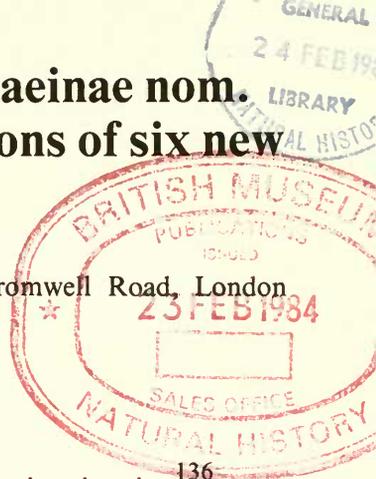


# A review of the spider subfamily *Spartaeinae* nom. n. (Araneae: Salticidae) with descriptions of six new genera

F. R. Wanless

Department of Zoology, British Museum (Natural History), Cromwell Road, London SW7 5BD



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## Synopsis

The spider subfamily Spartaeinae nom. n., is defined; a key to genera and species check list are provided. Morphological characters and generic affinities both fossil and recent are discussed. Six new genera, *Meleon*, *Mintonia*, *Neobrettus*, *Taraxella*, *Veissella* and *Yaginumanis* are proposed. *Spartaeus* Thorell and *Gelotia* Thorell are revised. Distributional data are given and separate keys to the species of *Gelotia* and *Mintonia* are provided. The genera *Cocalus* Koch, *Cyrba* Simon, *Phaeacius* Simon, *Portia* Karsch and *Veissella* are illustrated by figures of selected species. All the known species of *Gelotia*, *Mintonia*, *Neobrettus*, *Spartaeus*, *Taraxella*, *Yaginumanis*, the newly discovered males of *Brettus anchorum* Wanless and *Meleon solitaria* (Lessert) are figured and described. The type material of 12 nominate species was examined and seven lectotypes designated. One generic and three specific names are synonymised, and seven new combinations are proposed.

## Introduction

This study completes a preliminary revision of recent salticids formerly included in the subfamily Boethinae. Unfortunately the nominate genus *Boethus* Thorell, 1878 is a junior homonym of *Boethus* Foerster, 1868 and a new subfamily name (Spartaeinae) must be proposed. However, as a result of synonymy (see p. 148) the type species remains unchanged.

Simon (1901) stated that *Boethus* appeared to be transitional between *Lyssomanes* Hentz, *Cocalodes* Pocock and *Linus* Peckham & Peckham (= *Portia* Karsch) and proposed the subgroup Boetheae comprised of two genera, *Boethus* and *Portia*. Petrunkevitch (1928) subsequently reorganised the subgroup by elevating Boetheae to subfamily rank to include salticids characterised by their fairly large posterior median eyes. Roewer (1954) adopted Petrunkevitch's system, but divided the subfamily into five groups (Table 1). Of the genera listed, three, *Cocalodes* (revised Wanless, 1982), *Sonoita* Peckham & Peckham and *Holcolaetis* Simon, are removed from the Spartaeinae because the male palps possess a median apophysis (see below). The systematic position of a fourth genus *Tanna* Berland is uncertain

**Table 1** List of genera in the subfamily Spartaeinae (sensu Roewer, 1954)

1. Gr. Boetheae <i>Boethoportia</i> Hogg <i>Boethus</i> Thorell <i>Portia</i> Karsch	3. Gr. Lineae <i>Linus</i> Peckham & Peckham <i>Tanna</i> Berland
2. Gr. Cocaleae <i>Cocalus</i> Koch <i>Phaeacius</i> Simon	4. Gr. Cocalodeae <i>Cocalodes</i> Pocock <i>Sonoita</i> Peckham & Peckham
	5. Gr. Holcolaetaeae <i>Holcolaetis</i> Simon

**Table 2** Revised list of genera in the subfamily Spartaecinae

RECENT	
<i>Brettus</i> Thorell	<i>Neobrettus</i> gen. n.
<i>Cocalus</i> Koch	<i>Phaeacius</i> Simon
<i>Cyrba</i> Simon	<i>Portia</i> Karsch
<i>Gelotia</i> Thorell	<i>Spartaeus</i> Thorell
<i>Meleon</i> gen. n.	<i>Taraxella</i> gen. n.
<i>Mintonia</i> gen. n.	<i>Veissella</i> gen. n.
	<i>Yaginumanis</i> gen. n.
FOSSIL	
<i>Almolinus</i> Petrunkevitch	<i>Eolinus</i> Petrunkevitch
<i>Cenattus</i> Petrunkevitch	<i>Paralinus</i> Petrunkevitch
	<i>Prolinus</i> Petrunkevitch

as the male palpal organs are of a relatively simple euophryine type and show no affinities with other genera listed in the subfamily.

The Spartaecinae, as defined here, is now comprised of 13 recent and five fossil genera (Table 2). Of the recent genera, four have been revised—*Brettus* Thorell, *Cocalus* Koch, *Phaeacius* Simon and *Portia* (see Wanless, 1978*b*, 1979, 1981*a*, 1981*b*), and a paper on *Cyrba* Simon, is in preparation. Two genera are here formally transferred into the Spartaecinae from other subfamilies; *Cyrba* from the Plexippinae (sensu Prószyński, 1976) and *Gelotia* Thorell from the Magoninae. One genus, *Portia*, has been relimited and six new genera are proposed. The introduction of so many new genera in a family which is almost certainly overloaded with generic synonyms requires some explanation. Firstly, with the partial exception of *Cyrba*, all of the taxa thought to belong in this subfamily have been examined. Secondly, the subfamily is distinctive and would have been intuitively recognised by early taxonomists from the presence of relatively large posterior median eyes. Although it is now considered that at least two subfamilies are involved, the species concerned would even under Simon's classical system have been placed systematically close to one another. Exceptions may occur amongst those genera in which the posterior median eyes have been reduced, as for example in *Cyrba* and some species of *Gelotia*. Finally an attempt has been made to limit genera on the basis of synapomorphies and then place them in small and hopefully recognisable monophyletic groups, precisely the strategy advocated by Platnick & Shadab (1979).

The standard abbreviations and measurements are those used by Wanless (1978*a*), but for the leg spination the system adopted is that used by Platnick and Shadab (1975).

### Morphological characters

The following account of selected morphological characters provides the basis for the present taxonomic conclusions and clarifies some points which have been misinterpreted in earlier revisions (Wanless, 1978*a* & *b*). One new character, the femoral organ, is described and simple abbreviations ( $M_1$ ,  $M_2$ ,  $M_3$ ) used to designate elements of the distal haematodocha and palpal tegulum.

#### Posterior median eyes

These eyes are usually classified as being either small/minute or relatively large in relation to the posterior lateral eyes and I cannot recall a single instance in which there has been difficulty in assigning one state or the other. In the majority of salticids the posterior median eyes are small and it has been shown that in some species, *Metaphidippus harfordii* (Peckham

& Peckham) and *Phidippus johnsonii* (Peckham & Peckham), their retinae are vestigial (Eakin & Brandenburge, 1971). By contrast, in *Portia* they are large (Wanless, 1978*b*) and the retinal anatomy is non-degenerate as in the other lateral eyes (Blest, 1983; pers. comm.). It is therefore assumed that large posterior median eyes are primitive for Salticidae.

As far as I am aware, large posterior median eyes only occur in fossil genera (see Table II) and in recent old world genera of the subfamilies Lyssomaninae and Spartaeineae, and the *Cocalodes*-group of genera (i.e. *Cocalodes* Pocock, *Allococalodes* Wanless, *Holcolaelis* Simon and *Sonoita* Peckham & Peckham). They have been reduced at least four times in the Lyssomaninae, *Lyssomanes* Hentz and *Chinoscopus* Simon from the new world, *Pandisus* Simon and *Onomastus* Simon from the old, and twice in the Spartaeineae i.e. *Cyrba* and *Gelotia*. The latter genus including four species with large posterior median eyes and two with small. Homann (1971) has suggested that in spiders the eyes were originally more or less arranged in parallel rows of four equal sized eyes, that specialisation within families occurred through the enlargement of some eyes and their corresponding optic areas of the brain. Ontogeny has shown that in salticids the posterior eye row is primarily procurved and that eyes normally referred to as the posterior medians are in reality the posterior laterals. In the same work, Homann treated lyssomanine spiders as a distinct family, the Lyssomanidae, and demonstrated that their secondary eyes (i.e. AL, PM, PL), unlike those of the Salticidae, have all the retinal nuclei distal to the rhabdomes, as in most spiders, and not outside the pigment cups as in the Salticidae. Also, the lateral eyes lack elongated rods. Further studies by Blest (1983, pers. com.) confirm that the secondary eyes of *Lyssomanes* are different from those of advanced salticids. However, he advises against placing too much taxonomic weight on the importance of eye characters as they are liable to rapid selection. Clearly, the eyes of old world lyssomanines (sensu Wanless, 1980*c*) should be examined before drawing any phylogenetic conclusions. For the present therefore, I would still maintain that lyssomanine spiders merit only subfamilial rank while at the same time drawing attention to the fact that the monophyly of the group has still to be proven.

### Cheliceral teeth

The structure and number of teeth on the inner margins of the chelicerae have been used to divide the Salticidae into three major divisions, the Unidentati, Fissidentati and Pluridentati (Simon, 1901). The system has been much criticised (Petrunkevitch, 1928; Prószyński, 1971*a*; Wanless, 1975; Kaston, 1981) on the grounds that it is artificial and there are numerous examples where the number and structure of the teeth are intraspecifically inconsistent or asymmetrical. It has also been argued, correctly in my view, that the fissidentate tooth i.e. a tooth with two or three points, is essentially transitional between a single tooth (unidentate) and two or more separate teeth (pluridentate). Unfortunately, and contrary to the remarks of Lehtinen (1975) and Wanless (1980*b*), the sister group of the Salticidae is far from certain, it is therefore difficult to decide if the presence of numerous teeth on the inner margin represents a primitive or derived condition. Salticids lacking teeth or with a single tooth on the inner margin tend to share more derived characters i.e. small posterior median eyes and relatively simple (?) secondarily reduced male palpal organs, suggesting that the absence of teeth may also be a derived condition. However, even if these assumptions are correct they tell us little of the phylogeny as the trend towards a reduction in the number of teeth has probably occurred on numerous occasions.

While there can be no doubt that the divisions are artificial, it is suggested that contrary to current opinion we may yet find that they form useful key characters. For in practice the vast majority of salticids can be easily sorted into one division or another. Exceptions will of course always occur, but once recognised they may be allowed for in the key.

### Fovea

The fovea can sometimes provide a useful key character, but it does not appear to be of much use in assessing relationships as its length and position are variable and seemingly

unrelated to carapace shape. In species of both Lyssomaninae and Spartaestinae the fovea is generally elongate, and positioned further back on the thorax than is usual in many other groups, suggesting that it may represent a primitive condition. The derived state is either its absence or a more forward location—usually more or less between the posterior margins of the posterior lateral eyes.

#### **Femoral organ (Figs 30A–F; 32A–D)**

This unusual structure only occurs on the underside of the femora of the first pair of legs in some males belonging to the genera *Brettus*, *Gelotia*, *Mintonia* gen. n., and *Spartaeus*. It varies in development and has probably been lost in some species. In *Spartaeus spinimanus* (Thorell) and *Gelotia bimaculata* Thorell, the femoral organ is represented by a small angular tubercle bearing a shallow perforated depression surrounded by irregular pleats (Fig. 30A–F). It is clearly visible under the optical microscope, but in species where the tubercle is lacking the organ may be recognised as a pale amber spot or streak. In *Mintonia tauricornis* sp. n., the femoral organ, appearing as a pale amber spot under low power, is probably non-functional consisting of a ring of pleats with the central perforations lacking (Fig. 31A). *Mintonia ramipalpis* (Thorell) is similar, but there are scattered pores a few of which are apparently setose (Fig. 31B–D). However, in an untreated specimen, i.e. one which had not been cleaned in an ultrasonic bath previous to coating for SEM, the femoral organ is seen to contain numerous amorphous globules, almost certainly a secretion (Fig. 31E–F). Some globules are still attached to the secretory pores a few of which are evidently plugged (Fig. 31F, arrowed), but in reality the beginning of an exudate; it therefore seems unlikely that 'true' setose pores are present. The phenomenon is in one sense an artifact as the exudate, possibly a sex pheromone, will have been produced and coagulated while the specimen was languishing in spirit. In *Brettus cingulatus* Thorell, the femoral organ, appearing as a minute pale amber streak and overlooked by Wanless (1979), has the form of a perforated gully which appears to contain an amorphous secretion (Fig. 32A–C).

When poorly developed and only evident as a pale amber spot, the femoral organ resembles those sometimes found on the first and second pairs of legs of certain female spiders in the family Mysmenidae (Platnick & Shadab, 1978). Unfortunately mysmenids are rare in collections and it has only been possible to examine the legs of a single unidentified Portuguese species. The first sample, a leg I, disintegrated in preparation and was lost; the second, a leg II, shows the femoral organ as a rather featureless spot (Fig. 32D) which bears a passing resemblance to that found in *M. tauricornis* (Fig. 31A). In some mysmenids, including the Portuguese species, the femoral organ appears to be more pronounced on the first pair of legs, while some published figures suggest that the organ has the form of a low mound (Kraus, 1967; Brignoli, 1980). Clearly further studies are warranted, but as salticids and mysmenids belong to different phyletic groups it would be surprising if the femoral organs proved to be homologous.

For the present, well developed femoral organs are regarded as primitive, the derived condition being their vestigial state or absence. On the whole they have been of little use in resolving intergeneric relationships.

#### **Retrolateral tibial apophysis (RTA)**

The retrolateral tibial apophysis shows a degree of development which is evidently unparalleled within the Araneae. In some genera e.g. *Portia*, *Phaeacius* and *Yaginumanis* gen. n., it is a solid, occasionally ramose prong (Figs 6E; 28A; 29D), while in others it has associated ducts with median or distal openings (Figs 21D; 32E, F; 33A–F). In one genus, *Cocalus*, the RTA is saucer-shaped and supports a membraneous finger-like extension of the tibia (Fig. 22C). Yet other genera (*Cyrba*, *Gelotia* and *Meleon* gen. n.) are characterised by RTAs which arise from a membraneous base, some of which may be moveable (Figs 20C; 26F).

In *Gelotia syringopalpis* sp. n., and *Mintonia melinauensis* sp. n., the openings of the apophyses can be seen under the optical microscope (Figs 21D; 13C), but in other species

the openings can only be detected by SEM (Figs 32E, F; 33A–E). Unfortunately it has only been possible to examine a few specimens and experience has shown that it is probably unwise to assume the presence of openings. For example, the RTA of *Mintonia ramipalpis* (Thorell) has every appearance of possessing a duct, but this was not confirmed by SEM studies (Figs 14H; 34A, B). Also, the occurrence of a membraneous base to the RTA is not necessarily indicative of openings—compare *G. bimaculata* Thorell which has an opening (Fig. 33A, B) with *Meleon kenti* (Lessert) and *Cyrba algerina* (Lucas) in which they are lacking (Fig. 34C, D, F).

The purpose of these complex apophyses is unknown. They could be functionally homologous with the femoral apophyses of *Asemonea* O.P.-Cambridge and *Pandisus* Simon (see Wanless, 1980c) and produce a contact pheromone or secretion for plugging the female copulatory openings. In *G. bimaculata* there is a sclerotised fold opposite the posterior margin of the epigyne (Fig. 17C, arrowed) suggesting that this region may receive the tip of the RTA. However, there is no evidence to indicate that this may occur in other species or genera. The apophysal openings may have been lost in some species of *Mintonia* and it is possible that ducted apophyses are a primitive, rather than an advanced character in salticids.

### Distal haematodocha

Wanless (1978b) referred to the distal haematodocha of *Portia* as a tripartite membraneous apophysis. This was incorrect since fresh material has shown that although the three elements are contiguous only two, for convenience labelled  $M_1$  and  $M_2$ , can properly be described as being part of the distal haematodocha. The third element discussed below and labelled  $M_3$  is thought to represent a separate distal modification of the tegulum.

In ventral aspect  $M_1$  lies partially over the embolic base and is usually on the prolateral side of the embolic duct where it enters the embolus. It often develops a minute lobe (Fig. 16A–C), but in *Neobrettus* and *Cyrba* they are large and petal-like (Figs 24D; 25F), while in *Phaeacius* there is a long filamentous process, erroneously labelled as a secondary conductor in Wanless (1981a).  $M_2$  lies on the retrolateral side of the embolus and is often seen as a small lobe or membraneous patch lying alongside or slightly apart from the embolus (Fig. 16A–C). Only occasionally does it extend posteriorly to produce a translucent ledge, *Brettus*, or fuse with  $M_3$ , *Gelotia*. In ventral aspect  $M_3$  lies above  $M_2$  and usually extends transversely or obliquely across the tegulum forming a narrow, delicate translucent ledge in *Portia* and *Meleon*, a lobe in many species of *Mintonia* and a short filament in *Spartaeus*. In *Gelotia* it takes the form of a curtain-like membrane not readily separated from  $M_2$ .

Although the distal haematodocha and tegular ledge are sometimes characteristic of spartaeine genera, the development of the former in other salticids is uncertain as it is not always evident in unexpanded palps, possibly being overlooked, whereas the tegular ledge seems to have no parallel in other salticids. The complexity of the distal haematodocha and presence of a tegular ledge may in themselves be synapomorphic for Spartaeinae.

### Tegular furrow

This structure which forms an integral part of the tegulum varies considerably. It is sometimes obscured by the embolus, distal haematodocha and the tegulum itself, especially when bulbous. It is usually situated on the retrolateral side of the tegulum and may be recognised as a pit, which is sometimes dark and may extend posteriorly as a groove alongside the retrolateral margin. Below the cuticle of the tegulum, adjacent to the pit or near the base of ( $M_3$ ) there is sometimes a black disc-like structure (Fig. 19F). The pit may be shallow and open with a thick anterior wall and slight hood (Fig. 24D), deep and almost circular (Fig. 35C), irregular or crescent-shaped (Fig. 9C). The groove may be deep (Fig. 36E), lacking or short and shallow (Figs 12E; 35E), occasionally terminating in a series of fine striae (Fig. 22D). In at least two species, *Phaeacius lancearius* (Thorell) (see Wanless, 1981a) and *Brettus cingulatus* Thorell, there is a minute pore in the wall of the pit which is evidently lacking in other genera.

The furrow is not known to occur in other Salticidae and its presence is regarded as a synapomorphy linking all members of this subfamily. Its function is unknown.

### Ventral tibial apophysis

The ventral tibial apophysis often has a characteristic oblique profile (Figs 7G; 19F; 22D) when viewed in ventral aspect. It varies in development and is usually obscured by tibial setae in the intact unshaven palp. It was initially considered to represent a second synapomorphy supporting this subfamily, but the occurrence of a similar apophysis in certain amber salticids (p. 146, Fig. 2A) believed to share closer affinities with the *Cocalodes*-group of genera raises doubts as to the validity of the proposal.

### Cymbium

The basal region of the cymbium is often modified. In some genera e.g. *Portia*, *Cyrba* and *Gelotia* there are evidently non-functional protuberances and excavations, while in others there are dorsal protuberances and recesses that interlock with tubercles on the palpal tibiae, which would appear to limit the extent to which the cymbial/tibial joint can be articulated. A similar protuberance on the palpal patella limits the flexing movement of the tibia. Provisional observations suggest that in *Cyrba* and *Meleon* the development of the locking mechanism is variable. In *Mintonia*, *Phaeacius*, *Spartaeus Taraxella*, *Veissella* and *Yaginumana* it is lacking or poorly developed, while in *Brettus*, *Gelotia*, *Neobrettus* and *Portia* it is relatively strong. Also, in *Brettus* and *Neobrettus* there is a basal retrolateral excavation which is apparently used, at least in part, to protect the tip of the long filamentous embolus (Figs 23F; 24C). The floor of the excavation is membranous and seems to be contiguous with the segmental membrane uniting the cymbium and tibiae. A similar, rather subtriangular region is found in some species of *Meleon* (arrowed Fig. 26B). Its purpose is unknown, but in *Meleon*, at least the membranous area plays no part in retaining the embolus.

Although some cymbial modifications are unique to the genera concerned, the locking mechanism is probably a primitive feature of these palps, and in any event, as a character it has not been of much use in determining affinities.

### Median apophysis

This male palpal structure, which does not occur in members of this subfamily, is only found in Lyssomaninae, the *Cocalodes*-group of genera (see p. 138) and the amber genus *Eolinus*. Within these groups it is sometimes seen as a (?) moveable bifid prong which arises from a membranous or pleated region of the tegulum (Fig. 1A; see also Wanless, 1982). Its occurrence in *Eolinus* and the implications thereof are discussed below.

### Subfamily *SPARTAEINAE* nom. n.

Boetheae Simon, 1901: 388, 400.

Boethinae Petrunkevitch, 1928: 57, 181; 1939: 184. Bonnet, 1955: 892. Roewer, 1957: 933.

REMARKS. In spite of Bonnet's remarks (Bonnet, 1955), Strand (1929) was correct to regard *Boethus* Thorell, 1878 as a junior homonym of *Boethus* Foerster, 1868. However, his replacement name (*Boethuola*) cannot be justified as *Spartaeus* Simon, a junior synonym of *Boethus*, is available. Since the subfamily name Boethinae is therefore invalid it is proposed that *Spartaeus* becomes the nominate genus of the subfamily Spartaeinae. In reality only the nomenclature has changed as the type species of *Spartaeus* (*S. gracilis* Thorell) is a junior subjective synonym of *Boethus spinimanus* Thorell, the type species of *Boethus*.

DEFINITION. A heterogeneous group of spiders ranging from about 3.0 to 11.0 mm in length. Markings occasionally conspicuous; general habitus sometimes hirsute with tufts and fringes. *Carapace*: of various shapes, usually elevated with highest point at about level of posterior

lateral eyes, rarely near centre of thoracic part; fovea usually long, sulciform and situated more or less just behind posterior lateral eyes. *Eyes*: in three rows, those of the second often fairly large. *Clypeus*: low to high with three long setae in lower space between anterior median eyes. *Chelicerae*: moderately robust, usually stronger in female; vertical or slightly inclined anteriorly, more or less parallel or slightly diverging; apophyses or spurs lacking; promargin with three to seven teeth, retromargin with three to nine, variously described as teeth or denticles. *Maxillae*: moderately long to long with outer distal margins varying from rounded to oblique; modifications lacking. *Labium*: about as long as broad or longer than broad. *Sternum*: more or less elongate scutiform. *Abdomen*: usually elongate ovoid with four indistinct apodemal spots; markings variable; spinnerets moderately long; anal tubercle cone-like; position of colulus usually indicated by scanty tuft of setae between tracheal spiracle and base of anterior spinnerets; tracheal spiracle an obscure transverse slit near base of anterior spinnerets. *Legs*: usually long and slender with numerous spines; sometimes strongly fringed; claws usually pectinate; tufts present; scopulae absent, but minute iridescent setae often present on tarsi and metatarsi; some males with femoral organs on first pair of legs (Figs 30A–F; 31A–F). *Female palps*: generally moderately long and slender with apical claw. *Male palps*: generally complex, sometimes with interlocking tubercles between cymbium/tibia and tibia/patella; tibiae with somewhat oblique ventral apophyses, rarely reduced, and usually complex retrolateral, rarely dorsal, apophyses sometimes possessing membranous elements, distal openings or adjacent tube-like process; cymbium with distal scopula, often with basal protuberances or excavations; embolus usually slender, of various lengths, arising apically or from prolateral side of tegulum, pars pendula or basal sheath rarely evident; distal haematodocha usually bearing delicate transparent or translucent lobes, flanges or filaments (elements  $M_1$  and  $M_2$ ); tegulum of various forms, with a furrow (Figs 35A–E; 36E) and usually with a delicate apical ledge or lobe (element  $M_3$ ). *Epigynes*: of various forms; copulatory openings sometimes separated by median guide or septum, often plugged or obscure; introductory ducts variable in length, sometimes lacking; spermathecae often globular, large and dark with fertilisation ducts on posterior margin.

**DIAGNOSIS.** Male salticids belonging in the subfamily Spartaeinae may be recognised by the presence of a palpal tegular furrow (see p. 140). Females are more difficult and may not always be distinguished in the absence of males, species with small posterior median eyes presenting the most problems, fortunately only two genera *Gelotia* and *Cyrba* are involved. *Gelotia* would not in all probability be recognised in the presence of a mixed group of female salticids, whereas *Cyrba* can even under these circumstances be assigned to Spartaeinae by the unusually long fovea and presence of numerous teeth on the posterior margin of the chelicerae.

Females with large posterior median eyes are slightly less difficult for in practice they can only belong in one of three groups—the Lyssomaninae, Spartaeinae or *Cocalodes*-group. The absence of a lyssomaniform type of carapace and eye pattern (see Wanless, 1980) quickly eliminates lyssomanine genera. But to distinguish between the *Cocalodes*-group and Spartaeinae it is necessary to consult the literature for descriptions and figures of the epigynes. Geographic distribution patterns are of some help as the genera of the *Cocalodes*-group are less widespread—*Cocalodes* and *Allococalodes* Wanless are only known to occur in the Moluccas and New Guinea, *Holcolaetis*, a genus of large flattened spiders is African, whereas *Sonoita*, represented by a single species, is only known from Cape Province, South Africa. A more practicable diagnosis will be presented when all of the *Cocalodes*-group have been revised.

**AFFINITIES.** The integrity of Spartaeinae is primarily based on the presence of the palpal tegular furrow, but until its degree of development (if any) in other salticids is at least partly understood there is little prospect of determining subfamilial relationships which for the presence remain obscure. I am unable to suggest derived characters supporting a sister group relationship with lyssomanine spiders, which as mentioned above may not be monophyletic. Part of the problem stems from the probability that structural elements of the male palpal

organs of lyssomanines have been misinterpreted by myself and other authors, for instance, the element labelled tegulum in Wanless (1980c) is almost certainly a modified conductor. The *Cocalodes*-group of genera probably represents another subfamily which seems to be characterised by the form of the median apophysis. The amber salticid discussed below (palp. Figs 1A, B; 2A–C) although closer to the *Cocalodes*-group by virtue of its median apophysis, is similar to Spartaeinae in the form of its tibial apophyses suggesting a possible link between the two groups. Alternatively, some old world lyssomanines possess a pale spot on the tegulum (*Asemonea*) or scale-like protuberance (*Pandisus*) that could represent either a vestigial or germinal median apophysis, thus supporting a *Cocalodes*-group/lyssomanine dichotomy. Broadly speaking, Lyssomaninae, Spartaeinae and the *Cocalodes*-group of genera probably belong to the most plesiomorphic branches of the family; they seem to be related, but the incongruencies cannot be resolved.

The question of intergeneric relations is also difficult as the majority of subfamilies are artificial and polarity assessments based on outgroup comparison with other salticids are largely intuitive. The subject of relationships should perhaps have been put aside until a broader spectrum of salticids has been revised, but in view of recent studies on the optics and behaviour of *Portia*, a brief review of generic affinities is justified, if only to highlight the problems and provide a basis for future criticism.

*Spartaeus*. The strong ventral spines on legs I and to a lesser extent on legs II appear to be synapomorphic for the genus. But as there are only two known species, only one of which is known from both sexes, I have been unable to detect other derived characters. Its affinities are uncertain.

*Yaginumanis*. This monotypic genus is difficult to place. It lacks the characters defining other genera and the pleated region of the tegulum  $M_3$  appears to represent its only autapomorphy. The robust retrolateral tibial apophyses of the male palps resemble those of *Portia* and to a lesser extent *Phaeacius*. However I am not sure that we are dealing with a shared synapomorphy as the ancestral state of these heavy apophyses can only be guessed at. The bulbous tegulum, presence of three pairs of ventral spines on metatarsi I, abdominal pattern and reddish black copulatory openings of the epigyne indicate that its affinities could lie near *Spartaeus*.

*Taraxella*. The broad encircling carapace band and massive tegular apophyses ('x' and 'y') are autapomorphic for this monotypic genus. Its affinities are uncertain, but if apophysis 'x' is homologous with the regular element  $M_3$ , then its nearest relative could be *Mintonia*.

*Mintonia*—*Gelotia*—*Cocalus*. These genera present difficulties which I am unable to resolve. Each is supported by synapomorphic male characters viz. *Mintonia* by the form of the tegular ledge  $M_3$  (e.g. Figs 8H; 9C); *Gelotia* by the cap-like retrolateral tibial apophyses (Fig. 20I) and *Cocalus* by the finger-like protuberance resting in the dish-like retrolateral tibial apophysis (Fig. 22C).

*Mintonia* and *Gelotia* seem to be close as both genera include males whose retrolateral tibial apophyses bear openings. Similar openings are unlikely to occur in *Cocalus*, but unfortunately this does not necessarily support a *Mintonia*/*Gelotia* sister group as the development of this character is uncertain, it is certainly lacking in *M. ramipalpis* and may not be present in all species of *Gelotia*. On the other hand the general conformation of the palps of *Gelotia* and *Cocalus* is similar, the apical inward curving embolus arising from a lobe-like part of the tegulum in both genera. Furthermore, if the finger-like process of *Cocalus* is analogous with the amorphous process of *Gelotia* (Fig. 20C) then there are possibly stronger reasons for suggesting that *Gelotia* and *Cocalus* are closer than either is to *Mintonia*.

*Meleon*—*Veissella*. The hyaline socket of the palpal tibial apophyses is synapomorphic for *Meleon*, while the thin flange-like palpal tibial apophyses and opposing apophyses of the patellae and femora (Fig. 27B, D) are autapomorphic for *Veissella*. They cannot be grouped on the basis of reliable synapomorphies, but their geographical distribution and the general

conformation of the male palps, especially the development of the transverse tegular ledge  $M_3$  (Figs 26G, E; 27G) suggests, that, in spite of their markedly different tibial apophyses, they are closer to one another than to other genera in the subfamily. Their habitus is also similar but probably symplesiomorphic as high carapaces and leg fringes are also characteristic of *Portia* and *Brettus*.

*Brettus*—*Neobrettus*—*Cyrba*. The tubular process lying near or alongside the male palpal retrolateral tibial apophysis (Fig. 33C–E) is synapomorphic for *Brettus* and the slightly bowed legs autapomorphic for *Neobrettus*. *Cyrba*, however, is not supported by characters which can at present be described as synapomorphic (see remarks p. 185).

The conformation of the male palps, particularly the long slender embolus and open tegular furrow, indicates that the spiders of this heterogenous group are closely allied. Relationships within the group are however uncertain as the alternatives seem to be balanced by an equal number of supposed synapomorphies. The petal-like element of the distal haemato-docha  $M_1$  and presence of an embolic guide, a groove on the outside wall of the tegular furrow, supports a *Cyrba/Neobrettus* relationship. On the other hand, *Neobrettus* shares with *Brettus* a subtrapezoid tegulum and basal cymbial modifications which appear to protect the embolic tip. Furthermore, in *Neobrettus* there is a curious minute delicate apophysis (Fig. 24D) which could be a degenerate auxilliary process similar to that of *Brettus*. If this is correct then the case for a *Brettus/Neobrettus* dichotomy is marginally stronger than that between *Cyrba* and *Neobrettus*.

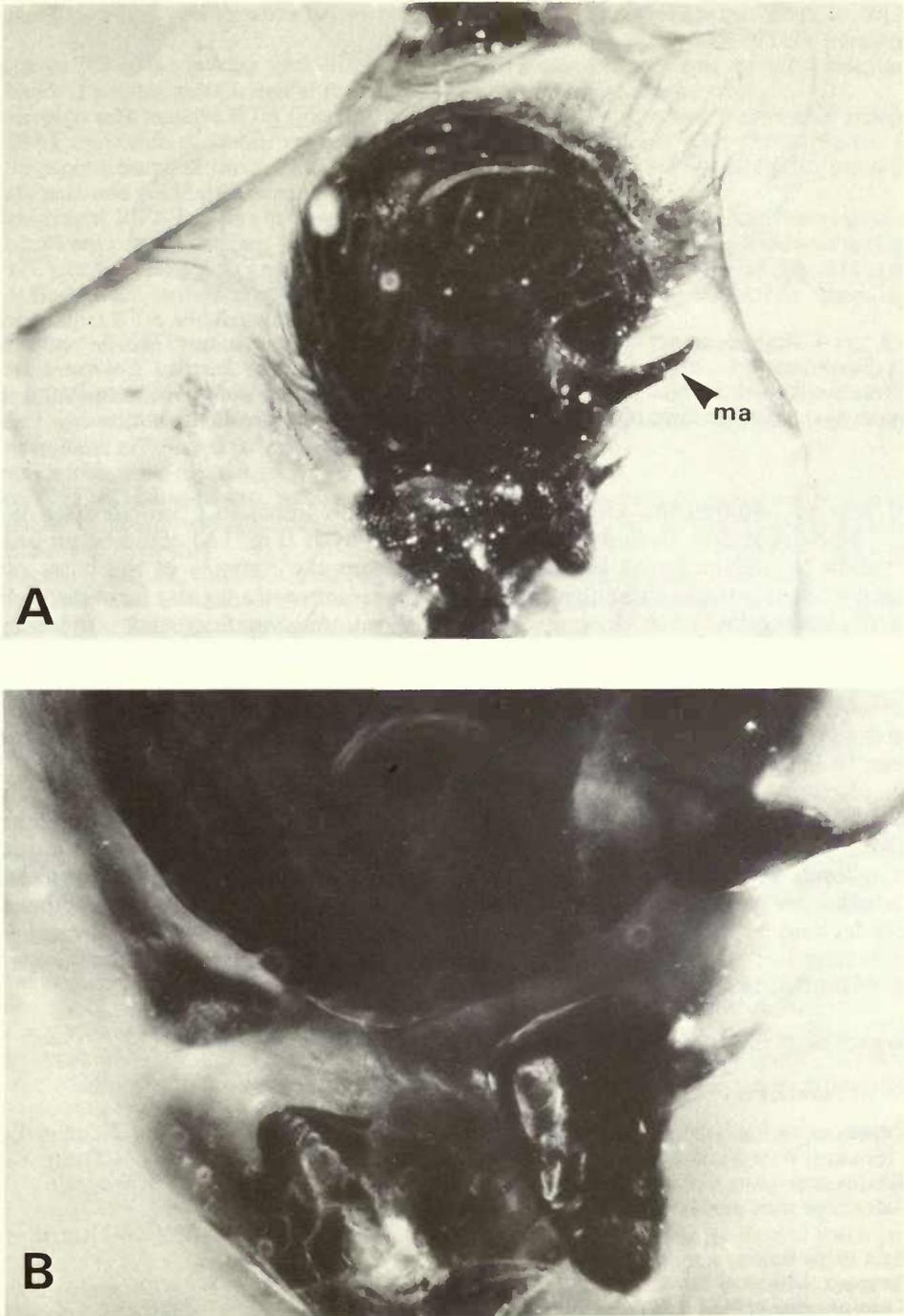
The subapical prolateral origin of the embolus and to a lesser degree the distally sinuous element of the seminal ducts suggests that these genera share affinities with *Portia* and *Phaeacius* and that together they may form a natural group within the subfamily.

*Phaeacius*—*Portia*. Whereas *Phaeacius* possesses several uniquely derived characters (pronounced pars pendula, massive retrolateral tibial apophyses and a long filamentous process  $M_1$ ), *Portia* is, in spite of its distinctive appearance, more difficult to characterise on the same basis. The lateral projecting embolus (Fig. 29A, D) and the large dorsal angular flange on the cymbium being the only synapomorphies which I can suggest at the present time. The well developed tufts and fan-like fringes characteristic of all *Portia* species are probably symplesiomorphic for as mentioned above elements of this ornamentation appear to a lesser extent in other genera.

