

Three new spider species of the genus *Miagrammopes* O. Pickard-Cambridge, 1870 (Aranei, Uloboridae) from Southeast Asia

Три новых вида пауков из рода *Miagrammopes* O. Pickard-Cambridge, 1870 (Aranei, Uloboridae) из Юго-Восточной Азии

D.V. Logunov
Д.В. Логунов

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

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

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Ключевые слова: Arachnida, Araneae, Вьетнам, Малайзия.

Abstract. Three new uloborid species, *Miagrammopes grodnitskyi* Logunov, **sp.n.** (♂) from Vietnam, *M. kinabalu* Logunov, **sp.n.** (♂) and *M. uludusun* Logunov, **sp.n.** (♂) from Malaysia (north Borneo) are diagnosed, illustrated and described. Their collecting localities are mapped.

Резюме. Диагностированы, иллюстрированы и описаны три новых вида пауков-улоборид: *Miagrammopes grodnitskyi* Logunov, **sp.n.** (♂) из Вьетнама, *M. kinabalu* Logunov, **sp.n.** (♂) и *M. uludusun* Logunov, **sp.n.** (♂) из Малайзии (северный Борнео). Точки находок этих видов прокартированы.

Introduction

The pantropical uloborid genus *Miagrammopes* O. Pickard-Cambridge, 1870 [*sensu* Opell, 1984] currently consists of 66 valid species [WSC, 2018], 23 of which have been described/recorded from the Oriental Region. Eleven species are known from South Asia (India and Sri Lanka) [Pickard-Cambridge, 1870; Tikader, 1971; Sen et al., 2013; Rajoria, 2015], with all of them, except for *M. thwaitesii* Pickard-Cambridge, 1870, being known from the holotype females and the type localities only. Eight species are known from the continental SE Asia (viz., China, Taiwan, Korea, Japan, Vietnam and Thailand) [Simon, 1886; Bösenberg, Strand, 1906; Kulczyński, 1908; Yoshida, 1982; Dong et al., 2004, 2005], including the common and currently best known species *M. orientalis* Bösenberg et Strand, 1906. Of the latter set of species, about a half (four species) is known from both sexes. Four species are known from Indonesia (Sumatra) and the Philippines [Thorell, 1887; Strand, 1911; Barrion, Litsinger, 1995]; all of them remain known from the holotypes only (three from the females).

The aim of the current paper is to describe three new Oriental *Miagrammopes* species, all on the basis of the males, which are characterized by the unique conformation of the male palp as compared to other congeners.

Material and methods

The holotypes of the newly described species are deposited in The Manchester Museum of the University of Manchester, UK (MMUE; curator: D.V. Logunov).

Specimens were photographed at the Oxford University Museum of Natural History with a Leica M165C stereo microscope (trinocular) with automated z-stepper, Camera Leica DFC495, Leica Application Suite (software to run above), and Helicon Focus 5.3 x64 as a processing software.

The terminology used for description of the male palp partly follows Opell [1979, 1984] and Coddington [1990], with some changes (see below under ‘Discussion’). Abbreviations used in the text and figures are as follows: *Eyes*: PME — posterior median eye, PLE — posterior lateral eye. *Copulatory organs*: E — embolus, C — cymbium, MA — median apophysis, R — radix, T — tegulum, TA — terminal apophysis, TE — tibial extension. *Leg segments*: Fm — femur, Pt — patella, Tb — tibia, Mt — metatarsus, Tr — tarsus. The sequence of leg segments in measurement data is as follows: femur + patella + tibia + metatarsus + tarsus (total). All measurements are in mm.

