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## Plant Protection

 ISSN: 2617-1287 (Online), 2617-1279 (Print)  
<http://esciencepress.net/journals/PP>

### SIX *HETEROPODA* SPIDERS (ARANEAE: SPARASSIDAE) FROM XISHUANGBANNA DAI AUTONOMOUS PREFECTURE, CHINA

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#### ARTICLE INFO

##### Article history

*Received: 19<sup>th</sup> January, 2023*
*Revised: 31<sup>st</sup> March, 2023*
*Accepted: 2<sup>nd</sup> April, 2023*

##### Keywords

*Heteropoda biodiversity*
*New record*
*Taxonomy*
*Yunnan province*

#### ABSTRACT

Due to the fact that they catch and consume insect pests, cockroaches, and other domestic soft-bodied pests in crops, *Heteropoda* spiders are highly important predator in tropical and subtropical regions. As with other vagrant spiders, pantropical huntsman spiders do not use webs to capture prey. Their great speed and strong chelicerae (jaws) are used to capture the insects on which they feed. Venom is also injected into the prey from glands extending from the chelicerae into the cephalothorax. In this study, more than 227 individuals belonging to six *Heteropoda* spiders were collected from Xishuangbanna Dai Autonomous Prefecture and brought back to lab, and then stored in 75% ethanol. Among which 64 individuals were males and 163 individuals were females. A total of six known species of the genus *Heteropoda* are described: *Heteropoda dagmarae* Jäger and Vedel, 2005, *H. onoi* Jäger, 2008, *H. simplex* Jäger and Ono, 2000, *H. tetrica* Thorell, 1897, *H. venatoria* (Linnaeus, 1767) and *H. zuviele* Jäger, 2008. Our findings provide new record for *H. dagmarae* from China, adding more knowledge to *Heteropoda* species distribution in China, and may help to study the biogeography and dispersal route of *Heteropoda* species. Our results also provide a little information for the origin and evolution study of *Heteropoda* genus, because no author has published any molecular phylogenetic study on this genus. We also provide description, illustration, and distribution map for each species in the current paper.

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#### INTRODUCTION

Spiders are ancient and successful group of invertebrate animals (Singh and Borkotoki, 2014), and also called poisonous arthropods (Perveen and Jamal, 2012). Some scientists believed that origin of spider take place in sea, and later spider evolved in two groups, one without and second with extensor leg muscles. It is estimated that 400 million years ago spider originated. Spiders belong to class Arachnida, order Araneae and Phylum Arthropoda, and they vary in size, shape and behavior. They use the silk to wrap the prey, to hang from and to

make egg sacs and nests (Turnbull, 1973; Nyffeler and Benz, 1987). A single spider may produce more than a half dozen difference kinds of silk (Sharma et al., 2010). They exploit a wide variety of niches in virtually all the earth's biomes and highly species rich Arthropoda. Some species of spiders build webs and trap prey in webs whereas some are webless. Spiders are taxonomically diverse, indicators of environmental change and community level diversity, and shows variety of ecological niches (James, 2004). About 40 species of spiders are reported potentially deadly to humans,

however, *Heteropoda* species are not threat to humans. Spiders are voracious predators and carnivorous and play role as bio agent. Biological control is the most effective control measures against insect pests, and insect pests have successfully been controlled by using natural predators like spiders and beetles (Cave et al., 2004). Spiders are natural predators in agro ecosystems (Marc et al., 1999; Nyffeler and Sunderland, 2003; Pearce and Zalucki, 2006), and do not only preys on adult insects but also egg, larval and other stages of organism (Tahir et al., 2011). Spiders are also feeding on small arachnids, insects that bothers human like mosquitoes and cockroaches etc. During the lifetime of spiders, they may eat hundreds of mosquitoes and reduce their numbers (James, 2004). Spiders are clearly an integral part of global biodiversity since they play an important role in ecosystem as predators. They are one of the most common predator group of ecosystem, they are hunters of insects and other small invertebrates and reduced pest animals inside and outside our houses. They are prey for many hunting animals like insectivorous birds and reptiles most spider spend their entire life in one particular habitat because of their ability to produce silk (James, 2004).

Commonly known as huntsman spiders, the *Heteropoda* Latreille, 1804 is the first largest genus of the spiders belonging to the subfamily Heteropodinae. They are distributed on a large area in tropical and subtropical regions, and can be found living on leaf litter, under rocks, in caves, on tree barks and in old houses (Jäger and Yin, 2001). However, only fifteen species were reported from China, while 189 valid species have been reported from all around the world (World Spider Catalog, 2022). The male of *Heteropoda* can be diagnosed by the RTA (retrolateral tibial apophysis) arising from tibia, sheath-like conductor, and filiform embolus, while the female can be diagnosed by the typical spiral windings which are located in the female of the copulatory duct system (Jäger, 2002).

