

Two new genera and species of Euophryinae (Aranei: Salticidae) from SE Asia

Два новых рода и вида Euophryinae (Aranei: Salticidae) из Юго-Восточной Азии

Dmitri V. Logunov¹ & Galina N. Azarkina²
Дмитрий В. Логунов¹ & Галина Н. Азаркина²

¹The Manchester Museum, The University of Manchester, Oxford Road, Manchester M13 9PL UK. E-mail: dmitri.v.logunov@manchester.ac.uk. The corresponding author.

Манчестерский Музей, Университет Манчестера, Окфорд Роуд, Манчестер, M13 9PL Великобритания.

²The Siberian Zoological Museum, The Institute for Systematics and Ecology of Animals, Siberian Division of the Russian Academy of Sciences, Frunze Street 11, Novosibirsk 630091 Russia. E-mail: urmakuz@yahoo.com.

³Сибирский Зоологический Музей, Институт Систематики и Экологии Животных, Сибирское отделение РАН, ул. Фрунзе 11, Новосибирск 630091 Россия.

KEY WORDS: Diagnoses, jumping spiders, Malaysia, Indonesia.

КЛЮЧЕВЫЕ СЛОВА: Диагнозы, пауки-скакуны, Малайзия, Индонезия.

ABSTRACT. Two new monotypic euophryine genera (*Aruattus* gen.n. and *Saaristattus* gen.n.) are diagnosed, and two new species are described: *Aruattus agostii* sp.n. (♂♀; eastern Indonesia) and *Saaristattus tropicus* sp.n. (♂♀, west Malaysia). A precise position and relationships of both genera within the subfamily Euophryinae remain uncertain.

РЕЗЮМЕ. Даны диагнозы двух новых монотипичных родов эуофрийн (*Aruattus* gen.n. и *Saaristattus* gen.n.), и описано два новых вида: *Aruattus agostii* sp.n. (♂♀; восточная Индонезия) и *Saaristattus tropicus* sp.n. (♂♀, западная Малайзия). Точное положение и родственные связи новых родов внутри подсемейства Euophryinae остается неясным.

Introduction

The subfamily Euophryinae was originally defined by Prószyński [1976] and is characterized by having the male embolus in the form of a distal/ventral coil separated from the tegulum by the distal haematodocha. Currently, the subfamily consists of as many as 75 salticid genera [Maddison & Hedin, 2003], but it is likely to be much more diverse. The aim of this study is to describe two new monotypic genera of the Euophryinae recently collected from south-east Asia.

Specimens for this study were borrowed from the Museum d'histoire naturelle, Genève, Switzerland (Dr P. Schwendinger), abbreviated in the text as MHNG. The abbreviations used in the text: *Eyes*: AME — anterior median eye, PLE — posterior lateral eye(s).

Leg segments: Fm — femur, Pt — patella, Tb — tibia, Mt — metatarsus. *Position of spines on legs*: ap — apical, d — dorsal, pr — prolatateral, rt — retrolateral, v — ventral. For the leg spination the system adopted is that used by Ono [1988]. The sequence of leg segments in measurement data is as follows: femur + patella + tibia + metatarsus + tarsus. All measurements are in mm.

Descriptions

Aruattus gen.n.

Type species: *Aruattus agostii* sp.n.

ETHYMOLOGY. The generic name consists of two parts: 'Aru' deriving from the Aru island group (eastern Indonesia), from which the main series of the type species was collected, and 'attus' meaning 'jumper'; gender masculine.

DIAGNOSIS. *Aruattus* gen.n. differs from all the euophryines in having a unique combination of genitalic characters: the tooth situated on the embolar disk (arrowed in Fig. 2), the prominent proximal reservoir of the spermathecae (arrowed in Fig. 5), and the epigynal plate with no median septum and no epigynal pocket (Fig. 4).

DESCRIPTION. As for the type species, see below.

