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Descriptions of three new *Heteropoda* spiders from tropical Asia (Araneae: Sparassidae)

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Abstract. Three new species of the genus *Heteropoda* (Araneae: Sparassidae: Heteropodinae) are described: *Heteropoda curvata* sp. nov. (♂, Sabah), *Heteropoda flamma* sp. nov. (♂, Hainan), and *Heteropoda lucerna* sp. nov. (♀, Guangxi Zhuang Autonomous Region). Detailed morphological descriptions, diagnostic illustrations, and a distribution map are provided for each species to facilitate identification and comparison with congeners.

Keywords. New species, species diversity, Guangxi, biodiversity, huntsman spider.

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Introduction

The genus *Heteropoda*, established by Latreille in 1804, comprises large, fast-moving spiders commonly known as giant crab spiders or huntsman spiders. Males of species of *Heteropoda* can be distinguished by a filiform embolus, resting in a sheath-like conductor, and females by the characteristic spiral windings of the internal duct system. *Heteropoda* is the second largest genus within the subfamily Heteropodinae Thorell, 1873, with 212 valid species currently recognized worldwide, of which twenty have been reported from China (Korai & Wang 2023a; Korai & Jäger 2024a, 2024b; World Spider Catalog 2025). These spiders are widely distributed from South, East and Southeast Asia to Australia in tropical and subtropical regions, and occur on tree trunks, in foliage, leaf litter, under rocks, in caves, and in human dwellings (Jäger & Yin 2001; Jäger 2002, 2008; Jäger & Vedel 2005; Korai & Wang 2023a, 2023b; Korai & Jäger 2024b). Only one species, *Heteropoda venatoria* Linnaeus, 1767, has been reported from tropical environments in Africa and the Americas as well as from heated buildings in temperate regions (Jäger 2024).

China, a vast country, spans two major zoogeographical regions: the relatively species-poor Palearctic zone in the north and the species-rich oriental zone in the southwest, south-central, and eastern parts. Over the past decade, colleagues from Hubei University have carried out extensive surveys of *Heteropoda* spiders in China, leading to the discovery of three new species, which are described in this paper.

Material and methods

Taxonomic description

Specimens were preserved in 75% ethanol and examined under an Olympus SZX16 stereo microscope. After dissection from the spider body, male palps and female copulatory organs were examined and illustrated. Female copulatory organs were cleaned with proteinase K at 56°C for 2–3 hours to remove soft tissues. Photographs were taken using a Leica 205C stereo microscope and an Olympus BX51 equipped with a Micropublisher 3.3 RTV camera (QImaging, Surrey, BC, Canada).

The leg formula is presented as: total length (femur, patella, tibia, metatarsus, tarsus). The number of spines per segment is given in the following order: prolateral, dorsal, retrolateral, and ventral. For femora and patellae, ventral spines are absent, and the fourth digit is omitted in the spination formula. Terminology follows that of Li *et al.* (2013). All measurements are given in millimetres.

Abbreviations used in text

Repository institution

CBEE	=	Centre for Behavioural Ecology and Evolution, College of Life Sciences, Hubei University, Wuhan, China

Somatic morphology

ALE	=	anterior lateral eyes
AME	=	anterior median eyes
AW	=	anterior width of prosoma
BL	=	body length
CH	=	clypeus height
dRTA	=	dorsal part of RTA
OL	=	opisthosoma length
OW	=	opisthosoma width
PL	=	prosoma length
PLE	=	posterior lateral eyes
PME	=	posterior median eyes
PW	=	prosoma width
RTA	=	retrolateral tibial apophysis
vRTA	=	ventral part of RTA
I, II, III, IV	=	legs I to IV

Results

Descriptions of new species

Class Arachnida Cuvier, 1812
Order Araneae Clerck, 1757
Family Sparassidae Bertkau, 1872
Subfamily Heteropodinae Thorell, 1873
Genus *Heteropoda* Latreille, 1804