The Xishuangbanna Dai Autonomous Prefecture, as it is known officially, is located in southern Yunnan province of China, on the borders of Laos and Myanmar, belonging to Indo-Burma biodiversity hotspot (Liu et al., 2010; Myers, 1988). It is reported that the Xishuangbanna Dai autonomous prefecture is a mild, humid, and warm all year around. The annual average temperature is recorded from 18.6 to 22.9°C, while the annually precipitation was recorded from 1347.4 to 1916.8 mm (Gao et al., 2020). In

order to understand the biodiversity of *Heteropoda* spiders in China and to study their dispersal route at China and global level, our colleagues of Hubei University conducted a series of surveys on huntsman spiders and yielded several *Heteropoda* species in Dai Autonomous Prefecture of Xishuangbanna during the last ten years. We aim to study the distribution of *Heteropoda* species in China and to provide new or know insight to science, with this objective a total of six known *Heteropoda* species including one new record from China are reported in this study. We also discussed color variation for some species of *Heteropoda* in current paper such as *H. tetrica*. Our findings elaborate the distribution range for *Heteropoda* species and lay a foundation to study the biogeography and biodiversity of *Heteropoda* spiders. Our results strongly helpful to study the dispersal route for *Heteropoda* as Xishuangbanna Dai Autonomous Prefecture bordering to the Laos and Myanmar, and belonging to Indo-Burma biodiversity hotspot (Myers, 1988).

#### MATERIAL AND METHODS

We first stored the specimens in 75% ethanol and examined them using an Olympus SZX16 stereomicroscope. The male palp and female reproductive organ were dissected from the spider body, and examined and illustrated respectively. We used the Leica 205C stereomicroscope and Olympus BX51 equipped with a Micropublisher 3.3 RTV camera (QImaging, Surrey, BC, Canada) were used to taken habitus photos. We used an Olympus BX51 compound microscope for detailed investigation.

Species are listed in alphabetical order. Leg measurements are listed as: total length (femur, patella, tibia, metatarsus, tarsus); eye diameters as AME, ALE, PME, PLE and interdistances as AME-AME, AME ALE, PMEPME, PME-PLE, AME-PME, ALE-PLE. Palp and leg spination patterns follow those described for the genus Li et al. (2013). Coloration patterns are described based on specimens preserved in 70% ethanol. Positions of male tegular appendages are given according to clock positions, based on the left palp in ventral view. Female epigynes were dissected and immersed in Proteinase K for better visualization of internal structures. In schematic courses of female internal duct system, copulatory openings are marked with a circle, glandular appendages with a 'T', and the end of the fertilization duct in direction of uterus externus with an arrow. Geographic coordinates of

collection localities were obtained from the labels (given in parentheses) or from Google Earth (given in square brackets). Distribution maps were prepared using ArcGIS. All measurements were recorded in millimetres, and the used abbreviations in the text and figures are listed below:

#### Abbreviations used in the text

##### 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

PLE = posterior lateral eyes

PME = posterior median eyes

PL = prosoma length

PW = prosoma width

RTA = retrolateral tibial apophysis

vRTA = ventral part of RTA

I, II, III, IV–legs I to IV

##### Institutional acronyms

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

#### Taxonomy

**Family Sparassidae Bertkau, 1872**

**Subfamily Heteropodinae Thorell, 1873**

**Genus *Heteropoda* Latreille, 1804**

***Heteropoda dagmarae* Jäger and Vedal, 2005**

Figures 1–2, 13, 14

See World Spider Catalog Version 23.0 (2022) for detailed taxonomic history of this species.

##### Material examined

CHINA: Yunnan Province, 8 males & 24 females (CBEE), Xishuangbanna Dai Autonomous Prefecture, Mengla County, Menglun Town, Tropical Botanical Garden (21°55'41"N, 101°15'21"E, 550 m), 23 November 2019, J. Chen, J. Liu, Z.C. Li & B. Liang leg. (CBEE).

##### Description

We provided the illustration and field photos for this species (Figures 1A–C, 2A–B, 13A). For more details see Jäger and Vedal (2005).

##### Diagnosis

For details see Jäger and Vedal (2005).

#### Distribution

China (newly recorded, Figure 14), Laos, Thailand.

#### DISCUSSION

The long and sword-shaped apophysis located in the base of conductor and the broad RTA, without additional apophysis on its proximal part, the somewhat penta- to hexagonal median septum and diagonally running lateral lobes indicate our individuals should belong to *H. dagmarae* though we did not check the holotype.

Previously, this species was reported from Laos and Thailand by Jäger and Vedal (Jäger and Vedal, 2005). This is a new record from China. This species was recorded from Muang Sing as the type locality, which is situated about 83 km away from Xishuangbanna Tropical Botanical Garden, and would fit into the distribution range of this species, whereas Thailand would be improbable due to the large distance to other known localities. The individuals of this species were collected on the ground, leaf litter and tree bark in Tropical Botanical Garden, Xishuangbanna Dai Autonomous Prefecture.

##### *Heteropoda onoi* Jäger, 2008

Figures 2–4, 13, 14

See World Spider Catalog Version 23.0 (2022) for detailed taxonomic history of this species.

##### Material examined

CHINA: Yunnan Province, 2 males and 8 females (CBEE), Xishuangbanna Dai Autonomous Prefecture, Mengla County, Menglun Town, Buguo Village (21°36'59"N, 101°35'7"E, 812 m), 20 March 2013, Y. Zhong & F.X. Liu leg. (CBEE).

##### Description

We provide the illustration and field photos for this species (Figures 2A–C, 4A–B, 13C–D). For more details see Jäger (2008).

##### Diagnosis

For details see Jäger (2008).