COMMENTS. *Aruattus* gen.n. is a fissidentate genus (Fig. 3) of the small litter-dwelling salticids. Although the genus is an obvious member of the subfamily Euophryinae, it is difficult to relate it correctly. Its spermathecae contain the well-developed proximal reservoir (arrowed in Fig. 5; 'the proximal receiver *a*' sensu Žabka [1987]), and by this character *Aruattus* gen.n. is close to other members of the so-called 'saitine' group of genera [see Davies & Žabka, 1989], e.g. *Lycidas* Karsch, 1878. Yet the male palp of *Aruattus* gen.n. does not possess the second sclerite of the embolar division called by some authors the conductor (usual-

ly subparallel to the embolus), which is common for many 'saitine' species [e.g., Zabka, 1987: figs 60, 62]. Besides, we cannot recollect any other euophryine genus having a tooth situated on the embolar disk (Figs 1–2). Thus, whereas *Aruattus* gen.n. should be placed in the Euophryinae, its precise position within the subfamily is to be further clarified.

COMPOSITION. Currently, the type species only, but there are several additional species awaiting description (kept in the MHNG and seen by one of us, DL, while sorting out the salticid collections from SE Asia retained by this museum).

Aruattus agostii sp.n.

Figs 1–9.

TYPES. Holotype ♂ (MHNG), Indonesia, Aru Islands [= Aroe Islands], Wokan, c. 5 km of mouth of Sungai Tunguvatu, Om, primary forest on limestone, 22.08.1991 [F 91-937], D. Agosti. Paratypes: 3 ♂♂ (MHNG), together with the holotype; 1 ♀ (MHNG), Indonesia, Aru Islands [= Aroe Islands], Kola, Island Wafan, secondary forest, limestone, 20 m a.s.l., leaf litter, 27.08.1991 [F 91-968], D. Agosti; 1 ♂ (MHNG), Indonesia, Kai Besar [= Great Kai Island], Bombay, G. Dab, south face, secondary forest on limestone, 300 m a.s.l., leaf litter, 5.09.1991 [F 91-1048], D. Agosti.

ETHYMOLOGY. The species is named after its collector, D. Agosti.

DIAGNOSIS. As that of the genus.

DESCRIPTION. *Male* (the holotype): Carapace 1.10 long, 1.05 wide, 0.70 high at PLE. Ocular area 0.65 long, 0.97 wide anteriorly and 0.95 wide posteriorly; the 2nd eye row is in midway between AMEs and PLEs. Diameter of AME 0.30. Abdomen 0.95 long, 0.70 wide. Cheliceral length 0.30. Clypeal height 0.05. Length of leg segments: I 0.60 + 0.40 + 0.45 + 0.40 + 0.25; II 0.50 + 0.30 + 0.35 + 0.35 + 0.20; III 0.55 + 0.25 + 0.35 + 0.45 + 0.25; IV 0.60 + 0.30 + 0.45 + 0.60 + 0.30. Leg formula: IV, I, III, II. Leg spination: I: Fm d 0-0-1-1; Tb v 2-2-2-2; Mt v 2-2-2. II: Fm d 0-0-1-1; Tb v 1-1-0-0; Mt v 1-1-2 ap. III: Fm d 0-0-1-2; Tb pr and rt 0-1, v 1-0-2 ap; Mt pr and rt 0-0-2 ap, v 0-0-2 ap. IV: Fm d 0-0-1-1; Tb pr 0-1, rt 0-1-0, v 1-0-2 ap; Mt pr and rt 0-0-2 ap; v 0-0-2 ap. Colouration. Carapace high, with a very short thoracic part; light brown, with black around eyes (Fig. 9). Sternum yellow-brown. Clypeus and cheeks brown, sparsely covered with white hairs and bristles. Chelicerae brown. Sternum brown. Maxillae and labium yellow-brown, with white apices. Abdomen brown-grey: dorsum with poorly marked dorsal grey reticulate pattern, and the anterior two thirds of dorsum covered with brownish scutum (Fig. 7); venter yellow. Book-lung covers and spinnerets brownish. Legs and palps brownish. Palpal structure as in Figs 1–2; the embolar disk with a tooth (arrowed in Fig. 2), the medium-sized tibial apophysis presents.

