Female. Length of cephalothorax 3.25; length of abdomen 4.00.



Figures 433–442. *Mogrus sinaticus*, epigynum (433), spermatheca with channel (434), details of spermatheca (435). Relevant species *Mogrus fulvovittatus* (specimen from Egypt: Siwa; NHM-London coll.), epigynum (436), spermatheca (437), details of spermatheca ventrally (438), and dorsally (439), palpal organ laterally (440), ventrally, mirror reflection (441); palpal organ ventrally (specimen from Egypt: Assuan; Reimoser coll.) (442).

Seasonal appearance of adult specimens. Females – V.

Distribution. Egypt: Sinai – W. Nasib; Saudi Arabia – Khasm Khafs.

***Mogrus* sp. A**

(Fig. 402)

Remarks. Several specimens in bad condition, the final identification and detailed description is postponed until fresh specimens become available. Resembling *M. fulvovittatus* and *M. sinaicus* by epigynum. However, their abdominal pattern is more differentiated, presently median reddish streak contoured with thin white line, remaining marginal parts of dorsum grey with thinner reddish streak and a white marginal line around marginal edge, delimited ventrally by grey in the posterior half of abdomen, merging anteriorly with white anterior half of the sides, and ventral coloration of abdomen. Frontal aspect: face white, chelicerae yellowish brown, pedipalps and legs whitish yellow. Legs: whitish. Ventral aspect: generally whitish. Internal structure of epigynum not studied.

Measurements (mm). Female. Length of cephalothorax 3.60; length of abdomen 3.64.

Material. Several females from Kallia, Leg. Shulov in 1939. Coll. HUU.

Seasonal appearance of adult specimens. Females – VIII.

Distribution. Israel: Kallia (13).

Relevant species

***Mogrus cognatus* Wesolowska et van Harten**

Mogrus cognatus Wesolowska et van Harten, 1994: 53–56, Figs 112–114;

Remarks. Known from Yemen, palpal organ resembles *Mogrus neglectus*, but differs by narrower bulbous, location of protuberance at 12 o'clock position and longer thin part of tibial apophysis.

***Mogrus dillae* Prószyński**

Mogrus dillae Prószyński, 1989: 40, Figs 18–20;

Mogrus dillae: Wesolowska and van Harten 1994: 56, Figs 115–116.

Remarks. Anterior median parts of epigynum with folds and copulatory openings ends close to mid length of epigynum, soft copulatory channels longer, making two loose coils, sclerotized spermatheca elongate, bent and branching.

Seasonal appearance of adult specimens. Females – X.

Distribution. Saudi Arabia – Wadi ad Dilla.

***Mogrus fulvovittatus* Simon**

(Figs 436–442)

Mogrus fulvovittatus Simon, 1882;

Mogrus bonneti: Denis, 1947 (nec Savigny et Audouin 1827): 76, pl. 5 Figs 10–12;

Mogrus fulvovittatus: Andreeva, Kononenko and Prószyński 1981: 85–87, Figs 1–5; Prószyński 1989: 41–42, Figs 21–22; Wesolowska and van Harten 1994: 58, Figs 117–118.

Remarks. Characterized by male tibial apophysis gradually narrowing, its pointed tip bent. Female copulatory openings are visible as dark round spots, located anteriorly; darker shades are visible through semitransparent tegument of epigynum being fragments of internal structures but giving no indication of their real shape: first are thin shades from openings, straight, parallel but spaced, later there are darker semiarches bending medially and joining in the posterior half of epigynum. Copulatory channels membranous, large and swollen, often vesicle shaped, to whose median side are attached minute, sclerotized spermathecae; in this species spermathecae connected to channels anteriorly, elongate but bent and folded in the middle, with posterior part visible on the background of the anterior half, with distal end and conical membranous fertilisation channel directed anteriorly; I have not noticed accessory glands.

Distribution. Egypt – Siwa; Saudi Arabia – Wadi Phi Khul, Jebel; Yemen.

***Mogrus mirabilis* Wesolowska et van Harten**

Mogrus sp. 2: Prószyński 1989: 42–44, Figs. 24, 27, 32–34;

Mogrus mirabilis Wesolowska et van Harten, 1994: 58–60, Figs 119–121.

Remarks. According to Wesolowska males are conspecific with *Mogrus* sp. 2 of Prószyński (1989: 42–44).

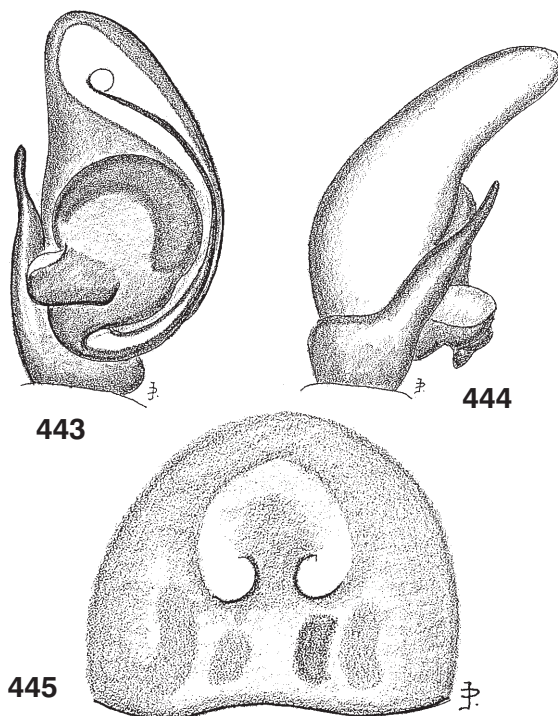
Distribution. Saudi Arabia and Yemen.

***Mogrus praecinctus* Simon**

(Figs 443–445)

Mogrus praecinctus Simon, 1890: 117;

Mogrus portentosus Wesolowska et van Harten 1994: 60–61, Figs 122–127, syn. nov.



Figures 443–445. Relevant species *Mogrus praecinctus* male (lectotype, designated by M.E. Galiano, “10776” from Aden), palpal organ dorsally (443), laterally (444), epigynum (445).

Remarks. Lectotype of *Mogrus praecinctus* Simon, 1890 (male, female being paralectotype) from Aden "10776", in Simon collection in MNHN-Paris was designated by M.E. Galiano by labelling, but not published. It is apparently conspecific with male of *Mogrus portentosus* Wesolowska, van Harten 1994. Lectotype is not congeneric with specimen "*Mogrus praecinctus* Sim. Khor Atta, Werner, 1905, det. Simon" in NHM-Vienna, studied by Prószyński (1984c: 104) as *Pellenes praecinctus* (Sim.), now transferred to genus *Evarcha*.

Tip of embolus twisted into small circle in all male specimens I have seen. Epigynum of paralectotype specimen (Fig. 445) is of generalized *Mogrus* type; more details of epigynum as well as its internal structure were given by Wesolowska and van Harten (1994: Figs 125–127) externally it closely resembles *M. neglectus*, but its internal structure seems to be more complicated.

Distribution. Yemen – Aden.

Mogrus sp. 3

Mogrus sp. 3: Prószyński 1989: 44, Figs 25, 28, 35–36.

Remarks. Known from Saudi Arabia, closely resembling *M. fulvovittatus*, from which it seems to differ in minor details of epigynum, spermathecae and abdominal pattern. Males unknown.

Seasonal appearance of adult specimens. Female – II.

Distribution. Saudi Arabia. Israel: not yet found.

Myrmarachne MacLeay, 1839

Type species. *Myrmarachne melanocephala* MacLeay, 1939: 11.

Introductory remarks. Large genus of ant-like jumping spiders, perhaps the most widely known example of that particular type of adaptation, containing 206 nominal species world-wide. It is recognisable by general appearance, with long petiolus, deep constriction on cephalothorax and, in many species constriction on abdomen also. Cephalic part is always higher than thoracic. These constrictions, as well as associated white spots and modifications of legs give *Myrmarachne* protective resemblance to ants, often to particular species of ants.

There is a group of usually much larger species in Africa and Asia, having no abdominal constriction, often considered as the genus *Belippo* Simon, 1909; the problem of separation of these genera, or keeping them as a single genus, require further studies. Males have overgrown chelicerae protruding horizontally forward, their size varying from a half to a whole length of cephalothorax, in some species even longer; females have short chelicerae set vertically.

Myrmarachne has a peculiar and very constant type of palpal organ and rather similar type of epigynum, well illustrated in the drawings in this paper. Identification of genus *Myrmarachne* usually begins by pointing to their numerous retrolateral cheliceral teeth, a character rather redundant in view of their obvious appearance. Identification of species of *Myrmarachne* is difficult because of particularly uniform palpal organs and other characters. Study of stained preparation of

epigynum is especially important because of complicated membranous copulatory channels, which have been usually overlooked in studies to date. There is a fundamental revision of *Myrmarachne* of Africa by Wanless 1978. A few papers were recently published on Oriental and Pacific Salticidae, including *Myrmarachne*. In Israel only a single species has been discovered.

Myrmarachne tristis (Simon)

(Figs 446–452)

Salticus tristis Simon, 1882: 212;

Myrmarachne tristis: Simon 1901a: 501, 503; Wanless 1978: 63–66, Figs 36A–H, 37A–E (s. M. t. diversipes); Prószyński 1989: 44–47, Figs 37–43; Wesolowska and van Harten 1994: 63–65, Figs 128–132.

Diagnosis. A typical *Myrmarachne*, characterized in males by broad and moderately short chelicerae with prominent basal constriction; epigynum of female with posterior median pockets on membranous white "window"; anterior, transverse loops of sclerotized spermathecae differ from type species (*M. formicaria*) by having only two bends.

Remarks. Included provisionally by Wanless into the *tristis* group of species, characterized by shape of epigynum (as described above), and by S-shaped bent pedipalpal apophysis in males; this group contains 24 species in Africa, as well as several species in SE and E Asia.

Males and females. Close to general appearance of the genus, differs by chelicerae in males and epigynum in females, as described above.

Distribution. Egypt; Libya; Saudi Arabia; Yemen; India. In Israel: 'En Kerem (11); 'En Tamar (13); Nahal Sekher (on *Tamarix* among *Tapinoma* ants) (15).

Napoca Simon, 1901

Type species. *Salticus insignis* O. Pickard-Cambridge 1872: 324.

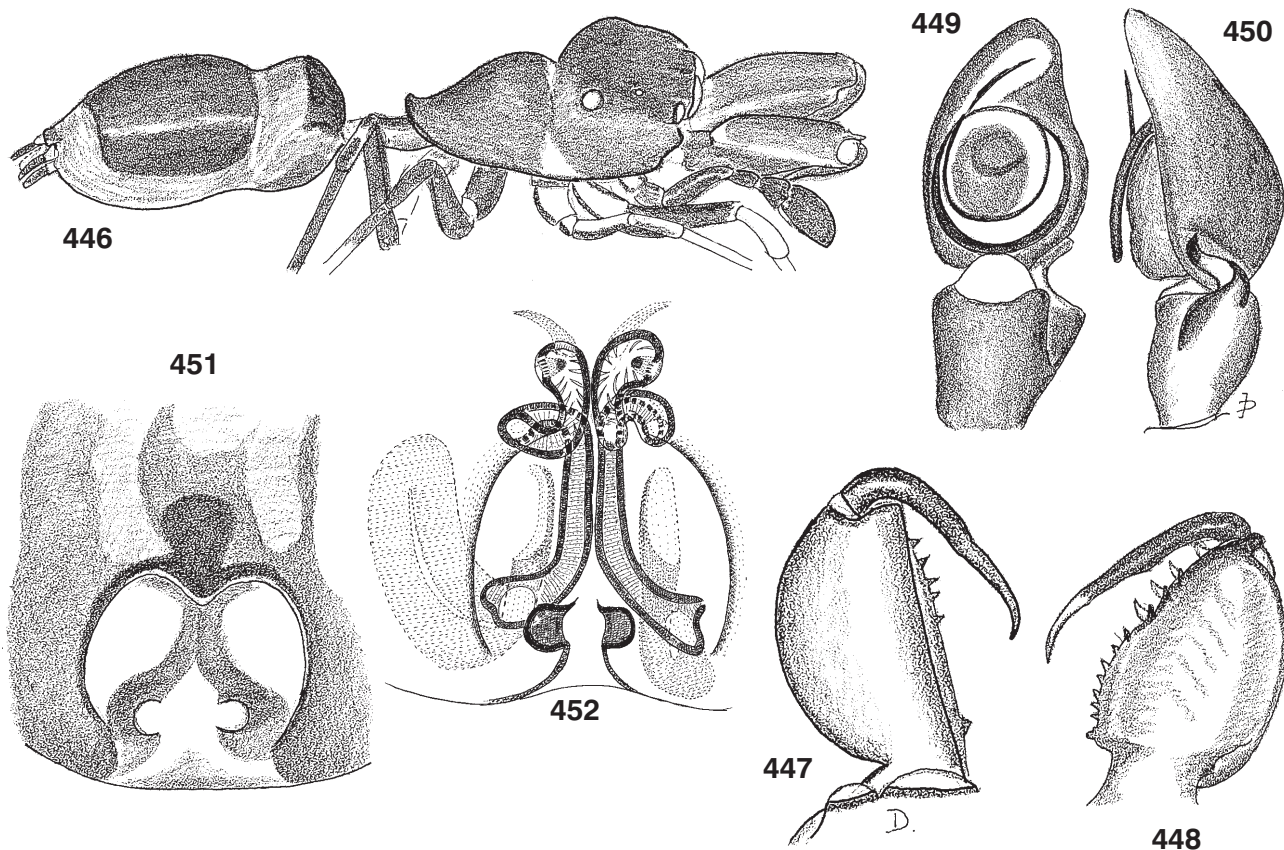
Introductory remarks. A genus of unclear position, closely related to *Bianor* Peckham et Peckham, 1885, transferred to *Napoca* by Simon (1901). That view was seconded recently by Logunov (2001 [2000]: 280–281), but based on different characters (presence of bulbus protuberance and broad tibia and femur I, which disagree with Logunov's view on genus *Bianor*. Genus *Napoca* contains at present only single species, which is questionable and apparently provisional.

Napoca insignis (O. Pickard-Cambridge)

(Figs 133–135)

Salticus insignis O. Pickard-Cambridge, 1872: 324–326;

Napoca insignis: Prószyński 1984: 57; *Napoca* i.: Logunov 2001 [2000]: 280–281.



Figures 446–452. *Myrmarachne tristis* (male), general appearance (446), overgrown chelicera dorsally (447) and ventro-laterally (448), palpal organ ventrally (449) and laterally (450); female, epigynum (451) and its internal structure (452).

Diagnosis. Abdomen short and broad, as broad as cephalothorax, bulbus round, without any flattening.

Description. Male. “The spider appears very broad, cephalothorax and abdomen being about of equal length, the abdomen covers tightly sloping part of the thorax. The general colouration blackish reddish brown, with the legs darkest” (O. Pickard-Cambridge 1872: 324–326). Cephalothorax: eye field flat and long, broader posteriorly, eyes II closer to eyes I; thoracic slope steep, begins just behind eye field; a few whitish scales dorsally. Abdomen flattened and oval, truncated anteriorly and pointed and oval posteriorly; glossy blackish red-brown with a few pale scales. Frontal aspect: chelicerae strong, straight and flattened anteriorly. Legs: I longer and stronger than II–IV.

Palpal organ: bulbus oval, almost round which distinguishes it from remaining species where is anteriorly flattened; apex of apophysis does not bend ventrally but slightly bent dorsally.

Measurements (mm). Male. Length of cephalothorax and abdomen 3.34 mm.

Seasonal appearance of adult specimens. Male – III. (collected in 1865).

Distribution. Israel: Hebron (11).

Neaetha Simon, 1884

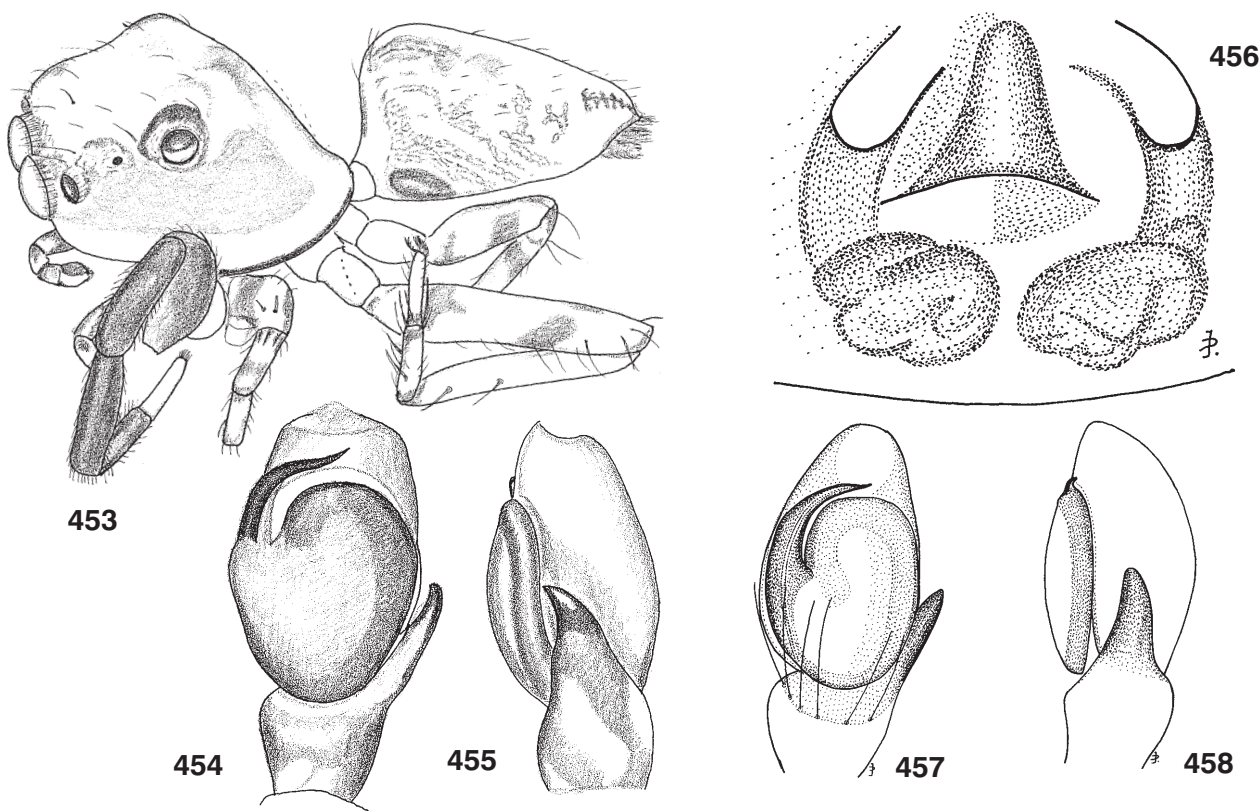
Type species. *Attus membrus* Simon 1868: 617.

Introductory remarks. A Pelleninae genus related to *Bianor*, containing 11 nominal species, occurring in the Mediterranean area, Africa and the Arabian Peninsula.

In comparison with *Yllenus*, cephalothorax is broad and low, eye field more angular at eyes III, posterior slope begins at about $\frac{1}{2}$ of length of thorax, and not immediately behind eyes III. Leg proportions unusual – III and I distinctly longer (by 32–39%) than IV and II (in *Yllenus* legs IV distinctly longest). Palpal organ, and especially epigynum, resembling *Bianor*. Bulbus is elongate oval with broader embolus, epigynum has much longer and narrower vaginal roof with entrance channel leading straight to heavily sclerotized spermatheca, without U-shaped, less sclerotized portion of the channel inserted in its middle.

Neaetha murphyorum Prószyński (Figs 453–455)

Neaetha murphyorum Prószyński, 2000: 256, Figs 93–95.



Figures 453–458. *Neaetha murphyorum* (male from Negev), general appearance (453), palpal organ ventrally (454), laterally (455); *N. oculata* (from Aden), epigynum (456), palpal organ ventrally (457), laterally (458).

Diagnosis. Shape of body and size resembles *Yllenus*, occurring in the same area, but colour pattern is strikingly different. Legs I robust, III the longest. Closely related to *Neaetha oculata*

Description. Male. Cephalothorax light yellow, sides dark with adpressed whitish setae, marginal belt strikingly white, but ventral edge is black; eye field yellow with minute colourless scales, indistinct greyish X-shaped spot between eyes III, there is a grey, median dorsal line along the thorax. Abdomen yellowish white with pattern of grey lines suffused with white, median streak splits in the mid-length of abdomen, giving two diverging diagonally lines, followed posteriorly by grey lines converging towards spinnerets, which delimit diamond-shaped light area in the posterior half of abdomen. Frontal aspect with high belt of strikingly white scales across clypeus, followed by a row of short scales overhanging chelicerae, a few small scales on surface of chelicerae. Chelicerae small, shorter than diameter of AME, and strikingly narrower than cephalothorax (about $\frac{1}{10}$ of cephalothorax width). Ventral edge of cephalothorax except clypeus, black, beginning under ALE. Pedipalps very small, bulbus oval, embolus bent in front of bulbus, tibial apophysis simple; dark, with lighter spots, white setae and scales apically

on femur; striking white scales on apical half of patella and dorsally on brown cymbium. Legs III the longest, mainly owing to very long femur, although legs I seem larger and are certainly more robust, dark brown, except yellow tarsi; remaining legs whitish with dark brown spots, legs II and IV distinctly smaller.

Measurements (mm). Male. Length of cephalothorax 1.43; length of abdomen 1.32; length of 5 segments of leg I 3.12; length of legs order: III, I, IV, II.

Seasonal appearance of adult specimens. Male – IV.

Distribution. Israel: Be'er Mash'abbim. (15)

Etymology. Named for a very sympathetic couple of prominent arachnologists – Frances Murphy, recently deceased, and John Murphy, both considered good friends by many, the author included.

Relevant species

Neaetha aegyptiaca Denis

Neaetha aegyptiaca Denis, 1947: 78 Tab. 5, Figs 14–16;

Neaetha aegyptiaca: Prószyński 1984b: 93.

Remarks. Species of uncertain systematic position.

Distribution. Egypt – Siwa Oasis.

Neaetha cerussata (Simon)

Attus cerussatus Simon, 1868: 615;
Neaetha cerussata Prószyński, 1984b: 93.

Distribution. Mediterranean: Italy, Greece.

Neaetha oculata (O. Pickard-Cambridge)

(Figs 456–458)

Attus oculatus O. Pickard-Cambridge, 1876: 612 Tab. 60, Fig. 90;
Neaetha oculata: Simon 1890a: 119, 123; Prószyński 1984b: 92.

Distribution. Egypt, Yemen.

Relevant genus *Pachyballus* Simon, 1900

Type species. *Pachyballus transversus* Simon, 1900.

Introductory remarks. The genus was not reported from Israel nor from any Palaearctic parts of Africa and Asia.

Pachyballus rotundus Wesolowska et van Harten

Pachyballus rotundus Wesolowska et van Harten, 1994: 65–67, Figs 133–139.

Remarks. Relevant species from Yemen, with genital organs resembling *Denryphantes* and the body shape comparable with some *Bianor* and *Ballus*. Classification to genus uncertain.

Pellenes Simon, 1876

Type species. *Aranea tripunctata* Walckenaer 1802: 247.

Introductory remarks. Medium size jumping spider, abdominal pattern usually dark with median strikingly white streak, with or without additional transverse or diagonal lines; cephalothorax moderately broad and high, often with white spot behind eyes III; legs robust, with tibia I slightly swollen and narrowing anteriorly. Whilst the above wording may fit several genera once memorized external appearance usually permits immediate recognition. The unmistakable criteria of recognition are structures of genital organs in both sexes, as described below.

Body proportions. Cephalothorax: length 1.54–2.0–2.61 mm; shape broad, its width (expressed in % of cephalothorax length) is 52–60–65% at eyes I, 71–77–86% at eyes III, height 44–50–59%. Eye field extending over 38–43–50% of cephalothorax, also short in relation to its width at eyes I (52–60–65%), trapezium shaped, broadening posteriorly by 5–7–11%; indistinctly narrower than cephalothorax, eyes III are located closely to the edges of cephalothorax. Abdomen: elongate oval tapering posteriorly; its length is 93–118–157%, its width 61–93–125% (expressed in % of length of cephalothorax).

Leg proportions differ in both sexes: in male leg order is I, III (mean 90% of the leg I), IV (mean 69%), II (mean 59%); in female III (mean 119%), I (= 100%), IV (mean 99%), II (mean 78%).

Cephalothorax: dark, usually with white belt behind and beneath eye field, sometimes reduced to intensive white spots behind eyes III (absent in male *P. ostrinus*); often with striking white mark anteriorly on eye field.

Abdomen: dark with intensely white median streak (rarely occurring in other Salticidae), in some cases thin or reduced to a chain of spots; often crossed or approached by transverse white line or lines, sometimes diagonal; anterior edge white, continuing as white marginal line encircling the whole abdomen, in some species broken. Differs from other genera with stripes on abdomen by intensity of white colour, oval shape of short and broad abdomen, short and high appearance of cephalothorax (by which differs from *Phlegra* and *Langona*).

Palpal organ: oval bulbous, on its side originates short and thick embolus, reaching anterior edge of bulbous; the tip of embolus is usually bifurcate (with prongs connected by thin, semitransparent plate) and has complicated structure visible only under high magnification (200 ×) of a good quality stereomicroscope. Tibial apophysis articulate with depression on retro-lateral surface of cymbium, surrounded anteriorly and dorsally with swelling, in some species dorsal swelling is particularly prominent. Epigynum: oval, sclerotized but usually whitish, divided longitudinally by a broad furrow of varying width and length, ending anteriorly with semispherical vaginal roof, usually brown; the furrow separates two lateral depressions or grooves, limited posteriorly by a semicircular margin continuous with edges of furrow, more strongly sclerotized and darker, encircling inconspicuous copulatory openings leading to the compact knot of strongly sclerotized internal channels. Separate chambers of spermathecae not developed. This description may partly fit general outline of epigynum in *Bianor* and *Neaetha*, but these genera differ in proportions and essential details. Exceptional structure of epigynum in *Pellenes ostrinus* and in *P. tripunctatus* (the latter not yet found in Israel) presumably derived from the general type described above.

Key to species of *Pellenes*

1. Abdomen black with prominent white median streak, clypeus with white setae and scales, epigynum with median furrow, vaginal roof and ridges encircling lateral grooves, cymbium without prominent dorso-lateral process **2**
- . Abdomen brown with reddish or golden hue (in preserved specimen) with very thin median white line along posterior half in male, in some specimens on black background, longer line in female; clypeus with golden or orange setae, epigynum single depressed sclerotized plate without median vaginal roof and ridges (Figs. 478–479); cymbium with prominent dorso-lateral process basally; tip of embolus divided into short, thin needle and longer fan-like plate *P. ostrinus*

- 2(1). No transverse or diagonal white lines across abdomen (except anterior marginal); white spots behind eyes III separated, clypeus with very thin white line; tip of embolus divided into long thin needle and funnel-like structure (visible under high power magnification) **3**
- . Abdomen with two pairs of diagonal white lines at the lateral edge, not reaching median white streak; white spots behind eyes III separated but extending anteriorly under lateral eyes; median epigynal groove long, posterior rims of lateral grooves transverse (Figs 471–472) *P. nigrociliatus*
 - . Abdomen crossed by transverse white line or lines **4**
- 3(2). Anterior abdominal white margin broken in the middle, median white streak extends over whole length of abdomen also entering its anterior slope; chelicerae without striking rows of white scales; tibial apophysis shorter; bottom of the embolar split narrow, V-shaped (Figs. 484, 485, 486) *P. epularis*
- . Anterior abdominal white margin continuous, separated by black space from the tip of the median white streak, extending over half or more of abdomen; in male three vertical rows of large white scales on chelicerae; tibial apophysis longer; bottom of the embolar split broadly rectangular (Figs 487–488); in female median epigynal furrow and vaginal roof broad and long, lateral grooves small (Figs 467–468) *P. simoni*
- 4(2). Anterior transverse thick white line makes T-junction with the median white streak, sometimes slightly triangular, but leaving black space before anterior white margin; broad white area behind eye field, sides of cephalothorax light; median epigynal furrow short, posterior rims of the lateral grooves diagonal (Figs 469–470) *P. maderianus*
- . Abdomen black with thin broken white median line joined posteriorly by a pair of thin diagonal lines; lateral surface of cymbium with three large protuberances, fused with tibial apophysis; tip of embolus forms a complicated bent plate; epigynum with a complicated median ridge *P. tripunctatus*

Pellenes epularis (O. Pickard-Cambridge)
(Figs 484–486, 489–491)

Attus calvus: Simon, 1868: 594;
Salticus epularis O. Pickard-Cambridge, 1872: 329;
Pellenes calvus: Prószyński 1984b: 101;
Pellenes epularis: Prószyński 1984b: 101.

Diagnosis. Differs from *P. simoni* by details of tip of embolus and shorter tibial apophysis; line of white scales along the edge of dorsal surface of thorax.

Remark. The present description is based on 5 males “*Salticus aepularis* OPC t. 63, B. 1731” in the O. Pickard-Cambridge collection in Oxford. Another male

is listed as “*Salticus calvus*, jar 1745, t. 25” “Corfu”, but since the type of the latter cannot be found, I retain the O. Pickard-Cambridge name for this species.

Description. Male. Cephalothorax uniformly black, covered with colourless scales; no white spots behind eyes III, longitudinal line of white scales along the edge of dorsal surface of thorax from behind eyes III (visible in 3 specimens, in 2 remnants – a few scales); no white scales beneath lateral eyes, ventral edge dark.

Abdomen black with anterior white semilunar margin, interrupted by a black narrow space, and a median streak along the whole abdomen, broadened slightly in mid-length and gradually narrowing towards both ends; anterior end of median streak penetrates black space in semilunar margin and enters anterior slope of abdomen; white, narrow, marginal line encircles almost the whole abdomen from spinnerets to the anterior slope, in some specimens that marginal line broadens posteriorly.

Frontal aspect: rims of eyes I with very inconspicuous colourless orbital setae, longer dorsally and with fawn hue; clypeus dark brown with a thin straight line of intensely white scales along ventral edge under AME, continuing horizontally on the same level under ALE above edge which bends ventrally. Chelicerae dark brown, without distinct white scales.

Legs: I fawn with femur dark brown, remaining segments light fawn, the lightest is the patella dorsally; legs II–IV light fawn. Ventral aspect: sternum light brown with a few indistinct whitish scales and setae, abdomen pale with brown hue and almost invisible whitish scales; coxae I brown, II–IV pale with brownish hue.

Palpal organ: bulbus approximately oval with embolus arising at 9 o'clock-position; embolus consists of a common fleshy trunk split in its mid-length into external needle shaped embolus proper and plate-like conductor, the latter half twisted along its axis, apically flattened fan-like and semitransparent; tibial apophysis sharp, slightly inclined apically, shorter than half bulbus length, articulates with lateral depression on cymbium and swelling of its basal, dorso-lateral end. The palpal organ is very similar to that in *Pellenes simoni* (O.P.-C.) from which it differs by shorter, less bent tibial apophysis and narrow, V-shaped bottom of the split on embolus trunk.

Measurements (mm). Male. Length of cephalothorax 1.69–2.13; length of abdomen 1.69–2.13.

Distribution. Corfu; Lebanon: Hazbeiya.

Pellenes maderianus Kulczyński
(Figs 459, 469–470)

Pellenes maderianus Kulczyński, 1905: 457;
Pellenes maderianus: Prószyński 1976: 52, Fig. 273, map 139;
Prószyński 1992b: 195–296, Figs 129–131;
Pellenes epularis (in part): Logunov, Marusik and Rakov 1999: 122.

Diagnosis. Female cephalothorax light with dark diamond shaped spot on posterior slope of thorax, legs I

light, with lateral surfaces of patella – tarsus I fawn. Epigynum: median furrow short, narrow (about $1/5^{\text{th}}$ of epigynum diameter), posterior ridges arching diagonally, lacking transverse parts; prominent sclerotized ridges in front of copulatory opening.

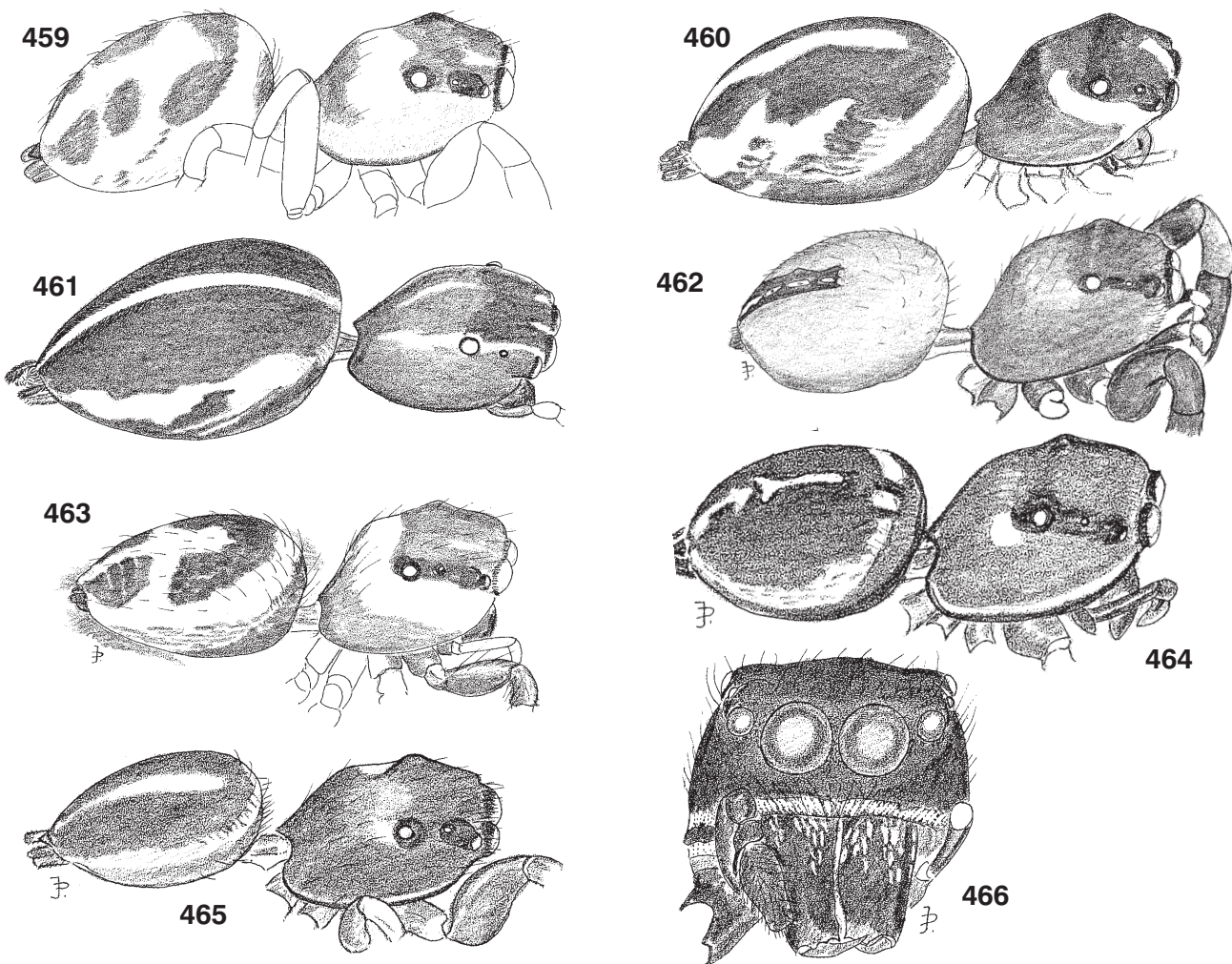
Remarks. Drawing of male holotype of this species provided by Logunov, Marusik and Rakov (1999: Fig. 121) does not seem identical with his drawing (Fig. 111, ibidem) of *P. epularis* from Central Asia, so synonymy of these forms does not seem convincing. There seem to be a group of closely related species, consisting of, among others, from *P. epularis*, *P. maderianus*, *P. nigrociliatus*, *P. simoni*, with minute differences in tip of embolus, difficult to interpretation. Identification of these species require preliminary study of colour pattern differences and individual variation in local populations.

Description. Male (not yet found in the Israel).

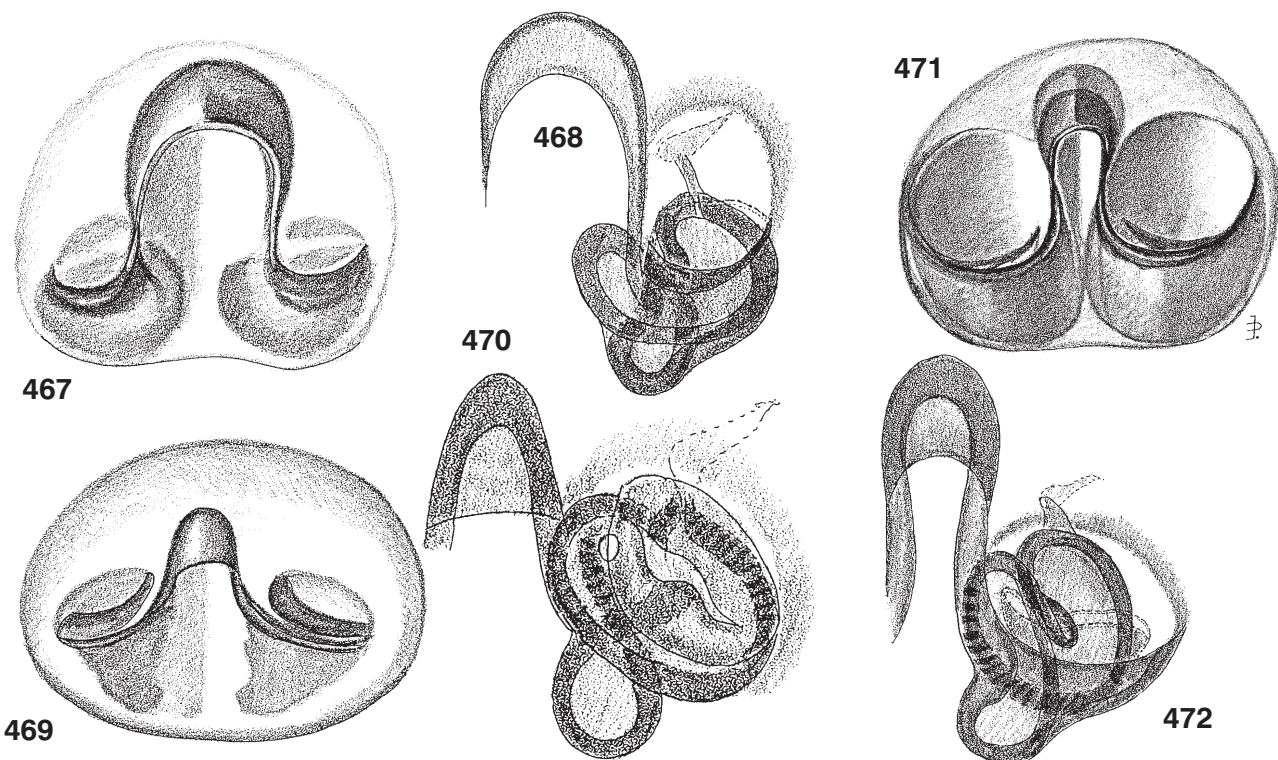
Female. Cephalothorax light yellow, with contrasting blackish eye field and diamond shaped blackish spot on

posterior slope of thorax, covered with long adpressed scales which additionally differentiate coloration: anterior half of eye field is covered with striking white scales which give white appearance (on second specimen these are lost, leaving entirely blackish eye field with a few white scales), posterior half with dark scales; anterior thorax fawn, again with large white scales, but sides with sparse and much smaller inconspicuous scales. Ventral edge light fawn, without striking belts of setae.

Abdomen dark with intensely white median longitudinal streak anteriorly meeting a transverse white belt, together making T-like pattern (the tip of the median streak protruding through the transverse one may be also compared to a white arrowhead); there are thin traces of a second transverse bar, more posteriorly, at about mid-length of abdomen; anterior marginal white line merges with white sides of abdomen. In the Negev specimens abdomen described as whitish with broad, uninterrupted dark pigmented submarginal oval ring,



Figures 459–466. General appearance of *Pellenes maderianus*, female (459); *P. nigrociliatus*, female (460); *Pellenes ostrinus*, female (461) and male (462); *Pellenes simoni* female (463) and variation (? or different species) in two males (464, 465), as well as face of male (466).



Figures 467–472. Comparison of epigynum and its internal structure in *Pellenes simoni* (467, 468); *Pellenes maderianus* (469, 470), and *Pellenes nigrociliatus* (471, 472).

covered with brown adpressed setae, encircling median white area covered with white scales; there is a small enlargement of that area slightly behind mid-length, resembling a pair of non separated white spots on the dark marginal ring; there is no connection between external white margin and central white area in two specimens from the Negev (for specimens from other areas, that pattern was described as white “T” on dark background). Sides white, spinnerets dark with white setae on tip. Frontal aspect: dark upper face contrasts with light fawn tegument of lower part of face, densely covered with broad white scales, also overhanging the clypeal edge, which is bald laterally. Chelicerae fawn without transverse ridges, pedipalps thin and light.

Legs I fawn with lateral surfaces of tibia, metatarsus and patella brown, but femur I distinctly lighter. Legs II–IV light yellow. Ventral aspect: sternum and coxae light fawn to yellow; abdomen uniformly whitish. Epigynum: median furrow short, narrow (about $1/5^{\text{th}}$ of epigynum diameter), its posterior ridges arching diagonally behind round grooves with sclerotized slits of copulatory openings, lacking transverse part, which is unique in the genus; prominent sclerotized ridges in front of copulatory opening, not seen in other species.

Measurements (mm). Female. Length of cephalothorax 1.87; length of abdomen 1.15; length of 5 segments of leg I 2.96.

Remarks. A few other species share the above described characters, with some variation. These are

Pellenes tocharistanus Andreeva (1976: Figs 106–109) from Tadjikistan, and dark coloured “*Pellenes semiater* E. Simon, Auctor det. 1898. Mustapha, P. Lesne, MNHN-Paris” – a non type specimen. For the moment no comments on relationships of these forms can be offered.

Seasonal appearance of adult specimens. Females – V, VI, X.

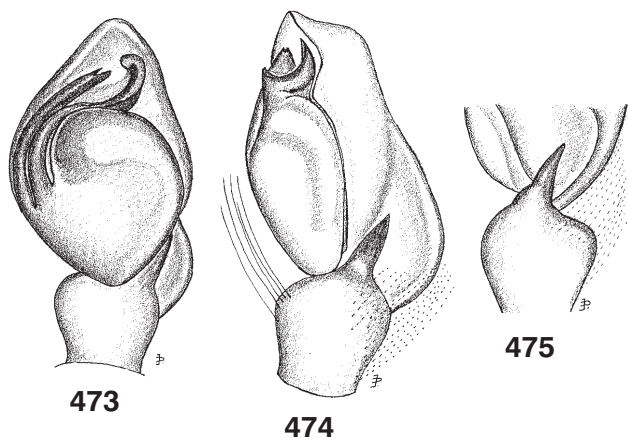
Distribution. Presumably Mediterranean, known from Madeira and India. Israel: mouth of Nahal Samakh (7); Sayeret Shaked Park (15); Hatira Ridge (17); Berekhat Ram(18).

Pellenes negevensis Prószynski
(Figs 473–475)

Pellenes negevensis Prószynski, 2000: 257, Figs 96–98.

Diagnosis. Unusual by grey colour of abdomen; palpal organ differs from *P. hedjazensis* in proportions and shape of details: retrolateral wall of cymbium with a huge flap articulating with tibial apophysis and hiding it entirely from the dorsal side; embolus split apically into two small needle shaped processes, accompanied medially by a large conductor, separated from embolus, in ventral view looking like a dark brown process running along the middle of cymbium, from bulbus towards anterior end of cymbium.

Remarks. Closely related to *Pellenes hedjazensis* Prószynski, 1993 from Saudi Arabia, also resembling



Figures 473–475. *Pellenes negevensis* (Sede Zin, 27. V. 1992), palpal organ ventrally (473) and latero-ventrally (474), tibial apophysis laterally (475).

Pellenes sytchevskayae from S Uzbekistan by appearance of palpal organ, with distinct differences in minute details of embolus, as shown on Figs 734–735. There seem to be a group of closely related species, consisting of, among others, from *P. hedjazensis*, *P. negevensis*, *P. sytchevskayae*, with small differences in embolus, difficult to interpretation. Identification of these species require preliminary study of colour pattern differences and individual variation in local populations.

Description. Male. Cephalothorax: generally light brown with lighter lower sides and eye field, covered with adpressed, long and broad, sometimes wavy, whitish scales. Eye field has a large, copper-fawn trapezium shaped area covered by light scales, delimited anteriorly and laterally by thin black rims along eyes anterior and lateral, posteriorly suffused with grey and then delimited by a pair of lighter, chevron shaped lines between eyes III. Anterior thoracic dorsum with darker brown triangular or round spot, extending towards thoracic hindmargin as a darker median line, delimited with lighter areas covered by more pronouncedly whitish scales. Upper sides brown, lower lighter brown, covered with whitish scales and setae; there is a dark bald marginal line delimited by denser white scales above it in the anterior part of sides, and followed by a fringe of hanging white scales beneath the edge.

Abdomen: generally grey with dense, long, yellowish scales, with an admixture of whitish scales, adpressed in their basal parts but slightly upright apically, which gives the abdomen a rough surface. There is a pattern of grey pigmented spots on integument, beneath the scales, which gives an overall impression of a median line of small light spots arranged in 7 chevrons or small triangles, resembling that in *Pellenes ignifrons* (Grube, 1861) (cf. Prószyński 1971a: 214–218, Figs 20–27) and *Pellenes limbatus* Kulczyński (1895: 87), in which, however, abdomen is black and dots, separated by darker spots and followed on each side by darker streaks of

dots interrupted by short transverse lines. There is a concentration of light scales marginally, but they do not make separate streaks.

Frontal aspect: striking contrast between large black anterior legs I (covered with whitish scales, tarsus brown) and light face. Diameter of ALE 2/5th of AME. Clypeus 3/5th of AME, covered with broad white scales, arranged horizontally, at the edge diagonal white scales overhanging cheliceral bases, sides of face below ALE light fawn with whitish scales, passing into brown sides of cephalothorax. Eyes I surrounded ventrally and laterally by white scales, dorsally by grey setae and colourless scales on dark pigmented rim; there is small white triangle above touching points of AME, extending onto anterior eye field. Chelicerae small, their width equal to AME, light brown, with brown bases, becoming darker apically, with transverse ridges (stridulatory ?); there are three vertical rows of minute white scales along each chelicera. Pedipalps light brown to yellow, with whitish scales scattered among sparse white setae on cymbium and tibia.

Palpal organ resembling *Pellenes hedjazensis* Prószyński (1993) of Saudi Arabia by having large postero-lateral flap on cymbium wall even more strongly developed; embolus apically split into two tiny spines (three in *P. hedjazensis*); embolus is followed by a large conductor in shape of an elongated horizontal “S” with apical loop distant from embolus and running almost straight from the middle of bulbus edge towards the apical end of cymbium; bulbus anteriorly rounded, broadly truncated, narrowing triangularly posteriorly. Tibial apophysis black sclerotized, of medium length, narrowing and slightly inclined posteriorly. Ventral aspect: chelicerae and mouth parts greyish brown, sternum dark brown, medially paler yellowish grey, with long white setae and scales. Coxae yellow. Abdomen light whitish yellow with median row of grey dots in one specimen, extended into grey streak in another, and into broad grey rectangular areas, delimited by thin light lines in the third specimen, sides dark grey.

Legs I overgrown, much longer than others, blackish brown to black, tarsus and ventral side of femur light brown to yellow; covered with setae and white scales; metatarsus, tibia and patella ventrally with dense fur of long black setae, prolateral surface of femur bald and dark; tibia I long, neither swollen medially nor narrowing at ends; spines, if present, not visible among the ventral brush of setae. Remaining legs yellowish grey to yellow, with darker lateral surfaces and dark incomplete annulation.