##### Distribution

China (Figure 14), Vietnam.

#### Discussion

The presence of basal apophysis of conductor, the embolus apophysis at the basement of embolus and the somewhat small anchor-shaped median septum and plane of first winding running orthogonal to body length axis indicate our individuals should belong to *H. onoi* though we did not check the holotype.

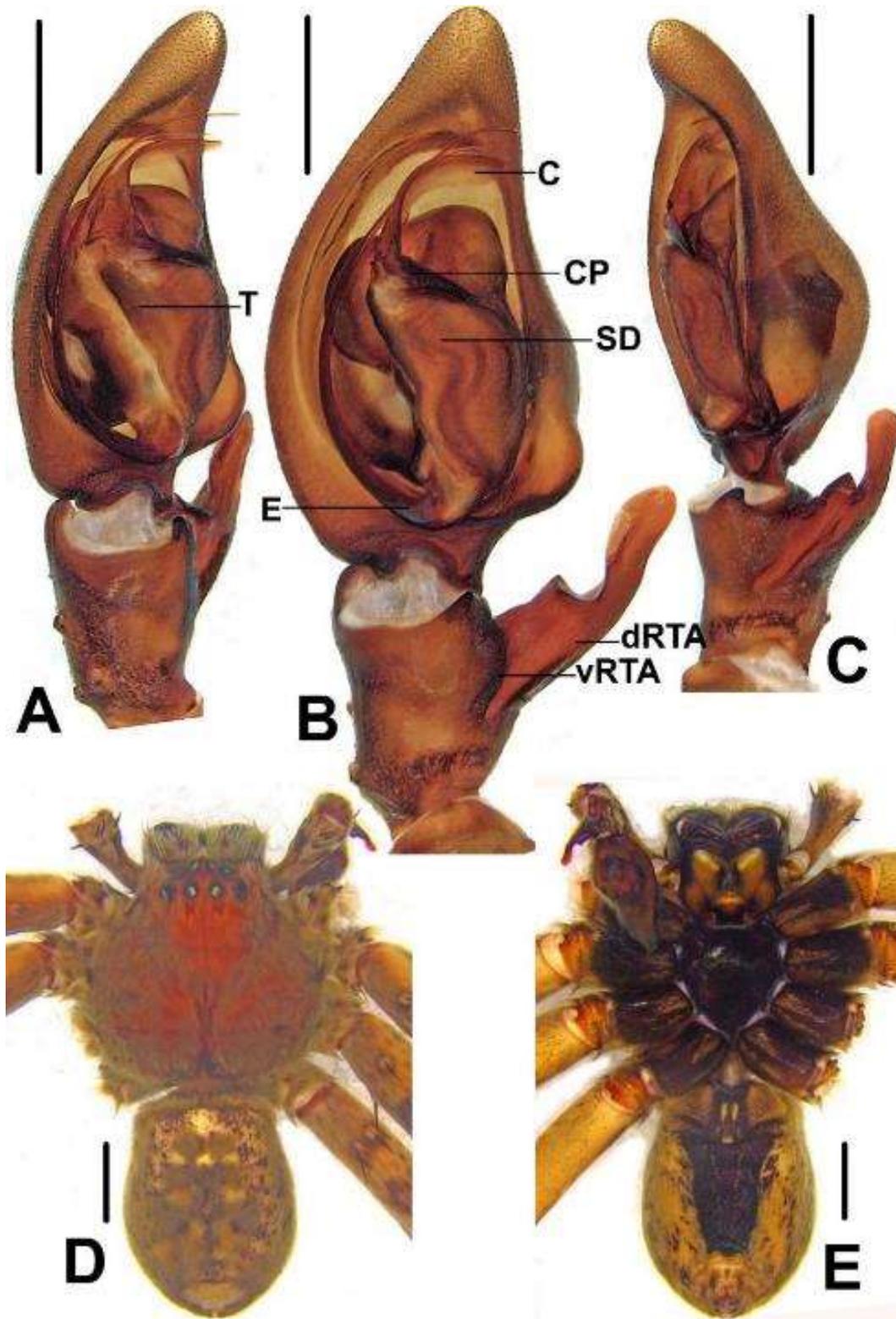


Figure 1: *Heteropoda dagmarae* Jäger and Vedel, 2005, male from Xishuangbanna Dai Autonomous Prefecture. A–C left male palp (A prolateral, B ventral, C retrolateral); D–E male habitus (D dorsal, E ventral). Abbreviations: C, conductor; dRTA, dorsal part of retrolateral tibial apophysis; E, embolus; SD, sperm duct; vRTA, ventral part of retrolateral tibial apophysis; T, tegulum; CP, conductor process. Scale bars: A–C 0.5 mm, D–E 2 mm.