Descriptions

Miagrammopes grodnitskyi

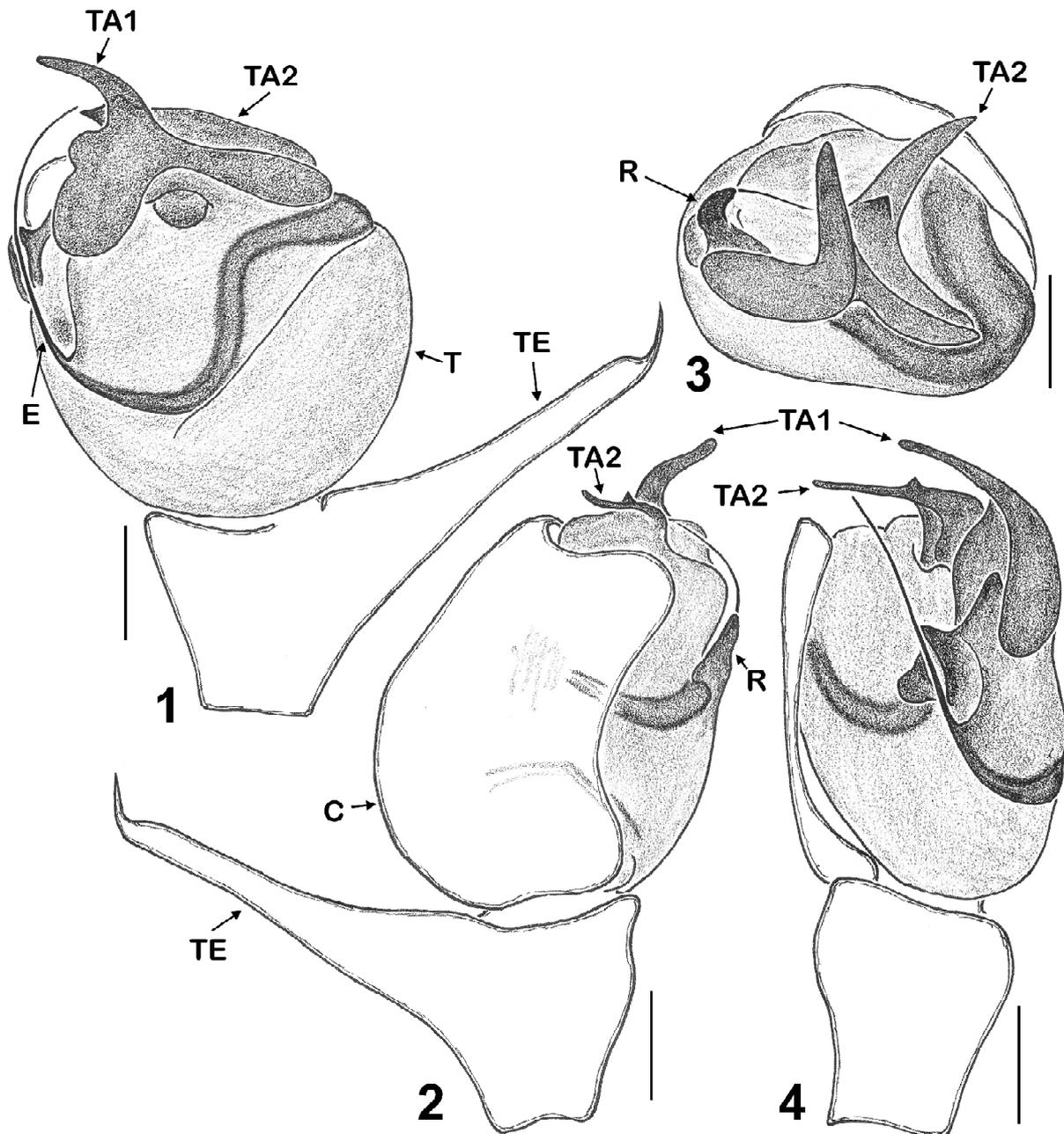
Logunov, **sp.n.**

Figs 1–11, 32.

Material. Holotype ♂ (MMUE, G7611.1) from Vietnam, Bao Ria — Vung Tau Prov., Binh Chau — Phuoc Buu Nature Reserve (10°32' N, 107°29' E), 50 m a.s.l., 07.2007, A.V. Abramov.

Etymology. The new species is dedicated to Dmitri L. Grodnitsky (1962–2018), my late colleague and university mate, in recognition of his scientific contributions to the areas of biological evolution, insect flight and forest entomology.

Diagnosis. By the presence of the very long tibial extension bearing a sharp spur at its end (Figs 1, 2), *M. grodnitskyi* is



Figs 1–4. *Miagrammopes grodnitskyi* sp.n., male palp (the holotype): 1 — retrolateral view; 2 — median view; 3 — apical view; 4 — ventral view. Scale bars 0.1 mm. Abbreviations as explained in Material and methods.

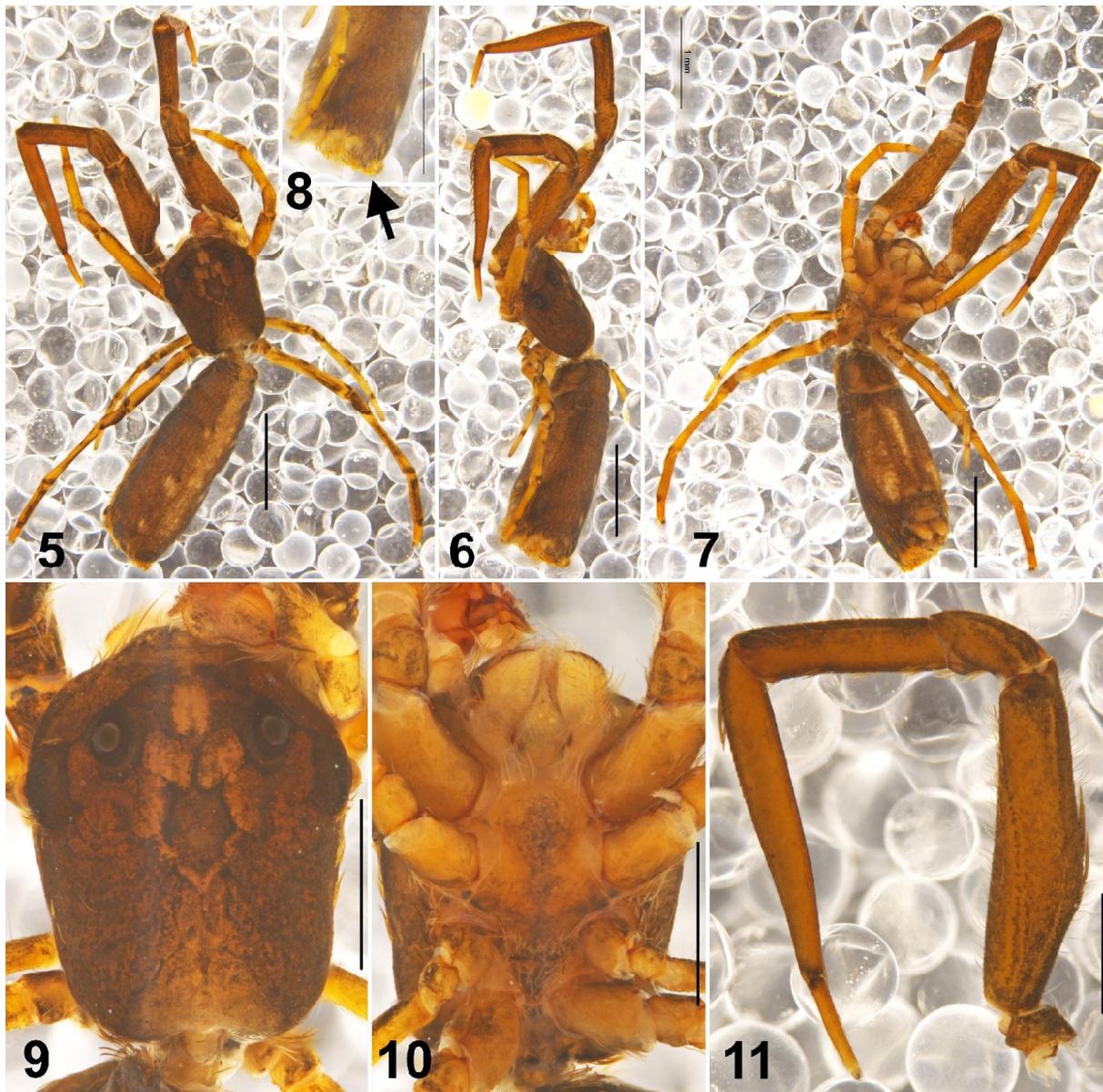
Рис. 1–4. *Miagrammopes grodnitskyi* sp.n., палепа самца (голотип): 1 — сзади-сбоку; 2 — медиально; 3 — апикально; 4 — снизу. Масштаб 0,1 мм. Сокращения см. «Материал и методы».