Measurements (mm). Male. Length of cephalothorax 2.24; length of abdomen 2.56; length of 5 segments of leg I 6.96.

Material. Holotype male – Israel: Sede Zin, near Sede Boqer (pitfall trap), 27. V. 1992; paratypes – Negev – Be'er Mash'abbim (pitfall trap); 2 males – 30. IV.93; male – V. 91. All leg. Y. Lubin. Coll. SB.

Comparative material. *Pellenes sytchevskayae* Logunov, Marusik, Rakov 1999, male holotype – Uzbekistan, Bukhara area, 1km NE from Gazli Vill. 25. V. 1994. Leg. A. A. Zyuzin.

Seasonal appearance of adult specimens. Males – IV, V; females – V.

Distribution. Israel: Be'er Mash'abbim, Nahal Sekher (sands) (15); Sede Zin (17).

***Pellenes nigrociliatus* (L. Koch)**

(Figs 460, 471–472, 729–733)

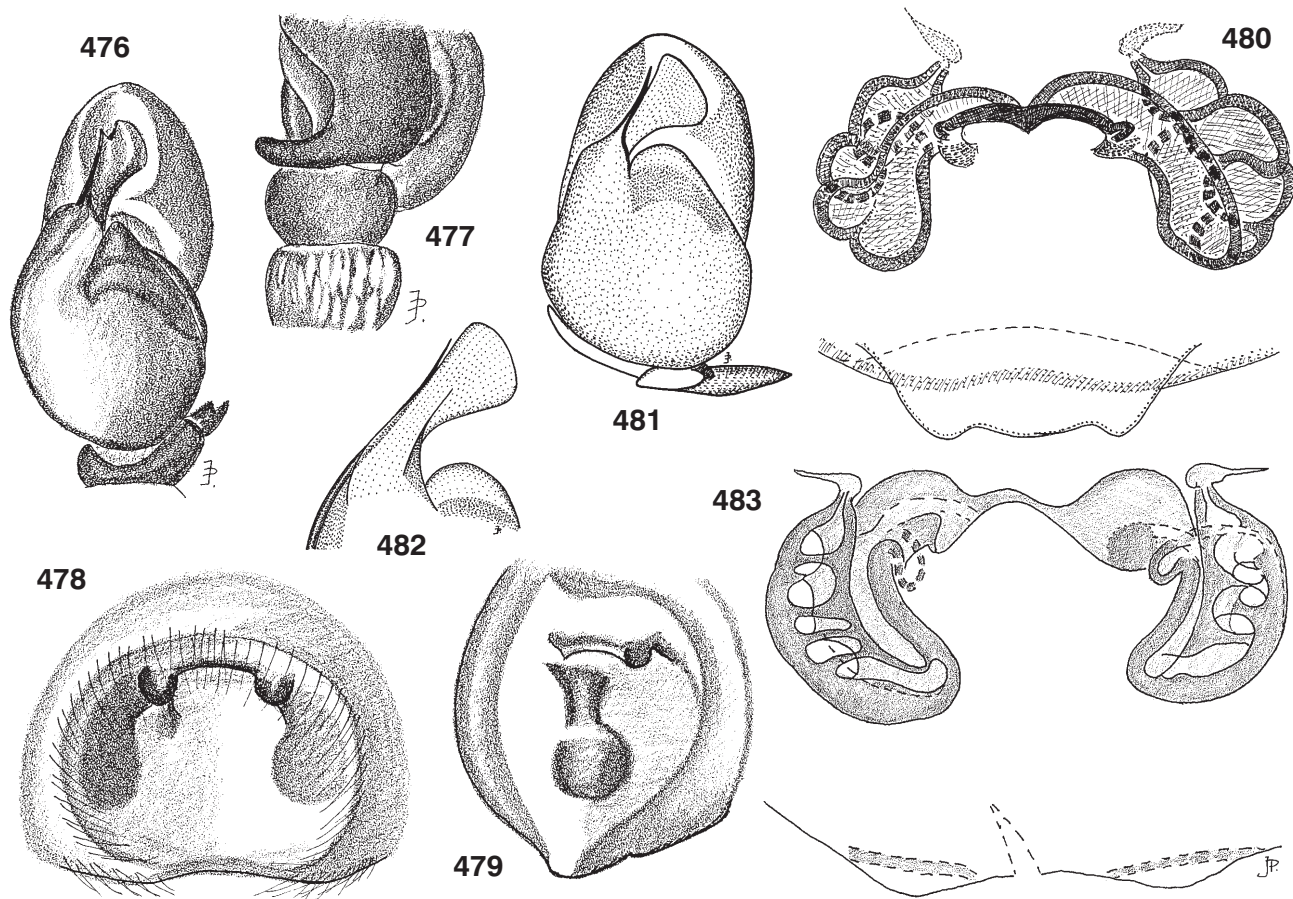
Attus nigrociliatus L. Koch, 1875: 14, t. 1, Figs 9–11;

Pellenes nigrociliatus: Miller 1971: 142, t. 21, Figs 11–13; Prószyński 1971: 244–248, Figs 33–44; Andreeva 1976: 85–86, Figs 103–105; Prószyński 1976: 41, 51, Figs 272, map 133; Prószyński 1979: 314, Figs 229–230; Flanczewska 1981: 215, Figs 75–76.

Diagnosis. Black, abdomen with median white line and two short, diagonal white lines at lateral edge. Cephalothorax with a pair of small spots of white scales behind eyes III. Distal half of leg I brownish black, proximal yellow.

Description. Male. Cephalothorax black, with a pair of small, wedge shaped spots of white scales behind eyes III. There is a line of intensively white scales beneath lateral edge of cephalothorax, and much weaker line of whitish scales just above the edge, which is continuous to the face, where becomes strikingly white and thick line of scales at the edge of clypeus, above chelicerae. Remaining clypeus black, rims of eyes I with inconspicuous black scales or bald. Chelicerae brownish black with three vertical lines of white setae along their basal half. Pedipalps brownish black with lighter patella, there are white scales and setae on patella, and tip of femur. Palpal organ very similar to *P. simoni*, with minute differences in tip of embolus and tibial apophysis, these two species differ from *P. epularis* by longer tibial apophysis.

More useful differences are provided by abdominal pattern, which in *P. nigrociliatus* is black, covered with adpressed black setae, There is a median white line covered with white setae, continuous or in some specimens consisting of white triangles, and two short, diagonal white lines at the dorso-lateral edge of abdomen, whitish scales make line at the anterior edge. Spinnerets blackish.



Figures 476–483. *Pellenes ostrinus* (Ramat Rachel specimen), palpal organ ventrally (476), dorsally (477), as well as epigynum ventral (478), and latero-ventral (479) views; internal structure of epigynum (480). Comparative specimens from Corfu, palpal organ ventrally (481), tip of embolus (482); specimen from Smyrna (Turkey), internal structure of epigynum (483).

Leg I – tarsus, metatarsus and half of tibia blackish, remaining tibia, patella and femur yellow with brownish shade; covered with sparse black setae. Leg II – yellow brownish, with darker sides. Leg III and IV – tarsi yellow, metatarsi, tibiae, and patellae dark brown to black; femur III blackish brown with lighter line along dorsal surface, femur IV apically dark, basally lighter. Ventral aspect: mouth parts and sternum dark brown, coxae yellow, abdomen black.

Female. Cephalothorax blackish brown; eye field almost black with anterior median spot of white scales; subocular white streak extends beneath lateral eyes and bends over the edge of dorsal surface making a white spot behind eyes III, but does not extend across the whole dorsal surface of thorax (difference with *Pellenes arcigerus* and *Pellenes maderianus*).

Abdomen dark; median white streak approached by two pairs of diagonal lines running from sides of abdomen but is not touched or crossed by them; anterior marginal white line continues diagonally over sides of abdomen. In the original drawing of *Pellenes ravoisiaei* (Lucas, 1846: 165, Tab. 8, Fig. 4) from Algeria there are two pairs of similar diagonal white lines but limited to margins of the dorsum only; I suspect this may be the same species with slightly modified pattern or a very closely related one, but unfortunately there are no type specimens of *Pellenes ravoisiaei* preserved.

Frontal aspect: ocular area dark with eyes I surrounded with reddish setae; clypeus under AME densely covered with intensely white scales, which are sparser under ALE and on fawn background; dark brown marginal line, delimited by white scales, begins under ALE and runs posteriorly; chelicerae light brown with a few white scales arranged in lines and with whitish setae; pedipalps yellow with patella white. Legs: I dark

brown, including tarsus, dorsal surfaces lighter brown, patella and tibia with rows of whitish scales; legs II–IV brownish grey, except femora dorsally light yellow.

Ventral aspect: sternum dark brown with a few colourless scales; anterior coxae brown, the posterior ones lighter; median area of abdomen whitish, laterally followed by a pair of grey and whitish stripes. Epigynum: median furrow long, narrow (about 1/5th of epigynum diameter), its posterior ridges arching transversely behind round lateral grooves with indistinct copulatory openings (Figs 471–472).

Measurements (mm). Female. Length of cephalothorax 1.82; length of abdomen 2.61.

Remarks. A very peculiar and interesting behaviour of this species was observed in Poland: the spider builds a retreat inside an empty snail shell, hoists it on threads above the ground, suspended from grasses or low bushes, and from here it jumps on insects flying by and drags them into the shell (Mikulska 1961). The original description (L. Koch 1875: 14) mentions retreats in similarly suspended dry and convoluted leaves, but not hunting behaviour.

Seasonal appearance of adult specimens. Male –IV, VIII, females – I.

Distribution. C and S Europe; Japan? Israel: Hanita (1); Dorot (15); Sansan Reserve (11).

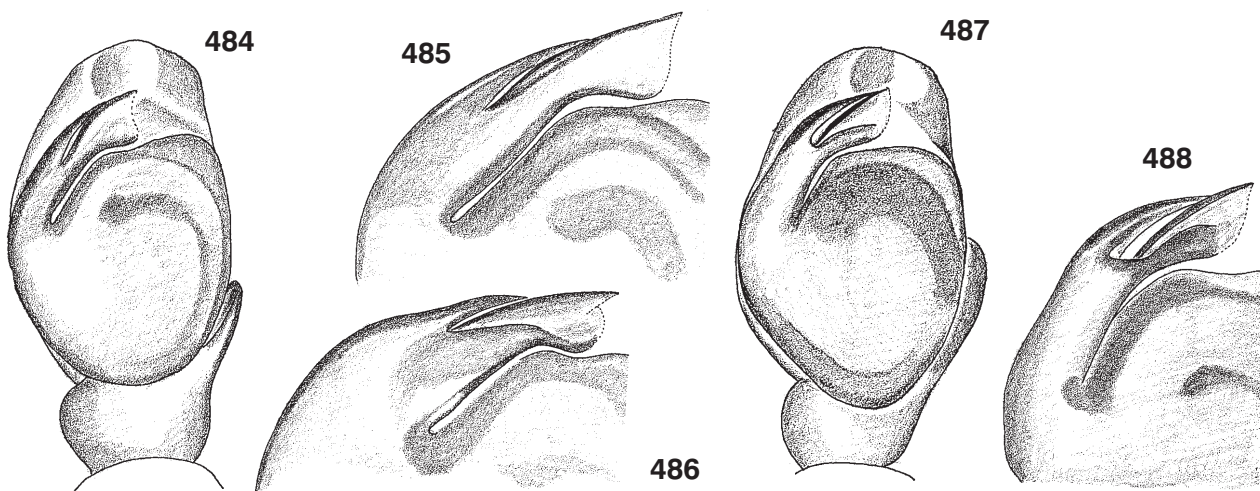
Pellenes ostrinus (Simon)

(Figs 461–462, 476–483)

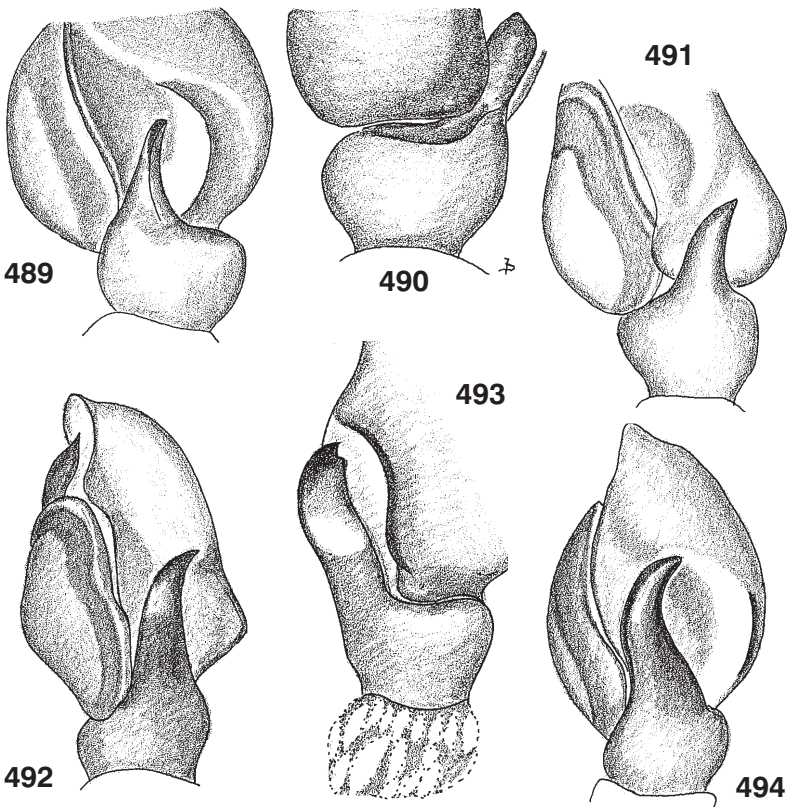
Attus ostrinus Simon 1868: 52;

Pellenes ostrinus: Prószyński 1984c: 102.

Diagnosis. Matching of female with male *Pellenes ostrinus* is provisional and tentative, based on mutual colour characters and assumed correspondence of



Figures 484–488. Palpal organ ventrally and detail of tip of embolus in *Pellenes epularis* (O. Pickard-Cambridge specimen), palpal organ ventrally (484), tip of embolus ventrally (485) and antero-laterally (486); and *P. simoni* (O. Pickard-Cambridge specimen labelled as “*Salticus laevigatus*”) palpal organ ventrally (487), tip of embolus antero-laterally (488).



Figures 489–494. Pedipalpal tibia in *Pellenes epularis* (O. Pickard-Cambridge specimen), tibial apophysis laterally (489), dorsally (490) and antero-laterally (491); and in *P. simoni* (O. Pickard-Cambridge specimen labelled as “*Salticus laevigatus*”), tibial apophysis laterally (492), dorso-laterally (493) and antero-laterally (494).

unusual structure of epigynum with broad, fan-like plate in complex embolus of males. *Pellenes ostrinus* share general plan of the palpal organ with Siberian *Pellenes ignifrons* (Grube, 1861) (cf. Prószyński 1971a: 214–218, Figs 20–27), *Pellenes limbatus* Kuleczyński (1895: 87) and male “*Evarcha*” *albopilosa* Tyschenko (1965a: 701, Fig. 9); differing in less pronounced basal latero-dorsal notch and process of cymbium, as well as much broader fan-like plate of embolus. Siberian species has different abdominal pattern consisting of a narrow median line of discrete white triangles, the abdomen being dark. The epigynum in female *Pellenes ostrinus* seems to be similar to the female found in Smyrna (“13.279 *Stenaclurillus*, Smyrna (Krupper)”) in Simon’s collection, MNHN-Paris, of presumably the same species, also to female from Spain and to female of *Evarcha albopilosa* Tyschenko, 1965 (Prószyński 1979: 307, Figs 87–88); it also resembles boreo-mountainous holarctic *Pellenes lapponicus* (Sundevall, 1832), and a number of North American species.

Description. Male. Cephalothorax dark brown, with a small indistinct spot of reddish yellow or whitish setae immediately behind eyes I; in one of studied specimens two light streaks with some white setae behind eyes III along edges of dorsal surface of level part of the thorax.

Abdomen dorsally and laterally, greyish with short golden addressed setae, along posterior half a thin white median line of white scales, continuous or broken, contoured by thin black line; in darker brown specimen that black contouring is not visible.

Frontal aspect: face covered entirely with golden-orange setae (clypeus up to ventral rims of eyes I, similar but slightly longer, overhanging cheliceral bases), a few tiny white setae under ALE, on one specimen clypeal edge medially white; two spots of intensely white scales on pedipalpal femur tip and dorsally on patella. Diameter of ALE 0.5 of AME, located along upper half of AME. Legs uniformly blackish brown, a few indistinct whitish scales proximally on patella I and sparse whitish scales prolaterally on apical tip of femur III and along patella III. Palpal organ: tip of embolus divided into thin needle and fan-like plate, of various width in different specimens.

Female. Cephalothorax dark brown with three whitish longitudinal lines of large scales: median one along dorsum of thorax and two lateral ones extending along lateral eyes and dorsal edge of thorax; spots of whitish scales at anterior margin of eye field, just between and behind eyes I.

Abdomen blackish with single thin median line of intensely white scales enhanced posteriorly by darker black scales (in male this white line occupies half of abdomen only); irregularly shaped marginal white streak.

Frontal aspect: face covered with golden-orange setae on clypeus, surrounding ventral rims of eyes I; a thin line of intensely white scales along ventral edge of clypeus with slightly longer ones overhanging cheliceral bases; chelicerae blackish brown. Contrasting white scales on pedipalpal femur tip and the whole dorsal surface of patella and tibia. Legs uniformly blackish brown, with sparse whitish scales.

Epigynum transverse oval depressed sclerotized plate without any median longitudinal ridges or arches; a short transverse ridge anteriorly ending with a pair of black protuberances which apparently provide external armour for copulatory openings; compact, sclerotized, oval spermathecae, which consist of tight internal spirals of sclerotized channels.

A similar but faded specimen labelled “13.279 *Stenaclurillus* Smyrna (Krupper)” is kept in the Simon collection in the MNHN-Paris. Its epigynum and spermathecae (Figs. 483) show some differences, which, however, may be due to shifting of these spherical, thick structures during mounting of the microscopic preparation. The specific status of that specimen requires confirmation from fresh specimens.

Measurements (mm). Male. Length of cephalothorax 2.61; length of abdomen 2.50; female – length of cephalothorax 2.39; length of abdomen 3.75.

Seasonal appearance of adult specimens. Males – II, III, IV, V; female – V.

Distribution. E Mediterranean from Greece and Turkey to Israel, if synonymies confirmed, then possibly from Spain to Kazakhstan. Israel: Ramot-HaShavim (8); Jerusalem, Ramat-Rahel, Bet Shemesh (11).

Pellenes simoni (O. Pickard-Cambridge)

(Figs 463–466, 467–468, 487–488, 492–494, 498–500)

Attus laevigatus Simon, 1868: 51 [possible synonym, not proved sufficiently yet];

Salticus laevigatus: O. Pickard-Cambridge 1872: 322;

Salticus semiater: O. Pickard-Cambridge 1872: 323;

Salticus simoni O. Pickard-Cambridge, 1872: 329–330;

Attus tauricus Thorell, 1875: 116, **syn. nov.**

Attus simoni: O. Pickard-Cambridge 1876: 101;

Pellenes simoni: Prószyński 1984b: 100;

Pellenes tauricus: Prószyński 1984b: 102.

Pellenes geniculatus: Logunov, Marusik and Rakov 1999: 126.

Diagnosis. Abdomen with white cross, femur I, metatarsus and tibia I black. Male differs from *Pellenes epularis* by longer, more distinctly bent tibial apophysis and broader bottom of the split on embolus trunk. Female cephalothorax blackish with a pair of light spots covered with white scales behind eyes III, continued anteriorly beneath eyes lateral and merging with white scales (setae?) on clypeus.

Remarks. A problem is created by the impossibility of checking type specimens of several *Pellenes* species, possibly conspecific, which should be in the Simon collection in the MNHN-Paris, but cannot be found. For that reason I select for this species the name of the oldest type specimen I could find and study, which appeared conspecific with the original, but non-type specimen of *Attus laevigatus*. Non-type specimens in the Peckhams' collection at MCZ, Harvard University, identified by Simon as male *P. geniculatus* from Corfu and *P. brevipes* from France, appear identical with *P. simoni* described below. The drawing I made some 30 years ago of the tip of embolus (Figs 498–500) of the type specimen of *Pellenes tauricus* is insufficient by present day standards and should be checked again. Logunov, Marusik and Rakov (1999) in an extensive study of Central Asian and Caucasian *Pellenes* suggest other synonymies for this, and some other species. However, they do not provide documentation of the genital organs of types studied, and identities of Mediterranean species with their Central Asian relatives seems not proved yet. It seems therefore to me more advisable to keep conclusion drawn from Israeli fauna, and leave synonymies with Central Asian species until more detailed studies become available.

Description. Male. Cephalothorax blackish with inconspicuous, sparse and small colourless scales on eye field; a pair of contrasting lighter pigmented spots behind eyes III, and a small, median lighter spot, all with remnants of white scales; area under eyes lateral is also slightly lighter; no white scales along the black ventral edge.

Abdomen dark with a white cross pattern, consisting of longitudinal median streak, slightly swollen posteriorly, narrowing at both ends, and thinner transverse bar, with bent lateral ends. The width of the cross streak and transverse bar is variable, in some specimens reduced to posterior part of streak only, then slightly ovoid. There is a broad white belt at the anterior edge of abdomen. Spinnerets dark.

Frontal aspect blackish, almost bald with inconspicuous orange or yellow setae surrounding eyes I, a line of white scales hanging down from the edge of clypeus. Chelicerae dark brown, small, each with three vertical lines of a few white scales; without transverse ridges. Pedipalps brown with patella lighter, fawn with white scales and setae dorsally.

Ventral aspect: mouthparts, sternum (with large whitish scales and setae) and abdomen ventrally dark brown, coxa and trochanter I greyish brown, remaining light yellow.

Palpal organ: bulbus approximately oval with embolus arising at 9 o'clock-position; embolus consists of a common fleshy trunk split in the mid-length into external needle shaped embolus proper and plate-like conductor; the latter half twisted along its axis, apically flattened, fan-like and semitransparent; tibial apophysis sharp, bent apically, longer than half bulbus length, articulates with lateral depression on cymbium and swelling of its basal, dorso-lateral end. The palpal organ is very similar to that of *Pellenes epularis* (O. P.-C.) from which it differs by longer, more distinctly bent tibial apophysis and broader bottom of the split on embolus trunk.

Legs I with femora ventrally blackish; basal part of patella and apical tibia, as well as basal metatarsus are brown; tarsus, metatarsus apically are fawn, patella and tibia are much lighter fawn. Femora I–IV blackish brown, with gradually larger lighter rims on lateral surface, II–IV dorsally light, remaining segments on leg II yellow, on III–IV light brown with darker annuli.

Female. Cephalothorax blackish with inconspicuous, colourless scales; a pair of light spots covered with white scales behind eyes III, in some specimens connected medially, varying in width, continuing anteriorly beneath eyes lateral and merging with white clypeus, there is also a small median spot of white scales on anterior eye field; no white scales along the ventral edge.

Abdomen dark with either white cross or single median streak; sides dark surrounded by white margin. White median streak narrows at both ends, its width varies from a thin line to broad oval spot, a thinner transverse bar across dark surrounding, if present, is located post mid-length; spinnerets dark.

Frontal aspect: tegument dark, with broad white scales in two lines on the clypeus: under eyes I and along ventral edge of carapace, leaving dark brown bald line between both, also edge along sides is bald and that area may be lighter, however, under AME the whole height of clypeus is covered with white scales. Eyes I surrounded with colourless orbital setae, except dorsal rim where there are some fawn setae, ventrally more intensively white scales, in some specimens tegument around eyes I lighter. Chelicerae brown with transverse ridges, a few white scales basally. Pedipalps light, with patellae white.

Ventral aspect: mouth parts and sternum brown, coxae I greyish fawn, remaining gradually lighter; abdomen with sides dark grey, median rectangular area lighter with two darker, greyish stripes.

Legs I black to brown, much darker than remaining legs, except tarsus I being contrastingly lighter yellow with whitish setae and scales; also patella I lighter and covered with inconspicuous whitish scales; tibia-metatarsus I dark brown with long black setae, devoid of scales. Legs II–IV: femora dorsally yellow, laterally brownish grey, remaining segments yellow with grey shades.

Ventral aspect: sternum brown; coxae I brown, II–IV yellow; abdomen striped with median streak light, followed by grey and whitish streaks, sides mosaic, an area in front of spinnerets whitish.

Epigynum: median groove and vaginal roof broad, wider than $1/3^{\text{rd}}$ of epigynum diameter; lateral grooves narrow.

Measurements (mm). Male. Length of cephalothorax 1.70–1.78; length of abdomen 1.88–1.69; female – length of cephalothorax 2.13; length of abdomen 3.02.

Remarks. Frequently collected in pitfall traps and spotted on the ground; on stabilised sands, rocky slopes

and wadis (majority of specimens) (Prószyński J., Lubin Y. 1994).

Seasonal appearance of adult specimens. Males – III, IV, V, VII, VIII, X, XI, XII; females – I, III, V, VI, VII, VIII, IX, X. Majority of specimens collected in spring – early summer (III–VI) and late summer – autumn (VII–X), much less in late autumn – winter (XI–II).

Distribution. Mediterranean (including France and Corfu), Iran, Tadjikistan, Lebanon: Ain-Atta, Hasbeiya. Israel: Mt. Carmel (3); Megiddo (6); Ben Shemen, Lod (9); Jerusalem (11); Be'er Mash'abbim, Nahal Sekher, Sayeret Shaked Park (15); Haluqim Ridge, Hatira Ridge, Ma'ale Ramon, Ma'agurat Loz, Sede Boqer, Sede Zin (17); Bab el Hawa (18); Samson Reserve.

Relevant species

Pellenes arcigerus (Walckenaer)
(Figs 495–497)

Attus arcigerus Walckenaer, 1837: 421;

Pellenes sp. 1: Prószyński 1979: 315, Figs 236–238 (ident. Deltshv);

Pellenes arcigerus: Hansen 1986: 108, Figs 9, 16.

Distribution. S Europe.

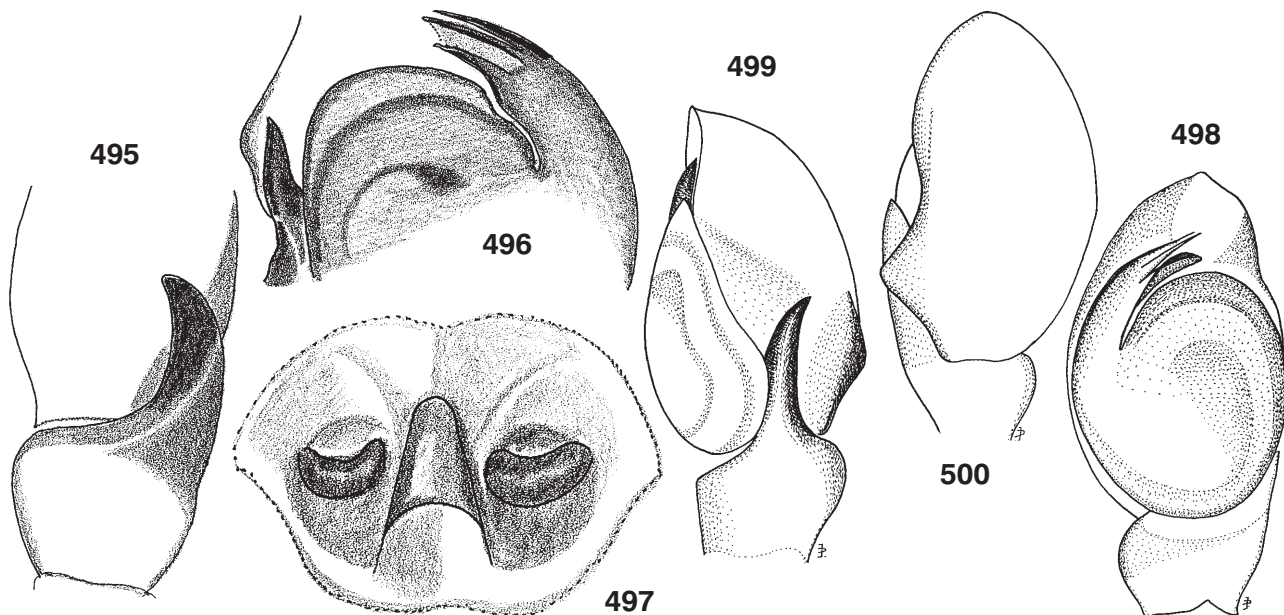
Pellenes diagonalis Simon, 1876

Attus lippiens L. Koch 1867: 881.

Attus diagonalis: Simon 1868: 46.

Pellenes diagonalis: Simon 1876: 101; Metzner 1999: 126–127, Tab. 91a–i, map 96 (basis of identification uncertain)

Remarks. The only specimen identified by Simon, but not type, came from “Pentes arides du djebel Kasioun, pres de Damas (Syrie) Henri Gadeau de Kerville 1911” in MNHN-Paris



Figures 495–500. Two relevant species, *Pellenes arcigerus* (specimen from Peckham collection, MCZ), tibial apophysis dorso-laterally (495), tip of embolus antero-ventrally (496), epigynum (497); *P. tauricus* (type specimen), palpal organ ventrally (498), laterally (499) and dorsally (500).

and is immature. Resembles *P. simoni* by dark abdomen with longitudinal white median streak from $\frac{1}{4}$ of length, slightly expanded like narrow diamond, crossed medially by a transverse bar with ends bending posteriorly and merging with marginal white line. Sides beneath eyes white, bending behind eyes III and forming large white spot on each side, but not connected dorsally. Legs dark except white tarsus I, and patella-tarsus II–IV. Identity of other specimens unknown.

Distribution. Syria (Djebel Kasioun); said to occur in Corfu, on Syra and in Turkey.

Pellenes hadaensis Prószyński

Pellenes hadaensis Prószyński, 1993: 43–44, Figs 28–31.

Distribution. Saudi Arabia.

Pellenes hedjazensis Prószyński

Pellenes hedjazensis Prószyński, 1993: 44–46, Figs 32–36.

Distribution. Saudi Arabia.

Pellenes seriatus (Thorell)

Attus seriatus Thorell, 1875: 116;

Pellenes tripunctatus: Prószyński 1979: 314; Figs 234–235; Flanczewska 1981: 215, Figs 77–79; (according to Logunov = *Pellenes seriatus* – personal communication);

Pellenes seriatus: Nenilin 1984b: 23 (nec *P. seriatus* Spassky et Shnitnikov 1938); 1985: 130.

Remarks. Relevant species resembling *Pellenes tripunctatus*, distributed in southern Palaearctic.

Distribution. Ukraine, Middle Asia.

Pellenes tripunctatus (Walckenaer)

Aranea tripunctata Walckenaer, 1802: 247;

Pellenes tripunctatus: Locket and Millidge 1951: 243 Figs 109 A, B; Miller 1971: 142, Tab. 21, Figs 8–10; Prószyński 1976: 22, 51–52, Figs 271, map 140; Prószyński 1979: 314; Figs 234–235; Flanczewska 1981: 215, Figs 77–79; Prószyński 1984b: 103; Roberts 1985: 130, Fig. 54d.

Remarks. Relevant species, type species of the genus. Closely resembling *Pellenes seriatus* and frequently mistaken for it.

Distribution. Palearctic.

Philaeus Thorell, 1869

Type species. *Aranea chrysops* Poda, 1761.

Introductory remarks. Genus known essentially from a single species, majority of others mentioned in the literature are presumably just synonyms. I have seen once black male specimen from Kazakhstan (upper Irtysh basin) but had no opportunity to study it in detail. In some Asian specimens there is variation in shape of tibial apophysis and seminal canal loop which may suggest specific differences, but these need further study.

The species can best be recognised by its unique coloration (see below), “hairiness” of the body, size and

proportions. The dorsal profile of cephalothorax is almost rounded, with flattening but no flat surface, abdomen broad and sloping, narrowing posteriorly; cephalothorax is high (54–54%), its width at eyes III is 83–88%; eye field rectangular, its length 38–40%, its width at eyes I 60–66% and 64–67% at eyes III. Whilst relationships of the genus are not yet established, it seems to be related to *Mogrus*.

Philaeus chrysops (Poda)

(Figs 501–506)

Aranea chrysops Poda, 1761: 123;

Attus sanguinolentus Walckenaer, 1805: 24;

Dendryphantus haemorrhoidicus C. L. Koch, 1846: 54;

Salticus haemorrhoidicus: O. Pickard-Cambridge 1872: 321;

Salticus sanguinolentus: O. Pickard-Cambridge 1872: 321;

Philaeus chrysops: Andreeva 1976: 82; Prószyński 1976: 27, 30, map 112, 215; Prószyński 1979: 315, Fig. 241; Wesolowska 1981a: 63; Prószyński 1991: 514, Figs 1372.1–4, 1374.1

Diagnosis. There is a row of 8 dark protuberances with long stiff setae, adpressed, directed diagonally up and anteriorly, along mid-height of cephalothorax sides below eyes lateral; in females clearly visible because of bald surface around, while in males hidden among other setae. There seem to be corresponding minute tubercles on the prolateral surface of apical part of femur I, numerous but not aligned in a straight line, very indistinct and hardly visible with the magnification available to me. Similar structures in *Pseudicius*, however located much higher under eyes lateral, were considered by W. Maddison to be a stridulatory organ (personal communication).

Description. Male. Cephalothorax: the dorsal profile of cephalothorax almost rounded, with flattening but no flat surface; blackish brown with two white lines along edges of dorsal and lateral surfaces stretching from mid-thorax to eyes III. Abdomen striking by its red colour with black median streak, narrowing posteriorly and contoured by two white lines; red coloration fading in alcohol to yellow or whitish. In Poland I have found that the red coloration is acquired during sexual maturation, young and immature male being black like adult female. Frontal aspect: face brown, eyes I surrounded with colourless setae; eyes ALE located along upper half of AME, their diameter approaches 75% of the latter; chelicerae brown, longer than in other spiders but set vertically, with a small ovoid space left between their inner curvature; pedipalps brown with white setae; legs brown. Palpal organ: very characteristic bulbus with large posterior angular flap in front of embolus base, embolus and cymbium long; seminal channel near base of embolus makes S-shaped meander dorsally to the bulbus flap.

Female. Cephalothorax resembles male, with a thin line of white setae running from under eyes III above eyes II and ending between ALE and AME. Abdomen:

with median black streak, broader than in male, followed laterally by two broad white streaks and by dark mosaic area of black and dark grey spots; there is variation of that pattern – in Poland there are two very regular straight parallel white lines along black abdomen. Frontal aspect: clypeus brown with line of white setae along ventral edge, a line of white adpressed setae runs from under eyes AL_E along sides of cephalothorax anteriorly; chelicerae brown, bulging, shorter than in males. Epigynum: consists of ventral walls of broad straight copulatory channels, indistinctly yellow, copulatory openings hidden in small, lighter depressions on each side of anterior diagonally cut tip of epigynum; channels run straight to the end of epigynum, then bend dorsally and return anteriorly, at halfway passing into small black, cone shaped spermathecae, heavily sclerotized and directed transverse laterally, the general plan somewhat comparable with some species of *Mogrus*.

Measurements (mm). Male. Length of cephalothorax 3.57, length of abdomen 3.25. Female. Length of cephalothorax 3.36, length of abdomen 4.83.

Seasonal appearance of adult specimens. Males – IV, V; females – IV, V, VII, VIII.

Distribution. Common in the Mediterranean, found throughout warmer places in the whole Palaearctic including Central Europe in the West and the coasts of the Sea of Japan in the East. Israel: M. Meron (foothill

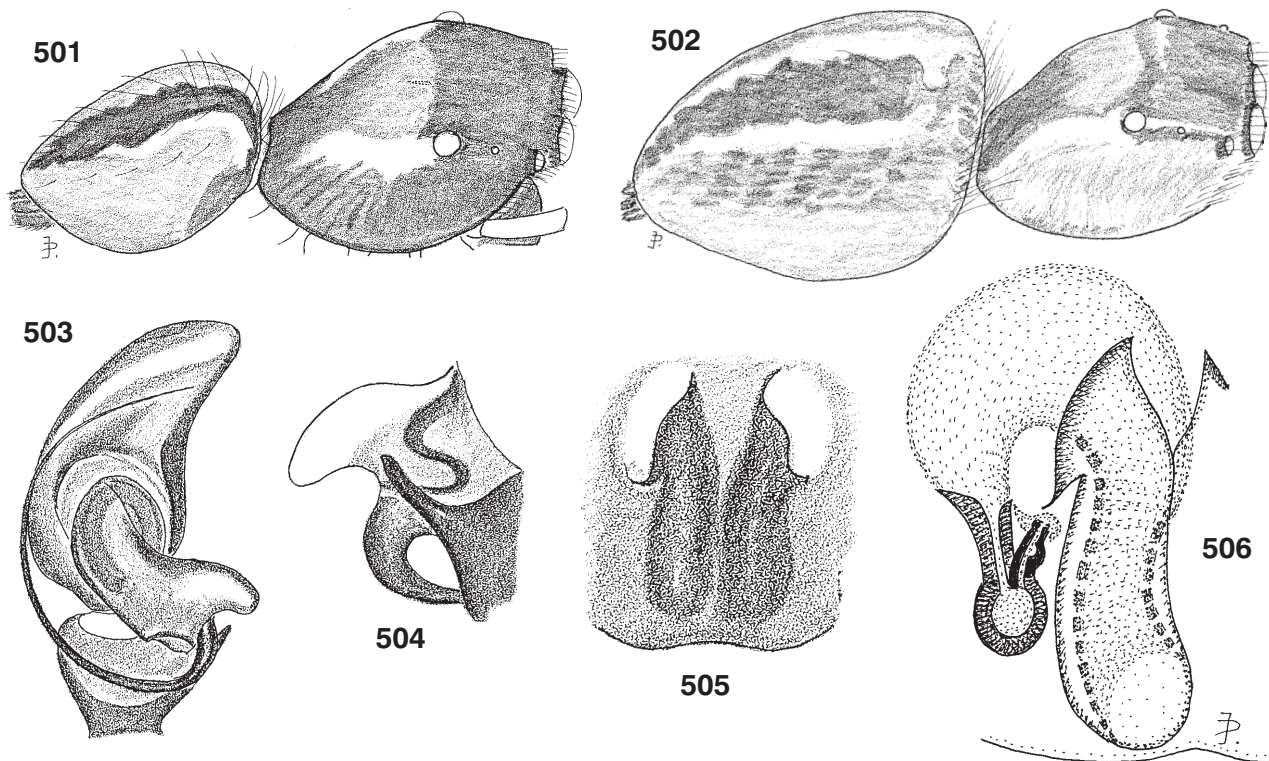
(1); Kafr Kanna, Kafr Manda, Mt. Tabor (2); Mt. Carmel (3); Rosh HaNiqra, (4); Bet Shemesh (10); 'En Kerem, Jerusalem, Ramat-Rahel, Qiryat-Anavim (11); Mt. Hermon (1500–2000 m) (19).

Phlegra Simon, 1876

Type species. *Attus fasciatus* Hahn, 1826.

Diagnosis. An Aelurillinae salticid characterized by legs IV being longer than legs I by 50% (mean) in both sexes, legs III being respectively longer by 15%, and these differences appear to be significant. Other characteristic features are shape of cephalothorax: short eye field – 33% (mean, as % of cephalothorax length), cephalothorax low – 39% and flat area of cephalothorax appearing unusually long – 78%.

Remarks. The genus *Phlegra* contains some 50 species of jumping spiders (Prószyński 1999b), ground living, found in sandy and stony, dry, warm environments, mainly in Africa and Asia; in Europe mainly in the Mediterranean, but several species also in central Europe (one of which has also colonized N America) (Prószyński 1976), and at least one species also occurring in the Sunda Islands. The number of species occurring in Israel and in neighboring countries is surprisingly high, but they are rarely collected because of their



Figures 501–506. *Phlaeus chrysops*, general appearance of male (abdomen red) (501), and female (abdomen black) (502); palpal organ ventrally (503) and tibial apophysis laterally (note meandering channel on bulbus' flap) (504); epigynum (505) and its internal structure – single spermatheca and channel (506).

cryptic coloration and solitary habits; one usually sees single specimens only. Majority of species are represented in the collections by single specimens, or a few specimens only. Matching of sexes is very uncertain.

Description. *Phlegra* species are characterized by striped pattern of dark cephalothorax (two light lines along edges of thorax dorsum) and abdomen (three white lines). In some species, however, abdomen is uniformly grey or has a chain of indistinct darker spots, sometimes mixed with lighter ones. The facial (frontal) colour pattern consists of orbital setae around eyes I (which may be white or light yellow or orange, or consisting of mixed patches of these colours). Some species have clypeus dull, other covered with contrasting white setae – entirely or forming a white stripe. In males pedipalps are usually black, with some white setae often present on patella and dorsal surface of femur.

Male genital organs resemble *Aelurillus*: characteristic, large and shapeless bulbus is covered entirely by hard shield, the tegulum; largest part of embolus is hidden between bulbus and cymbium, forming a single coil there. Differs from *Aelurillus* by longer tip of embolus, emerging from under bulbus and stretching along the tip of cymbium; it may be either thin and hair-like, or broader, sometimes in form of a plate. There are two tibial apophyses, as in *Aelurillus* (in contrast to other related genera *Langona* Simon, 1901 and *Rafalus* Prószyński, 1999), both of similar length, separated by a narrow gap (V- or U-shaped); apophyses may be thin and pointed, or broader and truncated.

Epigynum differs from *Aelurillus* by absence of external sclerotized “wings”, copulatory openings hidden at bottom of large circular or oval grooves, which may be either encircled by sclerotized edges, or without differentiated rims. Space between grooves varies from a narrow septum to a broad, flat area; position of grooves variable – from posterior to anterior part of epigynum. Copulatory channels runs from openings anteriorly, either thin and long, or broad and short, they then bend medially and turn posteriorly into a chain of circular, convoluted chambers.

A peculiar feature of internal structures of epigynum in *Phlegra* is a thin-walled, narrow duct, running posteriorly from minute opening in the wall of each channel, leading from it to a small pore in the external integument of epigynum, usually at the dorsal surface of channel, near its entrance. While pores in the channel walls are common in the majority of Salticidae, only in a few genera like *Phlegra*, do the ducts remain long, distinct and undamaged after preparation, and this allows the hypothesis that their function is to exude some substances from the genital organ to the outside of the body, most probably sex pheromones. I propose to call this structure the scent gland opening. The majority of Salticidae also have a second type of perforation in the spermathecae wall, located in the posterior part of spermatheca, near opening fertil-

ization channel: it is a small depression in the wall, perforated with minute pores which are usually followed inside spermatheca by a characteristic branching structure. Appearance of these structures suggests that they allow penetration of some substances from outside to inside spermatheca, presumably nutrition for spermatozoa, which are stored in spermathecae for long periods. I propose to call this structure the nutritive gland. The names scent and nutritive glands therefore replace “accessory glands” which I used in my descriptions for many years.

Body proportions in *Phlegra* of Near East (based on measurements of females of 9 species) are similar to those described by Hęciak (in unpublished PhD thesis), with minor differences. Cephalothorax long and narrow, with eye field covering 29-33-35% of its length, width varying 47-52-56% at eyes I, 58-60-64% at eyes III and 63-69-73% at the broadest part of the cephalothorax, which is located at about 75% of cephalothorax length; the sides of cephalothorax appear to be parallel; low, 36-40-44%. Eye field short in comparison to its width at eyes I 56-63-67%, rectangular in shape, its width at eyes III is 80-83-90% of cephalothorax width in the same area and 71-74-78% of maximal width of the cephalothorax; eyes III are located on edges of cephalothorax. Profile of cephalothorax: anterior slope of eye field scarcely visible, surface, slightly inclined or very gently rounded, extending to eyes II in *Ph. jacksoni* and *Ph. dimentmani*, but slightly more pronounced and steep in *Ph. v-epigynalis*; flat area of the cephalothorax, prominent, extending from eyes II to 74–83 % of cephalothorax length, where the steep, posterior slope of thorax begins. Shape of abdomen: long, oval, tapering posteriorly; broader than width of cephalothorax; dorsally, indistinctly convex; no scutum. Legs robust, all similar in shape; length of legs in decreasing order: IV 150–154%; III 112–118%; I 100%; II 94–98%.

Remarks. The descriptions of the species of *Phlegra* described in 1998 are largely based on the paper: Prószyński J. 1998. Description of new species of *Phlegra* (Araneae: Salticidae) from Israel. Israel J. Zool., 44, 2: 159–185, Figs. 1–48. Courtesy of Laser Pages Publishing Ltd., publishers of the Israel Journal of Zoology.

An abbreviated key to species of *Phlegra*

1. Males 2
 - Females 5
- 2(1). Embolus hair-like, thin and long, tibial apophyses pointed, separated by a V-shaped narrowing slit 3
 - Embolus broad, apophyses broad and blunt (at least one of them), separated by a broader, U-shaped gap 4
- 3(2). Specimens blackish brown with contrasting white streaks *Ph. particeps*
 - Specimens lighter, yellow, thin embolus broadened near edge of bulbus *Ph. stephaniae*

- 4(2). Embolus thin fan-shaped plate, gap broad, rounded, apophyses equally long, ventral relatively broad, colour pattern striped, light *Ph. yaelae*
 – Embolus consists of two parts – dorsal plate and a ventral rod – broad and bent; ventral tibial apophysis short, thin with bent tip, the dorsal one broad and blunt *Ph. tillyae*
- 5(1). Grooves on epigynum separated by distinct, sclerotized septum 6
 – Grooves on epigynum separated by a space, whose tegument does not differ from remaining epigynum 13
- 6(5). Septum V-shaped, consisting of sclerotised anterior rim of depressions; posterior rims absent 7
 – Posterior rims developed, grooves extend over posterior half of epigynum or more than half 8
- 7(6). Sclerotized anterior rims meeting, V-shaped, touch posterior edge of epigynum, copulatory channels narrow, parallel, longer than spermathecae *Ph. v-epigynalis*
 – Sclerotized anterior rims meeting, V-shaped, in mid-length of epigynum; channels broad and short, spermathecae extend behind rims by half their length *Ph. stephaniae*
- 8(7). Grooves almost round, take posterior half of epigynum, or less 9
 – Grooves oval or angular, often longer than half of epigynum 10
- 9(8). Septum narrowing posteriorly, channel runs ventrally to spermathecae *Ph. rothi*
 – Septum not narrowing posteriorly, channel lateral, bent, narrowing near spermathecae *Ph. jacksoni*
- 10(8). Anterior rim of grooves rounded 11
 – Anterior rim of grooves triangular 12
- 11(10). Grooves oval, septum not broadened posteriorly *Ph. dimentmani*
 – Grooves narrowing posteriorly, septum broadened posteriorly *Ph. ferberorum*
- 12(10). Antero-lateral angles of grooves prominent, edges of septum parallel *Ph. levyi*
 – Septum very broad anteriorly, narrowing triangularly until its mid-length; in remaining half thin, gradually narrowing *Ph. shulovi*
- 13(5). Grooves rounded, posterior edge of epigynum between grooves curved anteriorly; abdomen striped *Ph. amitaii*
 – Grooves elongated, posterior edge of epigynum curved posteriorly or straight; if curved anteriorly, then only indistinctly 14
- 14(13). Sclerotized anterior rims of grooves straight, abdomen without contrasting stripes ... *Ph. pori*
 – Sclerotized anterior rims of grooves rounded 15

- 15(14). Posterior edge of epigynum slightly triangular, extending posteriorly, abdomen without contrasting stripes *Ph. fulvastra*
 – Posterior edge of epigynum rounded, medially slightly curved anteriorly, abdomen with contrasting stripes *Ph. yaelae*

Phlegra amitaii Prószyński

(Figs 507–509)

Phlegra amitaii Prószyński, 1998: 171, Figs 1–3.

Diagnosis. Striped, with epigynum as in Fig. 508, channels and spermathecae as on Fig. 509.

Remark. Species described from single female specimen, the holotype, different from all known species from Israel, and sufficiently distinct from other related species, known from other geographical areas. There are no premises to match it with any male specimens described below, although that possibility cannot be excluded.