Female (the paratype): Carapace 1.20 long, 1.10 wide, 0.65 high at PLE. Ocular area 0.65 long, 1.05 wide anteriorly and 1.05 wide posteriorly; the 2nd eye row is in midway between AMEs and PLEs. Diameter of AME 0.35. Abdomen 1.15 long, 1.00 wide. Cheliceral length 0.25. Clypeal height 0.05. Length of leg segments: I 0.75 + 0.35 + 0.50 + 0.40 + 0.30; II 0.60 + 0.30 + 0.35 + 0.40 + 0.25; III 0.60 + 0.30 + 0.40 + 0.50 + 0.20; IV 0.70 + 0.30 + 0.50 + 0.60 + 0.25. Leg formula: IV, I, III, II. Leg spination: I: Fm d 0-0-0-1-1; Tb v 2-2-2-2 ap; Mt v 2-2-2 ap. II: Fm d 0-0-0-1-1; Tb v 1-0-2 ap; Mt v 2-2-2 ap. III: Fm d 0-0-0-1-3; Tb v 1-0-2 ap; Mt pr and rt 1-1, v 0-2-2 ap. IV: Fm d 0-0-0-1-1; Tb v 1-0-2 ap; Mt pr 0-0-1 ap, rt 0-1-2 ap; v 0-2-2 ap. Colouration. Carapace dark brown, with black around eyes. Chelicerae yellow-brown. Sternum yellowish brown. Maxillae and labi-

um yellow-brown, with white apices. Abdomen yellow-brown, ventrally with two brown stripes. Dorsum yellow-brown. Book-lung covers and spinnerets yellow-brown. All legs and palps brown. Palps without an apical claw. Epigyne and spermathecae as in Figs 4–6; the epigynal plate with no median septum and epigynal pocket, the prominent proximal reservoir of the spermathecae is well-developed (arrowed in Fig. 5).

DISTRIBUTION. Indonesia: Aru Islands and Kai Besar [present data].

Saaristattus gen.n.

Type species: *Saaristattus tropicus* sp.n.

ETHYMOLOGY. The generic name consists of two parts: 'Saarist' deriving from the name Saaristo, and 'attus' meaning 'jumper'; gender masculine. The genus is dedicated to our colleague and friend, Dr Michael Saaristo (Turku, Finland), a famous arachnologist, in recognition of his works on spiders.

