Asiafroneta, a new genus of the spider subfamily Mynogleninae, with two new species from Borneo, East Malaysia (Araneae: Linyphiidae)

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Abstract. A new genus and two new species of Mynogleninae are described from Borneo, East Malaysia: *Asiafroneta*, new genus, with *Asiafroneta pallida*, new species, as the type species, and *A. atrata*, new species. The new genus seems to be especially similar to *Parafroneta* Blest, 1979, a speciose genus from New Zealand. The new species are closely related to each other and resemble both *P. marrineri* (Hogg, 1909) and *P. minuta* Blest, 1979, but differ well by the significantly smaller size, the peculiar leg chaetotaxy formulae, and a few details of genitalic structure. The subfamily Mynogleninae is thereby recorded from the Oriental Region for the first time.

Keywords. taxonomy, Oriental region, Southeast Asia

INTRODUCTION

The spider subfamily Mynogleninae is presently known to contain 131 species (World Spider Catalog, 2019). In terms of species diversity, the major zoogeographical regions form the following succession: Australian Region (91), Afrotropical (37), Neotropical (2), and Pacific (1 species). Mynogleninae have hitherto been recorded neither from the Antarctic nor Nearctic, nor Palaearctic, nor Oriental regions.

The extensive undetermined spider collections from different regions of Southeast Asia that are housed in the Muséum d'Histoire Naturelle, Geneva (MHNG), contain several samples of Mynogleninae. They represent a new genus and two new species, all belonging to the subfamily and thus the first to be reported from the Oriental realm. Their descriptions are provided in this paper.

MATERIAL AND METHODS

This paper is based on material kept at the MHNG. Sample numbers are given in square brackets. Specimens preserved in 70% ethanol were studied using a MBS-9 stereo microscope. A Levenhuk C-800 digital camera was used for taking pictures. Leg chaetotaxy is presented in a formula, for example: TiI: 2-1-1(0)-0, II–III: 2-0-0-0, IV: 1-1-0-0, which means that tibia I has two dorsal spines, one pro-, one (or no) retrolateral spine, and no ventral spine; TiII and TiIII with

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© National University of Singapore ISSN 2345-7600 (electronic) | ISSN 0217-2445 (print) 2 dorsal spines only; TiIV with one dorsal, one prolateral, neither retrolateral nor ventral spines. The sequence of leg segment measurements is as follows: femur + patella + tibia + metatarsus + tarsus. All measurements are given in mm. Scale lines in the figures correspond to 0.1 mm unless indicated otherwise. Figure numbers are shown above the scale lines, the representing length below them.

Abbreviations, used in the text and figures: a.s.l.—above sea-level AW-anterior wall of epigyne (sensu Saaristo & Tanasevitch, 1996) D-duct DSA—distal suprategular apophysis (sensu Hormiga, 2000) E-embolus Fe-femur MD-median duct (sensu Merrett, 2004) MM—median membrane (sensu van Helsdingen, 1965) P-paracymbium Pa-parmula Pi-pit PMP-posterior median plate (sensu van Helsdingen et al., 1977) R-radix Re-receptacle M1, M2, M3-macrosetae Su-sub-ocular sulci Ti-tibia TmI-relative position of trichobothrium on metatarsus I

TAXONOMY

Order Araneae Clerck, 1757

Family Linyphiidae Blackwall, 1859

Subfamily Mynogleninae Lehtinen, 1967

Asiafroneta, new genus

Type species. Asiafroneta pallida, new species.

Etymology. The generic name is a combination of two words: "Asia", the "terra typica", and part of the generic name *Afroneta*. The gender is feminine.

Diagnosis. The new genus clearly belongs to the subfamily Mynogleninae which is mainly characterised by the presence of sub-ocular sulci, and a primitive structure of the genitalia in both sexes. *Asiafroneta*, new genus, is diagnosed by the following combination of somatic and genitalic characters:

- 1) small-sized spiders (compared to most Mynogleninae), with a total length of 1.85–2.12;
- sub-ocular sulci present in both sexes as a narrow elongated groove under each anterior lateral eye (Figs. 4, 5, 9, 10);
- 3) carapace unmodified, distinct dorsal abdominal pattern absent in both sexes;
- 4) leg chaetotaxy formula: FeI: 0-1(0)-0-0, II–IV: 0-0-0-0; TiI: 2-1-1(0)-0, II: 2-0-1(0)-0, III: 2-0-0-0, IV: 1-1(0)-0-0; metatarsi unarmed; apical spines on leg tibiae absent;
- 5) metatarsi IV without trichobothrium;
- 6) a strong spine on palpal patella present (Figs. 11, 13);
- two retrolateral trichobothria on palpal tibia (Figs. 11, 13);
- 8) palpal tibia unmodified, almost as long as cymbium;
- 9) cymbium with three macrosetae (M1, M2, M3 in Figs. 11, 13, 14);
- 10) distal suprategular apophysis a narrow spit;
- median membrane (= "conductor", auct.) strongly reduced;
- 12) embolic division extremely simple: radix continuous with embolus (Fig. 15);
- 13) epigyne with a small notch anteriorly, parmula (= scapus, auct.) rudimentary, median ducts (sensu Merrett, 2004) broadly expanded distally, receptacles more or less spherical (Figs. 17, 19, 20).