Description. Female. Specimen brown with striking white stripes, its general features shown in Fig. 507. Face has a single row of white setae on clypeus, stretching horizontally forwards, forming a sort of “shelf”, clypeus below that row is almost bald. In European *Ph. bresnieri* the whole clypeus is covered by dense fur of long white setae, also stretching forward.

Epigynum with copulatory openings hidden under anterior rims of almost circular grooves, separated by elevated space, which is not more strongly sclerotized than remaining epigynum. Width of that space is equal to half of diameter of groove; its posterior edge is curved anteriorly with translucent internal, darker, sclerotized roof of vagina. Copulatory channels, thin and long, running laterally and parallel, before turning into spermathecae, located medially and consisting of several convoluted chambers (Fig. 509). There is a thin, membranous scent pore channel, arising near anterior bend of copulatory channels, running from there posteriorly and ending under mid-length of the channels, where it possibly opens, but opening invisible on my preparation.

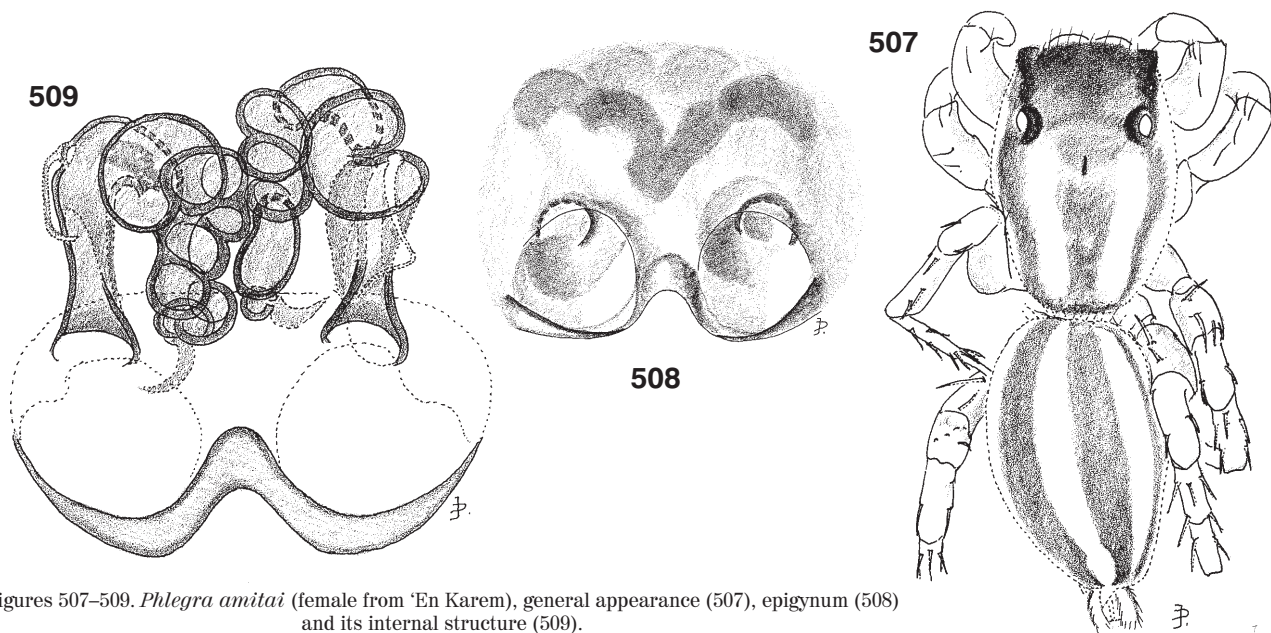
The shape and internal structure of epigynum differs distinctly from other striped *Phlegra* of Israel, but closely resembles European *Ph. bresnieri* (from which it differs by shorter channels) and several species from Yemen, Saudi Arabia and Senegal (*Ph. chrysops* Simon, 1890, *Ph. bairstowi* Simon 1885, and *Ph. tibetana* Prószyński, 1978).

Body proportions seem to be comparable with other species of *Phlegra*.

Material. Female holotype – Israel, En Karem, 12. V. 76. Leg. P. Amitai. Coll. HUJ.

Distribution. Israel: ‘En Karem (11).

Etymology. Named for Mr. Pinhas Amitai, an arachnologist, author of books on spiders of Israel, and a very



Figures 507–509. *Phlegra amitai* (female from 'En Karem), general appearance (507), epigynum (508) and its internal structure (509).

efficient field collector, who has contributed a large number of specimens to the Israel National Collection of Arachnids.

Phlegra bresnieri (Lucas)

Salticus bresnieri Lucas, 1846b: 154, Tab. 7, Fig. 8;

Salticus bresnieri: O. Pickard-Cambridge 1872: 323;

Phlegra bresnieri: Miller 1971: 134; Prószyński 1976: map 18; Cantarella 1982b: 248, Fig. 23; Prószyński 1991: Fig. 1373.5.

Diagnosis. Conspicuous dense white fur of setae on clypeus; abdomen with three thin narrow white lines (similar to *Ph. particeps*); epigynal depressions spaced by about half their diameter.

Remark. Identification of old specimens uncertain, requires confirmation from fresh material.

Description. Female (specimens identified by O. Pickard-Cambridge)

Cephalothorax: Thorax with a longitudinal pair of light stripes, yellow with whitish setae, separated by a median, brown streak and limited laterally by two brown streaks; lower sides pale yellowish. Eye field brown, anteriorly darker; an indistinct line of whitish, adpressed setae behind eyes I, possibly rubbed off on latter part of eye field.

Abdomen with two broad, dark stripes (each about 30% of abdomen width), separated from each other and from marginal, brown, narrow stripe by three white stripes: the median (18%) and the two lateral (11% each); sides whitish covered with inconspicuous, adpressed, whitish setae; sparse, small, dark bristles scattered over surface; longer white and dark bristles at the anterior tip

of abdomen; spinnerets elongate. Algerian specimens have narrower, white, abdominal lines, both median and marginal, and much broader, darker streaks.

Frontal aspect: dark eye field and surrounds to eyes I, but rims of eyes I with whitish setae; lower face intensely whitish with a dense row of horizontal white setae immediately beneath eyes I, directed forwards and forming a sort of "shelf", remainder of clypeus, pale whitish; chelicerae, pale yellow. Legs, in one specimen uniform pale whitish, in other specimens with slightly darker yellow tibiae, tarsi and metatarsi I–IV. Legs IV longest; III second in length; tibia I with three pairs of ventral spines. Ventral aspect: generally pale yellowish to whitish. Epigynum with two almost circular grooves in posterior half of epigynum, separated by a space of about half of groove diameter; copulatory openings much smaller than grooves, their edges highly sclerotized, partially hidden under anterior rim of groove. Algerian specimens have a similar epigynum but with a slightly different shape of the ducts as seen through semitransparent tegument.

Measurements (mm). Female. Length of cephalothorax 2.24–2.11; length of abdomen 2.24–3.79.

Distribution: S Europe, also Algeria. Israel: "Jerusalem, plains of Jordan" (O. Pickard-Cambridge 1872a: 323) (13).

Phlegra dimentmani Prószyński (Figs 524–525)

Phlegra dimentmani Prószyński, 1998: 171–172, Figs 18–19.

Diagnosis. Species with abdomen grey, without visible traces of contrasting stripes. Clypeus without con-

spicuous white streak, orbital setae of AME dorsally fawn (those around ALE slightly lighter), laterally and medially whitish. Epigynal depressions longitudinally oval, separated by a narrow septum.

Description. Female. Cephalothorax brown with lighter streaks of adpressed, sparse, whitish setae along dorsal edges, separated by brown area without whitish setae; eye field dark brown, sides brown, almost bald, somewhat lighter near ventral edge, the latter without white setae.

Abdomen altered now by preservation, uniformly greyish brown and partially shrunken.

Frontal aspect: dorsal part of orbital setae on rims of AME fawn, of ALE slightly lighter; lateral and median parts whitish; ventral inconspicuous. Clypeus bald with a few dark bristles; there are a few short, adpressed, whitish setae along the rim, and also scattered over the remainder of the clypeus. Chelicerae light brown; pedipalps light brown with darker annulations. Ventral aspect: coxae yellowish brown; sternum greyish brown with yellowish brown, broad margin; abdomen, uniformly light brownish grey. Legs: brown with darker annulations.

Epigynum with grooves oval, encircled with sclerotized rims and separated by narrow septum with parallel edges. Copulatory openings very broad, channels short, triangular posterior parts of spermathecae thinner than in other species. (Figs 524–525).

Measurements (mm). Female. Length of cephalothorax 2.29; length of abdomen 4.08; length of 5 segments of leg I 3.27.

Seasonal appearance of adult specimens. Females – V.

Distribution. Israel: Mt. Meron (1).

Etymology. Named for Dr. Chanan Dimentman of the Department of Evolution, Systematics and Ecology, Hebrew University, Jerusalem, Israel.

Phlegra fasciata (Hahn)

Attus fasciatus Hahn, 1826: 172, Tab. 12, Fig. D;

Salticus fasciatus: O. Pickard-Cambridge 1872: 322.

Remark. O. Pickard-Cambridge (1872a: 322) recorded males and females of *Salticus fasciatus* from Jericho and Jerusalem – much larger than European specimens “but M. Simon is of opinion that they are identical with the European form”.

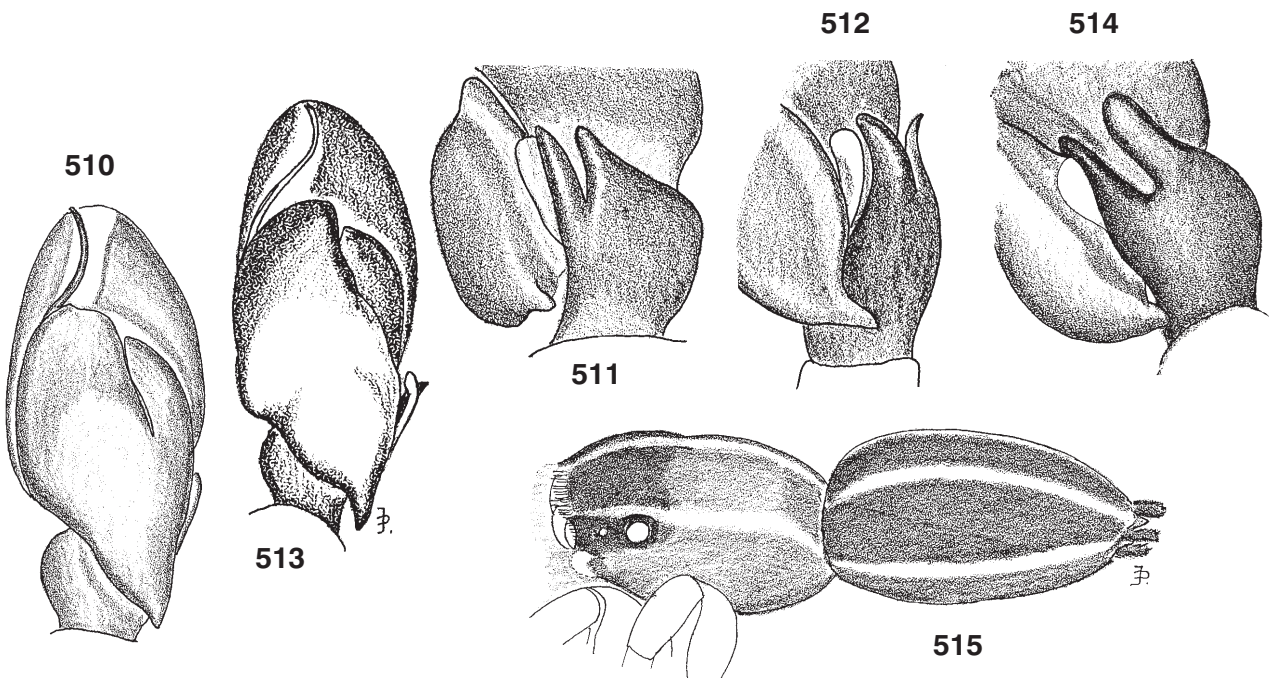
As no specimen could be found in the O. Pickard-Cambridge collection in the Hope Entomological Collections, Oxford and no recent specimen has been found, there is no possibility of verifying either the identification of the species or its occurrence in Israel.

Phlegra ferberorum Prószynski

(Figs 522–523)

Phlegra ferberorum Prószynski, 1998: 172–173, Figs 16–17.

Diagnosis. Specimen without distinct striped abdominal pattern. Orbital setae around AME dorsally reddish, laterally and medially whitish; clypeus brown without strikingly contrasting setae. Epigynal grooves oval, narrowing posteriorly.



Figures 510–515. *Phlegra particeps*, Ma'agan Mikhael specimen, palpal organ ventrally (510), tibial apophyses laterally (511), ventro-laterally (512); *Phlegra ferberorum*, En Hanifra specimen, palpal organ ventrally (513), tibial apophyses laterally (note rounded tip of the dorsal apophysis) (514), general appearance, striped pattern mutual for a number of species (515).

Remark. The species is entirely different from *Phlegra v-epigynalis*, also collected on slopes of Mt. Hermon, but at higher altitude – of 2000 m.

Description. Female. Cephalothorax brown; eye field blackish brown; dorsum of thorax lighter brown with sparse adpressed dark setae; very indistinct lighter streak along dorso-lateral edge with indistinct, short thin whitish and slightly denser setae; sides brown; ventral edge of carapace dark with minute sparse, whitish setae ventrally.

Abdomen dark brown, sparsely mottled yellow; median streak along the posterior half lighter and narrow ($\frac{3}{10}$ of abdomen width) with remnants of a mixture of dark and colourless setae.

Frontal aspect: AME surrounded dorsally by reddish setae, laterally and medially by whitish setae which ventrally become sparser; short and very inconspicuous; ALE surrounded dorsally by longer whitish setae with yellowish hue, laterally and ventrally by shorter whitish setae; clypeus brown, almost bald, with a few thin, very sparse and inconspicuous whitish, adpressed setae, not influencing its appearance, and a few brown bristles. Chelicerae brown; pedipalps brown, their patellae lighter with whitish setae; legs I brown with remnants of inconspicuous transverse rows of thin white adpressed setae across prolateral edge of tibia and patella.

Ventral aspect light brown, margin of ventral abdominal surface lighter but sides of abdomen much darker.

Epigynum: grooves almost oval, with slight antero-lateral expansion, encircled by sclerotized rim; septum narrow, slightly boadened posteriorly; copulatory openings narrower than in *Phlegra fulvastra* and *Ph. pori*, narrowing funnel-like before passing into first convoluted chamber, located laterally to the median, indistinctly narrower chain of chambers, which reaches level of rim of copulatory opening (Figs 522–523).

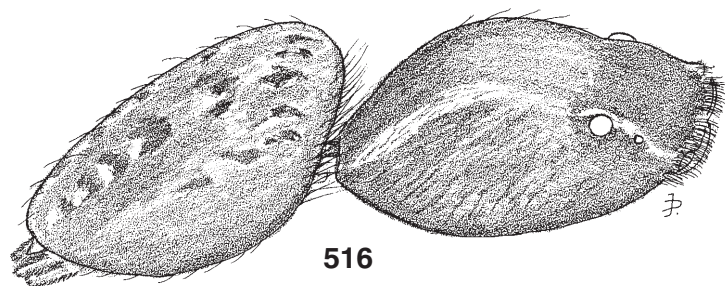
Legs I: tarsus light brown, darker brown basally, with indistinct short scopula; metatarsus short, brown, darker brown at both extremities; tibia broadened and somewhat swollen medially, with three pairs of ventral spines, brown, with two indistinct transverse stripes of white, adpressed setae, prolaterally lacking conspicuous setae; patella similar with two indistinct, lighter stripes prolaterally; femur apical half brown, basally slightly lighter, with both dark and white setae, small, thin and short. Legs II: similar to I, but lighter and darker stripes developed into somewhat more visible annuli. Legs III–IV: general coloration brown, pattern similar to I but annuli more contrasting.

Measurements (mm). Female. Length of cephalothorax 2.63; length of abdomen 3.31; length of 5 segments of leg I 3.97.

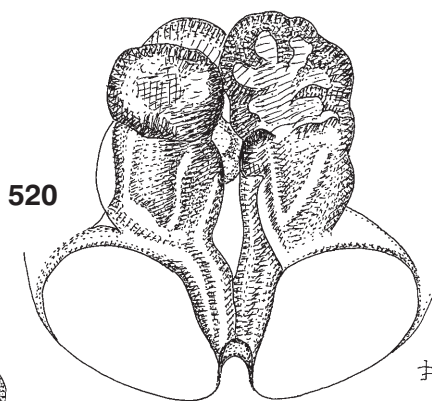
Seasonal appearance of adult specimens. Females – IV.

Distribution. Israel: Mt. Hermon, Marg Man 1400 m.

Etymology. Named for Miss Ilana Ferber and her parents.

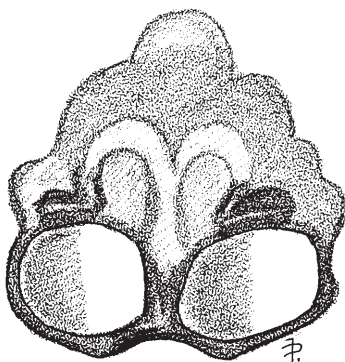
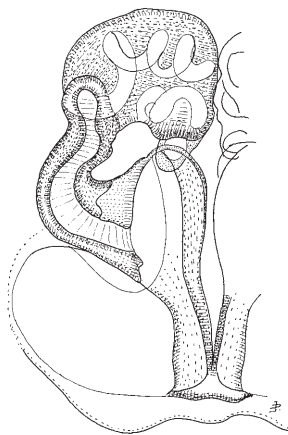


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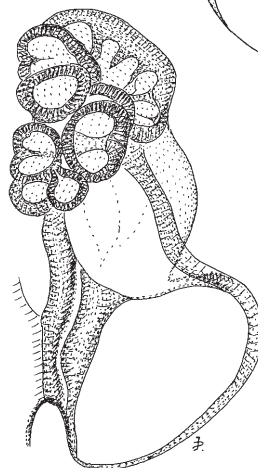


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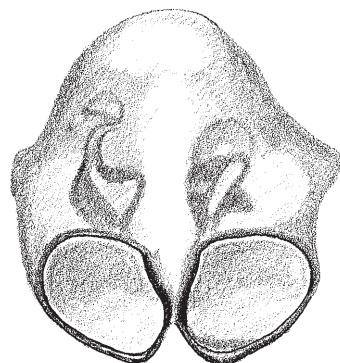
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Phlegra fulvastra (Simon)

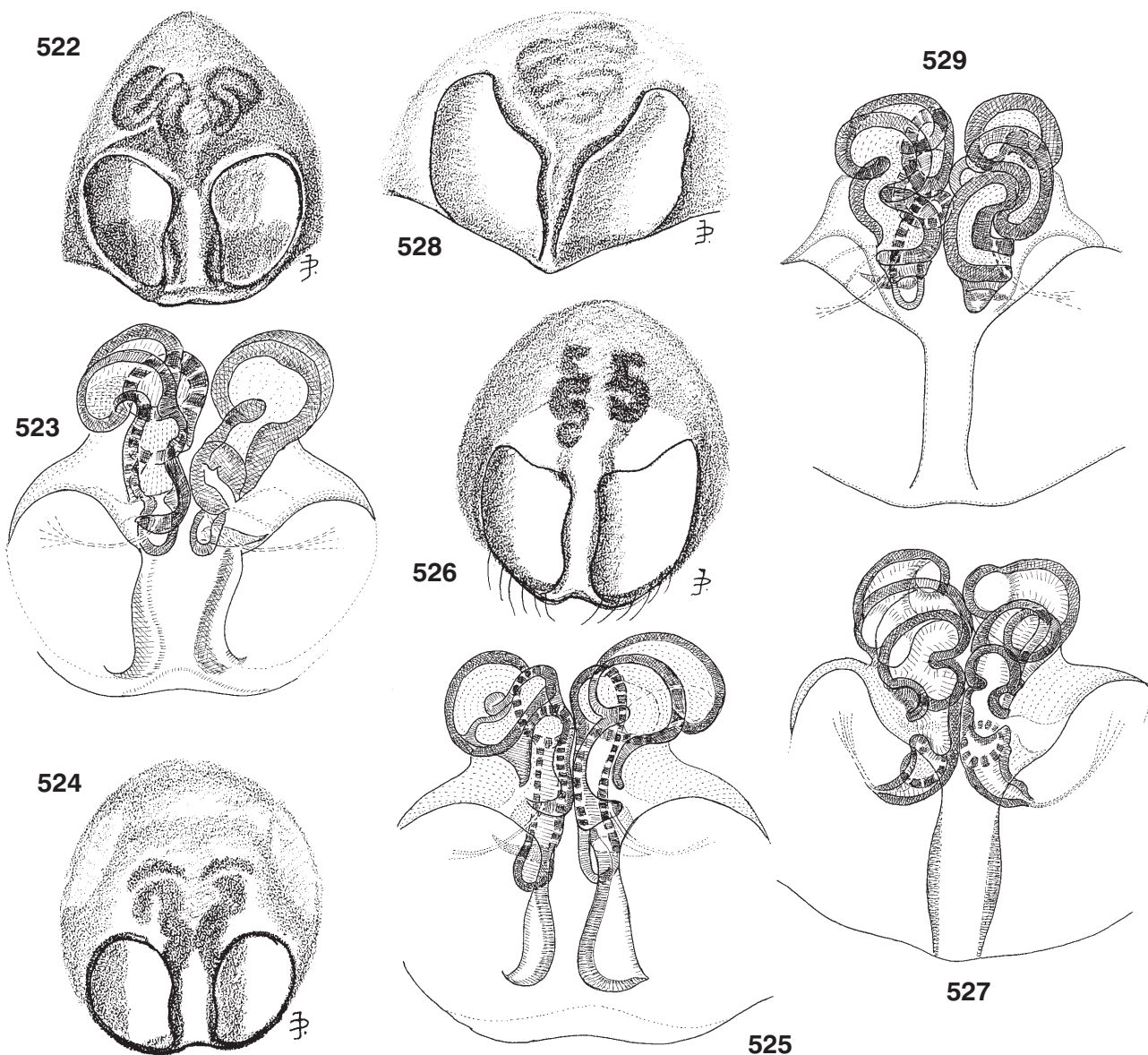
(Figs 534–535)

Attus fulvaster Simon, 1868: 556;*Salticus fulvaster*: O. Pickard-Cambridge 1872: 323;*Phlegra fulvastra*: Prószynski 1998: 173–174, Figs 28–29.

Diagnosis. Species without typical striped abdominal pattern. Face light brown, orbital setae above eyes I reddish, whitish laterally and medially; clypeus light fawn without contrasting setae. Epigynal depressions long and broad, with only antero-median rims sclerotized, openings very broad, first chamber of spermathecae particularly large, globular.

Description. Female. Cephalothorax light brown with sparse, adpressed, dark setae and with two lighter

streaks along dorsal edge; eye field, dark; indistinct spots of white setae antero-medially and laterally on eye field and also along lighter, thoracic streaks; sides of cephalothorax light brown, lighter ventrally; ventral edge of carapace dark with dense but inconspicuous, minute whitish setae. Abdomen with dense brown pigmented dots of darker setae on lighter yellow pigmented background with colourless setae; median light row of 7 small, whitish chevrons (containing both pigmentation and setae, the latter denser on the arms of the chevrons), about $\frac{1}{4}$ abdomen width, also a few indistinct spots posteriorly. Frontal aspect: face light brown; eyes I surrounded with short whitish setae; on O. Pickard-Cambridge's specimen, these setae are entirely white, whereas on the fresh specimen there are reddish setae



Figures 522–529. *Phlegra ferberorum*, epigynum (522) and its internal structure (523); *Ph. dimentmani*, epigynum (524) and its internal structure (525); *Ph. levyi*, epigynum (526) and its internal structure (527); *Ph. shulovi*, epigynum (528) and its internal structure (529).

dorsally, on rims of AME and the ALE; these setae are shorter than in *Ph. ferberorum* and *Ph. levyi*; ventral to both AME and ALE, the setae are sparser, short and inconspicuous. Clypeus is light fawn with colourless setae and a few brown bristles, not giving impression of being bald; also, white setae on clypeal margin of the old specimen are not so distinct as on the fresh one; chelicerae, light brown; lighter areas at extremities of pedipalpal segments as seen in *Ph. levyi*, here expand over almost whole segments, leaving narrow brown rings basally on tibia and metatarsus. Legs I brown with broad, transverse, lighter spots on the tibia and patella. Ventral aspect: sternum and coxae brownish yellow; abdomen light whitish yellow with small darker, grey spots, more concentrated along the median line; in O. P. Cambridge's specimen there is, ventrally on abdomen, a brown, median streak with some 4–5 pairs of spots of the same colour, connected by thin lines with streaks, all on a whitish grey background; margins, like the sides of the abdomen, dark brown with lighter grooves. Legs I–II similar to *Ph. ferberorum*, with their retrolateral surfaces brown and little differentiated, whilst prolateral and dorsal surfaces are much more differentiated with dark and light stripes and annuli appearing distinctly more contrasting; legs III–IV with yellow and dark brown annuli, particularly striking on femora, patellae and tibiae. Epigynum with two large grooves, oval anteriorly, opening broadly posteriorly; divided by a broad elevated space, slightly narrowing posteriorly; copulatory opening very broad, rounded and divided by a median spur; a narrowing, funnel-like, copulatory duct leads to a large spherical chamber located anterior to the openings, from whence a narrow passage leads to a much smaller anterior chamber, the first in a median chain of several convoluted chambers which ends midway along the spermathecae (Figs 534, 535).

Measurements (mm). Female. Length of cephalothorax 2.70–2.85; length of abdomen 2.83–3.40.

Seasonal appearance of adult specimens. Females – IV, V.

Distribution. Israel: "Plains of Jordan", 'Ein Duyuk (13).

Phlegra fulvastra (Simon)

(Figs 516–518)

Attus fulvaster Simon, 1868: 556;

Phlegra jacksoni Prószyński, 1998: 174–175, Figs 10–12.

Diagnosis. Abdomen grey without contrasting stripes, epigynal depressions transversally oval, shorter than half length of epigynum, separated by a septum.

Description. Female. Cephalothorax dark brown, covered with mixed dark, whitish and white, adpressed, very small and indistinct setae; eye field blackish; dorsum of thorax lighter brown; sides blackish brown; more noticeable concentrations of white setae produce an

indistinct elongated spot around dorsal rim of eyes III, which extends slightly behind, and fragments of two loose white streaks on the lighter brown, posterior, thoracic slope. There are no dorsal white streaks, at least in the studied specimen; sides with sparse whitish setae, there is no white, ventral margin.

Abdomen covered with dark grey setae and devoid of contrasting stripes; there is a median longitudinal row of several dark and light chevrons, not sharply outlined, which are slightly larger and more contrasting (Fig. 516) than in related, similarly coloured species; the stripe is separated from margins of abdomen with thin darker lines. Sides of abdomen are slightly lighter than dorsum.

Frontal aspect: anterior end of eye field with dense, black bristles stretching horizontally or diagonally forwards above eyes I; there is a concentration of dense white setae between the bases of these bristles, and partially hidden by them. Eyes I surrounded by spots of inconspicuous, light fawn and dark setae; clypeus brown, with sparse, colourless and brown setae, appearing almost bald. Pedipalps appear light yellow; legs I dark, annulated.

Ventral aspect generally brown, including abdomen.

Legs brown with darker annuli, tarsi I with indistinct scopula.

Epigynum has a pair of large grooves with sclerotized rims, separated by a narrow sclerotized septum. Copulatory openings are hidden beneath the anterior rim of the depression and are unusual by their longitudinal, median orientation. The copulatory channels are short, broad at the openings, runs first sideways, then turning anteriorly and narrowing and finally joining spermathecae. Spermathecae are unusual by their transverse position in the anterior part of the epigynum, without a part turned posteriorly; they are heavily sclerotized, oval bodies with internal convoluted chambers (Figs 516–518).

Measurements (mm). Female. Length of cephalothorax 3.06; length of abdomen 3.23; length of 5 segments of leg I 4.17.

Seasonal appearance of adult specimens. Females – II.

Distribution. Israel: Even Yiz'haq (6).

Etymology. Named for Dr. Robert Jackson of Canterbury University, Christchurch, New Zealand, prominent arachnologist and student of Salticidae behavior, who contributed a number of species which he collected in Israel.

Phlegra levyi Prószyński

(Figs 526–527)

Phlegra levyi Prószyński, 1998: 175–176, Figs 20–21.

Diagnosis. Face with dorsal orbital setae reddish, laterally and medially whitish. Clypeus brown, without contrasting setae. Epigynal grooves rimmed around, anteri-

only broad with antero-lateral angles expanded, narrowing posteriorly, septum narrow with edges parallel.

Description. Female. Cephalothorax brown; eye field blackish brown; dorsum of thorax lighter brown with sparse, adpressed, dark setae with median, darker brown area separated by very indistinct, lighter streaks with some short weak, whitish setae along dorso-lateral edge; sides of cephalothorax brown; edge of carapace ventrally dark with sparse minute, whitish setae.

Abdomen – dorsal surface damaged.

Frontal aspect similar to *Ph. ferberorum* but better preserved and more distinct: AME surrounded dorsally by longer reddish setae, laterally and medially by whitish, ventrally by sparser, short and very inconspicuous whitish setae; ALE surrounded dorsally by longer red setae, laterally and ventrally by shorter, whitish setae; clypeus almost bald, brown with two lighter pigmented spots, medially (perhaps an individual feature), with a few thin, very sparse and inconspicuous whitish, adpressed setae, not affecting its appearance, and a few brown bristles; chelicerae brown; pedipalps brown, lighter patella with whitish setae and lighter extremities of segments; legs I brown with remnants of inconspicuous, transverse rows of thin white, adpressed setae

across the prolateral edge of tibia and patella. Ventral aspect light brown. Legs I–IV similar to *Ph. ferberorum* but with slightly more contrasting light stripes and annuli. Epigynum with two posterior grooves, about half the length of the epigynum, expanded angularly antero-laterally, closed posteriorly by a rim, divided by a narrow septum; copulatory opening, narrower than in *Ph. fulvastra* and *Ph. pori*, narrowing funnel-like and passing into the first convoluted chamber located lateral to the median chain of chambers, but not broader than them, the median chain ending at level of rim of copulatory opening (Figs 526–527).

Measurements (mm). Female. Length of cephalothorax 3.08, length of abdomen: 3.33.

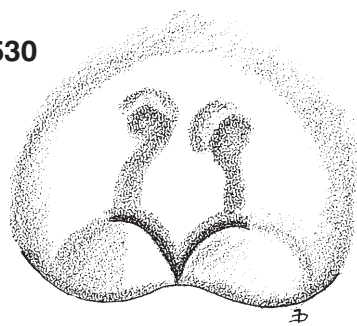
Distribution. Israel: En Kerem (11).

Etymology. Named for Dr. Gershom Levy, the curator of the Israel National Arachnid Collection, kept in the Department of Evolution, Systematics and Ecology, Hebrew University, Jerusalem, Israel.

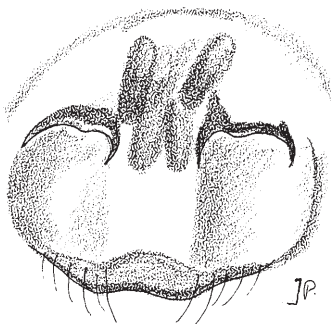
Phlegra palestinensis Logunov
(Figs 726–728)

Phlegra palestinensis Logunov, 1996: 57, Figs 8–12.

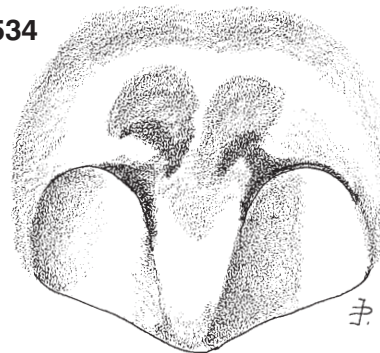
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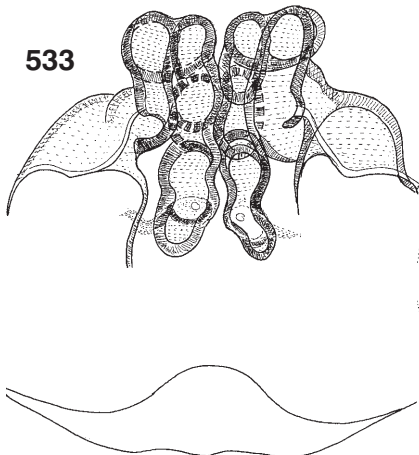
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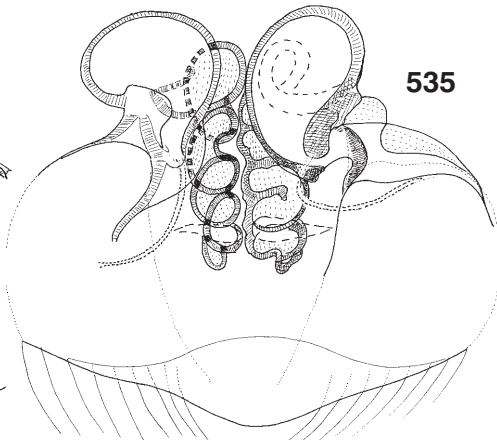
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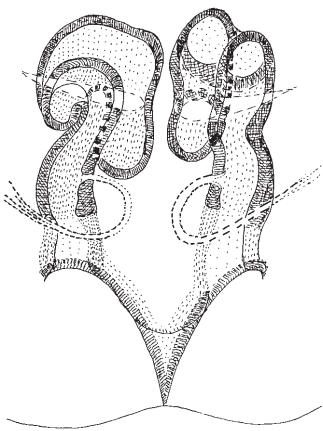
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535



531



Diagnosis. Species characterised by shape and size of embolus and bulbus (Fig. 726).

Description. Male (holotype). Species with large and swollen bulbus, and unusually broad and robust embolus, which is split apically into 2 broad, rounded swellings. Face black, with dense pillow of contrasting white setae on clypeus; directed transversally and adpressed. Pedipalpal patella covered with whitish and colourless setae, tip of femur with striking triangle of intensely white setae.

Cephalothorax uniformly blackish brown, except white lines of adpressed hairs along lateral edge of eye field, continued along edge of dorsal and lateral surfaces of thorax as slightly broader white lines, interrupted in places where setae have fallen out. Ventral surface dark brown.

Abdomen missing. Legs uniformly dark brown, with lighter brown tarsi I–IV.

Distribution. Israel: Nahal Oren (3).

Seasonal appearance of adult specimens. Male – II.

Phlegra particeps (O. Pickard-Cambridge)

(Figs 510–515)

Salticus particeps O. Pickard-Cambridge, 1872: 330;

Phlegra particeps: Prószyński 1978: 11–12, Figs 7–10; Prószyński 1998: 176–177, Figs 4–9.

Diagnosis. Body blackish brown, with white streaks on abdomen and lighter brown on cephalothorax, legs black. Orbital setae above eyes I orange or fawn, clypeus with contrasting narrow row of short white setae, (distinctly narrower and less prominent than striking, long, white fur on clypeus of *Ph. bresnieri*).

Remark. Lectotype specimen deteriorated since original description by O. Pickard-Cambridge (1872: 330–331), black colour is now, after over 120 years of preservation, faded to light brown, or even dark yellow; most hairs have been lost, remnants of the characteristic “yellow-red setae” surrounding anterior eyes now appears white.

Description. Male. Cephalothorax blackish brown, with thorax lighter brown, indistinct light brown streaks along dorsal edges of thorax, lighter streak along mid-height of sides and light yellow area on sides below eyes lateral, which also extend on face below ALE. Lighter streaks and areas with remnants of sparse whitish setae, broad ventral marginal area of sides blackish grey.

Abdomen blackish brown, with three narrow white lines of dense, adpressed, setae: one median and two marginal, narrow each $\frac{1}{10}$ of abdomen width, separating two broad blackish brown longitudinal areas each $\frac{4}{10}$ abdomen width, covered with adpressed brown setae. Upper streak on sides dark brown, remaining sides lighter grey. Dark appearance of body increased by dark general appearance of legs.

Face – upper half dark with conspicuous orange or fawn orbital setae along dorsal and lateral parts of rims

of eyes I; lower half divided into yellow areas under ALE and dark brown area under AME, the latter with prominent row of strikingly white setae, adpressed and set diagonally, the ventral margin of clypeus is dark brown, bald, with a sparse row of a few inconspicuous, colourless, evenly spaced longer setae hanging down from the edge. Chelicerae brown.

Pedipalps blackish with white setae on patella and in a sparse row along dorsal edge of femur, tip of cymbium light grey.

Examination of palpal organ difficult because of black or blackish coloration of parts, for this reason their descriptions and drawings often uncertain. Embolus long and thin, reaching anterior end of cymbium, bulbus blackish grey, tibial apophyses blackish, almost invisible on blackish background of cymbium, details visible only after separation of tibia from cymbium. Apophyses are long and narrow, separated by narrow, V-shaped slit; in various specimens differ in relative width, length and tip of each of these apophyses; significance of these minor differences is not certain, and some differences may be interpreted as related species.

Legs blackish, femora I–IV blackish with two lighter, olive grey or yellowish lines separating median black line. Dorsal surfaces of patellae I–IV olive brown, tibiae and metatarsi I–IV dark brown with dark median line on dorsal surfaces, delimited by two lighter lines, tarsi I–IV lighter brown.

Seasonal appearance of adult specimens. Males – II–IV.

Distribution. Israel: ‘En HaMifraz (4); Ma’agan Mikha’el (8); Jerusalem (11); Sede Boker (17).

Phlegra pori Prószyński

(Figs 532–533)

Phlegra pori Prószyński, 1998: 177–178, Figs 26–27.

Diagnosis. Epigynal depressions large, without a posterior rim, spaced by about their diameter, septum of constant width, first chamber of spermathecae narrow.

Description. Female. Cephalothorax light brown with lighter, yellow streaks along the dorsal edges, separated by a light brown area; eye field dark brown; upper sides fawn, lower yellow with dark ventral edge and white setae.

Abdomen much damaged, soft tissues shrunken and now separated from tegument; remnants of whitish and darker setae; no positive proof of previous existence of stripes.

Frontal aspect: clypeus light yellow with indistinct, colourless setae and brown bristles basally; eyes I surrounded with white setae; there is a yellowish spot, dorso-laterally at ALE. Chelicerae light yellow; pedipalps light yellow with darker spots basally on tarsus, tibia and patella. Legs I light brown with light transverse spot

on tibia and patella. Ventral aspect generally whitish yellow, abdomen light whitish yellow with small, darker grey spots, more concentrated along median line.

Epigynum with two grooves, truncated anteriorly, broadly open posteriorly, divided by broad septum not narrowing posteriorly. Copulatory opening very broad, funnel-like narrowing channel leads to the anterior chamber from which convoluted narrow chambers of spermathecae run medially to midway along the epigynum (Figs 532–533).

Distribution. Egypt, Sinai: Mt Catherina (22).

Etymology. Named for Professor F. D. Por, of the Department of Evolution, Systematics and Ecology, Hebrew University, Jerusalem, Israel, who supported and greatly assisted in the present research.

Phlegra rothi Prószynski

(Figs 519–521)

Phlegra rothi Prószynski, 1998: 178–179, Figs 13–15.

Diagnosis. Legs black, epigynal depressions rimmed around, septum narrowing posteriorly.

Remark. Male specimens of *Phlegra*, identified as *Ph. particeps*, were found in the same locality but that mutual occurrence is insufficient to consider both specimens conspecific, especially since female does not have the striped pattern of the male.

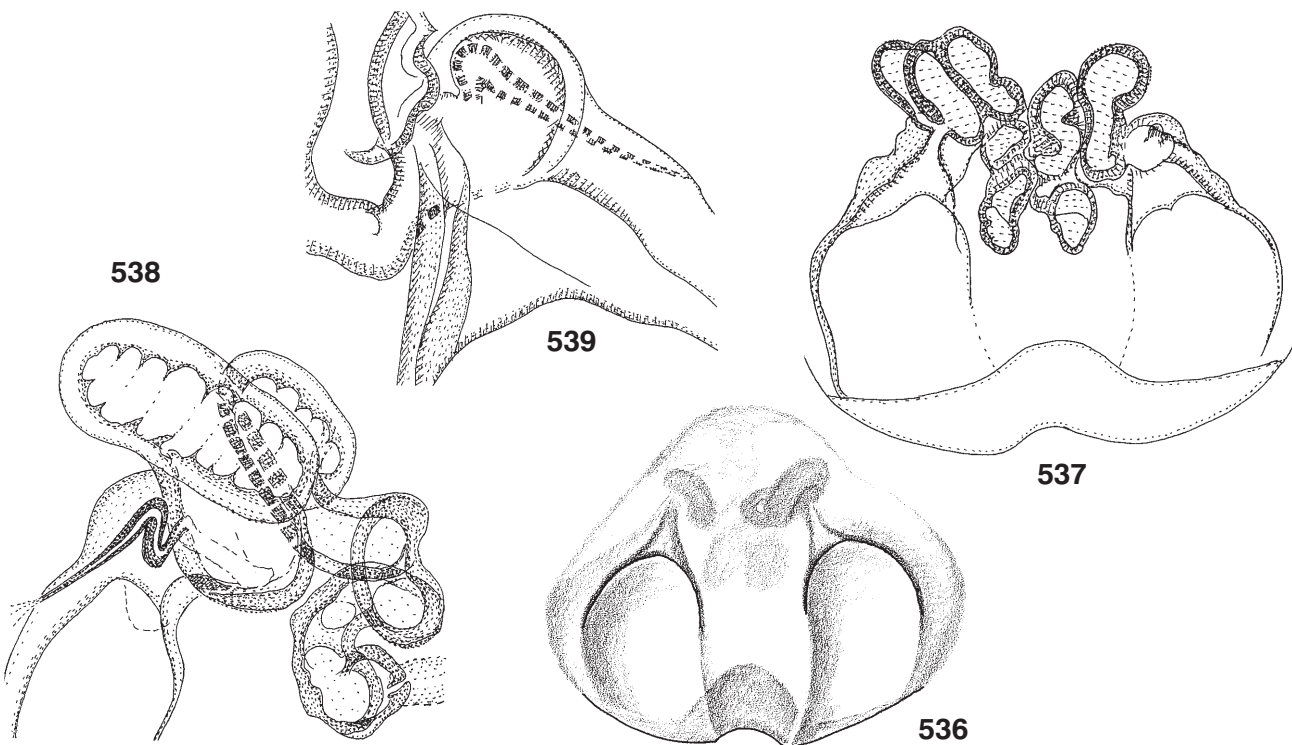
Description. Female. Cephalothorax dark brown, with eye field blackish brown, covered with inconspicuous, short and adpressed whitish and colourless setae, more dense and more intensively white along edges of dorsal surface of thorax, which give appearance of two weak white streaks.

Frontal aspect: face dark brown, with lower clypeus lighter yellowish brown; orbital setae around eyes I are longer dorsally, becoming shorter laterally and absent ventrally, dorsal ones over AME are fawn, over ALE consist of two bunches: white and fawn, and laterally fawn. Clypeus almost bald, with a few longer bristles and sparse, short and inconspicuous colourless setae. Chelicerae dark brown. Pedipalps and legs I dark brown, darker ringed.

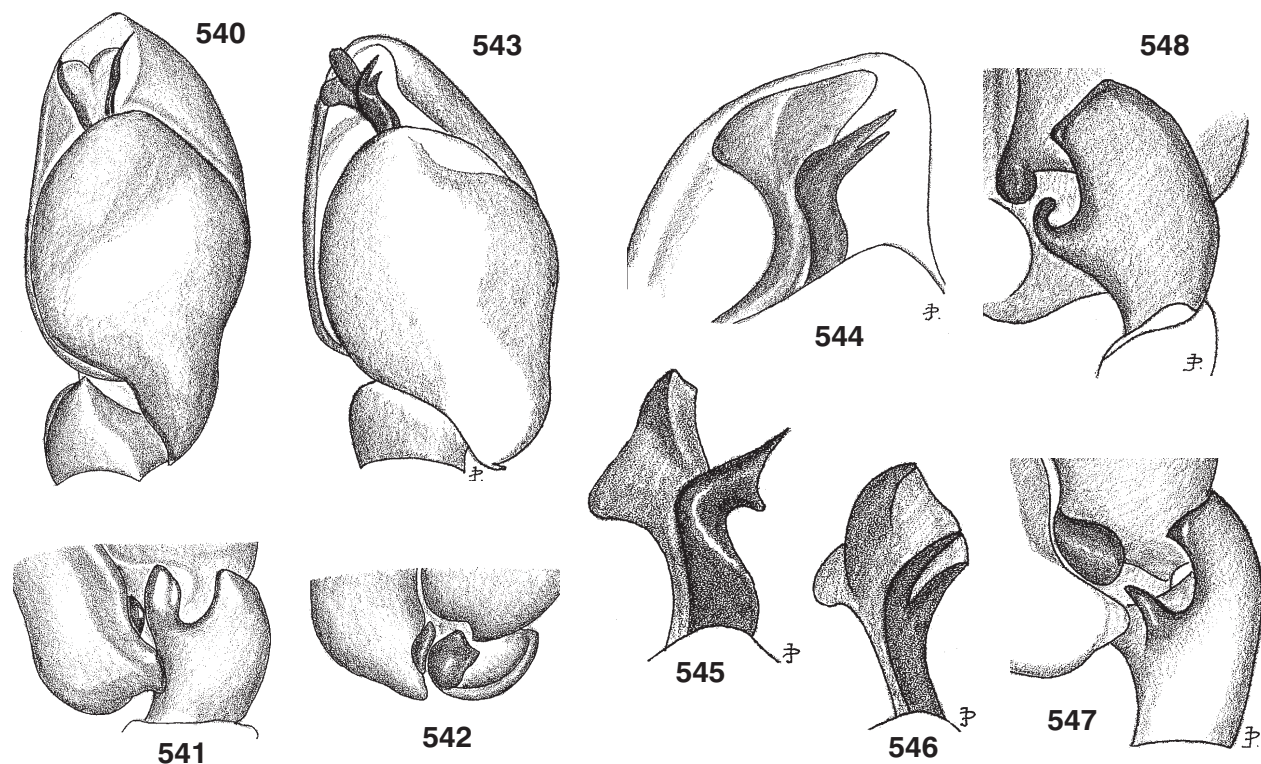
Abdomen appears greyish with indistinct irregular spots, which concentrate posteriorly into indistinct median streak, about $\frac{1}{3}$ of abdomen width, consisting of thin white and brown chevrons, delimited laterally by darker brown spots, and centrally the streak is more prominently whitish, absent in the anterior part of abdomen.

Ventral aspect: sternum brown, coxae lighter, yellowish brown. Abdomen ventrally with median area delimited by light yellowish lines and with two such lines running more medially, sides darker brown, anterior area around epigynum almost white.

Epigynum with two prominent deep grooves, entirely encircled with dark brown sclerotized rims; the sep-



Figures 536–539. *Phlegra yaelae* (from Haluqim Ridge), epigynum (536), its internal structure (537), details of single spermatheca dorsally (538), details of the accessory gland (539).



Figures 540–548. *Phlegra yaelae* (from Haluqim Ridge), palpal organ ventrally (540), tibia laterally (541) and ventro-laterally (542); *Ph. tillyae*, palpal organ ventrally (543), Jerusalem specimen, tip of embolus ventrally (544), En Gedi specimen, tip of embolus (under higher power) ventro-laterally (545) and ventrally (546), pedipalpal tibia dorsally (547) and laterally (548).

tum separating grooves narrows posteriorly and is distinctly narrower than in *Ph. amitai*. The anterior half of epigynum is sclerotized, light brown, with sparse brown bristles.

Legs dark brown, ringed, legs III–IV more contrastingly ringed with lighter rings and spaces.

Measurements (mm). Female. Length of cephalothorax: 2.94, length of abdomen: 3.40.

Seasonal appearance of adult specimens. Females – II, III, VI.

Distribution. Israel: Ma'agan Mikha'el (8).