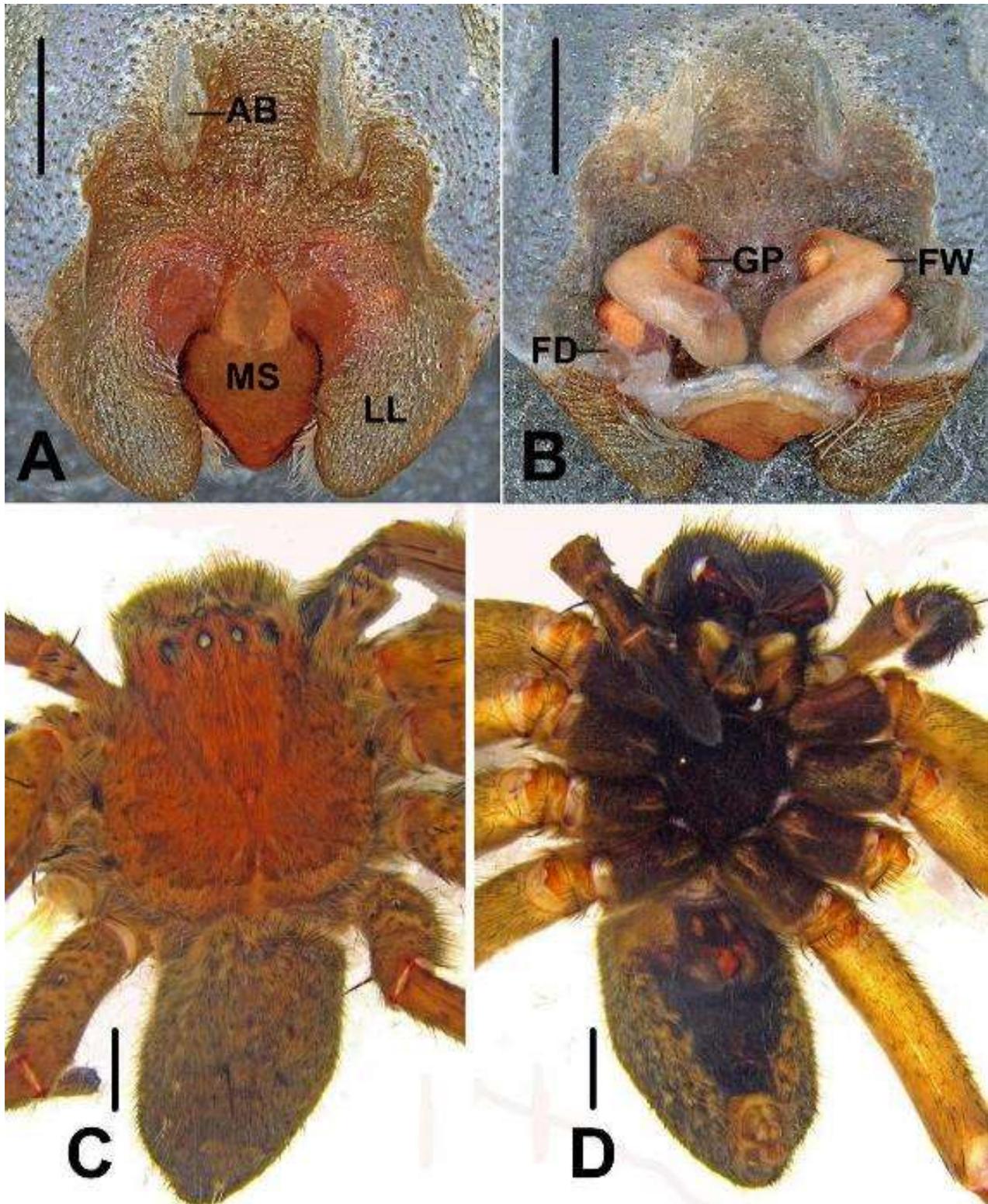


Figure 2: *Heteropoda dagmarae* Jäger and Vedel, 2005, female from Xishuangbanna Dai Autonomous Prefecture. A–B (A epigyne, ventral; B vulva, dorsal); C–D female habitus (C dorsal, D ventral). Abbreviations: AB, anterior bands; MS, median septum; LL, lateral lobes; FW, first winding; GP, glandular pores; FD, fertilization duct. Scale bars: A–B 0.5 mm, C–D 2 mm.