closest to *M. kinabalu* Logunov, sp.n. (Figs 12–15), from which it can easily be distinguished by the markedly (two times) longer embolus, the shape of TA1 and TA2 (as seen in prolateral and apical views, Figs 1, 3, 12, 14), and the absence of sharp prolateral hook at the proximal end of the cymbium (present in *M. kinabalu*; arrowed in Fig. 13). See also comments below under «Diagnosis» of *M. uludusun* Logunov, sp.n.

Distribution. The type locality only: Vietnam, Binh Chau — Phuoc Buu Nature Reserve (Fig. 32).

Description. Male. Measurements. Carapace 1.25 long, 0.95 wide and 0.48 high. Eyes and eye interdistances: PME

0.10, PLE 0.12, PME–PME 0.41, PME–PLE 0.28; eye row procurved. Abdomen 2.38 long, 0.84 wide. Length of leg segments: I: 1.48 + 0.49 + 0.83 + 1.48 + 0.58 (4.86); II: 1.03 + 0.35 + 0.48 + 0.55 + 0.31 (2.72); III: 0.58 + 0.20 + 0.38 + 0.38 + 0.25 (1.79); IV: 0.93 + 0.31 + 0.80 + 0.55 + 0.25 (2.84). **Coloration** (in alcohol; Figs 5–11). Carapace brown, with O-shaped yellow figure in its centre and a yellow median stripe running towards the front margin of the carapace (Fig. 9). Sternum: the front half yellow, with a median brownish stripe; the rear half entirely brownish (Fig. 10). Endites, labium and chelicerae light yellow. Abdomen brown, with a wide light



Figs 5–11. *Miagrammopes grodnitskyi* Logunov, sp.n. (the holotype): 5 — general appearance, dorsal view; 6 — ditto, lateral view; 7 — ditto, ventral view; 8 — tip of abdomen, lateral view; 9 — carapace, dorsal view; 10 — sternum, ventral view; 11 — leg I, retrolateral view. Scale bars 1 mm (5–8); 0.5 mm (9–11).

Рис. 5–11. *Miagrammopes grodnitskyi* Logunov, sp.n. (голотип): 5 — общий вид, сверху; 6 — то же, сбоку; 7 — то же, снизу; 8 — конец брюшка, сбоку; 9 — головогрудь, сверху; 10 — стернум, снизу; 11 — нога I, сзади-сбоку. Масштаб 1 мм (5–8); 0,5 мм (9–11).

yellow longitudinal stripe on the dorsum and a thin light yellow longitudinal stripe on the venter (Figs 5–7). The rear end of the dorsum with a bunch of short, dense orange hairs (arrowed in Fig. 8); similar orange hairs cover the flat back side of the abdomen. Spinnerets brownish dorsally and light yellow ventrally. Leg I stronger and longer than others, light brown (Fig. 11), with a group of dorso-prolateral strong spines on its Fm and a row of dorso-prolateral bristles/spines on its Tb. Legs II–IV: yellow, but both sides of legs II–III and the dorsal side of leg IV brownish; Pt, Mt and Tr of the leg IV dark brown. Palps light yellow, tinged with grey. Palpal structure as in Figs 1–4: Tb with a long, dorsal TE bearing a sharp spur at its end; bulb oval; embolus relatively long, reaching TA2; MA absent;

TA1 trilobate, with the apical lobe visibly pointed towards its tip; TA2 blade-shaped, with a dorsal sharpened bulge.

Female unknown.

Miagrammopes kinabalu Logunov, sp.n.

Figs 12–22, 32.

Material. Holotype ♂ (MMUE, G7572.6657) from Malaysia, Sabah, North Borneo, Kinabalu National Park [c. 6°09' N, 116°39' E], rainforest paths, 1800 m a.s.l., 30.07.1979, J. Murphy.