Etymology. Named for the late Vinc Roth, an American arachnologist and collector of valuable specimens from Israel.

Phlegra shulovi Prószyński
(Figs 528–529)

Phlegra shulovi Prószyński, 1998: 179, Figs 22–23.

Diagnosis. Anterior half of epigynal partition broadly triangular, posterior narrow.

Description. Female. Cephalothorax brown, eye field blackish brown, dorsum of thorax lighter brown with sparse adpressed dark setae, median darker brown area separated by very indistinct, lighter streaks with a few short, whitish setae along dorso-lateral edge; sides of

cephalothorax, brown, edge of carapace dark with sparse, minute, whitish setae ventral to it.

Abdomen much damaged now, dark brownish grey, mottled with yellow, with remnants of two submedian rows of reddish brown spots; remnants of brown and whitish setae.

Frontal aspect: eyes I surrounded by whitish setae, with an indistinct, dorsal, brownish spot; clypeus baldish, brown, with a few thin, very sparse and inconspicuous whitish, adpressed setae, not influencing its general coloration, and a few brown bristles. Chelicerae light brown; pedipalps with tarsi brown, patella and tibia yellow with brownish basal parts; legs I brown with remnants of inconspicuous, transverse rows of white, adpressed, thin setae across the prolateral edge of tibia and patella. Ventral aspect generally light brown; abdomen greyish brown. Legs I–IV similar to those of *Ph. ferberorum*, generally dark brown.

Epigynum with two posterior grooves, longer than half epigynum length, pronouncedly expanded angularly, antero-laterally, opened posteriorly, divided by a septum, broad anteriorly but rapidly narrowing, posteriorly; copulatory opening narrower than in *Ph. fulvastra* and *Ph. pori*, with the roof cut diagonally, narrowing, funnel-like and passing into first convoluted chamber located at anterior end of the median chain of chambers and not much broader than them, the posterior end of the median chain at the level of the rim of the copulatory opening (Figs 528–529).

Seasonal appearance of adult specimens. Females – III.

Distribution. Israel: Qiryat 'Anavim (11).

Etymology. Named for Professor A. Shulov, founder of the Israel National Arachnid Collection.

Phlegra stephaniae Prószyński

(Figs 549–554)

Phlegra stephaniae Prószyński, 1998: 180–181, Figs 43–48.

Diagnosis. Typical striped pattern, lighter than in other species, particularly in females, in which dark streaks are reduced to thin, light brown lines. Pedipalps darkly contrasting, embolus long and thin, broader near edge of bulbus, space between tibial apophyses slit-like, tips of apophyses slightly bent. Epigynum with angular meeting point of anterior rims located in its mid-length.

Description. Male. Cephalothorax: thorax and upper sides of cephalothorax light yellow with thin light brown streaks on dorsum: one median and two marginal. Eye field dark brown, covered with inconspicuous adpressed, colourless setae; there are remnants of two whitish lines of denser and longer whitish setae running along eye field from a white spot on median rims of ALE, medially to eyes II and III and joining light thoracic streaks. These white lines may be much more conspicuous in some specimens.

Abdomen with typical light and dark striped pattern. Two median light yellow and two darker brown stripes, whose width are each $\frac{1}{5}$ of abdomen width, marginal light stripes are $\frac{1}{10}$ of abdomen width. Upper sides light greyish brown, lower whitish. Dark streaks, covered with brown adpressed setae, light yellow streaks with colourless setae.

Frontal aspect. Dorsal surface of eye field appears black with fawn adpressed setae, a striking spot of white setae above medial half of ALE rim, the remaining half has inconspicuous fawn setae. Orbital setae around AME

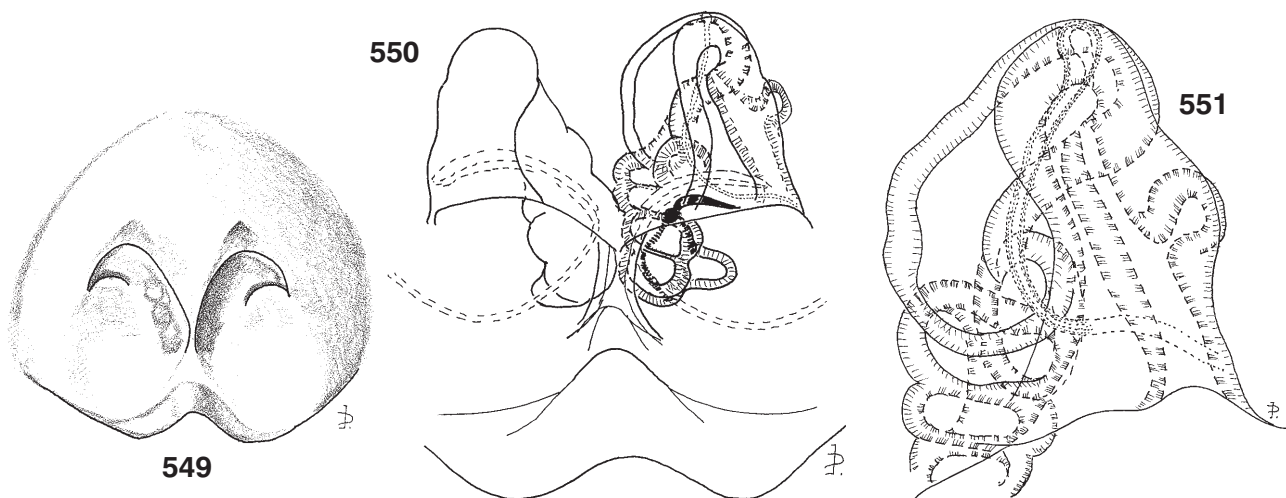
dorsally fawn with a few white, laterally greyish, ventrally colourless. Clypeus low, slightly higher than $\frac{1}{3}$ of AME diameter; space beneath AME is greyish brown, with slightly lighter median vertical line, with stronger setae dark brown, pointing diagonally down. Part of these setae diagonally overhang cheliceral bases. The dark area beneath AME is delimited laterally by light yellow area running from the rim of ALE to carapace edge and extending onto sides of cephalothorax, upper half of that lighter area, under ALE rim, is covered with conspicuous white, adpressed setae. Chelicerae laterally brown, medially fawn, with lighter, almost white apical part. This contrasts with black cymbium (with a whitish grey tip), tibia and medial half of pedipalpal patella; the retrolateral half of patella is lighter, grey with a spot of white setae. Palpal femur is dark grey with a crest of longer white setae along its dorsal surface. Legs I in this position are light yellowish grey, tibia and metatarsus I fawn; prolateral surface of femur I is darkened, which on femur II is followed by narrower dark streak.

Palpal organ resembles *Ph. particeps*, from which it seems to differ by slightly broader bulbus, posterior part of protruding tip of embolus seems to be broadened.

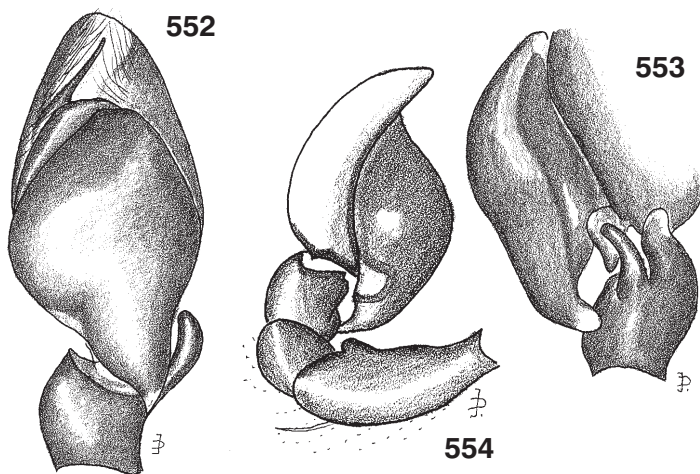
Ventral aspect light greyish yellow, abdomen whitish.

Female. Cephalothorax yellow with dark eye field and two thin, light brown streaks of adpressed setae along marginal edges of dorsal and upper lateral surfaces of thorax. There are remnants of median streak of dark adpressed setae on slope of thorax, which may suggest presence of median streak in some specimens, dividing light dorsal surface into two light streaks, apparently somewhat broader than the dark median one, just as in males. Eye field dark brown (in the younger specimen dark olive brown) with inconspicuous colourless, adpressed setae and sparse black bristles.

Abdomen whitish yellow, with two light greyish brown pigmented streaks, thinner than three light streaks,



Figures 549–551. *Phlegra stephaniae* (holotype from Arava), epigynum (549) and its internal structure (550), details of spermatheca (551).



Figures 552–554. *Phlegra stefaniae* (paratype from Arava), palpal organ ventrally (552), laterally (553), pedipalp lateral view (554).

there is also a thin dark rim on the edge with sides. The setae on the dorsal surface are very inconspicuous, small, sparse and dark. Spinnerets yellowish grey.

Frontal aspect: upper part of face dark with tiny white setae, eyes I surrounded by orbital setae dorsally yellow, ventrally whitish. Space beneath eyes light yellow, without any contrasting setae. In the paratype specimen clypeus is light grey, also without contrasting coloration, but partially hidden by a triangular patch of inconspicuous long whitish setae, protruding from under eye rims diagonally forward and down, there are also thin and colourless, almost invisible sparse setae overhanging cheliceral bases. Chelicerae yellow. Pedipalps whitish yellow, with tibiae and tarsi yellowish brown, covered with upright, dense and long, colourless setae. Ventral aspect almost uniformly whitish

Legs yellowish or yellow except tibiae and metatarsi I–IV fawn, femora I–II with prolateral surface darkened or with dark streak, covered with small and sparse dark setae.

Measurements (mm). Male. Length of cephalothorax: 1.87, length of abdomen: 1.81, length of 5 segments of leg I 2.75. Female. Length of cephalothorax: 2.00, length of abdomen: 2.37, length of 5 segments of leg 3.19.

Seasonal appearance of adult specimens. Male – I, female – I.

Distribution. Israel: Qetura (14).

Etymology. Named for Dr. Stefania Hęciak, of Siedlce, Poland, an arachnologist who has contributed valuable redescriptions of types of over 20 species of *Phlegra* (in a PhD thesis,) which I used in my studies, and also consulted for my identifications, including this species.

Phlegra tillyae Prószyński
(Figs 543–548)

Phlegra tillyae Prószyński, 1998: 181–182, Figs 37–42.

Diagnosis. Embolus unusual in consisting of two different elements and by tibial apophyses of unequal length and width.

Remark. The specimens studied are faded due to long period of storage; however, the structure of embolus and tibial apophyses are so special that there is no doubt the species is different from all known species and is apparently new. Their conspecific status is uncertain.

Description. Male. Present body coloration, presumably faded, is yellowish, with traces of white stripes on the abdomen. Clypeus covered with adpressed whitish setae.

Palpal organ typical for *Phlegra*, with relatively long and robust embolus, consisting of two parts. The brown dorsal part is broad and has a complicated shape, expanded apically into flat plate, directed medially, and with a ventral rise.

The second part, located ventrally to the first, is a broad black rod, apically bent under almost at right angles, and split into two processes, which may possibly be due to splitting of the tip. The tibial apophyses are separated by a U-shaped gap, and are of unequal width and length. The dorsal apophysis is longer, broad and broadly truncated; its apical edge is straight and slightly inclined. The ventral apophysis in lateral view appears shorter, thin and pointed; when examined in dorsal view, it appears hook-like, bent apically; there is also a rounded process of cymbium, apparently fitting into gap between both apophyses, presumably articulating there and locking both segments in a fixed position during copulation.

Seasonal appearance of adult specimens. Males – III, X.

Distribution. Israel: Jerusalem (11); ‘En Gedi (13).

Etymology. Named for Dr. Heather “Tilly” Bromley-Schnur, formerly of the Department of Evolution, Systematics and Ecology, the Hebrew University of Jerusalem.

Phlegra v-epigynalis Hęciak
(Figs 530–531)

Phlegra v-epigynalis Hęciak, in Prószyński 1998: 182–183, Figs 24–27.

Diagnosis. Abdomen brown, without stripes; epigynal depressions small, located posteriorly, separated by very short diagonal V-shaped partition made of sclerotized anterior rims, meeting at posterior edge of epigynum.

Remark. Description of an old, non-identified specimen from “Syria” in Simon collection, was contributed by Dr. S. Hęciak. Five specimens were collected in 1971 on Mt. Hermon at 2000 m, they differ from *Ph. ferberorum*, also from Mt Hermon but at a lower altitude.

Description. Female. Cephalothorax brown, with anterior eye field and surrounds of eyes III darker; cov-

ered with adpressed, dark reddish brown and a few whitish setae, the latter located mainly posteriorly on dorsum but not forming any pattern. Sides light brown with thin, dark, sclerotized ventral edge, without any fringe of setae.

Abdomen uniformly brown with reddish gold hue, without any visible pattern [there seem to be remnants medially of two parallel, longitudinal lines of denser, darker setae, however, not enough is visible to be sure of its existence], covered with mixed adpressed, reddish brown and black setae, with a few white setae, antero-medially; numerous upright, but short, blackish brown bristles give a "hairy" appearance.

Frontal aspect. Eye field black with dense bristles, surrounds of eyes I dark without visible setae on the rim. Clypeus light brown, bald; chelicerae brown with reddish hue; pedipalps small and thin, brown with dark setae.

Ventral aspect: coxae and sternum brownish yellow, abdomen ventrally uniformly brownish grey.

Epigynum with grooves located in posterior part, delimited anteriorly by sclerotized anterior rims, meeting at posterior edge of epigynum, forming a very short V-shaped septum; the posterior rims are not developed. Copulatory channels are narrow, run parallel and are longer than spermathecae (Figs 530–531).

Legs brown with some differentiation but not annulated, with sparse, dark and distinct setae.

Measurements (mm). Female. Length of cephalothorax 2.36, length of abdomen 3.99.

Seasonal appearance of adult specimens. Females – IX.

Distribution. "Syria". Israel: Mt. Hermon, 2000 m.

Phlegra yaelae Prószynski

(Figs 536–542)

Phlegra yaelae Prószynski, 1998: 183–184, Figs 30–36.

Diagnosis. Typical striped coloration, contrasting but distinctly lighter than *Ph. particeps*; legs also light. Embolus plate-like, gap between tibial apophyses U-shaped. Epigynal grooves long, sclerotized rims of openings at $\frac{1}{6}$ of epigynum length, septum broad and parallel, its posterior end curved anteriorly.

Description. Male. Cephalothorax brown, with contrasting white lines of adpressed setae, along light yellow dorso-lateral margins of thorax, continue as thin white lines of setae along margins of eye field until ALE.

Brown median area of thorax and upper sides covered with black adpressed setae, lower sides yellowish brown with inconspicuous whitish setae, ventral rim of sides blackish. Anterior edge of eye field covered with whitish setae.

Abdominal pattern consists of contrasting, conspicuous stripes: median streak light, posteriorly strikingly white, about $\frac{1}{6}$ of abdomen width, followed on each side by brown streak and then by white marginal line.

Face divided into three horizontal stripes: the anterior edge of eye field with short whitish setae, merging with whitish dorsal orbital setae, ocular area dark with orbital lateral setae orange, the ventral orbital setae whitish, upright, in several rows, distinctly different from short but dense, adpressed whitish setae on clypeus under AME, clypeus under ALE yellowish or greyish yellow.

Pedipalps: cymbium and tibia blackish brown, however retrolateral half of dorsal surface of tibia and whole of patella covered with white setae; a few white setae retrolaterally on cymbium, the tip of cymbium light greyish; femur light brown with dense, strikingly white setae on dorsal surface. Embolus flattened and broad with dark rims; bulbous black. Tibial apophyses separated by a broad, U-shaped gap.

Ventral aspect yellowish, abdomen whitish yellow with three thin dark lines.

Legs greyish yellow without annulation, patella and tibia I darker brown.

Female. Cephalothorax light brown with blackish brown eye field, contrasting with two broad lighter yellowish brown streaks along margins of dorsal surface of thorax, delimiting somewhat broader greyish brown median thoracic streak. Covered with inconspicuous whitish and colourless adpressed setae. Frontal aspect, eyes I surrounded with white orbital setae, longer dorsally. Upper half of face dark with indistinct whitish adpressed setae, lower half yellow with whitish bristles medially.

Abdomen dorsally light yellowish grey, with indistinct light median streak posteriorly and lighter margin.

Legs. Femora I–IV dorsally and prolaterally yellow, except their apical ends, which are brown; retrolateral surface brown, with lighter stripe medially. Remaining segments of legs yellow with brown rings.

Ventral aspect: sternum light yellow with darker yellow margin; coxae light yellow; abdomen whitish yellow with inconspicuous light grey dots, scattered sparsely and forming median grey line.

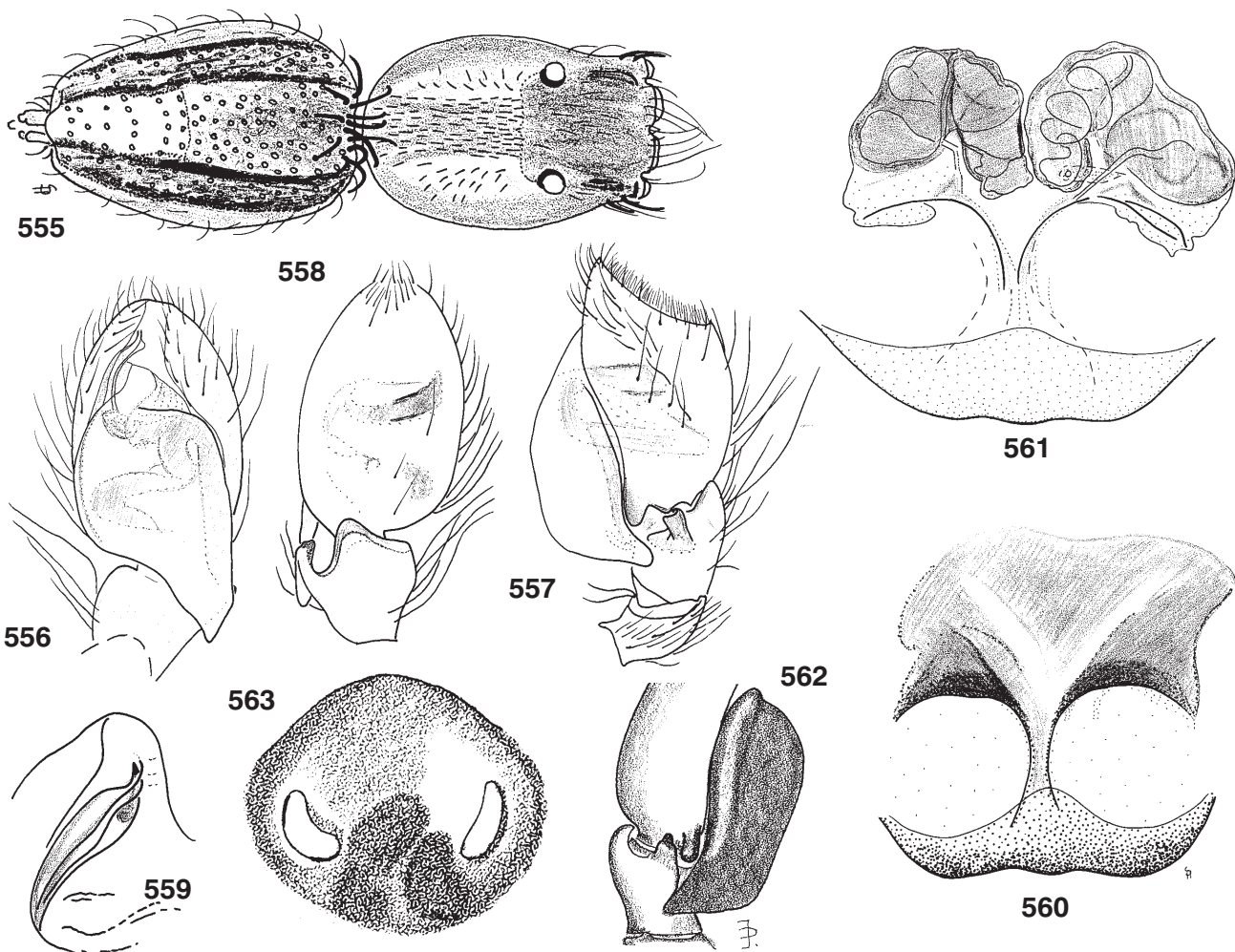
Epigynum with long grooves, sclerotized rims of openings at $\frac{1}{6}$ of epigynum length, opening posteriorly; septum broad with parallel edges and posterior end curved anteriorly. Internal structure differs from both *Ph. pori* and *Ph. fulvastra* by shorter chain of spermathecal chambers and details of first chamber of spermathecae; also externally by shape of the septum.

Measurements (mm). Male. Length of cephalothorax 2.31, length of abdomen 2.00, length of 5 segments of leg I 3.24. Female. Length of cephalothorax 2.62, length of abdomen 3.20, length of 5 segments of leg I 3.65.

Seasonal appearance of adult specimens. Males – IV, VI, VII; females – V, VII.

Distribution. Israel: Haluqim Ridge, Hatira Ridge, Nizzana, Sede Boqer (17).

Etymology. Named for Dr Yael Lubin, an arachnologist and ecologist, organising and carrying out important research in the Negev, including Sede Boqer area.



Figures 555–561. *Phlegra "lineata"* (from Smyrna), male, dorsal pattern (555), palpal organ ventrally (556), laterally (557), dorsally (558), tip of embolus (559); female, epigynum (560), its internal structure (561) (drawn by S. Heciak). *Ph. nitidiventris* (relevant North African species), tibial apophyses (562), epigynum (563).

Relevant species

Phlegra cf. *lineata* (Figs 555–561)

Diagnosis. Resembles *Phlegra fasciata*, but less contrasting colored; female with grooves of epigynum more narrowly separated, number of chambers of spermathecae smaller; male palpal tibia dorsal apophysis broader and shorter.

Remark. Not conspecific with *Euophrys lineata* C. L. Koch 1848: 43, fig. 1303 = *Phlegra lineata* (C. L. Koch 1848) and apparently deserves description as a new species, which I delay until fresh specimens will become available.

Description. Male. Cephalothorax: Eye field dark brown, covered with lighter adpressed setae, brownish and colourless, longer setae along anterior edge, thorax and sides in one specimen almost uniformly brown, in the second, sides and area behind eyes III are somewhat lighter yellowish brown.

Abdomen brownish suffused with darker greyish brown, almost bald with remnants of adpressed whitish and more

upright brown setae, no distinct traces of striped pattern; sides lighter brownish grey. Spinnerets brownish grey.

Frontal aspect. Eye field appears dark brown, clypeus and chelicerae light yellowish brown, no striking, contrasting setae; sparse colourless setae present on clypeus do not change its general coloration, a few long brownish bristles stretching horizontally under AME. Eyes I surrounded with whitish setae, dorsally mixed with slightly longer and thicker brown setae.

Pedipalps yellowish brown, with light, pale fawn setae on cymbium. Bulbus pale yellow, dorsal tibial apophyses separated by a U-shaped space, dorsal apophysis relatively broad, ending triangularly; ventral one sclerotized, end broadly truncated, apically with a tiny ventral lobe articulating with a bent plate-like process of cymbium.

Legs: tarsi, metatarsi, tibiae I–IV brown, patellae I–IV light brown; femora III–IV much lighter, yellow, femora I–II whitish yellow, slightly darker apically.

Ventral aspect: chelicerae, coxae and sternum yellow to yellowish brown, abdomen whitish grey.

Female. Cephalothorax brown, with light yellow stripes along dorso lateral edge of thorax, eye field dark brown with

whitish adpressed setae. Sides light brown, ventrally lighter, edge brown.

Abdomen with three stripes of equal width: median white and two lateral brownish fawn, all covered with adpressed setae, corresponding in colour with pigmentation, spinnerets brown. Legs brown, prolateral surfaces of femora I–IV light yellow, femur I retrolaterally black spotted, apically brown; femora III–IV with broad, dark annuli medially and apically.

Frontal aspect: eye field appears dark brown with numerous, short upright brown bristles, face light brown, with large light yellow spots under ALE, clypeus suffused with grey, eyes I surrounded with white setae; setae on clypeus colourless, do not influence general appearance.

Chelicerae yellow, slightly bulging, narrowing apically, with sparse colourless setae. Pedipalps and anterior legs give striped appearance, brown and lighter brown.

Ventral aspect: pale yellow with colourless setae; abdomen grey with lighter longitudinal streaks, covered with whitish setae, spinnerets brown.

Epigynum with round grooves, very narrowly separated, narrower than in *Ph. fasciata*, number of chambers in spermathecae smaller.

Material. 1) 2 females "*Phlegra lineata* C. Koch Smyrna Bottle 1788, t. 26 (2)"

2) 2 males *Phlegra lineata* C. Koch "Bottle 1788 t.126 (2) Smyrna" "117" All: Coll. HEC.

Distribution. Turkey: Smyrna.

Phlegra nitidiventris (Lucas)
(Figs 562–563)

Salticus nitidiventris Lucas, 1846: 138.

Remarks. Relevant species from Algeria and Tunisia, with interesting adaptation in males – abdomen covered by hard, black, light-reflecting scutum, very similar to that in *Aelurillus politiventris*.

Phlegra pusilla Wesolowska et van Harten

Phlegra pusilla Wesolowska et van Harten, 1994: 70, Figs 140–143.

Remarks. Described from Yemen. Palpal organ and cephalothorax coloration seem to resemble *Ph. particeps*; however, published drawing does not show details of tibial apophysis.

Plexippoides Prószyński, 1984

Type species. *Yllenus starmuehlneri* Roewer, 1955 [male, not female].

Introductory remarks. The genus belong to the group of genera characterized in males by peculiar shape of palpal organ: characteristic hooks on expanded basal retrolateral angle of cymbium, touching similar hook formed by tibial apophysis; also broad flattened cymbium which is much broader than bulbus, the latter half encircled by long thin embolus. Females of several species, classified until now in the genus *Menemerops*, have compact, highly sclerotized spermathecae, with internal convoluted chambers. Species of related Oriental genus (*Epeus*) usually have elongated anterior half of cymbium and internal

structures of epigynum in form of long, coiled channels. Eastern Palaearctic species of *Plexippoides* have sclerotized, bag-shaped spermathecae and coiled channels (Prószyński 1984a). There seem to be significant differences between *Epeus* and *Plexippoides* in general shape of body including height of cephalothorax and slope of thorax, location of eyes anterior lateral, proportions of legs in relation to body, general colour pattern and setae pattern, all overlooked in the previous studies.

Plexippoides has a robust body with robust legs, variable height and profile of cephalothorax, in some species high, in others thorax lower and gently sloping. Coverage by setae and bristles variable, usually rich, with "hairy" appearance, somewhat resembling *Mogrus*, due to relatively dense bristles scattered over cephalothorax and body; these may be lost by live specimens, which appear partially bald.

Body proportions.

Body length; cephalothorax – 3.24–3.60 in males; abdomen 3.24–4.33. Cephalothorax: moderately broad, its width is 61–67% at eyes I, 71–88% at eyes III, height 51–61%. Eye field extends over 39–47% of cephalothorax, also short in relation to its width at eyes I, trapezium shaped, narrowing posteriorly by 3–6%; indistinctly narrower than cephalothorax, eyes III are located closely to the edges of cephalothorax. Abdomen: elongate oval tapering posteriorly; its length is 100–130%, its width 82%. Leg proportions in both sexes similar; leg order: III is approximately = IV (III – male 118%, female 127%, IV – male 118%, female 127%), I approximately = II (I – 100%, II – 98%).

Matching of males and females was made possible recently owing to discovery by Dr. D. Logunov of a sample of both sexes of a species which I identified as *Plexippoides arabicus* (described by Wesolowska 1996 as *P. flavescens*) in Turkmenistan.

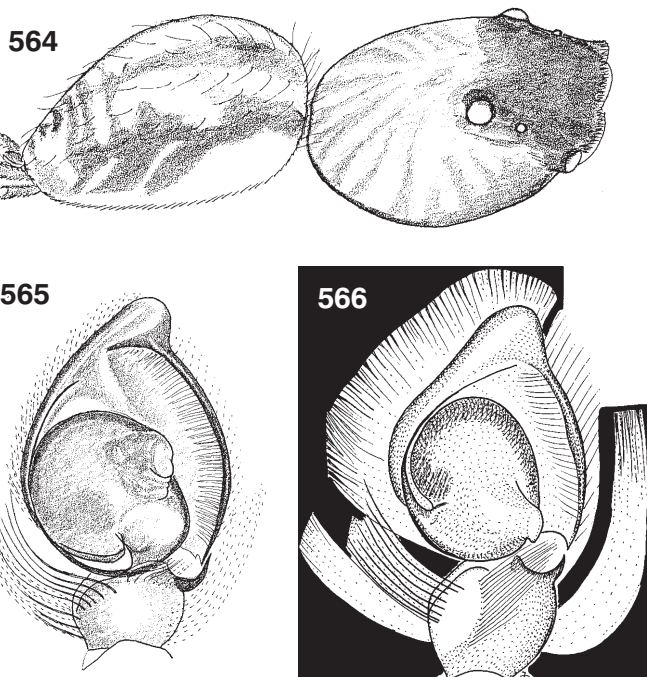
Plexippoides arabicus Prószyński
(Figs 564–565, 569–579)

Plexippoides arabicus Prószyński, 1989: 47–49, Figs 44–45;
Menemerops sollistimus Wesolowska et van Harten, 1994: 45, 97–98;

Plexippoides flavescens: Wesolowska 1996 (nec O. Pickard-Cambridge): 34–35, Fig. 24a–d. (syn. *Menemerops sollistimus*).

Diagnosis. Differs from type species – *P. starmuehlneri* (Roewer, 1955) (cf. Prószyński 1984a: 400, Figs 5–8) from Iran by narrower bulbus (which in the latter species is transversely oval); narrower cymbium, embolus arising at "5 o'clock" position and bulbus protuberance at "1 o'clock" separating it from *P. gestroi* (Dalmas, 1920) (see below), in which these positions are "8 o'clock" and "4 o'clock" respectively.

Remark. Environmental conditions of specimens collected by Dr. D. V. Logunov in Turkmenistan may have some importance for searching for the same species in



Figures 564–566. *Plexippoides arabicus*, general appearance (564), palpal organ ventrally (565); comparison with *P. gestroi*, palpal organ (566) (from Prószyński 1987: 60).

Israel. He has found them in Gezgyadyk Mt. Range, (on the Turkmenistan frontier with Iran), on very hot, abrupt clay slopes – a very special environment, where no other similar species occur – consequently conspecificity of male and female seems to be certain. Morphology of these specimens resemble *Plexippoides arabicus* in palpal organ, although they differ in body proportions (higher, less sloping thorax), coloration, possibly setae and bristles; have a row of dark, horizontal, harder setae along anterior, dorso-lateral edge of femur I. Identification of females as *Plexippoides flavescens* by Dr. W. Wesołowska is based on drawings made from old specimens in Prószyński (1984c: 86, and 1992a: 99–100, Figs 44–45). Conspecificity of these specimen, collected in distant localities (Dead Sea, Iran), is doubtful. On the other hand males of Turkmenia specimens seems to be conspecific rather with specimen shown in Prószyński (1989: 47–49, Figs 44–45), that is *P. arabicus*. Solution of identity of this species therefore depends from collecting of both sexes in the same locality in Israel, Saudi Arabia, or other neighbouring countries.

Description. Male. Medium size spider with long and robust legs, legs IV appearing the longest, legs hairy with numerous strong spines. There is no trace of upright “crown” of setae on eye field, characteristic of some related species in E Asia; actually the studied specimen is bald. Cephalothorax light brown, eye field darker brown and bald.

Abdomen with dark median streak and dark margins along anterior half, delimited by white sides, posterior

half of abdomen with dark and light chevrons; this pattern differs somewhat from mosaic holotype and more uniformly dark paratype, presumably due to geographic variation. Frontal aspect: eye field appears dark contrasting with fawn clypeus; eyes I encircled by single line of longer whitish setae ventrally, dorsally brown; clypeus with sparse colourless or greyish horizontal setae, stronger, longer and darker grey along ventral margin of clypeus, height of clypeus equal to half of ALE diameter; AME diameter 1.75 times that of ALE; chelicerae yellowish fawn with sparse short bristles arising from darker protuberances, scattered over surface. Cymbium and tibia yellow with long mane of white setae, a few darker and stronger on tibia; femur apically with a dorsal flat surface of short but upright and thicker dark setae and a bunch of longer strong dark setae arising laterally. Ventral aspect: abdomen whitish with median area darker grey along the whole abdomen, including area corresponding to epigynum in female; coxae, sternum and femora ventrally whitish or yellowish, with white and locally grey setae. Legs light brown with darker annuli and with black tarsus I, including its dorsal surface (in Saudi Arabian specimens only ventral surface is black); black basal half of ventral surface of tibia I and black and white setae delimitate lines apically on lateral surfaces of femur I; spines numerous and long, slightly darker than respective segments. Palpal organ: broad flatten cymbium, much broader than round bulbus, half encircled by embolus which is almost twice as long as bulbus; there are also characteristic hooks on expanded basal angle of cymbium and corresponding hook formed by tibial apophysis and a mane of long white setae around cymbium.

Female. No fresh specimen known from the Levant; I assume that a female from Turkmenistan, Gezgyadyk Mt. Range (Fig. 569) is conspecific with an old specimen from Sinai (Figs 570–571), but delay description until new specimens become available.

Material. Male paratype – Sinai: Mt. Catharina, 16. VII. 68, coll. Shulov.

Comparative material – male and female Turkmenia, Gezgyadyk Mt. Range (described also by W. Wesołowska as *Plexippoides flavescens*). Leg. Logunov. Coll. ISE

Seasonal appearance of adult specimens. Males – I, III, VII; females – unknown.

Distribution. Egypt: Sinai – Mt Catherina (22); Saudi Arabia; Turkmenistan: Gezgyadyk Mts Range.

Plexippoides flavescens (O. Pickard-Cambridge)

(Figs 567–568)

Salticus flavescens O. Pickard-Cambridge, 1872: 343;

Menemerus flavescens: Prószyński 1984c: 86; Deltshv and Paraschi, 1990: 5;

Menemerops flavescens: Prószyński 1992a: 99–100, Figs 44–45.

Diagnosis. Resembles female *Plexippoides arabicus* collected recently by Dr. D. Logunov in Gezgyadyk Mt. Range, Turkmenistan. Some attention has been given to old female specimens of this species from Sinai, from where male of *Plexippoides arabicus* was also described. The problem of differences between these species, or eventual synonymization of some of these forms, requires study of fresh specimens.

Description. Female. Description partially based on that of O. Pickard-Cambridge (1872: 343 – quotations in “ ”. Cephalothorax: There is a row of long bristles on protuberances under eyes lateral, less regular than in *Pseudicius* and often hidden among other setae, similar to some *Menemerus* species. “Head black brown and thoracic portion dark yellow brown, ... the whole clothed with short yellowish adpressed hairs or coarse pubescence”. Eye field broader than long, eyes II closer to eyes III.

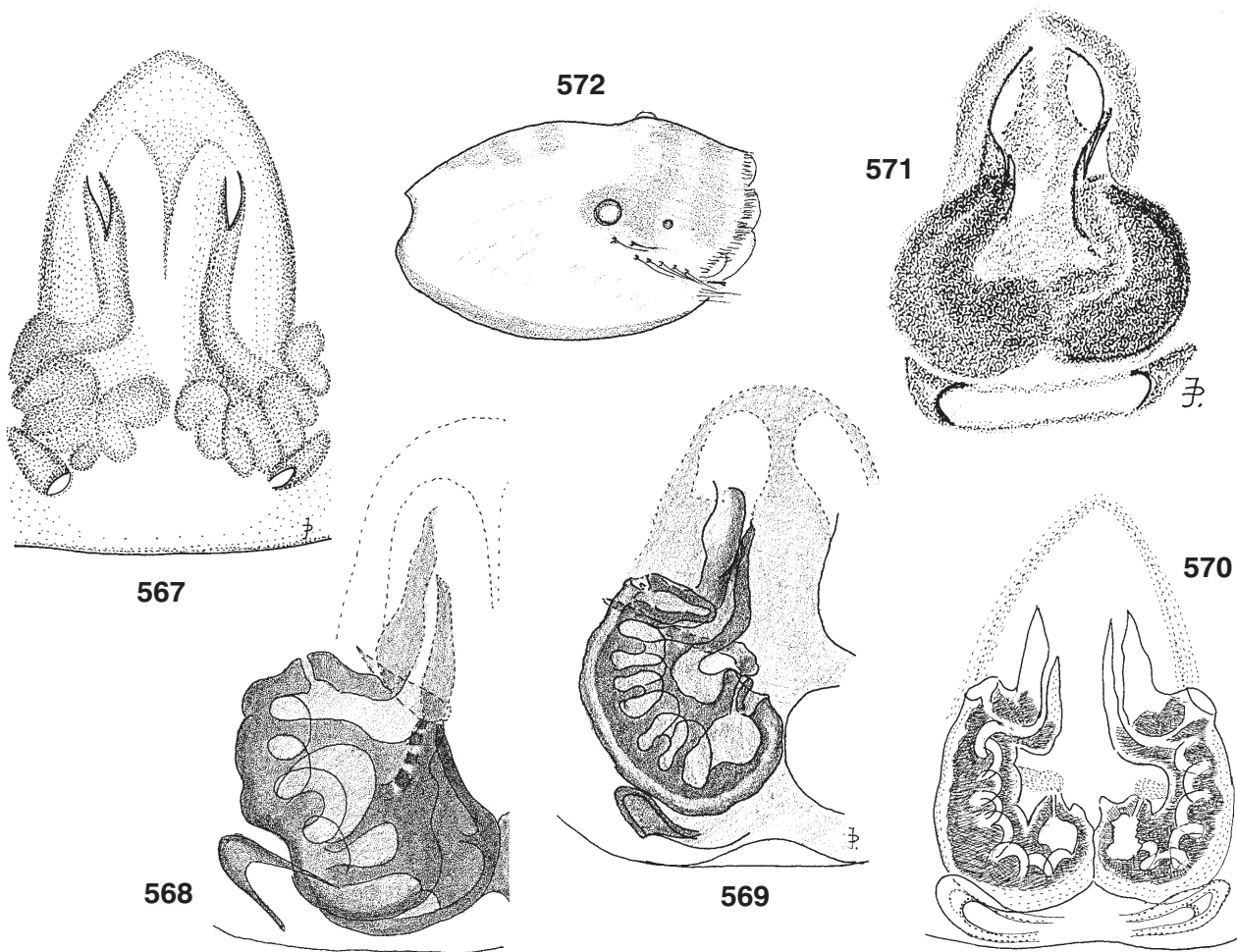
Abdomen: “yellowish, ... obscurely marked .. with black brown irregular transverse bars in the posterior half of abdomen, a pair of yellowish spots in 3/4th of length of the abdomen..”.

Frontal aspect: “... on the clypeus are some long fine yellowish white prominent hairs...”; pedipalps “yellow ... with long whitish hairs”. Legs: “... yellow, ... obscurely banded with dull yellow brown, ... each tarsus terminates with a strong black claw tuft”. Spination of tibia I does not differ from *Menemerus* (Fig. 374). Epigynum with small posterior pockets; anterior pair of small grooves, with indistinct, slit-like openings which pass through short channels into elongate spermathecae, running medially and parallel to main body axis, posteriorly bent, haevily sclerotized with internal convoluted chambers.

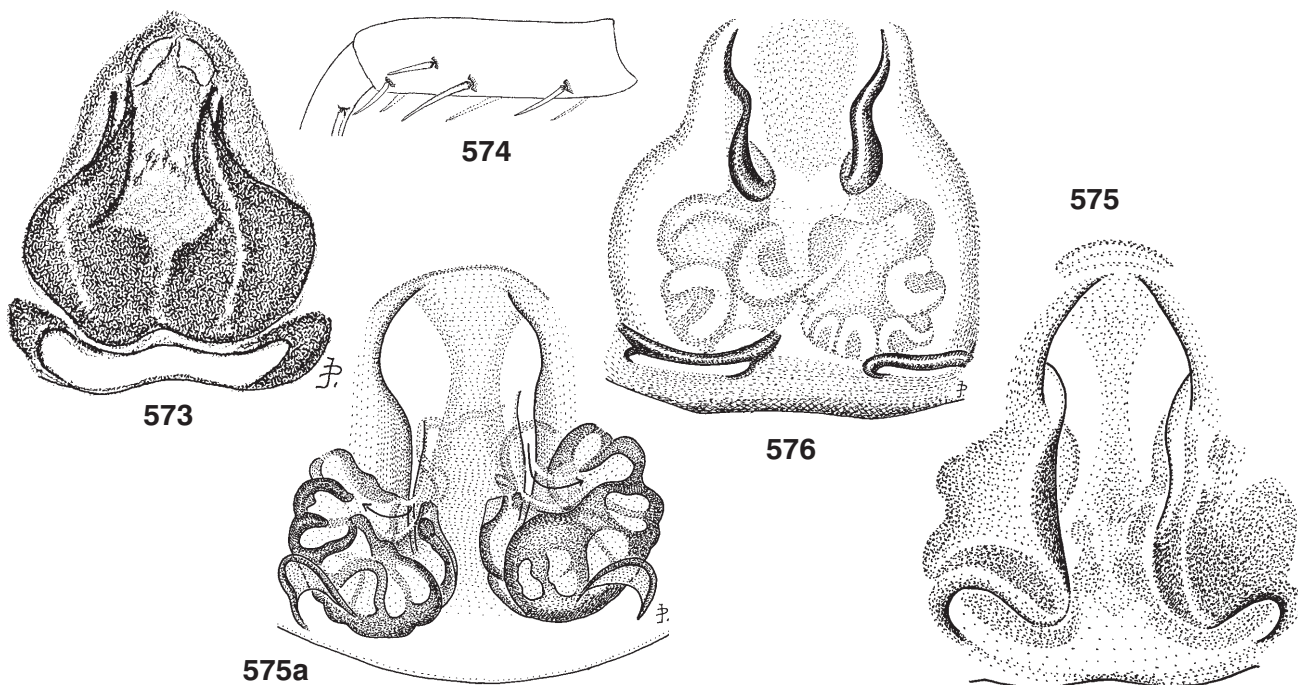
Measurements (mm). Female. Length of cephalothorax 3.33–3.60; length of abdomen 4.08–4.33; length of 5 segments of leg I 6.61; length of legs order: IV, III, I, II.

Seasonal appearance of adult specimens. Females – II, VIII.

Distribution. Egypt: Sinai – St. Catharina Monastery (22); Greece; Iran: Khuzistan Province; Lebanon: Ain Atta. Israel: Dead Sea (13).



Figures 567–572. *Plexippoides flavescens* (O.P.-Cambridge collection specimen), epigynum (567) and its internal structure (568); *P. arabicus*, Turkmenian specimen, internal structure of epigynum (569), Sinai specimen, internal structure of epigynum (570), and epigynum (571), cephalothorax laterally (572).



Figures 573–576. *Plexippoides* sp., uncertain Dead Sea specimen, epigynum (573), Sinai specimen, tibia I spination (574). Comparison with *Plexippoides gestroi* from Rhodos, epigynum and its internal structure (575, 575a), *P. afghanus* paratype, epigynum (576) (from Prószyński 1987: 60).

Relevant species

Plexippoides afghanus (Roewer) comb. nov.
(Fig. 576)

Evarcha afghana Roewer, 1961: 26, Fig. 109;
Evarcha afghana: Prószyński 1984c: 47;
Menemerops afghanus: Prószyński 1992a: 99;

Remark. Known from Afghanistan and Middle Asia.

Plexippoides gestroi (Dalmás)
(Fig. 566)

Habrocestum gestroi Dalmás, 1920: 60, 65, 68;
Plexippoides gestroi: Prószyński 1987: 60; Deltshv and Paraschi
1990: 6, Figs 6–7; Metzner 1999: 135, 253, Tab. 99;

Distribution. E Mediterranean: Greece, Turkey.

Plexippoides sp.
(Figs 575)

Material. Female – Rhodos: Apolona, leg. Wunderlich.

Remarks. Identification and description delayed until more material will be available. Also drawings 99d–e by Metzner (1999) do not permit unequivocal identification of this species as *Plexippoides gestroi*, which he quotes from Rhodos.

Plexippus C. L. Koch, 1846

Type species. *Attus paykulli* Savigny et Audouin, 1827.

Introductory remarks. Large genus containing several pantropical species; during the XIXth century the generic name *Plexippus* was misused and given to large number of species, later gradually reclassified, the process not yet completed. The genus contains several interesting species in Israel and deserves more attention.

Palpal organ very characteristic, with bulbus broad, anteriorly broadly truncated, posteriorly narrowing, with embolus thin, bent and short, located anteriorly, near prolateral edge of bulbus or moved to near the mid-length of its anterior truncature, the antero-prolateral edge of bulbus medially to embolus expanded and usually covered by a row of minute, sclerotized teeth.

Epigynum characteristic, large, sclerotized plate divided by median longitudinal furrow, beginning posteriorly to a sclerotized fold followed by small oval or rounded depression, and extending to hind end of epigynum. In majority of species, median furrow begins at junction of diagonal branches, which gives it a Y-shape, with convex, rounded or elliptical area in front of junction; the copulatory openings are then located the bottom of diagonal branches of furrow (*P. paykulli*, *P. setipes*, *P. devorans*). In species where diagonal branches not developed, opening located alongside median furrow, also diagonally (*P. clemens*). Copulatory channels flat and broad, extending alongside median furrow, pass by constriction into spherical or spherical convoluted spermatheca. Epigynum in adult (mated?) female often covered by thin layer of very hard secretion blurring sculpture of epigynum; drawings

done without removal of that secretion (with a needle or by maceration in KOH) are usually unclear.

Plexippus clemens (O. Pickard-Cambridge, 1872)
comb. nov.
(Figs 592–593)

Salticus clemens O. Pickard-Cambridge, 1872: 335–336;
Menemerus clemens: Prószyński 1984c: 85;
Plexippus similis Wesolowska et van Harten, 1994: 72–74, Figs
147–149, **syn. nov.**

Diagnosis. Remarks of O. Pickard-Cambridge (1872: 335–336) on this species being allied to three species of *Euophrys* (*frontalis*, *reticulatus* and *gambosus*), which apparently inspired its subsequent transfer to that genus by Roewer, was presumably prompted by small dimensions and coloration of specimen. However, internal structure of epigynum proves its relationship with *Plexippus*. The species is different from female of *Plexippus devorans*, and there are no premises to comment on eventual relationships with *Plexippus tectonicus* sp. nov.

Description. Female. Distinctly smaller than two remaining species of *Plexippus*. Cephalothorax: Coloration changed now, was originally “yellow with a paler patch on the occiput, ... ocular area strongly suffused with black, ... several slightly converging black streaks on the hind slope, sides tinged with brown-black” (O. Pickard-Cambridge 1872: 335–336). Abdomen: median part white, marginal traces of thin greyish yellow folds; according to the original description it was “dull yellow, finely and thickly yellow brown striated longitudinally. A central longitudinal paler band (being free from these striations) is indistinctly visible, divided anteriorly by a short red brown longitudinal line, trifid at its hinder extremity, followed by several yellow brown chevrons”. Frontal aspect: eye field light brown now, that coloration ending at mid length of eyes AME, externally to ALE blackish grey area with a few remaining whitish setae; diameter of ALE half of that of AME, ALE set at $\frac{1}{2}$ of that diameter below dorsal tip of AME rim. Clypeus now white, no setae or bristles preserved. External outline of chelicerae slightly rounded, their antero-median surfaces flattened and set slightly diagonally. Legs once yellow, now entirely white: tibia I with 3 pairs of ventral spines and one additional prolateral pair slightly above and anterior to the median ventral, forming a diagonal pair; two pairs of long ventral spines on metatarsus I; single prolateral spine on patella I, 3 upright spines along dorsal crest of femur I, the apical one at about $\frac{1}{8}$ of segment length, followed transversely by two others of the same length, thus forming a transverse dorsal row of 3 short spines from dorsal mid-line of the segment to its prolateral edge; similar arrangement of spines on leg II; number of spines on legs III–IV is larger than in *Plexippus devorans*.