Heteropoda curvata sp. nov.
urn:lsid:zoobank.org:act:711409ED-856B-4752-A660-379F593207E8
Figs 1, 4

Diagnosis

The male of *Heteropoda curvata* sp. nov. is similar to that of *H. duo* Jäger, 2014, in having a similarly undulating spermophor, a sub-distally arising RTA with a curved dRTA, and a distinct vRTA in retrolateral view, the embolus arising at 7:30-o'clock-position from tegulum (Fig. 1A–C; Jäger 2014: figs 69–72), but can be distinguished from the latter species by 1. spermophor with only slightly bulging retrolaterad part; 2. conductor arising at 9:30-o'clock position from tegulum, not extending retrolaterally beyond cymbial margin in ventral view, its tip disto-retrolaterad; 3. vRTA flat, broadly rounded in retrolateral view; and 4. cymbium length/cymbium tip depth (in lateral view) = 4.72 (vs spermophor with distinctly bulging retro-proximad part, conductor arising from 11:00-o'clock position, extending beyond cymbial margin, its tip retrolaterad, vRTA distinctly bulging, and cymbium length/cymbium tip depth [in lateral view] = 6.67 in *H. duo*). Females are unknown.

Etymology

The specific name is derived from the Latin perfect passive participle of '*curvare*, *curvatus*', meaning 'curved', and refers to the dRTA in retrolateral view.

Type material

Holotype
MALAYSIA • ♂; Sabah State, Interior Division, Mount Trusmadi; [5°15′56″ N, 116°16′23″ E]; [524 m a.s.l.]; 5 Oct. 2015; L.Y. Wang and G.Q. Huang leg.; CBEE.

Paratypes
CHINA • 3 ♂♂; same data as for holotype; CBEE.

Description

Male (holotype)
Measurements. BL 12.4; PL 6.4, PW 6.0; AW 2.4; OL 6.0, OW 2.8. Eyes: AME 0.29, ALE 0.42, PME 0.32, PLE 0.46, AME–AME 0.21, AME–ALE 0.08, PME–PME 0.28, PME–PLE 0.41, AME–PME 0.35, ALE–PLE 0.32, CH AME 0.31, CH ALE 0.26. Spination: palp 131, 101, 2121; Fe I–III 323, IV 331; Pa I–IV 101; Ti I–II, IV 2026, III 2126; Mt I–II 1014, III 2014, IV 3036. Measurements of palp and legs: palp 13.3 (3.9, 1.4, 3.6, –, 4.4); I 31.3 (8.3, 3.0, 8.2, 9.1, 2.7); II 34.2 (8.6, 3.4, 9.2, 9.9, 2.6); III 25.5 (7.2, 2.4, 6.9, 7.0, 2.0); IV 28.4 (7.6, 2.4, 7.4, 8.7, 2.3). Leg formula: II–I–IV–III. Cheliceral furrow with 3 anterior, 4 posterior teeth and ca 26 intermarginal denticles.

Palp. As in diagnosis. RTA arising distally to sub-distally from tibia. dRTA slender and pointed, vRTA with distinct hump in retrolateral view. Cymbium retro-proximally only slightly bulging. Tegulum elongated, alveolus visible between tegulum and conductor in ventral view, spermophor distally