Species included. *Asiafroneta pallida*, new species, and *A. atrata*, new species.

Taxonomic remarks. *Asiafroneta*, new genus, resembles many genera of Mynogleninae because of a limited diversity of somatic characters and a primitive/simple structure of the genitalia in the group. Nevertheless, the new genus seems to be particularly similar to *Parafroneta* Blest, 1979, a speciose genus from New Zealand. Both representatives of *Asiafroneta*, new genus, differ from other known mynoglenines by by a significantly smaller size, the chaetotaxy (absence of ventral spines on legs; leg segments without apical spines), the presence of only two prolateral trichobothria on the palpal tibia vs. three in the majority of the subfamily's members, and by structural details of the genitalia in both sexes (see below in the Taxonomic Remarks under *A. pallida*, new species).

Distribution. Known from Sabah and Sarawak (East Malaysia) on Borneo Island.

Asiafroneta pallida, new species (Figs. 1–5, 11, 12, 16, 17)

Holotype. Male (MHNG), EAST MALAYSIA, Sabah (West Coast Residency), Kinabalu Park, Mt Kinabalu, 2590 m a.s.l., wet ravine below Layang Layang, mist forest, sifting wet plant debris, 1 May 1987, coll. D. Burckhardt and I. Löbl [10a].

Paratypes. 1 male, 4 females (MHNG), together with the holotype; 1 male, 1 female (MHNG), EAST MALAYSIA, Sarawak, Santubong, 32 km N of Kuching, 0–50 m a.s.l., under bark of fallen trees along edge of secondary mixed dipterocarp forest, 28–29 May 1994, coll. I. Löbl and D. Burckhardt [13a].

Etymology. The specific epithet is a Latin adjective referring to the pale body in the new species.

Description. Male holotype. Total length 1.95. Carapace unmodified (Fig. 1), 1.05 long, 0.78 wide, pale greyish brown, with indistinct grey radial stripes. Clypeus below each anterior lateral eye with a narrow and elongated groove (sub-ocular sulci), as in Fig. 4. Chelicerae 0.38 long, anterior margin of fang groove with three strong teeth, mastidion absent. Legs pale greyish brown to yellow. Leg I $3.16 \log (0.88 + 0.28 +$ 0.75 + 0.75 + 0.50), IV 3.27 long (0.88 + 0.28 + 0.75 + 0.78 + 0.58). Chaetotaxy: FeI: 0-1-0-0, II-IV: 0-0-0-0; TiI: 2-1-0-0, II-III: 2-0-0-0, IV: 1-1-0-0. Metatarsi unarmed. Length of spines 1.5-3 diameters of corresponding leg segment. TmI 0.65. Metatarsi IV without trichobothrium. Palp (Figs. 11, 12): Patella with a stout dorso-apical spine. Tibia long, subequal in length to cymbium. Cymbium narrow, bearing three macrosetae distally. Paracymbium simple, small, flat, L-shaped. Distal suprategular apophysis relatively short and thin, needle-shaped. Tegulum with a conical extention distally. Median membrane poorly visible, simply a short and membraneous process. Embolus relatively short and narrow, radix small, oblong-oval. Abdomen (Fig. 1) 1.05 long, 0.60 wide, grey.

Female. Total length 1.90. Carapace unmodified (Fig. 2), 0.95 long, 0.73 wide, pale greyish brown. Clypeus below each anterior lateral eye with a narrow and elongated groove (sub-ocular sulci), as in Fig. 5. Chelicerae 0.40 long, anterior margin with three strong teeth, mastidion absent. Legs pale brown to yellow. Leg I 2.93 long (0.90 + 0.30 + 0.65 + 0.60 + 0.48), IV 2.98 long (0.85 + 0.25 + 0.70 + 0.65 + 0.53). TmI 0.65. Metatarsi IV without trichobothrium. Abdomen (Fig. 2) 1.05 long, 0.70 wide, grey. Epigyne and vulva (Figs. 3, 16, 17): Epigyne small, anterior wall (= ventral plate, auct.) with a notch, posterior median plate (= dorsal plate, auct.) with a rudimentary parmula (= scapus, auct.), a pit



Figs. 1–10. Photographs of *Asiafroneta pallida*, new species, male holotype (1, 4), female paratype from Layang Layang (2, 3, 5); *A. atrata*, new species, male holotype (6, 9) and female paratype (7, 8, 10). 1, 2, 6, 7, body, dorsal view; 3, 8, posterior part of body, ventral view; 4, 5, 9, 10, prosoma, frontal view.

present. Receptacles sub-spherical, median ducts globularly expanded distally, almost contiguous. Body colouration and chaetotaxy as in male.