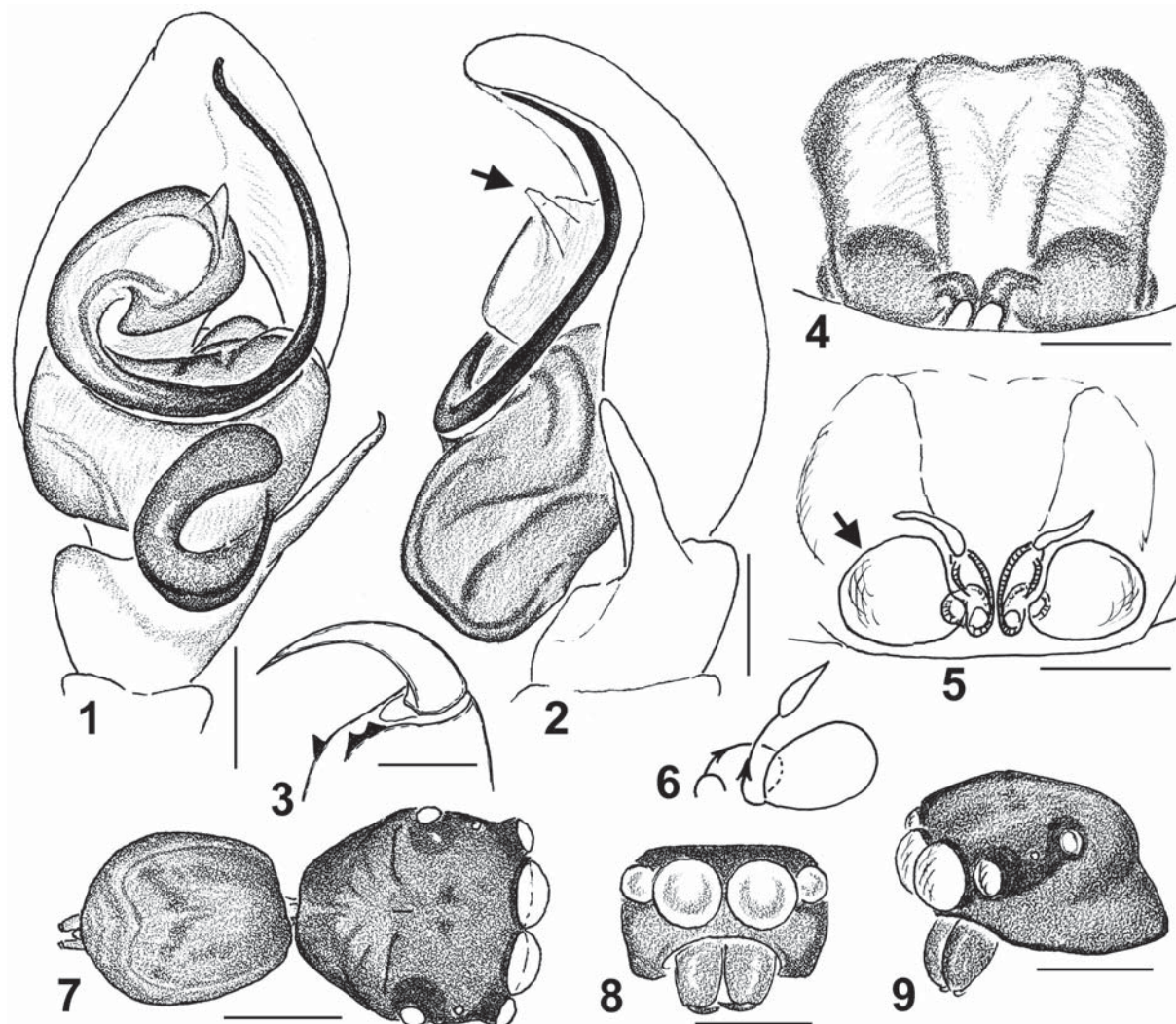
DIAGNOSIS. From all the euophryines, *Saaristattus* gen.n. differs in having the seven-cusped retromarginal tooth (Fig. 13), the well-developed cymbial pocket, in which the embolus is hidden, the median apophysis (arrowed in Figs 10–11), the strongly convoluted embolus (three and a half coils; Fig. 12) and spermathecae (Fig. 15), and the epigynal plate with no median septum and epigynal pocket (Fig. 14).

DESCRIPTION. As for the type species, see below.

COMMENTS. *Saaristattus* gen.n. is a fissidentate salticid, with three small promarginal and a wide retromarginal tooth resembling a comb of seven points (Fig. 13). Such the seven-cusped retromarginal tooth is rare (if not unique) in the Salticidae. For instance, to date the largest number of tooth points (six cusps!) have been known in *Bindax* Thorell, 1892 [Prószyński, 1987: p. 25] and *Aruana* Strand, 1911 [Prószyński, 1984: p. 2].

The genus seems to belong to the subfamily Euophryinae. By the conformation of the copulatory organs (particularly, by the long and spiral insemination ducts), *Saaristattus* gen.n. is most similar to *Cytaea* Keyserling, 1882 [see Davies & Żabka, 1989: plate 30; Prószyński, 1984: pp. 27–31] and *Emathis* Simon, 1899 [see Żabka, 1985: figs 106–107; Prószyński, 1984: p. 37], but differs from both by the presence of the cymbial pocket, the median apophysis, and the risen embolar disk [*sensu* Edwards, 2002] (Fig. 12); at rest, the embolar disk is hidden in the cymbial pocket. Some species of *Xenocytaea* Berry, Beatty et Prószyński, 1998, e.g. *X. anomala* Berry, Beatty et Prószyński, 1998 [see Berry *et al.*, 1998: figs 116–121], possess the coiled embolus and spermathecae, but both are not as strongly coiled as those in *Saaristattus* gen.n. The twist of three and a half coils is not very common in Salticidae. For instance, it has been described for some genera of the Ballinae [see Benjamin, 2004].