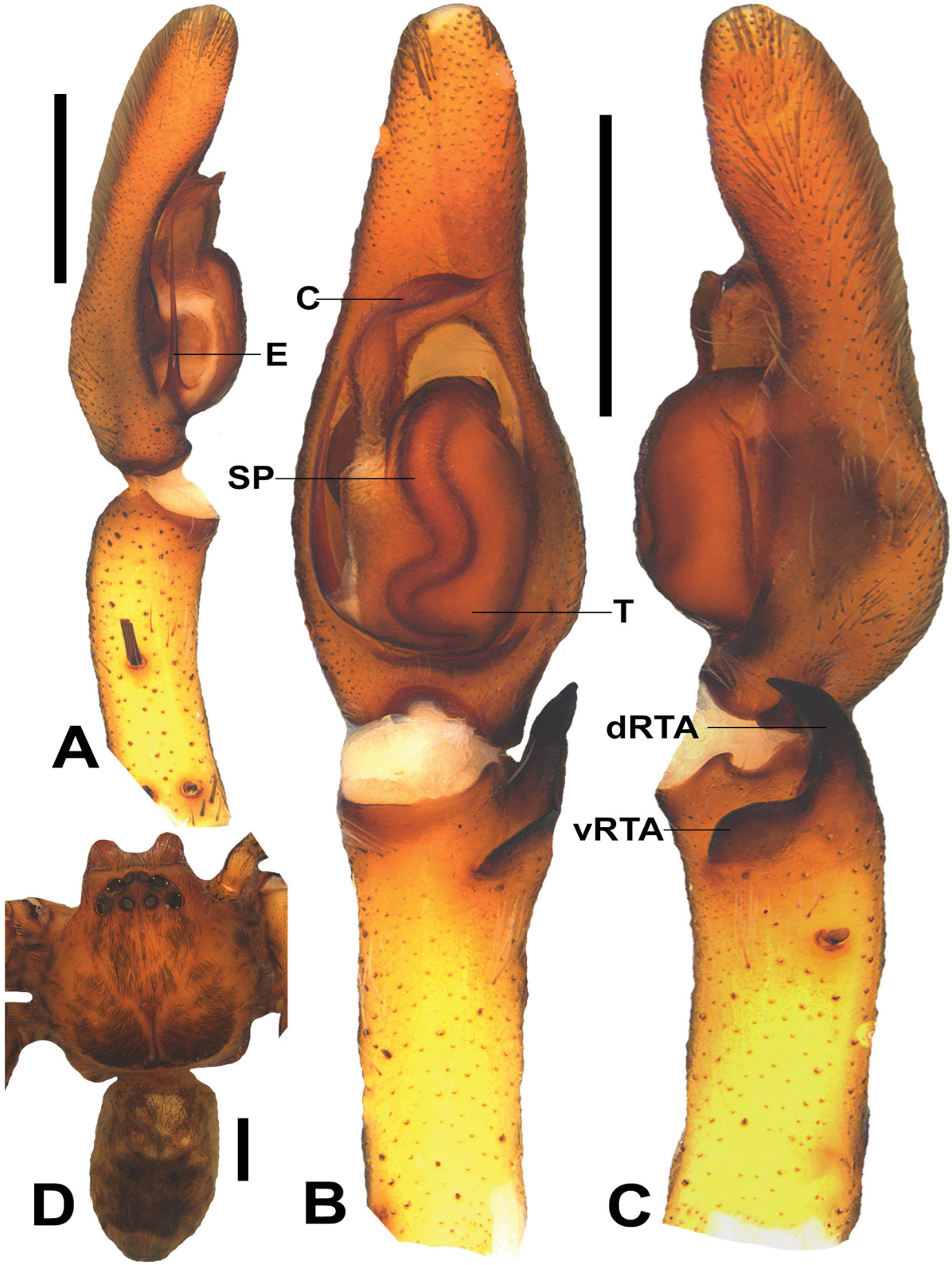

Fig. 1. *Heteropoda curvata* sp. nov., holotype male from Mount Trusmadi, Malaysia (CBEE), **A-C** left palp. **A**. Prolateral view. **B**. Ventral view. **C**. Retrolateral view. **D**. Habitus, dorsal view. Abbreviations: C = conductor; dRTA = dorsal part of retrolateral tibial apophysis; E = embolus; SP = spermophor; vRTA = ventral part of retrolateral tibial apophysis; T = tegulum. Scale bars: A–D = 2 mm.

retrolaterad to dorsad in ventral view. Embolus almost running straight in visible part, totally slightly semi-circular (Fig. 1A–C).