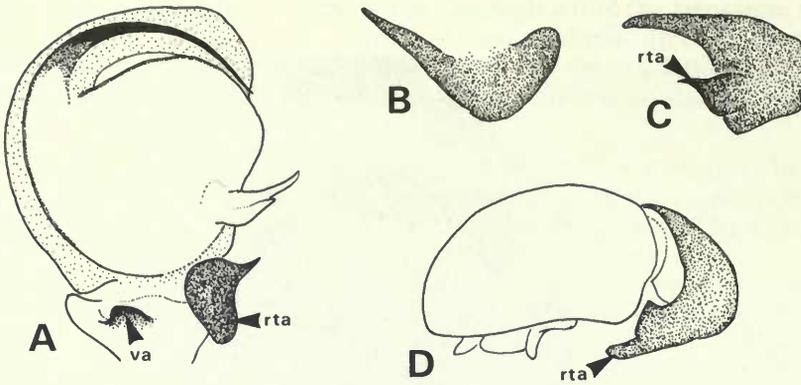
Their affinities are uncertain for, apart from general similarities in the conformation of the palpal organs, the only derived character which seems to link *Phaeacius* and *Portia* is the large size of the palps. A feature which alone offers only minimal support for the supposed relationship.

### Fossil genera

Some of the amber salticids described by Petrunkevitch (1924) are preserved in a mixture of clarite and mineral oil on microscope slides in the collections of the British Museum (Natural History). They are neat and well documented, but an examination of this material has shown that important genitalic characters are largely obscured and not a single species could be reliably placed in the Spartaeinae as defined here. However, the condition of one slide labelled *Eolinus succineus* Petrunkevitch, no. 3782, offered a partial solution to the problem as a fracture line through the amber block indicated that it might be possible to expose the palps which were totally obscured by a crushed carapace. The specimen, originally described as badly damaged (Petrunkevitch, 1942; 424) was easily removed from its clarite mount and cleaned in xylene; pressure from a fine scalpel being sufficient to fracture the block which broke into several pieces revealing a dark, but nevertheless well preserved palp (Fig. 1A–B). This clearly shows that the specimen is not conspecific with *E. succineus* (Fig. 2D) and neither does it entirely agree with published figures of *E. theryi* Petrunkevitch, or *E. tystschenkoi* Prószyński & Zabka. It may represent a new taxon, but of more importance is the fact that the palp appears to possess a median apophysis which looks similar



**Fig. 1** (A–B) Palp in amber labelled *Eolinus succineus* Petrunkevitch, no. 3782: A, ventral view, note lighter region at base of median apophysis; B, tibia showing ventral and retrolateral apophyses. Abbreviation: ma, median apophysis.



**Fig. 2** (A–C) Palp in amber labelled *Eolinus succineus* Petrunkevitch, no. 3782: A, ventral view; B, tibia, dorsal; C, tibiae, retrolateral. D, palp in amber also labelled *Eolinus succineus* Petrunkevitch—slide no. 29126-A, androtype. Note distinct forms of retrolateral tibial apophyses. Abbreviations: rta, retrolateral tibial apophysis, va, ventral apophysis.

to and may be homologous with the median apophysis found in *Cocalodes* (see Wanless, 1982). The paler region around the base of the apophysis (Fig. 1A) could be an artifact of preservation in amber, but it is believed to represent the remains of the basal pleating, characteristic of some median apophyses. There is no evidence of a tegular furrow which could admittedly be overlooked as the palp is dark. Other interesting features are the dorsal and retrolateral apophyses (Figs 1B; 2A–C), the latter resembling that of *Gelotia* in general form. In addition there is a small ventral apophysis (Fig. 1B) not unlike that found in species of Spartaeinae. In spite of these similarities the absence of a tegular furrow excludes this taxon from this subfamily, its affinities together with those of *E. theryi* and *E. tystschenko*i probably lie closer to the *Cocalodes*-group.

The relationships of other fossil genera (see Table 2) placed in this subfamily (Petrunkevitch, 1958) have been discussed by Prószyński (1980) and for the present no formal changes are proposed. However, as most recent genera believed to show affinities with amber salticids will have been revised in the fairly near future, a decision should be made as to whether we can justify removing the palps of type specimens from their amber blocks. Modern techniques, considerably less crude than that described above, will minimise the risk of damage but it is clear that unless male palps are examined properly amber specimens will be of limited taxonomic value.

**Key to genera of the subfamily Spartaeinae**

Females of *Taraxella* are unknown.

- 1 Habitus as in Fig. 24A; highest point of carapace clearly near centre of thoracic part (Fig. 24B) (Bhutan; West Malaysia) . . . . . *NEOBRETTUS* gen. n. (p. 181)
- Habitus otherwise; highest point of carapace at about level of posterior median eyes . . . . . 2
- 2 Male palps with massive apophyses ‘x’ and ‘y’ (Fig. 7G) (Sarawak) . . . . . *TARAXELLA* gen. n. (p. 155)
- Male palps lacking apophyses ‘x’ and ‘y’ . . . . . 3
- 3 Carapace with low elevation in eye region (Fig. 22A, B); male RTA with sinuous finger-like protuberance (Fig. 22C) (Australia; Indonesia) . . . . . *COCALUS* Koch (p. 180)
- Carapace lacking low elevation in eye region; palpal RTA otherwise . . . . . 4
- 4 Male palpal patellae and femora with opposing retrolateral apophyses (Fig. 27B, D); epigyne with median guide as in Fig. 27E; (South Africa) . . . . . *VEISSELLA* gen. n. (p. 189)
- Male palpal patellae and femora lacking retrolateral apophyses (see note 1); epigynal guide otherwise or lacking . . . . . 5

- 5 Male palpal tibiae with flask-like vacuole giving rise to tubular process adjacent to or separate from RTA (Fig. 23D, F); Epigynes with long median introductory ducts; carapace with broad marginal bands of silky white hairs (see note 2) (Burma; India; Madagascar; Sulawesi; Sri Lanka) . . . . . **BRETTUS** Thorell (p. 181)
- Male palpal tibiae lacking flask-like vacuole and tubular process; epigyne otherwise; carapace bands if present more irregular (c.f. *Portia*) and comprised of coarser setae . . . . . 6
- 6 Male palp with massive RTA (Fig. 28C); distal haematodocha with long filamentous process (Fig. 28A); underside of female coxae IV clothed in minute spatulate setae (Nepal; India; Burma; Singapore; Sumatra; Java; Philippines) . . . . . **PHAEACIUS** Simon (p. 190)
- Male palp and coxae otherwise . . . . . 7
- 7 Male palpal RTA cap-like in ventral aspect (Figs 17D; 18D; 19F; 20I), sometimes possessing a backward pointing syringe-like apophysis (Fig. 21I); epigynes with thin median ridge (Figs 16F; 17C), or if lacking then apparently with two pairs of rounded spermathecae (Fig. 21C) (see note 3) (Indonesia; Malaysia) . . . . . **GELOTIA** Thorell (p. 169)
- Male palpal RTA and female epigyne otherwise . . . . . 8
- 8 Posterior median eyes small (PM:PL about 1:4) (Ethiopian, Mediterranean and Oriental Regions) . . . . . **CYRBA** Simon (p. 185)
- Posterior median eyes relatively large (PM:PL about 3:4) . . . . . 9
- 9 Legs I with stiff fan-like fringes or if lacking (one Madagascan species) then palpal cymbium with deep basal excavation (see note 4) . . . . . 10
- Legs I without fan-like fringes . . . . . 11
- 10 Very hirsute, abdomen with tufts; anterior eye row weakly to strongly procurved in frontal view; palpal cymbium with pronounced dorsobasal flange (Fig. 29C, E) (Australasian, Oriental and Ethiopian Regions) . . . . . **PORTIA** Karsch (p. 191)
- Moderately hirsute, abdomen clothed in minute, often iridescent setae; anterior eye row weakly to strongly recurved in frontal view; palpal tibiae with apophyses arising from membranous socket (Fig. 26F) (Africa; Madagascar) . . . . . **MELEON** gen. n. (p. 186)
- 11 Tibiae of legs I with numerous long ventral spines (Fig. 5C); chelicerae with 5 or 6 *promarginal* teeth . . . . . **SPARTAEUS** Thorell (p. 147)
- Tibiae of legs I with ventral, lateral and usually dorsal spines (see note 5); chelicerae with 3 teeth on prolateral margin . . . . . 12
- 12 Male palp with stout RTA, bulbous tegulum and pleated tegular ledge ( $M_3$ ) (Fig. 6E, J); female epigyne with median blackish red copulatory openings (Fig. 6I) (Japan) . . . . . **YAGINUMANIS** gen. n. (p. 152)
- Male palps with RTA's slender (Figs 8F, 11B, 13B), ramose (Fig. 14B) or bifid (Figs 9C; 12D); tegular element ( $M^3$ ) a delicate transparent ledge (Fig. 8H) or lobe (Fig. 9C), rarely sclerotised (Fig. 14B); epigynes with rounded spermathecae (Figs 8D; 10F; 12B; 15A) and more or less central copulatory openings (Indonesia; Malaysia) . . . . . **MINTONIA** gen. n. (p. 157)

### Notes on the keys

1. The male palpal femora of *Gelotia argenteolimbata* (Simon) possesses a large ventral apophysis (Fig. 18C), which may initially be confused with that of *Veissella durbanii* (Peckham & Peckham).
2. It is not certain if silky white carapace bands are present in *Brettus celebensis* (Merian) and *B. madagascarensis* (Peckham & Peckham) which are known only from type specimens. However they are characteristic of Indian and Sri Lankan species and their presence may help to place females in the correct genus.
3. The epigyne of *Mintonia syringopalpis* sp. n., appears at first sight to possess two pairs of spermathecae, but in reality the anterior pair are looped parts of the introductory ducts.
4. *Meleon madagascarensis* (Wanless) is the only species of the genus without leg fringes. The palp is however quite distinctive and unlikely to be confused with any other (see Wanless, 1978).
5. Females of *Yaginumanis sexdentatus* (Yaginuma) have a single median prolateral spine on tibiae I which could easily be overlooked.

### Genus *SPARTAEUS* Thorell

*Boethus* Thorell, 1878: 220. Type species *Boethus spinimanus* Thorell, by original designation and monotypy [junior homonym of *Boethus* Foerster, 1868]. Scudder, 1882, 1: 46; 2: 40. Peckham & Peckham, 1885: 268, 295. Simon, 1901: 400, 401, 402. Petrunkevitch, 1928: 181. Neave, 1939, 1: 444. Roewer, 1954: 933. Bonnet, 1955: 892. Wanless, 1978: 85.

*Spartaeus* Thorell, 1891: 137. Type species *Spartaeus gracilis* Thorell, by original designation and monotypy. Simon, 1901: 401, 402 [= *Boethus*]. Waterhouse, 1902: 347. Petrunkevitch, 1928: 246. Neave, 1940, IV: 230.

*Nealces* Simon, 1900: 30. Type species *Nealces striatipes* Simon, by original designation. Simon, 1901: 400, 403 [= *Boethus*]. Waterhouse, 1902: 236. Petrunkevitch, 1928: 234. Neave, 1940, III: 273.

*Boethuola* Strand, 1929: 15 [replacement name for *Boethus* Thorell]. Bonnet, 1955: 892.

**DEFINITION.** Medium to large spiders ranging from about 4.0 to 8.5 mm in length. Sexual dimorphism not marked, patterns (Figs 4A; 5A) fairly well defined, first pair of legs with numerous long ventral spines on tibiae.

*Carapace* (Figs 3D; 4B; 5B): moderately high, longer than broad, widest at level between coxae II and III: fovea long and sulciform, apex just behind or level with posterior margins of posterior lateral eyes. *Eyes*: with moderately large lenses set on pronounced tubercles; anteriors subcontiguous with apices slightly recurved in frontal view and recurved in dorsal; anterior medians largest; anterior laterals greater than half diameter of anterior medians; posterior medians relatively large, positioned closer to and inside optical axis of anterior laterals; posterior laterals as large as anterior laterals and set well inside lateral margins of carapace when viewed from above; posterior ocular quadrangle broader than long and wider behind; entire quadrangle occupying about 52 per cent of carapace length. *Clypeus*: moderately low. *Chelicerae*: moderately robust with lateral condyles sometimes strong; inclined anteriorly; parallel or slightly diverging; fang moderately long and curved; promargin with five or six teeth, retromargin with seven to eleven denticles. *Maxillae*: moderately long, slightly diverging with rounded outer distal margins. *Labium*: about as long as broad, half or slightly less than half maxillae length. *Sternum* (Fig. 4D): elongate scutiform. *Abdomen*: elongate ovoid; spinnerets moderately long; posteriors slender and longer than robust anteriors, medians slender and slightly shorter than anteriors. *Legs*: long and slender; first pair with numerous long ventral spines on metatarsi and tibiae, other leg spines weaker; males with femoral organs, a minute tubercle on underside of femora I (Figs 3E; 30A–D); claws pectinate; tufts present; scopulae lacking, but legs I with minute setae (c.f. *Portia*) covering venter of tarsi and forming two rows on metatarsi. *Female palps*: moderately robust with apical claw. *Male palps*: moderately complex with poorly developed interlocking protuberances; patellae with rudimentary anterodorsal tubercle; tibiae with dorso-prolateral tubercle, a slight dorso-retrolateral flange, ventral and retrolateral apophyses, the latter broad with ventral spike; cymbium extended and narrowing distally with apical scopulae and slight retrolateral lobe; embolus moderately long, slender and curved; distal haematodocha forming a membraneous patch  $M_1$  and a translucent prong  $M_2$  containing a sclerotised rod-like structure; tegulum bulbous with peripheral seminal ducts, a short filamentous process  $M_3$  and a crescent-shaped furrow almost completely obscured by the tegulum (Fig. 3A, B); median haematodocha a short broad membraneous tube visible only in expanded palp; subtegulum a pleated and partly sclerotised disc at distal end of basal haematodocha. *Epigyne*: variable, refer to species descriptions.

**DIAGNOSIS.** From other genera in the subfamily by details of the secondary genitalia and presence of numerous ventral spines on the tibiae of legs I (Figs 3E; 5C). The two known species are easily separated from one another and a key is hardly necessary.

### *Spartaeus spinimanus* (Thorell)

(Figs 3A–F; 4A–G; 30A–D; 33F; 35A)

*Boethus spinimanus* Thorell, 1878: 221, 309, juvenile. Holotype juvenile Amboina, (MCSN, Genova) [examined]. Thorell, 1881: 431, 705. Simon, 1901: 401, 402. Petrunkevitch, 1928: 181. Roewer, 1954: 933. Bonnet, 1955: 893.

*Spartaeus gracilis* Thorell, 1891: 6, 137, ♂. Holotype ♂, Sumatra, (UZM, København) [examined]. Roewer, 1954: 933.

*Sparthaeus gracilis*: Bonnet, 1955: 893 [lapsus calami].

*Boethus gracilis* (Thorell): Simon, 1901: 402. Reimoser, 1925: 90. Roewer, 1954: 933. Bonnet, 1955: 893. Prószyński, 1971: 385. **Syn. n.**

*Nealces striatipes* Simon, 1900: 30, ♂. LECTOTYPE ♂ (here designated) Java, (MNHN, Paris) [examined]. Roewer, 1954: 933. Bonnet, 1955: 893.

*Boethus striatipes* (Simon): Simon, 1901: 401, 402. Roewer, 1954: 933. Bonnet, 1955: 893. Prószyński, 1971: 385. **Syn. n.**

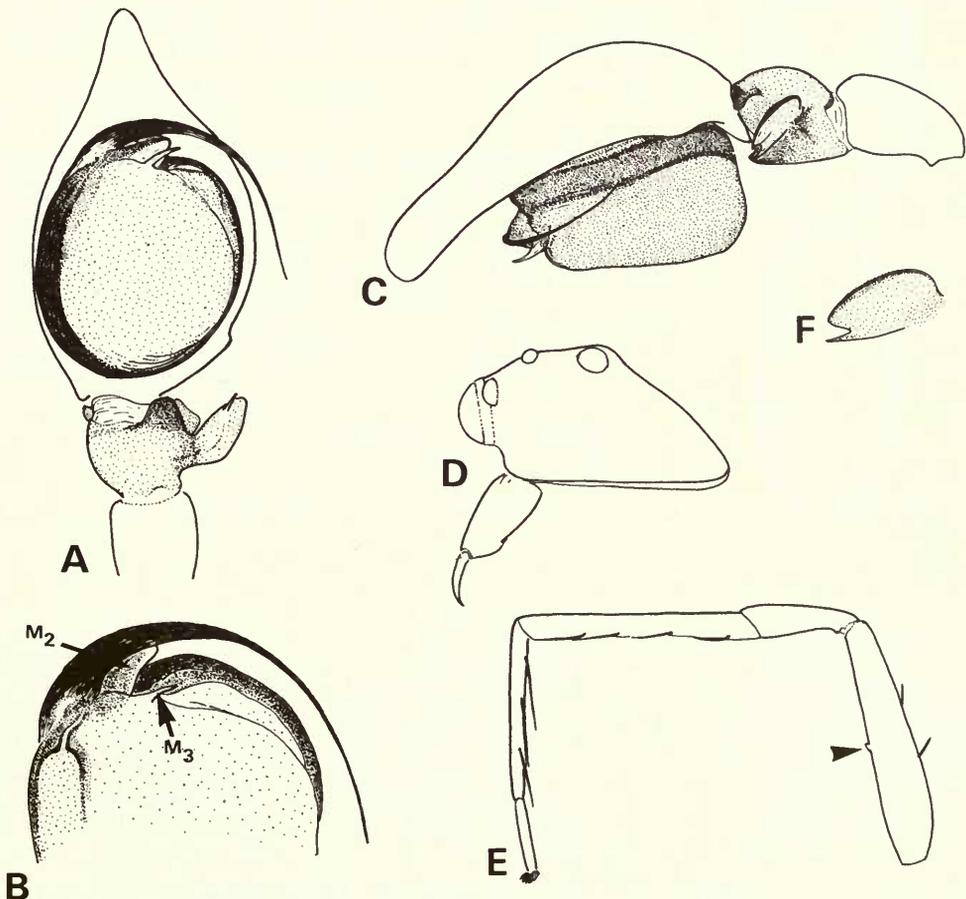
*Nealces caligatus* Simon, 1900: 30, ♀. LECTOTYPE ♀ (here designated) Sri Lanka, (MNHN, Paris) [examined]. Roewer, 1954: 933. Bonnet, 1955: 893.

*Boethus caligatus* (Simon): Simon, 1901: 401, 402. Roewer, 1954: 933. Bonnet, 1955: 893. Prószyński, 1971: 385. **Syn. n.**

**REMARKS.** The general habitus and distinctive spination of legs I suggests that the juvenile type specimen of *Boethus spinimanus* is conspecific with and a senior synonym of *Spartaeus gracilis*. However, in the case of juveniles there is always an element of uncertainty which cannot be overcome until the species and its geographical distribution are well known. Of the other taxa listed in the above synonymy there is no doubt that they are conspecific as the habitus and distinctive secondary genitalic organs are alike.

**DIAGNOSIS.** *S. spinimanus* is easily distinguished from *S. thailandica* sp. n. by the presence of median epigynal guides in females (Fig. 4E). Males of *thailandica* are unknown.

*Male* from Sarawak, in fair condition. *Carapace* (Fig. 3D): light brown with blackish mottling on sides and a central tapering yellow-brown band on thoracic part; clothed in recumbent



**Fig. 3** *Spartaeus spinimanus* (Thorell), ♂: A, palp, ventral; B, distal half of tegulum; C, palp, retrolateral; D, carapace, lateral; E, leg I; F, retrolateral tibial apophysis.

brown and whitish hairs, shiny under some angles of illumination. *Eyes*: with black surrounds; fringed by whitish hairs. *Clypeus*: thinly clothed in light brown and whitish hairs. *Chelicerae*: yellow-brown with sooty markings and scattered fine brown hairs; promargin with five teeth, retromargin with seven denticles. *Maxillae and labium*: pale yellow-brown. *Sternum*: pale yellow-brown with darker margins; shiny with scanty clusters of short stiff light brown hairs opposite coxae. *Coxae*: pale yellow-brown, shiny. *Abdomen*: yellow-brown with blackish lateral mottling; dorsum and sides covered in fine recumbent pale brown/iridescent lanceolate hairs with testaceous ones on venter; anal tubercle and spinnerets pale yellow, the latter with sooty lateral stripes on anterior and posterior pairs. *Legs*: long and slender with numerous spines (strongest on legs I) and femoral organ, a small tubercle on underside of femoral I (Figs 3E; 30A-D); legs I with tarsi pale yellow, metatarsi, tibiae and patellae yellow-brown tinged black on lateral sides, femora pale yellow with black lateral stripes; other legs similar, but with longitudinal bands of short pale amber hairs particularly on femora, and vague sooty annuli on metatarsi III and IV. Spination of legs I: metatarsi v 2-2-2; tibiae 3-4-3; femora p 0-1-0, d 1-1-2, r 0-1-0. *Palp* (Figs 3A-C; 33F; 35A).

*Dimensions* (mm): total length 4.7; carapace length 2.08, breadth 1.72, height 1.28; abdomen length 2.56; eyes, anterior row 1.54, middle row 1.12, posterior row 1.39; quadrangle

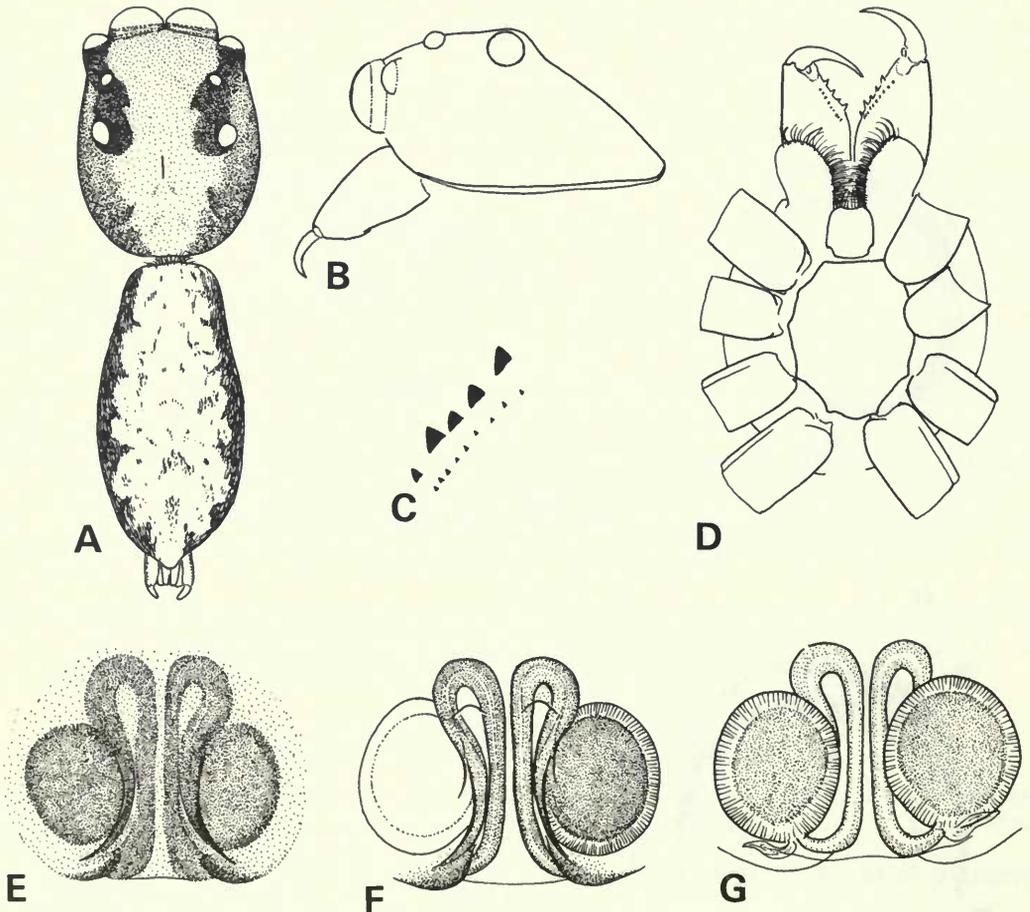


Fig. 4 *Spartaeus spinimanus* (Thorell), ♀: A, dorsal; B, carapace, lateral; C, cheliceral teeth, inner view; D, mouthparts, sternum and coxae; E, epigyne; F, vulva, outer view; G, vulva, inner view.

length 1.2 (57 per cent of carapace length). *Ratios*: AM:AL:PM:PL::12.5:7.5:4.5:7; AL-PM-PL::6.5:8; AM:CL::12.5:3.

*Female* from Java (in same vial as lectotype ♂ of *Nealces striatipes*), in fair condition. Similar to ♂ except for the following: colour markings more clearly defined, possibly an artifact of preservation. *Chelicerae* (Fig. 4C): more robust than in ♂; orange-brown with sooty markings; sparsely clothed in brownish hairs; promargin with five teeth, retromargin with nine denticles. *Abdomen* (Fig. 4A): pale yellow clothed in creamy white hairs with vague sooty markings above and blackish mottling covered in dark amber hairs on sides; below, an indistinct band of short pale amber hairs from epigyne to spinnerets. *Legs*: legs and especially spines of legs I more robust than in ♂; legs I pale yellow with sooty metatarsi, other legs similar, but metatarsi with vague annuli. *Palps*: yellow-brown with tarsi orange-brown tinged black distally; clothed in pale yellowish, and light amber hairs. *Epigyne* (Figs 4E-G): dark reddish brown, relatively large.

*Dimensions* (mm): total length 5.44; carapace length 2.42, breadth 2.04; height 1.4; abdomen length 3.12; eyes, anterior row 1.8, middle row 1.38, posterior row 1.68; quadrangle length 1.28 (52 per cent of carapace length). *Ratios*: AM:AL:PM:PL::15:9:5:8.5; AL-PM-PL::7-10; AM:CL::15:3.

VARIATION. ♂ total length varies from 4.2 to 5.8 mm, carapace length 2.0-2.5 mm (five specimens). ♀ total length 5.4-6.3 mm, carapace length 2.38-2.5 mm (five specimens). One male, the type of *N. striatipes*, has a dark orange carapace with the thoracic band poorly defined, also the distal extension of the cymbium is slightly more elongate and narrow. In some males the seminal duct is more clearly defined in the region of the embolic base.

DISTRIBUTION. Indonesia: Amboina, Java and Sumatra; Malaysia: Sarawak; Singapore; Sri Lanka.

MATERIAL EXAMINED. **Amboina**: holotype [of *Boethus spinimanus*], a juvenile, (MCSN, Genova). **Java**: Palabuan, lectotype ♂ [of *Nealces striatipes*], 2♀♀ not types, *Fruhstorfer* (MNHN, Paris, 20328). **Sumatra**: Padang, holotype ♂, [of *Spartaeus gracilis*], *P. A. Klein*, (UZM, København); Padang, 1♀, ix.1913, *E. Jacobson*, (RNH, Leiden, 540). **Sarawak**: Marudi, on outside wall of house, 1♂, 26.iv.1978, *F. R. Wanless*, R.G.S./Sarawak Government Mulu Expedition, (BMNH). **Singapore**: 1♂, *H. N. Ridley*, (BMNH). **Malaya**: 1♂, 1♀, no other data, (BMNH). **Sri Lanka**: Galle, lectotype ♀, [of *Nealces caligatus*], with one juvenile specimen, *E. Simon*, (MNHN, Paris, 20537).

### *Spartaeus thailandica* sp. n.

(Fig. 5A-D)

DIAGNOSIS. Distinguished from *S. spinimanus* by the absence of pronounced median epigynal guides (Fig. 5D).

*Male*. Unknown.

*Female holotype*, in poor condition. *Carapace* (Fig. 5A, B): dark mahogany with light yellow-brown thoracic markings and more or less contiguous lateral blotches; thinly clothed in recumbent fine whitish hairs. *Eyes*: with blackish surrounds except anterior medians; fringed by whitish hairs. *Clypeus*: with scattered light brown hairs. *Chelicerae*: dark mahogany, shiny with scattered dark brown hairs; promargin with six teeth, retromargin with 11. *Maxillae*: amber with inner distal margins yellow-brown. *Labium*: brown-black grading to amber distally. *Sternum*: yellow-brown with dark amber margins; clothed in pale yellow-brown hairs. *Coxae*: yellow-brown. *Abdomen*: dirty pale yellow-brown with blackish markings, ventrally a broad sooty band from epigyne to spinnerets; mostly rubbed, but areas clothed in fine whitish hairs with scattered flecks of pale amber ones. *Legs*: long and slender; legs I (Fig. 5C), pale yellow-brown with metatarsi and tibiae dark amber and ventrally strongly spinose; legs II similar but metatarsi and tibiae paler with fewer and weaker ventral spines; other

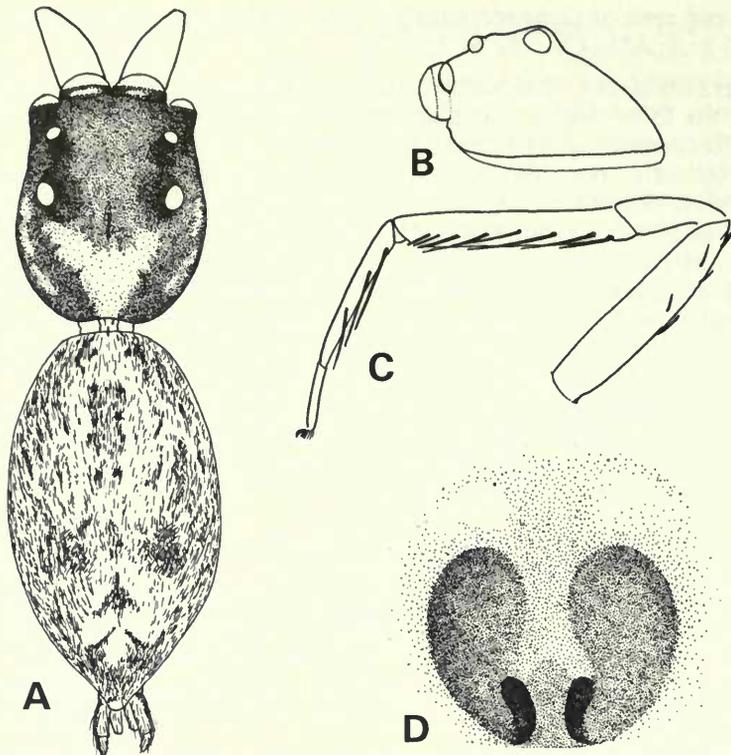


Fig. 5 *Spartaeus thailandica* sp. n., holotype ♀: A, dorsal; B, carapace, lateral; C, leg I; D, epigyne.

legs pale yellow-brown with vague sooty annuli. Spination of legs I: metatarsi v 2-2-1, p 0-0-1; tibiae v 6-4-6; femora p 0-1-1, d 0-2-1. *Palps*: pale yellow with dark amber tarsi and tibiae. *Epigyne* (Fig. 5D): thinly clothed in fine hairs, vulva not examined.

*Dimensions* (mm): total length 8.4; carapace length 3.2, breadth 2.72, height 2.08; abdomen length 5.08; eyes, anterior row 2.44, middle row 1.96, posterior row 2.18; quadrangle length 1.64 (51 per cent of carapace length). *Ratios*: AM:AL:PM:PL::18:11:8:11; AL-PM-PL::8-15; AM:CL::18:5.

**DISTRIBUTION.** Thailand.

**MATERIAL EXAMINED.** **Thailand:** Dui Sutep, 1100 m, holotype ♀, 13.i.1959 (*B. Degerbøl*) (UZM. København, Pr. 2110).

#### Genus *YAGINUMANIS* gen. n.

**DEFINITION.** Medium to large spiders ranging from about 7.0 to 9.6 mm in length. Sexual dimorphism not marked, patterns fairly well defined (Fig. 6A).

*Carapace* (Fig. 6A, C): moderately high, longer than broad, widest at level between coxae II and III; fovea long and sulciform, apex almost level with posterior margin of posterior lateral eyes. *Eyes*: with moderately large lenses set on moderately pronounced tubercles; anteriors subcontiguous with apices more or less level in frontal view and moderately recurved in dorsal; anterior medians largest; anterior laterals more than half diameter of anterior medians; posterior medians relatively large, positioned closer to and more or less on optical axis of anterior laterals; posterior laterals as large as anterior laterals and positioned inside lateral margins of carapace when viewed from above; posterior ocular quadrangle broader than long and wider behind; entire quadrangle about 45 per cent of carapace

length. *Clypeus*: of medium height. *Chelicerae*: moderately robust with strong lateral condyles; more or less parallel and slightly inclined anteriorly; fang moderately robust and curved; promargin with three teeth, retromargin with five or six denticles. *Maxillae*: moderately long, slightly diverging with outer distal margins rounded. *Labium*: about as long as broad and about half maxillae length. *Sternum* (Fig. 6D): elongate scutiform. *Abdomen*: elongate ovoid with four indistinct apodemal spots; spinnerets moderately long, posteriors moderately robust and slightly longer than robust anteriors, medians slender and shorter than anteriors. *Legs*: moderately long and slender, in females first pair slightly more robust; spines numerous and moderately strong; claws pectinate, tufts present; scopulae absent. *Male palps*: fairly large, dark and moderately complex with poorly developed interlocking protuberances; patellae with rudimentary anterodorsal tubercle; tibiae with robust ventral and retrolateral apophyses, the latter bearing a strong lobe; cymbium with distal scopulae, a small basal tubercle and slight lobe on retrolateral margin; embolus short, slender and arising distally; distal haematodocha a membranous patch ( $M_1$ ); tegulum bulbous with peripheral seminal ducts a pleated distal element  $M_2$  and an irregular sclerotised pit-like furrow; median haematodocha, subtegulum and basal haematodocha not examined. *Epigyne*: moderately distinct and protruding with some frilling anteriorly; median openings obscured by blackish red surrounds; introductory ducts short, wide and poorly defined; spermathecae also ill-defined, somewhat pear-shaped with posterior portion partly rolled-up and bearing fertilisation ducts.

TYPE SPECIES. *Boethus sexdentatus* Yaginuma.

ETYMOLOGY. Named in honour of Dr Takeo Yaginuma; the gender is masculine.

DIAGNOSIS. From other genera in the subfamily by details of the secondary genitalia (Fig. 6E, G-I, J) and geographical distribution.

*Yaginumanis sexdentatus* (Yaginuma) comb. n.  
(Fig. 6A-J)

*Boethus sexdentatus* Yaginuma, 1967: 54, holotype ♀, paratype ♂, Ohtemon-Gakuin University, Osaka [not examined]. Shinkai & Hara, 1975: 16. Matsumoto, Shinkai & Ono, 1976: 95; Yaginuma, 1977: 398.

DIAGNOSIS. By geographical distribution, the structure of the palp in males (Fig. 6E, J) and by the presence of dark reddish copulatory openings on the posterior margin of the protruding epigynal plate in females (Fig. 6I).

REMARKS. Yaginuma's original description is excellent and the species is redescribed here only for the sake of completeness.