Many of the Euophryinae genera possess the embolus partly hidden by its basal part in the apical cavity of the tegulum, e.g. *Servea* Simon, 1888 [see Davies & Żabka, 1989: plate 30], *Pseudeuophrys* Dahl, 1912 [see Logunov, 1998: figs 5, 25–30] and others, but none of them apart from *Saaristattus* gen.n. displays a properly developed cymbial pocket. With regards to the conformation of the male palp of the Euophryinae, three main modifications of the embolus position have been described [Edwards, 2002]: (1) the entire embolus is situated on the repro-lateral side of the tegulum; (2) the embolus is on the distal end, perpendicular to the tegulum; and (3) the embolus is partly hidden in the apical



Figs 1–9: *Aruattus agostii* sp.n. (♂ holotype, ♀ paratype): 1 — male palp, ventral view; 2 — ditto, retrolateral view; 3 — female chelicera, ventral view; 4 — epigyne, ventral view; 5 — spermathecae, dorsal view; 6 — diagrammatic course of the insemination ducts; 7 — male general appearance, dorsal view; 8 — male face; 9 — male carapace, lateral view. Scale lines: 0.1 mm (1–5), 0.5 mm (7–9).

Рис. 1–9: *Aruattus agostii* sp.n. (♂ голотип, ♀ паратип): 1 — пальпа самца, снизу; 2 — то же, сзади-сбоку; 3 — хелицера самки, снизу; 4 — эпигина, снизу; 5 — сперматека, сверху; 6 — схема протоков сперматеки; 7 — общий вид самца, сверху; 8 — фейс самца; 9 — головогрудь самца, сбоку. Масштаб: 0,1 мм (1–5), 0,5 мм (7–9).

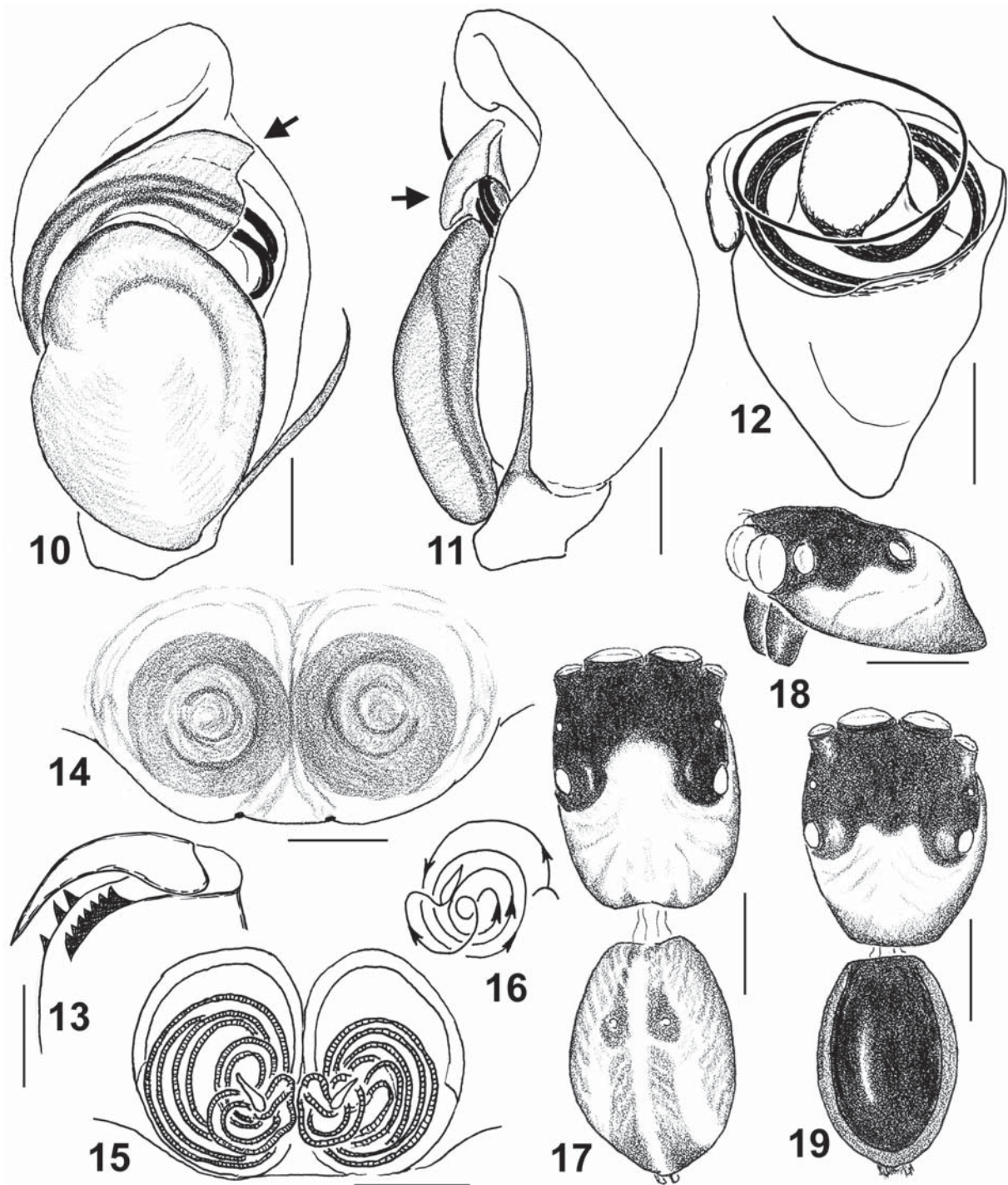
cavity of the tegulum. Thus, the conformation of the male palp of *Saaristattus* gen.n., when the embolus is completely hidden in the cymbial pocket, clearly represents the forth distinct modification for the Euophryinae.