Colouration in ethanol. Dorsal shield of prosoma yellowish brown to light reddish-brown, with bright transversal crescent postero-submarginally, and longitudinal stripes covered by setae around fovea. Chelicerae light reddish-brown. Opisthosoma dorsally yellowish-brown, with large dark patches located just before posterior part, these covered by darker setae (Fig. 1D).

Distribution

Malaysia (Sabah State) (Fig. 4).

Heteropoda flamma sp. nov.
urn:lsid:zoobank.org:act:95496F39-BC1F-4A91-A7A1-E2CF13B0E08F
Figs 2, 4

Diagnosis

The male of *Heteropoda flamma* sp. nov. is similar to that of *H. obe* Jäger, 2014 in having a sub-distally arising RTA with a distally widened dRTA and a dorsal outgrowth, a similar course of the spermophor in ventral view, and a conductor as long as the tegulum (Fig. 2A–C; Jäger 2014: figs 145–150), but can be distinguished from the latter species by: 1. conductor strongly bent and with tip narrowly pointed (vs slightly bent and continuously tapering in *H. obe*); 2. embolus arising in a 5-o'clock-position (vs 6-o'clock position in *H. obe*); 3. dRTA with long pointed ventrad tip and vRTA rounded, but tapering (vs dRTA with broadly rounded ventrad tip and vRTA broadly rounded in *H. obe*). The male of *H. flamma* is also similar to that of *H. tetrica* Thorell, 1897 in having a similar conductor with a flame-like shape and a narrowly pointed tip as well as a similar course of the spermophor in ventral view, and the embolus arising from tegulum at approximately 5-o'clock-position (Jäger 2001: fig. 16a–c), but can be distinguished from the latter species by 1. dRTA with widened tip and dorsal outgrowth (vs simple and narrow in *H. tetrica*); 2. conductor very broad and abruptly narrowing apically (vs narrow and continuously narrowing apically in *H. tetrica*). Females are unknown.

Etymology

The specific name is derived from the Latin noun '*flamma*', meaning 'flame', referring to the flame-shaped conductor; noun in apposition.

Type material

Holotype

CHINA • ♂; Hainan Province, Haikou City, Meilan District, Yanfeng Town, Dongzhaigang Mangrove Nature Reserve; [19°56′56″ N, 110°34′47″ E]; [1 m a.s.l.]; 13 Apr. 2013; Y. Zhong and J. Liu leg.; CBEE.

Paratype

CHINA • 1 ♂; same data as for holotype; CBEE.

Description

Male (holotype)

Measurements. BL 11.4; PL 5.5, PW 5.0; AW 2.9; OL 5.9, OW 3.8. Eyes: AME 0.28, ALE 0.41, PME 0.33, PLE 0.48, AME–AME 0.22, AME–ALE 0.08, PME–PME 0.29, PME–PLE 0.43, AME–PME 0.37, ALE–PLE 0.31, CH AME 0.30, CH ALE 0.28. Spination: palp 131, 101, 2121; Fe I–III 323, IV 331; Pa I–IV 101; Ti I–II 1018, III 2226, IV 2126; Mt I–II 1014, III 1014, IV 3036. Measurements of palp and