Note. The female paratype from Santubong has two dorsal spines on TiIV vs. only one in other paratypes.

Taxonomic remarks. The new species is very similar to the following new species from Borneo, see below. By the structure of the genitalia, namely, the distal suprategular apophysis, radix and embolus, *A. pallida*, new species, resembles *Parafroneta marrineri* (Hogg, 1909) and *P. minuta* Blest, 1979, both known from New Zealand. The new species differs well in its significantly smaller size (about 2 mm vs. 6.50 in *P. marrineri*, 2.80 in *P. minuta*), a deeper notch in the anterior wall of the epigyne, as well as by the median ducts placed more closely to each other.

Distribution. Known only from Sabah and Sarawak (East Malaysia) on Borneo Island.



Figs. 11–15. Details of male palp structure of *Asiafroneta pallida*, new species, male holotype (11, 12) and *A. atrata*, new species, male holotype (13–15). 11, 13, right palp, retrolateral view; 12, 14, right palp, prolateral view; 15, embolic division, mesal view, not to scale.

Asiafroneta atrata, new species (Figs. 6–10, 13–15, 18–20)

Holotype. Male (MHNG), EAST MALAYSIA, Sabah (West Coast Residency), Kinabalu Park, Mt Kinabalu, 2600 m a.s.l., near Layang Layang, mist forest, sifting very wet moss and dead leaves, 2 May 1987, coll. D. Burckhardt and I. Löbl [11a].

Paratypes. 5 females (MHNG), together with the holotype.

Etymology. The specific epithet is a Latin adjective referring to the dark prosoma in the new species.

Description. Male holotype. Total length 1.93. Carapace unmodified, 1.03 long, 0.73 wide, dark reddish brown, with an indistinct grey median spot and radial stripes (Fig. 6).

Clypeus below each anterior lateral eye with a narrow and elongated groove (sub-ocular sulci), as in Fig. 9. Chelicerae 0.38 long, anterior margin with one small and two strong teeth, mastidion absent. Legs yellow. Leg I 2.86 long (0.80 + 0.28 + 0.70 + 0.58 + 0.50), IV 2.66 long (0.70 + 0.25 + 0.63 + 0.63 + 0.45). Chaetotaxy: TiI: 2-1-1-0, II: 2-0-1-0, III: 2-0-0-0, IV: 1-0-0-0. Femora and metatarsi unarmed. Length of spines 1–2 diameters of corresponding leg segment. TmI 0.45. Metatarsi IV without trichobothrium. Palp (Figs. 13-15): Patella with a stout spine. Tibia long, subequal in length to cymbium. Cymbium narrow, conical distally, bearing three macrosetae. Paracymbium simple, small, flat, L-shaped. Tegulum with a conical extention distally. Distal suprategular apophysis short and slender. Median membrane very small, poorly visible. Embolus short and narrow, radix small, oblong-oval. Abdomen (Fig. 6) 0.98 long, 0.60 wide, dark grey.



Figs. 16–20. Epigyne and vulva structure of *Asiafroneta pallida*, new species, female paratype from Layang Layang (16, 17) and *A. atrata*, new species, female paratype (18–20). 16, 18, epigyne, ventral view; 17, 19, 20, vulva, dorsal view, different aspects.

Female. Total length 2.10. Carapace unmodified (Fig. 7), 1.03 long, 0.72 wide. Clypeus below each anterior lateral eye with a narrow and elongated groove (sub-ocular sulci), as in Fig. 10. Chelicerae 0.40 long, anterior margin with one small and two strong teeth, mastidion absent. Legs yellow. Leg I 2.53 long (0.70 + 0.28 + 0.60 + 0.50 + 0.45), IV 2.45 long (0.70 + 0.25 + 0.60 + 0.45 + 0.45). Length of spines 1-2 diameters of corresponding leg segment. TmI 0.46. Metatarsi IV without trichobothrium. Abdomen (Fig. 7) 1.15 long, 0.75 wide, grey to dark grey. Epigyne and vulva (Figs. 8, 18–20): Epigyne small, anterior wall (= ventral plate, auct.) with a notch, posterior median plate (= dorsal plate, auct.) with a rudimentary parmula (= scapus, auct.), a pit present. Receptacles sub-spherical, median ducts globularly expanded distally, almost in contact. Body colouration and chaetotaxy as in male.

Taxonomic remarks. The species is very similar to *A. pallida*, new species, the only congener so far known (see above), but both sexes of *A. atrata*, new species, can easily be distinguished from *A. pallida*, new species, by a dark carapace: dark reddish brown vs. pale greyish brown (Figs. 6, 7 cf. Figs. 1, 2). The male differs by both twice shorter embolus and distal suprategular apophysis. The female genitalia in both species are very similar, but the median ducts in *A. atrata*, new species, seem to be larger.

Distribution. Known only from the type locality in Sabah (East Malaysia) on Borneo Island.

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