The cymbium pocket is known to be a characteristic feature of the subfamily Aelurillinae, and exists in two modifications: open (e.g., in *Proszynskiana* Logunov, 1996) and closed (in the rest of Aelurillinae) [see Logunov, 1996]. Surprisingly, *Saaristattus* gen.n. possess the more advanced and fully-developed closed cymbial pocket, which is however formed not by just the tegulum and the cymbium, as in *Aelurillus* Simon, 1884 or *Phlegra* Simon, 1876 [Logunov, 1996: fig. 4], but by the tegulum, the median apophysis and the cymbium (Figs 10–11). It is a unique feature among all the jumping spider genera known to us.

Yet the nomenclature of the median apophysis (arrowed in Figs 10–11) requires a further study. In its classical definition [Comstock, 1910: p. 176], the median apo-

physis is 'a conspicuous appendage, which projects from the ventral sides of the bulb' [see also Merrett, 1963: fig. 1], and it is just the case of *Saaristattus* gen.n. The presence of the median apophysis has been considered a plesiomorphic trait in Salticidae, e.g. for the subfamily Lyssomaninae [Wanless, 1980] or more recently for the 'lapsiines' [Maddison, 2006]. Yet, the knowledge on the detailed structure of male palp in Salticidae remains too fragmentary, and hence we are not sure if the median apophysis of *Lyssomanes* Hentz, 1845 [Galiano, 1962: fig. 1] or *Lapsias* Simon, 1900 [Maddison, 2006: fig. 1] is homologous with that of *Saaristattus* gen.n. Moreover, the sclerite called here as 'the median apophysis' is unknown in the rest of Euophryinae, and therefore its presence leaves some doubts that the new genus is indeed a member of the subfamily. At the current state of knowledge of the Salticidae, we cannot resolve this problem now.

COMPOSITION. The type species only.



Figs 10–19: *Saaristattus tropicus* sp.n. (♂ holotype, ♀ paratype): 10 — male palp, ventral view; 11 — ditto, retrolateral view; 12 — tegulum, dorsal view; 13 — male chelicera, ventral view; 14 — epigyne, ventral view; 15 — spermathecae, dorsal view; 16 — diagrammatic course of the insemination ducts; 17 — female general appearance, dorsal view; 18 — male carapace, lateral view; 19 — male general appearance, dorsal view. Scale lines: 0.1 mm (10–15), 0.5 mm (17–19).