Ventral aspect “labium, maxillae and sternum yellow.”

Epigynum: anterior median circular depression, followed by median furrow, openings in diagonal slits laterally to furrow with short channel running diagonally, which is rather unusual in the genus, and passing under sharp angle into spherical oval spermatheca – the general plan corresponding with *Plexippus*.

Material. 1 female – Ma’agan Mikhael II/III 1987 Leg. V. K. B. Roth. Coll. HUIJ; 1 female “*Salticus clemens* OPC tube 21, B. 1821”. Coll. O.P.-Cambridge, HEC, Oxford.

Seasonal appearance of adult specimens. Female – II/III.

Distribution. Israel: “low plants on the plains of Jordan”, Ma’agan Mikhael.

Plexippus devorans (O. Pickard-Cambridge) comb. nov.
(Figs 579–580, 584–585, 589–591)

Salticus devorans O. Pickard-Cambridge, 1872: 327–328;
Plexippus coccineus Simon, 1902: 403; Nenilin 1985: 132 (s. *P. strandi*); Wesolowska 1996: 36–38, Figs 25a–c, 26a–c;
Plexippus strandi Spassky, 1939: 299, Figs 1–2, **syn. nov.**
Plexippus strandi: Andreeva 1969: 90, Figs 2 v, z, d; Prószyński 1984c: 112; Nenilin 1984b: 27;
Plexippus setipes: Prószyński 1973: 120–124, Figs 61–66;
Plexippus strandi dushanbinus Andreeva, 1976: 88–90, Figs 121–124; Prószyński 1984b: 112;
Menemerus devorans: Prószyński 1984c: 85 (transfer from *Salticus*).

Diagnosis. Small, cephalothorax yellowish white with two brown reddish spots on posterior thoracic slope, abdomen white with spots different from those of *Plexippus paykulli*, different proportions of palpal organ, a flag of long white setae on palpal femur. Epigynum differs from *Plexippus setipes* by shorter longitudinal channels, broader and proportionately larger spermathecae and broader slit behind vaginal roof.

Remark. *Plexippus strandi* from Uzbekistan and Tadjikistan, as well as *Plexippus strandi dushanbinus* from Tadjikistan agree with Israeli specimens in general colour pattern, palpal organ and presence of a flag (bunch) of long white setae on palpal femur. Matching of males and females is confirmed by occurrence of identical pairs in Algeria and in Tadjikistan. Related species *Plexippus kondarensis* (Charitonov, 1951) has narrower bulbous, without serrated prolateral edge, epigynum with longer median oval grooves, both illustrated correctly by Andreeva (1976: Figs 116–117).

Description. Male. Cephalothorax yellow with two striking brown, large spots on posterior slope of thorax; eye field fawn with no white streak.

Abdomen: median area whitish yellow, with three pairs of marginal darker spots and single darker spot in front of spinnerets; spinnerets whitish.

Face yellow with dense long white setae on clypeus, some of which stretch diagonally forward, partially

overhanging cheliceral bases. Eyes I surrounded ventrally by white, dorsally by yellowish setae, eye field fawn. Chelicerae basally yellow, apical half light brown. Pedipalps light yellow, with yellow cymbium, which dorsally has large basal spot of white setae (resembling *Plexippus sp.*, but less contrasting because cymbium lighter); pedipalpal femur, tibia and cymbium with long white setae.

Palpal organ: embolus thin and short, located at about mid-length of anterior edge of bulbus, the part of bulbus opposite to apophysis particularly strongly developed (Figs 584–585), stronger than in any other Israeli *Plexippus*.

Ventral aspect whitish. Legs I: femur ventrally whitish, along prolateral surface light brown line, tibia-patella I light fawn, metatarsus-tarsus I yellow; legs II–IV yellow.

Female. Cephalothorax yellow with lighter median thoracic streak ending by broader spot in the foveal area; posterior slope of thorax steeper than in *P. paykulli*; sides whitish yellow with traces of indistinct darker radial bars; eye field darker yellow with an indistinct thin diagonal line of white setae along lateral edges of eye field, medially from eyes II to junction between ALE and AME; eyes surrounded black.

Abdomen variable – in one specimen anterior half divided into three indistinct transverse belts: white, brown and white; posterior half divided into three indistinct longitudinal streaks: light median (with remnants of chevrons) and two dark brown lateral, the latter with two pairs of very small white dots; tip of abdomen dark brown, sides yellow, spinnerets yellow. In remaining specimens examined, distinct belts and streaks not visible, more or less uniform whitish grey with adpressed yellowish grey setae and longer, darker setae, giving hairy appearance (resembling Chinese *P. setipes*).

Frontal aspect: while dorsal surface of eye field in this position appears dark, remaining parts are whitish yellow including lower face, chelicerae, pedipalps, femora of legs; eyes surrounded with white setae.

Legs generally yellow, femora whitish yellow. Ventral aspect: whitish yellow. Epigynum with anterior median circular depression, behind sclerotized semicircular fold [vaginal roof] and extended posteriorly by the median furrow; openings in diagonal slits laterally to furrow, often covered by hard brown semitransparent secretion; spermathecae spherical;

Fresh female specimen from Enot Samar differs by having eye field dark brown, black anteriorly and with lateral eyes surrounded by black, but these are partly covered by white setae: surrounding eyes III, along eyes lateral, scattered over eye field and between ALE and AME. Thorax yellow with greyish shade, covered with sparse but distinct short black bristles arising from dark bases, giving specimen a hairy appearance. Abdomen yellowish white with greyish lateral areas, no distinct

pattern, also “hairy” owing to black bristles. Face yellow with lines of white scale-like setae under orbits of ALE, eyes I surrounded by whitish setae. Long sparse horizontal white setae form triangle under AME. Epigynum almost black, abdomen ventrally white greyish.

Measurement of male specimen from Enot Hazor (in mm and % of LC). LC 2.16 mm = 100%, LE 1.4 = 65%, WE1 1.44 = 67%, WE3 1.44 = 67%, HC 1.04 = 48%, LA 2.32 = 2.16%. Flat area beyond eye field 0.8 = 37%. Measurement of male segments of legs: tarsus to femur (in mm and in % of leg I): leg I 0.56 + 0.72 + 1.04 + 0.8 + 1.28 = 4.4 mm = 100%; leg II 0.56 + 0.72 + 0.8 + 0.8 + 1.2 = 4.08 mm = 93%; leg III 0.64 + 1.2 + 1.44 + 0.72 + 1.4 = 5.4 mm = 123%; leg IV 0.56 + 1.2 + 0.96 + 0.8 + 1.44 = 4.96 mm = 113%. Leg order III, IV, I, II.

Seasonal appearance of adult specimens. Males – III, X; females – III, V, VIII.

Distribution. Caucasus; Tadzhikistan; Uzbekistan; Lebanon: Rasheiya. Israel: Nahal S'nir near Hagosherim (1); Degania (7); 'Ein Gedi (sulphur springs), 'Enot Samar; Sedom (13), “plains of the Jordan” [O. Pickard-Cambridge reports them from walls, rocky banks and among stones on the plains of Jordan].

Plexippus paykulli (Savigny et Audouin)

(Figs 577–578, 583, 587–588)

Attus paykulli Savigny et Audouin, 1827: 409, Table 7, Figs 22;

Salticus vaillantii: O. Pickard-Cambridge 1872: 323;

Plexippus paykulli: Prószyński 1976: 41, map 156, Figs 282;

Žabka 1985: 432–434, Figs 458–463, map 33; Prószyński 1987:

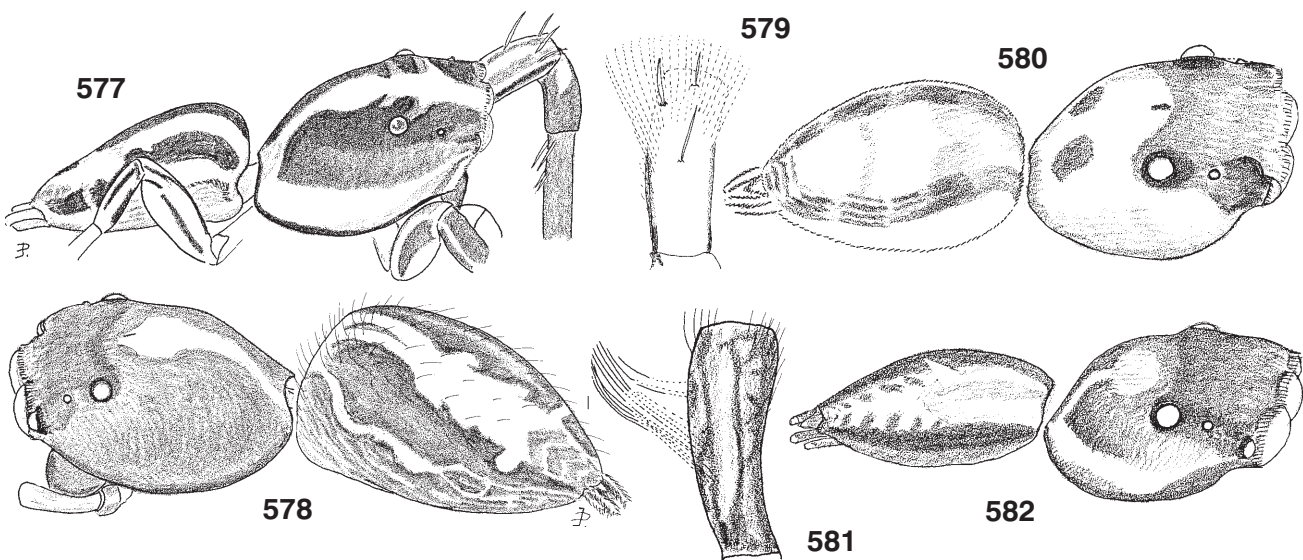
80; Bohdanowicz and Prószyński 1987: 116–117, Figs 222–227;

Davies and Žabka 1989: Tab. 49; Koh 1989: 113 (colour photo);

Wesołowska and van Harten 1994: 70, Figs 144–146.

Description. Male. Cephalothorax dorsally striped: 1) median light yellow streak, at eye field turning into striking white, covered with white setae, continued vertically on the face; 2) two black streaks, beginning on posterior thoracic slope, with weaker extension touching hindmargin, running anteriorly along dorso-lateral edge, continuing laterally along eye field, and then as vertical bars on face; 3) lower sides are whitish yellow; 4) thin black margin along ventral edge.

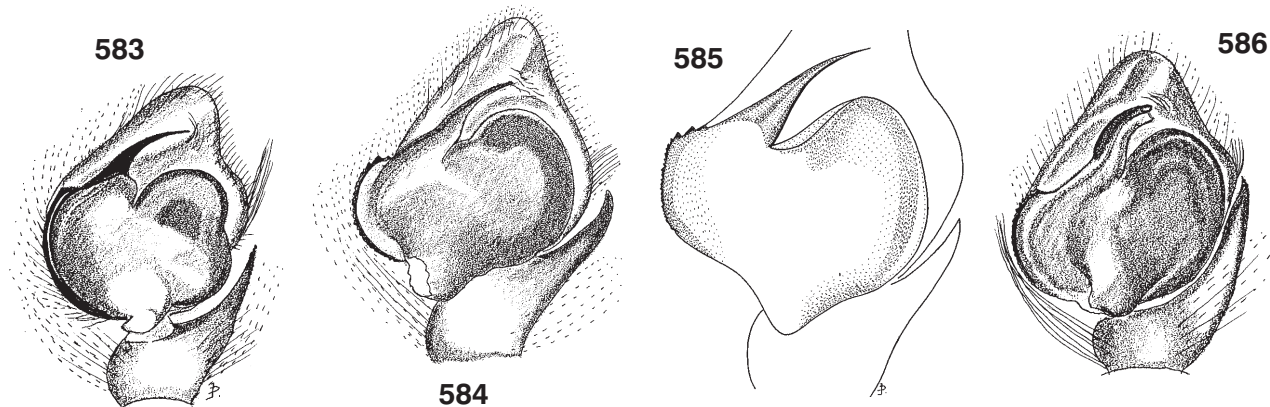
Abdomen striped, with two marginal black streaks and median yellowish white streak, expanding ovally in the posterior half, posteriorly with a pair of small white spots touching median streak; sides whitish, spinnerets yellowish. Face crossed by contrasting vertical bars, being continuation of stripes running along cephalothorax: 1) single median white bar, which runs along eye field, reaching space between AME, median orbital setae of AME white, continues down across clypeus to its ventral edge, then further along median parts of chelicerae; 2) a pair of blackish brown bars, continuing from eye field, formed of dark brown setae along dorsal and ventral rim of AME, further continue down to edge



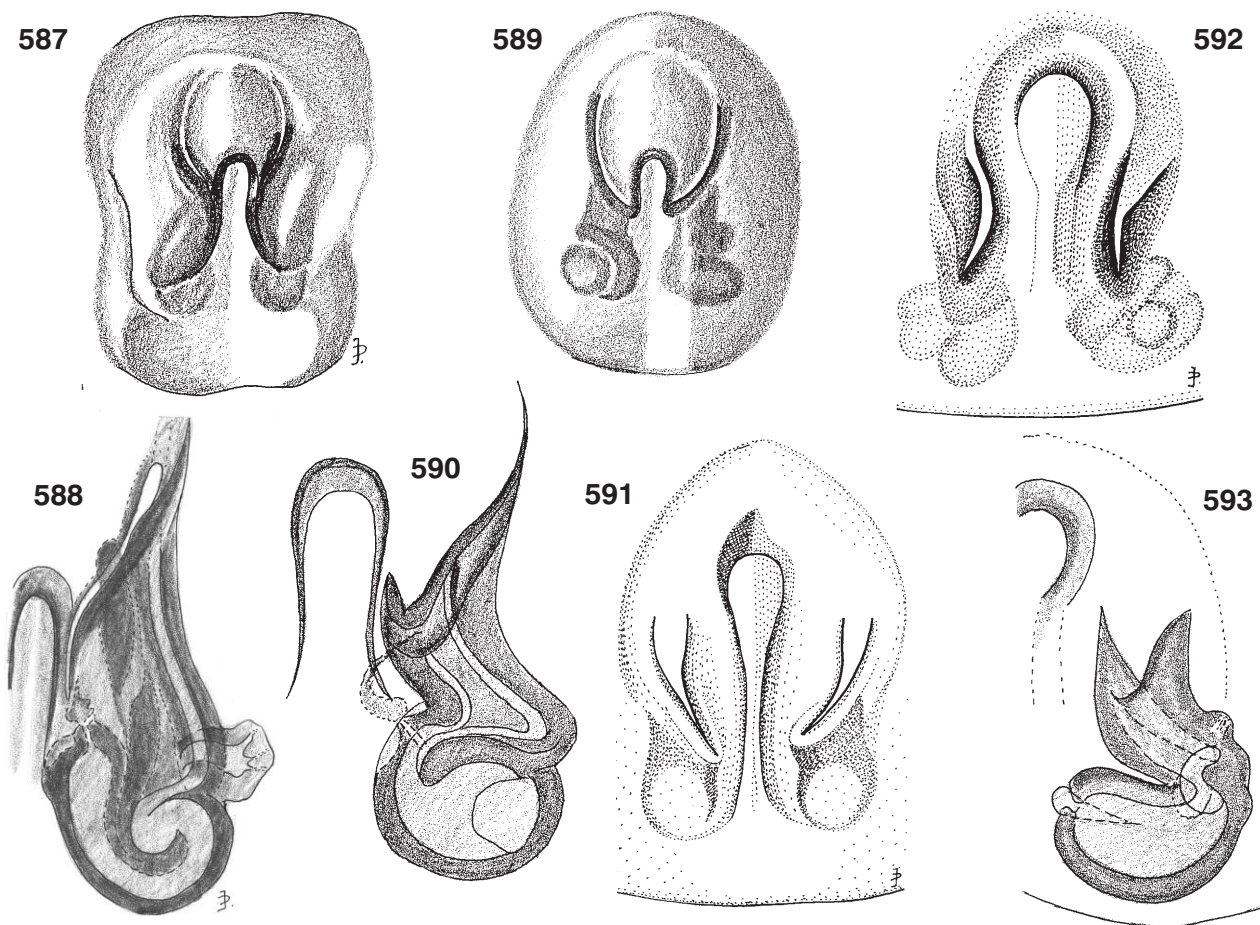
Figures 577–582. *Plerippus paykulli*, general appearance of male (577) and female (578); *P. devorans* (Ein Gedi sulphur springs specimen), dorsal bunch of white setae on palpal femur (579), general appearance of male (580); *P. tectonicus* sp. nov., bunch of setae on palpal femur (581), general appearance of male (582).

of clypeus and onto chelicerae; 3) a pair of white bars between AME and ALE, beginning from the white spot on anterior edge of eye field, continue to edge of clypeus; 4) a pair of dark brown bars, from the dorsal and ventral rim of ALE, down to lateral edge of clypeus, where they bend and continue along ventral margin of cephalothorax; 5) white lateral surfaces of cephalothorax continue anteriorly as a pair of lateral white bars. Chelicerae black. Pedipalps light yellow, with small spot of black setae; femur with line of long white setae dorsally; cymbium with indistinct spot of white adpressed setae basally on dorsal surface. Legs – whitish yellow with black line on prolateral surface of femur I, black lateral surfaces of patella and tibia I, metatarsus and tarsus I black, also dorsally.

Female. Conspicuous dorsal pattern. Cephalothorax dark brown with light thoracic stripe ending by small swelling at the foveal area, not extending over eye field as in male; lower sides lighter brown, edge of carapace black. Eye field dark brown with eye surroundings black. Abdomen flattened, divided into longitudinal stripes: median light and two lateral brown (on live specimens the coloration appears light grey). Frontal aspect: face dark brown without contrasting pattern. Legs generally dark brown, almost uniform; femur I prolaterally with lighter brown longitudinal line. Ventral aspect light brown, abdomen with darker longitudinal stripes. Epigynum shown in Fig. 707, very often covered by hard, semitransparent brown waxy secretion which can be removed carefully with needle or during maceration in KOH.



Figures 583–586. *Plerippus paykulli*, palpal organ ventrally (note that it is $\frac{1}{3}$ larger than in other species) (583); *P. devorans* (Ein Gedi sulphur springs specimen), palpal organ ventrally (584), same in the specimen from the O. P.-Cambridge collection (585); *P. tectonicus* sp. nov. palpal organ ventrally (586).



Figures 587–592. Epigynum and single spermatheca with channel in *Plexippus paykulli*, Israeli specimen (587) and Algerian specimen (588); *P. devorans*, Israeli specimens (589) and (590), *P. tectonicus* sp. nov., specimen from the O. Pickard-Cambridge collection (591), *P. clemens*, Israeli specimen (592) and Algerian specimen (593).

Measurement. Male (in mm and % of LC). LC 4.03 mm = 100%, LE 1.56 mm = 39%, WE1 2.34 mm = 55%, WE3 2.21 mm = 55%, HC 1.75 mm = 42%, LA 3.9 mm = 97%. Flat area beyond eye field 1.17 = 42%. Five segments of legs of male (tarsus to femur; in mm and in % of leg I): leg I 1.04 + 1.3 + 1.95 + 1.62 + 2.08 = 8.35 mm – 100%; leg II 0.97 + 1.43 + 1.75 + 1.43 + 2.34 = 7.92 mm – 95%; leg III 1.17 + 2.27 + 1.62 + 1.3 + 2.6 = 8.96 mm – 107%; leg IV 1.04 + 2.21 + 1.82 + 1.3 + 2.6 = 8.97 mm – 107%. Leg order: III, IV, I, II.

Seasonal appearance of adult specimens. Males – IV, V; females – III, IV, V, VI, VII.

Distribution. Pantropical, including the whole Mediterranean and Saudi Arabia, in cooler areas sometimes in greenhouses. Israel: numerous localities.

Plexippus tectonicus sp. nov.

(Figs 581–582, 586, 591, 736–737)

Diagnosis. Closely related to *Plexippus devorans*, from which it differs by a black (faded to brown or grey

on long preserved specimens) flag of setae on pedipalpal femur, broader embolus, white round spot of scales dorsally on cymbium, white line along pedipalpal tibia, thin long abdomen. Differs from *Plexippus setipes* by absence of prominent triangular tooth at end of row of minute teeth medially to embolus; the latter has no flag of long setae on pedipalpal femur. Half the size of *P. paykulli*, from which it also differs in median position of embolus.

Description. Male. Cephalothorax dark brown with traces of white adpressed setae on eye field, with white thoracic streak expanded into large, round white spot on the foveal area, continued posteriorly up to hindmargin by narrower whitish median streak along thoracic slope, delimited from eye field by darker fawn transverse line, similar light streak runs medially along abdomen. Sides light fawn with whitish adpressed setae, dark brown margin along ventral edge.

Abdomen with three streaks: two marginal dark brown, expanding onto sides and passing further onto ventral surface; median streak lighter, anteriorly light fawn, in posterior half consisting of a chain of connected

four thin white chevrons. Posterior edge of the abdomen dark, dorsal spinnerets dark brown with lighter tips.

Face uniformly dark brown, setae around eyes I yellow. Clypeus dark brown, almost bald, with a few longer grey setae under AME, stretching diagonally and overhanging chelicerae; sparse white setae peculiarly swollen apically, on clypeus and entering chelicerae. Chelicerae dark brown. Pedipalps light brown to yellow, cymbium dorsally with contrasting spot of adpressed white setae, almost round basally; pedipalpal femur terminally, and patella dorsally, with a line of dense adpressed white setae. Characteristic retrolateral bunch of horizontal long brown or black setae on pedipalpal femur. Palpal organ: embolus broad and tapering, but apically truncated, without making sharp tip, located medially; side of bulbus opposite to apophysis particularly strongly developed (Fig. 586).

Legs brown with mosaics of black spots. Legs I dark brown, with apical end of tarsus yellow. II brown with darker metatarsus, III–IV yellow with brownish shade.

Male (paratype). Specimen seems much lighter, with darker area brown, dominant coloration yellow, probably due to fading. Due to yellow coloration white setae less striking. Dark areas on thorax consist of adpressed scales, elongate and brown, dark streaks on abdomen consist of adpressed grayish brown, thinner but denser scales. Palpal organ and “grey flag” on pedipalpal femur as in holotype specimen. Legs yellow.

Measurement of paratype male (in mm and % of length of cephalothorax). Length of cephalothorax 1.9 mm = 100%, length of eye field 0.88 = 46%, width of eye field at eyes I 1.28 = 67%, width of eye field at eyes III 3.128 = 67%, height of cephalothorax 0.88 = 46%, length of abdomen 2 = 1.05%, flat area beyond eye field 0.56 = 29%. Measurement of 5 segments of legs: (tarsus to femur, in mm and in % of leg I): leg I 0.48 + 0.56 + 0.72 + 0.6 + 1.04 = 3.4 mm – 100%, leg II 0.48 + 0.56 + 0.64 + 0.56 + 1 = 3.24 mm – 95%, leg III 0.64 + 0.72 + 0.64 + 0.64 + 1.2 = 3.84 mm – 113%, leg IV 0.64 + 0.96 + 0.8 + 0.64 + 1.12 = 4.16 mm – 122%. Leg order: IV, III, I, II.

Female (allotype). Eye field light brown, covered with invisible, adpressed and colourless scales. Thorax yellow with sparse darker, brownish olive, adpressed setae, concentration of these makes four elongate darker spots on posterior slope of thorax. Face light yellow with whitish sparse setae on clypeus and whitish setae encircling eyes anterior. Chelicerae creamy yellow, arising horizontally and almost immediately bending perpendicularly down. Pedipalps yellow with sparse, long stiff setae dark and whitish.

Abdomen pinkish yellow with lighter median, ill delimited streak, lateral parts of dorsum darker brown, due to adpressed brown scales, anteriorly a group of longer dark bristles. There is a pair of white spots in 4/5th of length of abdomen, encircled by dark brown scales. Spinnerets dark yellow. Abdomen ventrally

lighter pinkish yellow. Sternum and coxae yellow with pinkish hue. Epigynum covered by waxy secretion blurring its shape (Fig. 736), after removal of both waxy secretion and soft tissues in KOH, the shape of epigynum is shown on Fig. 737.

Legs yellow with short and sparse, dark setae.

Measurement of allotype female (in mm and % of length of cephalothorax). Length of cephalothorax 2.6 = 100%, length of eye field 1.17 = 45%, width of eye field at eyes I 1.69 = 65%, width of eye field at eyes III 1.73 = 65%, height of cephalothorax 1.04 = 40%, flat surface of thorax beyond eye field 0.78 = 30%, length of abdomen 2.99 = 115%. Measurement of 5 segments of legs: tarsus to femur (in mm and in % of leg I): leg I 0.65 + 0.78 + 0.97 + 1.04 + 1.3 = 4.74 mm – 100%, leg II 0.65 + 0.78 + 0.84 + 0.84 + 1.43 = 4.54 mm – 96%, leg III 0.65 + 0.97 + 0.91 + 0.78 + 1.56 = 4.87 mm – 103%, leg IV 0.91 + 1.3 + 1.17 + 0.78 + 1.69 = 5.85 mm – 123%. Leg order: IV, III, I, II.

Material. Holotype male, allotype female: Israel, Geshur 217/240 VIII, 1998, pitfall trap. Leg. I. Warburg. Paratypes: male, Israel, Kalia, 11. IV. 68, Leg. Pener; male, Israel, No 169. Leg. Oren Hasson. All in coll. HUJ; male, Israel, Sede Boker, April 1996. Leg. R. R. Jackson. Col. IZ.

Seasonal appearance of adult specimens. Seasonal appearance of adults: males – IV, VIII; females – VIII.

Distribution. Israel: Kalia, Dead Sea shore, Geshur (13).

Etymology. Related to the occurrence at the bottom of the tectonic rift of Dead Sea and Jordan Valley.

Pseudeuophrys Dahl, 1912

Type species. *Attus erraticus* Walckenaer, 1826: 46.

Introductory remarks. Improved knowledge of genital organs in *Euophryinae* suggests revival of the genus *Pseudeuophrys* Dahl, 1912 (actually done recently by Logunov 1998), containing species previously included into *Euophrys erraticus* group of species. The genus is characterized in females by epigynum with two large white membranous oval “windows” with thin, sclerotized rims, spermathecae oval, sometimes constricted into two chambers, located posteriorly to windows or partially parallel, channels short and broad. In males, bulbus is broad, coil of embolus large, located on anteroventral or anterior surface of bulbus, sometimes in anterior cavity; tibial apophysis prominent.

Pseudophrys pascualis (O. Pickard-Cambridge) comb. nov.
(Figs 198–199)

Salticus pascualis O. Pickard-Cambridge, 1872: 334–335;
Euophrys pascualis: Prószyński 1984c: 43 (transfer from *Salticus*); Logunov 1998: 125.

Diagnosis. Palpal organ very similar to *Euophrys obsoleta* (cf. Prószyński 1979: 307, Figs 80–83;

Prószyński 1991: Figs 1333.1–2 – mislabelled *Eu. herbigrada*), differing by tibial apophysis being equally narrow along major part of its length and by minute terminal hook; possibly conspecific, the establishment of which require examination of female and of fresh male.

Description. Male. Cephalothorax: now light greyish brown with eye field lighter, surrounding of eyes dark; lighter lines radiating from fovea, this character being shared by several *Euophrys* species in Israel.

Abdomen originally “black brown with some white squamose hairs towards fore extremity, ... indistinct pale ... chevrons on the hinder half”; dorsal spinnerets “white tipped with black, ventral one black”. Frontal aspect: coloration like cephalothorax, without contrasting pattern, surrounding of ALE darker pigmented, almost black, no distinct setae; diameter of AME equal to 150 % of that of ALE, clypeus under AME lighter, its height equal to half of diameter of ALE; chelicerae short and slender, with an oval space left between their inner bent edges.

Pedipalps: femur and patella “yellow with white hairs”, tibia “brown” with long thin apophysis, cymbium “brown-black”. Palpal organ: with large hole inside coil of the embolus, on anterior surface of bulbus, tibial apophysis long and thin, small, apically bent and hook-like. Ventral aspect whitish. Legs: originally “dark brown”, now faded, tarsus I dorsally whitish, prolaterally darkened; II–IV uniformly whitish yellow. (Based on original description of O. Pickard-Cambridge, 1872: 334–335 and on his specimen).

Measurements (mm). Male. Length of cephalothorax 1.14; length of abdomen 1.08.

Seasonal appearance of adult specimens. Male – IV.

Distribution. Israel: Nein (2).

Relevant species

Pseudeuophrys vafra (Blackwall)

Salticus vafra Blackwall, 1876: 205;

Euophrys vafra: Miller 1971: 141; Wunderlich 1987: 270; Nenilin 1985: 130;

Pseudeuophrys vafra: Logunov 1998: 124, Figs 15, 35, 36, 41, 42.

Distribution. S Europe, Azores, Madeira, Tunis, Syria.

Pseudicius Simon, 1885

Type species. *Pseudicius encarpatus* (Walckenaer, 1802).

Introductory remarks. A large, diversified genus having at present about 80 species occurring in the whole Old World, Australia, and Pacific Islands, particularly numerous in warm areas, including dry and eremic environments. Characterized by striking general appearance: long and relatively low body, flattened cephalothorax, very long and robust leg I, particularly striking in M, contrasting with shorter and slender legs

II–IV, usually flattened and elongated abdomen, all with characteristic colour pattern. They are further characterized by tibia I more or less swollen medially with reduced spines, partially or entirely, and striking trichobothria: thick, long and often bent. There is always a row of about 10 bristles on tubercles partially adpressed and directed horizontally, under eyes lateral and parallel to them; they are considered by W. Maddison (1987) to be a stridulatory organ, complemented functionally by a group of microscopic sized micro-bristles subapically on prolateral surface of femur I. Their genital organs differ so widely both in male and female, that only the existence of intermediary forms testify to their relationships. Their relationship to other genera unclear and requires further study.

Body proportions. In male: cephalothorax: length 1.38-1.95-2.67, broad, its width is 50-55-60% at eyes I, 68-71-83% at eyes III, height 34-39-50%. Eye field extending over 35-40-43% of cephalothorax, also short in relation to its width at eyes I; trapezium shaped, broadening posteriorly by 4–7%; indistinctly narrower than cephalothorax, eyes III are located close to the edges of cephalothorax. Abdomen: elongate oval tapering posteriorly; its length is 106-126-150%, its width 65-71-75%. Leg proportions (expressed in % of five segments of the first leg) differ in both sexes: in male leg order is – I, IV (80-93-107%), III (64-74-80%), II (60-67-76%); in female – IV (105-121-129%), I (100%), III (78-94-100%), II (74-84-88%).

Key to *Pseudicius* of Levant

1. Females 2
 - Males 7
- 2(1). Epigynal pockets located anteriorly, epigynum without large grooves 3
 - Pockets located posteriorly, epigynum with large anterior oval groove or two grooves 5
- 3(2). Pockets widely spaced, sclerotized edge of pockets reach posterior end of epigynum, entangled coils visible through tegument both in posterior and anterior part of epigynum *P. spiniger*
 - Pockets less widely spaced, sclerotized edge of pockets not longer than half of epigynum, internal entangled coils visible through tegument only in posterior part of epigynum 4
- 4(3). Median part of copulatory channels extends along the largest part of epigynum, transverse lateral channel in mid length clearly visible through tegument *P. wadis*
 - Median part of copulatory channels shorter, extends over posterior half of epigynum, accessory gland channel long, runs externally to epigynum *P. asoroticus*
 - Median part of copulatory channels extends along posterior part of epigynum (as above), the pockets almost touching each other *P. tamaricis*

- 5(1). Epigynum with large oval groove, incompletely divided anteriorly *P. kulczynskii*
 – Epigynum with two large oval grooves in anterior half 6
- 6(5). Grooves almost round, openings prominent, entrance channel U-shaped, pockets not visible *P. miriae*
 – Grooves elongate oval, openings very indistinct, entrance channel lying flat along spermatheca, pockets prominent *P. palaestinensis*
- 7(1). Bulbus rounded, embolus very long, encircling bulbus, anterior tip of cymbium elongate *P. spiniger*
 – Bulbus oval, usually elongate, embolus not encircling bulbus, cymbium of normal length 8
- 8(7). Embolus arising latero-posteriorly 9
 – Embolus arising anteriorly, tibial apophysis about half bulbus length, biramous .. *P. palaestinensis*
- 9(8). Tibial apophysis about as long as bulbus, uniramous 10
 – Tibial apophysis about half bulbus length, apically biramous 11
- 10(9). Tibial apophysis without small hook apically, inclined diagonally, with developed anterior “blade” *P. mikhalovi*
 – Tibial apophysis resembling tamaricis but with small hook apically, bulbus slightly broader *P. wadis*
 – Tibial apophysis in profile more vertical, sharp pointed, without developed anterior “blade” *P. tamaricis*
- 11(10). Ventral ramus of apophysis spine like *P. shiriniae* and *P. sindbadi*
 – Ventral ramus of apophysis short and broad ... *P. miriae*

Pseudicius amicus Prószynski

(Figs 597, 603–604)

Pseudicius amicus Prószynski, 2000: 257, Figs 99–101.

Diagnosis. Epigynum resembling *P. palaestinensis*, with shorter copulatory channel.

Description. Female. Cephalothorax brown, thorax lighter brown; lowest part of sides yellow; ventral edge thin dark line; lateral eyes darkly encircled; sides covered with indistinct whitish adpressed setae, dorsally rubbed off. Eye field brown with two medium size indistinct central dark spots. Abdomen: general pattern, similar for several species (Fig. 597), anterior two thirds now grey, with pairs of elongate white spots along thin irregular median grey streak apparently consisting of fused spots; posterior third of abdomen with dark triangular pattern of spots, encircled with broken white lines and spots. Frontal aspect: clypeus densely covered with long intensely white setae up to ventral edges of eyes I,

contrasting with brown lower sides of cephalothorax, covered with sparse setae, area beneath lateral eyes still darker; area around eyes I brown with sparse white setae; white setae and scales above eyes AME on dark pigmented tegument; pedipalps white; chelicerae fawn.

Legs: tibia I yellow, with two closely spaced, reduced short ventral spines in a prolateral subapical position.

Ventral aspect light. Epigynum anterior 3/4 divided into two elongate oval grooves, prominently delimited by a sclerotized edge, their partition narrow, slightly broadened in its mid-length; pockets prominent, lateral to grooves, edge of their openings broadly bent, located at about 2/3 of epigynum length; copulatory opening indistinct; spermathecae make flattened transverse loop, not exceeding posterior third of epigynum length.

Measurements (mm). Female. Length of cephalothorax 2.67; length of abdomen 3.36; length of 5 segments of leg I 3.99

Remarks. The holotype specimen labelled – “1246 – Syria (C.Br.)” was found mixed up among non-identified material in the E. Simon Coll., MNHN-Paris.

Distribution. “Syria”

Pseudicius asoroticus Simon

(Figs 628–629)

Pseudicius asoroticus Simon, 1890: 116;

Pseudicius asoroticus: Prószynski 1993: 50–53, Figs 41–46;

Afraflacilla asorotica Wesolowska et van Harten, 1994: 7, Figs 11–13 (change of combination not accepted).

Diagnosis. Resembles *P. wadis*, differs by abdominal pattern with two pairs of indistinct transverse white lines, as well as indistinct median lighter streak with two grey narrow chevrons in its posterior half; tibial apophysis thinner, bent dorsally in apical quarter, embolus in the 5 o’clock position, spermatheca longer than median loop of channel.

Description. Male. Cephalothorax: brown with black encircled eyes lateral and two black spots on the middle of eye field; sparse whitish setae over cephalothorax, slightly denser between eyes I on anterior edge of eye field; no contrasting spots or marks, ventral edge dark without fringe of white setae.

Abdomen: greyish brown with indistinct pattern, posterior triangle of abdomen darker brown with indistinct narrow white indentation laterally; two pairs of indistinct transverse white lines in approximately 3/6 and 4/6 of abdomen length, as well as indistinct median lighter streak with two grey narrow chevrons in its posterior half. Frontal aspect: face fawn, without contrasting features, eyes I surrounded with colourless scales, more whitish dorsally; clypeus almost completely reduced under AME; chelicerae and pedipalps dark yellow, leg I brown.

Ventral aspect: yellow with chelicerae, coxa and trochanter I, light brownish yellow.

Leg I: brown, strongly sclerotized, typical for *Pseudicius*, tibia I with two short ventro-prolateral spines in apical half, none retro-latero-ventrally. Legs II–IV: thinner uniformly greyish yellow. Palpal organ: bulbus oval elongate with triangular lateral protuberance large but smaller than in *Pseudicius braunsi* of South Africa (cf. Prószyński 1987: 53); embolus long, arising in the 5-o'clock position (in *Pseudicius wadis* in the 8-o'clock position) encircling bulbus posteriorly then running along its side and ending in front of it; tibial apophysis long, as long as bulbus.

Female. Cephalothorax: brown with black encircled eyes lateral and two black spots on the middle of eye field; sparse whitish setae over cephalothorax, slightly denser between eyes I on anterior edge of eye field; no contrasting spots or marks, ventral edge dark without fringe of white setae; lower sides of cephalothorax somewhat lighter yellow than in *P. wadis*.

Abdomen: greyish brown, its characteristic features are two pairs of indistinct transverse white lines at approximately $\frac{3}{8}$ and $\frac{4}{8}$ of abdomen length, as well as indistinct median lighter streak with two narrow grey chevrons in its posterior half; posterior brown triangle of abdomen darker, light reflecting, much more conspicuous than in male; there are laterall, short and narrow white spots.

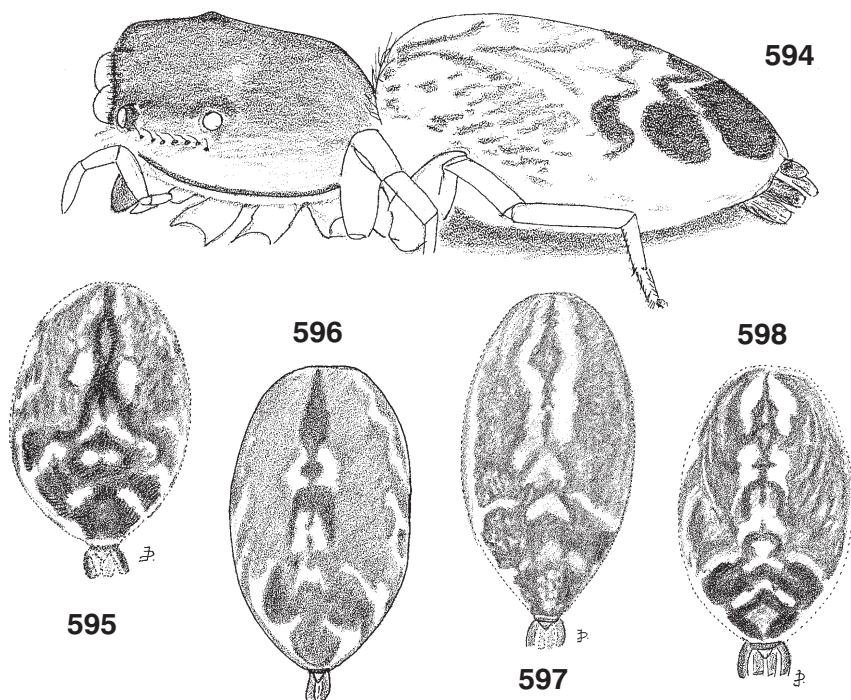
Frontal aspect: face fawn, eyes I surrounded by narrow orbits of white setae, clypeus very low, covered with whitish setae, setae overhanging cheliceral bases whitish; chelicerae and pedipalps yellow, leg I yellow; in *P. wadis* orbits of white setae around eyes I appear more conspicuous, setae on clypeus and overhanging cheliceral bases strikingly white.

Leg I: yellow, more robust than remaining but difference less striking than in male, slightly shorter than legs IV. Legs II–IV: whitish yellow.

Epigynum: characterized by anterior location of pockets (whose spacing varies considerably among 6 studied F), their distance from the posterior edge equal to twice length of median spermathecal channels; copulatory opening quite long and clearly visible, channel of the accessory gland long, running laterally to epigynum, also anterior location of terminal triangles of spermathecae.

Seasonal appearance of adult specimens. Males – III; females – III, IV.

Distribution. Saudi Arabia, Aden. Israel: Kallia, 'En Gedi (13); Nahal Zin (17).



Figures 594–598. General appearance of female of *Pseudicius miriae* (594); abdominal pattern in *Pseudicius kulczynskii* (female and an immature specimens from “Syria”) (595, 596), *P. amicus* (597), *P. palaestinensis* (598).

Pseudicius kulczynskii Nosek

(Figs 595, 596, 599–600)

Pseudicius kulczynskii Nosek, 1905: 145, Tab. 5, Fig. 26;

Pseudicius espereyi Fage, 1921: 229–231, Fig. 6 a, 7 [female – suspected new synonym; nec male Hadjissarantos 1940: 108–109, Fig. 36];

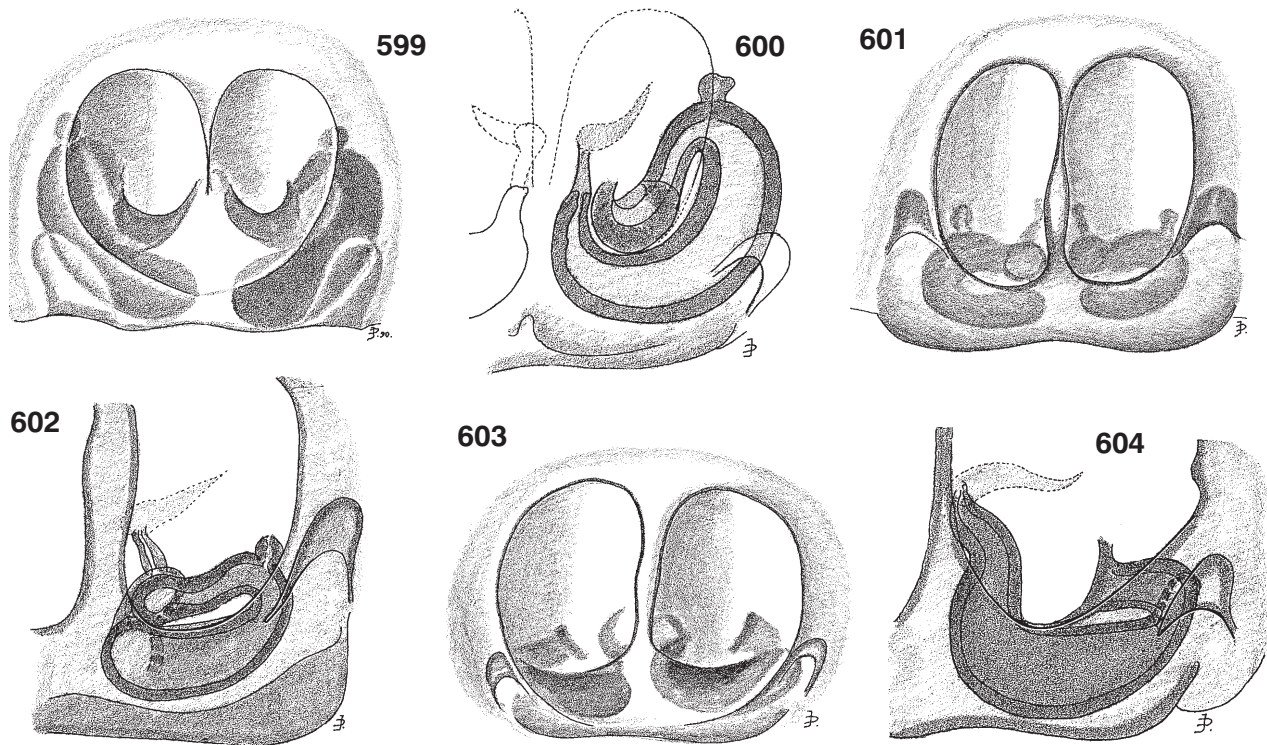
Icius kulczynskii: Andreeva et al. 1984: 373, Figs 52–56.

Diagnosis. Closely related to *Pseudicius palaestinensis*, differs by longer loop of spermathecae, tibial apophysis divided into three prongs, shape of bulbus and embolus.

Description. Female (“Syria” specimen). Cephalothorax: brown covered with indistinct whitish, adpressed setae, lower sides yellow; ventral edge with thin dark line; lateral eyes darkly encircled; median thoracic line slightly lighter. Eye field brown, with two indistinct central dark spots.

Abdomen: anterior two thirds of abdomen now grey, with pairs of elongate white spots along thin irregular median grey streak of apparently fused spots; posterior third of abdomen with dark triangular pattern of spots, encircled with broken white lines and spots.

Frontal aspect: clypeus densely covered with long whitish setae up to ventral edges of eyes I, merging laterally with whitish setae on light fawn lower sides of cephalothorax and contrasting with darker area beneath lateral eyes; area around eyes I fawn with white



Figures 599–604. *Pseudicius kulczyński* from “Syria”, epigynum (599), its internal structure (600); *P. palaestinis*, epigynum (601), its internal structure (602); *P. amicus*, epigynum (603), its internal structure (604).

scales; white setae and scales above eyes AME on dark pigmented tegument; pedipalps white; chelicerae fawn.

Legs: tibia I yellow, with two closely spaced, reduced short ventral spines in a prolateral subapical position.

Ventral aspect light. Epigynum: single depression occupying about $\frac{1}{5}$ of epigynum, almost round, anteriorly divided into two narrowly separated grooves, about half epigynum length, their partition incomplete, and sharply pointed, pockets prominent with opening at posterior edge of epigynum; copulatory opening large and prominent, semicrescent at the posterior end of grooves; spermathecae make elongate loop (of variable length) extending anteriorly, longer than half epigynum length.

Measurements (mm). Female. Length of cephalothorax 2.13; length of abdomen 2.93; length of 5 segments of leg I 2.97.

Material. Female, *Pseudicius kulczyński* “1246 Syria (C.Br.)” [non identified material, det. J. Prószynski], Coll. E. Simon, MNHN-Paris.

Distribution. Greece: Lesbos; Turkey; “Syria”

Pseudicius mikhaïlovi Prószynski
(Figs 612–613)

Pseudicius mikhaïlovi Prószynski, 2000: 258–259, Figs 102–103.

Diagnosis. Tibial apophysis diagonal, bent ventrally in the middle, with developed anterior “blade”.

Description. Male. Cephalothorax: fawn with thin addressed white flattened setae or scales, denser in anterior part of the eye field, forming three white spots between the eyes; differs from *P. palaestinis* by lack of light thoracic streak, having instead lighter broad area between eyes III and on anterior thorax, also no marginal band of white setae; however, edge of carapace also black.

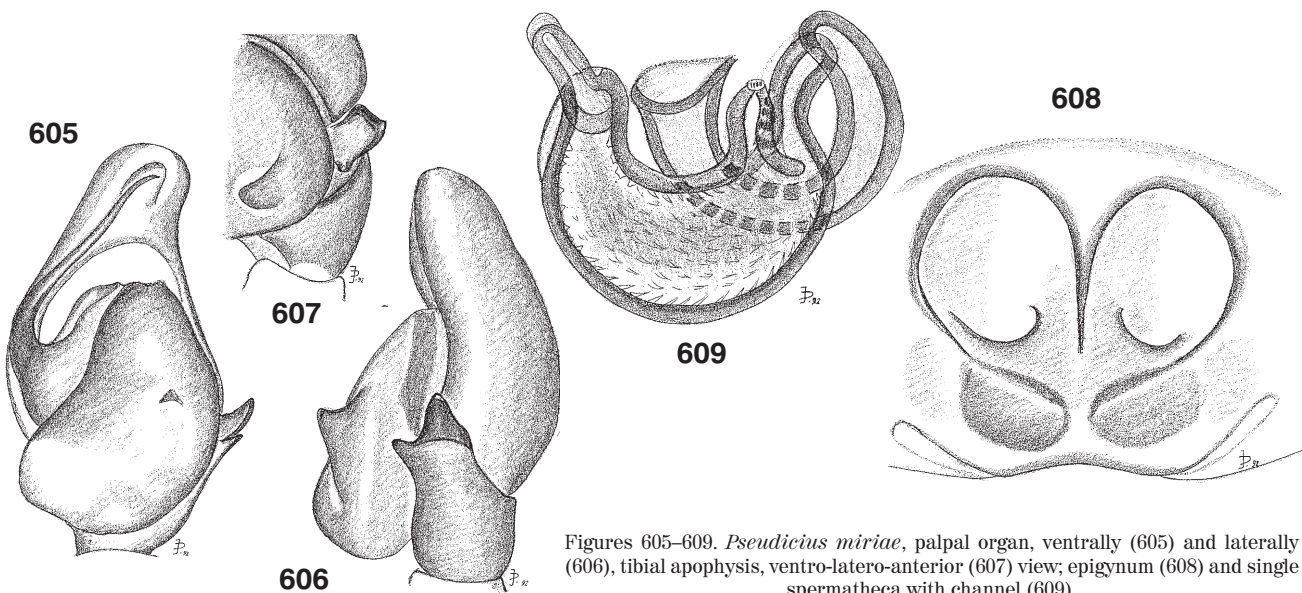
Abdomen whitish (now) with median yellow area along anterior half – with its thin median line darker brown, followed by two brown chevrons in the middle of abdomen, a transverse dark brown line across abdomen and dark brown posterior end of abdomen. There are some weak darkenings on white margins, corresponding to the darker median spots on the middle area of abdomen; sides with diagonal yellowish lines.