*Male* from Idzu, in fair condition. *Carapace*: cephalic part and thoracic sides dark amber lightly tinged and mottled black with middle of thorax paler, more or less as in (Fig. 6A); clothed in fine whitish hairs with brownish ones on sides. *Eyes*: with black surrounds except anterior medians; fringed by whitish hairs. *Clypeus*: clothed in fairly coarse pale amber hairs and edged with scattered long brownish ones. *Chelicerae*: orange-brown with sooty markings on basal and middle regions; thinly clothed in long fine whitish, and pale brown hairs; promargin with three teeth, retromargin with five or six denticles. *Maxillae and labium*: yellow-brown with inner distal margins of maxillae and labial tip whitish. *Sternum*: pale yellow-brown with slightly darker margins; thinly clothed in fine pale hairs. *Coxae*: pale yellow-brown. *Abdomen*: generally pale yellow-brown with vague sooty markings; dorsum clothed in recumbent fine whitish hairs interspersed with scattered stiff pale amber ones, upper sides clothed in short dark brownish hairs forming a pattern as shown in (Fig. 6A), lower sides clothed in fine whitish hairs with venter dark greyish clothed in fine pale amber ones; spinnerets yellow-brown with some black on outer sides of anteriors and posteriors. *Legs*: generally yellow-brown with indistinct annuli on metatarsi III and IV; spines moderately strong and numerous. Spination of legs I: metatarsi v 2-2-2, p 0-0-1, r 0-0-1; tibiae

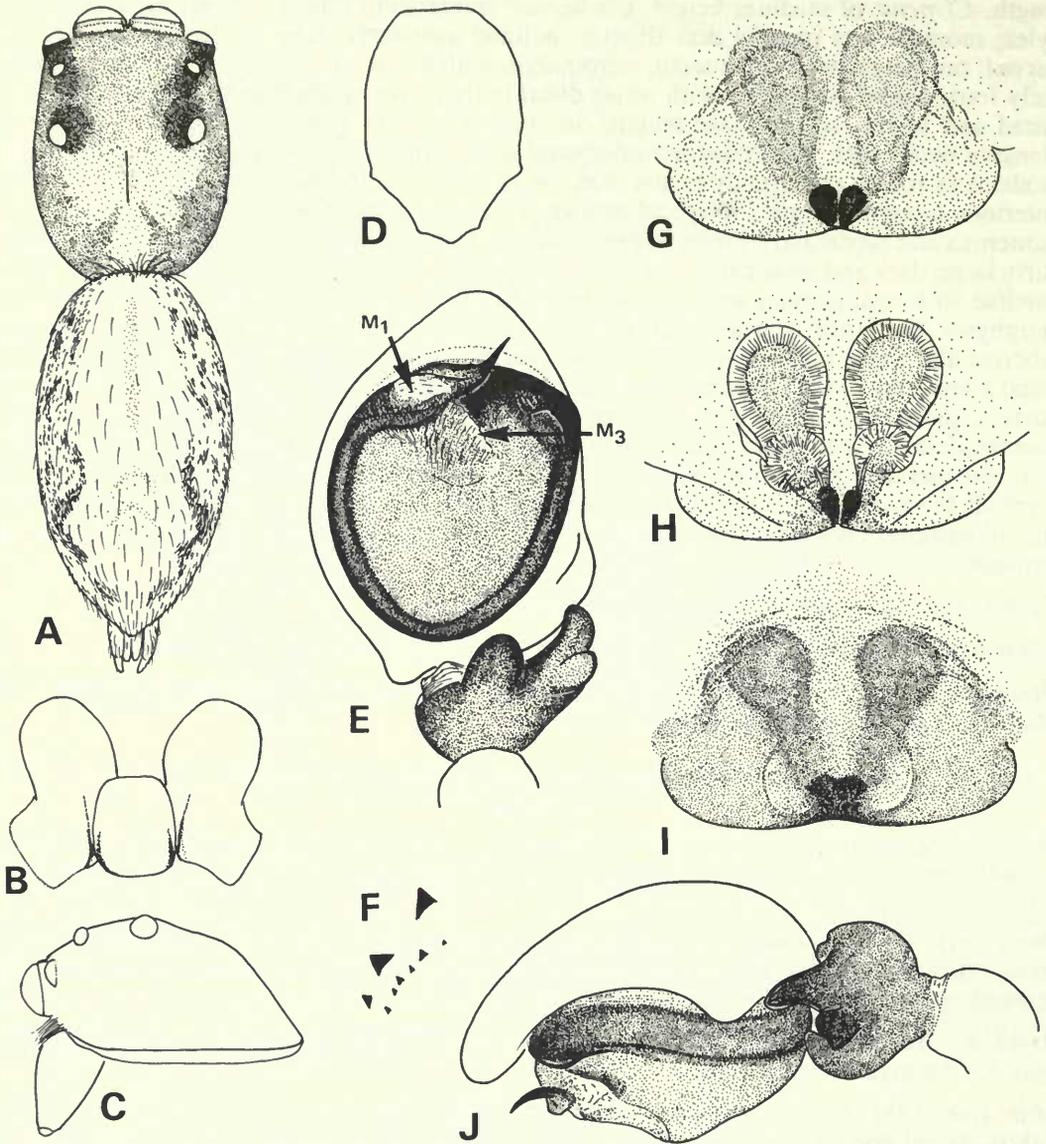


Fig. 6 *Yaginumanis sexdentatus* (Yaginuma), ♂: E, palp, ventral; F, cheliceral teeth, inner view; J, palp, retrolateral; ♀: A, dorsal; B, maxillae and labium; C, carapace, lateral; D, sternum; G, vulva, outer view; H, vulva inner view; I, epigyne.

v 2-2-2, p 0-1-1, d 1-1-0, r 0-1-1; patellae p 0-1-0, r 0-1-0; femora p 0-0-1, d 0-2-4. *Palp* (Fig. 6E, J).

*Dimensions* (mm): total length 6.96; carapace length 3.12, breadth 2.32, height 1.64; abdomen length 3.8; eyes, anterior row 1.98, middle row 1.74, posterior row 1.84; quadrangle length 1.36 (43 per cent of carapace length). *Ratios*: AM: AL: PM: PL :: 15.5: 9: 6.5: 9; AL-PM-PL :: 8-12; AM: CL :: 15.5: 6.

*Female* from Idzu, in fair condition. Essentially similar to ♂ except for the following: *Carapace*: with paler indistinct and uneven marginal band from clypeus to level of coxae II-III. *Clypeus*: clothed in long white hairs. *Chelicerae*: amber with median sooty transverse band;

shiny; thinly clothed in fine pale amber hairs; promargin with three teeth retromargin with five. *Legs*: spination of legs I: metatarsi v 2-2-2; tibiae v 2-2-2, p 0-1-0; femora p 0-0-1, d 0-2-3. *Palps*: femora and patellae yellow-brown with whitish hairs, tibiae and tarsi yellow-brown with yellow-brown hairs. *Epigyne* (Figs 6G-I): clothed in fine whitish hairs.

*Dimensions* (mm): total length 7.12; carapace length 3.08, breadth 2.36, height 1.68; abdomen length 4.12; eyes, anterior row 2.04, middle row 1.76, posterior row 1.91; quadrangle length 1.4 (45 per cent of carapace length). *Ratios*: AM:AL:PM:PL::15.5:9:6.5:9; AL-PM-PL::7-12; AM:CL::15.5:6.

VARIATION. Another ♂ measures 6.3 mm total length, 2.76 mm carapace length, while ♀♀ vary from 6.96 to 9.6 mm total length, 2.84-3.16 mm carapace length (seven specimens).

DISTRIBUTION. Japan.

MATERIAL EXAMINED. **Japan**, Idzu, Shizuoka Prefecture (nr. Mt. Fuji), 2♂♂, 7♀♀, (purchased from S. Akiyama, 5.vi.1910) (BMNH. 1911.12.12.208-366 part).

### Genus *TARAXELLA* gen. n.

DEFINITION. Spiders of medium size, i.e. between 4.0 and 8.0 mm in length. Males with conspicuous markings (Fig. 7A), but extent of sexual dimorphism unknown.

*Carapace* (Fig. 7A, B): high, longer than broad, widest at level of coxae II; fovea long and sulciform, apex level with centre of posterior median eyes; clearly marked with broad encircling band. *Eyes*: with large lenses set on moderately well developed tubercles; anteriors contiguous with apices weakly procurved in frontal view and moderately recurved in dorsal; anterior medians largest; anterior laterals more than half diameter of anterior medians; posterior medians relatively large, positioned slightly closer to and more or less on optical axis of anterior laterals; posterior laterals as large as anterior laterals and positioned inside lateral margins of carapace when viewed from above; posterior ocular quadrangle broader than long and wider behind; entire quadrangle about 57 per cent of carapace length. *Chlypeus*: moderately high. *Chelicerae*: moderately robust; inclined anteriorly and slightly divergent; fang moderately slender and curved; promargin with six or seven teeth, retromargin with eight or nine denticles. *Maxillae*: moderately long, more or less parallel with outer distal margins rounded. *Labium*: longer than broad and about half maxillae length. *Sternum* (Fig. 7E): elongate scutiform. *Abdomen*: elongate avoid; spinnerets moderately long, posteriors moderately robust and more or less as long as robust anteriors, medians slender and slightly shorter than anteriors. *Legs*: moderately long and slender; spines numerous and moderately strong; claws pectinate; tufts present; scopulae absent. *Female palps*: unknown. *Male palps*: moderately large and complex with dorsal interlocking tubercle and recess on tibiae/cymbial joint; femora slightly bowed; patellae with slight anterodorsal tubercle; tibiae slightly excavated retrolaterally, with anterodorsal tubercle, a large ventral apophysis and retrolateral apophysis bearing a lightly sclerotised flange, also, between ventral and retrolateral apophyses a tuft of stout setae; cymbium with distal scopulae and basal depression opposite tibial anterodorsal tubercle; embolus short, slender and arising apically, but largely hidden by apophysis 'x' and anterior margin of tegular furrow; distal haematodocha forming a white membraneous area M<sub>1</sub> bearing a large delicate fan-shaped process, another membraneous region (?) M<sub>2</sub> lies between apophyses 'x' and 'y'; tegulum bulbous with peripheral seminal ducts looping distally, massive apophyses 'x' and 'y' the latter possibly homologous with M<sub>3</sub> and a heavily sclerotised crescent-shaped furrow; median haematodocha, subtegulum and basal haematodocha not examined. *Epigynes*: unknown.

TYPE SPECIES. *Taraxella solitaria* sp. n.

ETYMOLOGY. The genus name is an arbitrary combination of letters; the gender is considered to be feminine.

DIAGNOSIS. Distinguished from other genera in this subfamily by the presence of palpal apophyses 'x' and 'y' (Fig. 7G) and encircling carapace band (Fig. 7A).

*Taraxella solitaria* sp. n.  
(Fig. 7A-G)

DIAGNOSIS. By the broad encircling carapace band and massive palpal tegular apophyses 'x' and 'y' (Fig. 7G).

*Female*. Unknown.

*Male holotype*, in good condition. *Carapace* (Fig. 7A, B): orange-brown suffused and mottled black with broad encircling creamy white band; irregularly clothed in dark amber hairs, mostly rubbed, with a few fine whitish ones in the encircling band. *Eyes*: with black surrounds except anterior medians; fringed by amber hairs with whitish ones around anteriors. *Clypeus*: pale yellow with broad vertical black bands below anterior median eyes; shiny. *Chelicerae*: amber suffused and mottled black with inner basal region grading to yellow-brown; shiny; thinly clothed in brownish hairs; promargin with six or seven teeth, retro-margin with eight or nine. *Maxillae and labium* (Fig. 7D): yellow-brown. *Sternum*: (Fig. 7E): pale yellow with darker margins; thinly clothed in brownish hairs. *Coxae*: pale yellow-brown, anteriors faintly tinged with some black. *Abdomen*: yellow-brown tinged and mottled black; clothed in dark amber hairs particularly on sides; spinnerets whitish yellow with

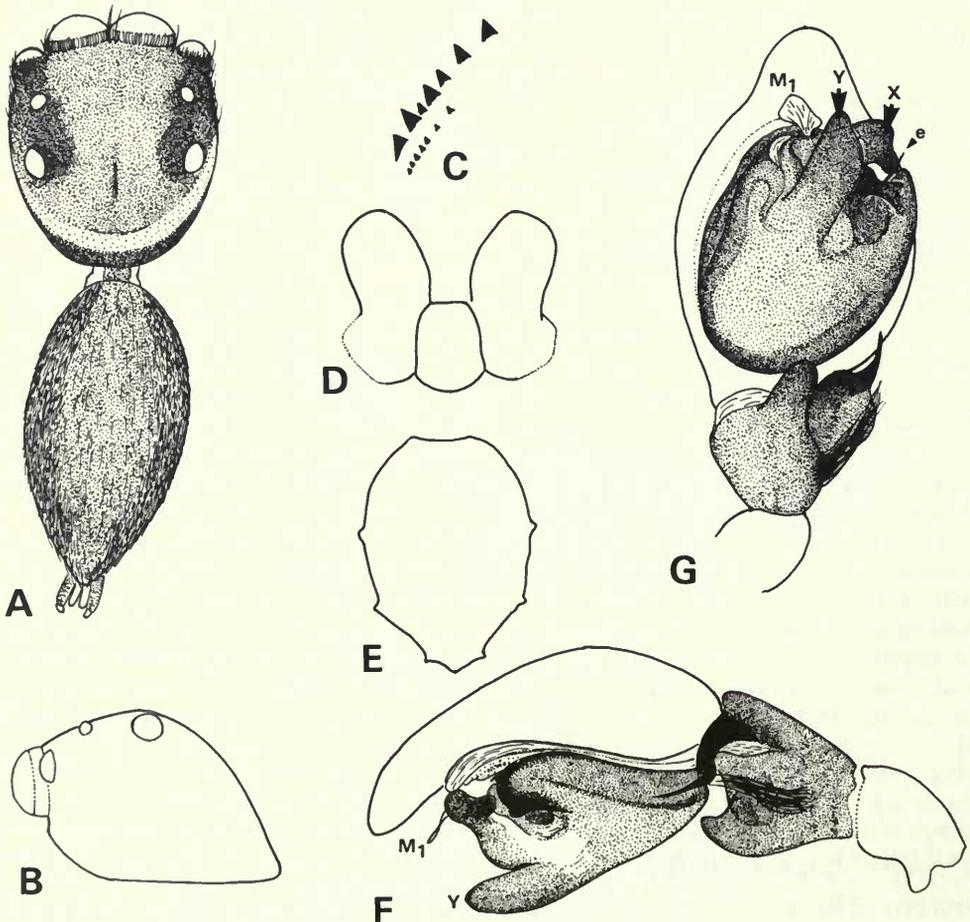


Fig. 7 *Taraxella solitaria* sp. n., holotype ♂: A, dorsal; B, carapace, lateral; C, cheliceral teeth, inner view; D, maxillae and labium; E, sternum; F, palp, retrolateral; G, palp, ventral. Abbreviation: e, embolus.

anterior and posterior tibiae tinged black. *Legs*: moderately long and slender with numerous spines; generally yellow-brown with blackish femora and vague blackish annuli on metatarsi and tibiae. Spination of legs I: metatarsi v 2-1-1, p 1-2-1, d 0-0-2, r 1-0-0; tibiae v 2-2-2, p 1-0-1, d 2-1-0, r 0-0-1; patellae p 0-1-0; femora d 0-2-4. *Palp* (Fig. 7F, G): the embolus can be seen just protruding beyond the edge of apophysis 'x' (arrowed, Fig. 7G).

*Dimensions* (mm): total length 6.0; carapace length 2.64; breadth 2.16, height 1.88; abdomen length 3.2; eyes, anterior row 2.18, middle row 1.8, posterior row 2.04; quadrangle length 1.52 (57 per cent of carapace length). *Ratios*: AM:AL:PM:PL::18:10:6:10; AL-PM-PL::9-9.5; AM:CL::18:6.

**DISTRIBUTION.** East Malaysia, Sarawak.

**MATERIAL EXAMINED.** Sarawak, Gunung Mulu National Park, Melinau Gorge, under dead wood in limestone forest, holotype ♂, 1.v.1978 (F. R. Wanless, R.G.S./Sarawak Government Expedition) (BMNH, 1982.1.11.1).

### Genus *MINTONIA* gen. n.

**DEFINITION.** Spiders small to medium in size, i.e. total length between 2.0 and 8.0 mm. Markings sometimes distinctive, but extent of sexual dimorphism uncertain as most species only known from one sex.

*Carapace*: moderately high, longer than broad, widest at level between coxae II-III: fovea long and sulciform, apex near centre or posterior margin of posterior lateral eyes. *Eyes*: with moderately large lenses set on low tubercles; anterior more or less contiguous with apices level or slightly procurved in frontal view and moderately recurved in dorsal; anterior medians largest; anterior laterals greater than half diameter of anterior medians; posterior medians relatively large, positioned closer to and on or near optical axis of anterior laterals; posterior laterals about as large as anterior laterals and set inside lateral margins of carapace when viewed from above; posterior ocular quadrangle broader than long and wider behind; entire quadrangle occupying between 48 and 62 per cent of carapace length. *Clypeus*: low to moderately high. *Chelicerae*: small to medium in size, slightly more robust in female; slightly inclined anteriorly and more or less parallel; fang moderately strong and curved; promargin with three teeth, retromargin with five to seven denticles. *Maxillae*: moderately long, generally parallel with rounded outer distal margins. *Labium*: as long as broad or slightly longer than broad, about half maxillae length. *Sternum* (Figs 8B; 10E): more or less elongate scutiform. *Abdomen*: elongate ovoid; spinnerets moderately long, posteriors slender and sometimes longer than robust anteriors, medians slender and slightly shorter than anteriors. *Legs*: moderately long and slender, first and second pairs slightly more robust in females; males usually with femoral organ, a minute amber spot or tubercle on underside of femora I; spines numerous and moderately strong; claws pectinate; tufts present, scopulae absent. *Female palps*: moderately robust with distal claw. *Male palps*: moderately complex and interspecifically distinct, moderately hirsute with dorsal interlocking tubercles weak or lacking on cymbial/tibial joint and weak to pronounced on patellae; tibiae more or less excavated retrolaterally with moderately large ventral apophyses and complex retrolateral apophyses of various forms, some with secretory openings; cymbium with distal scopulae, sometimes modified distally to accommodate embolic region or basally to protect retrolateral apophysis; embolus of various forms arising apically; distal haematodocha forming poorly defined membrane region  $M_1$  which is often only apparent in prolateral view, region  $M_2$  either apparently lacking or bearing a slender delicate process (Fig. 8H); tegulum usually subovoid with peripheral seminal ducts, a delicate translucent ledge or lobe-like process  $M_3$  rarely sclerotised, and usually with a small lightly sclerotised crescent-shaped furrow; median haematodocha a membrane sac only evident in expanded palps, subtegulum a ring-like sclerite at distal end of basal haematodocha (examined only in *M. ramipalpis*). *Epigynes*: interspecifically distinct; sometimes with anterolateral frilling; opening positioned centrally with or without a short median septum and sometimes with sclerotised posterior margin;

introductory ducts not evident; spermathecae rounded with fertilisation ducts on posterior margins.

TYPE SPECIES. *Mintonia tauricornis* sp. n.

ETYMOLOGY. The genus name is an arbitrary combination of letters; the gender is considered to be feminine.

DIAGNOSIS. Males by the development of the palpal tegular ledge  $M_3$ , e.g. (Figs 8H; 9C; 12E; 14B). Females with more difficulty by details of the epigynes.

### Key to species of *Mintonia*

Males (those of *nubilis* unknown)

- 1 Embolus with pronounced basal prong (Fig. 11C arrowed) (Singapore) . . . . . *protuberans* sp. n. (p. 162)
- Embolus without basal prong . . . . . 2
- 2 RTA long and sinuous with short lateral prong (Fig. 14B) (Java, Sarawak, Sumatra) . . . . . *ramipalpis* (Thorell) (p. 166)
- RTA otherwise . . . . . 3
- 3 RTA comprised of two long slender prongs (Fig. 9C) (Kalimantan). . . . . *mackiei* sp. n. (p. 160)
- RTA otherwise . . . . . 4
- 4 RTA with lateral lobe or condyle (Fig. 13B arrowed) (Sarawak) . . . . . *melinauensis* sp. n. (p. 165)
- RTA otherwise . . . . . 5
- 5 RTA long slender and curving (Fig. 8F) (Sarawak) . . . . . *tauricornis* sp. n. (p. 158)
- RTA robust, distally bifid (Fig. 12D) (Sarawak) . . . . . *breviramis* sp. n. (p. 164)

Females (those of *mackiei*, *melinauensis* and *protuberans* are unknown)

- 1 Epigyne with thin dark median ridge (Fig. 10F) (Kalimantan). . . . . *nubilis* sp. n. (p. 161)
- Epigyne without thin dark median ridge. . . . . 2
- 2 Epigynal opening with blackish T-shaped mark or blotch (Fig. 15A) (Java, Sarawak, Sumatra) . . . . . *ramipalpis* (Thorell) (p. 168)
- Epigynal opening without T-shaped mark or blotch . . . . . 3
- 3 Posterior rim of epigynal opening resembling buffalo horns (Fig. 8D) (Sarawak) . . . . . *tauricornis* sp. n. (p. 159)
- Posterior rim of epigynal opening tube-like and curving (Fig. 12B) (Sarawak) . . . . . *breviramus* sp. n. (p. 165)

### *Mintonia tauricornis* sp. n. (Figs 8A–H; 32E, F; 35B)

DIAGNOSIS. Distinguished by the curved retrolateral tibial apophysis in males (Figs 8F, H), and by the horn-like rim of the epigynal opening in females (Fig. 8D).

*Male holotype*, in fair condition. *Carapace* (Fig. 8G): dark orange-brown lightly tinged black in eye region with vague yellowish brown markings on thoracic part; shiny and weakly iridescent under some angles of illumination; irregularly clothed in recumbent black lanceolate hairs on sides of thorax, otherwise rubbed. *Eyes*: with black surrounds except anterior medians; ventral rim of anterior row fringed by whitish hairs, otherwise rubbed. *Clypeus*: yellow-brown edged black; thinly covered in light brownish hairs below anterior medians with dense fringes of long white hairs below anterior laterals and outer margins of anterior medians which sweep inwards covering cheliceral bases. *Chelicerae*: yellow-brown, shiny; basal half densely white haired; promargin with three teeth retromargin with seven. *Maxillae and labium*: pale yellow-brown lightly tinged with some black. *Sternum*: shape more or less as in ♀; pale yellow with darker margins; thinly clothed in fine hairs. *Coxae*: pale yellow. *Abdomen*: similar to ♀, but more slender; pale yellow; rubbed. *Legs*: moderately long and slender with numerous spines and minute pale amber spot (femoral organ) on under side

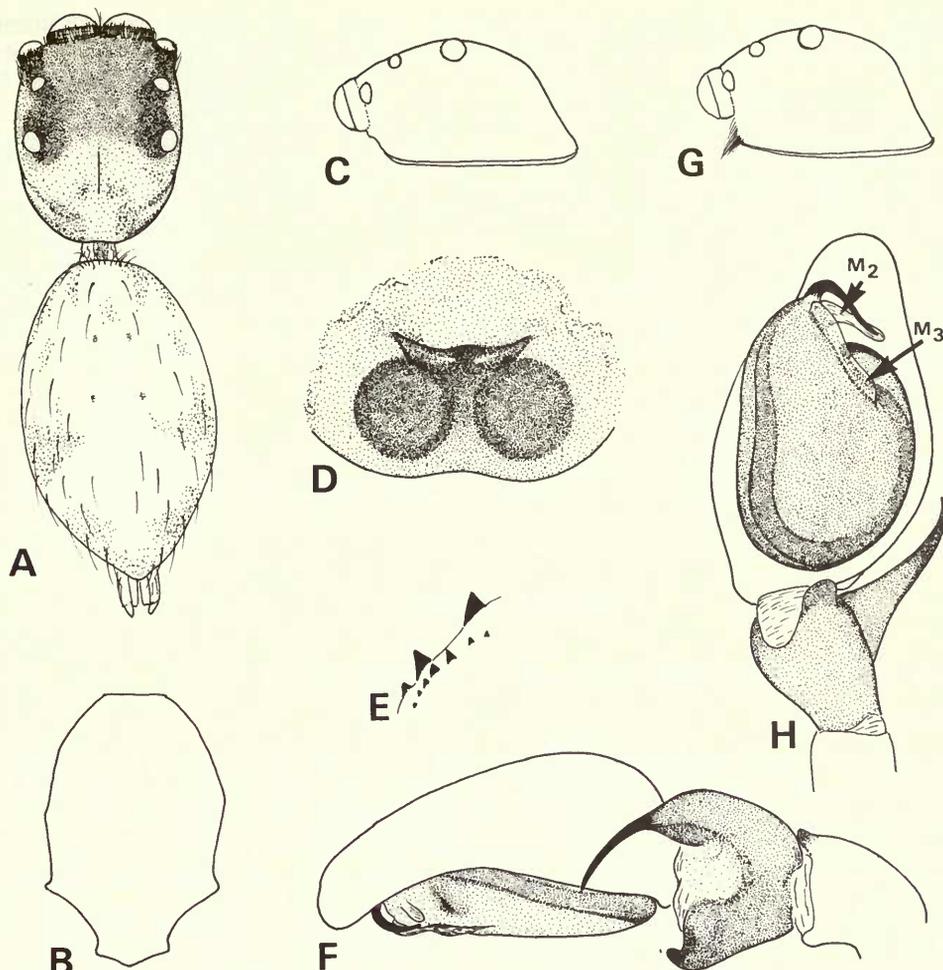


Fig. 8 *Mintonia tauricornis* sp. n., holotype ♂: F, palp, retrolateral; G, carapace, lateral; H, palp, ventral. Paratype ♀: A, dorsal; B, sternum; C, carapace, lateral; D, epigyne; E, cheliceral teeth, inner view.

of femora I; generally yellow-brown becoming darker distally except for femora I which is suffused with black and tibiae III which has a black proventral stripe. Spination of legs I: metatarsi v 2-2-0, p 1-0-1, d 0-1-0, r 1-0-1; tibiae v 2-3-2, p 0-1-0, d 3-3-0; patellae p 0-1-0, r 0-1-0; femora d 0-2-4. *Palp* (Figs 8F, H; 32E, F; 35B): the lobe  $M_2$  is not as conspicuous as illustrated.

*Dimensions* (mm): total length 4.48; carapace length 2.04, breadth 1.8, height 1.4; abdomen length 2.44; eyes, anterior row 1.68, middle row 1.44, posterior row 1.64; quadrangle length 1.24 (60 per cent of carapace length). *Ratios*: AM:AL:PM:PL::13.5:8:4.8:7.5; AL-PM-PL::7.5-10; AM:CL::13.5:5.

*Female paratype*, in fair condition. *Carapace* (Fig. 8A, C): eye region amber tinged black, sides and thorax pale yellow with blackish markings; shiny and weakly iridescent under some angles of illumination; rubbed. *Eyes*: generally as in ♂. *Clypeus*: fringed by long white hairs below anterior median eyes. *Chelicerae*: yellow-brown, shiny with scattered yellow-brown hairs along inner margins; promargin with three teeth, retromargin with six or seven (Fig. 8E). *Maxillae and labium*: as in ♂. *Sternum* (Fig. 8B): as in ♂. *Coxae*: pale yellow. *Abdomen*:

whitish grey with sooty markings; rubbed. *Legs*: moderately long and slender with numerous spines; light yellow-brown grading to yellow-brown distally. Spination of legs I: metatarsi v 2-2-0, p 1-0-1, d 0-2-2, r 1-0-1; tibiae v 2-3-2, p 1-1-0, d 0-1-0, r 1-1-0; patellae p 0-1-0, r 0-1-0; femora d 0-2-4. *Epigyne* (Fig. 8D): clothed in fine golden hairs.

*Dimensions* (mm): total length 5.76; carapace length 2.2, breadth 1.84, height 1.4; abdomen length 3.36; eyes, anterior row 1.76, middle row 1.53, posterior row 1.74; quadrangle length 1.29 (58 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 14 : 8 : 5.5 : 8; AL-PM-PL :: 8-9.5; AM CL :: 14 : 2.

VARIATION. A paratype ♂ measures 4.48 mm total length, 2.12 mm carapace length. The carapace is clothed in scattered pale amber hairs above, while the abdomen has poorly defined blackish markings, as in ♀, with fine recumbent pale golden hairs and scattered stiff brownish ones.

DISTRIBUTION. Malaysia: Sarawak.

MATERIAL EXAMINED. Sarawak, Gunung Mulu National Park, (F. R. Wanless, R.G.S./Sarawak Government Expedition): holotype ♂, paratype ♀, Melinau Gorge, on limestone cliff, 9.v.1978. (BMNH. 1981.11.5.1-2); paratype ♂, Gunung Mulu, summit helicopter pad, on shrubs, 2275 m. 29.v.1978 (BMNH. 1981.11.5.3).

*Mintonia mackiei* sp. n.

(Fig. 9A-D)

DIGNOSIS. By the elongate bifid retrolateral tibial apophysis (Fig. 9C, D).

*Female*. Unknown.

*Male holotype*, in good condition. *Carapace* (Fig. 9A): yellow-brown faintly tinged black; clothed in recumbent light and dark brownish hairs with central white haired stripe from level of posterior median eyes to posterior thoracic margin. *Eyes*: with blackish surrounds except anterior medians; fringed by light brownish hairs with whitish ones around lower rims of anteriors. *Clypeus*: clothed in long white hairs. *Chelicerae*: pale yellow-brown with black markings; shiny with scattered stiff brownish hairs; promargin with three teeth, retromargin with four or five. *Maxillae and labium*: whitish yellow faintly tinged black. *Stenum*: pale yellow tinged black, somewhat stippled; shiny with scattered light amber hairs. *Coxae*: pale yellow-brown; shiny. *Abdomen*: clothed above in recumbent dark brown hairs with two white haired stripes followed by series of five white spots posteriorly; venter greyish yellow thinly covered in brown and whitish hairs; spinnerets pale yellow-brown with basal segments of anteriors tinged black. *Legs*: moderately long and slender with numerous spines and minute light brownish spot (femoral organ) on under side of femora I; yellow-brown, clothed in dark brown hairs, forming stripes on femora, with somewhat incomplete bands of whitish hairs on patellae, tibiae and metatarsi. Spination of legs I: metatarsi v 2-0-0, p 1-1-1, d 0-2-1, r 1-1-2; tibiae v 2-2-2, p 2-0-1, d 1-1-0, r 2-0-1; patellae p 0-1-0, r 0-1-0; femora d 0-1-4, p 0-0-1. *Palp* (Fig. 9C, D): lobe M<sub>2</sub> evidently lacking; tegular furrow a lightly sclerotised groove (arrowed, Fig. 9C); tibia deeply excavated.

*Dimensions* (mm): total length 3.68; carapace length 1.66, breadth 1.44, height 1.0; abdomen length 1.88; eyes, anterior row 1.44, middle row 1.19, posterior row 1.32; quadrangle length 1.04 (62 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 11 : 7 : 5 : 6.6; AL-PM-PL :: 6-7; AM : CL :: 11 : 3.5.

DISTRIBUTION. Indonesia: Kalimantan.

MATERIAL EXAMINED. Borneo, Kalimantan, rig 8, on road between Balikpapan and Samboja, holotype ♂, 6.iii.1976, (R. Thomson) (BMNH. 1981.11.5.4).

REMARKS. The prongs of the retrolateral tibial apophysis may each possess a distal opening,

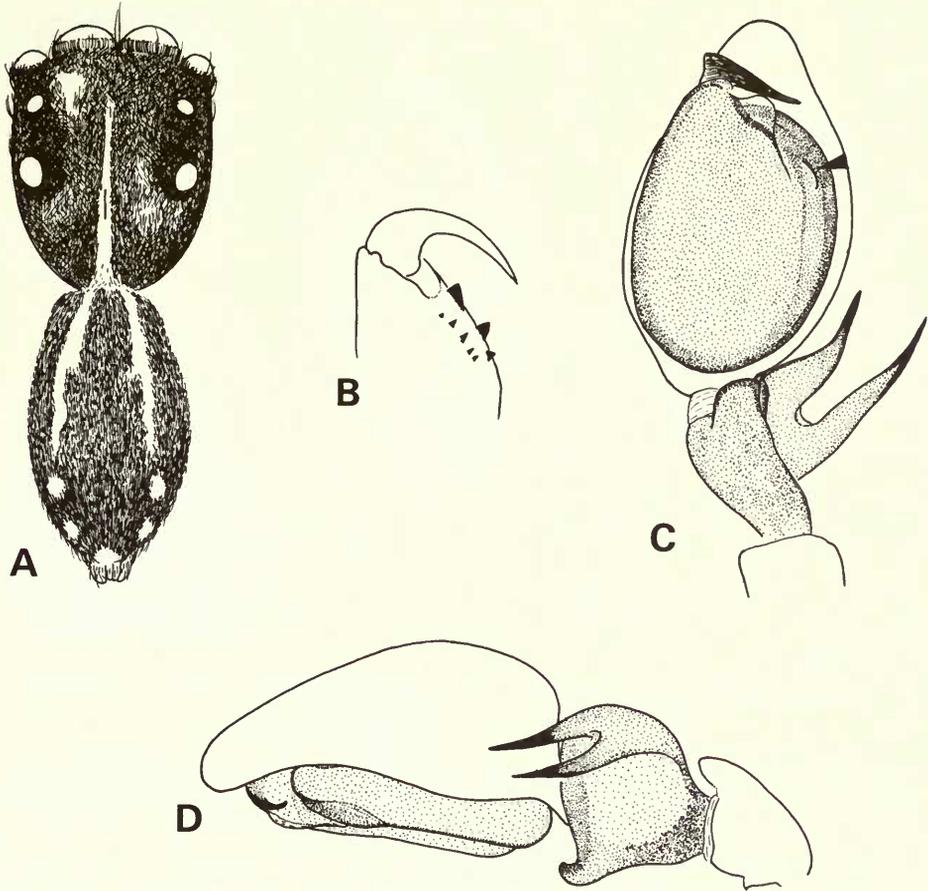


Fig. 9 *Mintonia mackiei* sp. n., holotype ♂: A, dorsal; B, cheliceral teeth, inner view; C, palp, ventral; D, palp, retrolateral.

for the posterior prong (Fig. 9C) contains an amorphous substance for part of its length, while the other appears to contain a duct, possibly an artifact, under certain angles of illumination.

ETYMOLOGY. Named in honour of Mr D. W. Mackie, Stockport, Cheshire.

*Mintonia nubilis* sp. n  
(Fig. 10A–F)

DIAGNOSIS. By the thin median epigynal ridge (Fig. 10F).

*Male*. Unknown, but see remarks below.