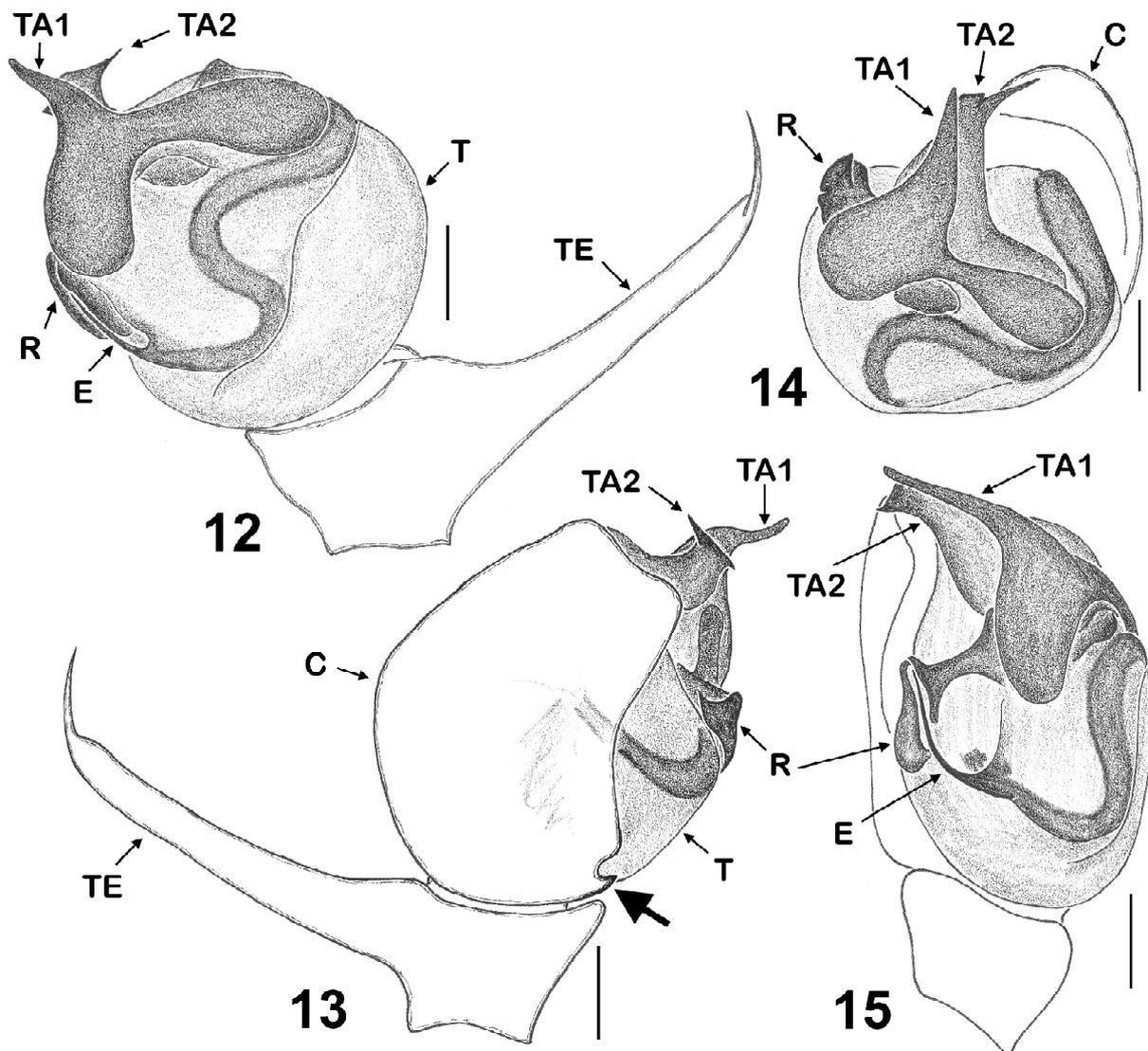
Etymology. The specific epithet is a noun in apposition taken from the type locality, the Kinabalu National Park in North Borneo (Malaysia).

Diagnosis. By the presence of the very long tibial extension bearing a sharp spur at its end (Figs 12, 13), *M. kinabalu* is closest to *M. grodnitskyi* (Figs 1–4), from which it can easily be distinguished by the markedly (two times) shorter embolus, the shape of TA1 and TA2 (as seen in prolateral and apical views, Figs 1, 3, 12, 14), and the presence of sharp prolateral hook at the proximal end of cymbium (arrowed in Fig. 13; absent in *M. grodnitskyi*). See also comments below under «Diagnosis» of *M. uludusun*.

Distribution. The type locality only: Malaysia, Kinabalu National Park (Fig. 32).