Рис. 10–19: *Saaristattus tropicus* sp.n. (♂ голотип, ♀ паратип): 10 — пальпа самца, снизу; 11 — тоже, сзади-сбоку; 12 — тегулум, сзади; 13 — хелицера самца, снизу; 14 — эпигина, снизу; 15 — сперматека, сверху; 16 — схема протоков сперматеки; 17 — общий вид самки, сверху; 18 — головогрудь самца, сбоку; 19 — общий вид самца, сверху. Масштаб: 0,1 мм (10–15), 0,5 мм (17–19).

Saaristattus tropicus sp.n.

Figs 10–19.

TYPES. Holotype ♂ (MHNG), West Malaysia, Kedah, Pulau Langkawi, Gunung Raya, 700–800 m a.s.l., 6°23'N, 99°48'E, 1–7.01.2005 [AS-04/29], A. Schulz. Paratypes: 5 ♀♀ (MHNG), together with the holotype.

ETHYMOLOGY. The species epithet is derived from the Latin '*tropicus*' meaning 'tropical'.

DIAGNOSIS. As that of the genus.

DESCRIPTION. *Male* (the holotype). Carapace 1.20 long, 0.90 wide, 0.55 high at PLE. Ocular area flat, 0.70 long, 0.85 wide anteriorly and 0.85 wide posteriorly; the 2nd eye row is in midway between AMEs and PLEs. Diameter of AME 0.30. Abdomen 1.10 long, 0.75 wide. Cheliceral length 0.30. Clypeal height 0.05. Length of leg segments: I 0.60 + 0.40 + 0.50 + 0.40 + 0.25; II 0.50 + 0.30 + 0.35 + 0.40 + 0.25; III 0.55 + 0.30 + 0.35 + 0.40 + 0.25; IV 0.70 + 0.30 + 0.55 + 0.55 + 0.30. Leg formula: IV, I, III, II. Leg spination: I: Tb v 2-2-2; Mt v 2-2. II: Tb v 2-1-2 ap; Mt rt 1-1 ap, v-rt 1-1-1-2-1-1 ap. III-IV spineless. The general appearance as that of female, no special somatic features or modifications occur. Coloration. Carapace dark yellow, with brown sides and black eye field (Fig. 19). Clypeus is not marked, AMEs almost in contact with the anterior edge of the carapace (Fig. 18). Cheeks and chelicerae dark brown. Maxillae and labium yellowish brown, with white tips. Sternum brown. Abdomen dark brown. Dorsum black, with scutum covering almost the entire dorsal surface; venter brown, with a small round scutum in front of the spinnerets. Book-lung covers and spinnerets dark brown. All legs are equally developed, without nay modification. All legs and palps yellow-brown. Palpal structure as in Figs 10–12; the well-developed cymbial pocket and the median apophysis present (arrowed in Figs 10–11), the embolus is strongly convoluted (three and a half coils; Fig. 12) and hidden in the cymbial pocket, the long and thin tibial apophysis presents and is bent ventrad.

Female (the paratype). Carapace 1.30 long, 0.90 wide, 0.55 high at PLE. Ocular area flat, 0.65 long, 0.90 wide anteriorly and 0.90 wide posteriorly; the 2nd eye row is in midway between AMEs and PLEs. Diameter of AME 0.25. Abdomen 1.25 long, 0.70 wide. Cheliceral length 0.30. Clypeal height 0.05. Length of leg segments: I 0.65 + 0.35 + 0.45 + 0.30 + 0.25; II 0.55 + 0.30 + 0.35 + 0.35 + 0.25; III 0.60 + 0.25 + 0.30 + 0.45 + 0.25; IV 0.70 + 0.30 + 0.50 + 0.55 + 0.25. Leg formula: IV, I, III, II. Leg spination: I: Tb v 2-2-2; Mt v 2-2. II: Tb v 2-2-2; Mt v 2-2 ap. III-IV spineless. The general appearance as that of male (Fig. 17). Coloration. Carapace dark yellow, with brownish margins. Eye field dark brown, almost black. Clypeus is not marked, AMEs almost in contact with the anterior edge of the carapace. Cheeks dark brown. Chelicerae and sternum brown. Maxillae and labium yellowish brown, with white tips. Abdomen pale yellow to yellow. Dorsum grey to dark grey, with three yellow longitudinal stripes (Fig. 17). Book-lung covers and spinnerets grey. All legs are equally developed, without nay modification. All legs and palps brownish yellow. Palps without an apical claw. Epigyne and spermathecae as in Figs 14–16;

the epigynal plate flat, with no median septum and epigynal pocket; the spermathecae is spiral (Fig. 15).