*Female holotype*, in fair condition. *Carapace* (Fig. 10A, B): dark brown suffused and mottled with black; irregularly clothed in light amber hairs (rubbed) with fine black hairs on thoracic sides; on thoracic margins from coxae I to IV a narrow band of short white hairs; also on central part of thorax a few scattered white hairs possibly remains of a median stripe. *Eyes*: with black surrounds except anterior medians; generally fringed in amber hairs, but with white and amber ones on rims of anterior row. *Clypeus*: margin clothed in whitish and scattered black hairs with ill-defined oblique whitish bands converging between anterior median eyes; elsewhere thinly covered in light amber hairs. *Chelicerae*: yellow-brown suffused with some black; thinly clothed in scattered light brown hairs; promargin with three teeth, retro-

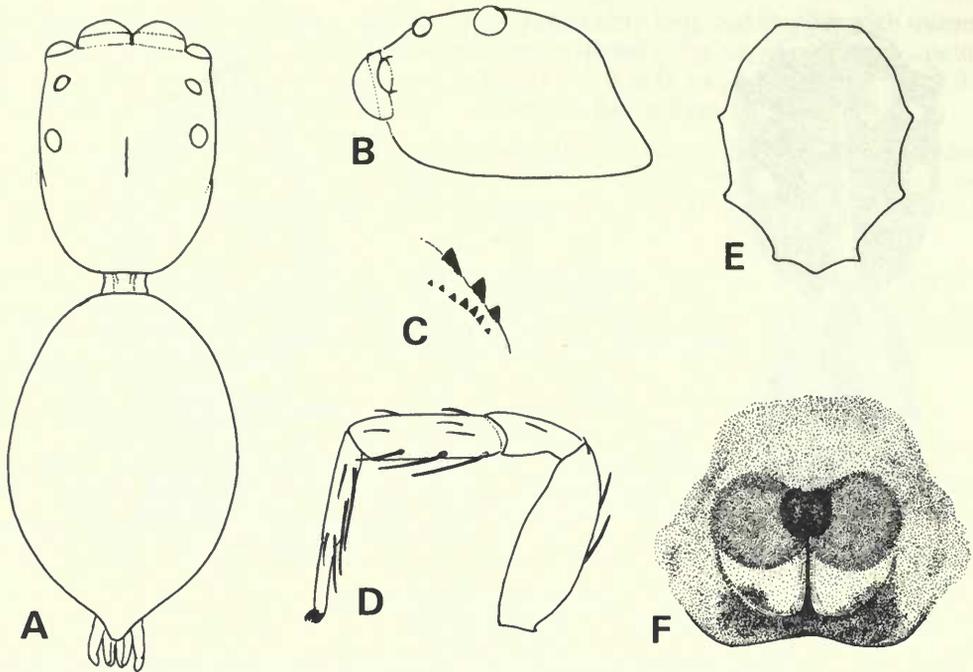


Fig. 10 *Mintonia nubilis* sp. n., holotype ♀: A, dorsal; B, carapace, lateral; C, cheliceral teeth, inner view; D, leg I; E, sternum; F, epigyne.

margin with seven (Fig. 10C). *Maxillae and labium*: yellow-brown lightly tinged with some black. *Sternum* (Fig. 10E): yellow-brown lightly suffused black; thinly clothed in fine pale brown hairs. *Coxae*: yellow-brown with sooty markings on lateral sides. *Abdomen*: mostly rubbed, original pattern lost; generally light greyish yellow with vague black markings; partly clothed in light brown and blackish hairs; spinnerets light yellow-brown tinged black on outer sides of anteriors and medians. *Legs*: moderately long and slender with numerous spines; generally light to dark yellow-brown with vague sooty markings except for femora I which are heavily suffused black and weakly iridescent violet under some angles of illumination. Spination of legs I: metatarsi v 2-2-0, p 1-0-1, d 0-2-2, r 1-0-1; tibiae v 2-2-2, r 1-0-1, d 1-1-0, p 2-0-1; patellae p 0-1-0, r 0-1-0; femora d 0-2-4. *Palps*: yellow-brown lightly tinged with some black; clothed in whitish and dark brown hairs. *Epigyne* (Fig. 10F): clothed in fine whitish hairs.

*Dimensions* (mm): total length c. 4.8 (pedicel stretched); carapace length 1.88; breadth 1.52, height 1.23; abdomen length 2.72; eyes, anterior row 1.44, middle row 1.26, posterior row 1.43; quadrangle length 1.0 (53 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 11 : 7 : 5 : 6; AL-PM-PL :: 6-8; AM : CL :: 11 : 4.

DISTRIBUTION. Indonesia: Kalimantan.

MATERIAL EXAMINED. **Borneo**: Kalimantan, Sepaku (Balikpapan), from a leaf, 16. vii. 1979, holotype ♀, (*P. R. Deeleman*) (RNH, Leiden).

REMARKS. This species represented by a single female may be conspecific with *M. mackiei*, known only from the male, but the presence of narrow white marginal bands on the carapace, lacking in *mackiei*, suggests that they are separate taxa and are treated as such for the present.

*Mintonia protuberans* sp. n.  
(Fig. 11A-F)

DIAGNOSIS. Readily by the prong arising from the base of the embolus (Fig. 11C, arrowed).

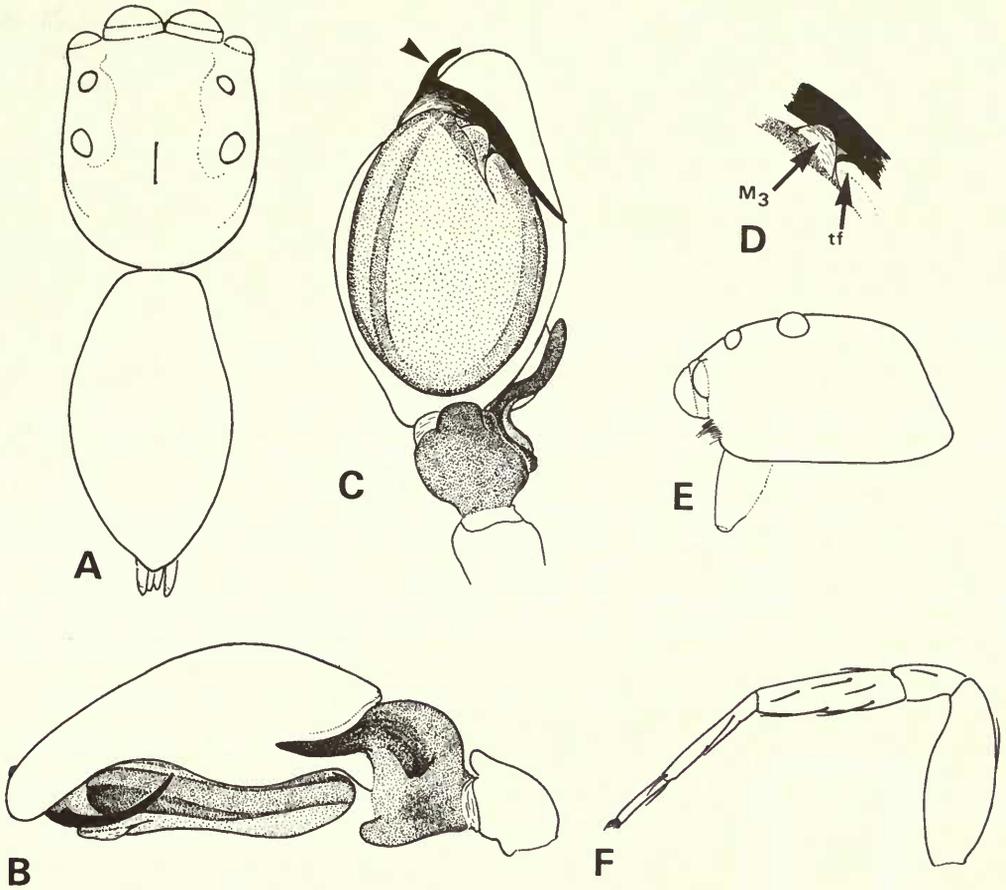


Fig. 11 *Minionia protuberans* sp. n., holotype ♂: A, dorsal; B, palp, retrolateral; C, palp, ventral; D, region M<sub>3</sub>; E, carapace, lateral; F, leg I. Abbreviation: tf, tegular furrow.

*Female.* Unknown.

*Male holotype*, in poor condition. *Carapace* (Fig. 11A, E): yellow-brown lightly tinged black with vague sooty markings on thoracic part; weakly iridescent green under some angles of illumination; irregularly clothed in recumbent light amber and whitish hairs (mostly rubbed) with thin marginal fringe of short white hairs. *Eyes*: with blackish surrounds; fringed by light amber hairs with whitish ones around lower rims of anterior medians and anterior laterals. *Clypeus*: white haired. *Chelicerae*: distally amber otherwise dark brown with sooty markings; promargin with three teeth retromargin with six. *Maxillae*: yellow-brown suffused with some black. *Labium*: yellow-brown tinged black with paler distal margin. *Sternum*: yellow-brown tinged black. *Coxae*: yellow-brown. *Abdomen*: amber faintly tinged black grading to greyish white posteriorly; rubbed, but with scattered patches of amber, and whitish hairs; spinnerets yellow-brown tinged black. *Legs*: broken, some missing; generally dark brownish with lighter annuli; sparsely clothed in whitish hairs on metatarsi and tibiae; femoral organ apparently lacking; spines strong and numerous. Spination of legs I: metatarsi v 2-1-1, p 1-1-1, d 0-2-2, r 1-1-1; tibiae v 2-2-2, p 0-1-1, d 1-1-0, r 0-1-1; patellae p 0-1-0, r 0-1-0; femora p 0-0-1, d 0-2-4. *Palp* (Fig. 11B-D): generally dark brown with whitish hairs on femora and patella and brownish ones on tibia and cymbium; the lobe M<sub>2</sub> is lacking.

*Dimensions* (mm): total length 4.6; carapace length 2.12, breadth 1.72, height 1.28; abdomen length 2.52; eyes, anterior row 1.64, middle row 1.36, posterior row 1.52; quadrangle length 1.10 (51 per cent of carapace length). *Ratios*: AM:AL:PM:PL::12.5:8:5:7; AL-PM-PL:7-8; AM:CL::12.5:c.3.5.

DISTRIBUTION. Singapore.

MATERIAL EXAMINED. Singapore: holotype ♂, (*H. N. Ridley*) (BMNH. 1981.11.5.6).

*Mintonia brevirus* sp. n.

(Fig. 12A-E)

DIAGNOSIS. By the stumpy embolus and form of the retrolateral tibial apophysis in males (Fig. 12D, E), and the curved tubular rim of the epigynal opening in females (Fig. 12B).

*Male holotype*, in fair condition. *Carapace*: orange-brown tinged black in eye region; irregularly clothed in brown, and whitish hairs, mostly rubbed. *Eyes*: with blackish surrounds except anterior medians; fringed by whitish hairs appearing light amber under some angles of illumination. *Clypeus*: tinged black with lateral sooty markings; thinly covered in light brown hairs. *Chelicerae*: orange-brown with sooty markings; shiny with scattered light brown hairs; promargin with three teeth, retromargin with six. *Maxillae, labium, sternum and coxae*: light yellow-brown. *Abdomen*: generally pale yellow-brown with black spots near bases of anterior spinnerets; mostly rubbed, otherwise clothed in short shiny light golden and amber hairs. *Legs*: moderately long and slender with numerous spines and slightly raised pore (femoral organ) on underside of femora I; generally light yellow-brown. Spinination of

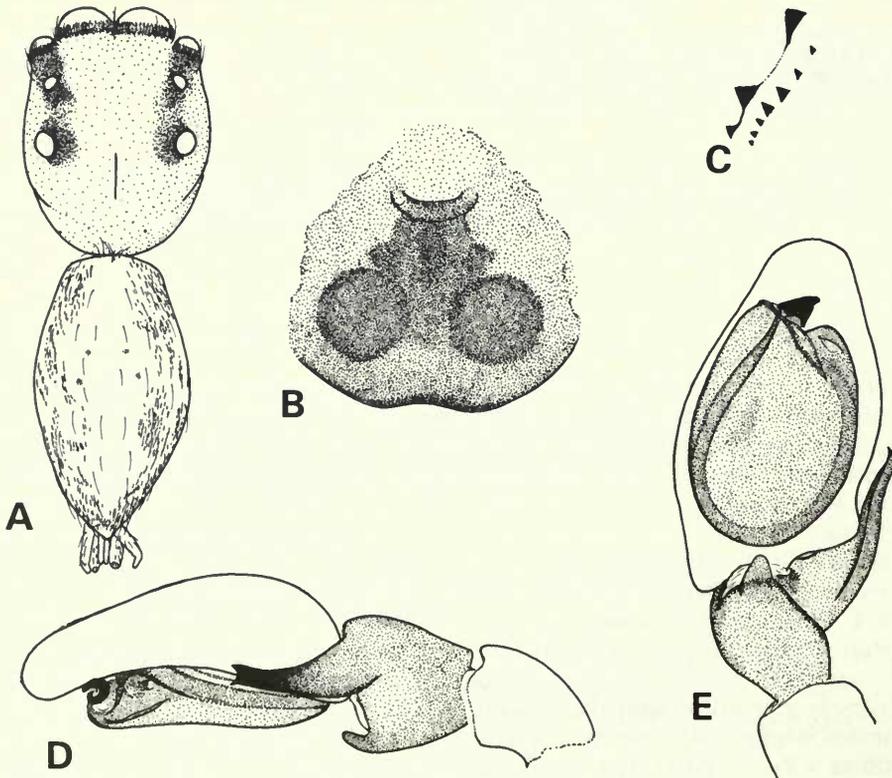


Fig. 12 *Mintonia brevirus* sp. n., holotype ♂: D, palp, retrolateral; E, palp, ventral. Paratype ♀: A, dorsal; B, epigyne; C, cheliceral teeth, inner view.

legs I: metatarsi v 2-2-0, p 1-0-1, d 0-1-2, r 1-1-1; tibiae v 2-2-2, p 1-0-1, d 1-1-0, r 1-0-1; patellae p 0-1-0, r 0-1-0; femora d 0-2-3, p 0-0-1. *Palp* (Fig. 12D, E): distal haematodochal region present as a minute lobe ( $M_2$ ) lying over the embolic base.

*Dimensions* (mm): total length 3.72; carapace length 1.72, breadth 1.45, height 1.12; abdomen length 1.8; eyes, anterior row 1.36, middle row 1.26, posterior row 1.4; quadrangle length 1.0 (58 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 11 : 6 : 4 : 6; AL-PM-PL :: 6-6.5; AM : CL :: 11 : 3.

*Female paratype*. Slightly faded, but otherwise in good condition. *Carapace* (Fig. 12A): yellow-brown with vague creamy markings; clothed in recumbent pale amber, and whitish hairs. *Eyes*: with black surrounds except anterior medians; fringed by creamy white hairs. *Clypeus*: clothed in creamy white hairs. *Chelicerae*: yellow-brown with scattered light amber hairs; promargin with three teeth, retromargin with seven (Fig. 12C). *Maxillae, labium, sternum and coxae*: pale yellow. *Abdomen*: pale yellow; dorsum clothed in recumbent pale yellow hairs with mottled pattern of pale amber ones on sides; spinnerets pale yellow-brown. *Legs*: moderately long and slender with numerous spines; yellow-brown grading to amber distally especially on first pair. Spination of legs I: metatarsi v 2-0-0, p 1-1-1, d 0-2-2, r 1-1-1; tibiae v 2-2-2, p 1-1-0, d 0-1-1, r 1-1-0; patellae p 0-1-0, r 0-1-0; femora d 0-2-4. *Epigyne* (Fig. 12B): reddish orange clothed in fine testaceous hairs.

*Dimensions* (mm): total length 5.44; carapace length 2.48, breadth 2.04, height 1.56; abdomen length 2.8; eyes, anterior row 1.84, middle row 1.56, posterior row 1.8; quadrangle length 1.4 (56 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 14 : 8.5 : 6 : 9; AL-PM-PL :: 7.5-11; AM : CL :: 11 : 4.

VARIATION. A paratype  $\sigma$  measures 3.6 mm total length, 1.64 mm carapace length.

DISTRIBUTION. Malaysia: Sarawak.

MATERIAL EXAMINED. Sarawak, Baram District, Mt. Dulit, (Oxford University Sarawak Expedition): holotype  $\sigma$ , (BMNH. 1952.9.8.1); paratype  $\sigma$ , (SM. Kuching); paratype  $\varphi$ , Koyan Forest, beaten from trees, xi.1932 (BMNH. 1952.9.8.234).

### *Mintonia melinauensis* sp. n.

(Fig. 13A-D)

DIAGNOSIS. By the heavy inward curving embolus and the form of the retrolateral tibial apophysis (Fig. 13B, C).

*Female*. Unknown.

*Male holotype*, in fair condition. *Carapace* (Fig. 13A, D): dark brown suffused and mottled black; clothed in short amber hairs with thin white haired stripe on thoracic part and narrow white haired marginal bands extending from level of coxae II to IV. *Eyes*: with dark surrounds; fringed by amber hairs. *Clypeus*: thinly clothed in amber and blackish hairs. *Chelicerae*: yellow-brown suffused and mottled black with scattered long black hairs; promargin with three teeth, retromargin with six. *Maxillae and labium*: pale yellow-brown tinged black. *Sternum*: yellow-brown tinged black; shiny, thinly covered in light brownish hairs. *Abdomen*: yellow-brown tinged and mottled black; irregularly clothed in shiny amber hairs (?rubbed); spinnerets pale yellow tinged black. *Legs*: first pair missing, others generally yellow-brown to orange-brown tinged with some black forming vague annuli on legs III-IV; spines strong and numerous. *Palps* (Fig. 13B, C): apophysal opening indicated by an arrow (Fig. 13C).

*Dimensions* (mm): total length 3.85; carapace length 1.84, breadth 1.48, height 1.24; abdomen length 1.88; eyes, anterior row 1.38, middle row 1.2, posterior row 1.32; quadrangle length 0.96 (52 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 11 : 6.5 : 4 : 6; AL-PM-PL :: 6-6.5; AM : CL :: 11 : 5.

DISTRIBUTION. Malaysia; Sarawak.

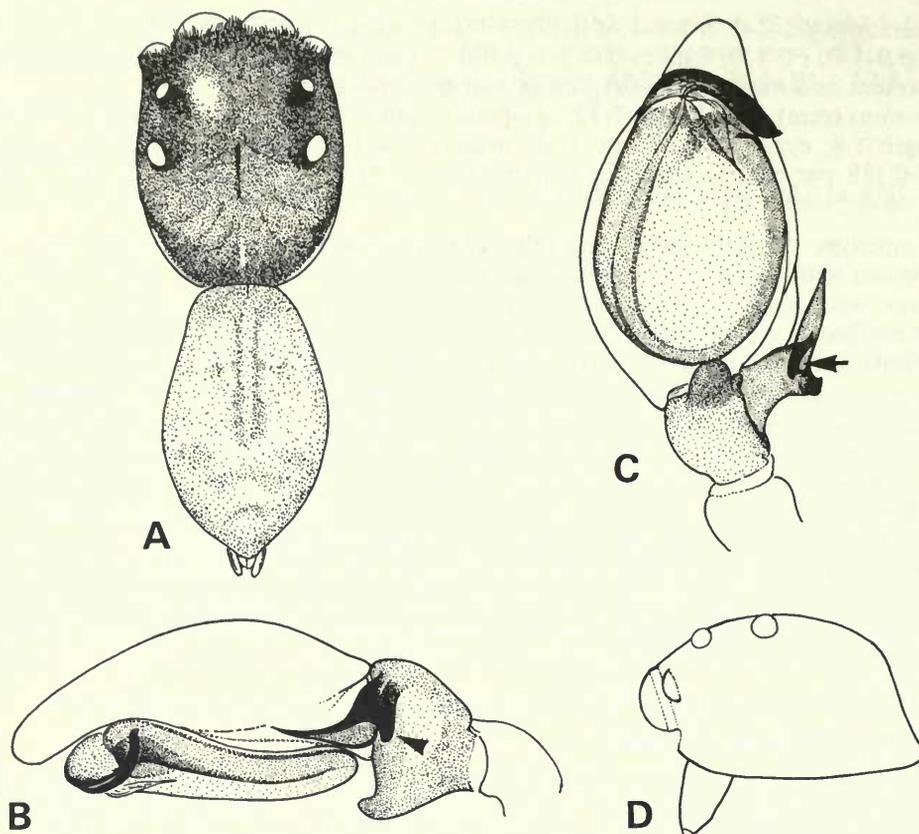


Fig. 13 *Mintonia melinauensis* sp. n., holotype ♂: A, dorsal; B, palp, retrolateral; C, palp, ventral; D, carapace, lateral.

**MATERIAL EXAMINED.** Sarawak: Gunung Mulu National Park, R.G.S./Sarawak Government Expedition, holotype ♂, Melinau Gorge, 21.vi.1978 (F. R. Wanless) (BMNH. 1981.11.5.5).

*Mintonia ramipalpis* (Thorell) comb. n.  
(Figs 14A–I; 15A–C; 34A, B; 35E, F; 36F)

*Cocalus ramipalpis* Thorell, 1892: 353, 475, ♂, ♀. LECTOTYPE ♂, PARALECTOTYPE ♀ (here designated) Sumatra, (UM, Oxford) [examined]. Thorell, 1890: 165. Wanless, 1981: 202 [belongs in *Boethus*].

*Phaeacius ramipalpis*: Simon, 1901: 406–408. Roewer, 1954: 935. Bonnet, 1958: 3494.

**DIAGNOSIS.** Readily by the structure of the male palps (Fig. 14B, F) and female epigyne (Fig. 15A–C).

*Male* from Sarawak, in good condition. *Carapace* (Fig. 14A, C): yellow-brown, shiny; eye region and upper part of thorax covered in amber hairs with patchy covering of dark brownish hairs on thoracic sides; on lateral sides patches of cuticle apparently free of hairs or clothed in fine weakly iridescent whitish hairs, a similar vague band extends from foveal region to posterior margin. *Eyes*: with blackish surrounds; posteriors fringed by amber hairs, anteriors by amber and whitish ones. *Clypeus*: clothed in white hairs, dense and long on margins near chelicerae becoming shorter on sides and extending posteriorly to level of coxae I–II. *Chelicerae*: pale yellow; basal half clothed in long white hairs; promargin with three teeth, retromargin with seven. *Maxillae and labium*: pale yellow lightly tinged with some

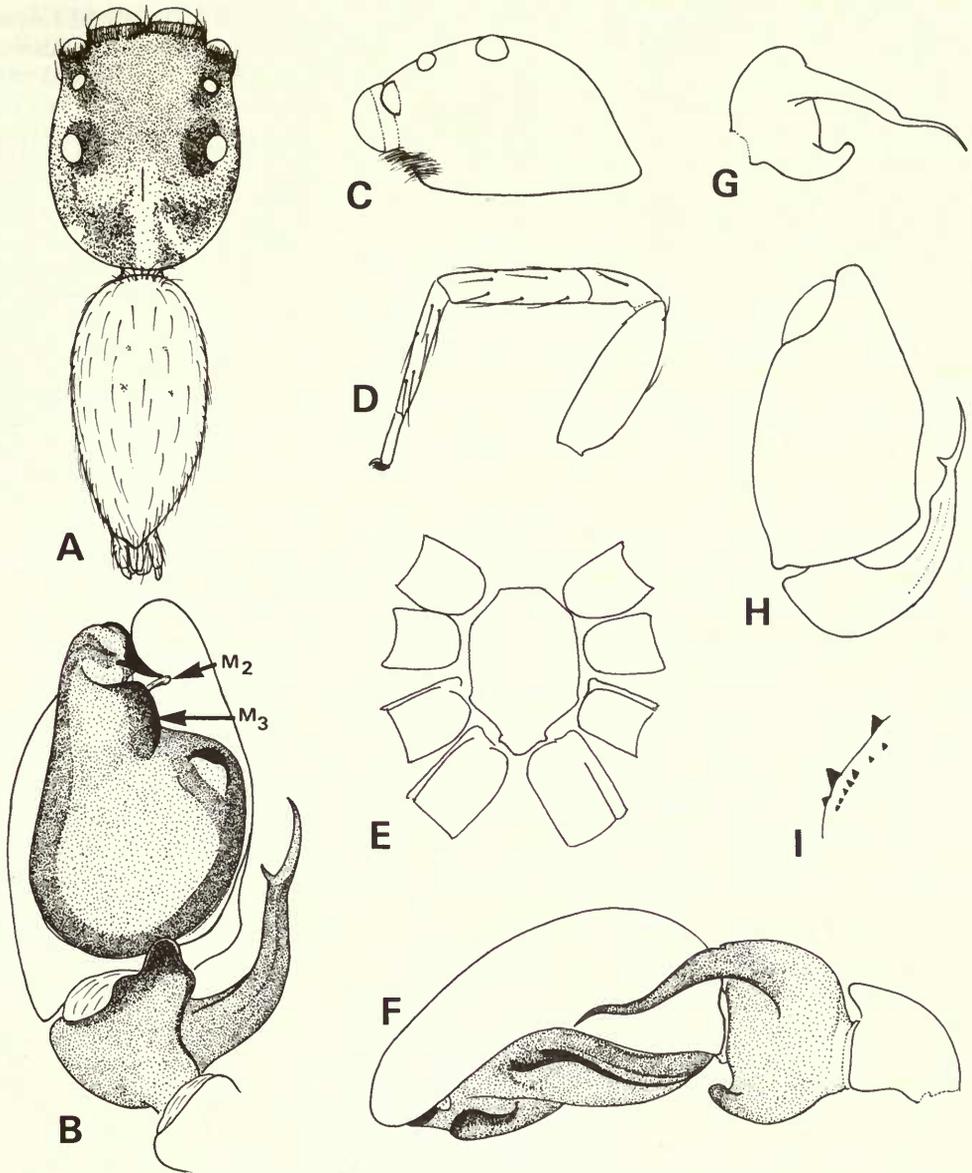


Fig. 14 *Mintonia ramipalpis* (Thorell), ♂: A, dorsal; B, palp, ventral; C, carapace, lateral; D, leg I; E, sternum and coxae; F, palp, retrolateral; G, palpal tibia, retrolateral; H, cymbium and retrolateral tibial apophysis, dorsal; I, cheliceral teeth, inner view.

grey. *Sternum* (Fig. 14E): pale yellow with fine scattered hairs. *Coxae*: pale yellow. *Abdomen*: pale yellow with two pairs of obscure impressed spots; clothed in pale and dark amber hairs with scattered long greyish ones. *Legs*: moderately long and slender with numerous moderately robust spines and minute light amber spot (femoral organ) on under side of femora I; pale yellow to yellow-brown. Spination of legs I: metatarsi v 2-2-2-, p 0-0-1, d 0-2-2, r 0-0-1; tibiae v 2-2-2, p 1-1-0, d 1-1-0, r 1-1-0; patellae p 0-1-0, r 0-1-0; femora p 0-0-1, d 0-2-3. *Palp* (Fig. 14B, F-H): hirsute with tufts of long white hairs on inside of femora, patellae and tibiae. The lobe  $M_2$  is obscured by hairs and is not as conspicuous as shown in Fig. 14B.

*Dimensions* (mm): total length c. 5.6; carapace length 2.24, breadth 1.76, height 1.4; abdomen length 2.32; eyes, anterior row 1.6, middle row 1.34, posterior row 1.56; quadrangle length 1.2 (53 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 13 : 7.5 : 5 : 7.5; AL-PM-PL :: 7-9; AM : CL :: 13 : c. 4.5.

*Female* from Sumatra, in fair condition. *Carapace*: yellowish brown with dark amber eye region; clothed in whitish hairs with scattered patches of pale amber ones; mostly rubbed. *Eyes*: with blackish surrounds except anterior medians; fringed by whitish hairs. *Chelicerae*: orange-brown, shiny; clothed sparsely in amber hairs; teeth as in ♂. *Maxillae*: pale orange-brown grading to whitish yellow on inner distal margin. *Labium*: pale orange-brown tipped whitish yellow. *Sternum*: pale yellow with darker margins. *Abdomen*: pale dirty yellow-brown, clothed in recumbent whitish hairs with patches of amber hairs forming a somewhat speckled pattern, also as in ♂ a scattering of long stiff hairs; venter greyish yellow with series of minute indistinct spots. *Legs*: moderately long and slightly more robust than in ♂ with numerous spines; pale to dark yellow-brown with vague annuli on posterior legs, also darker patches on femora IV. Spination of legs I: metatarsi v 2-0-0, p 1-1-1, d 0-2-2, r 1-1-1; tibiae v 2-2-2, p 1-1-0, r 1-0-0; patellae p 0-1-0, r 0-1-0; femora d 0-2-4. *Epigyne* (Fig. 15A-C): clothed in fine whitish hairs.

*Dimensions* (mm): total length c. 7.5; carapace length 3.12, breadth 2.36, height 1.68; abdomen length 4.36; eyes, anterior row 2.04, middle row 1.96, posterior row 2.0; quadrangle length 1.54 (49 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 16.5 : 9.5 : 6 : 9.5; AL-PM-PL :: 9.5-11; AM : CL :: 16.5 : c. 4.

VARIATION. ♂ total length varies from 4.52 to 5.6 mm, carapace length 2.08-2.32 mm (4 specimens); paralectotype ♀ measures c. 6.8 mm total length, 2.92 mm carapace length. Most of the specimens examined were rubbed and generally pale yellow-brown with only vague markings. In males the retrolateral tibial apophysis varies slightly in thickness and the basal protuberance of the cymbium varies in development being a little more pronounced in some individuals. In the female from Sumatra the T-shaped epigynal marking is indistinct and the spermathecae are set closer together.

DISTRIBUTION. Indonesia: Java, Sumatra; Malaysia: Sarawak.

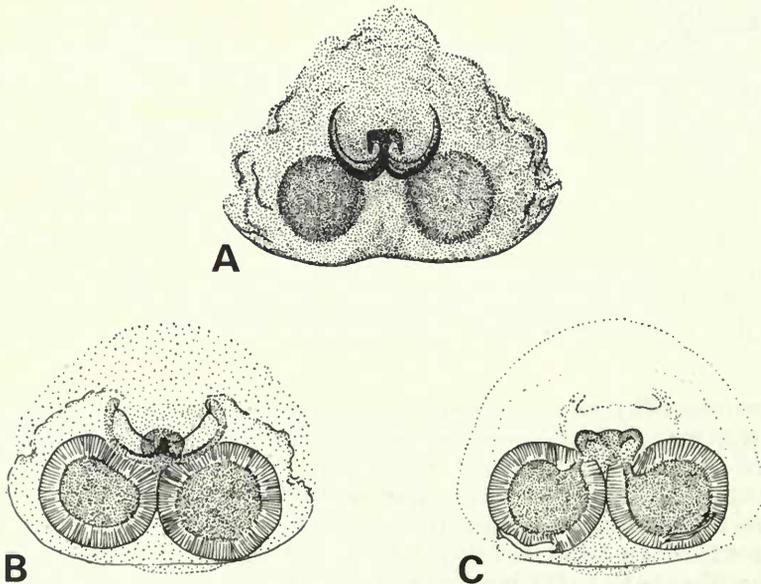


Fig. 15 *Mintonia ramipalpis* (Thorell), paralectotype ♀: A, epigyne. Another specimen: C, vulva, outer view; B, vulva, inner view.

**MATERIAL EXAMINED.** **Java:** 1 ♀, no other data (BMNH). **Sarawak,** Gunung Mulu National Park, R.G.S./Sarawak Government Expedition: 1 ♂, alluvial forest, from tree trunks environs of base camp, 2.v.1978 (*F. R. Wanless*); 1 ♂, mixed dipterocarp forest, brushed off mossy trunks and rocks (*J. Marshall*) (BMNH); 1 ♂, mixed dipterocarp forest, pitfall trap 28.iii.1978 (*M. Collins*) (Sarawak Museum, Kuching). **Sumatra:** Lectotype ♂, paralectotype ♀, (UM, Oxford).

### Genus *GELOTIA* Thorell

*Gelotia* Thorell, 1890: 164. Type species *Gelotia frenata* Thorell, by subsequent designation (Thorell, 1892: 344). Thorell, 1892: 345. Simon, 1901: 412, 413. Waterhouse, 1902: 146. Petrunkevitch, 1928: 184. Neave, 1939, II: 452. Roewer, 1954: 957. Bonnet, 1957: 1986. Prószyński, 1968: 12, 13; 1971: 410.

*Policha* Thorell, 1892: 351. Type species *Gelotia* (?)*bimaculata* Thorell, by original designation. Simon, 1901: 412, 413. Petrunkevitch, 1928: 185. Neave, 1940, III: 844. Roewer, 1954: 957. Bonnet, 1958: 3745. Prószyński, 1968: 12, 13 [= *Gelotia*]; 1971: 461.

[*Polichus* Waterhouse, 1902: 298, lapsus calami].

*Codeta* Simon, 1900: 33. Type species *Codeta argenteolimbata* Simon, by original designation and monotypy. Simon, 1901: 411–413. Waterhouse, 1902: 80. Petrunkevitch, 1928: 184. Neave, 1939, I: 783. Roewer, 1954: 957. Bonnet, 1956: 1176. Prószyński, 1971: 391. Wanless, 1981: 254. **Syn. n.**

**DEFINITION.** Spiders of medium size, i.e. total length between 4.0 and 8.0 mm. Sexual dimorphism evidently not marked; patterns generally inconspicuous.

**Carapace:** moderately high, longer than broad, widest at about level between coxae II–III; fovea moderately long, sulciform, apex behind or near centre of posterior lateral eyes; moderately hairy (i.e. in species known from unrubbed specimens) sometimes with white marginal bands. **Eyes:** with relatively weak to moderately strong lenses, set on low tubercles; anteriors contiguous or subcontiguous with apices weakly procurved or weakly recurved in frontal view; anterior laterals more than half diameter of anterior medians; posterior medians small or relatively large, positioned midway or slightly closer to and on or just outside optical axis of anterior laterals; posterior laterals as large or slightly smaller than anterior laterals and positioned just inside lateral margins of carapace when viewed from above; posterior ocular quadrangle broader than long, wider behind; entire quadrangle between 43 and 57 per cent of carapace length. **Clypeus:** low to moderately high. **Chelicerae:** moderately robust, parallel or slightly diverging and slightly inclined anteriorly; fang moderately robust and curved; promargin with three teeth, retromargin with four or five. **Maxillae:** moderately long, more or less parallel with rounded outer distal margins. **Labium:** as long or slightly longer than broad and about half maxillae length. **Sternum:** more or less elongate scutiform. **Abdomen:** elongate ovoid to long and narrow; patterns generally inconspicuous, but largely unknown as most species represented by rubbed specimens; spinnerets moderately long, posteriors moderately slender and as long or slightly longer than robust anteriors, medians shorter and more slender than anteriors; **Legs:** moderately long and slender with numerous moderately strong spines; ventral tibial fringes rarely present; males sometimes with minute tubercle (femoral organ) on underside of femora I; claws pectinate, tufts present, scopulae absent, but tarsi I and apices of metatarsi I with minute setae (c.f. *Portia*). **Female palps:** moderately long and slender with distal claw. **Male palps:** relatively large, complex and interspecifically fairly distinct with strongly developed interlocking protuberances; femora robust, rarely possessing large ventral apophysis bearing minute peg-like spines; patellae with moderate to strong anterodorsal tubercle; tibiae with anterodorsal tubercle, obtuse ventral apophysis and cap-shaped (i.e. in ventral view) retrolateral apophysis which sometimes bears a backward pointing syringe-like process; cymbium with distal scopulae, and sometimes pronounced basal excavations and tubercles; embolus short and stout to long and slender, generally curving inwards towards alveolus; distal haematodocha largely obscured with elements  $M_1$  and  $M_2$  usually bearing lobes (Fig. 16A–C), the latter ( $M_2$ ) sometimes not readily separated from regular ledge  $M_3$ ; tegulum generally subovoid with peripheral seminal duct, an open or irregular furrow which

may extend around retrolateral margin, and lobe-like process bearing the distal haematodocha, embolus and curtain-like membrane—the tegular ledge  $M_3$ ; median haematodocha, subtegulum and basal haematodocha not examined. *Epigynes*: of various forms; median longitudinal ridge sometimes present; copulatory openings positioned anteriorly, occasionally obscured by black hood-like surrounds; introductory ducts short and bent or looped, opening into spermathecae, often large, bearing fertilisation ducts on posterior margin; in one species, opposite the epigyne and on other side of epigastric furrow a curved sclerotised fold.