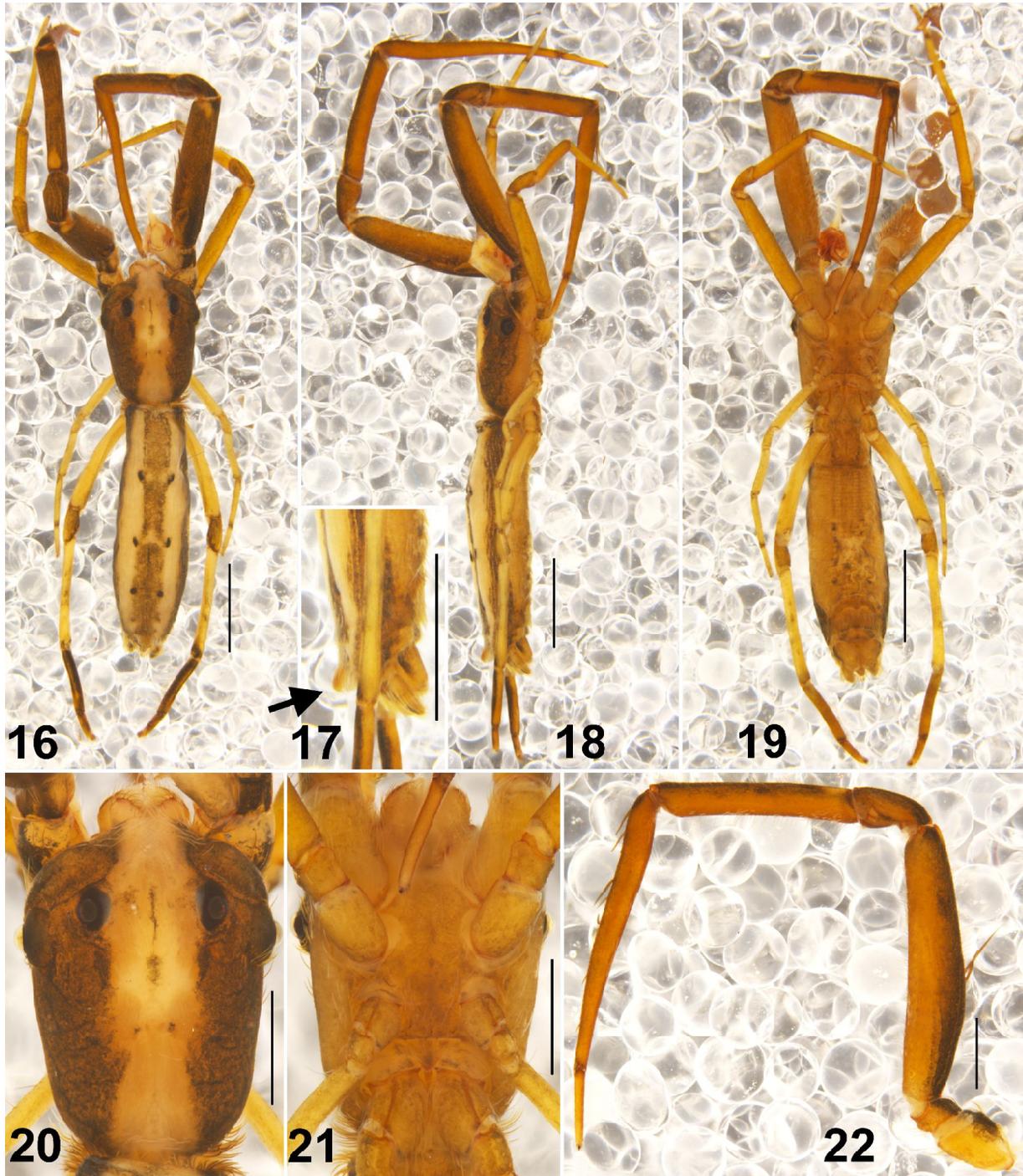
Description. Male. Measurements. Carapace 1.52 long, 1.05 wide and 0.60 high. Eyes and eye interdistances: PME 0.10, PLE 0.13, PME–PME 0.47, PME–PLE 0.29; eye row procurved. Abdomen 2.78 long, 0.88 wide. Length of leg segments: I: 1.98 + 0.58 + 1.45 + 2.20 + 0.53 (6.74); II: 1.40

+ 0.40 + 0.79 + 0.90 + 0.43 (3.92); III: 0.75 + 0.21 + 0.50 + 0.54 + 0.38 (2.38); IV: 1.23 + 0.39 + 1.20 + 0.71 + 0.31 (3.84). **Coloration** (in alcohol; Figs 16–22). Carapace with brownish sides and a wide median light yellow stripe (Fig. 20). Sternum yellow, with light brownish tinge (Fig. 21). Labium, endites and chelicerae light yellow. Abdomen: dorsum light yellow, with a wide, longitudinal grey brownish stripe and four pairs of black spots situated along outer edges of the stripe; sides brownish; venter yellow, tinged with light brown (Figs 16–19). Spinnerets yellow, tinged with light brown. Leg I yellow-orange, but the dorsal sides of Fm, Pt and Tb brown (Fig. 22). Legs II–III: light yellow, with narrow brownish rings at segment joints. Leg IV: coxae, Fm and Tb light yellow; Pt, Mt and Tr brown. Palps light yellow. Palpal structure as in Figs 12–15: Tb with a long, dorsal TE bearing a sharp spur at its end; C with the