DISTRIBUTION. The type locality only.

ACKNOWLEDGEMENTS. We wish to express our warmest thanks to Dr P. Schwendinger (of the MHNG) for giving access to the collections of his museum. Dr Yuri Marusik (Magadan, Russia) and one anonymous referee are obliged for their critical comments helping to improve the ms.

References

- Benjamin S.P. 2004. Taxonomic revision and phylogenetic hypothesis for the jumping spider subfamily Balliinae (Araneae, Salticidae) // Zool. J. Linnean Soc. Vol.142. P.1–82.
- Berry J.W., Beatty J.A., Prószyński J. 1998. Salticidae of the Pacific Islands. II. Distribution of seven genera with descriptions of nineteen new species and two new genera // J. Arachnol. Vol.26. No.2. P.149–189.
- Comstock J.H. 1910. The palpi of male spiders // Ann. Ent. Soc. America. Vol.3. No.3. P.161–185.
- Davies V.T., Żabka M. 1989. Illustrated keys to the genera of jumping spiders (Araneae: Salticidae) in Australia // Mem. Qd. Mus. Vol.27. No.2. P.189–266.
- Edwards G.B. 2002. A review of the Nearctic jumping spiders (Araneae: Salticidae) of the subfamily Euophryinae north of Mexico // Insecta Mundi. Vol.16. No.1–3. P.65–76.
- Galiano M.E. 1962. Redescrpción de especies del género *Lysso-manes* Hentz, 1845 basadas en los ejemplares típicos // Acta Zool. Lillona. Vol.18. P.45–97.
- Logunov D.V. 1996. Salticidae of Middle Asia. 3. A new genus, *Proszynskiana* gen.n., in the subfamily Aelurillinae (Araneae, Salticidae) // Bull. Br. arachnol. Soc. Vol.10. Pt.5. P.171–177.
- Logunov D.V. 1998. *Pseudeuophrys* is a valid genus of the jumping spiders (Araneae, Salticidae) // Revue Arachnologique. T.12. Fasc.11. P.109–128.
- Maddison W.P. 2006. New lapsiine jumping spiders from Ecuador (Araneae; Salticidae) // Zootaxa. No.1255. P.17–28.
- Maddison W.P., Hedin M.C. 2003. Jumping spider phylogeny (Araneae: Salticidae) // Inv. Syst. Vo.17. P.529–549.
- Merrett P. 1963. The palpus of male spiders of the family Linyphiidae // Proc. Zool. Soc. London. Vol.140. Pt.3. P.347–467.
- Ono H. 1988. A revisional study of the spider family Thomisidae (Arachnida, Araneae) of Japan. Tokyo: National Science Museum. 252 pp.
- Prószyński J. 1976. Studium systematyczno-zoogeograficzne nad rodziną Salticidae (Aranei) Regionów Palearktycznego i Nearktycznego. Siedlce: Rozprawa Naukowa WSRP. 260 pp. [in Polish].
- Prószyński J. 1984. Atlas rysunków diagnostycznych mniej znanych Salticidae. Siedlce: Zeszyty Naukowe WSRP. 177 pp.
- Prószyński J. 1987. Atlas rysunków diagnostycznych mniej znanych Salticidae 2. Siedlce: Zeszyty Naukowe WSRP. 172 pp.
- Wanless F. 1980. A revision of the spider genera *Asemonea* and *Pandisus* (Araneae: Salticidae) // Bull. Br. Mus. nat. Hist. (Zool.). Vol.39. No.4. P.213–257.
- Żabka M. 1985. Systematic and zoogeographic study on the family Salticidae (Araneae) from Viet-Nam // Ann. Zool., PAN. T.39. No.11. P.197–485.
- Żabka M. 1988. Salticidae (Araneae) of Oriental, Australian and Pacific Regions, II. Genera *Lycidas* and *Maratus* // Ann. Zool., PAN. T.40. No.11. P.451–482.