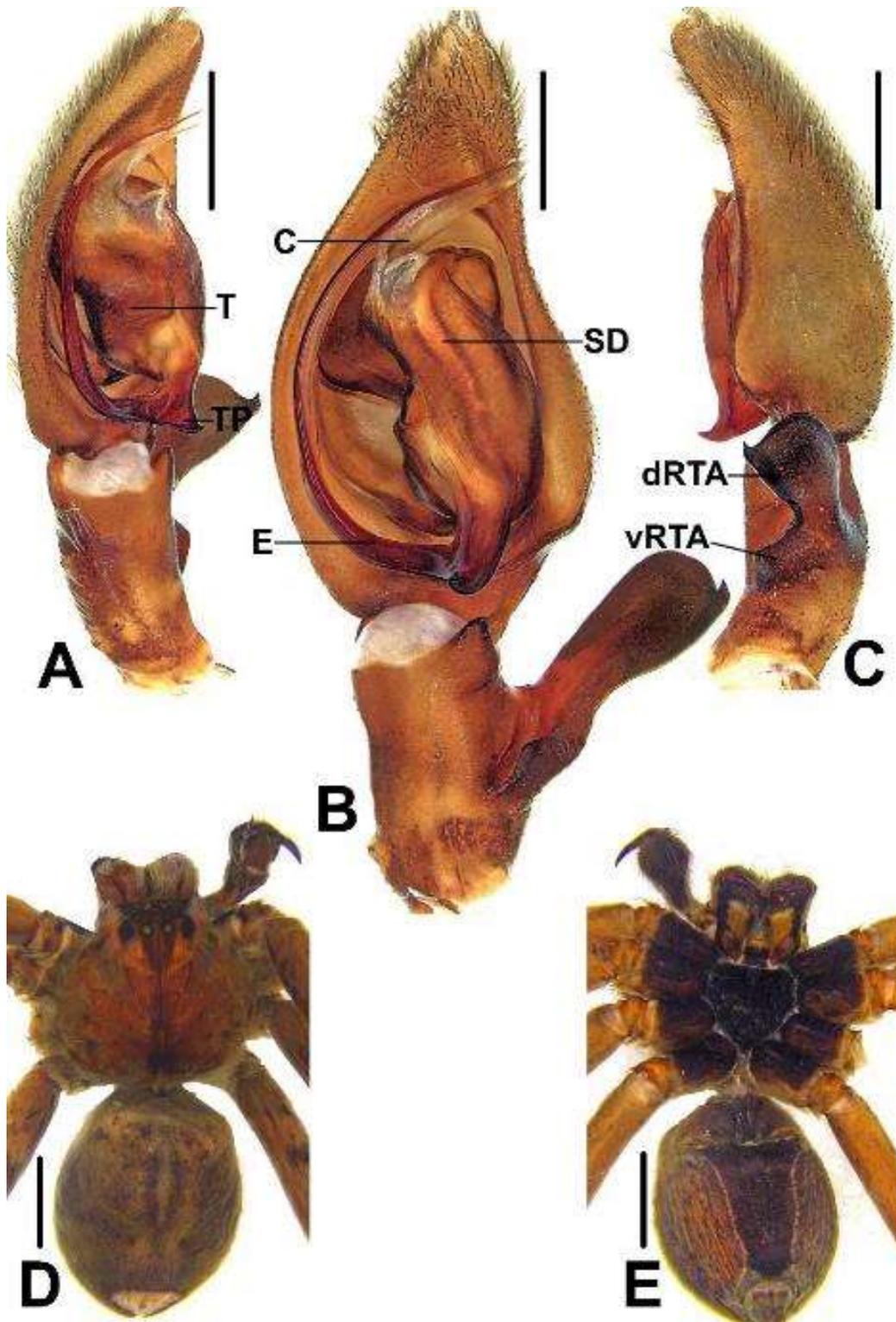


Figure 3: *Heteropoda onoi* Jäger, 2008, male from Xishuangbanna Dai Autonomous Prefecture. A–C left male palp (A prolateral, B ventral, C retrolateral); D–E male habitus (D dorsal, E ventral). Abbreviations: C, conductor; dRTA, dorsal part of retrolateral tibial apophysis; E, embolus; SD, sperm duct; vRTA, ventral part of retrolateral tibial apophysis; T, tegulum; TP, tegular process. Scale bars: A–C 0.5 mm, C–D 2 mm.