**DIAGNOSIS.** Males readily by cap-like appearance of the retrolateral tibial apophyses in ventral aspect (e.g. Fig. 20I), in one species there is an additional backward pointing process (Fig. 21D, I). Females with more difficulty by details of the epigyne which is usually characterised by the presence of a thin median ridge (Fig. 17C).

### Key to species of *Gelotia*

Males (those of *frenata* are unknown)

- |   |   |                                    |
|---|---|------------------------------------|
| 1 | Posterior median eyes relatively small (PM : PL :: 1 : 4) . . . . .   | 2                                  |
| – | Posterior median eyes relatively large (PM : PL :: 3 : 4) . . . . .   | 3                                  |
| 2 | Palpal femora with large ventral apophysis bearing minute peg-like spines (Fig. 18C) (Singapore)  |                                    |
|   | . . . . . <i>argenteolimbata</i> Simon (p. 174)   |                                    |
| – | Palpal femora lacking a ventral apophysis; distal haematodocha with large lobe-like process $M_2$ ,<br>Figs 17D; 35C,D) (Borneo, Sumatra) . . . . . | <i>bimaculata</i> Thorell (p. 172) |
| 3 | Palpal RTA with backward pointing syringe-like process (Fig. 21D, I) (Malaysia)   |                                    |
|   | . . . . . <i>syringopalpis</i> sp. n. (p. 178)  |                                    |
| – | Palpal RTA without a backward pointing process . . . . .  | 4                                  |
| 4 | Embolus long and slender (Fig. 20I) (Sulawesi) . . . . .  | <i>salax</i> (Thorell) (p. 176)    |
| – | Embolus short and robust (Fig. 19F) (New Britain) . . . . .   | <i>robusta</i> sp. n. (p. 174)     |

Females (those of *argenteolimbata*, *robusta* and *salax* are unknown)

- |   |   |                                      |
|---|---|--------------------------------------|
| 1 | Posterior median eyes relatively small (PM : PL :: 1 : 4); epigyne with median longitudinal ridge<br>(Figs 16F; 17C) . . . . .          | 2                                    |
| – | Posterior median eyes relatively large (PM : PL :: 3 : 4); epigyne without median longitudinal ridge<br>(Fig. 21C) (Malaysia) . . . . . | <i>syringopalpis</i> sp. n. (p. 178) |
| 2 | Legs I with ventral fringe of hairs on tibiae (Sumatra) . . . . .   | <i>frenata</i> Thorell (p. 170)      |
| – | Legs I lacking ventral fringe of hairs on tibiae (Borneo, Sumatra) . . . . .  | <i>bimaculata</i> Thorell (p. 172)   |

### *Gelotia frenata* Thorell

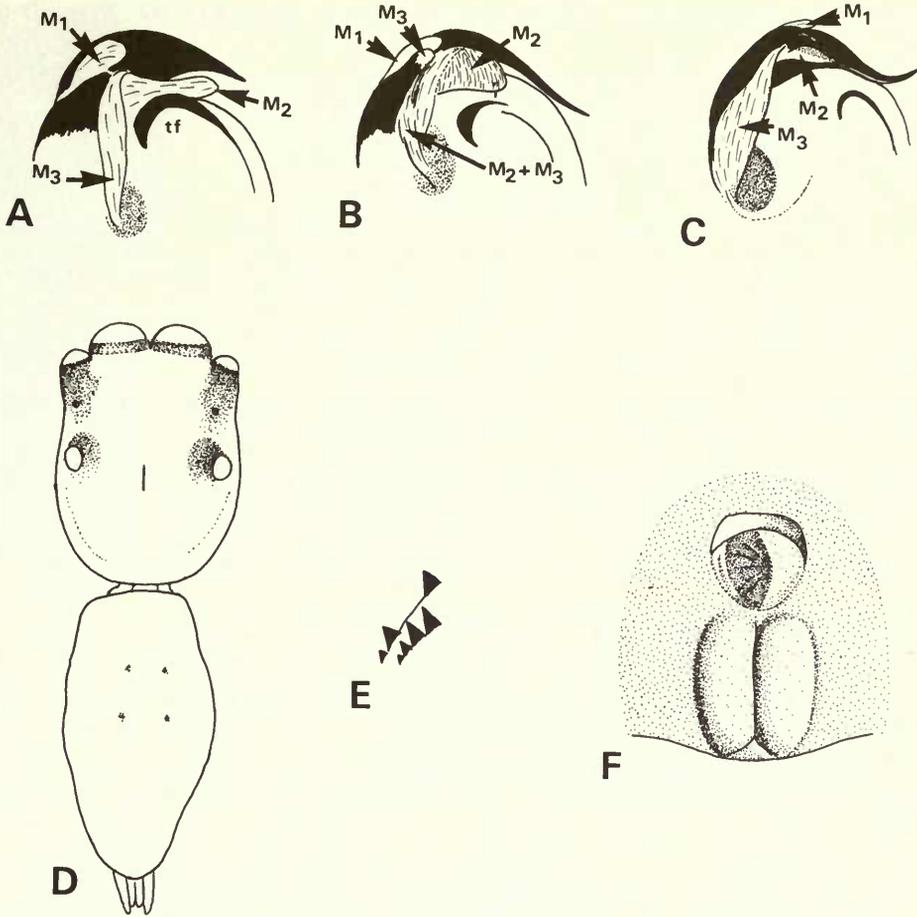
(Fig. 16D–F)

*Gelotia frenata* Thorell, 1890: 345, ♀. Holotype ♀, Sumatra (MCSN, Genova) [examined]. Thorell, 1892: 345, 475. Simon, 1901: 412, 413. Petrunkevitch, 1928: 184. Roewer, 1954: 857. Bonnet, 1957: 1896. Prószyński, 1968: 13; 1971: 410.

**DIAGNOSIS.** By the presence of ventral fringes on the underside of the tibiae of legs I.

*Male.* Unknown, but *G. argenteolimbata* possibly belongs here.

*Female holotype*, in poor condition. *Carapace* (Fig. 16D): brownish grey with yellow-brown eye region; lateral sides densely clothed, apart from rubbed patches, in whitish hairs with indistinct marginal bands of light brownish ones, eye region rubbed, but dorsum of thoracic part with scattered whitish hairs posteriorly, becoming fine, clear and weakly iridescent towards foveal region. *Eyes*: with black surrounds except anterior medians; anteriors fringed by whitish hairs. *Clypeus*: edged in whitish hairs. *Chelicerae*: amber faintly tinged black; shiny; clothed basally in whitish hairs mixed with overlaying clypeal ones, with scattered long amber hairs along inner sides; promargin with three teeth, retromargin with four. *Maxillae and labium*: light yellowish brown with greyish brown markings. *Sternum*: yellowish



**Fig. 16** (A–C) *Gelotia* spp. showing elements of distal haematodocha and tegular ledge, schematic: A, *G. argenteolimbata* (Simon); B, *G. bimaculata* Thorell, note  $M_2$  and  $M_3$  partly fused; C, *G. robusta* sp. n. (D–F) *Gelotia frenata* Thorell, holotype ♀: D, dorsal; E, cheliceral teeth, inner view; F, epigyne, after Prószyński (1968). Abbreviation: tf, tegular furrow.

brown with slightly darker margins; shiny, clothed in pale greyish hairs. *Coxae*: yellowish brown; shiny. *Abdomen*: dirty pale yellow-brown with vague greyish markings; mostly rubbed, but with patches of fine whitish/iridescent, and dark amber hairs on dorsum and sides with amber, and long greyish hairs ventrally; spinnerets yellowish brown tinged black. *Legs*: long and slender, generally yellowish brown with fringes of stout greyish yellow hairs on underside of tibiae, patellae and apex of femora of legs I and apex of femora of legs IV; spines strong and numerous. Spination of legs I: metatarsi v 2-0-2, p 1-0-0, d 2-1-2, r 1-1-0; tibiae v 2-2-2, p 1-0-1, d 1-1-0, r 1-1-0; patellae p 0-1-0, r 0-1-0; femora p 0-0-1, d 0-2-3, r 0-1-0. *Palp*: pale yellow-brown with darker tarsi; clothed in whitish hairs. *Epigyne* (Fig. 16F): see remarks below.

*Dimensions* (mm): total length 6.36; carapace length 2.84, breadth 2.34, height c. 1.76; abdomen length 3.56; eyes, anterior row 2.24, middle row 1.8, posterior row 2.11; quad-angle length 1.64 (57 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 18.5 : 10 : 2.2 : 10; AL-PM-PL :: 12 : 11.5; AM : CL :: 18.5 : 5.

**DISTRIBUTION.** Indonesia: Sumatra.

MATERIAL EXAMINED. **Sumatra**, Sungei Bulu, holotype ♀, ix.1878 (*O. Beccari*) (MCSN, Genova).

REMARKS. Prószyński (1968) gave a good description of this specimen, but cleared the epigyne which is now preserved in canada balsam on a microscope slide. Its original appearance (Fig. 16F) is therefore redrawn from Prószyński's text Figure 5.

*Gelotia bimaculata* Thorell

(Figs 17A–J; 30E–F; 33A, B; 35C, D)

*Gelotia* (?) *bimaculata* Thorell, 1892: 348, ♀, juvenile ♀. LECTOTYPE ♀ (here designated) Borneo, (MCSN, Genova) [examined]. Prószyński, 1968: 12–20 [restored to *Gelotia*].

*Policha bimaculata* (Thorell). Thorell, 1892: 351 [assigned to *Policha*]. Simon, 1901: 413. Petrunkevitch, 1928: 185. Roewer, 1954: 957. Bonnet, 1958: 3745. Prószyński, 1968: 12–20; 1971: 461.

*Codeta bouchardi* Simon, 1903: 305, ♂. LECTOTYPE ♂ (here designated) Sumatra (MNHN, Paris). Roewer, 1954: 957. Bonnet, 1956: 1176. Prószyński, 1971: 391. **Syn. n.**

DIAGNOSIS. Similar to *G. argenteolimbata* known only from the male and *G. frenata* known only from the female, by having relatively small posterior median eyes. Differs from *argenteolimbata* by lacking a robust apophysis on the underside of the palpal femora, and from *frenata* by the absence of ventral fringes on the tibiae of the first pair of legs.

*Male* from Sarawak, in good condition. *Carapace* (Fig. 17A, F): brownish orange covered in recumbent black lanceolate hairs shining iridescent violet under some angles of illumination; also from level of coxae II to IV a marginal band of short white hairs, and on thoracic slope a central narrow white haired band with streaks of whitish hairs on either side. *Eyes*: with black surrounds; fringed by blackish hairs. *Clypeus*: with scattered long stiff black hairs and numerous short black ones forming a more or less distinct marginal fringe. *Chelicerae*: dark amber with sooty markings; shiny; thinly clothed in stiff black hairs; promargin with three teeth, retromargin with four. *Maxillae and labium* (Fig. 17A): yellow-brown lightly suffused black. *Sternum*: yellow-brown lightly suffused black; thinly clothed in stiff brownish hairs. *Abdomen*: raised and somewhat square fronted anteriorly; generally greyish; covered in recumbent black/iridescent violet lanceolate hairs interspersed with clear hairs forming a vague pattern of chevrons, also a conspicuous white haired spot practically covering the anal tubercle and on lateral sides longitudinal bands of whitish hairs; spinnerets pale yellow-brown tinged black except for creamy white medians; clothed in blackish hairs. *Legs*: long and slender with numerous spines and minute tubercle (femoral organ) on underside of femora I (Figs 17G; 30E, F); generally yellow-brown; clothed in recumbent black lanceolate hairs particularly on metatarsi, tibiae, patellae and upper surfaces of femora; also on tibiae IV a patch of whitish hairs. Spination of legs I: metatarsi v 2-0-2, p 1-1-0, d 0-0-2, r 1-1-0; tibiae v 2-2-2, p 1-1-0, d 1-1-0, r 1-1-0; patellae p 0-1-0, r 0-1-0, femora p 0-0-1, d 0-2-3, r 0-1-1. *Palp* (Figs. 17D, H; 33A, B): clothed in black hairs with whitish hairs on tibiae and patellae.

*Dimensions* (mm): total length 7.2; carapace length 3.36, breadth 2.54, height 1.88; abdomen length 4.0; eyes, anterior row 2.28, middle row 1.96, posterior row 2.24; quadrangle length 1.8 (53 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 19 : 10.5 : 3 : 11; AL-PM-PL :: 12-14; AM : CL :: 10.5 : 5.5.

*Female* from Sarawak, in poor condition. General habitus similar to male. *Carapace*: brownish orange with an iridescent sheen and scattered covering of fine black hairs interspersed with patches of more robust whitish ones especially on thoracic part. *Eyes*: similar to male, but fringed by whitish, and dirty pale amber hairs. *Clypeus*: clothed in scattered whitish hairs. *Chelicerae*: dark orange-brown lightly tinged black with coppery iridescent sheen under some angles of illumination; thinly clothed in mixed short whitish and long black hairs; promargin with three teeth, retromargin with four; fang with basal third a little swollen. *Maxillae and*

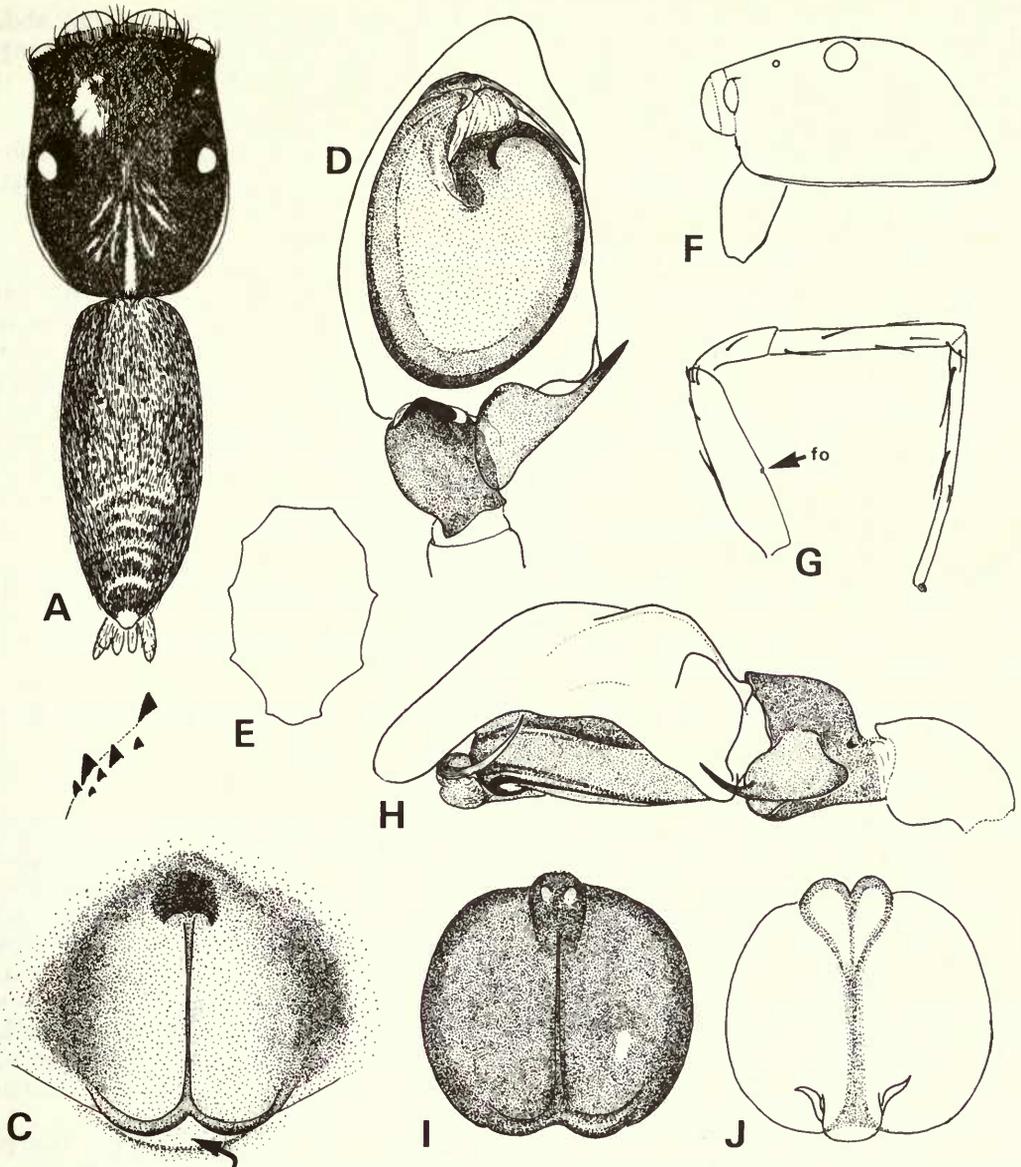


Fig. 17 *Gelotia bimaculata* Thorell, ♂: A, dorsal; B, cheliceral teeth, inner view; D, palp, ventral; E, sternum; F, carapace, lateral; G, leg I; H, palp, retrolateral. ♀: C, epigyne; I, vulva, outer view; J, vulva, inner view. Abbreviation: fo, femoral organ.

*labium*: orange-brown tinged black with inner distal margin of maxillae and labial tip yellowish. *Sternum*: orange-brown tinged black; shiny; sparsely clothed in stiff black hairs. *Abdomen*: grey-black somewhat speckled with four apodermal spots; badly rubbed, but with patches of brown-black and whitish hairs posteriorly. *Legs*: moderately long and slender with numerous spines; tarsi I yellow-brown, legs otherwise orange-brown suffused and mottled with some black. Spination of legs I: metatarsi v 2-0-2, tibiae v 2-2-2, p 1-0-0; patellae p 0-1-0; femora p 0-0-1, d 0-1-4. *Palp*: dark brownish orange suffused and mottled black, iridescent violet under some angles of illumination especially tarsi and tibiae. *Epigyne* (Fig. 17C, I, J): relatively large with a median ridge and dark copulatory openings; also, opposite the posterior margin on the other side of the epigastric furrow a curved sclerotised fold.

*Dimensions* (m): total length c. 7.7; carapace length 3.08, breadth 2.4, height 1.92; abdomen length 4.72; eyes, anterior row 2.24, middle row 1.88, posterior row 2.12; quadrangle length 1.76 (57 per cent of carapace length). *Ratios*: AM:AL:PM:PL::18:10:3:10; AL-PM-PL::12.5:3.5; AM:CL::18:4.

VARIATION. Males vary from 5.68–8.16 mm total length, 2.84–3.96 mm carapace length, four specimens. Another female, lectotype of *G. bimaculata*, measures 8.32 mm total length, 3.8 mm carapace length.

DISTRIBUTION. Indonesia: Kalimantan; Sumatra. Malaysia: Sarawak.

MATERIAL EXAMINED. **Kalimantan**: Makunjung, 1♂, 21.iv. 1976 (*J. R. Thomson*) (BMNH). **Sarawak**: lectotype ♀ [of *Gelotia bimaculata*] (*O. Beccari & G. Doria*) (MCSN, Genova); Gunung Mulu National Park, R.G.S./Sarawak Government Expedition: alluvial forest, environs of base camp 1♀, iv. 1978 (*P. Chapman*); Hidden Valley, mixed dipterocarp forest-helicopter landing pad, 1♂, iv. 1978 (*P. Chapman*); Melinau Gorge, environs of camp 5, 1♂, 18.v.1978 (*F. R. Wanless*) (BMNH). **Sumatra**: Forêt du Nirou, Palembang Province, lectotype ♂ [of *Codeta bouchardi*] (*M. J. Bouchard*) (MNHN, Paris, 22187).

*Gelotia argenteolimbata* (Simon) Comb. n.

(Fig. 18A–F)

*Codeta argenteo-limbata* Simon, 1900: 33, ♂. LECTOTYPE ♂ (here designated) Singapore (MNHN, Paris) [examined].

*Codeta argenteolimbata* Simon. Simon, 1901: 411–413. Petrunkevitch, 1928: 184. Roewer, 1954: 957. Bonnet, 1956: 1176. Prószyński, 1971: 391.

DIAGNOSIS. By the presence of a robust apophysis on the underside of the palpal femora (Fig. 18C).

*Female*. Unknown, but possibly belongs with *G. frenata*.

*Male lectotype*, in fair condition. *Carapace* (Fig. 18A, B): orange-brown lightly tinged and mottled black with paler eye region; rubbed, but short recumbent hairs forming rather patchy submarginal white bands from level of coxae I to IV. *Eyes*: with black surrounds except anterior medians; fringed by some whitish hairs; lenses of anteriors damaged. *Clypeus*: probably rubbed, but with several fine hairs and stout bristles. *Chelicerae*: pale yellow-brown with sooty markings; promargin with three teeth, retromargin with four. *Maxillae and labium*: pale yellow-brown lightly tinged with some black. *Sternum*: pale yellow-brown faintly tinged black; shiny. *Abdomen*: pale yellow-brown with faint sooty markings; clothed in fine recumbent iridescent setae; spinnerets whitish yellow. *Legs*: long and slender with numerous spines; femoral organs lacking; generally pale yellow-brown with faint markings on femora, patella and tibiae of legs I. Spinination of legs I: metatarsi v 2-0-1, p 1-1-1, r 1-1-1; tibiae v 2-2-2, p 1-1-0, d 1-1-1, r 1-1-0, patellae p 0-1-0, r 0-1-0; femora p 0-0-1, d 1-1-3. *Palp* (Fig. 18C, D): the retrolateral tibial apophysis has an amorphous interior suggesting the presence of a distal opening.

*Dimensions* (mm): total length 5.04; carapace length 2.32, breadth 1.8, height 1.4; abdomen length 2.8; eyes, anterior row 1.78, middle row 1.52, posterior row 1.76; quadrangle length 1.32 (56 per cent of carapace length). *Ratios*: AM:AL:PM:PL::15:8.5:2:8; AL-PM-PL::10-10; AM:CL::15:c. 6.

DISTRIBUTION. Singapore.

MATERIAL EXAMINED. **Singapore**: lectotype ♂, (*E. Simon*) (MNHN, Paris, 12820).

*Gelotia robusta* sp. n.

(Fig. 19A–F)

DIAGNOSIS. Comparable with *G. salax* by having large posterior median eyes, but easily distinguished by the short robust embolus (Fig. 19F).

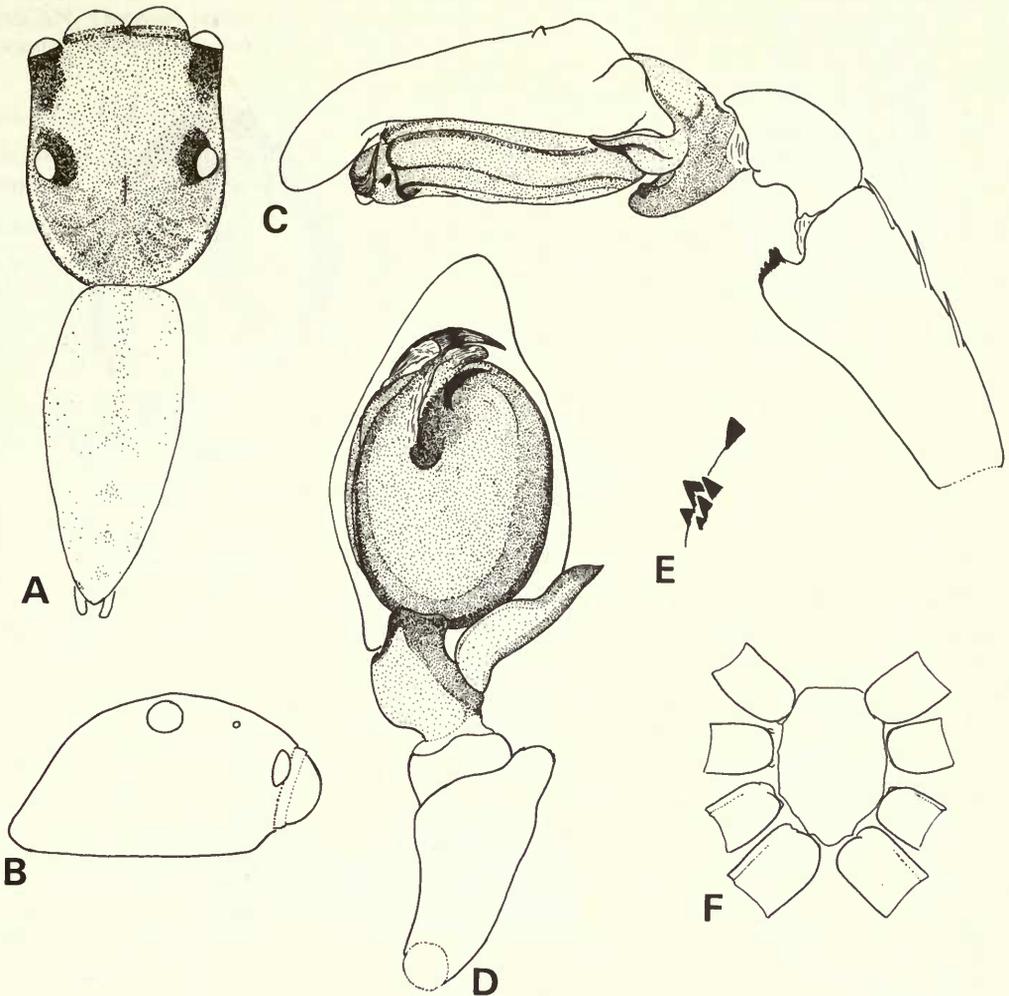


Fig. 18 *Gelotia argenteolimbata* (Simon), lectotype ♂: A, dorsal; B, carapace, lateral; C, palp, retrolateral; D, palp, ventral; E, cheliceral teeth, inner view; F, sternum and coxae.

*Female.* Unknown.

*Male holotype*, in fair condition. *Carapace* (Fig. 19A, B): orange-brown lightly mottled black on sides; clothed in short whitish and pale amber hairs with short black hairs on mottling. *Eyes*: with black surrounds except anterior medians; fringed by whitish and pale amber hairs. *Clypeus*: clothed in long pale amber hairs. *Chelicerae*: generally yellow-brown to orange-brown tinged with some black; clothed in whitish and pale amber hairs with scattered stiff black ones; promargin with three teeth, retromargin with five. *Maxillae and labium*: yellow-brown tinged black with inner margins of maxillae and labial tip paler. *Sternum* (Fig. 19C): yellow-brown suffused with black; clothed in grey-black hairs with whitish ones around anterior margins. *Coxae*: yellow-brown with black on inner sides of coxae I. *Abdomen*: rubbed; generally yellow-brown with blackish markings on lateral sides and irregular covering of recumbent pale amber and black hairs; also, posteriorly on one side a sparse tuft of white hairs; ventrally a tapering sooty band. *Legs*: moderately long and slender with numerous spines; femoral organ evidently lacking; generally yellow-brown with vague sooty annuli on metatarsi and tibiae of legs III–IV. Spinination of legs I: metatarsi v 3-0-0, p 1-1-0, d 0-2-2,

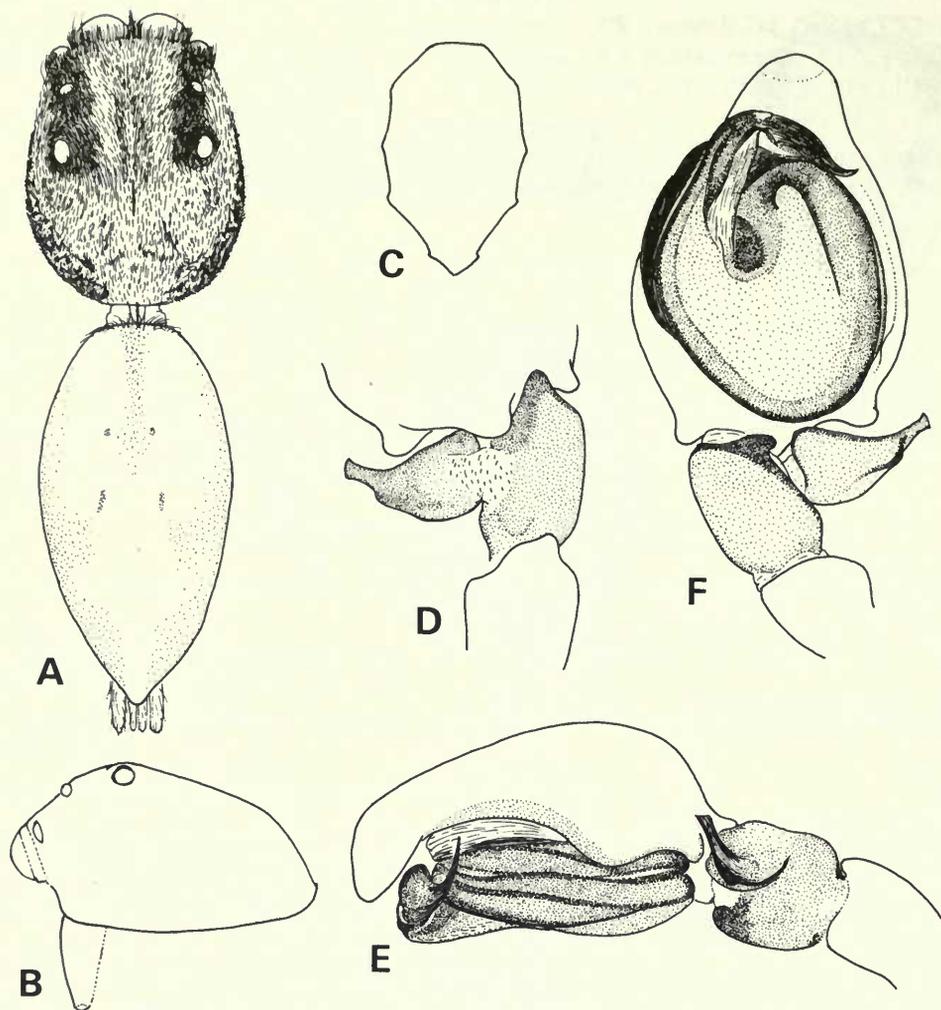


Fig. 19 *Gelotia robusta* sp. n., holotype ♂: A, dorsal; B, carapace, lateral; C, sternum; D, retro-lateral tibial apophysis and locking mechanism, dorsal; E, palp, retrolateral; F, palp, ventral.

r 2-0-1; tibiae v 2-2-2, p 0-1-2, d 1-0-2, r 0-1-1; patellae p 0-1-0, r 0-1-0; femora d 0-2-4. *Palp* (Fig. 19D-F): the short embolus curves inwards towards the alveolus.

*Dimensions* (mm): total length c. 7.2 (pedicel stretched); carapace length 3.04, breadth 2.4, height 1.84; abdomen length 3.92; eyes, anterior row 1.84, middle row 1.6, posterior row 1.82; quadrangle length 1.32 (43 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 14.5 : 7.5 : 5.5 : 7.5; AL-PM-PL :: 9-11; AM : CL :: 14.5 : 8.

**DISTRIBUTION.** Papua New Guinea: East New Britain.

**MATERIAL EXAMINED.** Papua New Guinea, Keravat, Gazelle Peninsula, East New Britain, holotype ♂, pyrethrum knockdown sample, Wairiki cocoa plantation, 13.vi.1979 (Stewart Smith, 021-024) (MCZ, Harvard).

*Gelotia salax* (Thorell) comb. n.  
(Fig. 20A-I)

*Cocalus salax* Thorell, 1877: 594, ♂ only [see remarks]. **LECTOTYPE** ♂ (here designated) Celebes

(MCSN, Genova) [examined]. Thorell, 1892: 352, 475. Simon, 1901: 407. Roewer, 1952: 934. Bonnet, 1956: 1174. Prószyński, 1971: 391.

REMARKS. The immature female described by Thorell (1877: 597) belongs in *Cocalus* Koch.

DIAGNOSIS. Readily by the long slender embolus and the form of the retrolateral tibial apophysis.

*Female*. Unknown.

*Male lectotype*, in poor condition. *Carapace* (Fig. 20A, B, D): dark amber, weakly iridescent under some angles of illumination; irregularly clothed in short recumbent white hairs (rubbed). *Eyes*: with brown-black surrounds; fringed by whitish hairs. *Clypeus*: clothed in light amber hairs. *Chelicerae*: dark amber with sooty markings grading to yellowish orange

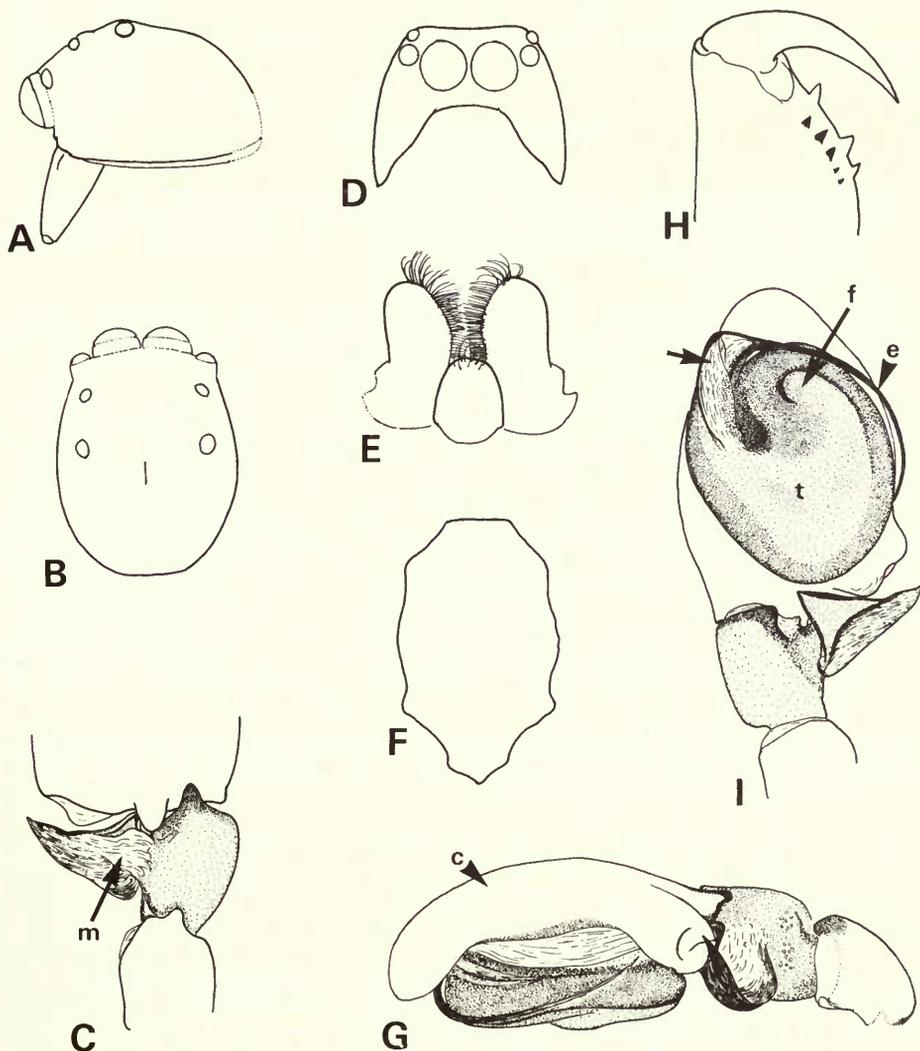


Fig. 20 *Gelotia salax* (Thorell, lectotype ♂: A, carapace lateral; B, carapace dorsal; C, retrolateral tibial apophysis and locking mechanism, dorsal; D, facies; E, maxillae and labium; F, sternum; G, palp, retrolateral; H, cheliceral teeth, inner view; I, palp, ventral. Abbreviations: c, cymbium; e, embolus; f, tegular furrow; m, membranous attachment; t, tegulum.

distally; sparsely clothed (?rubbed) in long pale amber and short dull whitish hairs; promargin with three teeth, retromargin with four. *Maxillae*: light brown with whitish inner margins. *Labium*: brown tipped whitish with sclerotised patches basally. *Sternum*: (Fig. 20F): light brown with amber margins. *Abdomen*: damaged; apparently elongate ovoid; pale grey with white and pale amber hairs; pattern indiscernible. *Legs*: generally yellow-brown to light amber. Spination of legs I: metatarsi v 2-1-0, p 1-1-0, d 0-2-2, r 1-2-0; tibiae v 2-2-2, p 1-1-0, d 2-2-0, r 1-0-0; patellae p 0-1-0, r 0-1-0; femora d 1-1-4. *Palp* (Fig. 20C, G, I): the amorphous region 'm' seems to form the only means of attachment between the tibia and retrolateral apophysis.