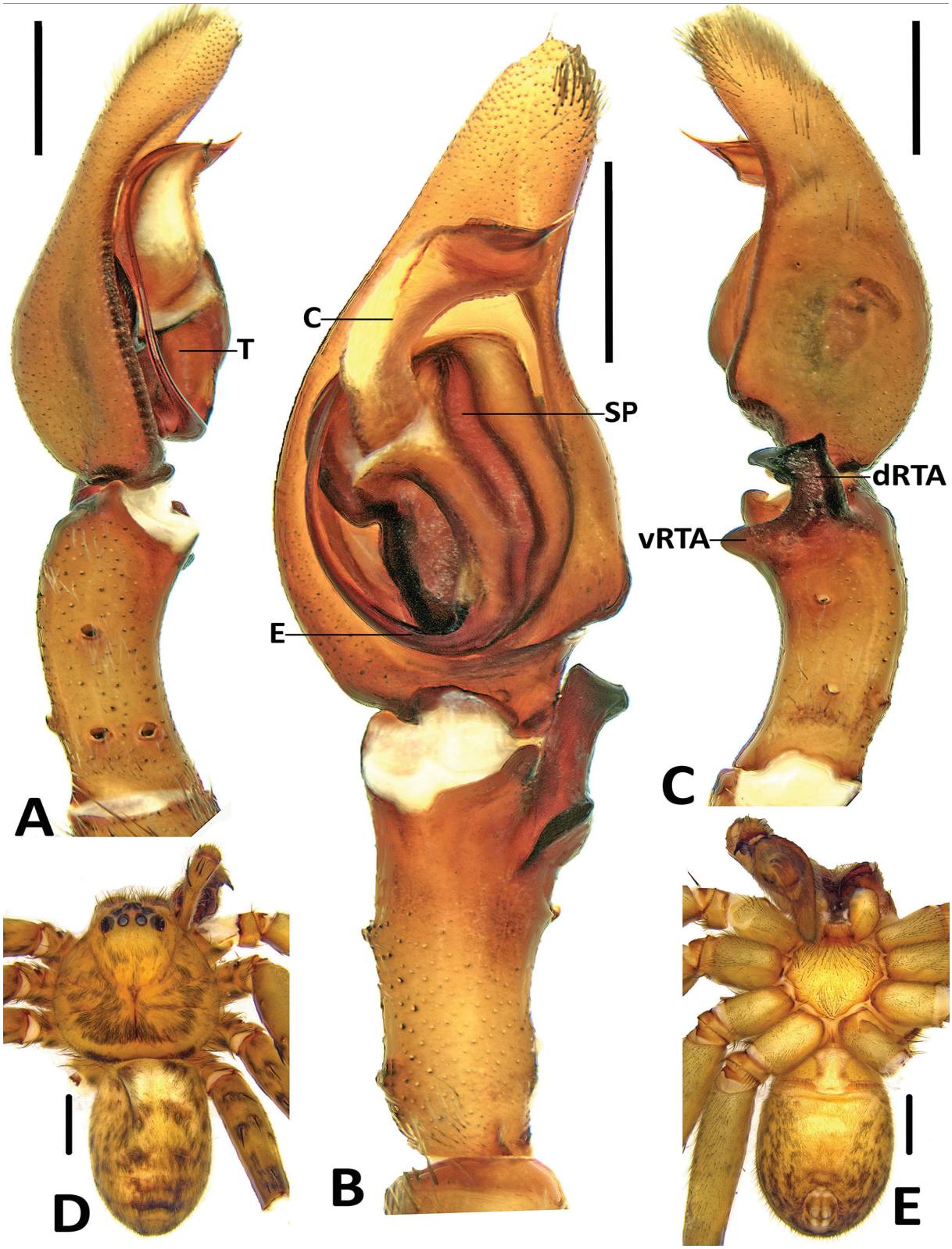

Fig. 2. *Heteropoda flamma* sp. nov., holotype male from Dongzhaigang Mangrove Nature Reserve, China (CBEE), **A-C** left palp. **A**. Prolateral view. **B**. Ventral view. **C**. Retrolateral view. **D**. Habitus, dorsal view. **E**. Ventral view. Abbreviations: C = conductor; dRTA = dorsal part of retrolateral tibial apophysis; E = embolus; SP = spermophor; vRTA = ventral part of retrolateral tibial apophysis; T = tegulum. Scale bars: A–C = 1 mm; D–E = 2 mm.

legs: palp 10.7 (3.5, 1.2, 2.6, –, 3.4); I 32.2 (8.8, 3.2, 8.6, 9.3, 2.9); II 35.5 (8.9, 3.6, 9.5, 10.6, 2.8); III 26.5 (7.3, 2.6, 7.0, 7.2, 2.2); IV 29.2 (7.7, 2.5, 7.6, 8.8, 2.5). Leg formula: II–I–IV–III. Cheliceral furrow with 3 anterior, 4 posterior teeth and ca 26 intermarginal denticles.