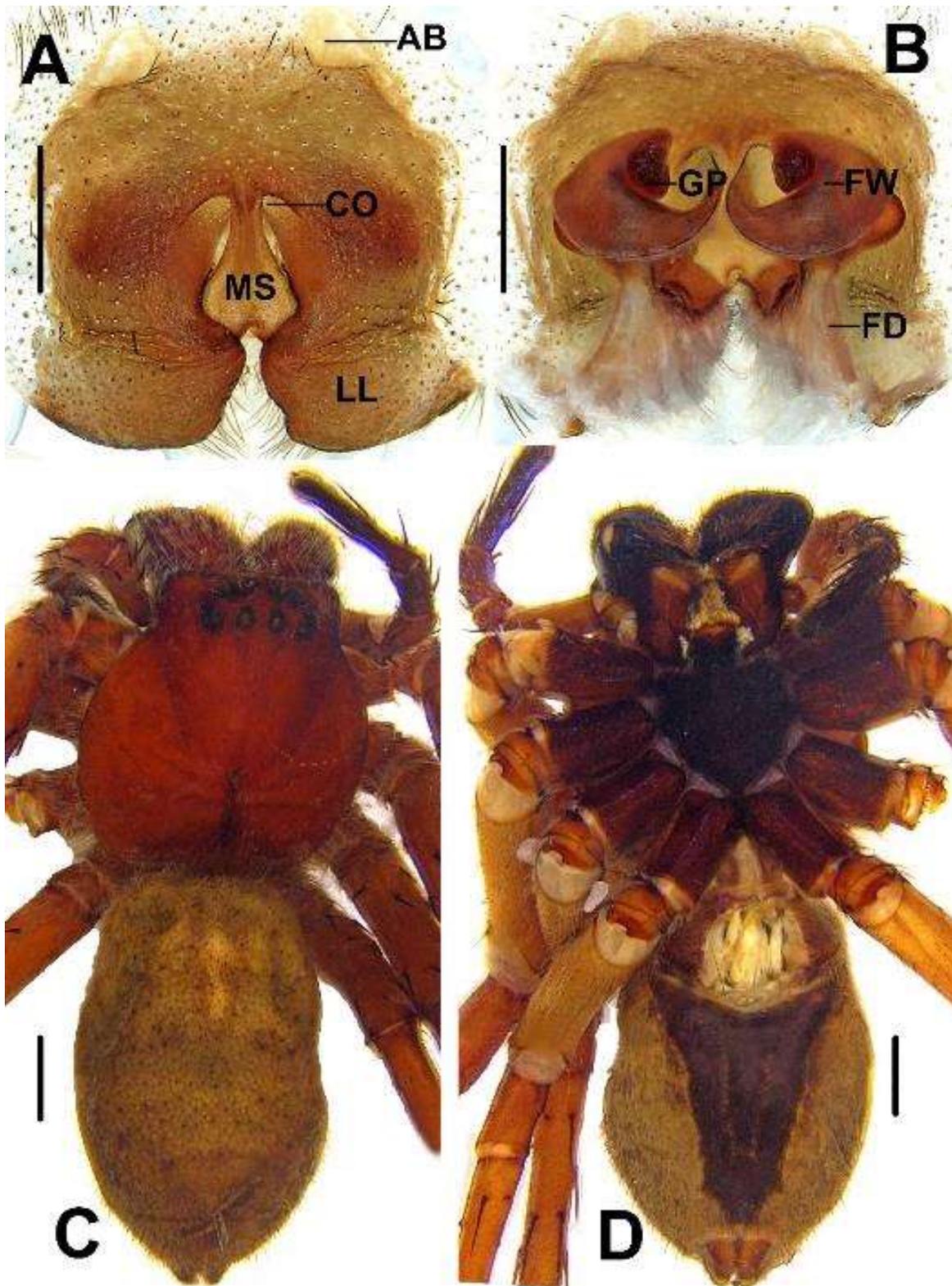


Figure 4: *Heteropoda onoi* Jäger, 2008, female from Xishuangbanna Dai Autonomous Prefecture. A-B (A epigyne, ventral; B vulva, dorsal); C-D female habitus (C dorsal, D ventral). Abbreviations: AB, anterior bands; CO, copulatory openings; MS, median septum; LL, lateral lobes; FW, first winding; GP, glandular pores; FD, fertilization duct. Scale bars: A-B 0.5 mm, C-D 2 mm.

**Coloration**

Generally greyish-beige, with bright hairs. Prosoma with distinct dark median band in ventral view. Opisthosoma with dark median band and off-white marking located at posterior part of abdomen in ventral view. Legs with distinct and large spine patches as compared to other specimens recorded from Vietnam. Previously, this species was reported from China (Hainan) and Vietnam (Thua Thien Hae) (Jäger, 2008; Zhang and Liu, 2014). This is the first record from Yunnan Province, China. The individuals of this species were collected on the ground, leaf litter and old houses in Xishuangbanna Dai Autonomous Prefecture.

***Heteropoda simplex* Jäger and Ono, 2000**

Figures 5–6, 13, 14

See World Spider Catalog Version 23.0 (2022) for detailed taxonomic history of this species.

**Material examined**

CHINA: Yunnan Province, 4 males and 1 female (CBEE), Xishuangbanna Dai Autonomous Prefecture, Mengla County, Menglun Town, Tropical Botanical Garden (21°55'41"N, 101°15'21"E, 550 m), 22–23 November 2019, J. Chen, J. Liu, B. Liang, Z.C. Li leg. (CBEE).

**Description**

We provide the illustration and field photos for this species (Figures 5A–C, 6A–B, 13B). For more details see Bayer and Jäger (2009).

**Diagnosis**

For details see Bayer and Jäger (2009).

**Distribution**

China (Figure 14), Laos, Japan.

**DISCUSSION**

The special RTA with long dRTA and tiny vRTA in the palp, the long and sabre-like conductor, the elongated and wide median septum, and both glandular pores and spermatheca (significantly anterior part smaller than the posterior part) indicate our individuals should belong to *H. simplex* though we did not check the holotype. Previously, this species was reported from Laos, Taiwan and Japan (Jäger and Ono, 2000; Ono, 2009; Bayer and Jäger, 2009). It is a new record from Yunnan Province, China. This species has a wide range of distribution. The individuals collected from Xishuangbanna Tropical Botanical Garden seem to have longer anterior bands as reported in the specimens from Japan and eastern part of Laos (Figure 6A–B). The

male pedipalp varies barely in the shape, but distinct differences were observed in size. The anterior part of the internal duct system barely or not covering the posterior part as shown in the specimens recorded from Laos (Bayer and Jäger, 2009). For more details see Bayer and Jäger (2009). The individuals of this species were collected on the ground, leaf litter and tree bark in Tropical Botanical Garden, Xishuangbanna Dai Autonomous Prefecture.

***Heteropoda tetrica* Thorell, 1897**

Figures 7–8, 12, 14

See World Spider Catalog Version 23.0 (2022) for detailed taxonomic history of this species.