*Dimensions* (mm): total length c. 7.4; carapace length 3.4; breadth 2.68, height 1.96; abdomen length c. 4.0; eyes, anterior row 2.16, middle row 1.92, posterior row 2.06; quadrangle length 1.6 (47 per cent of carapace length). *Ratios*: AM:AL:PM:PL::17:9:6:8; AL-PM-PL::10-13; AM:CL::17:6.

DISTRIBUTION. Indonesia: Sulawesi.

MATERIAL EXAMINED. **Sulawesi**, Kandari lectotype ♂, (*Dott. O. Beccari*, 1874) (MCSN, Genova).

### *Gelotia syringopalpis* sp. n.

(Fig. 21A-I)

DIAGNOSIS. The most derived species in the genus easily recognised by the syringe-like process of the retrolateral tibial apophysis in males (Fig. 21D, I), and by the appearance of the epigyne in females (Fig. 21C).

*Male holotype*, in fair condition. *Carapace*: light orange-brown with paler thoracic stripe and vague marginal bands; eye region clothed in shining hairs with fine dark amber hairs elsewhere except for whitish ones on stripe and marginal bands. *Eyes*: with black surrounds except anterior medians; fringed by whitish, and pale golden hairs. *Clypeus*: with black markings; thinly clothed in long whitish hairs. *Chelicerae*: yellow-brown with sooty markings and scattered fine yellowish hairs; promargin with three teeth, retromargin with five. *Maxillae and labium*: yellow-brown lightly tinged grey with fine scattered hairs. *Sternum*: pale yellow-brown, margins slightly darker; sparsely clothed in light brown hairs. *Coxae*: yellow-brown with scattered light brownish hairs. *Abdomen*: whitish yellow with vague sooty markings posteriorly; sparsely clothed in stiff brownish hairs with fine recumbent shiny hairs dorsally and scanty patches of amber ones on sides; spinnerets yellow-brown heavily tinged black. *Legs* (Fig. 12E): moderately long and slender with numerous spines and minute tubercle (femoral organ) on underside of femora I; pale to dark yellow-brown with blackish tarsi I. Spination of legs I: metatarsi v 2-1-0, p 0-1-0, d 2-1-2, r 0-1-0; tibiae v 2-2-2, p 1-0-1, d 1-1-0, r 1-0-1; patellae p 0-1-0, r 0-1-0; femora p 0-0-1, d 0-2-3, r 0-1-0. *Palp* (Fig. 21D, I): the profile of the retrolateral tibial apophysis in ventral aspect is like that of other *Gelotia* species in spite of the syringe-like process, which has a whitish exudate blocking the opening in this particular specimen.

*Dimensions* (mm): total length 4.4; carapace length 2.14, breadth 1.68, height 1.32; abdomen length 2.28; eyes, anterior row 1.64, middle row 1.56, posterior row 1.64; quadrangle length 1.2 (56 per cent of carapace length). *Ratios*: AM:AL:PM:PL::13:7.8:5:8; AL-PM-PL::8:7.5; AM:CL::13:4.

*Female paratype*, in good condition. Habitus similar to ♂ except for the following. *Carapace* (Fig. 21A, B): lacking marginal bands. *Clypeus*: thinly clothed in fine light brown, and whitish hairs with several stout bristles. *Chelicerae*: more bulbous than in ♂; yellow-brown, shiny with scattered stout brown hairs. *Maxillae, labium, sternum and coxae*: as in ♂, but scattered hairs darker and more conspicuous. *Abdomen*: yellow-brown, with scattered bristles and dense covering of short dark brownish hairs with pale golden ones forming a vague median stripe; spinnerets yellow-brown suffused black. *Legs*: generally as in ♂, but tarsi I yellow-

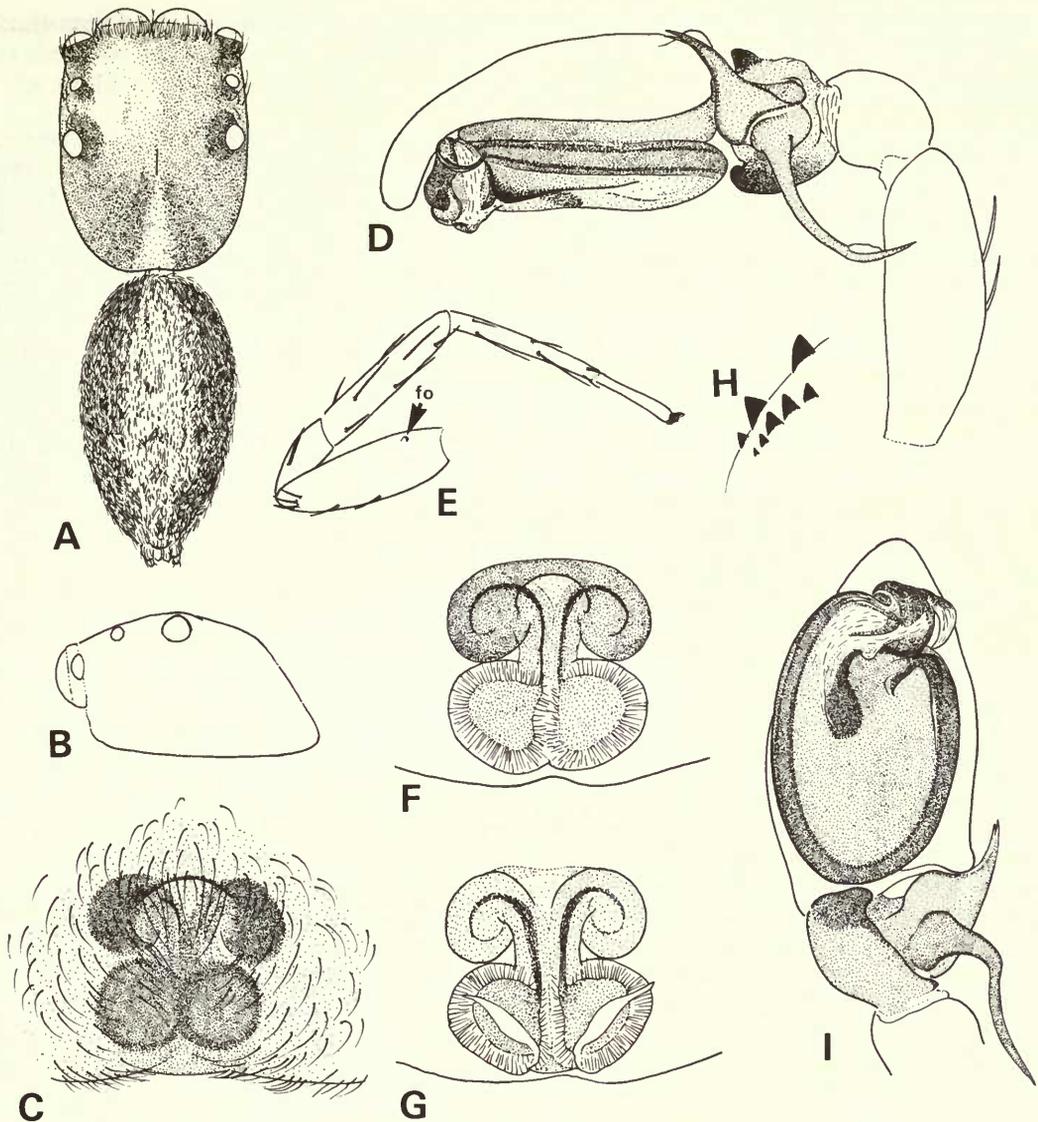


Fig. 21 *Gelotia syringopalpus* sp. n., holotype ♂: D, palp, retrolateral; E, leg I; I, palp, ventral. Paratype ♀: A, dorsal; B, carapace, lateral; C, epigyne; F, vulva, outer view; G, vulva, inner view; H, cheliceral teeth, inner view. Abbreviation: fo, femoral organ.

brown. Spination of legs I: metatarsi v 2-1-1; tibiae v 2-2-2, p 1-1-0; patellae p 0-1-0; femora d 0-2-4. Epigyne (Fig. 21C, F, G): thinly covered by rather coarse blackish hairs.

*Dimensions* (mm): total length 5.52; carapace length 2.6, breadth 2.06, height 1.56; abdomen length 2.84; eyes, anterior row 1.96, middle row 1.9, posterior row 2.0; quadrangle length 1.4 (53 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 15 : 9 : 5.5 : 8; AL-AM-PL :: 11-9; AM : CL :: 15 : 4.

VARIATION. A paratype ♂ measures 4.72 mm total length, 2.08 mm carapace length. ♀ total length varies from 4.4 to 5.52 mm, carapace length 2.16-2.6 mm (three specimens). In the paratype male the marginal cephalic bands and thoracic stripe are more conspicuous than

in the holotype, while in females the spermathecae are sometimes less evident than those shown in (Fig. 21C).

DISTRIBUTION. Malaysia.

MATERIAL EXAMINED. West Malaysia, Batu, village about 8 miles north of Kuala Lumpur: holotype ♂, beaten from low growing vines by standing water, 14.ix.1973 (*A. D. Blest*, Batu 33(D)) (BMNH. 1981.12.31.9); paratype ♀, beaten from creepers in damp open forest, ix.1973 (*A. D. Blest*, Batu 12 (C)) (BMNH. 1981.12.31.10); paratype ♀, from vines in dense humid forest. 13.ix.1973, (*A. D. Blest*, Batu 28 (C)) (BMNH, 1981.12.31.11). Sarawak, Gunung Mulu National Park, R.G.S./Sarawak Government Expedition, alluvial forest environs of base camp, (*F. R. Wanless*): paratype ♀, beaten from shrubs, 6.vii.1978 (BMNH. 1981.12.31.12); paratype ♂, from litter, 21.vi.1978 (BMNH. 1981.12.31.13).

### Genus *COCALUS* Koch

REMARKS. This small Oriental and Australasian genus comprised of four known species (see check list) has been revised recently (Wanless, 1981*b*). The low elevation in the centre of

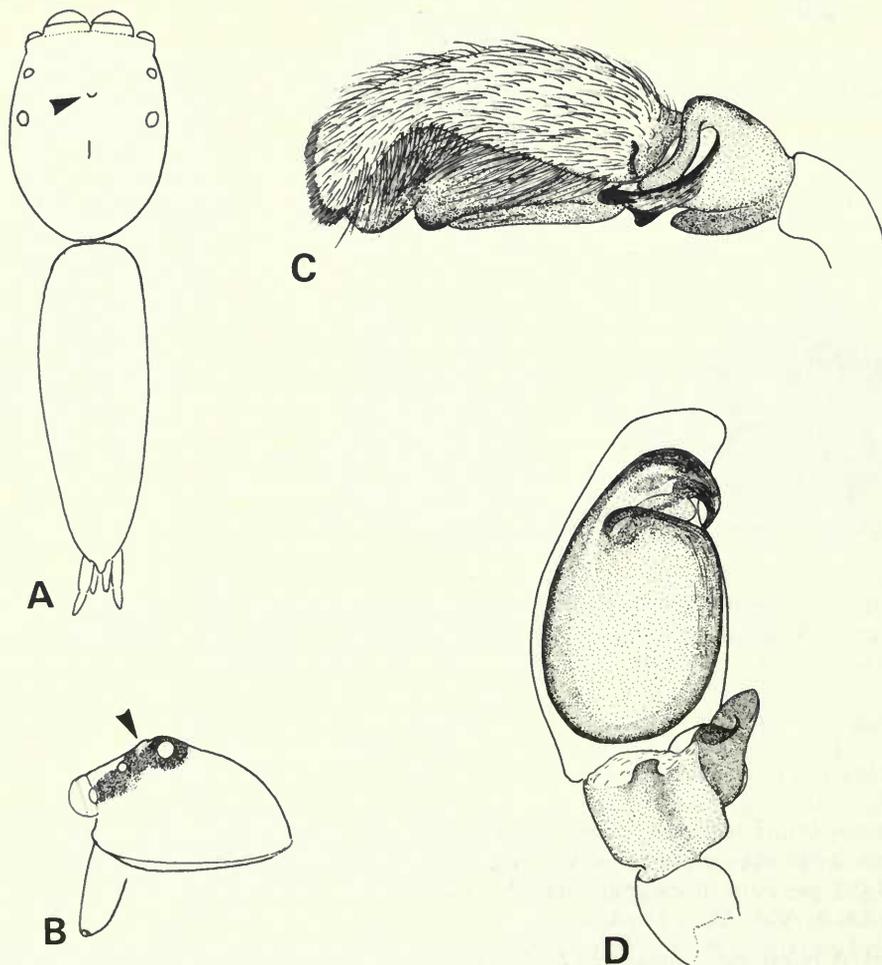


Fig. 22 *Cocalus limbatus* Thorell, holotype ♂: A, dorsal; B, carapace, lateral; C, palp, retro-lateral; D, palp, ventral.

the posterior ocular quadrangle (Fig. 22A, B) and the curious finger-like projection resting on the male palpal retrolateral tibial apophysis (Fig. 22C) are diagnostic for the genus.

Its affinities are uncertain, but some possibilities are discussed elsewhere (p. 143).

### Genus *BRETTUS* Thorell

REMARKS. This genus is comprised of six species (see check list) from India, Sri Lanka, Burma, Sulawesi and Madagascar (Wanless, 1979, 1980a).

The males are of considerable interest because the first pair of legs possess gutter-like femoral organs (Fig. 32A–C), and the palps, a tubular process which arises from a flask-shaped vacuole which lies near or alongside the retrolateral tibial apophysis (Figs 23D, F; 33C–E). Furthermore the tegular furrow of at least one species, *B. cingulatus* Thorell, has a minute pore (Fig. 36C, D) similar to that found in *Phaeacius lancearius* (Thorell). The function of these organs can only be guessed at (see p. 140) and they are of little use in determining the affinities of *Brettus* which are discussed elsewhere (p. 144).

The unknown male of *B. anchorum* Wanless has recently been discovered in the collections of BMNH and it is described to illustrate many of the features of the genus.

### *Brettus anchorum* Wanless (Fig. 23A–H)

*Brettus anchorum* Wanless, 1979: 188, ♀. Holotype ♀, India, Madras (BMNH) [examined].

*Male* from Madras, in poor condition. *Carapace* (Fig. 23A, C): amber; irregularly clothed in fine iridescent setae with broad marginal white haired bands edged above in clear brown-black hairs. *Eyes*: with black surrounds except anterior medians; fringed in pale amber hairs. *Clypeus*: white haired. *Chelicerae*: moderately robust, slightly inclined anteriorly; amber; basally a transverse fringe of white hairs with scanty covering of clear light amber ones elsewhere; promargin with three teeth, retromargin with three or four. *Maxillae and labium*: light orange-brown tinged with some grey. *Sternum* (Fig. 23G): yellow-brown with darker margins; clothed in testaceous hairs. *Coxae*: yellow-brown, first pair slightly darker. *Abdomen*: damaged, elongate ovoid; yellow-brown, lightly tinged black with paler region posteriorly. *Legs*: long and slender with black ventral fringes on tibiae and femora of the first and to a less marked degree, second pair of legs; femoral organ a minute elongate broken furrow; legs I orange-brown, others yellow-brown; spines moderately strong and numerous. Spination of legs I: metatarsi v 2-0-0, p 1-1-1, d 0-1-0, r 1-0-1; tibiae v 2-2-0, p 1-0-1, d 1-1-1; patellae p 0-1-1; femora p 1-1-0, d 0-2-3, r 1-1-0. *Palp* (Fig. 23D–F, H):  $M_1$  and  $M_3$  are both slender translucent prongs, whereas  $M_2$  forms an oblique translucent ledge which appears to arise from a sclerotised base that runs parallel with the oblique portion of  $M_3$ ; notice also the apophysis 'a' protruding from below the tegulum.

*Dimensions* (mm): total length c. 5.6; carapace length 2.48, breadth 2.10, height 1.36; abdomen length c. 3.24; eyes, anterior row 1.32, middle row 1.04, posterior row 1.14; quadrangle length 1.02 (41 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 11.5 : 6 : 4.5 : 6; AL–PM–PL :: 6–9; AM : CL :: 11.5 : 5.

DISTRIBUTION. India.

MATERIAL EXAMINED. India: holotype, ♀, data as in synonymy; 1 ♂, Ootacamund, Madras, purchased from G. F. Hampson, BMNH. 1888.57.

REMARKS. The elements  $M_1$ ,  $M_2$  and  $M_3$  are less well developed or even lacking in other species of *Brettus*; apophysis 'a' is also evidently absent.

### Genus *NEOBRETTUS* gen. n.

DEFINITION. Small squat hairy spiders (2.0 to 4.0 mm total length). Sexual dimorphism not marked.

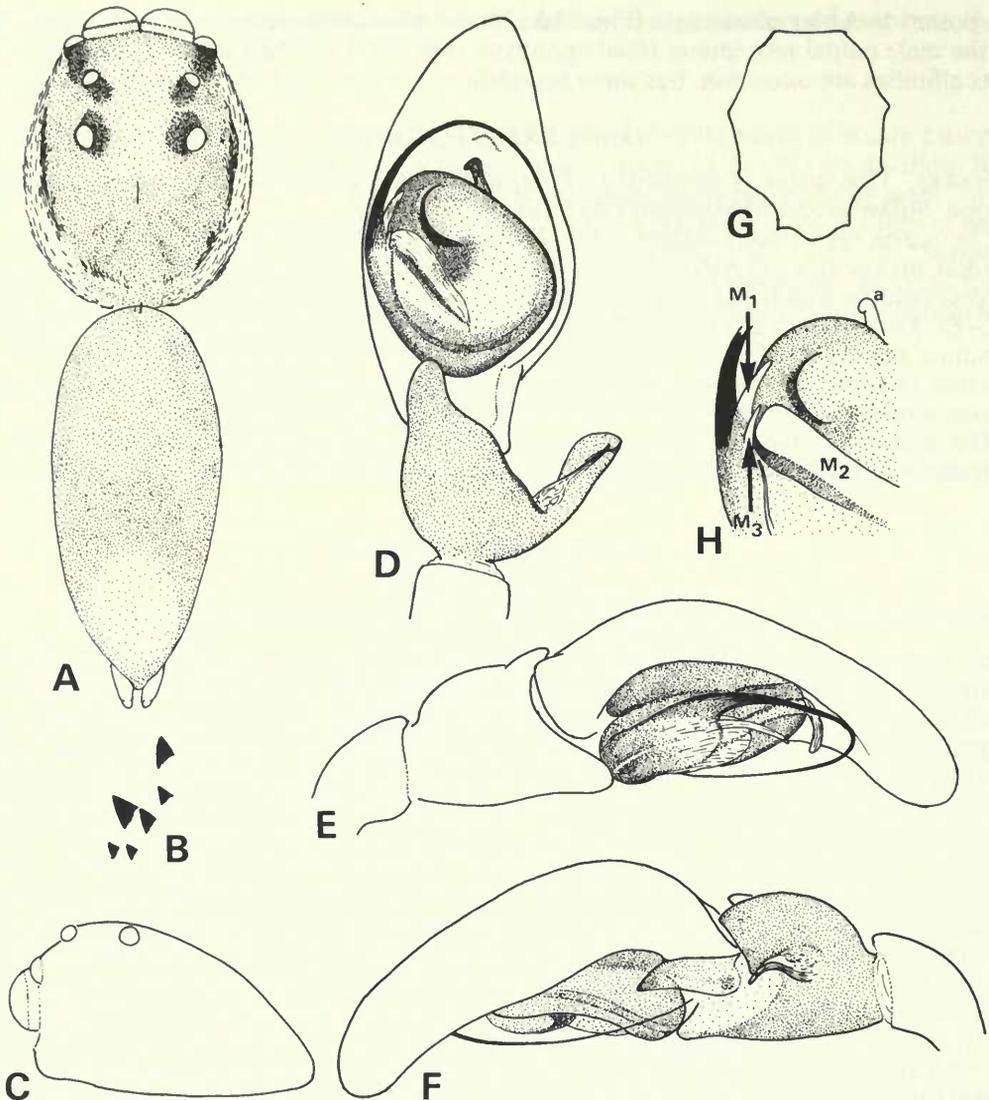


Fig. 23 *Brettus anchorum* Wanless, ♂: A, dorsal; B, cheliceral teeth, inner view; C, carapace, lateral; D, palp, ventral; E, palp, prolateral; F, palp retrolateral; G, sternum; H, distal haematochoa, tegular ledge and apophysis 'a'.

*Carapace* (Fig. 24A, B): moderately high, greatest height near middle of thoracic part, slightly longer than broad, widest at level of coxae III; fovea of medium length, positioned more or less midway between posterior lateral eyes; sides clothed in long hairs. *Eyes*: with moderately large lenses set on low tubercles; anteriors subcontiguous with apices recurved in frontal and dorsal views; anterior medians largest; anterior laterals about half diameter of anterior medians with noticeably dorsal direction of regard; posterior medians relatively large, positioned slightly closer to and more or less on optical axis of anterior laterals; posterior laterals slightly smaller or as large as anterior laterals and positioned inside lateral margins of carapace when viewed from above; posterior ocular quadrangle broader than long and wider behind; entire quadrangle about 56 per cent of carapace length. *Clypeus*: moderately high. *Chelicerae*: small, more or less parallel and slightly inclined anteriorly; fang

slender and curved; promargin with three teeth, retromargin with four of five. *Maxillae*: moderately long, more or less parallel with rounded outer distal margins. *Labium*: about as long as broad and about half maxillae length. *Sternum* (Fig. 24F): elongate scutiform. *Abdomen*: subovoid, slightly broader behind; spinnerets moderately long, posteriors moderately robust and slightly shorter than robust anteriors, medians slender and shorter than others; tracheal spiracle and position of colulus obscure, presumably in usual location near base of spinnerets. *Legs*: moderately long and slender with stout ventral fringes on tibiae, patellae and femora of legs I; femoral organ evidently lacking; patellae and tibiae together somewhat bowed, a characteristic emphasised by curving black lateral stripes; spines numerous and moderately strong; claws pectinate, tufts present, scopulae absent. *Female palps*: long and slender with distal claw. *Male palps*: moderately complex; interlocking tubercles well developed especially between cymbium/tibiae; patellae with slight anterodorsal tubercle; tibiae with pronounced anterodorsal tubercle, broad retrolateral apophysis bearing an inner flange, a rather elongate ventral apophysis and a minute intermediate apophysis (arrowed, Fig. 24D); cymbium with distal scopulae, basal excavations and protuberances; embolus long slender and flattened, arising from anterolateral margin of tegulum; distal haematodocha an obscure membranous patch  $M_1$  and an ill-defined whitish area  $M_2$ , the former bearing a large petal-like lobe (arrowed, Fig. 24D); tegulum subtrapezoid with a broad open furrow whose outer wall bears a groove forming an embolic guide, an oblique fine distal ledge  $M_3$  and a distally sinuous peripheral seminal duct; median haematodocha, subtegulum and basal haematodocha not examined. *Epigyne*: relatively large; copulatory openings positioned laterally, introductory ducts evidently with one spiral and then opening into flask shaped spermathecae.

TYPE SPECIES: *Cyrba tibialis* Prószyński.

ETYMOLOGY. The genus name means newly related to *Brettus*; the gender is feminine.

DIAGNOSIS. As the only known species is squat and hairy it is unlikely to be confused with other taxa in the subfamily.

*Neobrettus tibialis* (Prószyński) comb. n.  
(Fig. 24A–H)

*Cyrba tibialis* Prószyński, 1978: 19. Holotype ♂, Bhutan (NHM, Basel) [examined].

DIAGNOSIS. By the squat hairy body (Fig. 24A).

*Male* from Malaysia, in good condition. *Carapace* (Fig. 24A, B): pale yellow suffused and mottled black with whitish subcutaneous guanin in eye region and vertical pale yellowish stripes on sides above coxae I to III; clothed in long black, and whitish hairs on sides with short light brown iridescent ones dorsally. *Eyes*: with black surrounds except anterior medians; fringed by whitish, and light brown iridescent hairs. *Clypeus*: suffused black; clothed in long whitish, and pale grey-yellow hairs. *Chelicerae*: whitish yellow suffused with some black; shiny; basally clothed in short more or less recumbent pale yellow hairs, distally in scattered long pale orange ones; promargin with three teeth, retromargin with five. *Maxillae and labium*: whitish yellow. *Sternum*: whitish yellow clothed in light yellowish hairs. *Coxae*: whitish yellow. *Abdomen*: pale grey with light yellowish subcutaneous guanin; irregularly clothed in minute iridescent setae with patches of short light brown lanceolate hairs, and anteriorly a fringe of mixed stout black and fine whitish hairs; ventrally pale greyish yellow with whitish guanin. *Legs*: moderately long and slender with patellae and tibiae of legs II to IV slightly bowed (Fig. 24E, G); legs I femora whitish yellow suffused black on sides, patellae, tibiae and metatarsi whitish yellow with longitudinal black pro-lateral stripes and ventral fringes of stout black hairs, tarsi whitish yellow; other legs whitish yellow with black transverse stripes on inside of femora and black longitudinal stripes on inside of patellae and tibiae; spines moderately strong and numerous. Spination of legs I:

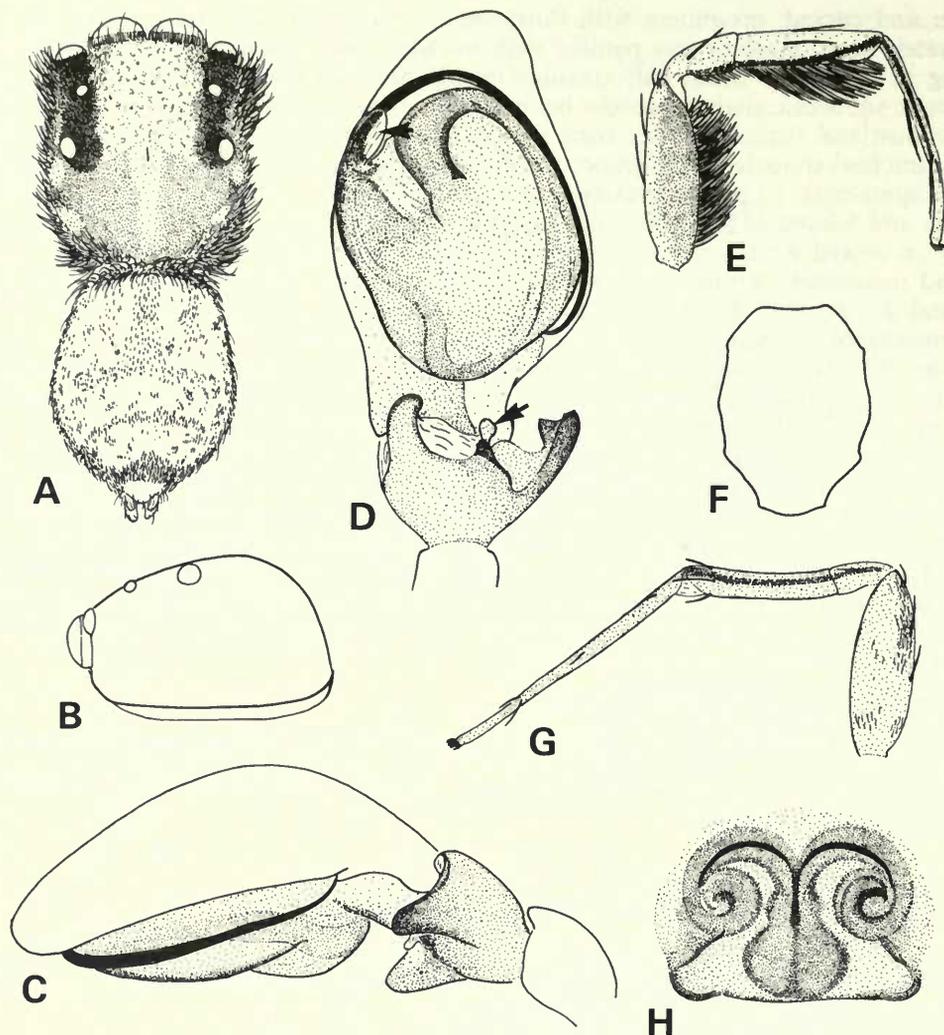


Fig. 24 *Neobrettus tibialis* (Prószyński), ♂: A, dorsal; C, palp, retrolateral; D, palp, ventral; E, leg I; G, leg IV. ♀: B, carapace, lateral; F, sternum; H, epigyne.

metatarsi v 0-2-1, p 0-1-1, d 0-1-2, r 0-1-1; tibiae v 1-2-2, p 0-1-1, d 0-1-0, r 0-1-1; patellae p 0-1-0, r 0-1-0; femora d 0-2-4. *Palp* (Fig. 24C, D).

*Dimensions* (mm): total length 3.2; carapace length 1.7, breadth c. 1.48, height 1.04; abdomen length 1.64; eyes, anterior row 1.33, middle row 1.07, posterior row 1.29; quadrangle length 0.96 (56 per cent of carapace length). *Ratios*: AM:AL:PM:PL:: 10:5.5:3:5; AL-PM-PL:: 6.5-7; AM:CL:: 10:4.

*Female*, formerly undescribed, from Malaysia in good condition. *Carapace*: similar to ♂, but markings slightly more distinct. *Eyes*: fringed by whitish hairs. *Clypeus*: sparsely white haired with scattered black ones. *Chelicerae*: pale yellow-brown with sooty markings; thinly covered in fine light brownish hairs; promargin with three teeth, retromargin with four or five. *Maxillae and labium*: pale yellow-brown lightly suffused with some black. *Sternum* (Fig. 24F): whitish yellow with darker margins; thinly clothed in pale yellowish hairs. *Coxae*: whitish yellow. *Abdomen*: similar to ♂, but whitish guanin forming more distinct transverse bands. *Legs*: first pair with femora whitish yellow heavily tinged black on sides with scanty

dorsal fringe of black hairs and ventral fringe, comprised of stout black hairs inside and fine whitish ones on outer, other segments whitish yellow with curving black stripe on outer side of patellae, tibiae and metatarsi, also on patellae and tibiae a ventral fringe of fine greyish, and white hairs, the former restricted to patellae and basal region of tibiae; other legs lacking fringes; legs II–III pale yellow with black blotches on femora and curving black lateral stripes on inner sides of patellae and tibiae II and on outer sides of patellae and tibiae III; legs IV similar to III, but with black lateral stripes on sides of tibiae only. Spination of legs I: metatarsi v 0-2-1, p 0-1-1, d 0-1-2, r 0-2-0; tibiae v 0-2-1, p 1-0-1, d 0-1-0; patellae p 0-1-0, r 0-1-0; femora d 0-2-4. *Epigyne* (Fig. 24H).

*Dimensions* (mm): total length 4.0; carapace length 1.76, breadth 1.58, height 1.2; abdomen length 2.4; eyes, anterior row 1.32, middle row 1.14, posterior row 1.4; quadrangle length 1.0 (56 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 10 : 5.2 : 3 : 5.2; AL–PM–PL :: 7–7.5; AM : CL :: 10 : 5.

VARIATION. ♂ total length varies from 2.76 to 3.2 mm, carapace length 1.48–1.7 mm (four specimens). Another ♀ measures 3.28 mm total length, and c. 1.6 mm carapace length.

Some of these specimens are darker than those described above and in the female the epigyne is less distinct, but nevertheless still comparable with Fig. 24H.

DISTRIBUTION. India: Bhutan; Malaysia.

MATERIAL EXAMINED. **Bhutan**: Phuntsholing, holotype ♂, 21.iv.1972 (Basal Natural History Museum Expedition to Bhutan, 1972). **Malaysia**: Genting, about 30 miles NE Kuala Lumpur, under dead banana trees, 1♂, 1♀, 18–22.viii.1979 (*J. & F. Murphy* coll.) (BMNH. 1982.2.4.1–2), 1♀, 2♂♂, (*J. & F. Murphy* coll.); Johore, Layang-Layang, 21–23. vii.1979, 1♀, (*J. & F. Murphy* coll.).

### Genus *CYRBA* Simon

According to Roewer (1954) *Cyrba* is comprised of 11 species, of these at least two, *C. dotata* Peckham & Peckham and *C. armillata* Peckham & Peckham, have been misplaced and are not included in the check list (p. 194). Three other species are also excluded, *C. tibialis* Prószyński is made the type species of a new genus (see above), while *C. flavimanus* Simon and *C. tadzika* Andreeva are junior synonyms of *C. micans* Simon (Prószyński, 1978). A revision of the genus is in preparation, but studies are at an early stage and remarks are based mainly on the type species, *C. algerina* (Lucas), figures of which are provided for comparative purposes.

*Cyrba* unlike many salticid genera is fairly easy to recognise by the combined presence of small posterior median eyes, elongate fovea and numerous cheliceral teeth. Some species have abdominal patterns and are brightly coloured, but in other respects their general habitus is rather similar, the genitalia providing as usual the more important diagnostic features. Although *Cyrba* cannot at present be supported by uniquely derived characters the genus nevertheless appears to be valid and would seem to belong in the *Brettus/Neobrettus* complex, while at the same time showing similarities with *Portia*. The epigynes of some species of *Cyrba* and *Portia* are structurally alike, especially in *C. algerina* and *P. fimbriata*. Also, in males of both genera the palpal organs possess a dorsal projection, small in *Cyrba*, large in *Portia*, on the basal margin of the cymbium (Fig. 25B, arrowed). Other palpal similarities are also evident, as noted by Prószyński (1978), but in contrast the development of the retro-lateral tibial apophyses seems to be quite different from those of *Portia*. However, it is possible that too much importance is being attached to this character as the paired tibial apophyses of *C. algerina* (Fig. 25B, F) are possibly unique, since other mostly unidentified species of *Cyrba* possess only a single apophysis bearing hyaline elements similar to those found in *Taraxella*.

The inclusion of *Cyrba* in the Plexippinae (Prószyński, 1976) is unjustified, as is also its original placement in the Thiodininae (Petrunkevitch, 1928) since it lacks the characters of either subfamily.