Frontal aspect: eyes I surrounded with whitish dorsally, reddish patch between ALE and AME, apart from that the appearance of frontal aspect is brown, with patella-tibia of pedipalps yellowish.

Legs I light brown, robust, with swollen tibia, patella and femur, tibia I with two short ventro-prolateral spines in apical half, none retrolatero-ventrally; legs II–IV slender and short, yellow.

Palpal organ: resembling both *Pseudicius tamaricis* and *P. wadis*, but tibial apophysis more diagonal, bent ventrally in the middle, with developed anterior “blade”.

Measurements (mm). Male. Length of cephalothorax 1.65; length of abdomen 2.05.



Figures 605–609. *Pseudicius miriae*, palpal organ, ventrally (605) and laterally (606), tibial apophysis, ventro-latero-anterior (607) view; epigynum (608) and single spermatheca with channel (609).

Distribution. Israel: 'Enot Zukim (= En Fashka, inside gall of *Tamarix* sp.) (13); Nahal Zin (17).

Etymology. Named for Dr. K. G. Mikhailow, a prominent Russian Arachnologist and my good friend.

Pseudicius miriae Prószyński
(Figs 594, 605–609)

Pseudicius miriae Prószyński, 2000: 259–260.

Diagnosis. Palpal organ resembling European *Pseudicius encarpatus*, with embolus arising laterally in the anterior half of bulbus; tibial apophysis broad, with small, cone shaped ventral ramus; bulbus intermediate between *P. shirinae* and *P. sindbadi*. Epigynum with cordiform [heart shaped] depression, divided incompletely by a thin anterior septum; the copulatory channel dorsally encircles the distal half of spermatheca and after a prominent bend, joins it at its lateral end, near very prominent cone of the accessory gland; the external pockets are not visible.

Remark. Closely related species *Pseudicius vankeeri* was recently described from Rhodos by Metzner (1999: 95, Tab. 60a–h), the relationships of these forms require further study.

Description. Male. Cephalothorax, dark brown, with eye field blackish brown, striking submarginal streak of short, dense white setae; less striking, sparse, short whitish setae scattered over eye field, making a narrow median whitish streak along thorax. There is a row of 8–9 adpressed, characteristic bristles on dark tubercles beneath eyes lateral.

Abdomen divided into three stripes, of various intensity in different specimens: dark median streak consisting of several darker chevrons and two lighter lateral streaks,

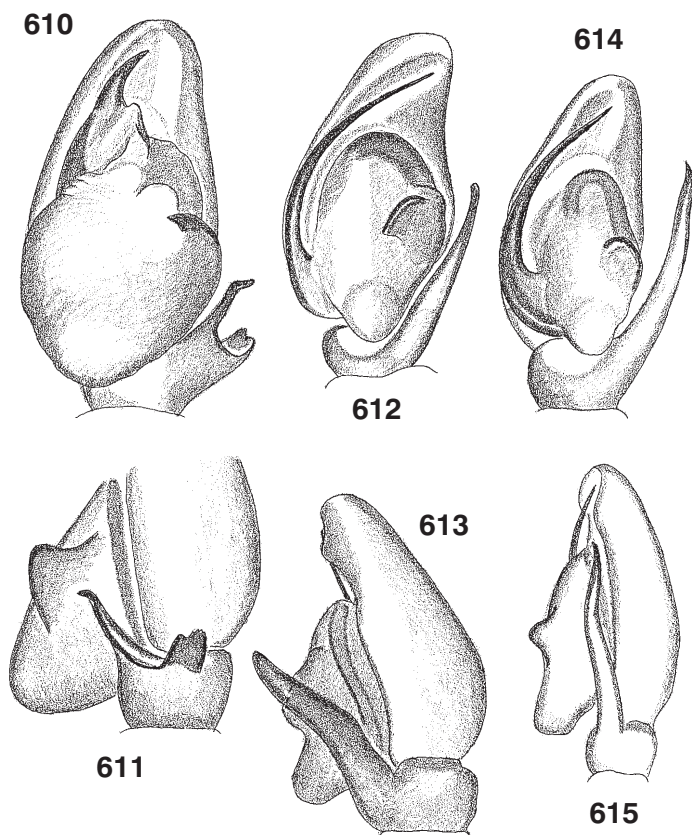
either uniform whitish, or suffused light greyish, or greyish brown in that case with 4 pairs of white spots, of various intensity; dark sides form lateral frame. Frontal aspect: eyes I encircled with orange setae; striking belt of dense, short white setae along ventral clypeal edge, passing into less dense white submarginal streak along sides.

Ventral aspect: Chelicerae dark brown, maxillary plates and labium brown, white tipped. Coxae light brownish grey, posteriorly much lighter, almost white. Sternum light fawn to whitish fawn, like posterior coxae, with indistinct and thin, darker marginal line. Abdomen ventrally light whitish or whitish fawn, in majority of specimens with more or less distinct darker rectangular area, greyish or fawn, in a few specimens entirely whitish.

Legs order I, IV, III, II. The first pair characteristically larger and dark brown, strongly sclerotized, with long thin setae and trichobothria, dorsally with sparse white adpressed setae, femur-tibia strikingly broader than metatarsus-tarsus; tibia I swollen medially, with single and much reduced distal prolateral spine. Legs II–IV slender, greyish yellow with darker brown lateral surfaces, darker proximal rings dorsally on tibia and metatarsus. In one specimen, right leg I, pedipalp and palpal organ undeveloped and much reduced.

Palpal organ: embolus, long, arising in the 10 o'clock position, running along median side of bulbus, ending at the tip of cymbium. Tibial apophysis broad, divided apically into two rami, the ventral ramus being very short.

Female. Closely resembles *P. palaestinensis* but is larger and has different although related epigynum. The colour pattern differences may be result of preservation of specimens and need comparison with fresh specimens; however internal structure of epigynum is different – much more complicated than in *P. kulczynskii*, external pockets not visible; number of spines on tibia I also different.



Figures 610–615. *Pseudicicus palaestinensis*, palpal organ ventrally (610) and laterally (611); *P. mikhailevi*, palpal organ ventrally (612) and laterally (613); *P. tamaricis*, palpal organ ventrally (614) and laterally (615).

Cephalothorax, dark greyish brown, covered uniformly with sparse, short whitish setae, somewhat denser on submarginal streak, but not as striking as in male; eye field does not differ from remaining parts; in some specimens indistinct median whitish streak along thorax. The row of characteristic bristles on dark tubercles beneath eyes laterally present, but hidden among whitish setae.

Abdomen differs from that of male by having pattern of greyish brown spots on whitish background; the median spots are chevron shaped, delimited by white spots, and are comparable with those in male; in Jerusalem specimen, anterior abdomen white with three thin median chevrons and several broken diagonal lines. The posterior third of abdomen with three intensely black, light reflecting spots, separated by three small white dots, or by white chevron; there is usually a pair of similar black, lateral spots in front of the latter. Sides whitish with a few diagonal darker lines.

Frontal aspect: face intensely white with eyes I encircled with white setae, dorsally partly hidden under horizontal, longer, dark brown bristles; clypeus covered with white setae, some longer setae overhanging cheliceral bases. Chelicerae brown, pedipalps white, with sparse, long white setae. Legs order IV, I, III, II. The first

pair broader than remaining, but not as strikingly as in male, and not as strongly sclerotized, shorter than leg IV; tibia I with single, reduced, prolateral spine; pale yellowish grey, with lateral surfaces darker; femur I whitish except darker apical end dorsally and laterally. Remaining legs somewhat slender, coloured similarly but somewhat lighter.

Ventral aspect: Chelicerae dark brown, maxillary plates and labium fawn, white tipped. Coxae whitish; sternum yellowish white, with indistinct, grey, marginal line. Abdomen ventrally whitish.

Epigynum with cordiform depression divided anteriorly by thin septum, usually ending before posterior edge of depression, separating two large grooves, shorter than in *P. kulczyński* and almost round. External pockets not visible. Copulatory openings broad at the anterior side of spermatheca, located inside the saddle-like bend of it, with the duct U-shaped, running dorsally to the lateral half of spermatheca, then making a prominent bend antero-laterally to spermatheca and joining it at its lateral end, near very prominent cone with pores of the accessory gland. Spermatheca semi-circular, located horizontally near posterior edge of depression; fertilisation duct located at the medial end of spermatheca.

Measurements (mm). Male. Length of cephalothorax 2.00–2.19; length of abdomen 2.19–2.62; length of 5 segments of leg I 3.50–4.19. Female. Length of cephalothorax 2.12–2.44; length of abdomen 2.37–2.75; length of 5 segments of leg I 3.19–3.69.

Seasonal appearance of adult specimens. Males – I, II, III; females – I, II, III, IX. Live in pine forests, on bark of *Pinus brutia* and *Pinus halepensis*.

Distribution. Israel: Mt. Carmel (3); Har Horshan, near Arava (6) Newe Shalom, Tarum, Bet Jimal (10); Jerusalem (11).

Etymology. Named for the collector, Mrs. Miri Halevy, formerly of Dept. of Entomology, Faculty of Agriculture, Hebrew University, Rehovot, Israel.

Pseudicicus palaestinensis (Strand) comb. nov.

(Figs 598, 601–602, 610–611)

Pseudicicus picaceus palaestinensis Strand, 1915: 169.

Diagnosis. Embolus on top of bulbus, ventral ramus of tibial apophysis thin, moderately long and apically bent, dorsal ramus short, blade-like; epigynal grooves elongate oval, copulatory channel short, pressed to anterior surface of spermatheca.

Remark. The species is redescribed on the basis of male type of *Pseudicicus picaceus palaestinensis* Strand; matching with female tentative, on basis of a pair of specimens in the same sample from Mt. Carmel.

Collection of Simon in the MNHN in Paris contains an unidentified specimen of this species from "Palestine or Syria". Related *Pseudicius pseudocourtauldi* Logunov, 1998 from Armenia has genital structures indistinctly different (Figs 738–741); but differs by strikingly contrasting abdominal pattern of blackish brown streak, followed by silver white lateral streaks, framed by dark lateral surfaces; blackish median streak has fused large, contrasting yellow spot of complicated shape. In *Ps. palaestinensis* that yellow spot is divided into separate two pairs of narrow spots, followed by two indistinct chevrons, weakly contrasting on brownish yellow abdomen.

Description. Male. Cephalothorax brown, eye field slightly darker with black median spot, lateral eyes surrounded by black; lighter yellow thoracic streak; a streak of white setae along black ventral margin of carapace. Abdomen: median longitudinal streak light brown, with two pairs of elongate yellow spots on the median streak, followed by two small yellow chevrons and two posterior transverse marks; two lateral streaks of white setae, with indistinct lighter and darker marks corresponding to those on median brown streak; upper sides reddish brown with grey diagonal stripes.

Frontal aspect: a band of vertical, strikingly white scales along ventral clypeal edge, overhanging cheliceral bases, contrasting with remaining clypeus, which is fawn, baldish, with some colourless setae (in *Pseudicius picaceus* there is no bald tegument, the whole width of clypeus under AME is covered by white scales, with some fawn scales immediately beneath ALE). Chelicerae, legs and pedipalps yellow; patella of pedipalps with whitish setae.

Legs typical for the genus: I robust with tibia swollen and reduced spines; II–IV slender, yellow.

Palpal organ resembling *Ps. courtauldi* from which it differs by anterior bulbus more expanded, and by details of tibia.

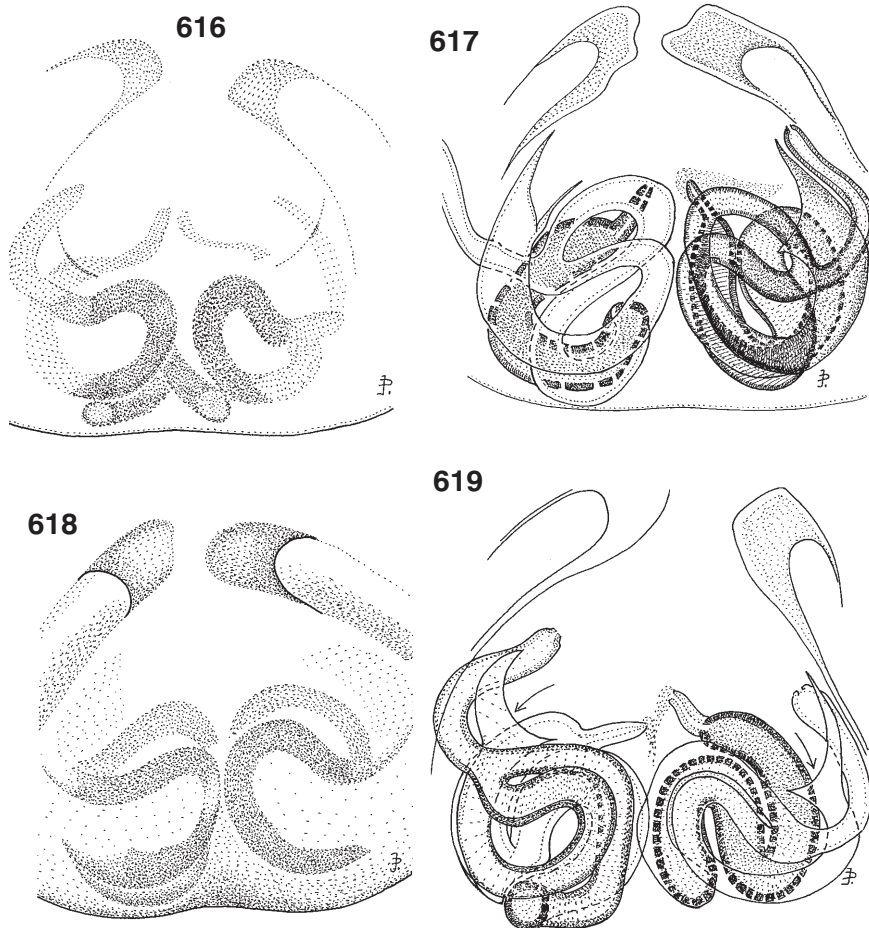
Female (new – tentatively matched). Cephalothorax brown covered with indistinct whitish adpressed setae, denser along lower sides and anteriorly on eye field; eye field with two central indistinct dark spots of medium size; thorax lighter brown with slightly lighter median line; lower sides yellow, ventral edge thin and dark; lateral eyes darkly encircled.

Abdomen: anterior two thirds now grey with three pairs of elongate white spots along thin irregular median grey streak of apparently fused spots; posterior third of abdomen with dark triangular pattern of three dark spots encircled with white, anteriorly limited by transverse white belt of four thin white spots, laterally with two white spots; encircled with broken white lines and spots.

Frontal aspect: a dense spot of white setae above eyes AME on dark pigmented tegument; area around eyes I brown pigmented with white setae; long, dense and intensely white setae cover clypeus up to ventral edges of eyes I, contrasting with yellow lower sides of cephalothorax, and still darker area beneath lateral eyes; pedipalps white; chelicerae yellow.

Legs: I – yellow and robust, tibia I yellow, with two closely spaced, reduced short ventral spines in a prolateral subapical position; legs II–IV whitish, slender and shorter.

Ventral aspect: sternum yellow, coxae whitish, abdomen whitish. Epigynum: anterior $\frac{2}{3}$ divided into two elongate oval grooves (blocked by transparent waxy substance, removable by maceration in KOH), somewhat broader than in *P. mikhailovi*, prominently delimited



Figures 616–619. Epigynum and its internal structure in *Pseudicius tamaricis*, specimens from Cufra (616, 617), and identified by Denis as *Pseudicius punctatus* from Egypt, Siwa (618, 619).

anteriorly and laterally by a sclerotized edge, their partition narrow, width not changing along its length; pockets prominent, postero-laterally to grooves, edge of their opening' narrowly but deeply bent, located at about posterior $\frac{1}{4}$ length of epigynum; copulatory opening indistinct; spermathecae in posterior $\frac{1}{4}$ length of epigynum, transverse and shallowly bent, but not forming a loop.

Measurements (mm). Male. Length of cephalothorax 2.10; length of abdomen 2.39. Female. Length of cephalothorax 1.94; length of abdomen 2.75; length of 5 segments of leg I 3.16.

Seasonal appearance of adult specimens. Males – III, IV, V, VI, IX; females – IV, V, IX.

Distribution. "Syria". Israel: Mt. Carmel (3), Har Horshan (6); Tel Aviv, Rehovot (9); Jerusalem, Nahal Zin (17).

Pseudicius tamaricis Simon
(Figs 614–615)

Pseudicius tamaricis Simon, 1885: 2;

Pseudicius tamaricis: Prószyński 1989: 54–57, Figs 56–63;

Pseudicius punctatus Denis, 1947.

Diagnosis. Male tibial apophysis single, as long as bulb, slightly bent dorsally in anterior half, almost parallel to cymbium; female median loop of the copulatory channel semicircularly bent, as long as spermathecae, reaching about half epigynum length.

Description. Male. Cephalothorax brown with eye field blackish, no lighter areas. Abdomen presumably once dried up, now partly constricted along median longitudinal axis, median streak blackish brown with four transverse branches across marginal white streaks.

Legs typical for the genus: I robust with tibia swollen with reduced spines; II–IV slender, yellow.

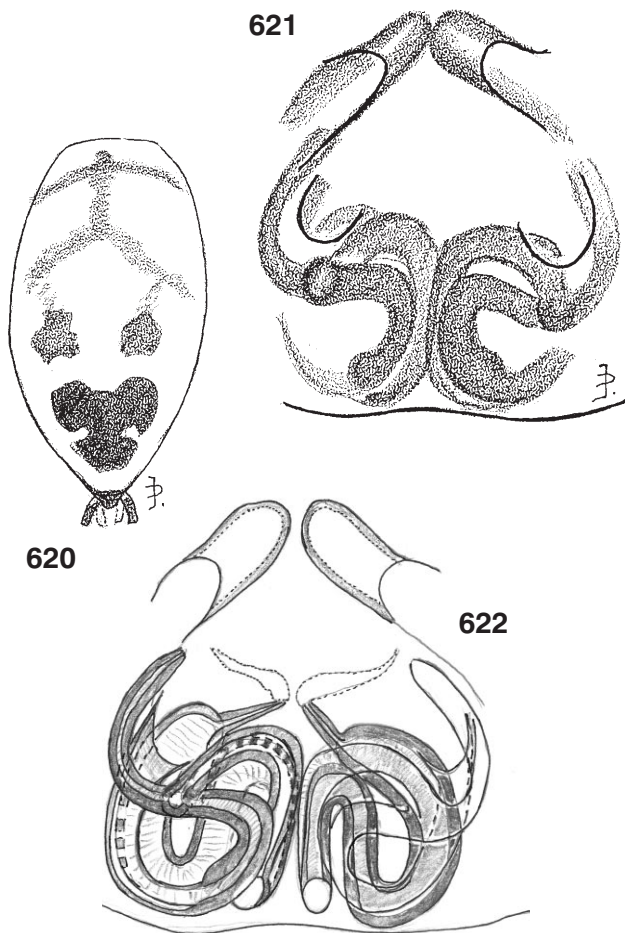
Palpal organ: tibial apophysis more vertical without developed anterior "blade".

Female. Cephalothorax brown with adpressed short whitish setae giving a slightly lighter colour; dark central spot and black lateral edges of the eye field; sides yellow with indistinct whitish setae; a row of 10 dark tubercles with stridulatory setae beneath eyes lateral.

Abdomen: white with indistinct traces of two transverse darker yellow lines anteriorly, connected by a short median line of the same colour; distinct posterior black spot (complicated by a pair of small but striking white dots) and a pair of near median brown spots; tip of abdomen white, anal tubercle and dorsal spinnerets dark. Ventrally – abdomen devoid of pigment – a mosaic of white glands impregnated by guanine.

Epigynum and its internal structure are shown in Figs 614–615, median loop of the channel semicircularly bent, as long as spermathecae, about half epigynum length.

Frontal aspect: clypeus densely covered with long white setae, eyes I surrounded with white setae, legs I and pedipalps yellow.



Figures 620–622. *Pseudicius tamaricis* from Israel, abdominal pattern (620), epigynum (621) and its internal structure (622).

Legs: I robust and long with tibia long but less swollen than usually in the genus, with two short pro-lateral spines in the apical half.

Measurements (mm). Male. Length of cephalothorax 1.70; length of abdomen 1.82. Female. Length of cephalothorax 1.82; length of abdomen 2.73.

Seasonal appearance of adult specimens. Male – IV; female – XI.

Distribution. N Africa: Algeria, Morocco, Libya; Egypt: Sinai: 50 km S. of Nahel; Saudi Arabia. Israel: En Yahav (14); HaMachtesh HaGadol (17).

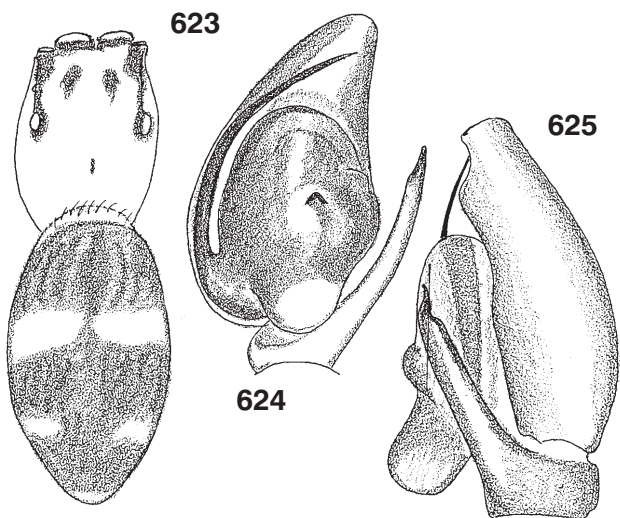
Pseudicius wadis Prószyński
(Figs 623–625, 626–627)

Pseudicius wadis Prószyński, 1989: 57–59, Figs 64–68;

Pseudicius wadis: Prószyński 1993: 48–53, Fig. 47;

Afraflacilla wadis: Wesołowska and van Harten, 1994: 9, Figs 14–18 (combination not accepted).

Diagnosis. A pair of large transverse, almost rectangular white spots in middle of abdomen; tibial apoph-



Figures 623–625. *Pseudicius wadis*, general appearance (623); palpal organ ventrally (624) and laterally (625).

ysis semi-diagonal, with minute, narrower hook apically, epigynum medially with long, straight channel loops.

Remark. A light on behaviour and environmental requirements of this species was thrown by Dr Yael Lubin, who collected 14 males and 9 females, often 3–5 specimens together, inside legumen silicles of *Accacia* trees, in Nahal Zin, in January 1995.

Description. Male and female. Cephalothorax light fawn to light brown, eye field with two black spots in anterior half and with blackish margins; sides in female lighter, covered with whitish adpressed setae, edge of carapace black.

Abdomen grey, striking by unusual pair of broad, rectangular, transverse white spots near the middle of abdomen, also a pair of small submarginal white spots at the $\frac{3}{4}$ of abdomen length; anterior edge white.

Frontal aspect: in male brown without white setae, lack of dense white setae across clypeus, AME surrounded ventrally with fawn, dorsally with white setae, spots of white setae between AME at the anterior edge of eye field more conspicuous than in *P. asoroticus*; in female densely covered with thick white setae, pedipalps whitish, chelicerae and legs I yellow. Ventral aspect: sternum yellow, coxae whitish, abdomen whitish; legs I are darker in male.

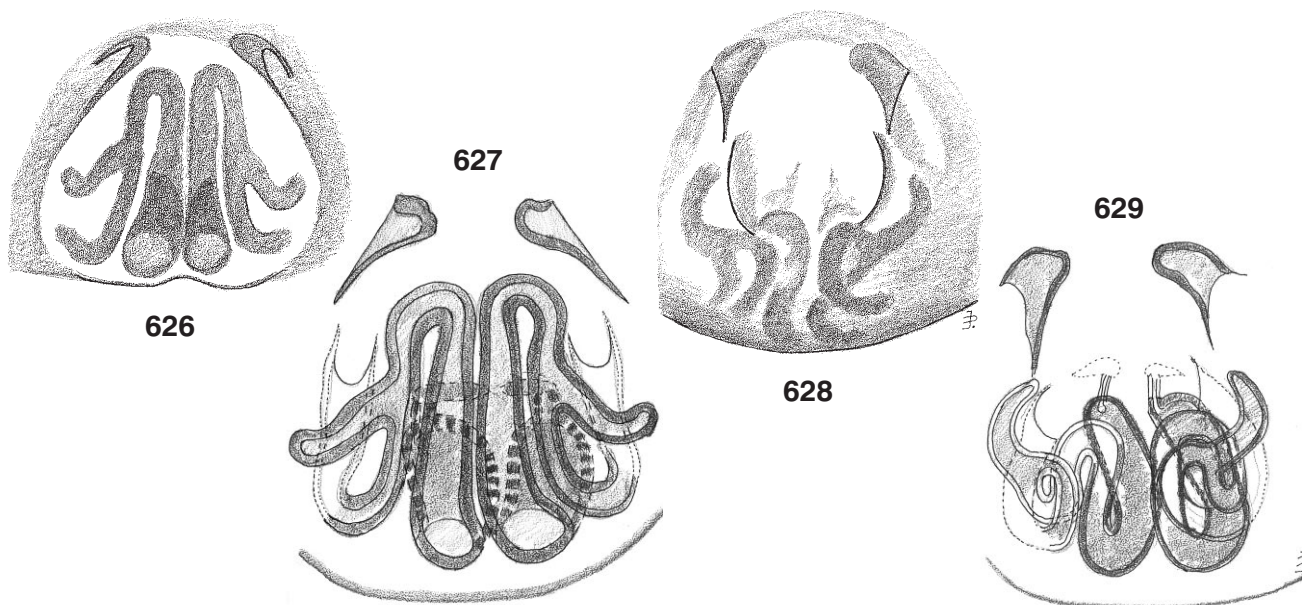
Palpal organ: bulbus oval without lateral protuberance (cf. Prószyński 1993: Figs 65–66), embolus arising in the 8-o'clock position, shorter than in *P. asoroticus*; tibial apophysis intermediate between *P. mikhailovi* and *P. tamaricis*, with small hook apically.

Epigynum: striking by particularly long straight channel loop running medially along whole length of epigynum, reaching the anteriorly located pockets, in other species homologous loop ends in the mid-length of epigynum; spermathecae located dorsally to loops, shorter, extending along half the length of loops.

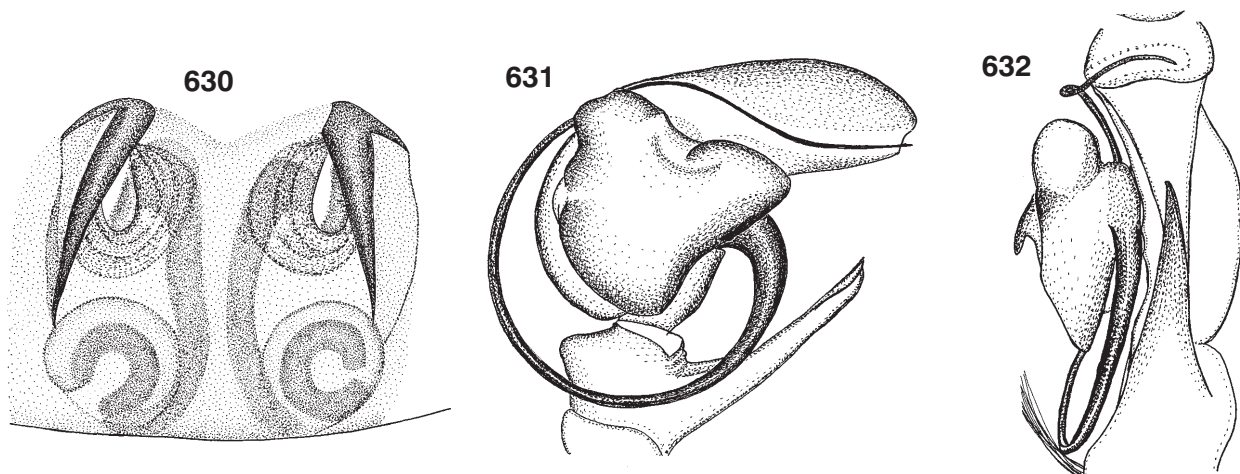
Measurements (mm). Male. Length of cephalothorax 1.38; length of abdomen 1.62; length of 5 segments of leg I 2.67. Female. Length of cephalothorax 1.50; length of abdomen 2.10; length of 5 segments of leg I 2.33.

Seasonal appearance of adult specimens. Males – I, III; females – I, III.

Distribution. Aden, Saudi Arabia. Israel: Nahal Amazyahu, Hazeva, Nahal Timna (14), Nahal Zin (17).



Figures 626–629. *Pseudicius wadis*, epigynum (626) and its internal structure (627) and *P. asoroticus*, epigynum (628) and its internal structure (629).



Figures 630–632. *Pseudicius spiniger*, epigynum (630), palpal organ ventrally (631) and laterally (632), matching of male and female doubtful (from Andreeva et al. 1984: 372, ff. 46–48).

Relevant species

Pseudicius arabicus (Wesolowska et van Harten) comb. nov.

Afraflacilla arabica Wesolowska et van Harten, 1994: 4–7, Figs 6–10.

Remarks. Described from Yemen. Single male described and illustrated by Wesolowska. Specific identity uncertain because a typical position of Fig. 7. Somewhat resembles *P. wadis* by transverse white bands on abdomen.

Pseudicius badius (Simon)

(Figs 633–634)

Marpissus badius Simon, 1868: 23;

Pseudicius badius: Prószynski 1987: 50;

Pseudicius espereyi Hadjissarantos, 1940: 108–109, Fig. 36 (male most probably *P. badius* – cf. Prószynski 1987: 50, but not female – cf. Fage 1921: 229–231 Figs 6a, 7).

Distribution. S Europe: Corsica, Greece, Italy, Sicily.

Pseudicius braunsi (Peckham et Peckham)

Icius braunsi Peckham et Peckham, 1903: 211;

Pseudicius braunsi: Prószynski 1987: 53.

Distribution. South Africa (according to Logunov 1995a: 240–241, Figs 27a–d – also in Turkmenistan).

Pseudicius courtauldi Bristowe

Pseudicius courtauldi Bristowe, 1935b: 733, 772, 786, Figs 21–24;

Pseudicius courtauldi: Prószynski 1976: map 109;

Icius courtauldi: Andreeva, Hęciak and Prószynski 1984: 373, Figs 57–60.

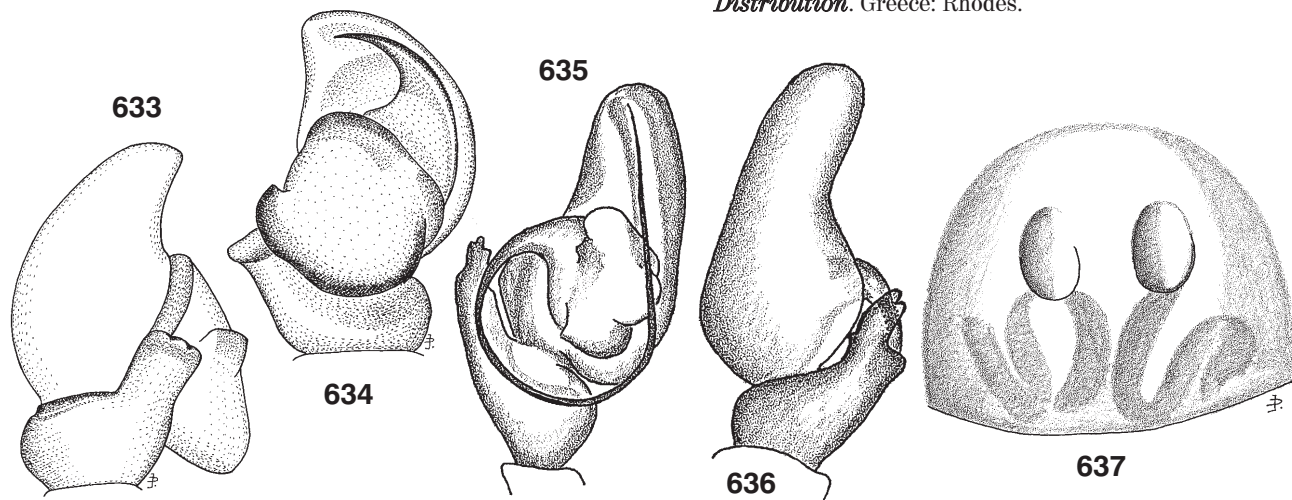
Distribution. Greece: Patmos – terra typica; Tadjikistan; China: Xinjiang Uygur Region: Urumchi, Bohu, Manas.

Pseudicius cultrifer di Caporiacco

Pseudicius cultrifer Caporiacco 1948: 69, Fig. 1;

Pseudicius cultrifer: Fuhn and Gherasim 1984: 54 (proposed synonymisation with *Pseudicius picaceus* (Sim., 1868) not accepted).

Distribution. Greece: Rhodes.



Figures 633–637. *Pseudicius badius* from Naxos, palpal organ ventrally (633) and laterally (634); SE European *P. epiblemoides*, lectotype male, palpal organ ventrally (635) and laterally (636), paralectotype female, epigynum (637).

Pseudicius epiblemoides Chyzer
(Figs 635–637)

Pseudicius epiblemoides Chyzer, in Chyzer and Kulczyński 1891: 12, Tab. 1, Fig. 16;

Pseudicius epiblemoides: Fuhn and Gherasim 1984: 52, Figs 2A–B.

Distribution. Macedonia.

Pseudicius picaceus (Simon)

Attus picaceus Simon 1868b: 573, Tab. 7, Fig. 4;

Pseudicius picaceus: Caporiacco 1948: 71;

Pseudicius picaceus: Flanczewska 1981: 221, Fig. 96;

Icius picaceus: Andreeva et al. 1984: 373–374, Figs 61–62;

Pseudicius picaceus: Deltshv and Paraschi 1990: 6.

Distribution. Mediterranean: Greece, Italy, Dalmatia, Rhodes; N Africa: Tunis.

Pseudicius spiniger (O. Pickard-Cambridge)
(Figs 630–632)

Salticus spiniger O. Pickard-Cambridge, 1872a: 339–340;

Pseudicius rufithorax Simon (nom. nud. – nom. museorum on label): Prószyński 1987: 51;

Icius spiniger: Andreeva et al. 1984: 372, Figs 46–48;

Pseudicius spiniger: Prószyński 1987: 51 (syn. *P. rufithorax*);

Remarks. According to O. Pickard-Cambridge (1872: 339–340) *Salticus spiniger* was actually described from Egypt and he did not see any adult specimen from Israel, but “there is no doubt whatever of the specific identity of the Egyptian and Palestinian examples”. However, external appearance in many *Pseudicius* is very similar and cannot be used for identification of species, thus the record of this species in Israel requires confirmation by adult specimens.

Distribution: Egypt; Sudan.

Rafalus Prószyński, 1999

Type species. *Rafalus christophori* Prószyński, 1999.

Introductory remarks. Description of this genus was prompted by the discovery of several new species, distributed over the Eremic environments of the Near East and East Africa, together with some closely related forms known from middle and central Asia. Data on particular species, known mainly from a single, or a few specimens, are scarce. The *Rafalus* species are small, cryptically coloured, ground dwelling spiders, most probably occurring singly and are difficult to find. Behavioural observations are lacking and matching of sexes, done for two species, is tentative. Searching by the author for females of *Rafalus* in two localities in the Negev Desert, where males were captured in pit-fall traps, gave no results. The existing collections mainly contain specimens collected as single individuals, no males and females were collected in the same locality. The species, described in 1999 as new, come from the desert regions of Israel and Sinai; presumably similar ecological requirements are also true for the Yemen and Aden species.

Diagnosis. An Aelurillinae salticid characterized by legs III being the longest (rarely about equal to legs IV)

in both sexes and by high, convex cephalothorax; in males single tibial apophysis without a bunch of stiff setae; female epigynum with two indistinct openings posteriorly, channels long and broad, bent in S-shape, very small spermathecae located transversely.

General character of the genus. The genus *Rafalus* can be easily recognized by the genital organs. In males, palpal organ is of the Aelurillinae type, with a single, thin, palpal apophysis, comparable to that of *Langona* Simon, 1901, from it differs by the lack of characteristic bunch of hard bristles and setae; scales are also different. In females, the epigynum is externally comparable with *Phlegra* Simon, 1876, but has a much simpler internal structure; it differs from *Aelurillus* Simon, 1884 by the absence of sclerotized “wings”. Both sexes differ from *Phlegra* and even more from *Langona* by the gently rounded profile of the cephalothorax, which appears short and relatively higher, with the eye field gently inclined anteriorly, rising to the highest point at eyes III, followed by a gentle thoracic slope which at a varying distance turns into more abrupt posterior slope. Legs III are longer than legs IV in both sexes, which makes *Rafalus* clearly different from with remaining Aelurillinae: *Aelurillus*, *Langona* and *Phlegra*, where legs IV are the longest (except for cases of individual variation in which III and IV are almost equal or, more rarely III are indistinctly longer). ALE set somewhat above AME, the difference being about $\frac{1}{6}$ of ALE diameter in males, $\frac{1}{4}$ in females, which resembles some *Aelurillus* (except for the *conveniens* group, where ALE are set higher). The eye field is narrower posteriorly (mean 8%), whereas in *Phlegra* it is practically rectangular.

Body proportions in *Rafalus*. Cephalothorax: length varies (in all studied specimens, of all species) 1.70–2.80–4.11 mm (shortest–mean–longest), the height vary 45–53–58%; the width of the cephalothorax at eyes III is 65–72.46–83%, maximal width of cephalothorax 65–74.90–87%. Eye field of variable length, rather short, extending over 35–42.53–50% of cephalothorax, trapezoid, narrowing posteriorly (by 0 to mean – 4.92% to maximum – 8%), its width at eyes I is 53–62.53–73% and 50–57.76–66% at eyes III; eyes III are located close to the dorso-lateral edge. The profile of the cephalothorax is gently rounded and without really flat surface; anterior slope of the eye field rises gently as a flat inclined surface approaching eyes III, which are located at the highest point of the cephalothorax; eye field is depressed between the ALE, slightly also between eyes III; there is a gentle, rounded slope from eyes III to about 82% of the length of the cephalothorax where a steep posterior slope begins.

Shape of abdomen elongate oval: length 81–91.09–107%, width 61–67–79%, broadest behind the middle, slightly narrower than the width of the cephalothorax; dorsally flat; anterior tip is hardened and forms a small scutum, usually hidden under setae. Legs robust, similar; their lengths (in % of 5 segments of leg I) in decreasing order is in males: III 134–137.42–145%, IV 116–128.14–

147%, II 100-101.71-105%, I 100%; and in females: III 136-144-155%, IV 115-130-154%, II 91-103.71-109%, I 100%.

Remarks. The descriptions of the species of *Rafalus* described in 1999 are largely based on the paper by Prószyński (1999).

Etymology. Named for the late Dr. Jan Rafalski (1909-1995), professor of zoology at the Adam Mickiewicz University in Poznań, Poland. He is remembered with gratitude by large number of followers, including the author of this paper.

Key to species of *Rafalus*

1. Males 2
 - Females 3
- 2(1). Clypeus with two rows of white setae, orbital setae around eyes I orange or fawn, fans of setae on pedipalps orange, pedipalpal tibia straight and thin *R. christophori*
 - Clypeus with single, broad row of white setae, orbital setae around eyes I whitish grey, fans of setae on pedipalps white, pedipalpal tibia bent, broader *R. stanislawi*
- 3(1). Cephalothorax covered with striking dense white setae, long and adpressed; abdomen with indistinct yellow spots surrounded by grey *R. karstkii*
 - Cephalothorax without dense white setae 4
- 4(3). Thorax high, flattened area absent or short 5
 - Thorax, flattened area longer 6
- 5(4). Flattened curvature behind eye field extends over $\frac{1}{2}$ of the thorax *R. christophori*
 - Thoracic slope begins immediately behind the eye field, flattened curvature absent, no rounded surface *R. sp. 2*
- 6(4). Flattened curvature behind eye field extends over $\frac{3}{4}$ of thorax; specimen distinctly larger; cephalothorax brown; eye field with mixed setae white and brown, much denser in the centre; abdomen covered densely with light sandy brown setae *R. feliksi*
 - Flattened curvature extends for about $\frac{3}{5}$ of the thorax 7
- 7(6). Specimen light sandy, setae of anterior eye field predominantly white, darker between eyes III; abdominal median streak light *R. sp. 3*
 - Specimen dark brown; setae of anterior eye field predominantly dark with white setae in centre; darker abdominal median streak, delimited by two rows of 7 indistinct white spots *R. sp. 1*

Rafalus christophori Prószyński
(Figs 638-644, 645-649)

Rafalus christophori Prószyński, 1999: 91-94, Figs 1-12.

Diagnosis. Clypeus with two rows of white setae separated by narrow, bald brown belt. Orbital setae of

eyes I dorsally orange, ventrally white. Fans of long orange setae radiating on male pedipalps, and with white setae retro-laterally on patella and with sparse, harder, black bristles. Femora I and II, with long, white setae retro-laterally, a bunch of black setae ventro-basally. In female, abdomen with long orange scales, darker scales on dark grey spots.

Description. Male. Cephalothorax integument dark brown, light reflecting on thorax, blackish mat scales make eye field very dark; contrasting orange fringe of setae along anterior edge of cephalothorax, above eyes I. Light spots on cephalothorax: a white spot of admixed scales medially along anterior part of eye field, beginning from touching point of AME and stretching along $\frac{2}{3}$ of eye field, in one specimen similar spots also from between ALE and AME; eyes III with a narrow rim of white setae posteriorly and ventrally; ventral margin of carapace with a thin margin of white setae.

Abdomen: integument dark brown with white mosaic of adpressed setae of varying degree of denseness; sides whitish; dorsal spinnerets black, cylindrical and slightly spaced. Ventral aspect: coxae dark brown with very dark brown setae, lighter with whitish setae on pro-latero-ventral part of coxa I; sternum dark brown with sparse whitish setae in anterior half, dark setae in posterior half; coxae in long-preserved Sinai specimen are faded to a light colour.

Frontal aspect: face generally dark, with two "shelf" - lines of striking, whitish setae stretching across clypeus, horizontally forwards, separated by a bald dark, belt: the first line directly under AME, continues across the face leaving a space below ALE; the second, along edge of clypeus, proceeds slightly diagonally downwards. There is a triangle of dark, and much harder, vertical setae originating on the clypeus above the lower horizontal line and pushing through it, partly overhanging the chelicerae bases. Eyes I surrounded dorsally and laterally with orange or fawn setae, broader and longer, making a dense "bonnet"; ventral setae white; a few black setae at upper outer quarter of rim of ALE. Bristles on eye field less numerous and less dense than in F, but more distinct than in *Rafalus stanislawi*. ALE set at $\frac{1}{6}$ of their diameter above upper rim of the AME, diameter of ALE is $\frac{7}{10}$ of AME, height of clypeus $\frac{2}{5}$ of the AME diameter.

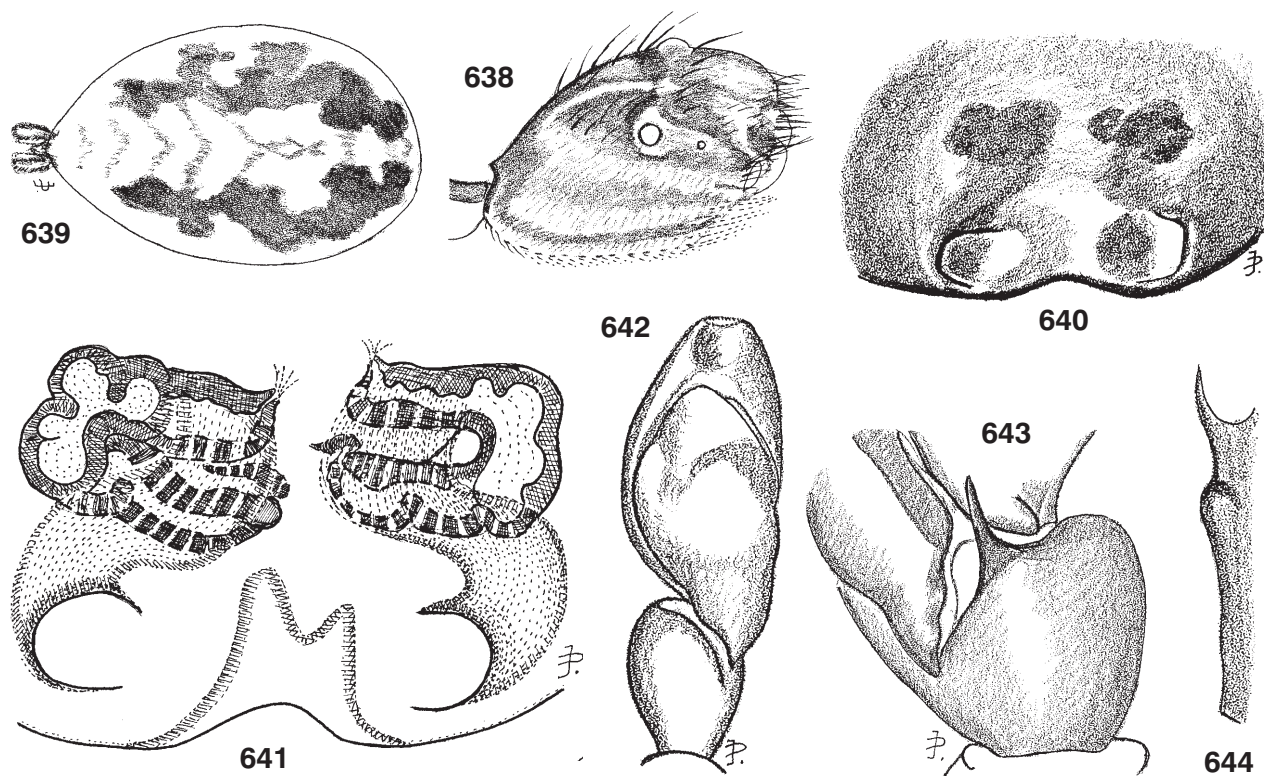
Pedipalps, covered with long radiating setae, concentrated into three "fans": a) of white on apical edge of femur, b) of orange with a few harder, dark brown, and white at the retrolateral edge, on patella, c) intensely orange admixed with a few, stouter, long black bristles, on tibia and cymbium. Chelicerae, brown, with thin, soft, sparse, whitish setae anteriorly. This colourful picture is complemented on leg I-II by a sparse fringe of white setae retro-laterally on tarsus, metatarsus, tibia and patella of leg I; there is white fur on the ventro-lateral edge of femora I-II, contrasting with an intensely black

“pillow” of short, dark upright thick bristles on basal part of ventral surface of femora I–II (these are, however, absent on specimens from Elat). This colourful, contrasting pattern is probably visible during the spider’s display, and so is an important recognition character.