**Material examined**

CHINA: Yunnan Province, 43 males and 81 females (CBEE), Xishuangbanna Dai Autonomous Prefecture, Mengla County, Menglun Town, Tropical Botanical Garden (21°55'41"N, 101°15'21"E, 550 m), 22–25 November 2020, J. Chen, J. Liu, B. Liang, Z.C. Li, Y. Zhong, L. Yu, F.X. Liu and Y. Zhu leg. (CBEE); 2 females (CBEE), Xishuangbanna Dai Autonomous Prefecture, Jinghong County, Menglong Town, Qiumalangbang Village, Dalu Mountain (22°41'4"N, 100°33'55"E, 1340 m), 1 August 2020, R. Zhong, Z.C. Li, Z.W. Deng, W. Zhang and Y.T. Zhang leg. (CBEE); 5 females (CBEE), Xishuangbanna Dai Autonomous Prefecture, Menghai County, Mingsong Township, Central Primary School (21°27'38"N, 100°33'35"E, 1070 m), 27 July 2020, R. Zhong, Z.C. Li, Z.W. Deng, W. Zhang and Y.T. Zhang leg. (CBEE); 1 female (CBEE), Xishuangbanna Dai Autonomous Prefecture, Mengla County, Xiangming Yi Township, Anle Village, Kongming Mountain (22°5'30"N, 101°11'31"E, 1410 m), 9 August 2020, R. Zhong, Z.C. Li, Z.W. Deng, W. Zhang and Y.T. Zhang leg. (CBEE); 5 females (CBEE), Xishuangbanna Dai Autonomous Prefecture, Mengla County, Menglun Town, Buguo Village (21°58'55"N, 100°28'38"E, 1340 m), 26 July 2020, R. Zhong, Z.C. Li, Z.W. Deng, W. Zhang and Y.T. Zhang leg. (CBEE).

**Description**

We provided the illustration and field photos for this species (Figures 7A–C, 8A–B, 12A–G). For more details see Eusemann and Jäger (2009).

**Diagnosis**

For details see Eusemann and Jäger (2009).

**Distribution**

China (Figure 14), Indonesia.