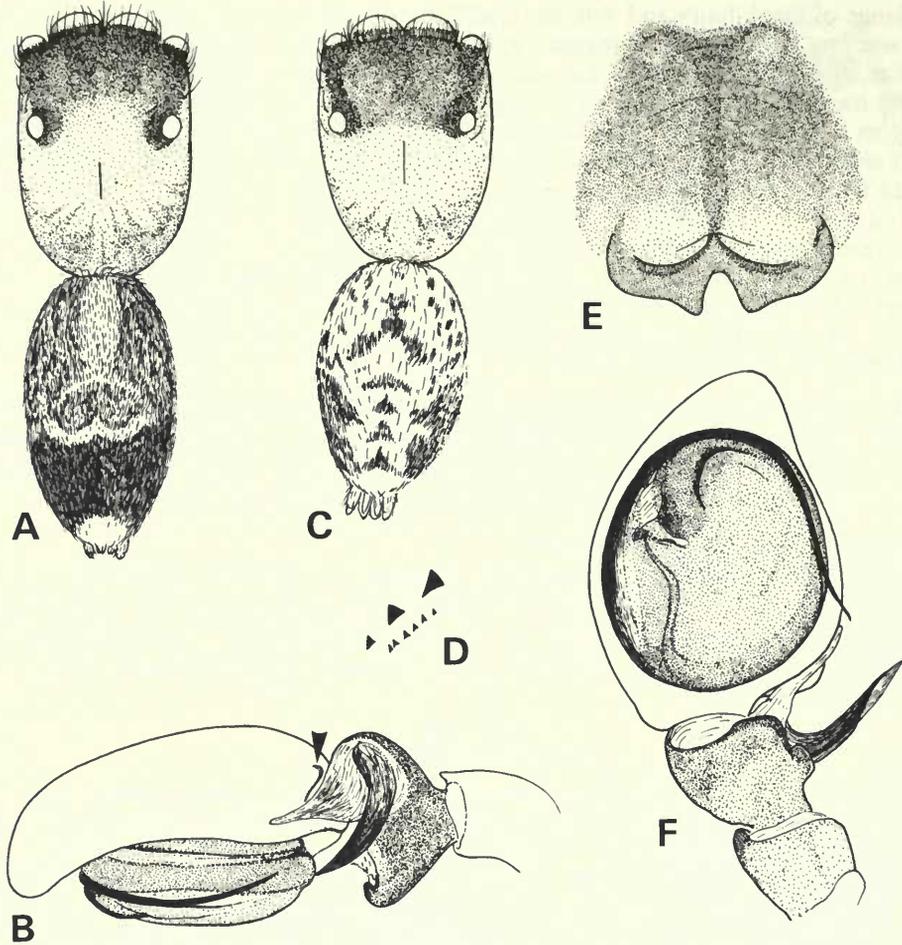


Fig. 25 *Cyrba algerina* (Lucas), ♂: A, dorsal; B, palp, retrolateral; F, palp, ventral. ♀: C, dorsal; D, cheliceral teeth, inner view; E, epigyne.

#### Genus *MELEON* gen. n.

*Portia* Karsch, 1878: 774 [in part].

**DEFINITION.** Spiders of medium size (i.e. between 4.0 and 8.0 mm in length). Patterns not distinctive, preserved specimens usually orange-brown to pale yellowish brown with vague sooty abdominal chevrons and sometimes light flecking; often clothed in minute whitish/iridescent setae; posterior median eyes sometimes with pronounced hair tuft posteriorly; legs I, at least in African species with strong ventral fringes.

*Carapace:* high, usually with an abrupt slope from about level of posterior median eyes to anterior eye row; longer than broad, widest at about level between coxae II and III; fovea moderately long and sulciform, positioned a little behind posterior margins of posterior lateral eyes. *Eyes:* with moderately strong lenses set on moderately low tubercles; anteriors subcontiguous or closely spaced with apices weakly to strongly recurved in frontal view; anterior medians largest; anterior laterals slightly larger than half diameter of anterior medians; posterior medians large, positioned slightly nearer to and on or slightly inside optical axis of anterior laterals; posterior lateral eyes slightly smaller or as large as anterior laterals and situated inside lateral margins of carapace when viewed from above; posterior

ocular quadrangle broader than long and wider behind; entire quadrangle between 38 and 50 per cent of carapace length. *Clypeus*: moderately high, concave. *Chelicerae*: moderately robust, more or less parallel and slightly inclined anteriorly; fang moderately robust and curved; promargin with three teeth, retromargin with three to six. *Maxillae*: moderately long, parallel or slightly diverging with rounded outer distal margins. *Labium*: about as long as wide and about half maxillae length. *Sternum*: generally scutiform. *Abdomen*: generally elongate ovoid; spinnerets moderately long, posteriors moderately robust and slightly longer than robust anteriors, medians slender and shorter than others. *Legs*: long and slender with numerous moderately strong spines, femoral organ lacking; legs I sometimes with strong fan-like fringes on venter and dorsum of tibiae, venter of femora and to a less marked degree on venter of patellae; also, on legs II and IV sometimes a ventral fringe more or less limited to tibial apices; claws pectinate; tufts present, scopulae absent, but minute setae present (c.f. *Portia*). *Female palps*: moderately long, rather slender with apical claw. *Male palps*: complex, interspecifically fairly distinct with dorsal interlocking tubercles variable between cymbium/tibiae and weak between tibiae/patellae; tibiae with ?moveable dorsal or retro-lateral apophysis arising from a membranous joint, and ventral apophyses which vary in development; cymbium distally scopulate, sometimes modified apically to accommodate embolic region, basally excavated or scalloped with raised sclerotised margins sometimes surrounding an indistinct subtriangular membranous area similar to, but evidently not contiguous with connective tissue of the cymbial/tibial joint; embolus arising apically, short and slender to moderately long and robust curving inwards towards alveolus or outer edge of cymbium; distal haematodocha an obscure membranous patch  $M_1$  which sometimes bears a minute lobe, region  $M_2$  sometimes patch-like but generally not evident being largely obscured by tegular element  $M_3$ ; tegulum subovoid, with deep peripheral furrow and distal lobe-like region bearing the embolus, distal haematodocha, and distal element  $M_3$  which often has a small delicate lobe that extends laterally as a fine delicate ledge which terminates in the furrow and appears to function as an embolic guide; median haematodocha, subtegulum and basal haematodocha not examined. *Epigynes*: relatively large and interspecifically distinct; internal structures poorly known—only examined in one species (*M. solitaria* (Lessert)). In this, obscure anteriorly situated copulatory openings are separated by an indistinct median groove, apparently lacking in other species; the introductory ducts are moderately long, gently curving and open distally into large dark spermathecae bearing short slender fertilisation ducts near posterior margin.

TYPE SPECIES. *Portia kenti* Lessert.

ETYMOLOGY. The genus name is an arbitrary combination of letters; the gender is considered feminine.

DIAGNOSIS. Species of this genus superficially resemble those of *Portia*, *Brettus* and *Veissella*, but they are not likely to be confused for in practice the epigynes are quite distinct (see Wanless, 1978b) and the male palps easily recognised by the membranous socket of the tibial apophyses (Figs 26F: 34C–E).

***Meleon solitaria* (Lessert) comb. n.**  
(Fig. 26A–G)

*Portia solitaria*: Wanless, 1978: 91 [synonymy and ♀ description].

*Male*, formerly undescribed, in poor condition. *Carapace* (Fig. 26A, C): orange-brown with blackish margins and mottling on lower thoracic sides; weakly iridescent under some angles of illumination; irregularly clothed in short fine whitish hairs with pale amber tufts behind posterior median eyes. *Eyes*: with black surrounds except anterior medians; anterior row strongly recurved in frontal view; fringed by dull amber hairs with paler tips. *Clypeus*: thinly covered in short whitish hairs mixed with long brownish ones. *Chelicerae*: moderately robust; orange-brown mottled black; iridescent; thinly clothed in short clear whitish hairs and long

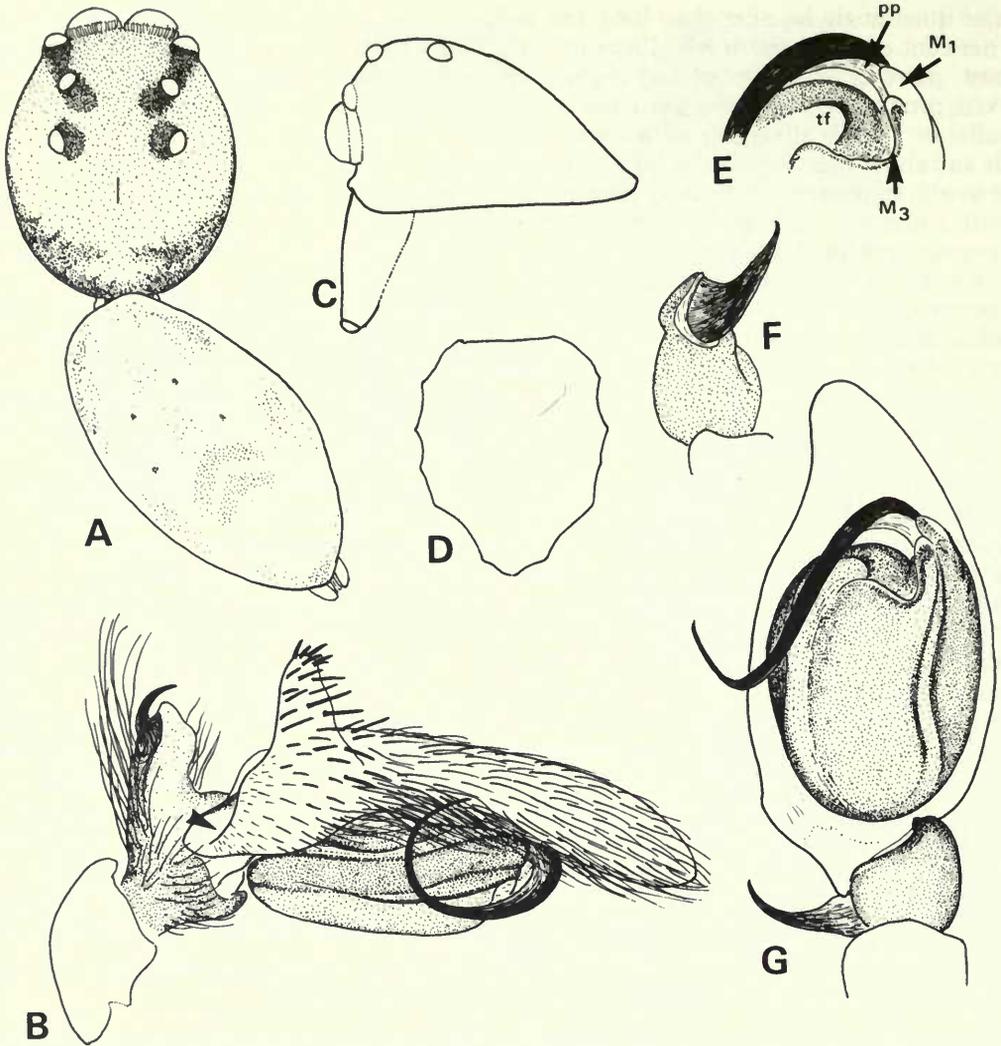


Fig. 26 *Meleon solitaria* (Lessert), ♂: A, dorsal; B, palp, retrolateral; C, carapace, lateral; D, sternum; E, distal haematodocha and tegular ledge; F, retrolateral tibial apophysis, dorsal; G, palp, ventral. Abbreviations: pp, pars pendula; tf, tegular furrow.

pale brownish ones; promargin with three teeth, retromargin with four. *Maxillae and labium*: yellow-brown tinged black. *Sternum* (Fig. 26D): orange-brown tinged black, shiny, thinly clothed in clear whitish hairs with brownish ones more or less opposite coxae. *Coxae*: first pair orange-brown lightly tinged black, rest paler. *Abdomen*: dull yellow-brown tinged grey with vague dorsal chevrons and broad longitudinal black stripe ventrally; irregularly clothed in fine pale amber/iridescent setae. *Legs*: long and slender; legs I generally dark orange-brown, but apices of patellae and femora paler, with strong black ventral and dorsal fringes on tibiae and ventral ones on femora—mostly rubbed; other legs orange-brown with blackish markings on metatarsi and femora IV, also short fringes and blackish annuli on apices of tibiae IV; spines moderately strong and numerous. Spination of legs I: metatarsi v 2-0-2, p 1-0-1, d 0-1-0, r 1-1-1; tibiae v 2-1-0, p 1-0-1, d 1-1-0, r 1-0-1; patellae p 0-1-0, r 0-1-0; femora p 1-1-1, d 1-1-3, r 1-1-1. *Palp* (Fig. 26B, E-G): typical of genus except for spinose protuberance on cymbium.

*Dimensions* (mm): total length c. 5.6; carapace length 2.36, breadth 2.22, height 1.68; abdomen length 3.2; eyes, anterior row 1.48, middle row 1.12, posterior row 1.32; quadrangle length 1.2 (50 per cent of carapace length). *Ratios*: AM : AL : PM : PL :: 13.4 : 7.5 : 6 : 7; AL-PM-PL :: 7.5-9.4; AM : CL :: 13.4 : 6.5.

DISTRIBUTION. Guinea; Ivory Coast; Zaire.

MATERIAL EXAMINED. **Ivory Coast**: environs of Kотиessou, nr. Bandama River, 1♂, from *Piliostigma thonningei* (Schum) Milne Redhead, a small tree common in savannah, (*J. Jezequel*, PNB. 145) (MNHN, Paris).

### Genus *VEISSELLA* gen. n.

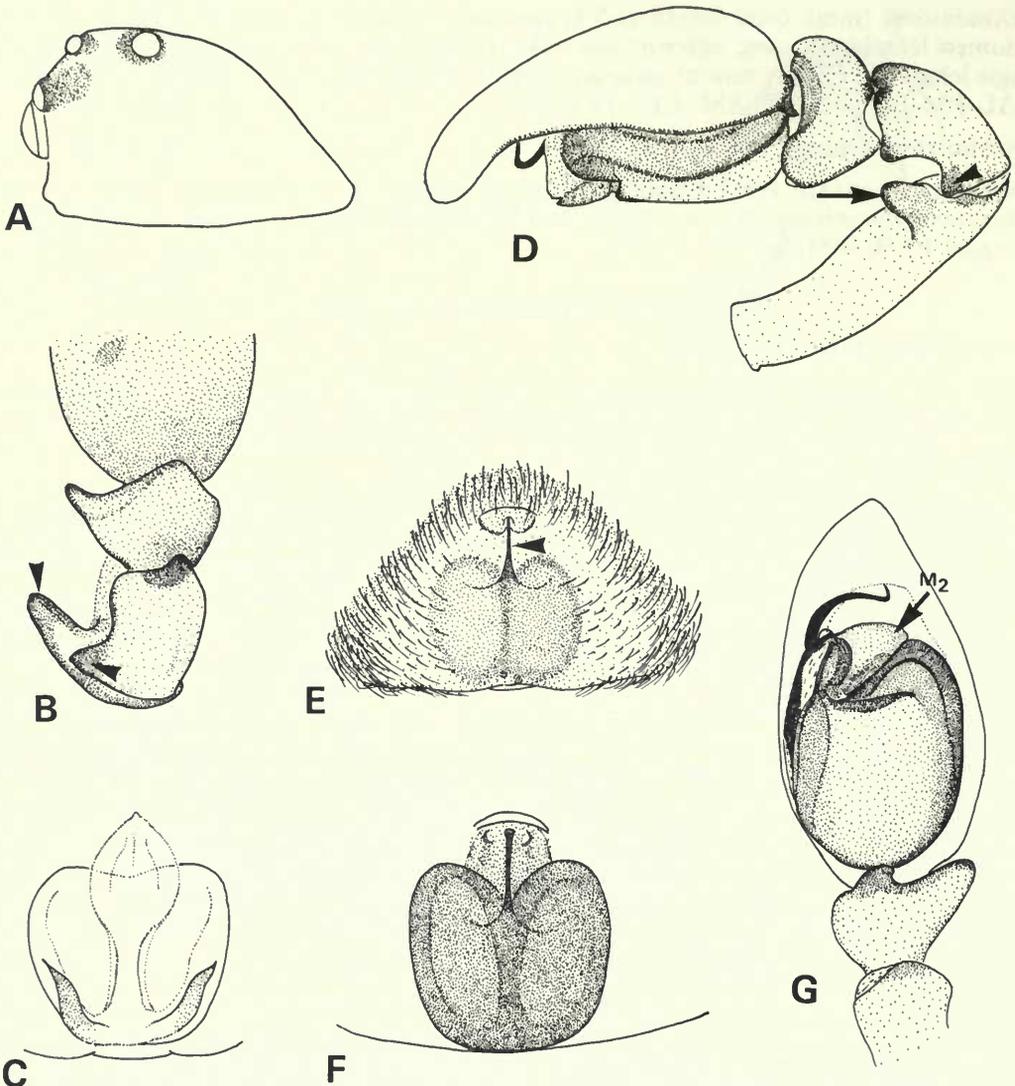
*Portia* (Karsch, 1878: 774 [in part].

DEFINITION. Spiders of medium size (i.e. between 4.0 and 8.0 mm in length). Sexual dimorphism not marked, patterns of preserved specimens not very distinctive—generally orange-brown with whitish yellow abdomen bearing a ventral black stripe, clothed in fine whitish/iridescent setae; legs I and II with strong ventral fringes.

*Carapace*: high with an abrupt slope from about level of posterior median eyes to anterior eye row; longer than broad, widest at level between coxae II and III; fovea moderately long and sulciform, apex at level of posterior margins of posterior lateral eyes. *Eyes*: with moderately strong lenses set on moderately low tubercles; anteriors subequally spaced and closely set with apices strongly recurved in frontal view; anterior medians largest; anterior laterals slightly larger than half diameter of anterior medians; posterior medians large and positioned slightly nearer to and more or less on optical axis of anterior laterals; posterior lateral eyes slightly smaller than anterior laterals and situated inside lateral margins of carapace when viewed from above; posterior ocular quadrangle broader than long and wider behind; entire quadrangle between 42–45 per cent of carapace length. *Clypeus*: moderately high, concave. *Chelicerae*: moderately robust, more or less parallel; vertical or slightly inclined anteriorly; fang moderately robust or curved; promargin with three teeth, retromargin with three or four. *Maxillae*: moderately long, more or less parallel with rounded outer distal margins. *Labium*: about as long as broad and about half maxillae length. *Sternum*: elongate scutiform. *Abdomen*: elongate ovoid, spinnerets moderately long, posteriors moderately robust and about as long as robust anteriors, medians slender and slightly shorter than others. *Legs*: long and slender with numerous strong spines; femoral organs lacking; legs I and to a lesser extent II, with strong ventral fringes; claws pectinate, tufts present, scopulae absent, but with minute iridescent setae, (c.f. *Portia*). *Female palps*: moderately long and slender with apical claw. *Male palps*: complex, intergenerically distinct; lacking dorsal interlocking tubercles on cymbium/tibial joint, but with pronounced anterodorsal tubercle on patellae; also on patellae a large retrobasal apophysis opposing a similar but larger femoral apophysis bearing on its inner surface curving recumbent setae; tibiae with an oblique ventral apophysis and broad flange-like retrolateral apophysis; cymbium with distal scopulae, lacking excavations or protuberances; embolus arising apically, moderately long and slender, but sinuous and curving inwards towards alveolus; distal haematodocha with membranous patch  $M_1$  bearing a minute delicate lobe,  $M_2$  an indistinct region giving rise to a large sclerotised lobe (Fig. 27G, arrowed). Tegulum subovoid with an open furrow extending a short distance around prolateral margin, a distal tegular ledge  $M_3$  and lobe-like region bearing the distal haematodocha and embolus; median haematodocha, subtegulum and distal haematodocha not examined. *Epigyne*: with anterior copulatory openings divided by median guide; introductory ducts short and curving; spermathecae large, dark and contiguous with fertilisation ducts on posterior margin.

TYPE SPECIES. *Portia durbanii* Peckham & Peckham.

ETYMOLOGY. The genus name is an arbitrary combination of letters; the gender is considered feminine.



**Fig. 27** *Veissella durbanii* (Peckham & Peckham), ♂: A, carapace, lateral; B, palpal tibia, patella and femora, from above; D, palp, retrolateral; G, palp, ventral. ♀: vulva, inner view; E, epigyne; F, vulva, outer view.

**DIAGNOSIS.** The only known species in this genus resembles those of *Meleon*, *Brettus* and *Portia*, but it is easily distinguished by the opposing apophyses on the male palpal patellae and tibiae (Fig. 27B, D), and median epigynal guide in females (arrowed, Fig. 27E).

#### Genus *PHAEACIUS* Simon

*Phaeacius*: Wanless, 1981: 199 [synonymy, definition and species descriptions].

**REMARKS.** A small Oriental genus comprised of five species (see check list). Most are relatively large in size (total length between 7.5 and 11.5 mm) and somewhat flattened in profile. Males are easily recognised by the massive retrolateral tibial apophyses and filamentous process  $M_1$  (e.g. Fig. 28A, C). Females are more difficult, the best diagnostic feature being

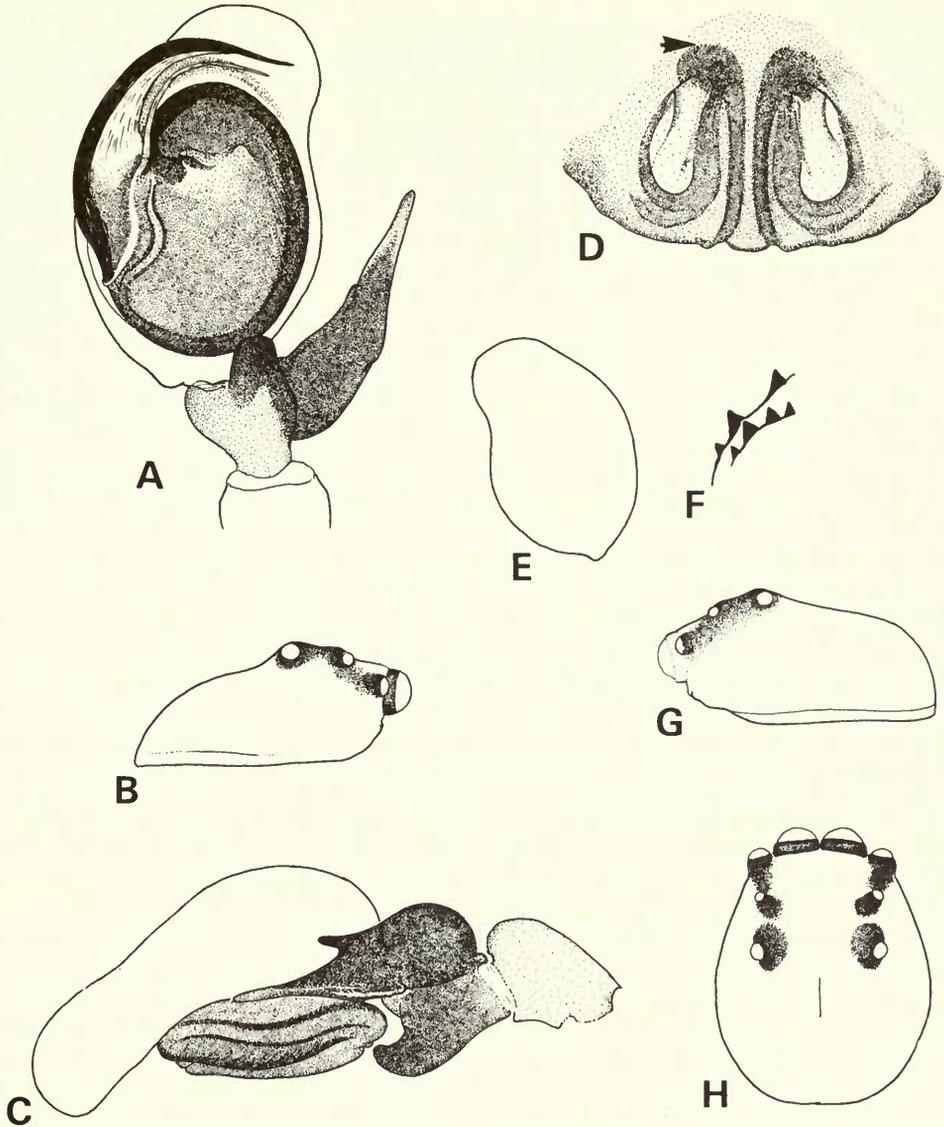


Fig. 28 *Phaeacius fimbriatus* Simon, ♂: A, palp, ventral; C, palp, retrolateral; E, cymbium, dorsal; G, carapace, lateral. ♀: B, carapace, lateral; D, epigyne; F, cheliceral teeth, inner view; H, carapace, dorsal.

the patch of fine spatulate setae on the underside of coxae IV. Its affinities are uncertain (see p. 144), but *Portia* is possibly its closest relative.

Two new records have been noted since the genus was revised (Wanless, 1981). *P. malayensis* Wanless: 1 ♀, collected from a *web* together with a juvenile specimen of *Portia*, Pasir Kis, Singapore, (Joseph Koh) 1982; another specimen, 1 ♂, (1901, BMNH. coll.) was taken from tree trunks and described by the collector as 'very protectively coloured'.

#### Genus *PORTIA* Karsch

*Portia*: Wanless 1978: 84 [synonymy, definition and species descriptions].

The genus was redefined by Wanless (1978*b*), but some modifications are now necessary in view of proposed taxonomic changes.

**DEFINITION.** Cryptic spiders with ornate hair tufts and fan-like leg fringes; medium to large in size (i.e. total length between 4.0 and 16.0 mm); sexes alike in body form, but colour patterns sometimes dimorphic—males possess whitish marginal and median carapace bands which are usually less conspicuous in females.

*Carapace:* high with marked slope from posterior lateral eyes to anterior eye row; fovea long, apex just behind posterior margins of posterior lateral eyes. *Eyes:* anterior row weakly to strongly procurved in frontal view; posterior medians relatively large; lenses moderately strong. *Clypeus:* high, concave. *Chelicerae:* medium to large, more or less vertical, promargin with three teeth, retromargin with six. *Abdomen:* elongate ovoid with hair tufts. *Legs:* long and slender, especially tarsi and metatarsi, with strong fan-like fringes, tufts and numerous spines. *Male palps:* large and hirsute, moderately complex and intergenerically fairly distinct; cymbium with distal scopulae and basally a somewhat angular dorsal flange and a variously pronounced retrolateral one; embolus usually arising from distal prolateral margin of tegulum, and characteristically projecting laterally, moderately long slender and curved, sometimes with basal sheath; distal haematodocha with  $M_1$  an obscure membranous patch partly covering embolic base and  $M_2$  a lobe-like membrane between embolic base and tegular furrow; tegulum more or less ovoid with an open furrow, peripheral seminal ducts and distal ledge  $M_3$  which bears a small transparent lobe above and between ( $M_1$ ,  $M_2$ ) and sometimes a short delicate spike in the region of the furrow. *Epigynes:* relatively large, intraspecifically sometimes rather variable, openings often plugged; African species characterized by median plate forming an apparent arch between posterior margin and copulatory openings; Oriental species possess a variously developed anterior hood and caudal ledge, the latter bearing embolic guides that extend anteriorly and merge with the copulatory openings; introductory ducts of both African and Oriental species contiguous and looping distally to open into large, dark, rounded spermathecae bearing indistinct fertilization ducts on posterior margin.

**DIAGNOSIS.** From other genera in the subfamily by details of the genitalia (males possess a readily observable dorsal flange arrowed, Fig. 29B, F, on the palpal cymbium) and ornamentation.

**REMARKS.** Several important papers on the morphology and behaviour of *Portia* have appeared since the genus was revised (Wanless, 1978b).

Williams and McIntyre (1980) have shown that the anterior median eyes have a telephoto element which increases image size and assists the spider in stalking prey. Later studies (Blest *et al.*, 1981) indicate that the eyes of most salticids may share this design, but it is especially pronounced in *Portia*.

During the present study the development of the lenses was found to vary independently of the size of the carapace. For example, the lenses of *Phaeacius* and *Cocalus* are not pronounced and relatively small when compared with those of other genera, suggesting that their light gathering power is lower and possibly a reflection of ambient light levels of their habitats. The direction of regard of the eyes also varies, a feature first drawn to my attention by L. Forster (pers. comm.). In most species of this subfamily the eyes of the anterior row have a horizontal or slightly ventral direction of regard, sometimes the direction is the same for both anterior medians and anterior laterals, but it is not always so. In one genus, *Neobrettus*, the direction of regard is slightly dorsal and particularly evident when the facies are viewed from in front. Lens size in relation to the carapace has been noted in the generic descriptions, but it has not been practicable to indicate direction of regard which can, however, be more conveniently shown in the figures.

Jackson and Blest (1982) have provided an excellent account of the utilisation of webs and predatory versatility of *P. fimbriata* based on observations in a Queensland rainforest and the laboratory. They have shown that *fimbriata* builds two types of webs. Type I used as a resting site and type II as a more substantial structure in which the spider captures prey, moults, mates, oviposits and broods eggs. The predatory strategy includes the use of distinct tactics for capturing varied types of prey. They will enter the webs of various species and prey on the occupant by specialised leg and palp movements which vibrate the silk and at-

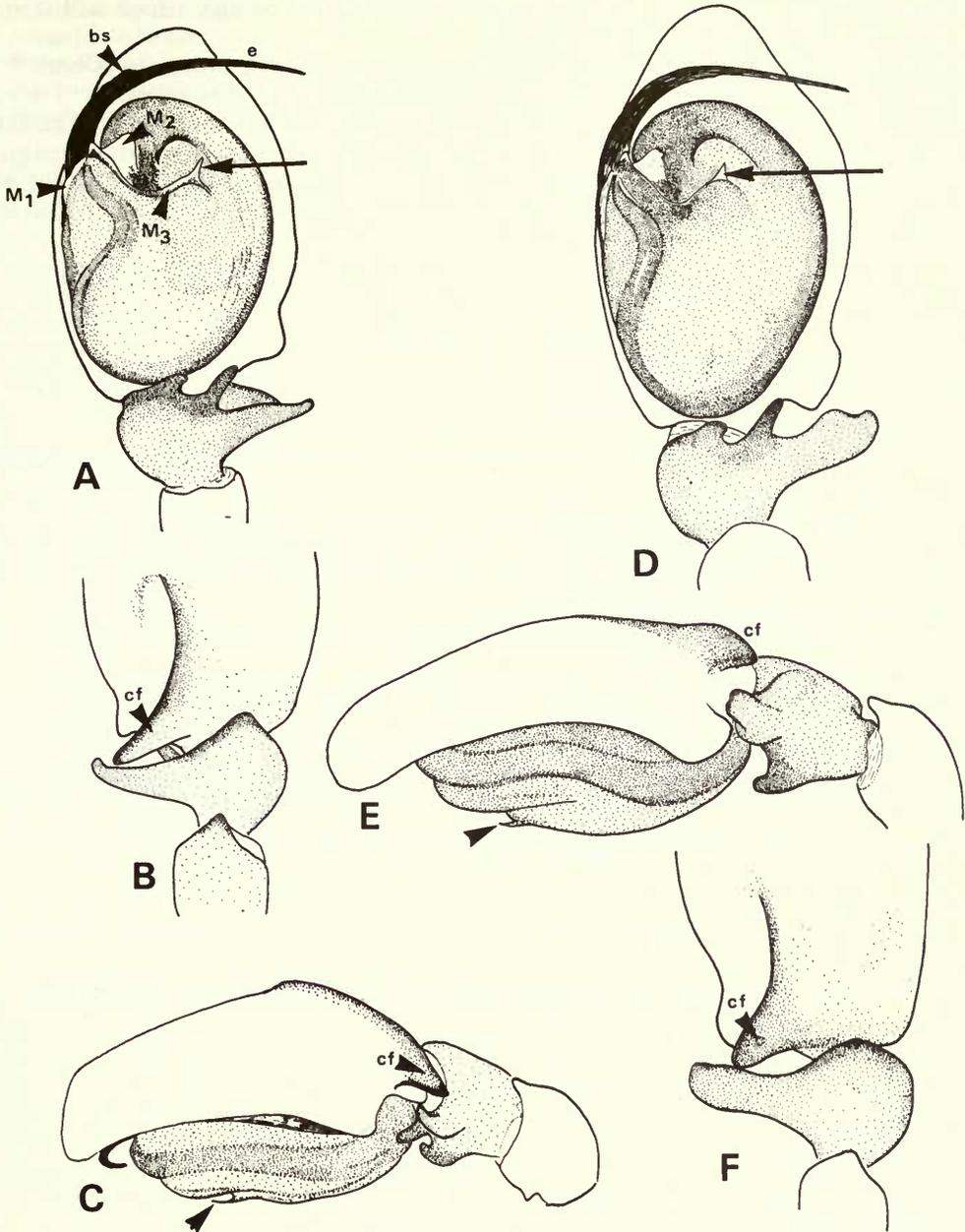


Fig. 29 (A–C) *Portia labiata* (Thorell), ♂: A, palp, ventral; B, palpal tibia and cymbial flange from above; C, palp, retrolateral. (D–F) *Portia assamensis* Wanless, ♂: D, palp, ventral; E, palp, retrolateral; F, palpal tibia and cymbial flange from above. Abbreviations: bs, basal sheath; cf, cymbial flange; e, embolus.

tract the owner to within striking distance. They also prey on other salticids outside of webs by moving in a slow mechanical fashion and stopping whenever noticed by the victim which evidently fails to recognise them as another salticid and potential predator. *Portia* also pursued insects, outside of webs, on its own web or in the webs of other spiders, but showed a preference for, and was more successful in capturing spiders. Jackson (1982) provides

additional data on intraspecific interactions and reproductive biology which will form the basis for comparative studies on other species.

Jackson and Blest (1982) proposed a hypothetical model for the evolution of both *Portia fimbriata* and typical cursorial salticids from non-visual web-building ancestors. They suggested that acute vision evolved in the context of web predation and once acquired permitted the vagrant predation of motile insects. The biology of other genera in this and related groups will undoubtedly test the model (parts of which have been collaborated by recent work, Jackson, in prep.) and provide further insight into the evolutionary events which lead to the adaptive radiation of the Salticidae.

### Taxonomic summary

1. *Boethus* Thorell, 1878 is a junior homonym of *Boëthus* Foerster, 1868.
2. Spartaeinae nom. n., is proposed.
3. Six new genera are proposed:  
*Meleon* gen. n., *Mintonia* gen. n., *Neobrettus* gen. n., *Veissella* gen. n., and *Yaginumanis* gen. n.
4. Ten new species are described:  
*Gelotia robusta* sp. n., *Gelotia syringopalpis* sp. n., *Mintonia breviramus* sp. n., *Mintonia mackiei* sp. n., *Mintonia melinauensis* sp. n., *Mintonia nubilis* sp. n., *Mintoria tauricornis* sp. n., *Spartaeus thailandica* sp. n. and *Taraxella solitarius* sp. n.
5. Three species are newly synonymised:  
*Boethus striatipes* (Simon, 1901) and *Boethus caligatus* (Simon, 1901) are junior synonyms of *Spartaeus spinimanus* Thorell, 1878.  
*Codeta bouchardi* Simon, 1903 is a junior synonym of *Gelotia bimaculata* Thorell, 1892.
6. Seven new combinations are proposed:  
*Gelotia argenteolimbata* (Simon) comb. n., *Mintonia ramipalpis* (Thorell) comb. n., *Neobrettus tibialis* (Prószyński) comb. n., *Gelotia salax* (Thorell) comb. n., *Meleon solitaria* (Lessert) comb. n., *Veissella durbanii* (Peckham & Peckham) comb. n., and *Yaginumanis sexdentatus* (Yaginuma) comb. n.
7. The males of *Brettus anchorum* Wanless and *Meleon solitaria* (Lessert) are newly described.