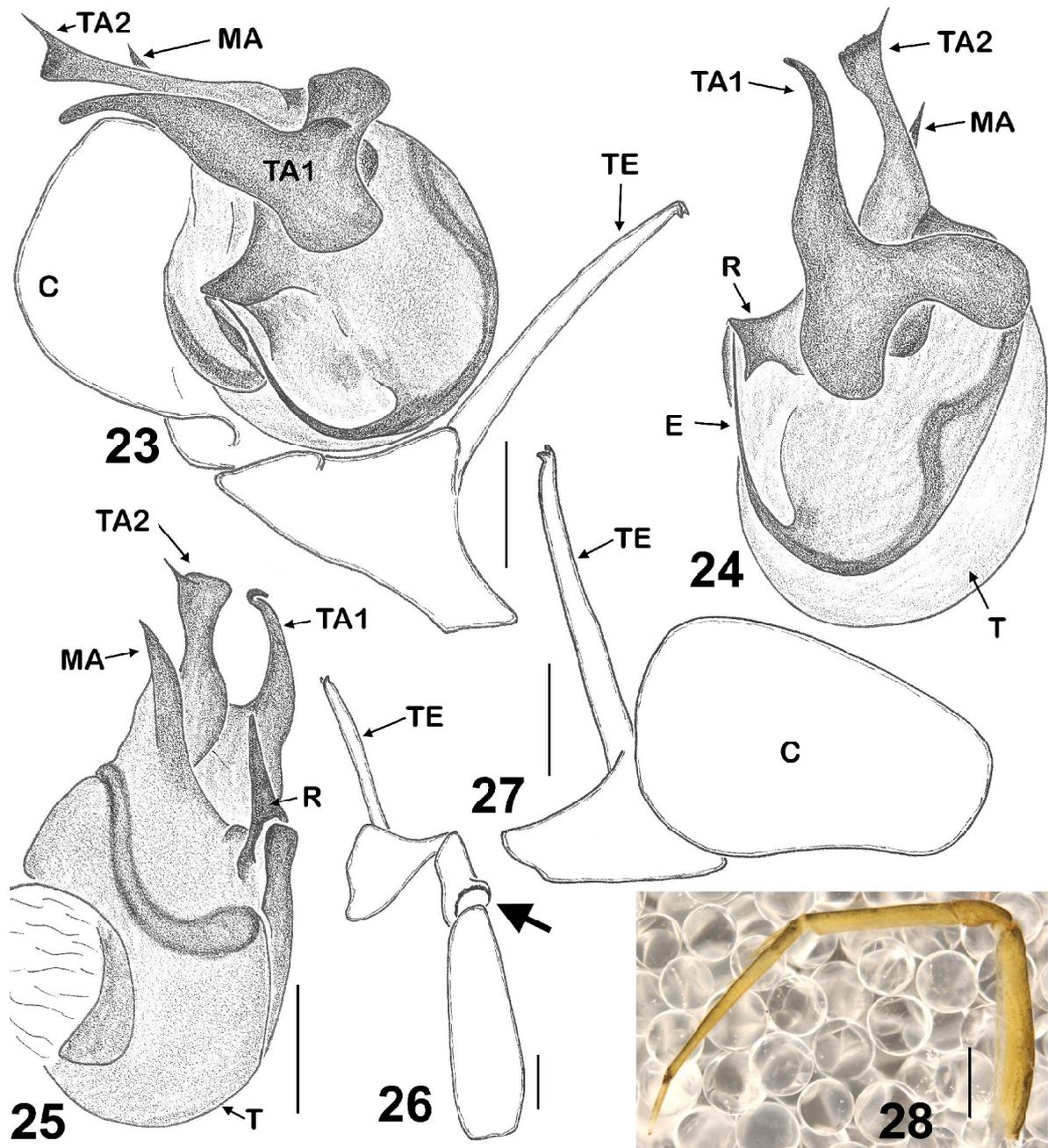
Figs 12–15. *Miagrammopes kinabalu* Logunov, sp.n., male palp (the holotype): 12 — retrolateral view; 13 — median view; 14 — apical view; 15 — ventral view. Scale bars 0.1 mm. Abbreviations as explained in Material and methods.

Рис. 12–15. *Miagrammopes kinabalu* Logunov, sp.n., палпа самца (голотип): 12 — сбоку-сзади; 13 — медиально; 14 — апикально; 15 — снизу. Масштаб 0,1 мм. Сокращения см. «Материал и методы».



Figs 16–22. *Miagrammopes kinabalu* Logunov, sp.n. (the holotype): 16 — general appearance, dorsal view; 17 — abdomen tip, lateral view; 18 — general appearance, lateral view; 19 — ditto, ventral view; 20 — carapace, dorsal view; 21 — sternum, ventral view; 22 — leg I, retrolateral view. Scale bars 1 mm (16–19); 0.5 mm (20–22).

Рис. 16–22. *Miagrammopes kinabalu* Logunov, sp.n. (голотип): 16 — общий вид, сверху; 17 — вершина брюшка, сбоку; 18 — общий вид, сбоку; 19 — то же, снизу; 20 — карапакс, сверху; 21 — стернум, снизу; 22 — нога I, сзади-сбоку. Масштаб: 1 мм (16–19); 0,5 мм (20–22).



Figs 23–28. *Miagrammopes uludusun* Logunov, sp.n. (the holotype): 23 — male palp, retrolateral view; 24 — ditto, ventral view; 25 — ditto, median view; 26 — palpal segments, dorso-prolateral view; 27 — palpal tibia and cymbium, dorsal view; 28 — leg I, retrolateral view. Scale bars 0.1 mm (23–27); 0.5 mm (28). Abbreviations as explained in Material and methods.

Рис. 23–28. *Miagrammopes uludusun* Logunov, sp.n. (голотип): 23 — палпа самца, сбоку-сзади; 24 — то же, снизу; 25 — то же, медиально; 26 — сегменты палпы, сверху-сбоку; 27 — голень палпы и цимбиум, сверху; 28 — нога I, сбоку-сзади. Масштаб 0,1 мм (23–27); 0,5 мм (28). Сокращения см. «Материал и методы».



Figs 29–31. *Miagrammopes uludusun* Logunov, sp.n. (the holotype): 29 — general appearance, dorsal view; 30 — ditto, lateral view; 31 — ditto, ventral view. Scale bars 1 mm.

Рис. 29–31. *Miagrammopes uludusun* Logunov, sp.n. (голотип): 29 — общий вид, дорзально; 30 — то же, сбоку; 31 — то же, снизу. Масштаб 1 мм.

proximo-medial sharpened hook; bulb round; embolus relatively short, not extending beyond the groove of R; MA absent; TA1 trilobate, with the apical lobe visibly pointed towards its tip; TA2 flat, with a dorso-medial apical spur.

Female unknown.

Miagrammopes uludusun

Logunov, sp.n.

Figs 23–32.

Material. Holotype ♂ (MMUE, G7572.7267) from Malaysia, Sandakan, Sabah, North Borneo, Ulu Dusun [c. 5°47'25" N, 117°46'31" E], garden, jungle edge, 100 m a.s.l., 7.09.1979, J. Murphy.

Etymology. The specific epithet is a noun in apposition taken from the type locality, Ulu Dusun in North Borneo (Malaysia).