Palp. As in diagnosis. RTA arising sub-distally from tibia. Cymbium roughly two times as long as tegulum, with distinct retrolateral bulge. Tegulum slightly elongated. Embolus arising from tegulum at 5-o'clock-position, running a semi-circle. Spermophor only very slightly S-shaped and bent at a right angle distally before running further dorsally of the conductor. vRTA with distinct ventrad hump (Fig. 2A–C).

Colouration in ethanol. Dorsal shield of prosoma pale-yellowish to yellowish-brown, with bright transversal crescent postero-submarginally, and longitudinal stripes covered by setae around fovea (some setae rubbed off). Chelicerae light reddish-brown. Labium, sternum, and gnathocoxae pale-yellowish to yellowish-brown. Opisthosoma dorsally yellowish-brown, with light-brown pairwise patches, these covered by darker setae; ventrally yellowish-brown, and a dark-brown marking located at posterior part, covered by setae (Fig. 2D–E).

Distribution

China (Hainan Province) (Fig. 4).

Heteropoda lucerna sp. nov.
urn:lsid:zoobank.org:act:B6B705D6-6626-45B4-89B9-C1F3B2E65607
Figs 3–4

Diagnosis

Female of this new species can be distinguished from most of the species of *Heteropoda* by the unique combination of having a transversal rim on a freely visible median septum (Fig. 3A–C; Jäger 2001: fig. 16h–j; Li *et al*. 2013: fig. 1a–f) and is most similar to those of *H. amphora* Fox, 1936 and *H. schwalbachorum* Jäger, 2008, but can be distinguished from the latter species by: 1. median margins of lateral lobes strongly diverging anteriorly (vs converging in *H. amphora* and only slightly diverging in *H schwalbachorum*); 2. first winding of IDS barely covered by posterior part (vs not covered in *H. amphora* and *H. schwalbachorum*).

Etymology

The specific name is derived from the Latin noun '*lucerna*', meaning 'oil lamp', referring to the anterior part of IDS in dorsal view; name in apposition.

Type material

Holotype

CHINA • ♀; Guangxi Zhuang Autonomous Region, City Nanning, Wuming County, Liangjiang Town, Daming Mountain; [23°25′59″ N, 108°30′29″ E]; [1250 m a.s.l.]; 26 May 2016; Y. Zhong leg.; CBEE.

Description

Female (holotype)

Measurements. BL 12.1; PL 5.1, PW 4.3; AW 2.6; OL 7.0, OW 4.3. Eyes: AME 0.24, ALE 0.45, PME 0.38, PLE 0.46, AME–AME 0.25, AME–ALE 0.12, PME–PME 0.32, PME–PLE 0.48, AME–PME 0.46, ALE–PLE 0.51, CH AME 0.46, CH ALE 0.38. Spination: palp 131, 101, 2121, 1014; Fe I–, II 323, III–, IV 331; Pa I–IV 101; Ti I–II 1018, III–IV 2026; Mt I 0004, II–III 1014, IV 3036. Measurements of palp and legs: palp 11.7 (3.2, 1.7, 2.3, –, 4.3); I 39.3 (9.8, 3.4, 10.6, 11.5, 3.8); II 46.8 (11.9, 4.8, 12.6,