### Check list, known sex and distribution of species in the subfamily Spartaeinae

(\* = type species)

#### *Brettus* Thorell

<i>B. adonis</i> Simon	♂♀	Sri Lanka
<i>B. albolimbatus</i> Simon	♀	India
<i>B. anchorum</i> Wanless	♂♀	India
* <i>B. cingulatus</i> Thorell	♂	Burma
<i>B. celebensis</i> (Merian)	♀	Sulawesi
<i>B. madagascarensis</i> (Peckham & Peckham)	♀	Madagascar

#### *Cocalus* Koch

* <i>C. concolor</i> Koch	♂	Bintang Island
<i>C. gibbosus</i> Wanless	♂	Australia
<i>C. limbatus</i> Thorell	♂	Amboina
<i>C. murinus</i> Simon	♀	Sumatra

#### *Cyrba* Simon

* <i>C. algerina</i> (Lucas)	♂♀	Canary Isl., Burma, India, Mediterranean Region, Nepal, Port. Guinea, Sumatra, Turkestan, W. Africa
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<i>C. bidentata</i> Strand	♀	Ethiopia
<i>C. bimaculata</i> Simon	♀	Republic of Congo
<i>C. boveyi</i> Lessert	♂	Angola
<i>C. nigrimana</i> Simon	♂♀	East Africa, South Africa
<i>C. micans</i> Simon	♂♀	Bhutan, India, Sumatra, USSR (Tadzhikistan)
<i>C. picturata</i> Karsch	♀	Hong Kong
<i>C. szechenyii</i> Karsch	♀	Hong Kong
<i>Gelotia</i> Thorell		
<i>G. argenteolimbata</i> (Simon)	♂	Singapore
<i>G. bimaculata</i> Thorell	♂♀	Borneo, Sumatra
* <i>G. frenata</i> Thorell	♀	Sumatra
<i>G. robusta</i> sp. n.	♂	New Britain
<i>G. salax</i> (Thorell)	♂	Sulawesi
<i>G. syringopalpis</i> sp. n.	♂♀	Sarawak
<i>Meleon</i> gen. n.		
<i>M. falcifera</i> (Wanless)	♂	Uganda
* <i>M. kenti</i> (Lessert)	♂♀	Angola, Malawi, South Africa
<i>M. madagascarensis</i> (Wanless)	♂	Madagascar
<i>M. oreophila</i> (Wanless)	♀	Madagascar
<i>M. russata</i> (Simon)	♀	Madagascar
<i>M. solitaria</i> (Lessert)	♂♀	Guinea, Ivory Coast, Zaire
<i>Mintonia</i> gen. n.		
<i>M. breviramus</i> sp. n.	♂♀	Sarawak
<i>M. mackiei</i> sp. n.	♂	Kalimantan
<i>M. melinauensis</i> sp. n.	♂	Sarawak
<i>M. nubilis</i> sp. n.	♀	Kalimantan
<i>M. protuberans</i> sp. n.	♂	Singapore
<i>M. ramipalpis</i> (Thorell)	♂♀	Java, Sarawak, Sumatra
* <i>M. tauricornis</i> sp. n.	♂♀	Sarawak
<i>Neobrettus</i> gen. n.		
* <i>N. tibialis</i> (Prószyński)	♂♀	Bhutan, Malaya
<i>Phaeacius</i> Simon		
<i>P. canalis</i> Wanless	♂♀	Philippines
* <i>P. fimbriatus</i> Simon	♂♀	Java
<i>P. lancearius</i> (Thorell)	♂	Burma, India
<i>P. malayensis</i> Wanless	♂♀	Singapore, Sumatra
<i>P. saxicola</i> Wanless	♀	Nepal
<i>Portia</i> Karsch		
<i>P. africana</i> (Simon)	♂♀	Angola, Cameroun, Central African Republic, French, Guinea, Gabon, Ghana, Ivory Coast, Sierra Leone, Zaire, Zambia
<i>P. albimana</i> (Simon)	♂♀	India, Sri Lanka
<i>P. assamensis</i> Wanless	♂♀	Assam, Malaya, Nepal
<i>P. crassipalpis</i> (Peckham & Peckham)	♂	Borneo, Singapore
<i>P. fimbriata</i> (Doleschall)	♂♀	Amboina, Australia, Mussau Isl., New Georgia, New Guinea, Solomon Isl., Sri Lanka, Yule Isl.
<i>P. labiata</i> (Thorell)	♂♀	Burma, India, Malaya, Sarawak, Siam, Sri Lanka, Sumatra, Philippines
<i>P. orientalis</i> Murphy & Murphy	♂	Hong Kong
* <i>P. schultzi</i> Karsch	♂♀	French Guinea, Kenya, Madagascar, Malawi, South Africa, Tanzania, Zaire

<i>Spartaeus</i> Thorell	
* <i>S. spinimanus</i> (Thorell)	♂♀ Amboina, Java, Sarawak, Singapore, Sri Lanka, Sumatra
<i>S. thailandica</i> sp. n.	♀ Thailand
<i>Taraxella</i> gen. n.	
* <i>T. solitaria</i> sp. n.	♂ Sarawak
<i>Veissella</i> gen. n.	
* <i>V. durbanii</i> (Peckham & Peckham)	♂♀ South Africa
<i>Yaginumanis</i> gen. n.	
* <i>Y. sexdentatus</i> (Yaginuma)	♂♀ Japan

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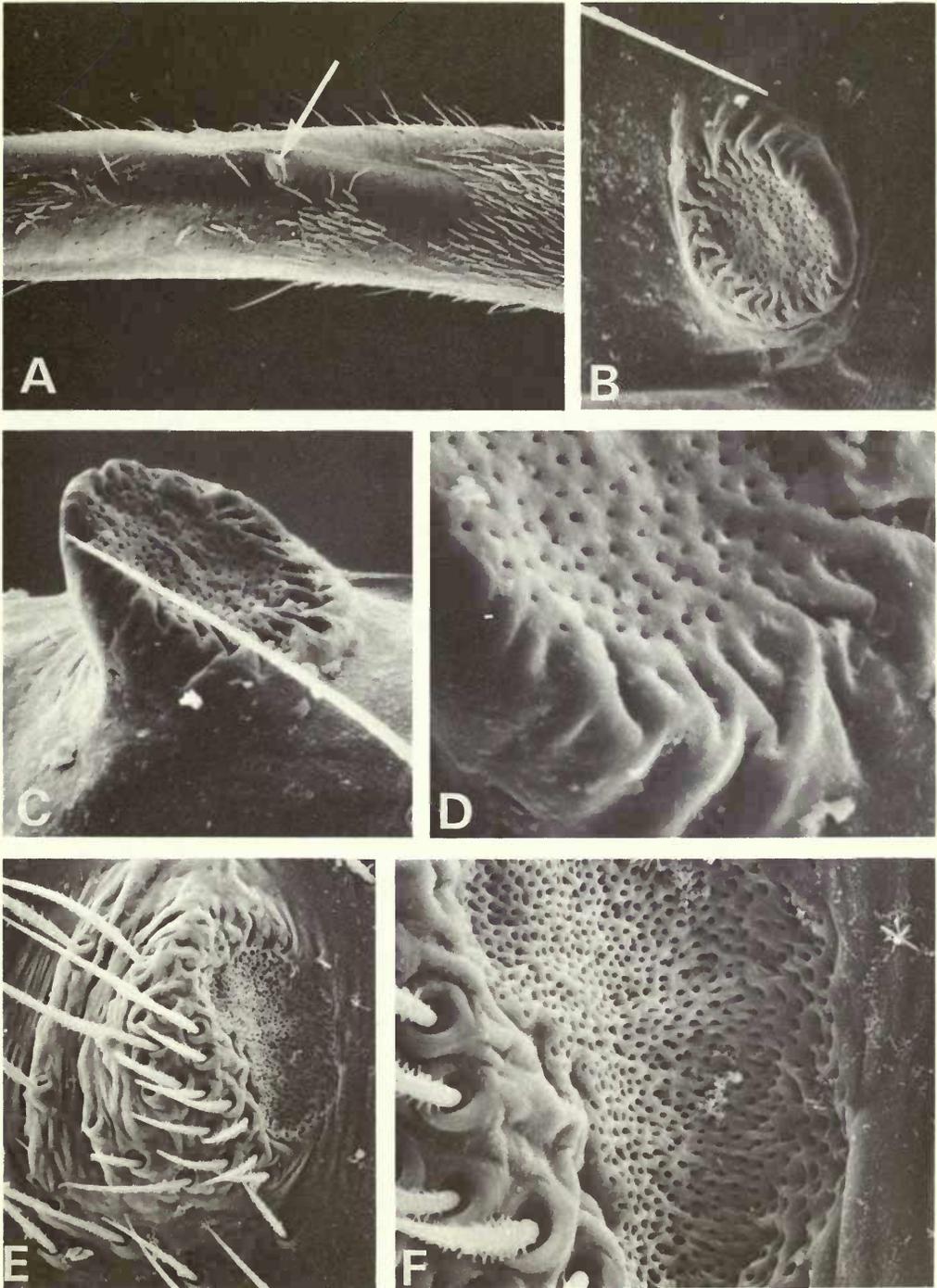
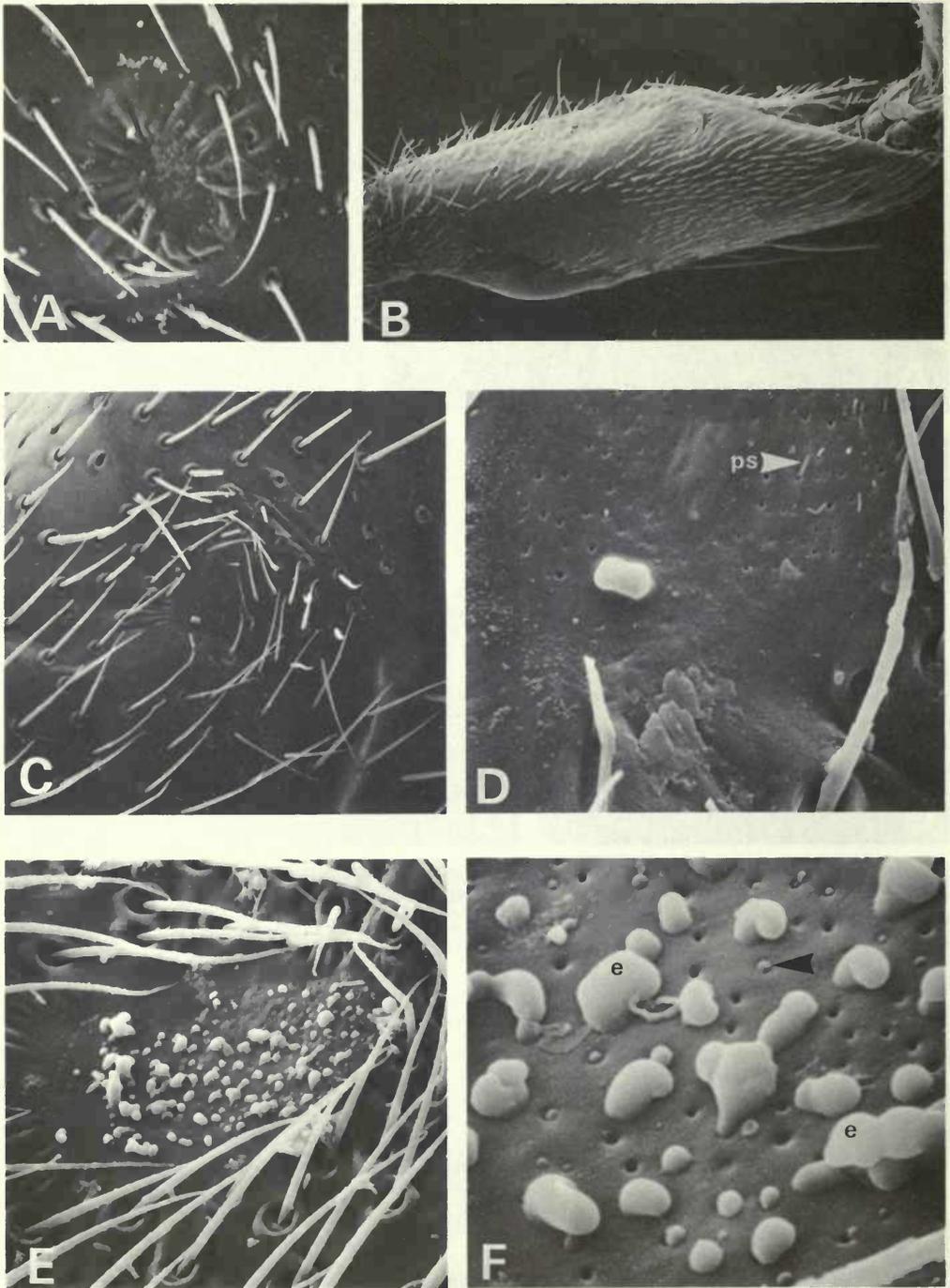
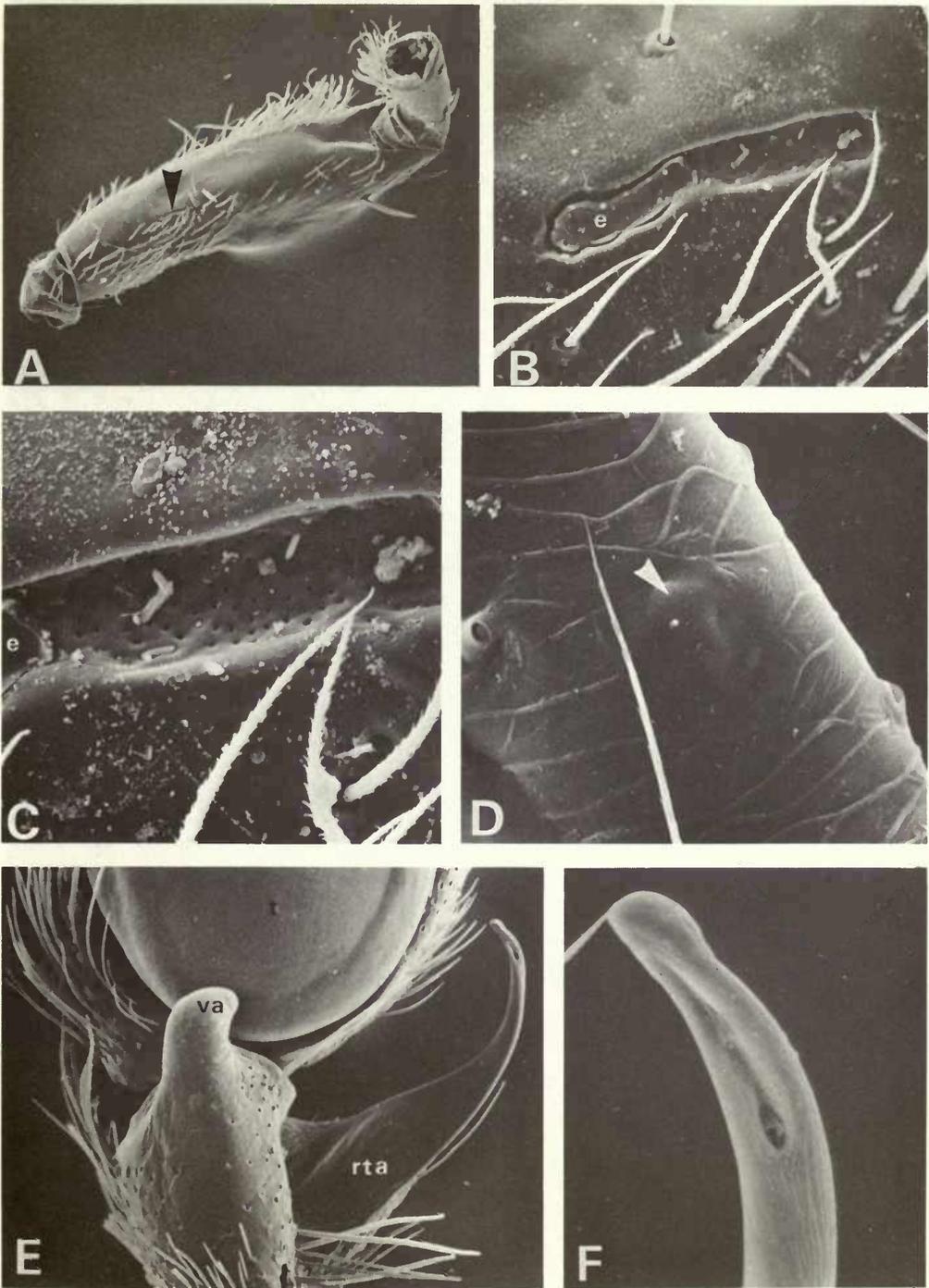


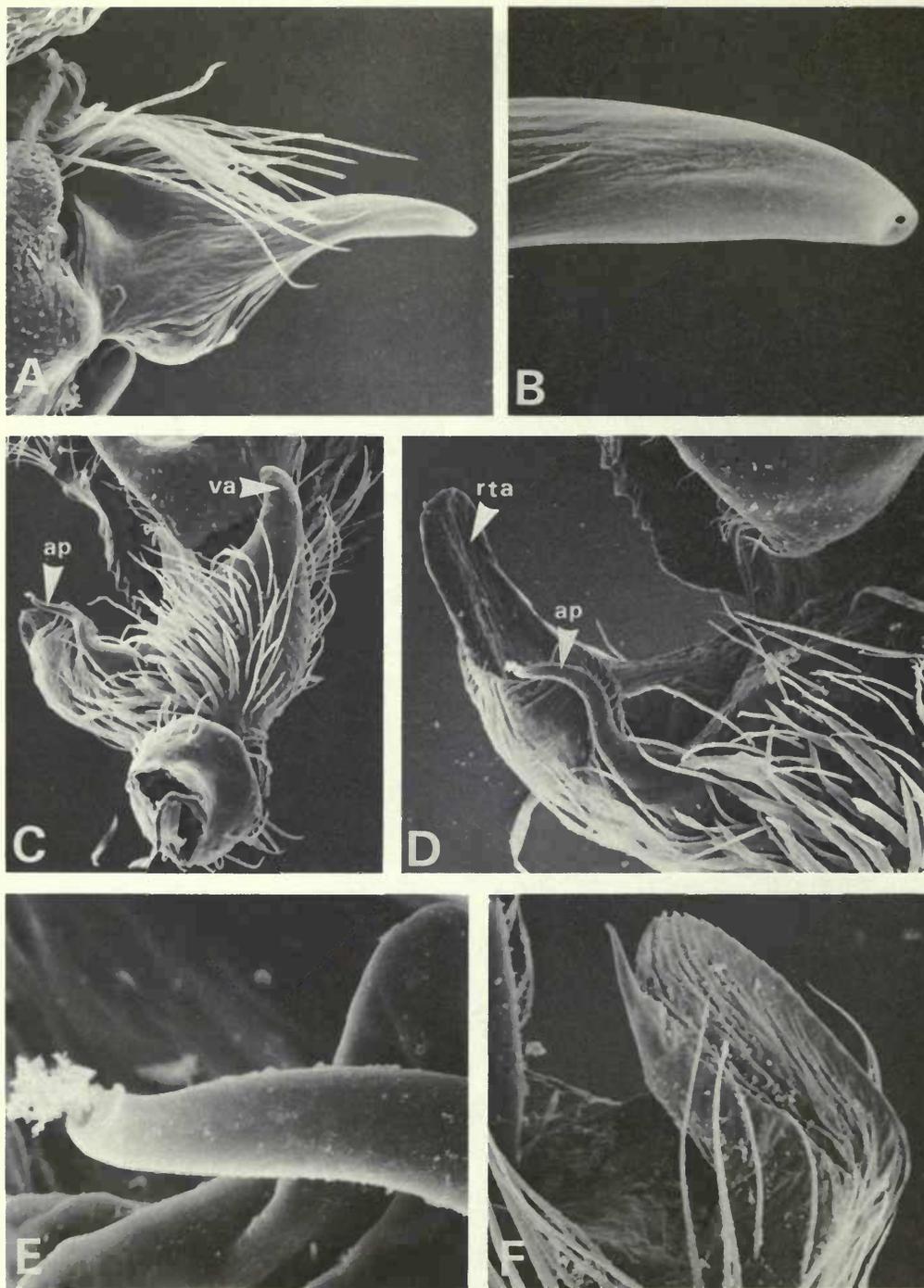
Fig. 30 (A–D) *Spartaeus spinimanus* (Thorell), ♂, femoral organ: A, femora I, ventral view (position of organ indicated by arrow)  $\times 45$ ; B, from above  $\times 450$ ; C, lateral view,  $\times 850$ ; D, from above,  $\times 2000$ . (E–F) *Gelotia bimaculata* Thorell, ♂, femoral organ from above,  $\times 380$ ,  $\times 900$ .



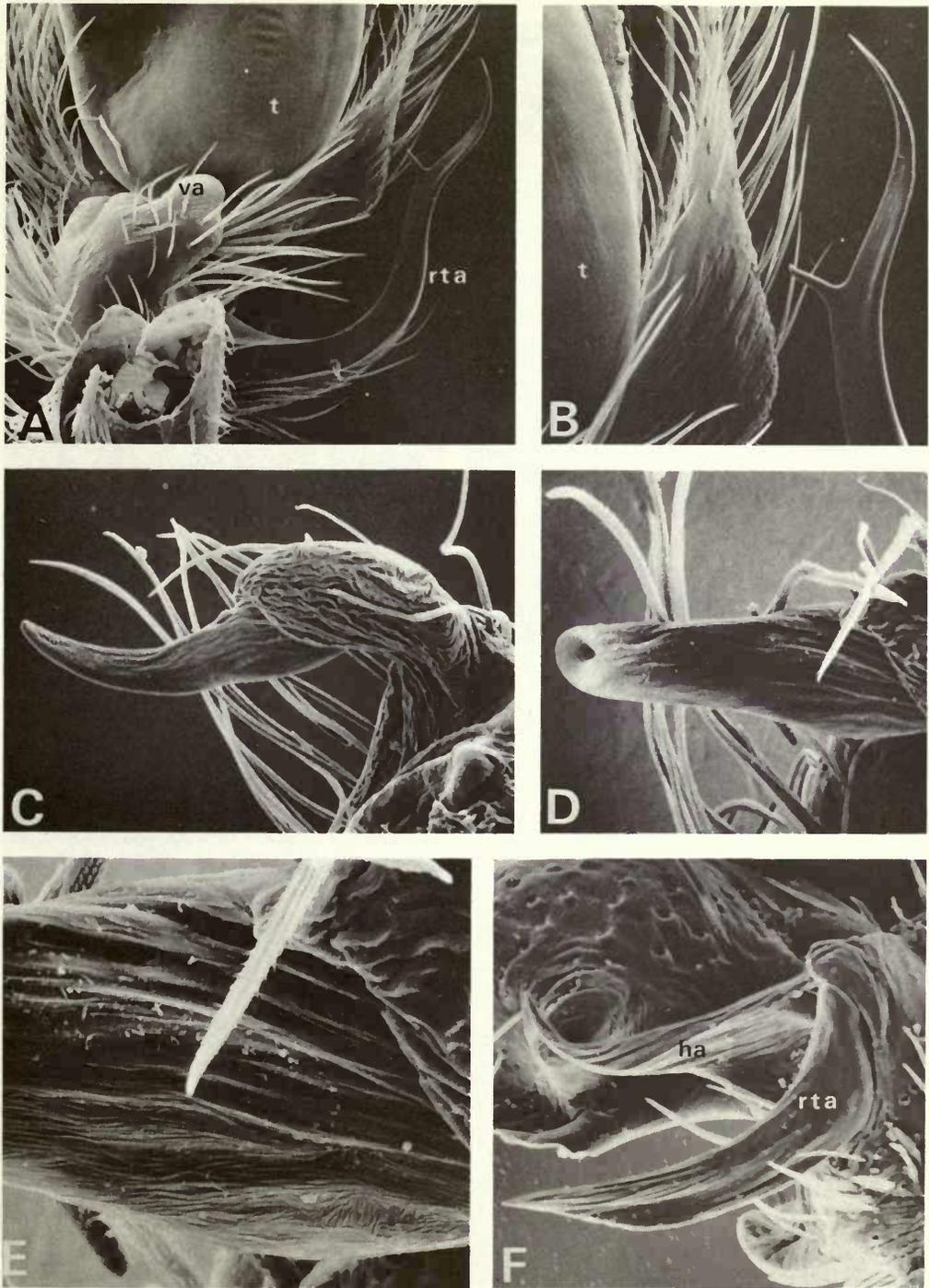
**Fig. 31** *Mintonia tauricornis* sp. n., ♂, femoral organ, A, from above,  $\times 500$ . (B–F) *Mintonia ramipalpis* (Thorell), ♂, femoral organ: B, femora I,  $\times 45$ ; C, D, from above (cleaned in ultrasonic bath)  $\times 350$ ;  $\times 2100$ ; E, F, from above (not cleaned and showing exudate)  $\times 900$ ,  $\times 5000$ . Abbreviations: e, exudate; ps, pseudosetae.



**Fig. 32** (A–C) *Brettus cingulatus* Thorell, ♂: A, femora I, ventral view,  $\times 35$ ; B, C, femoral organ from above,  $\times 350$ ,  $\times 1000$ . D, *Mysmena* sp., ♀, femoral organ on underside of femora II,  $\times 900$ . (E–F) *Mintonia tauricornis* sp. n., ♂, palp: E, tibia from below showing oblique ventral apophysis and retrolateral apophysis,  $\times 130$ ; F, distal opening of retrolateral apophysis,  $\times 800$ . Abbreviations: e, exudate; rta, retrolateral tibial apophysis; t, tegulum; va, ventral apophysis.



**Fig. 33** (A–B) *Gelotia bimaculata* Thorell, ♂ palp: A, retrolateral tibial apophysis from below,  $\times 120$ ; B, distal opening of retrolateral tibial apophysis,  $\times 400$ . (C–E) *Brettus cingulatus* Thorell, ♂ palp: C, showing ventral apophysis, retrolateral apophysis and adjacent tubular process,  $\times 200$ ; E, tubular process with distal opening partly obscured by detritus,  $\times 2000$ . F, *Spartaeus spinimanus* (Thorell), ♂ palpal retrolateral tibial apophysis. Abbreviations: ap, auxillary process; rta, retrolateral tibial apophysis; va, ventral apophysis.



**Fig. 34** (A–B) *Mintonia ramipalpis* (Thorell), ♂ palp: A, ventral and retrolateral apophyses,  $\times 80$ ; B, retrolateral apophyses,  $\times 170$ . (C–E) *Meleon kenti* (Lessert), ♂ palp showing retrolateral tibial apophysis: C, from below,  $\times 150$ ; D, from in front,  $\times 250$ ; E, from below,  $\times 700$ . F, *Cyrba algerina* (Lucas), ♂ palp, lateral view of retrolateral tibial apophysis. Abbreviations: ha, hyaline apophysis; rta, retrolateral tibial apophysis, t, tegulum; va, ventral apophysis.

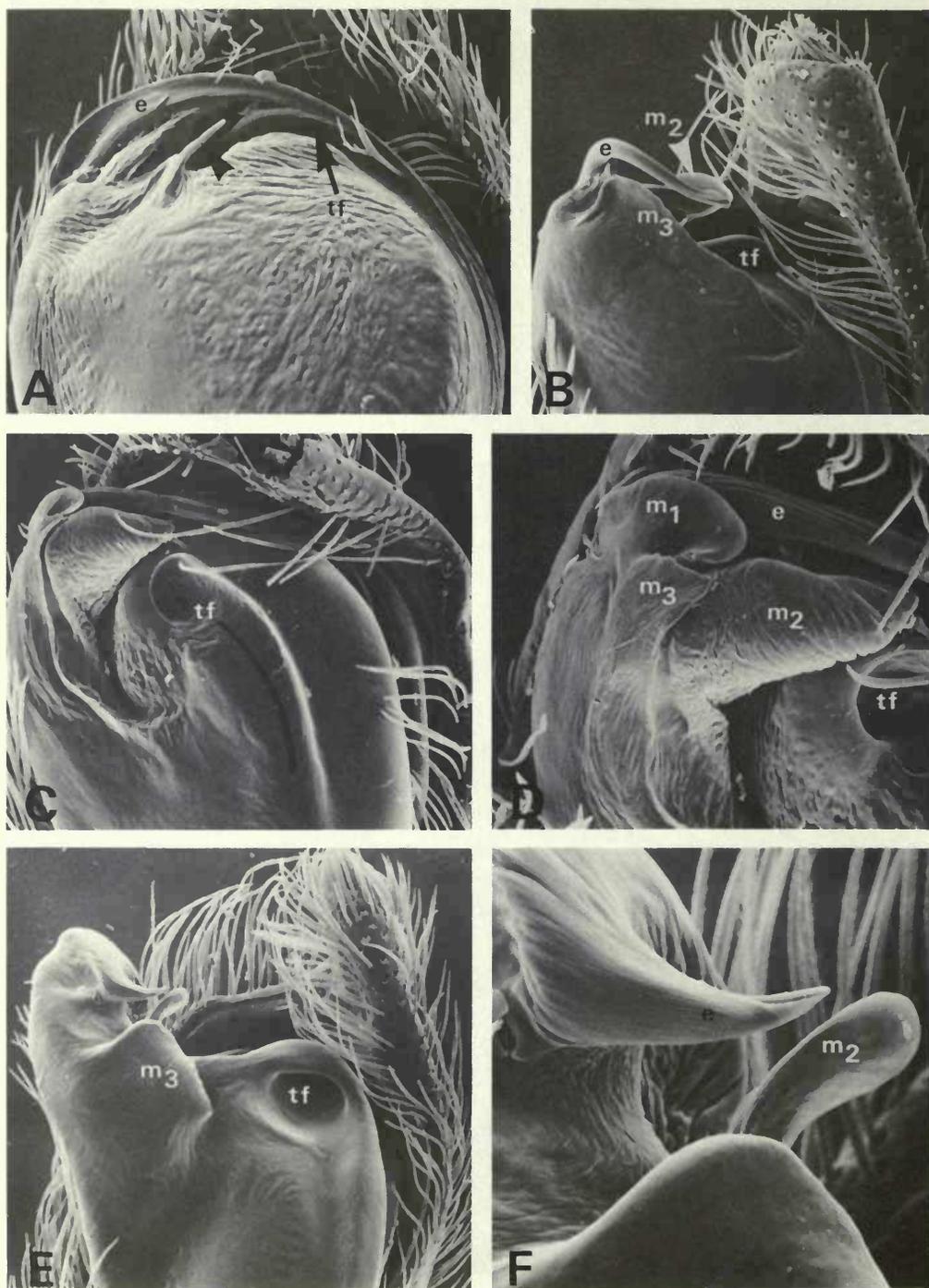


Fig. 35 (A-F) Distal region of  $\sigma$  palps, ventral view: A, *Spartaeus spinimanus* (Thorell),  $\times 110$ . B, *Mintonia tauricornis* sp.n.,  $\times 100$ . (C-D) *Gelotia bimaculata* Thorell,  $\times 90$ ,  $\times 150$ . (E-F) *Mintonia ramipalpis* (Thorell),  $\times 80$ ,  $\times 350$ . Abbreviations: e, embolus; tf, tegular furrow.

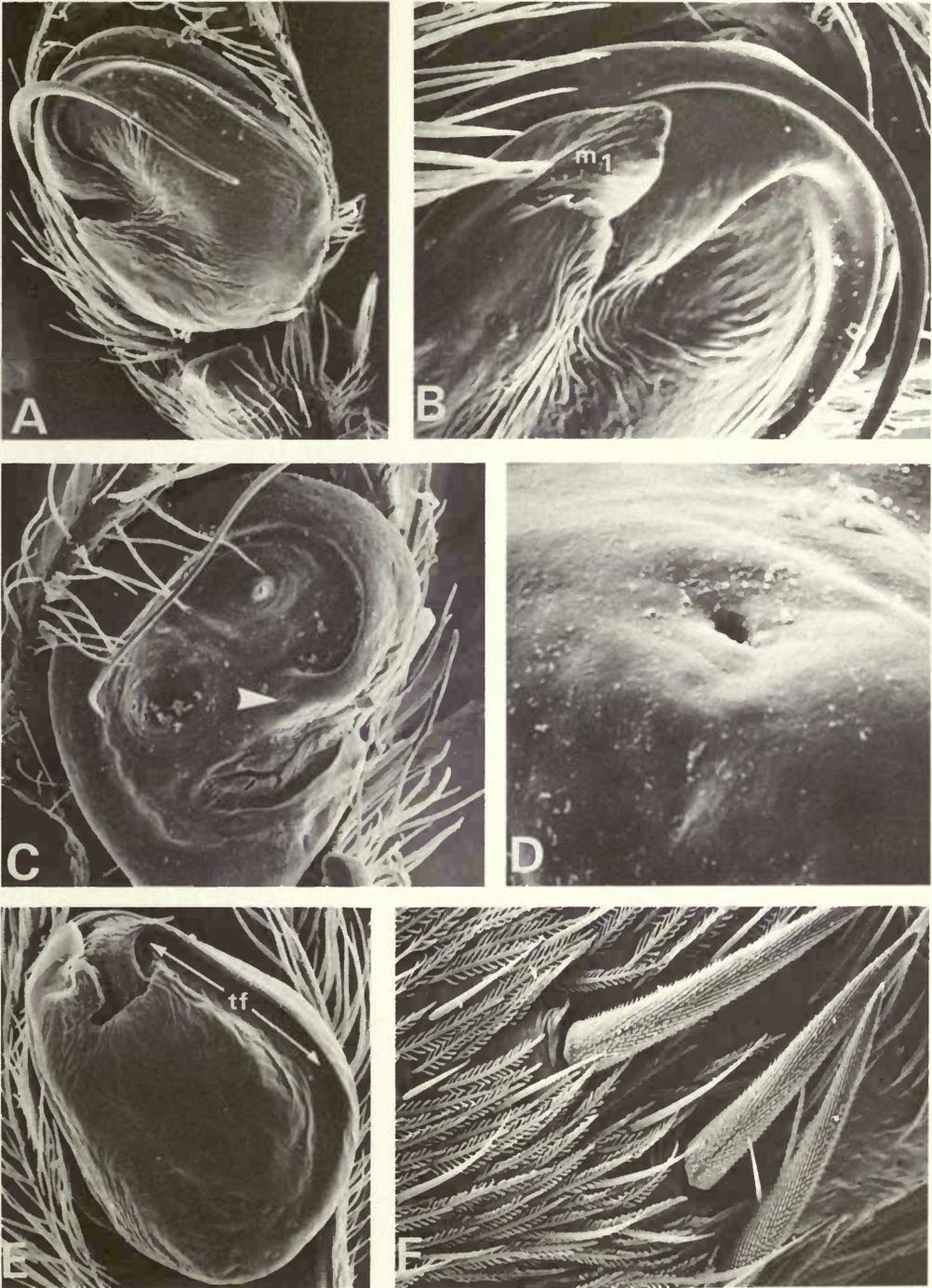


Fig. 36 (A–B) *Cyrba algerina* (Lucas), ♂ palp: ×70, ×200; (C–D) *Brettus cingulatus* Thorell, ♂ palp: C, ×150, position of pore arrowed; D, pore, ×2000. E, *Meleon kenti* (Lessert), ♂ palp showing deeply grooved furrow, ×80. F, *Mintonia ramipalpis* (Thorell), ♂ femora I showing setae and dorsal spines, ×150.