Diagnosis. By the presence of the very long tibial extension having (Figs 23, 27), *M. uludusun* is close to *M. grodnitskyi* (Figs 1–4) and *M. kinabalu* (Figs 12–15), from which it can easily be distinguished by the bifurcated tip of tibial extension (sharpened in both related species; cf. Figs 27 and 2, 13), the presence of basal patellar rim in the male palp

(arrowed in Fig. 26; absent in both related species), the shape of TA1 and TA2 (as seen in prolateral and ventral views, Figs 23, 24), and the presence of MA (Fig. 25; absent in both related species).

Distribution. The type locality only: Malaysia, Sabah, Ulu Dusun (Fig. 32).

Description. Male. Measurements. Carapace 1.10 long, 0.74 wide and 0.45 high. Eyes and eye interdistances: PME 0.10, PLE 0.11, PME–PME 0.39, PME–PLE 0.20; eye row procurved. Abdomen 2.07 long, 0.58 wide. Length of leg segments: I: 1.60 + 0.48 + 1.08 + 1.48 + 0.43 (5.07); II: 0.93 + 0.31 + 0.55 + 0.65 + 0.30 (2.74); III: 0.55 + 0.15 + 0.40 + 0.38 + 0.25 (1.73); IV: 1.03 + 0.25 + 0.98 + 0.55 + 0.25 (3.06). **Coloration** (in alcohol; Figs 28–31). Carapace with light brown sides and a wide median light yellow stripe (Fig. 29). Sternum light yellow, with a longitudinal light grey stripe. Endites, labium and chelicerae light yellow. Abdomen: dorsum light yellow, with four pairs of black dots; sides yellowish grey; venter light yellow, with two longitudinal grey stripes (Figs 29–31). Spinnerets light yellow, with greyish sides. Leg I: ventral sides of its segments light yellow, their dorsal sides grey (Fig. 28). Leg II: light yellow, except for grey prolateral

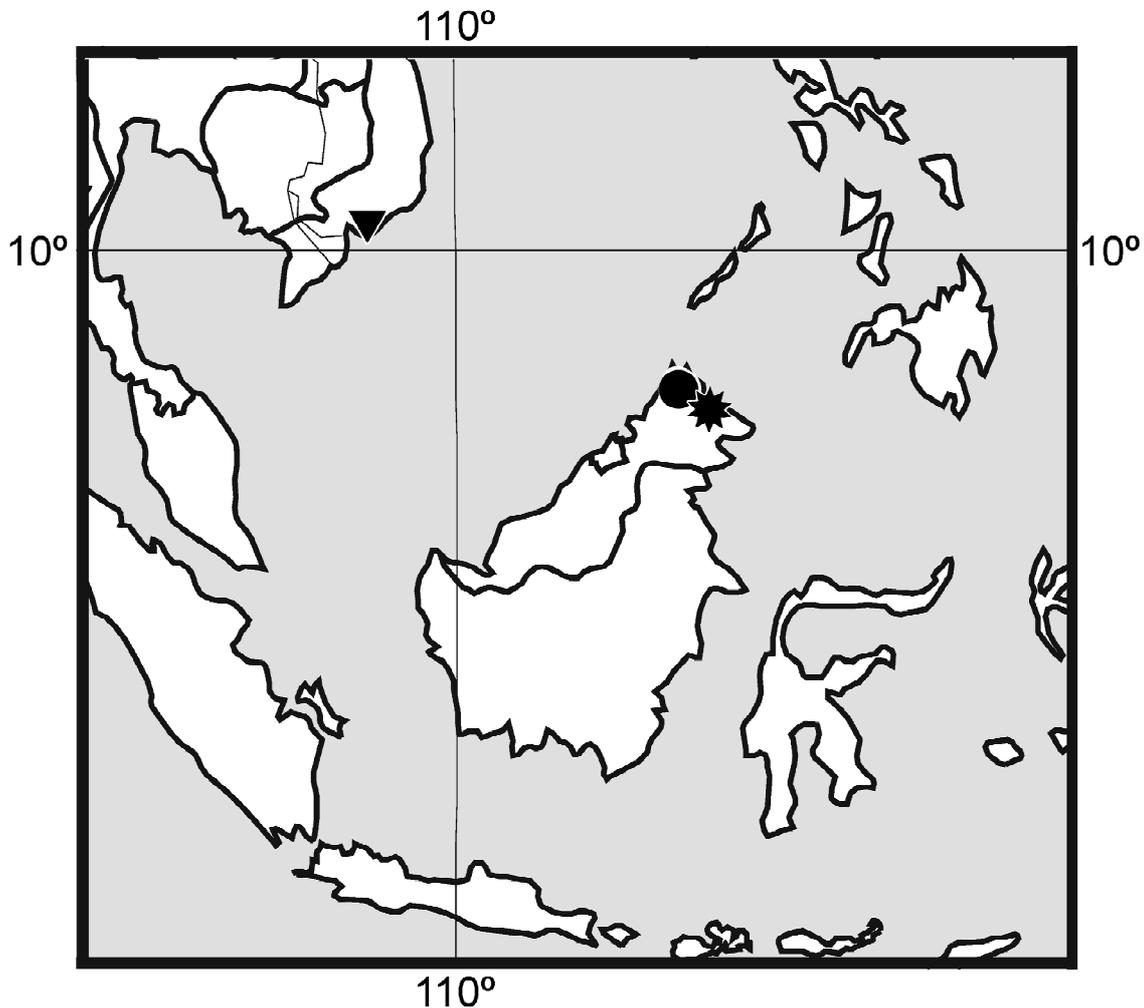


Fig. 32. The collecting localities of *Miagrammopes grodnitskyi* Logunov, sp.n. (inverted triangle), *M. kinabalu* Logunov, sp.n. (circle) and *M. uludusun* Logunov, sp.n. (asterisk).