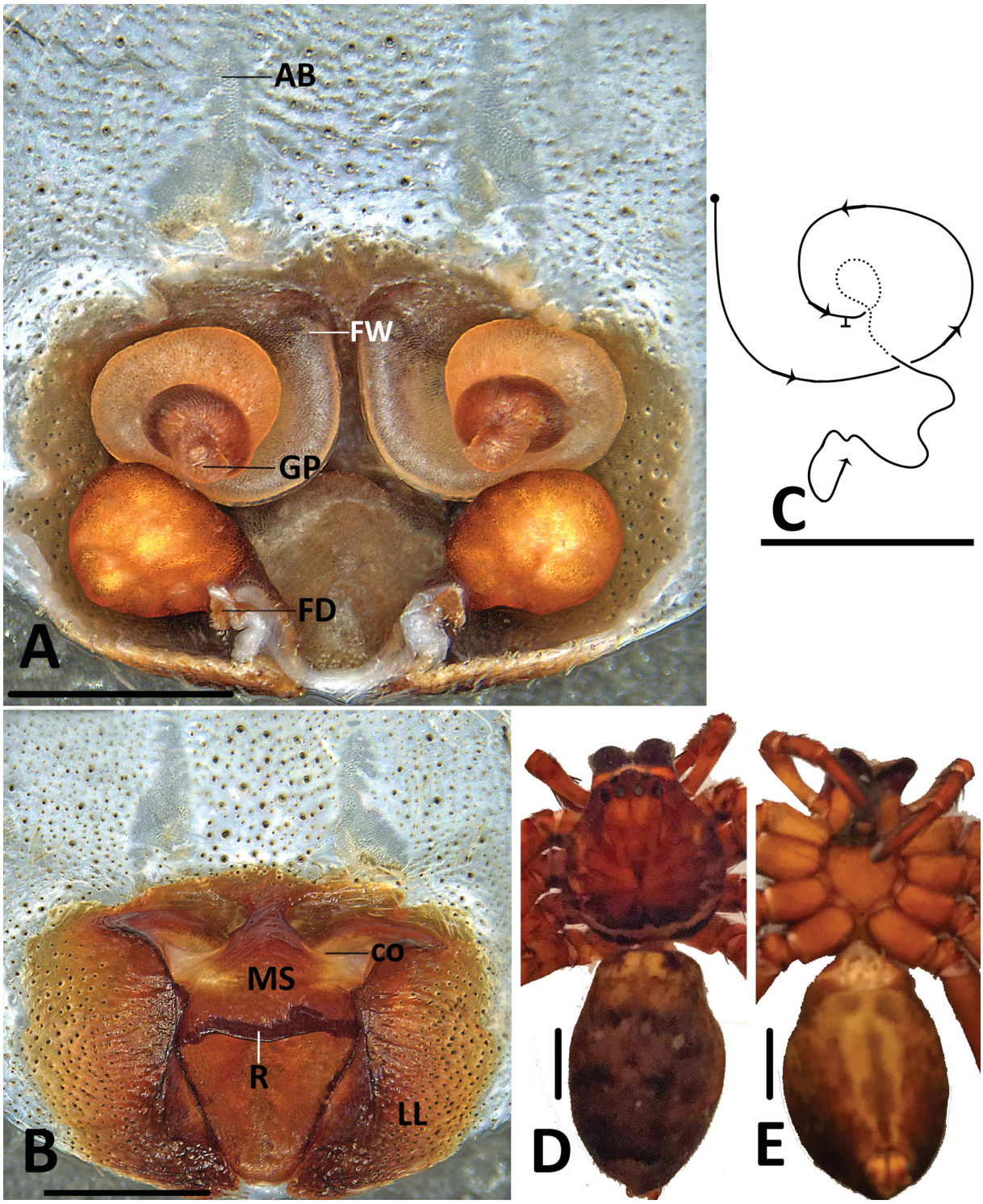

Fig. 3. *Heteropoda lucerna* sp. nov., holotype female from Daming Mountain, China (CBEE). **A**. Vulva, dorsal view. **B**. Epigyne, ventral view. **C**. Schematic course of internal duct system, dorsal view. **D**. Habitus, dorsal view. **E**. Habitus, ventral view. Abbreviations: AB = anterior bands; CO = copulatory opening; FD = fertilization duct; FW = first winding; GP = glandular pores; LL = lateral lobes; MS = median septum; R = transversal rim of median septum. Scale bars: A–C = 1 mm; D–E = 2 mm.