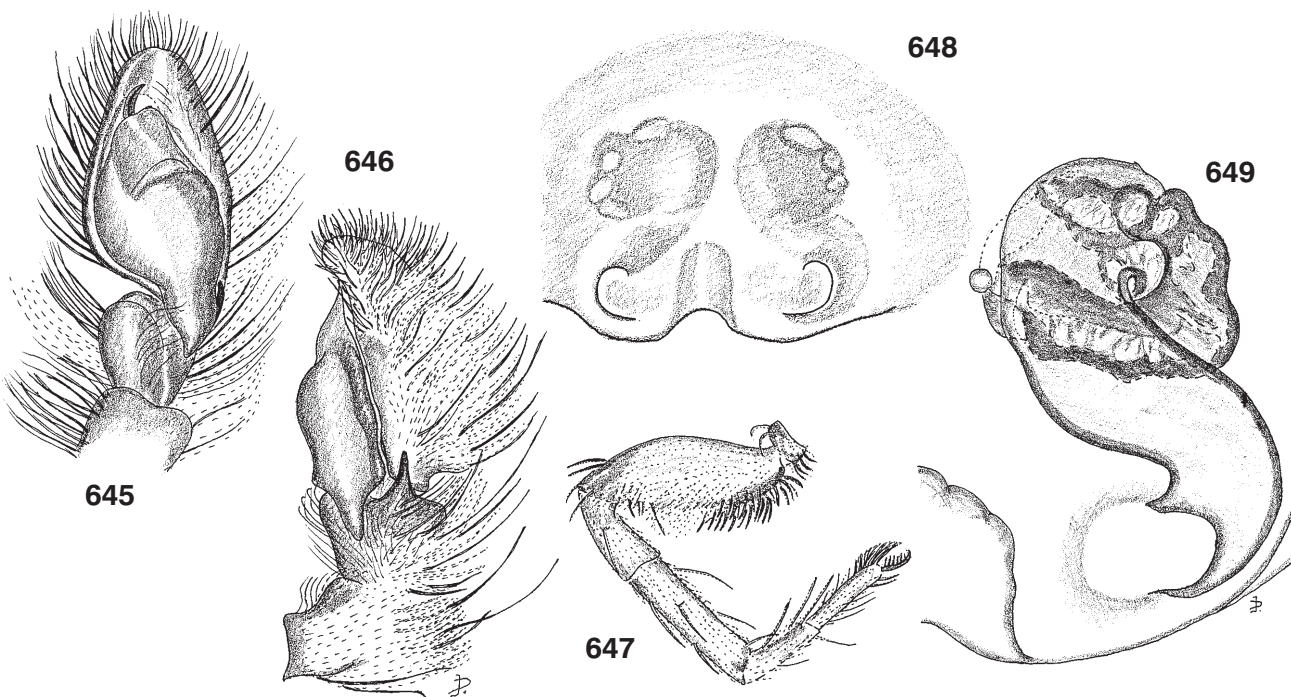
Legs: prolateral surface of femora I–II light yellow apically; the remaining, black more basally with short white setae; the remaining parts of the prolateral surface, brown; ventral setae on femora I–II are described above. Femora III–IV dark brown, prolaterally with two lighter spots along the median line, covered with short adpressed, whitish setae; there is no fur of long setae; femur IV is lighter brown. Patella and tibia I pale yellow, dorsally with longer setae, mixed colourless, whitish and dark. Patella and tibia II darker yellow, with dark pigmented spots; two parallel dark lines dorsally on tibia; patella with apical elongated dark triangle and basal spot consisting of dark grey pigmentation and dark, elongated scales and setae; there are remnants of a white mane retrolaterally on the patella. Patella and tibia III–IV still darker with dark greyish brown stripes, separated by a dark yellow space, scales dark and whitish, setae, single, light and dark; there is no dense mane. Tarsi III–IV, with peculiar group of dark, hard, spine-like setae ventro-apically just above the tarsal tuft of hard setae near the claws; these also occur in various

Aelurillus. Tarsi I–II, with apical tarsal tufts but without hard ventral setae.

Palpal organ: bulbus flat, narrow, pointed posteriorly; tibial apophysis elongated and narrow, straight or slightly curved; anterior edge of tibia runs straight dorsally, without any other protuberances; an indistinct, low, ventral protuberance on the pedipalpal femur (Figs 638–644, 645–649). Female. Cephalothorax brown with short white adpressed setae: mid-thoracic thin longitudinal line of white setae, extended by an “arrow head” into eye field, white setae surrounds eyes III; longer white spots enter eye field and white orbital setae above eyes I. Eye field with dark, partly iridescent integument, covered with admixed white and indistinctly orange, long adpressed scales; numerous scattered short, upright, blackish bristles. Sides with two white lines of setae, horizontal but irregular; a brown supra-marginal line and a white ventral fringe. Great variation can be due to lost setae from live specimens, some specimens being almost bald, with remnants of white setae on lower lateral sides and a few on thoracic hindmargin. Specimens with scales lost from posterior eye field and thorax, while preserved on anterior, sloping part, differ from *Aelurillus conveniens* where scales are lost from anterior eye field leaving it bald. Abdomen brown, with indistinct slight median streak, posteriorly consisting of



Figures 638–644. *Rafalus christophori*, female (Wadi Mish'mar specimen), general appearance of cephalothorax (638) and abdominal pattern (639), as well as epigynum (640) and its internal structure (641); male specimen (from Elat 15. IV. 87), palpal organ ventrally (642), its tibial apophysis ventrally (643) and palpal femur protuberance (644).



Figures 645–649. *Rafalus christophori*, male holotype, palpal organ ventrally (645), laterally (646), leg I retrolaterally; note bunch of black stiff setae ventro-basally (647); female from St. Catherine Monastery, epigynum (648) and single spermatheca (649).

fused chevrons; covered with adpressed, elongate scales, predominantly orange, with small addition of white and dark scales, the darker ones being arranged in an indistinct pattern of irregular submarginal spots, separated by lighter, orange median area, with pairs of indistinct, small white spots; marginal edges of brown dorsal surface indented by white expansions, extending from white sides. Frontal aspect: eye field, from this position appears dark, with a row of white setae further on and with dense upright short dark bristles, among which are adpressed whitish and orange scales; a row of longer fawn setae above dorsal rim of ALE. Eyes I surrounded with white setae, AME with a row of three-broadened setae, setae on lower rim of AME extended laterally by a streak of whitish setae, half upright, directed horizontally and diagonally forward. Clypeus yellow to brown, with a narrow, bald line between two rows of dense, white setae, lower row of setae overhanging cheliceral bases. There is a brown, bald, lateral line under ALE. Diameter of AME 150 % of ALE. Chelicerae, brown, bulging, surface sparsely covered with thin white, hairs; pedipalps, brown, with patella-tibia yellow. Leg I, tibia – patella yellow dorsally, with incomplete, darker annuli. Femur I: white bristles, thick and upright on basal part of the ventral surface.

Pedipalps yellowish white with sparse whitish setae, dark stronger setae admixed on tarsus. Legs yellow with indistinct darker annulation; tibia I, with three pairs of ventral spines; femora III and IV, with a particularly long, dorsal, basal spine. Ventral aspect: sternum dark; coxae

light; abdomen light ventrally. Epigynum and its internal structure is shown in Figs 640–641, 648–649.

Measurements (mm). Male. Length of cephalothorax 2.44–2.96; length of abdomen 2.18–2.57; length of 5 segments of leg I 4.63–5.40. Female. Length of cephalothorax 3.03–4.65; length of abdomen 3.15; length of 5 segments of leg I 4.65–4.85.

Seasonal appearance of adult specimens. Males – I, III, IV, XII; females – IV.

Distribution. Egypt, Sinai: St. Catherine's Monastery (22). Israel: 'En Gedi (sulphur springs), Nahal Mish'mar (13); Elat (14); Makhtesh Ramon (17).

Etymology. Named for Krzysztof [= Christopher] Prószyński, a first cousin of the author, born and died in Auschwitz Concentration Camp.

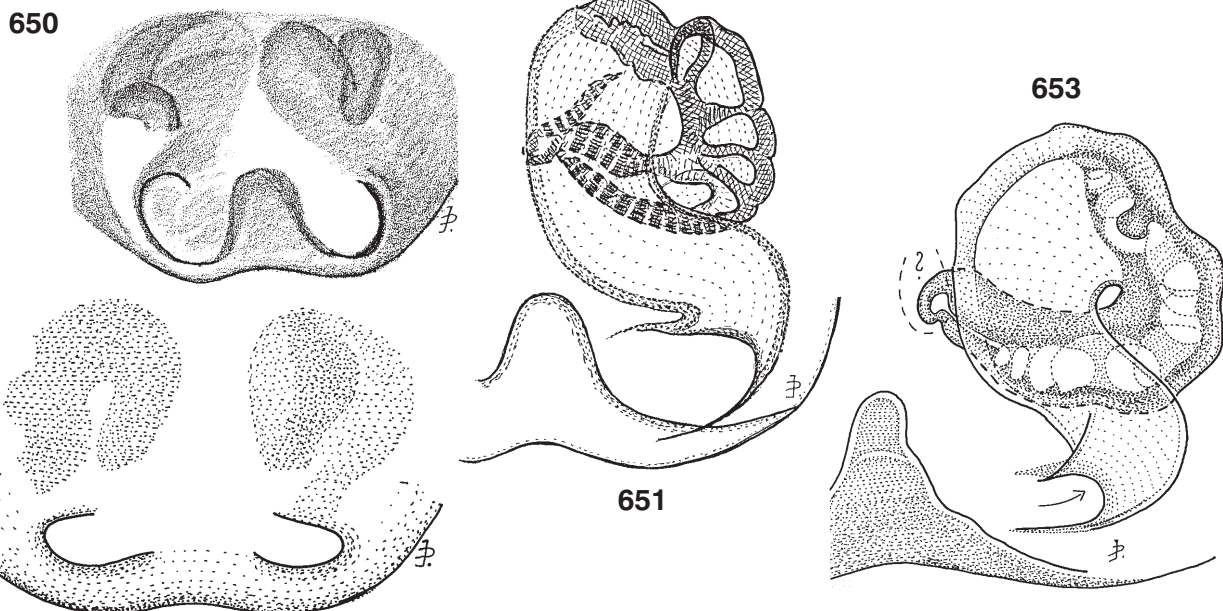
Rafalus feliksi Prószyński

(Figs 650–651)

Rafalus feliksi Prószyński, 1999: 94–95, Figs 13–14.

Diagnosis. Clypeus fawn, almost bald, with a few colourless setae stretching forward, eye field black, densely covered with white setae; thorax darker brown covered densely with uniform, thin white adpressed setae. Abdomen: sandy colour with traces of a median streak; specimen 25% larger than other *Rafalus* species.

Description. Female. Cephalothorax brown, eye field covered with a mixture of brown and whitish setae; eyes III surrounded by white; setae above eyes I white;



Figures 650–653. *Rafalus feliksi* sp. nov. (Sinai, WE 'Tamaovi), epigynum (650) and its internal structure (651). *R. insignipalpe* (cotype from Aden), epigynum (652) and its internal structure (653) (from Prószyński 1987: 37).

with dark stiff bristles lying horizontally along the anterior edge of the eye field; some white setae enter medially between AME; thorax and sides brown, with white setae concentrated into horizontal streaks. Profile differs from remaining species by having rim of ALE set slightly higher – $\frac{3}{8}$ of diameter above AME; gently rounded, low and flat, anterior 72% of the thorax very gently sloping.

Abdomen altered during preservation, with visible remnants of brown setae.

Frontal aspect: eye field covered uniformly with mixed scales, areas behind AME not appearing to differ from rest; eyes I surrounded with white; clypeus lighter brown, narrower, with fewer setae, but with colourless long setae stretching forward horizontally. Chelicerae brown; pedipalps yellow, with long whitish setae. Legs yellow with indistinct, darker annulation; femur I whitish ventrally, prolaterally yellow with hints of two darker brown spots; tibia I with 3 pairs of ventral spines; femora III and IV with a particularly long, dorsal spine basally. Ventral aspect: sternum dark; coxae light; abdomen light.

Epigynum and its internal structure is shown in Figs 650–651.

Measurements (mm). Female. Length of cephalothorax 4.11; length of abdomen 3.86; length of 5 segments of leg I 7.57.

Material. Female holotype – Sinai: Wadi e-'Tamaovi (NW Isla'), 24. X. 69, coll. G. Tsabar. Coll. HUJ.

Seasonal appearance of adult specimens. Females – X.

Distribution. Egypt: Sinai – Wadi e-'Tamaovi (near W. Isla) (22).

Etymology. Named for the late Feliks Prószyński, a judge and Reserve Officer of the Polish Army in the World War II, executed April 1940 at the Katyn Forest with 4500 co-victims; uncle of the author.

Rafalus karskii Prószyński
(Figs 654–658)

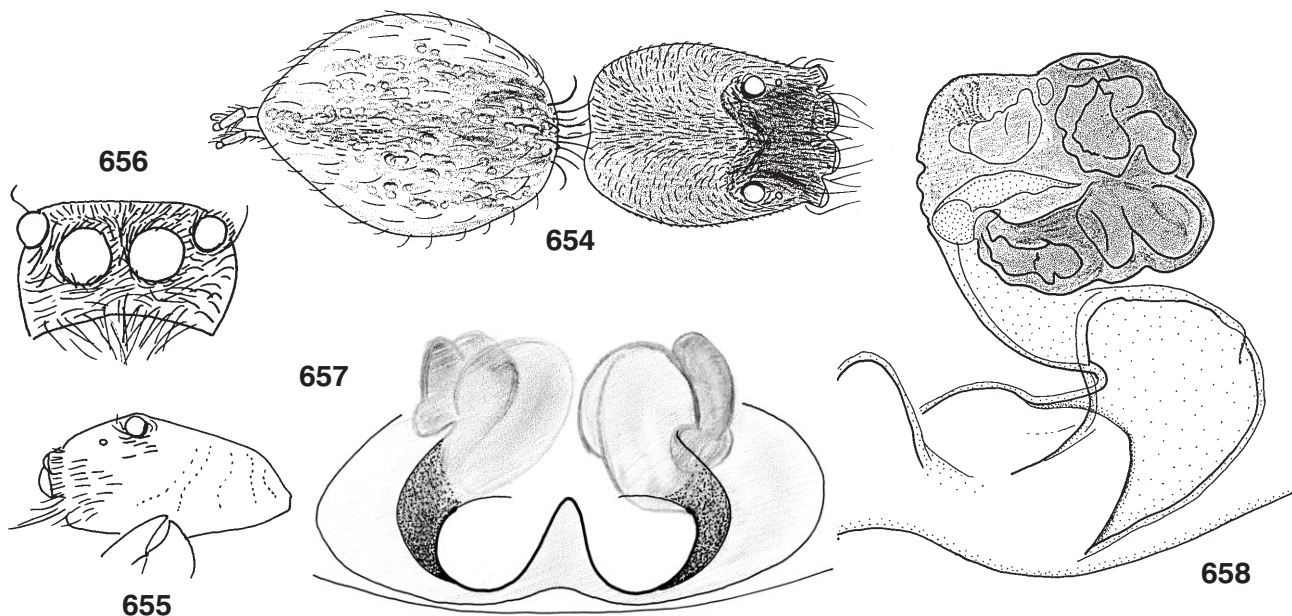
Rafalus karskii Prószyński, 1999: 95–96, Figs 17–21.

Diagnosis. Differs from all remaining species by cephalothorax covered with dense white setae, long and adpressed; abdomen with indistinct yellow spots surrounded by grey.

Description. Female. Cephalothorax: integument on eye field blackish brown, thorax dorsally and sides brown with brown lines and dots, all covered uniformly with white setae, slightly flattened and adpressed, and distinctly longer than in other species. Sparse brown bristles scattered over eye field. Fovea at level of eyes III, eyes II distinctly closer to eyes III than to eyes I.

Abdomen: integument anteriorly darker brownish grey, densely covered with white, adpressed setae making general appearance greyish fawn, slightly darker broad median streak, laterally lighter grey, sides light fawn; scattered longer upright setae, anteriorly white, brown over remaining surface. Spinnerets whitish yellow.

Frontal aspect: conspicuously dense, white adpressed setae; clypeus brown with white setae arranged horizontally and dense, white beard; eyes I surrounded by white scales. Chelicerae brown, basally lighter brown, covered with dense setae: whitish basally, colourless apically.



Figures 654–658. *Rafalus karskii* (female holotype), general appearance (654), cephalothorax laterally (655), frontal eyes (656), epigynum (657) and its internal structure (658) (drawn by S. Heciak).

Ventral aspect: sternum yellow suffused with grey with upright longer white setae, margin darker; labium longer than in *Phlegra*, brown with white margins; coxae yellow, chelicerae brown; with single retrolateral tooth; abdomen ventrally fawn.

Epigynum shown in Figs 657–658.

Legs I yellowish brown, II–IV yellowish with slightly darker tarsi, metatarsi and tibiae; all legs densely covered with white adpressed setae and sparse stronger setae and spines. There is a brush of setae on tarsi I–II, longer, thicker setae on tarsi III–IV.

Measurements (mm). Female. Length of cephalothorax 3.40; length of abdomen 3.95.

Material. Holotype and paratype, 2 females, “Ain Aruz [= En Tamar (183/044)] 13. VIII. 1939, A. Shulov”, “14953”, Coll. H.U.J.

Seasonal appearance of adult specimens. Female – VIII.

Distribution. Israel: ‘En Tamar (13).

Etymology. Named for the late Jan Karski (Jan Kozielski), professor emeritus of the Georgetown University, Washington DC, USA, earlier, during World War II, in November 1942, an emissary from the AK – Polish Resistance in Nazi occupied Poland to the Polish Government-in-Exile, in London.

Rafalus stanislawi Prószyński
(Figs 659–666)

Rafalus stanislawi Prószyński, 1999: 96–98, Figs 22–29.

Diagnosis. Distinct broad white belt of setae across entire lower face, not split into two, followed ventrally by

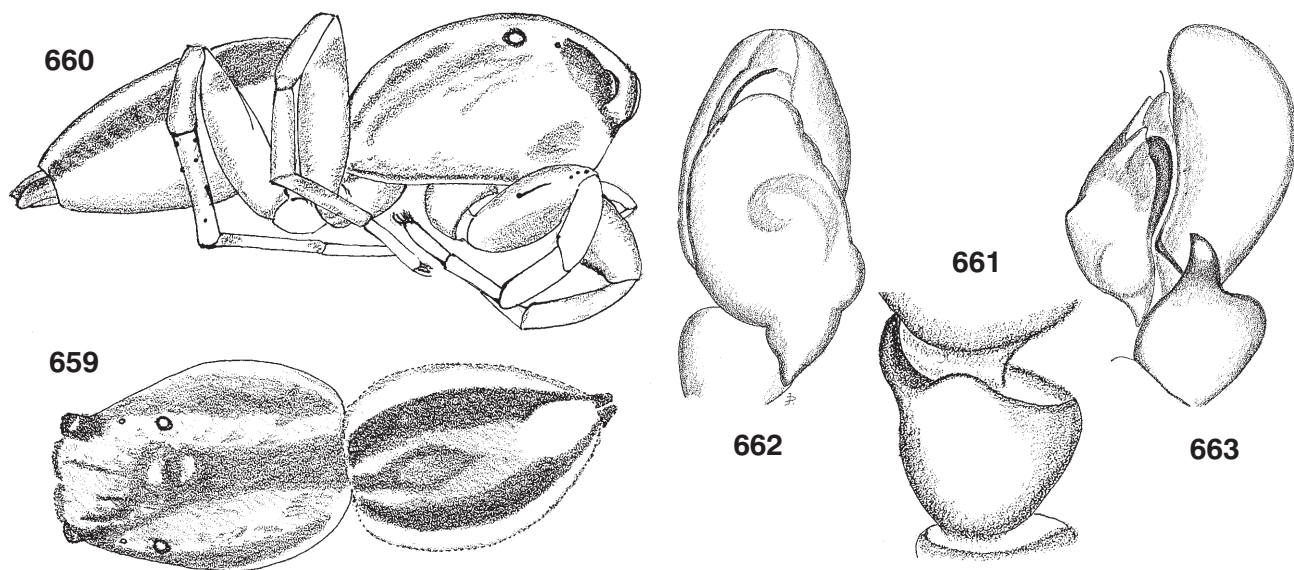
belt of similar white setae, overhanging cheliceral bases. Fans of long white setae on pedipalps.

Description. Male. Cephalothorax: integument dark brown, densely covered with small adpressed setae, apparently easily lost by live specimens; on eye field minute greyish setae, on thorax longer white, making two broad streaks along dorsal edges of the thorax, and also along ventral margins, separated by dark brown streaks, covered with sparse, indistinct, dark setae; orange brownish mat of scales along upper sides of cephalothorax under lateral eyes.

Abdominal pattern light median streak about 1/3 of width of abdomen: posterior half more distinctly white, median part fawn, in the anterior part streak of white setae is followed laterally by brown streak and by white marginal line.

Face: the whole lower part, from ventral rim of AME to the edge of clypeus covered with dense, adpressed, horizontal, strikingly white setae, followed ventrally by broad (1/3 of AME diameter) white belt of white setae directed ventrally and overhanging cheliceral bases. Upper rims of AME and ALE consist of greyish white setae, also extending onto the eye field, where they are somewhat smaller; lateral rims of AME and ventral rims of ALE of brownish setae, corresponding in colour to the indistinct darker transverse belt across the face. A “bonnet” of dorsal setae above AME, is less distinct and shorter than in *R. christophori*.

Pedipalps whitish yellow with longer whitish upright setae: a fan of long white setae dorsally and on both lateral sides of the palpal femur, white setae dorsally on patella and tibia, cymbium with sparse dark bristles



Figures 659–663. *Rafalus stanislawi* sp. nov., general appearance dorsally (659), and laterally (660), palpal tibia dorsally (661), palpal organ ventrally (662) and laterally (663).

dorsally. Palpal organ: bulbus whitish, single tibial apophysis articulating with a small, bent-plate like outgrowth of lateral wall of cymbium. Leg I light yellow.

Male specimen from Ein Fesha (31. III. 1935) possibly belongs to this species, as it also has curved tibial apophysis; unfortunately this specimen has lost almost all its setae during the 60 years of preservation, and colours are faded.

Female. Unknown, but since collecting localities in the Negev Dessert (Be'er Mash'abbim and Haluqim Ridge) are easily accessible and frequently visited, there are good chances of finding female specimens.

Measurements (mm). Male. Length of cephalothorax 1.70–1.96; length of abdomen 1.70–1.87; length of 5 segments of leg I 3.02–3.22.

Seasonal appearance of adult specimens. Males – V, VI.

Distribution. Israel: Be'er Mash'abbim, Haluqim Ridge (17).

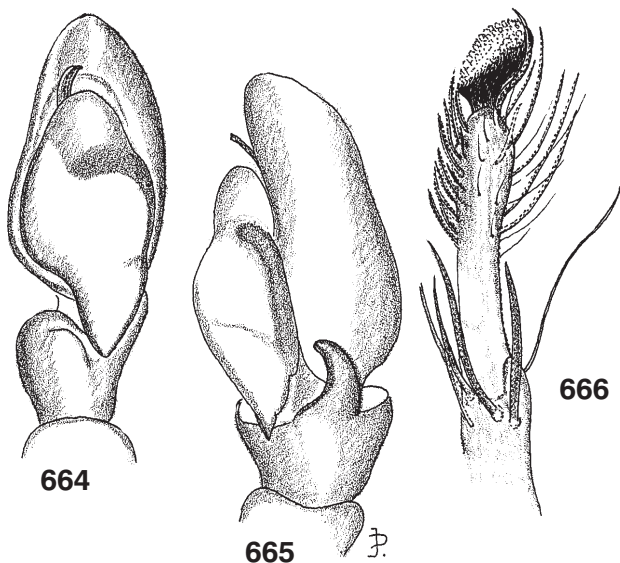
Etymology. Named in memory of the late Stanislaw Prószyński, in 1939 a student, soldier in defence of besieged Warsaw during September 1939, member of the Polish Resistance, died in Auschwitz Concentration Camp; uncle of the author.

Uncertain *Rafalus* species 1–3

Remarks. The following specimens listed below have changed during 30–60 years of preservation, their colours faded and part of the setae lost. Since they were collected as single individuals, the importance of differences in their genital organs cannot be evaluated; but there is no reason to consider them conspecific either. Legs are similar in all these females, yellow with indistinct darker annulation; tibia I with 3 pairs of ventral spines; femora III and IV have a particularly long, dorsal spine basally. Ventral aspect: sternum dark; coxae light; abdomen light, similar in all three females described. A decision on the specific status of these is left until such time that more material becomes available.

Rafalus sp. 1 (Figs 667–668)

Rafalus sp. 1: Prószyński 1999: 98, Figs 30–31.



Figures 664–666. *Rafalus* possibly *stanislawi* (specimen from Ein Fesha, 31. III. 1935), palpal organ ventrally (664), laterally (note bent apophysis) (665), tarsus IV (666).

Diagnosis. Eyes I surrounded by white ventrally, setae above ALE white dorsally to AME fawn, darker; clypeus brown with longer, horizontally stretched white setae; concentrated whitish setae in centre of eye field, similar setae make three horizontal streaks on thoracic sides; abdomen dark brown with median dark streak delimited by pairs of white spots.

Description. Female. Cephalothorax: blackish with whitish setae concentrated in middle of eye field, around eyes III and above ALE; there are, however, dark setae above AME; thorax and sides covered with thinner, whitish setae, concentrated on sides into three horizontal streaks.

Abdomen dark brown, with dark median streak delimited by pairs of white spots of adpressed setae, there are no sharp borders, some more white spots marginally; sides light grey.

Frontal aspect: eye field, seen from this position, appears dark, with an admixture of white setae, areas behind AME are darker and further on there is a row of white setae; eyes I surrounded ventrally by white and dorsally by light fawn orbital setae; clypeus brown, with longer, white setae stretching horizontally; "subocular" setae thinner and less numerous than in *R. christophori*,

whitish setae overhang the chelicerae. Chelicerae light brown, bulging, with indistinct colourless setae on surface. Pedipalps, yellow with patella, lighter. Legs yellow, indistinctly annulated; femora I ventrally whitish with 2 brownish spots, prolaterally light brown; patella – tarsus I light fawn, with indistinct darker spots prolaterally (pigmented and with scales). Ventral aspect: sternum dark; coxae light; abdomen light ventrally. Epigynum and its internal structure are shown in Figs 667–668.

Measurements (mm). Female. Length of cephalothorax 2.80; length of abdomen 3.00; length of 5 segments of leg I 4.90.

Distribution. Egypt: Sinai – Wadi Yah'med.

Seasonal appearance of adult specimens. Female – I.

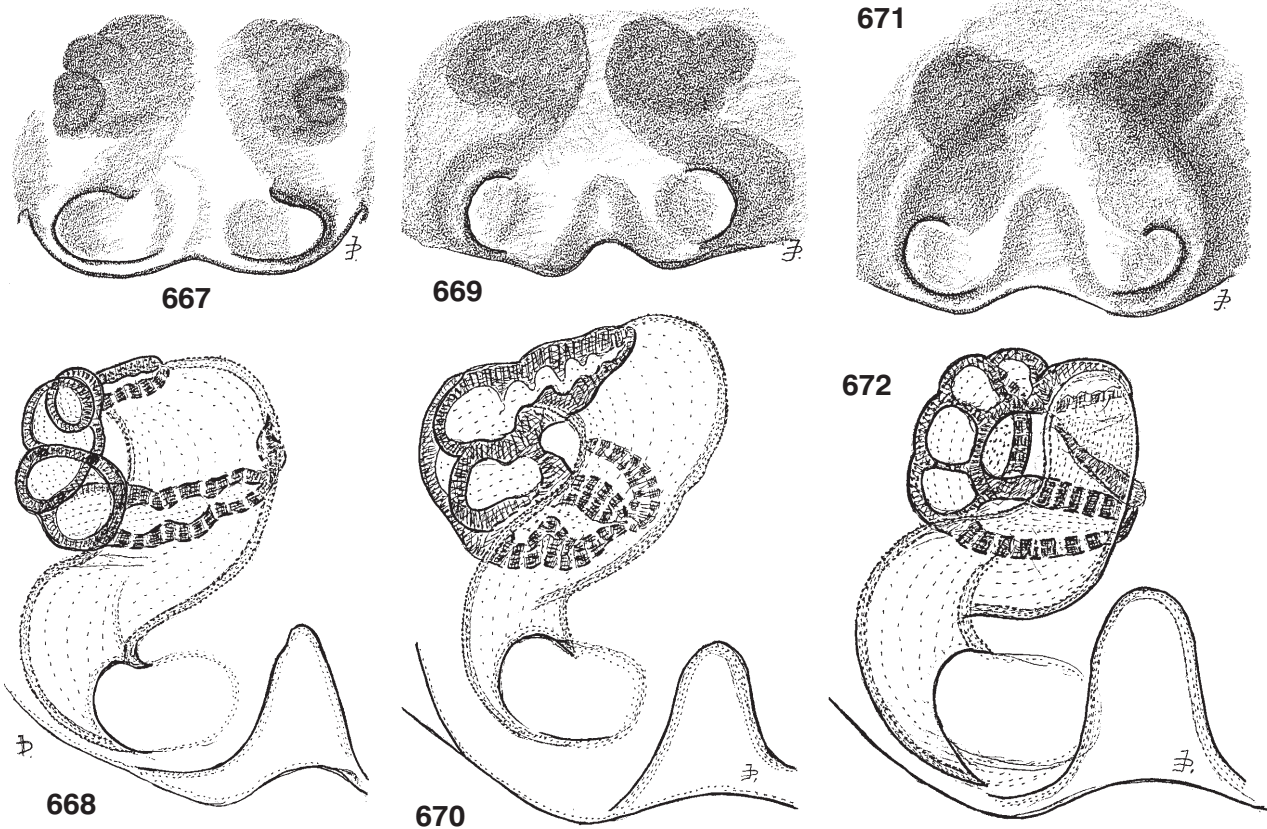
***Rafalus* sp. 2**

(Figs 669–670)

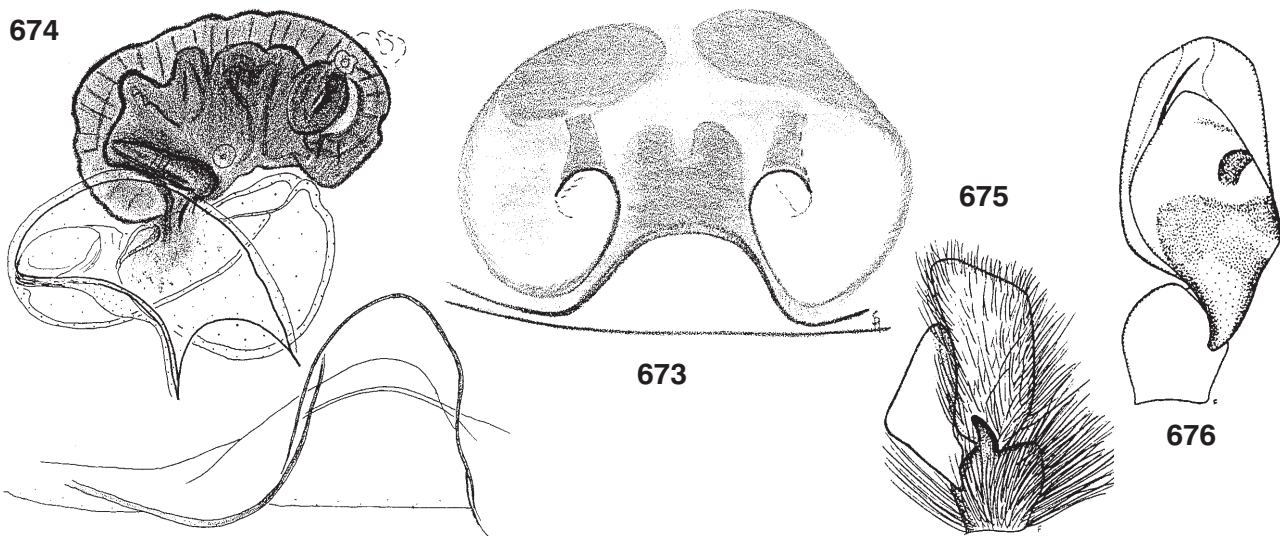
Rafalus sp. 2: Prószyński 1999: 98–100, Figs 32–33.

Diagnosis. Posterior slope of thorax begin immediately behind eyes III.

Description. Female. Cephalothorax with integument darker brown than in related species, covered



Figures 667–672. Variation in epigynum and its internal structure in females of three *Rafalus* spp. of uncertain status. *Rafalus* sp. 1 (from Sinai: Wadi Yah'med), epigynum (667) and its internal structure (668). *Rafalus* sp. 2 (from Nahal Roded near Elat), epigynum (669) and its internal structure (670); *Rafalus* sp. 3 (from Elat, 3.V.51), epigynum (671) and its internal structure (672).



Figures 673–676. Two relevant Asiatic species. *Rafalus variegatus* (holotype specimen from Uzbekistan), epigynum (673) and its internal structure (674) (drawn by S. Heciak); *R. wittmeri*, palpal organ laterally (675), ventrally and tibial apophysis ventro-laterally (676) (from Prószyński, 1978a: 9, Figures 1–3, modified).

densely and uniformly with thin, adpressed, white setae; there is no rounded surface behind eyes III, posterior slope of thorax begins immediately behind eye field and is more steep.

Abdomen light brown with a sandy tinge, median streak barely visible and not contrasting.

Frontal aspect: eye field appears dark; eyes I surrounded with white; clypeus fawn, almost bald, with a few setae stretching forwards horizontally. Chelicerae bulging, chestnut brown, darker than clypeus. Pedipalps yellow: tibia and patella I yellow, with traces of brown annuli.

Legs yellow, with indistinct darker annulation; tibia I with three pairs of ventral spines; femora III and IV, with a particularly long, dorsal spine basally. Ventral aspect: sternum dark; coxae light; abdomen ventrally light.

Epigynum and its internal structure are shown in Figs 669–670.

Measurements (mm). Female. Length of cephalothorax 3.27; length of abdomen 3.49; length of 5 segments of leg I 5.58.

Seasonal appearance of adult specimens. Female – I. *Distribution.* Israel: Nahal Roded near Elat (16).

Rafalus sp. 3
(Figs 671–672)

Rafalus sp. 3: Prószyński 1999: 100, Figs 34–35.

Diagnosis. Recognizable by epigynum.

Description. Female. Cephalothorax light brown with a mixture of whitish and dark setae; eye field darker; eyes III surrounded with white setae; orbital setae over eyes I white; thorax covered with thin, adpressed,

whitish setae on brown integument, white setae denser on lower sides.

Abdomen light brown, covered with a mixture of brown and whitish setae; median serrated streak whitish, consisting of fused chevrons, covering about $\frac{1}{3}$ of width of abdomen.

Frontal aspect: eye field from this position appears uniformly covered with mixed scales, white and dense, the areas behind AME slightly less white; face like *Rafalus christophori* but with white setae under eyes I and along clypeus, dense and long, some overhang the chelicerae; chelicerae yellow with dense, white setae; pedipalps yellow with white setae. Femora I ventrally whitish with hints of 2 greyish spots; patella and tibia I yellow with indistinct, darker annuli.

Epigynum and its internal structure is shown in Figs 671–672.

Measurements (mm). Female. Length of cephalothorax 3.12; length of abdomen 2.79; length of 5 segments of leg I 5.58.

Seasonal appearance of adult specimens. Female – V. *Distribution.* Israel: Elat (14).

Relevant species

Rafalus insignipalpis (Simon)
(Figs 650–651)

Habrocestum insignipalpe Simon, 1882: 214;
Habrocestum insignipalpe: Prószyński, 1987: 37 (female only);
Wesolowska and van Harten 1994: 28;
Rafalus insignipalpe: Prószyński, 1999: 95, Figs 15–16.

Remarks. The internal structure of the epigynum in the cotype from Aden, proves that this species is congeneric with *Rafalus christophori*, but does not clarify its systematic position within the genus. Male specimen, which should be in the MNHN in Paris, could not be found in the collection. Described from Aden; occurrence in Libya doubtful.

Description. Female (cotype from Aden). Thick-set looking spider, with short legs, generally brownish grey. Cephalothorax brownish, covered with adpressed whitish setae; on eye field, just behind eyes I, sparse upright short bristles; margins of eye field darkened.

Abdomen brownish grey with paler median area along the posterior half, covered with colourless scales with brown median ridge and longer setae; "hairy" appearance due to large upright, whitish setae along margins; there are also some larger brown and white bristles at the anterior end. Sides of abdomen yellowish white; spinnerets cylindrical, yellowish grey.

Frontal aspect: eyes I densely surrounded with thick white setae; clypeus low, yellowish fawn with white setae; chelicerae fawn, pedipalps yellow with white setae.

Legs I yellow with indistinct darker annulation dorsally, distinct only on prolateral surfaces: two darker bands on tibia I, one on patella I, two on femur I. Tibia I with 3 pairs of ventral spines, tarsi I–II with scopulae, indistinctly expanding onto ventral surface. Sternum brownish yellow, coxae yellow, abdomen light grey ventrally.

Measurements (mm). Female. Length of cephalothorax 3.00; length of abdomen 2.80.

Distribution. Yemen (Aden)

Rafalus variegatus (Kroneberg)
(Figs 673–674)

Aelurops variegatus Kroneberg, 1875: 51, Tab. 5, Fig. 39;

Aelurillus variegatus: Andreeva 1975: 339; 1976: 83, Figs 96–97; Prószyński 1976: map 8;

Rafalus variegatus Prószyński, 1999: 100, Figs 36–37.

Distribution. Uzbekistan.

Rafalus wittmeri (Prószyński)
(Figs 675–676)

Aelurillus wittmeri Prószyński, 1978a: 9–10, Figs 1–3;

Rafalus wittmeri: Prószyński 1999: 101, Figs 38–40.

Distribution. Bhutan.

Relevant genus *Saitis* Simon, 1876

Saitis barbipes Simon

Saitis barbipes Simon, 1886: 563

Common Mediterranean species.

Saitis taurica Kuleczyński

Saitis taurica Kuleczyński, 1905: 546

Europhys pulchella: Nosek 1905: 146; Prószyński 1984: 43 (drawings of the holotype)

Europhys prinkpona: Roewer 1951: 452 (replacement name)

Pseudeuophrys prinkpona: Lobunov 1998: 123–124, Figs 54–56.

Saitis taurica: Metzner 1999: 59–60.

Mediterranean species described from Eastern Mediterranean, Black Sea Coast and Turkey. Logunov (1998) proposed to transfer this species to the genus *Pseudeuophrys*, which on the basis of existing drawings does not seem convincing, recently Metzner (1999) synonymized it with *saitis taurica*. Not yet found in Israel.

Salticus Latreille, 1804

Type species. *Salticus scenicus* (Clerck, 1758).

Introductory remarks. *Salticus* species are usually recognized by characteristic colour pattern of abdomen: dark with white transverse bars or chevrons consisting of white scales arising from unpigmented tegument, dark areas pigmented and covered with dark scales. Cephalothorax is low, that appearance is increased by contrast between dark dorsum and upper sides sides, with a broad white lower margin, consisting of white scales.

Males have usually forward projecting overgrown chelicerae, reaching 51–87% of cephalothorax length; chelicerae in female and immature male are vertical and short.

Body proportions. Cephalothorax: length 1.68–1.87–1.99 in males; shape appears long and low, flat area extending over 3/4th of cephalothorax, width is 53–57–60% at eyes I, 61–68–74% at eyes III, height 39–44–49%. Eye field extending over 38–40–43% of cephalothorax, also short in relation to its width at eyes I, almost rectangular shaped, indistinctly broadening posteriorly by 1–3%; indistinctly narrower than cephalothorax, eyes III are located close to edge of cephalothorax. Abdomen: elongate oval tapering posteriorly; its length is 103–119–139%, its width 69%. Leg order (expressed in % length of 5 segments of leg I) in male *Salticus olivaceus* is IV (101%) and I (100%), III (88%), II (76%).

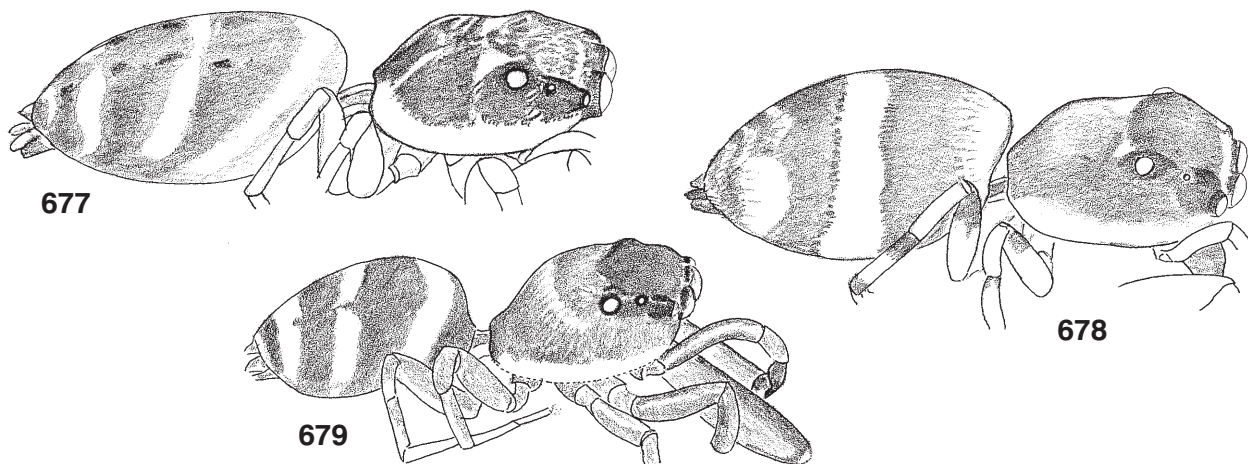
Salticus amitaii Prószyński
(Figs 677, 690–691)

Salticus amitaii Prószyński, 2000: 261, Figs 110–113.

Diagnosis. Epigynum unique, spermathecae running medially the length of epigynum and touching each other, twice as long as copulatory channels, openings lateral near the mid length of spermathecae; white abdominal belts narrower than the dark ones.

Description. Female. Cephalothorax: narrower than in *Salticus propinquus* Lucas, 1846 (see description below), blackish with brown median streak along thorax; eye field covered with large whitish, semitransparent scales; complicated pattern of white scales arranged in three vertical lines across each side of cephalothorax located respectively at the end of thorax, behind eyes III and behind eyes II; two intensely white, large triangular spots behind eyes III dorsally.

Abdominal pattern: three dark transverse belts and three white, slightly thinner belts, the second and third



Figures 677–679. *Salticus amitaii* sp. nov. (from Hatzabani), female, general appearance (677); *S. propinquus*, general appearance of female (678) and male (679).

white belt broken medially; lateral spots in front of spinnerets less strikingly white.

Frontal aspect: similar to *Salticus propinquus* but lighter, white scales more striking.

Legs: whitish with basal lateral darkening on tibiae – best visible on tibia I and IV.

Ventral aspect: sternum brown, coxae white, abdomen whitish.

Epigynum: oval, anteriorly with an oval depression; copulatory openings lateral in mid length of epigynum, spermathecae running medially the length of epigynum, touching each other.

Measurements (mm). Female. Length of cephalothorax 1.88; length of abdomen 2.61.

Seasonal appearance of adult specimens. Females – V, VII.

Distribution. Israel: Nahal S'nir near Ha Goshrim (1), Nahal Oren (3).

Etymology. Named for the arachnologist Mr. Pinhas Amitai, contributor of rich material to the Israel National Arachnid Collection.

***Salticus olivaceus* (L. Koch)**

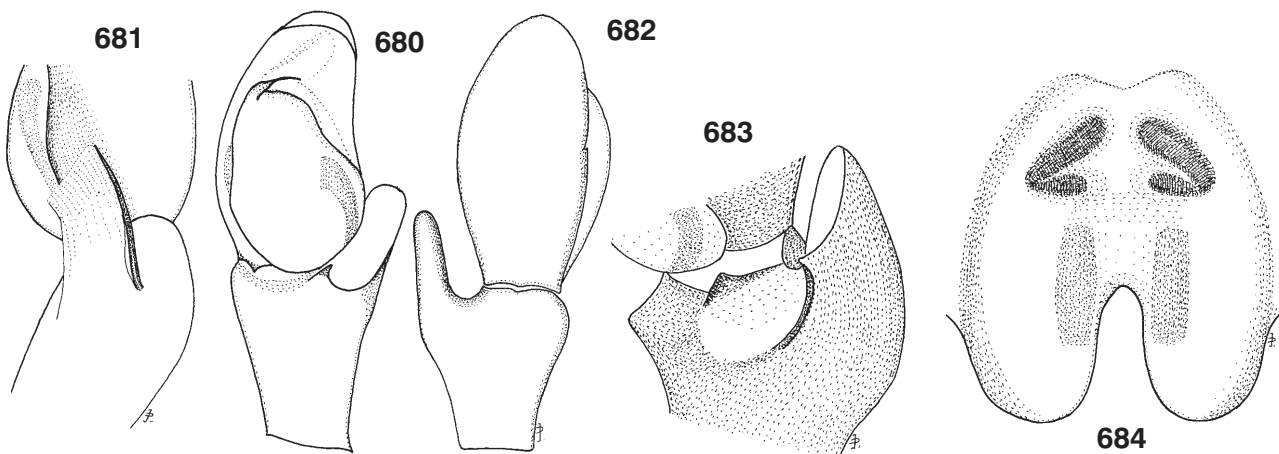
(Figs 687–689)

Calliethera olivacea L. Koch, 1867: 868;

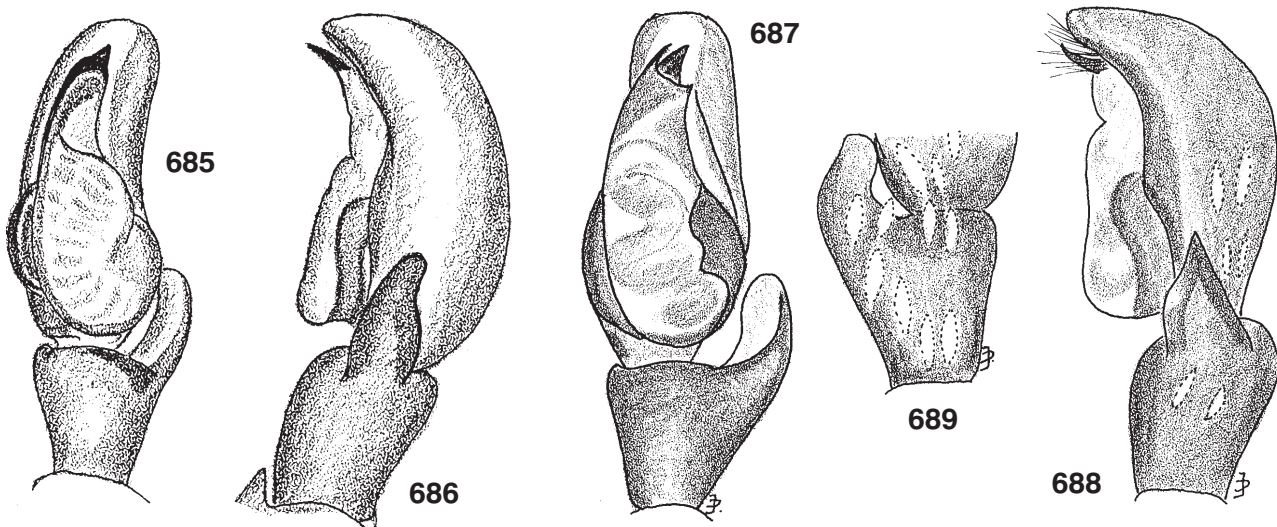
Salticus tenerus: O. Pickard-Cambridge 1872: 324 (nec L. Koch);

Salticus olivaceus: Prószyński 1984b: 128.

Remarks. Known from Hebron (single specimen in the O. Pickard-Cambridge collection); differs from *S. propinquus* by tip of embolus surrounded by a kind of sheet, produced at the top of bulbus; also by the shape of tibial apophysis, dorsally diagonal. Mr. F. R. Wanless reclassified female of *S. tricinctus* (= *S. propinquus*) in the O. P.-C. collection as *S. olivaceus*, for which I see no reason.