Рис. 32. Точки находок *Miagrammopes grodnitskyi* Logunov, sp.n. (перевернутый треугольник), *M. kinabalu* Logunov, sp.n. (кружок) и *M. uludusun* Logunov, sp.n. (звездочка).

sides of the segments. Legs III and IV: light yellow, with grey longitudinal stripes and dark grey patches; Pt, Mt and Tr of the leg IV dark grey dorsally. Palps light yellow, with their Fm tinged with grey. Palpal structure as in Figs 23–27: Pt with a basal, well-marked rim; Tb with a long and thin, dorsal TE that is bifurcated at its end; bulb oval; embolus relatively short, not extending beyond the groove of R; MA present, blade-shaped; TA1 trilobate, with the apical lobe extended apicad, pointed and bent at its tip; TA2 dumbbell-shaped and flattened at its top, with a dorso-medial apical spur.

Female unknown.

Discussion

The three newly described species are indeed members of the genus *Miagrammopes* [*sensu* Opell, 1979, 1984; Dong et al., 2005], as they have the main diagnostic characters of the genus: viz., anterior eyes are lost (Figs 9, 20), the labium and endites are twice as long as wide (Figs 10, 21), the sternum is divided into two/three flexi-

ble parts by transverse grooves (Fig. 21), and the radix acts as a functional conductor (Figs 2, 12, 15, 24: R). All these diagnostic characters were also shown to be true autapomorphies of the genus [Opell, 1984]. Within *Miagrammopes*, these species form a compact group that can easily be distinguished from the other eight species groups diagnosed by Opell [1984] by the following characters: eye row procurved (Figs 9, 20), low PLE tubercles, thoracic region long, tibial extension very long and thin (as long as the cymbium, or longer; Figs 2, 13, 27: TE). The latter character is unique not only in the genus *Miagrammopes*, but apparently in the whole family Uloboridae. The majority of described *Miagrammopes* species, for which the male is known, have the tibial extension resembling a thick dorsal outgrowth that is much shorter than the cymbial length [see Lehtinen, 1967; Dong et al., 2004, 2005; Yoshida, 1982, 2009]. The presence of nine easily distinguishable species groups in the genus *Miagrammopes* could possibly indicate its composite nature as a paraphyletic taxon [cf. Lehtinen, 1967;

Opell, 1984]. Yet, this matter cannot be sorted/discussed now due to the scarcity of comparative materials on *Miagrammopes*, particularly on Oriental species.

The current state of knowledge of the genus *Miagrammopes*, especially within the scope of Oriental fauna is rather fragmentary. For instance, of the 26 Oriental species described to date (including the three new species that are diagnosed in the present paper), 14 (54 %) are known from the holotype females and six (23 %) from the holotype males. Thus, in total 20 species (77 %) remain known from one sex only. Even the generotype — *M. thwaitesii* from Sri Lanka — has never been re-examined and re-described, and thus is still known from the original description only (Pickard-Cambridge, 1870); the whereabouts of its holotype female, which should have been deposited in the Oxford University Museum of Natural History, is also unknown (Z. Simmons, pers. comm.). Lehtinen [1967: fig. 506] poorly illustrated what he thought could be the male of *M. thwaitesii*, but without a description or any kind of taxonomic comments or evidence; the whereabouts of his specimen is also unknown. Thus, at present, it is even unclear what the generotype of *Miagrammopes* actually is.

Due to the generally poor knowledge of many *Miagrammopes* species, the composition and homology of sclerites in their male palps is a difficult problem that has not been satisfactorily resolved yet [Coddington, 1990]. This is why there is disagreement in the terminology and homology of palpal sclerites. For instance, in the present paper, the definition of «radix» follows that by Opell [1984: figs 35, 37, 41], and the term is here applied to the sclerite that acts as a functional conductor, serving to guide the embolus (Figs 2, 13, 15, 24: R). However, according to Coddington [1990: figs 37, 40], this sclerite should be called the «median apophysis». What was termed the «median apophysis» (consisting of two branches) by Opell [1979, 1984: figs 9, 10], according to Coddington [1990: figs 37–41; followed by Dong et al., 2005: fig. 12], is to be termed the «conductor». Neither the «median apophysis» [sensu Opell, 1984], nor the «conductor» [sensu Coddington, 1990] is used in the present paper. By positional criteria, the two subparallel sclerites that are situated more apically of the embolus are herein called 'terminal apophyses' (Figs 2–4, 13–15, 23–25: TA1 and TA2). Indeed, the true median apophysis belongs to the middle division of the male palp, being a movable or fused projection of the tegulum, whereas terminal apophyses belong to the embolic division [Merrett, 1963; Grasshoff, 1968; etc.], which seems to be the case of *Miagrammopes*. Although it is currently impossible to decide whether these two sclerites are true terminal apophyses (i.e., being homologous to the corresponding sclerites described in other araneoids) or one of them could actually be the lamella [sensu Merret, 1963], the use of the term «terminal apophysis» at least does not contradict the positional criteria: both sclerites are indeed part of the embolic division. Finally, in *M. uludusun* Logunov, sp.n., a third sclerite of unclear nature was found in the male palp. This sclerite seems to be a projec-

tion of the tegulum and therefore has provisionally been termed the median apophysis (Fig. 25: MA) [contra Opell, 1984 and Coddington, 1990]. Further consideration of the detailed *Miagrammopes* embolic morphology and sclerite composition is outside the scope of the present paper, and will be possible only when males of more Oriental species are described.

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