13.8, 3.5); III 33.1 (8.9, 3.7, 8.7, 8.9, 2.6); IV 36.8 (10.8, 3.4, 9.6, 10.3, 2.6). Leg formula: II–I–IV–III. Cheliceral furrow with 3 anterior, 4 posterior teeth and ca 38 intermarginal denticles.

Copulatory organ. As in diagnosis. Epigynal field wider than long, with short and basally wide anterior bands. Lateral lobes are widely separated from each other, and not covering the median septum. Fertilization ducts are separated about one width of posterior part of IDS (Fig. 3A–C).

Colouration in ethanol. Dorsal shield of prosoma reddish-brown to slightly yellowish-brown, with bright transversal crescent submarginally on posterior part, and longitudinal stripes covered by hairs around fovea. Chelicerae deep reddish-brown. Sternum, labium and gnathocoxae are yellowish-brown to reddish-brown. Opisthosoma dorsally yellowish-brown, with three pairs of six dots, and a dark-colored marking at posterior part; ventrally yellowish-brown, without obvious markings (Fig. 3D–E).

Distribution

China (Guangxi Zhuang Autonomous Region) (Fig. 4).

Fig. 4. Locality records for three new species of the genus *Heteropoda* Latreille, 1804; 1 = *H. curvata* sp. nov. (♂, Sabah); 2 = *H. flamma* sp. nov. (♂, Hainan); 3 = *H. lucerna* sp. nov. (♀, Guangxi Zhuang Autonomous Region).

Discussion

The discovery of *Heteropoda curvata* sp. nov., *H. flamma* sp. nov., and *H. lucerna* sp. nov. adds to the growing knowledge about the true diversity of the genus *Heteropoda* in East and Southeast Asia, particularly within the Chinese and Malaysian faunas (Fig. 4). These new species illustrate the morphological variation present within the genus, especially in the male palpal structures and female copulatory organs, which are crucial for species delimitation in *Heteropoda* (Figs 1–3). The special shapes of the RTA, the embolus, conductor and spermophor in males (Figs 1–2), along with the unique configuration of the internal duct system in females (Fig. 3), further support their recognition as separate species.

Our findings underscore the richness of poorly explored habitats such as Daming Mountain, Mount Trusmadi, and Hainan's mangroves (Fig. 4), which likely harbor additional undescribed species. These habitats have an exceptionally high biodiversity, complex microhabitats, and relatively limited historical sampling and are characterized by unique ecological conditions, including high humidity, dense vegetation, and structural complexity, which provide diverse niches that may foster speciation in large wandering spiders such as *Heteropoda*. Moreover, some of these areas remain underexplored in arachnological surveys, increasing the likelihood that many species have yet to be described. Their combination of ecological richness and sampling gaps makes them strong candidates for harboring an undescribed diversity of *Heteropoda*. So far only five species have been reported from these regions. Therefore, continued taxonomic surveys in these regions are essential for improving our understanding of regional arachnid biodiversity and biogeographic patterns. Moreover, the absence of known females for *H. curvata* sp. nov. and *H. flamma* sp. nov. emphasizes the need for further fieldwork to complete species profiles and to assess potential sexual dimorphism.

Overall, this study contributes to the taxonomic resolution within *Heteropoda* and highlights the importance of integrative morphological research in documenting spider diversity in Asia.

Acknowledgements

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