Figures 680–684. *Salticus marenzelleri* (from Turkey, lectotype and paralectotype), palpal organ ventrally (680), laterally (681) dorsally (682), palpal tibia apophysis and protuberance antero-laterally (683); epigynum (684).



Figures 685–689. *Salticus propinquus*, palpal organ ventrally (685) and laterally (686); *Salticus olivaceus* (*Calliethera tenera* specimen in O. Pickard-Cambridge collection), palpal organ ventrally (687), laterally (688), palpal tibia dorsally (689).

Description. Male. Cephalothorax: brown with posterior thoracic part rounded and steep; there are remnants of elongate whitish scales at the posterior end of eye field, remnants of small oval whitish scales at the anterior and lateral edges of eye field between eyes; broad belt of elongate whitish setae along ventral margin.

Abdomen: damaged, now greyish with remnants of transverse belts of large adpressed whitish scales: continuous across the middle, at the anterior edge and two marginal spots at $\frac{3}{4}$ of length, a few also in front of spinnerets.

Frontal aspect: face dark greyish brown with remnants of whitish scales and thin colourless setae diagonally overhanging cheliceral bases; dark brown chelicerae expanded with large elongated fang, pedipalps lighter brown with dense whitish scales; legs I brown with lateral surfaces darker and some whitish scales; remaining legs brown, locally darkened. Ventral aspect: chelicerae with single large tooth retrolaterally near base of enormously elongated fang; sternum dark brown, anterior coxae light brown, remaining yellowish grey, abdomen greyish.

Palpal organ: see Figs 687–689, note characteristic surrounding of embolus and diagonal dorsal edge of tibial apophysis.

Measurements (mm). Male. Length of cephalothorax 1.68; length of abdomen 1.16; length of 5 segments of leg I 3.10.

Distribution. Greece: Tinos, Syra, Corfu; Spain. Israel: Hebron.

Salticus propinquus Lucas
(Figs 678–679, 685–686, 692–693)

Salticus propinquus Lucas, 1846: 162;

Salticus tricinctus: O. Pickard-Cambridge 1872: 324 (nec *Calliethera tricincta* C.L. Koch, 1846: 50 Fig. 1117); Prószyński 1984b: 130;

Salticus nahaloren Logunov, 1996: 57–60, Figs 13–19 (new name for Israeli *Salticus tricinctus*: O. Pickard-Cambridge 1872); *Salticus propinquus*: Metzner 2000: 115–116, Tab. 81a–i, map 88.

Diagnosis. Recognisable by colour pattern and genital organs illustrated in this paper.

Description. Male. Cephalothorax brown with black eye field; spots of white setae behind eyes III and behind eyes I medially; ventral margin covered with broad belt of white scales. Chelicerae overgrown, their length in five specimens studied is 51–87% of cephalothorax length.

Abdominal pattern: three narrow white transverse bands separating three broader dark ones.

Frontal aspect: clypeus almost completely reduced, with remnants of long white setae along ventral edge; remnants of whitish setae around eyes I. Ventral aspect: chelicerae with single large, and bent, retrolateral tooth, and with single prolateral tooth in distal $\frac{3}{8}$ of their length; fang long, extending along the whole length of chelicerae; sternum dark brown, coxae greyish, abdomen grey.

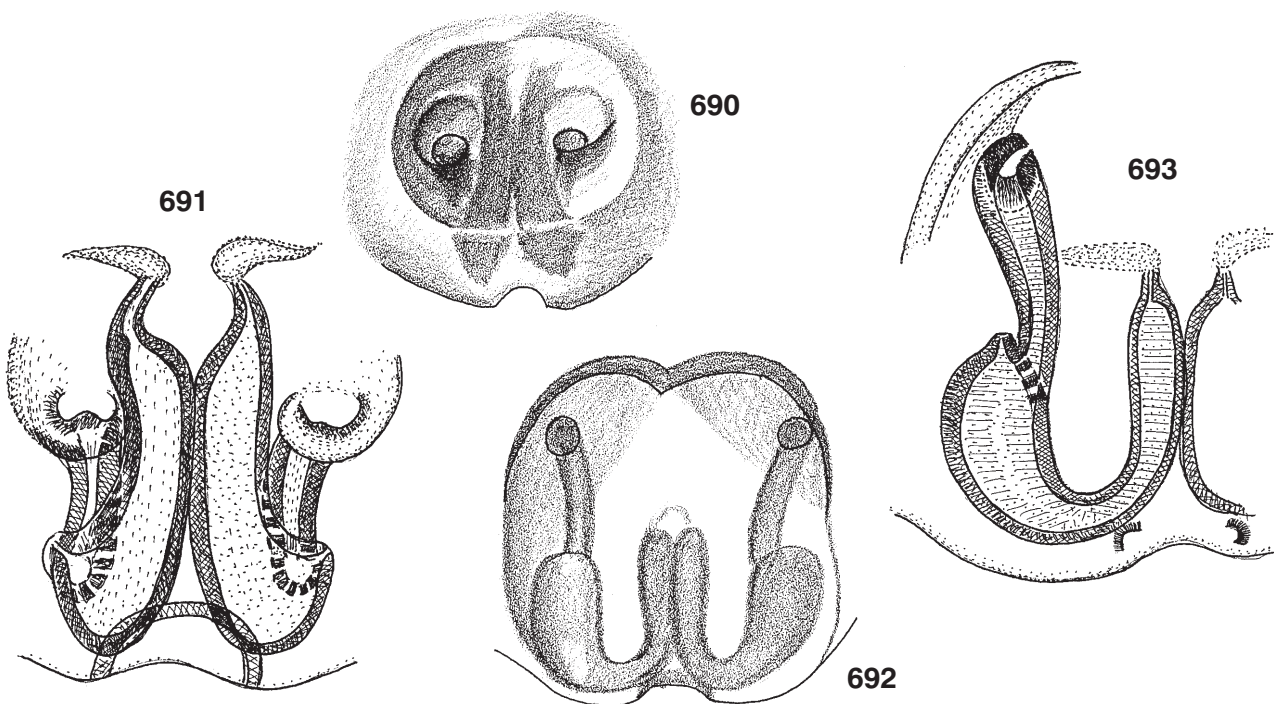
Legs: short and thin in proportion to the body; I brown, II–IV lighter brownish grey, all with sparse whitish scales.

Palpal organ: see Figs 685–686; pedipalps thin, long, slender with whitish setae.

Female. Cephalothorax brown, large white scales concentrated behind eyes I and behind eye field, form thick white ventral marginal band.

Abdominal pattern: three white and three dark transverse bands, equally broad; the posterior white band divided medially by two indistinct small dark chevrons; tip of abdomen dark with two strikingly white lateral spots.

Frontal aspect: clypeus low with large white scales, some overhanging chelicerae; eyes I surrounded with white scales, pedipalps whitish yellow with thin whitish setae and colourless scales.



Figures 690–693. *Salticus amitai* (from Hatzabani), epigynum (690) and its internal structure (691); *S. propinquus*, epigynum (692) and its internal structure (693).

Legs: I yellow, II–IV lighter yellow, tips of femora I–IV dark, tibiae I–IV with basal annuli.

Epigynum: depressed sclerotized plate, rectangular with rounded angles; spermathecae located posteriorly, U-shaped, with narrower median and twice as broad lateral rami; copulatory channels narrow and straight; copulatory openings located antero-laterally.

Measurements (mm). Male. Length of cephalothorax 1.93; length of abdomen 2.10. *Female*. Length of cephalothorax 1.99; length of abdomen 2.50.

Seasonal appearance of adult specimens. Males – I, II, III, IV, VI, VII; females – II, III, V, VII (with soft epigynum).

Remark. Relatively common species in the Negev, ground living.

Distribution. Egypt (Kafr-el-Sheikh). Israel: Banyas (near *Lasius alienus* ants), Elon, Rosh-Pinna (1); Nahal Oren (2); 'En HaMifrazz (4); Moshavat Kinneret (7); Ma'agan Mikhael, Caesarea (inside *Tamarix* galls) (8); Bet Shemesh (10); Qiryat-Anavim, Jerusalem (11); Haluqim Ridge, Nahal Zin (17).

Relevant species

Salticus marenzelleri Nosek

Salticus marenzelleri Nosek, 1905: 119, 143, Table 3, Fig. 25;

Salticus marenzelleri: Prószyński 1984c: 127.

Distribution. Turkey.

Synageles Simon, 1876

Type species. *Salticus venator* Lucas, 1836.

Introductory remarks. Small ant-like jumping spiders of uncertain relationship, with flat and low angular cephalothorax, without constriction, legs I robust, male chelicerae not overgrown. Male palpal organ with bulbus round, embolus thin and short, on top of rounded bulbus, tibial apophysis hook-like, small. Epigynum sclerotized plate, posteriorly rounded, with a posterior, median slit, and lateral openings, spermathecae small, arranged transversely, thin walled.

Body proportions (in male-female *Synageles dalmaticus*), length of cephalothorax 1.14–1.25 mm, length of eye field 57–59%, height of cephalothorax 34%, width of cephalothorax at eyes III 59–65%, width of eye field at eyes I 50–54%; length of abdomen 119–145%. Eyes II at $\frac{1}{3}$ distance to eyes III; eye field rectangular; its length to width at eyes I ratio is 115–109%. Length of legs order in female: IV 105%, I 100%, II 83%, III 80%.

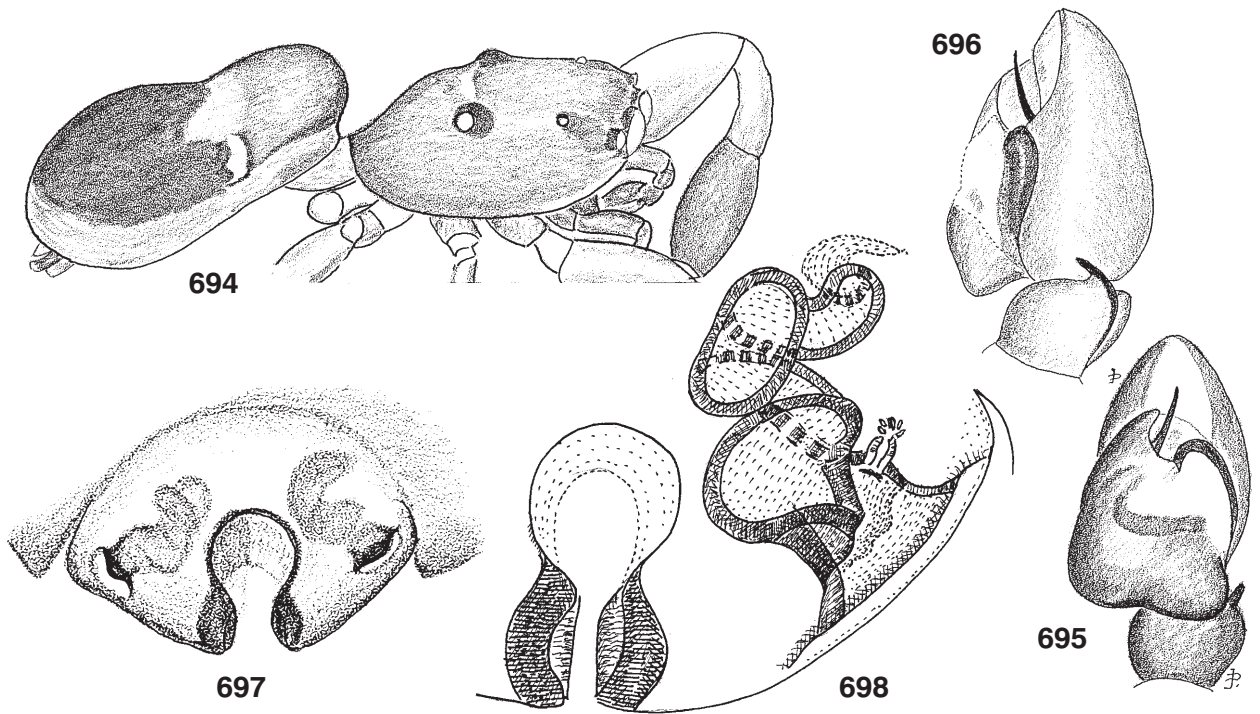
Synageles dalmaticus (Keyserling)

(Figs 694–698)

Salticus dalmaticus Keyserling, 1863: 371, Tab. 10, Figs 17–20;

Salticus todillus: O. Pickard-Cambridge, 1872: 324;

Synageles dalmaticus: Prószyński 1976: map 205; Flanczewska 1981: 221, Figs 66–68; Thaler 1983: 297–300, Figs 17–19, 22, 26, 29; Prószyński 1984b: 141.



Figures 694–698. *Synageles dalmaticus*, male, general appearance (694), palpal organ ventrally (695), laterally (696); female, epigynum (697) and its spermatheca (698).

Diagnosis. Male embolus located in a median, diagonal depression of anterior edge of bulbus, apophysis in form of diagonal spine (not broad plate), gently bent, separated from dorsal edge of tibia by a groove; epigynum posteriorly rounded with a median rounded slit, openings near postero-lateral edges of epigynum.

Description. Male. Cephalothorax light brown, apart from black surroundings of eyes III and edge between eyes II and III; striking intensely white transverse line of scales just behind the eye field, sometimes broadened to an oval spot. Immature specimens of *Synageles repudiatu*s (O. Pickard-Cambridge) identified by J. Denis from Siva, Egypt, have different colour pattern. Abdomen with light reflecting scutum, anteriorly brown, posteriorly black; shallow constriction marked with lighter spot and two lateral tufts of intensely white scales; sides low with shallow but long wrinkles; petiolus short, almost invisible.

Frontal aspect: eyes ALE located along upper half of AME, surrounded by whitish setae, clypeus fawn with inconspicuous sparse white setae, a few overhanging chelicerae; chelicerae short and slender, yellow, with a transverse row of whitish setae; pedipalps yellow. Legs: I robust with tibia dark and swollen, its prolateral surface black, tarsus and metatarsus I thin and white; legs II–IV slender, light with darker lines along prolateral surfaces of segments, such a line also appears on retro-lateral surfaces on leg IV. (In immature specimens of *Synageles repudiatu*s the darker lateral lines are lacking). Ventral aspect: sternum brown with darker mar-

gins, coxae whitish, abdomen blackish. Palpal organ: main diagnostic character seems to be the relatively large separation of tibial apophysis, by a deep groove from the remaining part of dorsal surface of tibia.

Female. Resembles male, from which it differs by legs I light and not swollen (although still thicker than remaining legs); scutum limited to the anterior tip of abdomen, lateral abdominal bunch of white scales (or white spot) in a number of specimens encircled by dark ring.

Epigynum: a small sclerotized plate with horseshoe-shaped postero-medial notch, copulatory openings located latero-marginally with spermathecae running antero-medially.

Measurements (mm). Male. Length of cephalothorax: 1.14–1.48; length of abdomen 1.36–1.74. Female. Length of cephalothorax 1.25; length of abdomen 1.82.

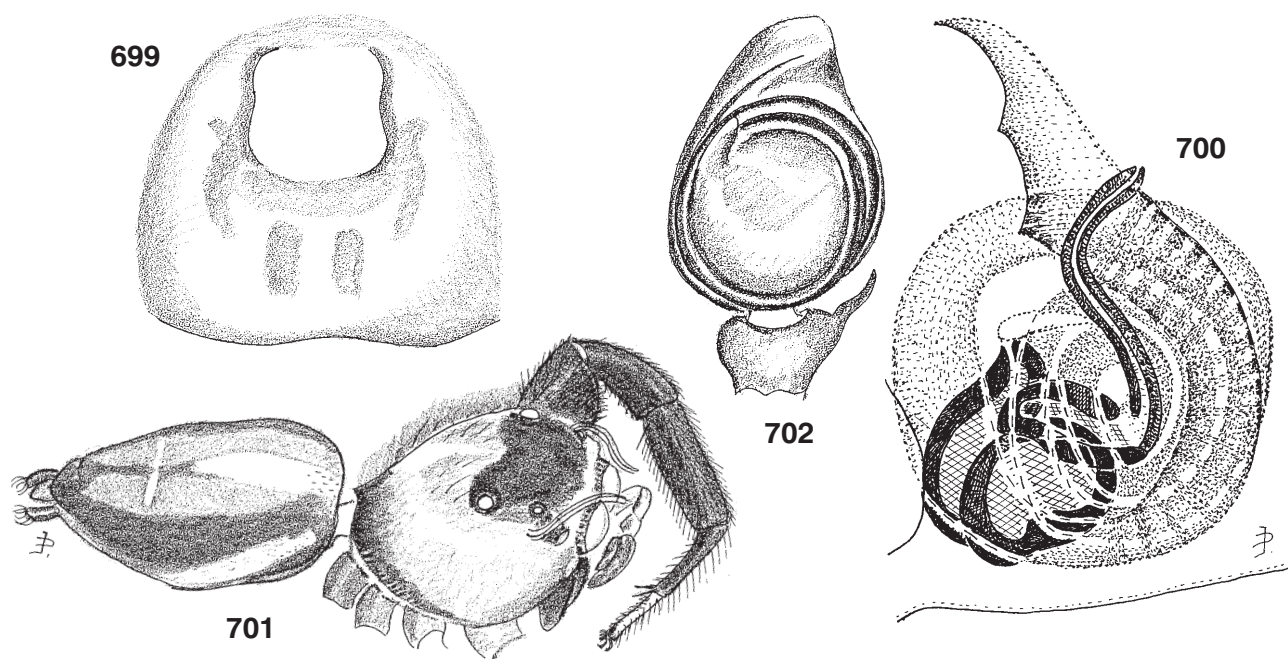
Seasonal appearance of adult specimens. Males – II, III, IV, V; females – III, IV, V, VI, VII.

Distribution. Mediterranean, Egypt. Israel: Kfar Giladi, Lake Hula (1); Biq'at Bet Zyda, Kinneret (7); Ben Shemen, Ben Zakkay (9); 'En Karem, Jerusalem, Moza (11); bank of river Jordan near Bet Ha-Arava (13).

Thyene Simon, 1885

Type species. *Attus imperialis* Rossi, 1847

Introductory remarks. Medium size jumping spiders with broad, rounded cephalothorax, narrower



Figures 699–702. *Thyene imperialis*, female, epigynum (699) and its spermatheca with channel (700); male, general appearance (701), palpal organ ventrally (702).

abdomen and robust leg I. Eye field forms a flattened island on top much broader cephalothorax, usually swollen laterally to varying degrees, broadest at eyes III, at its mid-height, retaining that width up to about half of thorax length. Maximum width of cephalothorax equal or greater than length of cephalothorax. Dorsal surface of cephalothorax slightly convex, highest at eyes III, from there sloping gently forward and posteriorly, from midway along thorax length much steeper, about 45 degrees. Frontal aspect: particularly distinct difference in diameter of anterior eyes: that of ALE is only $\frac{1}{3}$ of AME, the ALE being aligned to the upper third of AME, height of clypeus also about $\frac{1}{3}$ of AME diameter. Abdomen elongate oval, distinctly narrower than cephalothorax. Legs I robust.

Thyene imperialis (Rossi)
(Figs 699–703)

Attus imperialis Rossi, 1846: 12;

Attus regillus L. Koch, 1867: 879;

Salticus regillus: O. Pickard-Cambridge 1872: 323;

Thyene imperialis: Berland and Millot 1941: 374, Figs 72b, 73;

Andreeva 1976: 94–95, Figs 135–138; Prószyński 1987: 109–110;

Wesołowska and van Harten 1994: 74–76, Figs 150–153.

Diagnosis. Striking appearance due to coloration, light reflecting scales, broad cephalothorax and narrower abdomen. Palpal organ and epigynum unique.

Description. Male. Cephalothorax; eye field divided into two different areas: narrow anterior stripe of

intensely white scales behind eyes I and a brown island on remaining part; laterally a bent bunch of stouter white setae (black in female) arises from beneath eyes II and stands upright above the eye field. Thorax divided into two semicrescent shaped areas: upper one, pale whitish yellow, extending dorsally from behind eye field to behind mid-length of the thorax, extending antero-ventrally over sides and reaching ventral edge of carapace at level of coxae I and eyes III; lower one, blackish brown, covers posterior dorsal slope, coming forward along lower sides of thorax. There is a thin line of white scales on ventral side of carapace edge. This pattern is variable, being much less contrasting in some specimens.

Abdomen: as shown in Fig. 701, colour pattern variable.

Frontal aspect: light yellowish fawn with blackish brown lower half of clypeus beneath AME, clypeus and field around AME covered with whitish scales; anterior part of cephalothorax sides uniformly light, without mid-height line of white scales; chelicerae dark brown with dorsal surfaces flattened and crossed by numerous small furrows, presumably stridulatory; legs I anteriorly dark brown; pedipalps light brown with sparse, easily visible small whitish rounded scales.

Legs: I long, robust, dark brown; sparse brush of long blackish setae ventrally on tibia continues more narrowly along retro-ventral edge of patella and then in a single line of dense long black setae along retro-ventral edge of femur. Legs II–IV much shorter but not slender, lighter brownish yellow with darker apical half of femora; weak traces of ventral brush of setae on tibia II

and none on tibiae III–IV. Proportions of legs in female different.

Palpal organ typical for the genus: two tight coils of embolus, round bulbus, small softer flap at 10 o'clock position and simple tibial apophysis.

Female. Cephalothorax lighter than in male, yellow or whitish yellow, with darker fawn eye field and, in some specimen, slopes of thorax and sides; black tuft of stouter setae standing upright from beneath eyes II above the eye field.

Abdomen elongate oval, light yellowish fawn, with complicated pattern consisting of a central dark spot covered on both sides with adpressed dark brown setae, separated in the middle by a triangle of colourless light-reflecting scales. There are antero-lateral dark square spots touching the central spot with their corners, extending anteriorly into several narrow grey lines, which in some specimens are closed anteriorly by joining a darker area, or they may end separately on a light area. The central spot is delimited: anteriorly by two narrow white streaks, separated by the thin dark median streak, and these are followed on their sides by a transverse pair of thin white spots; laterally the spot is surrounded by light areas with more intensely white scales; posteriorly it is delimited by a thin transverse band of intensely white setae, followed first by a yellow area, next by another pair of small intensely white lines and finally by a darker triangular area reaching posterior end of abdomen, or, in some specimens, ending just short of it and leaving a terminal whitish triangle. All this pattern is variable and much reduced in some specimens. Spinnerets dark brown, ventrally pale greyish.

Frontal aspect: clypeus fawn, eyes AME surrounded ventrally and laterally by dense and intensely white scale-like setae, dorsally by dark setae; lateral parts of face with three horizontal white lines separated by fawn lines: a ventral line of white scale-like setae along the ventral edge of lateral part of clypeus, a mid-height line of white scales from lateral edge of face to white surrounding of AME, and an inconspicuous white line from upper edges of ALE sideways. Chelicerae pale yellow with a few small white scales; pedipalps pale yellow, thin, with long grey and whitish setae.

Legs: I more robust than II–IV, but not much longer; dark yellow and thicker, covered with sparse setae and very small whitish scales; tibia I slightly swollen, prolateral row of short ventral spines and an additional lateral apical, retrolateral row of three minute rudimentary spines, without ventral brush of setae; legs II–IV yellow, IV possibly the longest.

Ventral aspect: sternum, coxae and mouth parts yellow; abdomen ventrally whitish with dark grey lines, two lateral and one median, sides whitish.

Epigynum: usually weakly sclerotized, yellow with small anterior white membranous rectangular groove (Fig. 699; copulatory channels weakly sclerotized, begin

at the sides of groove and after initial run posteriorly turn into complicated flat spiral, accessory gland opening at the end of peculiar, very long channel running anteriorly; it seems that epigynum is very similar in all species of *Thyene*.

Measurements (mm). Male. Length of cephalothorax 2.25; length of abdomen 3.25. Female. Length of cephalothorax 3.00; length of abdomen 2.75.

Seasonal appearance of adult specimens. Males – I, II, III, IV, V, VI, VII, VIII; females – II, III, VI, VII, VIII, IX.

Distribution. Broadly distributed throughout Mediterranean, extending to East Africa, India, China and Indonesia. Israel: Dan (1); 'En Harod, Bet Alfa (5); Poriyya eastern slope, Sede-Eliyyahu (7); Miqwe Yisra'el (9); Bet Jimal (on bark of the *Pinus halepensis*) (10); Qiryat-Anavim, Jerusalem (11); Ma'ale Adumim (12); 'En Duyuk near Jericho, En Gedi (13); En Yahav (14); Haluqim, Hatira, Sede Boqer (17).

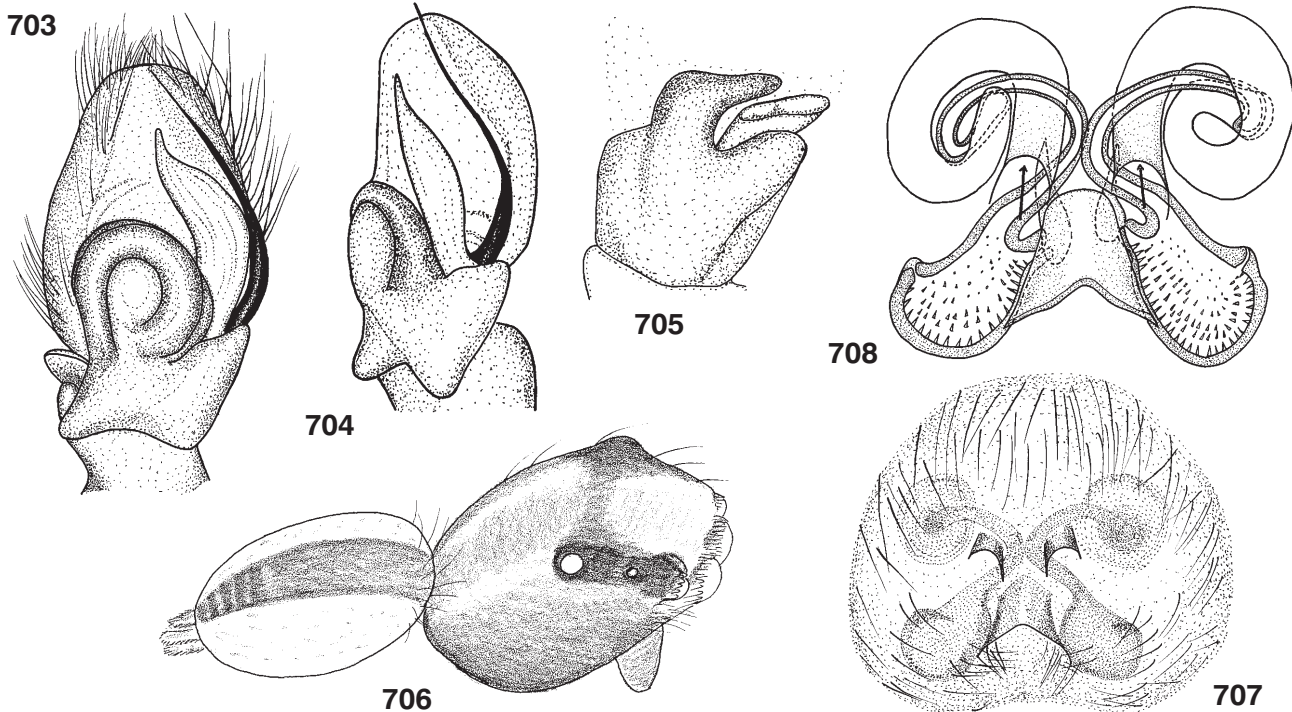
Ylenus Simon, 1868

Type species. *Ylenus arenarius* Menge (in Simon 1868).

Introductory remarks. General appearance short, broad and high, owing to sloping part of thorax hidden under anterior margin of cephalothorax, the impression actually not confirmed by measurements. Body light coloured due to coverage of tegument by dense, usually minute, whitish or colourless scales. There is usually indistinct darker streak medially along abdomen and often some darker spots on cephalothorax.

Legs robust, with scapula, a brush of hard setae extending from the tarsal claws onto distal parts of ventral surfaces of tarsi I–II, in older specimens becoming worn out, shorter and sparser. Good identification characters are furnished by genital organs, as well as by ventral appearance of chelicerae with undeveloped retrolateral margin and lacking a tooth, the prolateral margin being armoured with thin sclerotized edge ending with single prolateral tooth.

Shape of cephalothorax: broadest at the mid length of thorax, its width at eyes I is 70–78%, at eyes III 80–88% of cephalothorax length, height 57% of cephalothorax length, sloping thorax. Eye field: extending over 43–48% of cephalothorax, its length is 62% of width at eyes I; trapezoid shaped, broadening posteriorly by 9–14%; indistinctly narrower than cephalothorax, its width at eyes III is 85% of cephalothorax width in the same area. Posterior slope of thorax begins just behind eye field and is steep. Face proportions: ALE located along upper half of AME, their diameter half of the latter; height of clypeus equal to diameter of ALE, chelicerae slender. Length of abdomen varies from 89 to 109% of cephalothorax length, in the case of one female 148%. Legs IV the longest (in males 124–127% of 5 segments of leg I, in females 145%), legs II and III almost equal, 78–81% in males, 87–91% in females.



Figures 703–708. (703–705) *Yllenus salsicola*, palpal organ ventrally (703), prolaterally (note separation of embolus and conductor) (704), articulating processes of tibia and cymbium (705). (706–708) *Yllenus salsicola*, general appearance of male (706); female, epigynum (707) and its internal structure (708) (from Prószyński 1968).

Yllenus israelensis Logunov
(Figs 717–718)

Yllenus israelensis Logunov, 1996: 60, Figs 20–23.

Diagnosis. Closely resembling *Yllenus squamifer* by proportions of embolus and conductor, differs by broad space between basis of conductor and embolus, resembling letter “U”. Legs yellow, clypeus dark, devoid of white setae or scales.

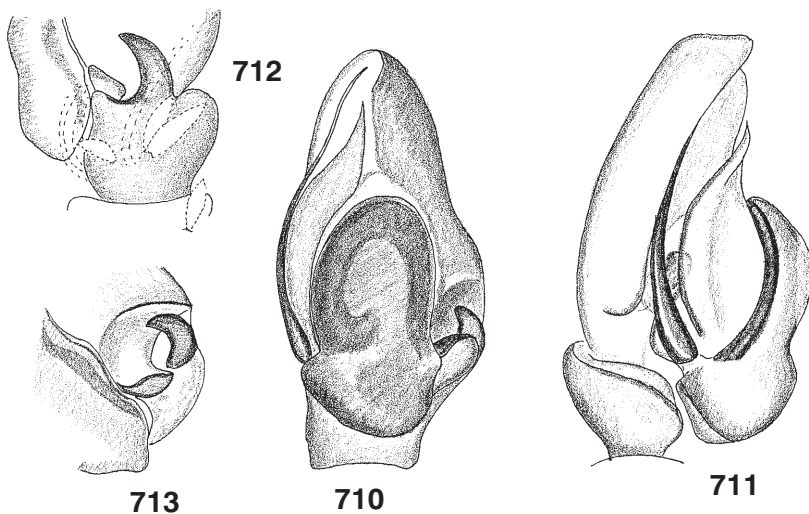
Description. Male. Cephalothorax high, abruptly sloping behind eyes III. Clypeus dark greyish brown, slightly lighter beneath AME, covered with sparse greyish setae; grey setae also overhang chelicerae. Chelicerae dark brown. AME surrounded by colourless setae, those above AME whitish. Abdomen missing. Ventral aspect: coxae uniformly yellow, sternum brown with small lighter central area, covered with colourless scales.

Legs I–IV uniformly yellow, both laterally and dorsally there are no differences between these surfaces; covered laterally by dense whitish scales. Tip of tarsus I darkened; antero-ventral edge of femora I–II with narrow black line, on femur III there is a blackish spot in the same area. Legs IV distinctly longer.

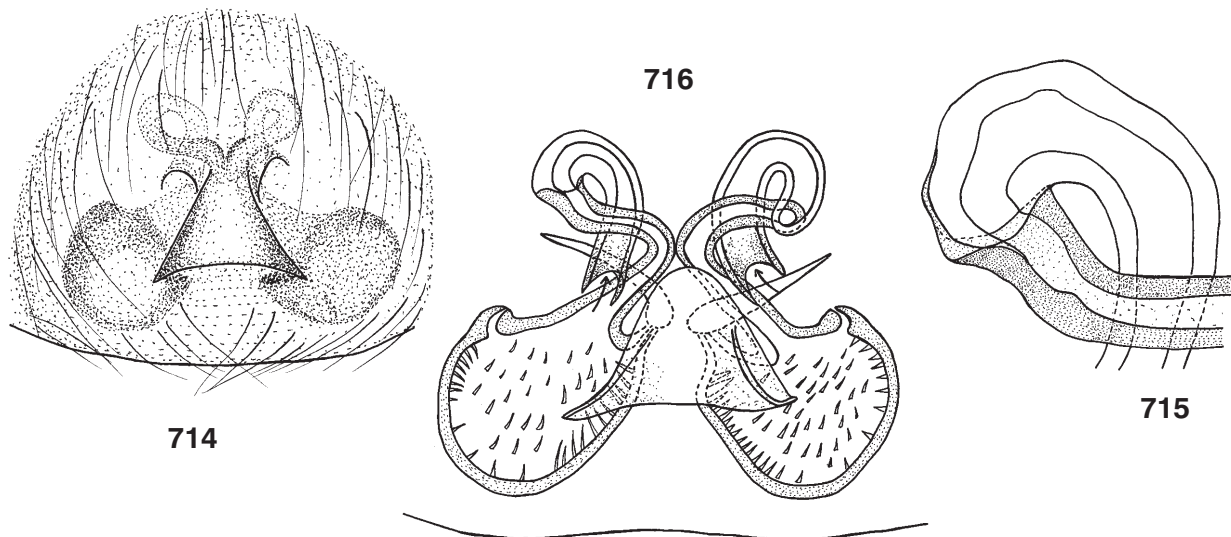
Material. Holotype, Israel: Negev, environ of Mizpe Ramon Village, Maktesh Ramon Desert, steppic like biotop. 21. III. 1995. Leg. I. P. Orlov.

Remarks. Described from Israel: Negev – Makhtesh Ramon. The collection locality is close to known localities of *Yllenus squamifer* and the environments are similar.

Seasonal appearance of adult specimens. Male – III.



Figures 710–713. *Yllenus squamifer*, palpal organ ventrally (710), prolaterally (711), also articulating processes laterally (712) and antero-laterally (713).



Figures 714–716. *Yllenus squamifer*, epigynum (714), its internal structure (715) and details of copulatory channel – distinct border between the sclerotized and not sclerotized parts of walls (716) (from Prószyński 1968).

Yllenus salsicola (Simon)
(Figs 704–708)

Attulus salsicola Simon, 1937: 1196, 1258, Figs 1891–1893;
Yllenus salsicola: Prószyński 1968: 455–458, Figs 15, 24, 49, 64,
121–125; Prószyński 1976: map 27.

Description. Male. Body coloration contrasting. Cephalothorax dark brown, eye field light fawn, broad streaks of elongate white scales from ALE, medially to eyes III, towards hind end of the eye field and further, along dorsolateral edges of thorax towards thoracic hindmargin.

Abdomen: dorsally lancet-shaped streak, blackish brown with scattered orange scales, surrounded laterally by bent white streaks of scales, margins of dorsal surfaces greyish yellow.

Frontal aspect: eyes I surrounded with whitish and a few colourless scales; clypeus light fawn with white triangular “beard” of setae overhanging cheliceral bases; chelicerae brown; tibia I dark with colourless scales.

Palpal organ: dorsal surface of cymbium and pedipalpal tibia yellow with white setae. Legs dorsally mainly yellow, laterally mainly brown or with brown spots and annuli, with sparse whitish scales. Sparse scopulae on tarsi I–II on distal parts of ventral surfaces. Ventral aspect yellow, abdomen whitish, sides of abdomen greyish.

Measurements (mm). Male. Length of cephalothorax 1.70; length of abdomen 1.59.

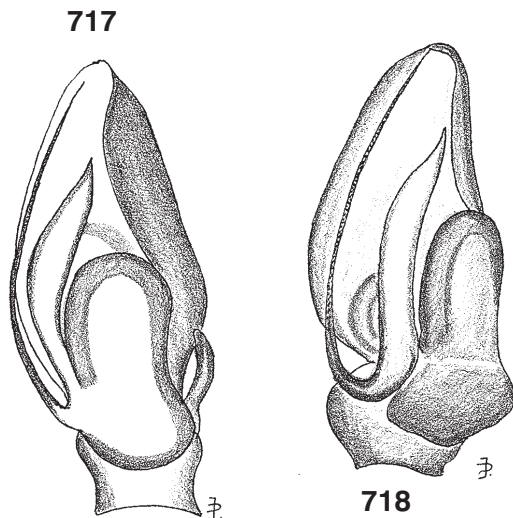
Seasonal appearance of adult specimens. Male – IV, VII, XII.

Distribution. Mediterranean: Egypt, Tunisia, Algeria, Spain, France. Israel: Ma’agan-mikhael (8); Be’er Mash’abbim (15).

Yllenus squamifer (Simon)
(Figs 710–716)

Eris squamifer Simon, 1881: 134;
Yllenus squamifer: Prószyński 1968: 460–463, Figs 129–135;
Prószyński 1976: map 28, Figs 5, 10.

Description. Male. Body coloration dull. Cephalothorax integument brown, covered with small, colourless scales, eye field covered very densely with small whitish scales; with two darker longitudinal streaks of brownish scales, not visible in the type of this species due to loss of scales, absent in *Yllenus salsicola*. Abdomen: dorsally



Figures 717–718. *Yllenus israelensis* (holotype), palpal organ ventral (717), and prolateral view (note broad space between conductor and embolus) (718).

uniformly covered by adpressed silver grey scales; with a few remnants of brown adpressed setae

Frontal aspect: clypeus brown with greyish setae. Palpal organ: cymbium brown with colourless or whitish setae; differs distinctly from *Yllenus salsicola* in shape of embolus and conductor and their proportions in relation to bulbus and cymbium, also in the articulating apparatus, which in the latter species has tibial apophysis broader and bent, which reduces the free space around the sclerotized lateral plate-like process of cymbium to a narrow but much deeper slot.

Female. No female specimen from Israel known yet. Description of female specimen from outside Levant is given in Prószyński (1968).

Measurements (mm) (of non Levantine specimens). Male. Length of cephalothorax 1.58; length of abdomen 1.71; length of 5 segments of leg I 3.16. Female. Length of cephalothorax 1.80; length of abdomen 1.96; length of 5 segments of leg I 3.18.

Seasonal appearance of adult specimens. Males – IV, XI; females – IV, V, VI, VII, X.

Distribution. Spain, Portugal. In Israel: Be'er Mash'abbim (sands) (15), Haluqim and Hatira Ridges (17).

Relevant species

Yllenus arabicus Prószyński

Yllenus arabicus Prószyński, 1993: 48, Figs 37–40.

Remarks. Distribution – Saudi Arabia: Hada Alsham (on alfa alfa field).

Yllenus improcerus Wesolowska et van Harten

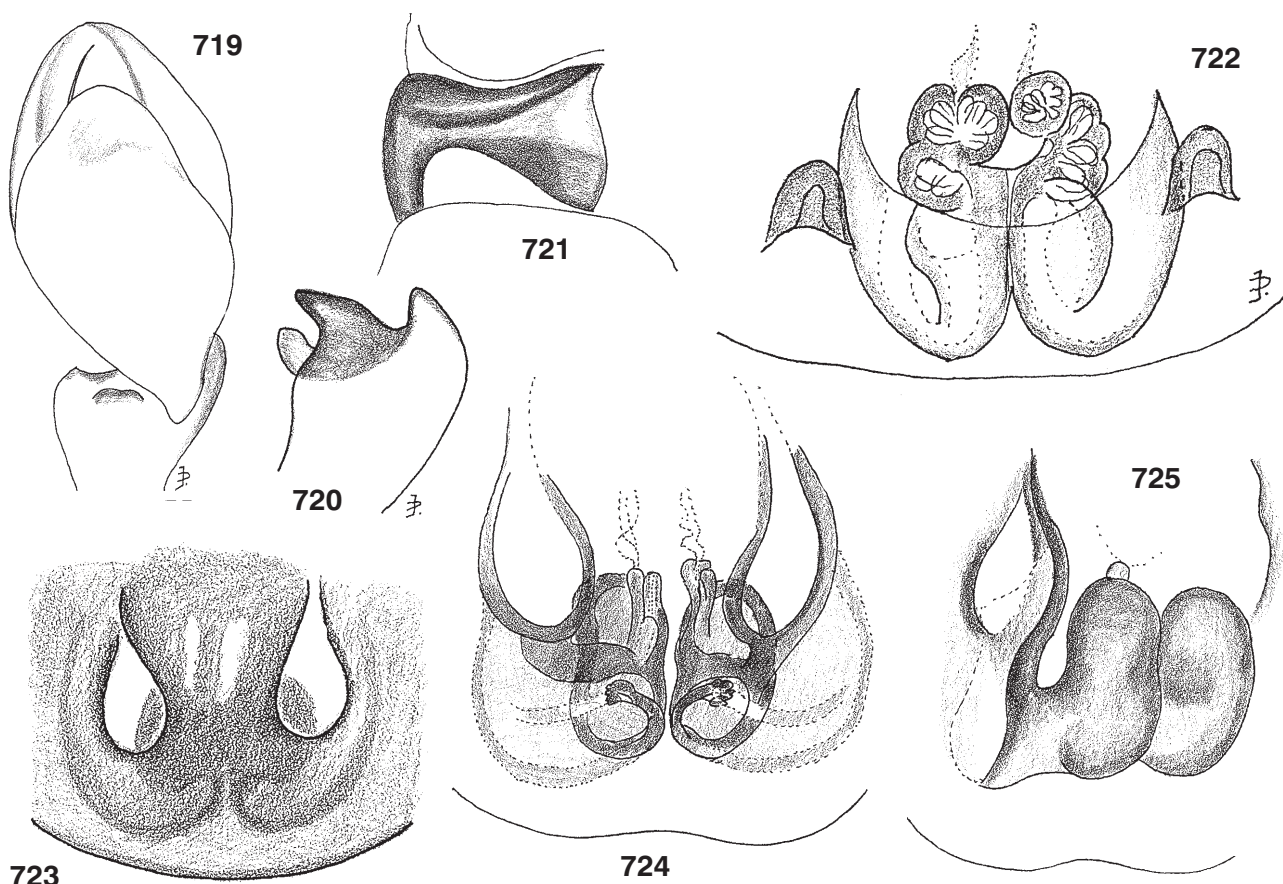
Yllenus improcerus Wesolowska et van Harten, 1994: 78–81, Figs 157–158.

Remarks. Described from Yemen. Seasonal appearance of female – III.

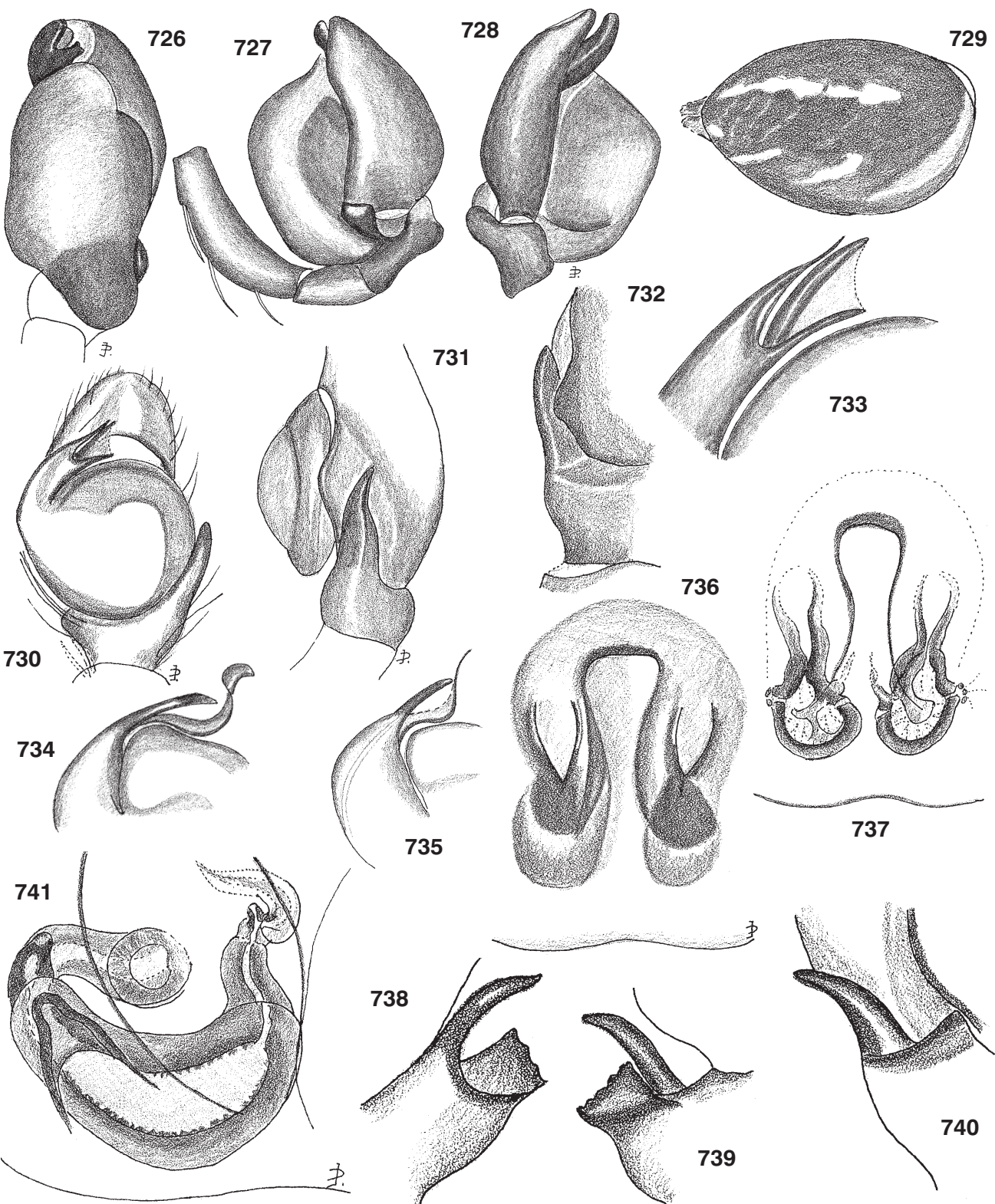
Yllenus knappi Wesolowska et van Harten

Yllenus knappi Wesolowska et van Harten, 1994: 78–81, Figs 159–160.

Remarks. Distribution – Yemen. Seasonal appearance of female – III.



Figures 719–725. Complementary drawings. (719–722) *Aelurillus nabataeus* sp. nov., palpal organ ventrally (719), tibial apophysis laterally (720). (721–722). Related species from Tadjikistan, *Evarcha nenilini* (paratypes), male, tip of embolus (721), female, internal structure of epigynum (722). (723–725) Variation in external appearance in *Mogrus neglectus* (white abdomen with three brown narrow stripes) is not correlated with differences in structure of epigynum: epigynum (723), internal structure of epigynum ventrally (724), connection of sclerotized spermathecae with copulatory channel and openings (725) (Israel, Sayeret Shaked).



Figures 726–741. Complementary drawings. (726–728) *Phegria palestinensis* (holotype), palpal organ, ventral view (note narrowness of bulbus, as well as shape of embolus) (726), retrolaterally (note broad space between apophyses) (727), and prolaterally (note thickness of embolus) (728). (729–735) Male *Pellenes nigociliatus*, abdominal pattern (729), palpal organ ventrally (730), laterally (731), tibial apophysis dorsally (732), tip of embolus seen under high power (733). (734–735) Related species from Uzbekistan, *Pellenes sytchevskayae* (holotype) – basis of embolus ventrally (734), and diagonally antero-ventrally (735). (736–737) *Plectippus tectonicus* sp. nov., epigynum (736), and its internal structure (737). (738–741) *Pseudocius pseudocourtauldi* (male holotype from Armenia), tibial apophysis in anterior (738), latero-posterior (739), and posterior views (740), as well as internal structure of epigynum of female paratype – right spermatheca and channel, ventral view (741).

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