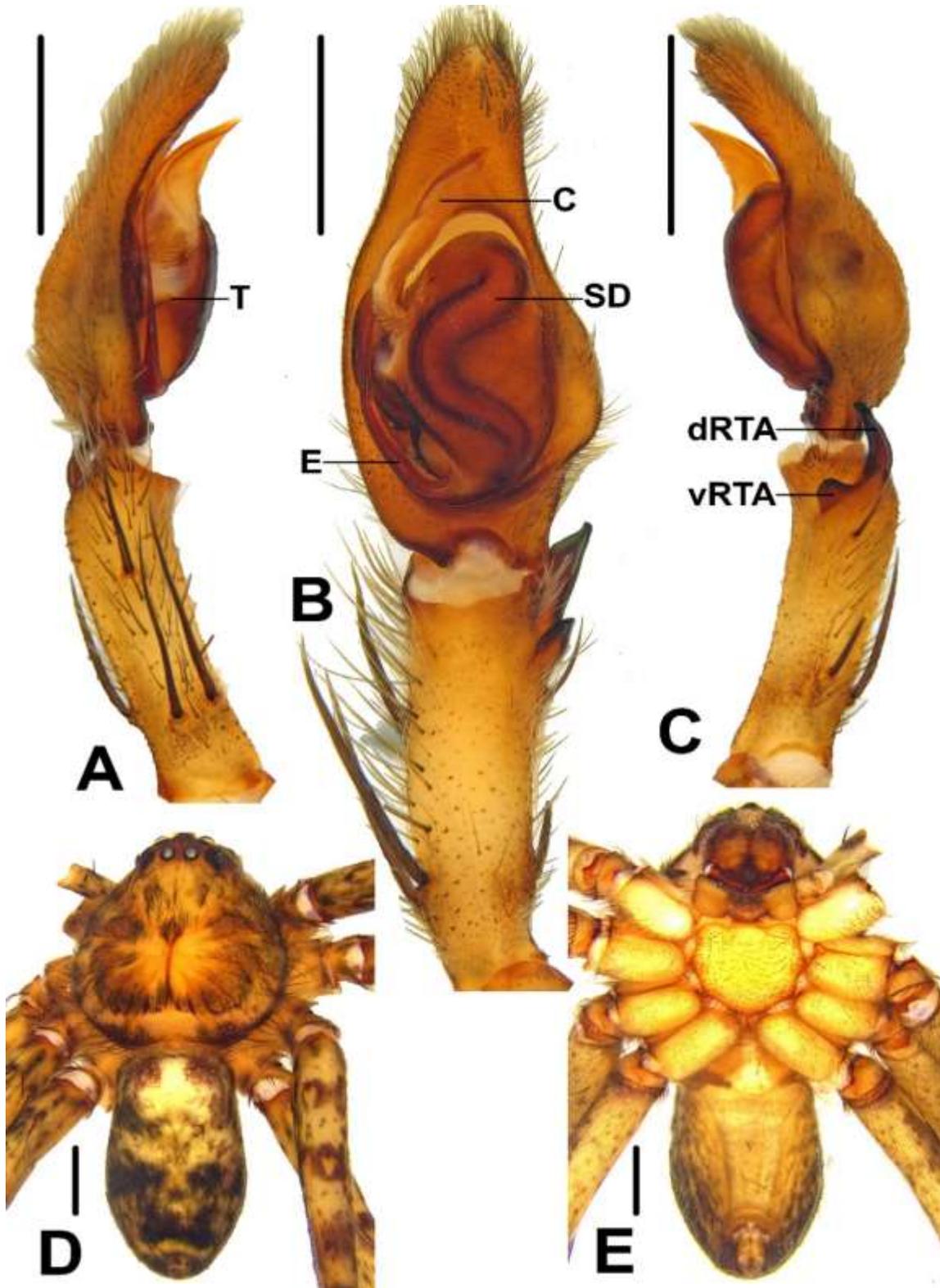


Figure 5: *Heteropoda simplex* Jäger and Ono, 2000, male from Xishuangbanna Dai Autonomous Prefecture. A–C left male palp (A prolateral, B ventral, C retrolateral); D–E male habitus (D dorsal, E ventral). Abbreviations: C, conductor; dRTA, dorsal part of retrolateral tibial apophysis; E, embolus; SD, sperm duct; vRTA, ventral part of retrolateral tibial apophysis; T, tegulum. Scale bars: A–C 0.5 mm, D–E 2 mm.

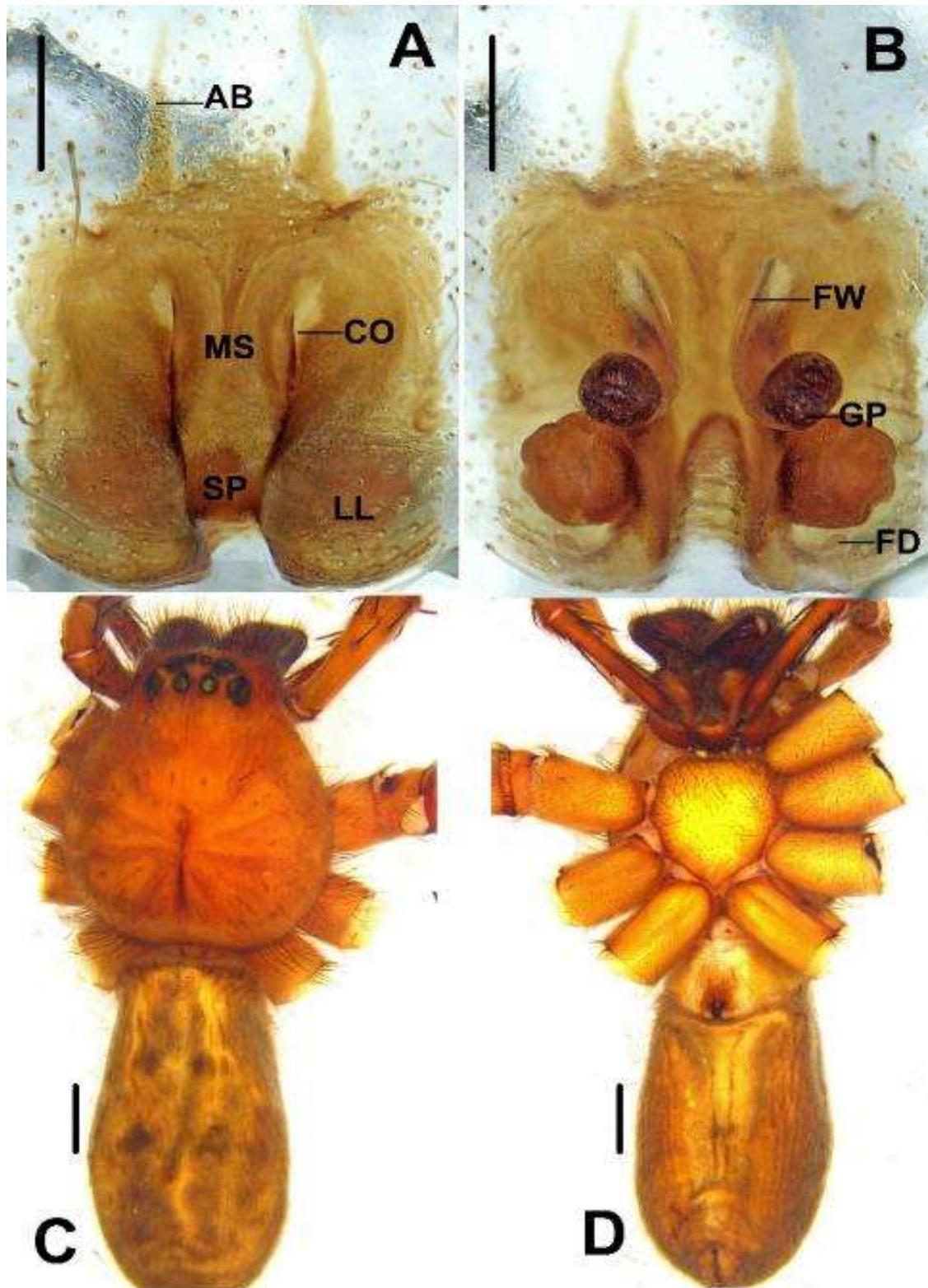


Figure 6: *Heteropoda simplex* Jäger and Ono, 2000, female from Xishuangbanna Dai Autonomous Prefecture. A-B (A epigyne, ventral; B vulva, dorsal); C-D female habitus (C dorsal, D ventral). Abbreviations: AB, anterior bands; CO, copulatory openings; MS, median septum; LL, lateral lobes; SP, septal pocket; FW, first winding; GP, glandular pores; FD, fertilization duct. Scale bars: A-B 0.5 mm, C-D 2 mm.

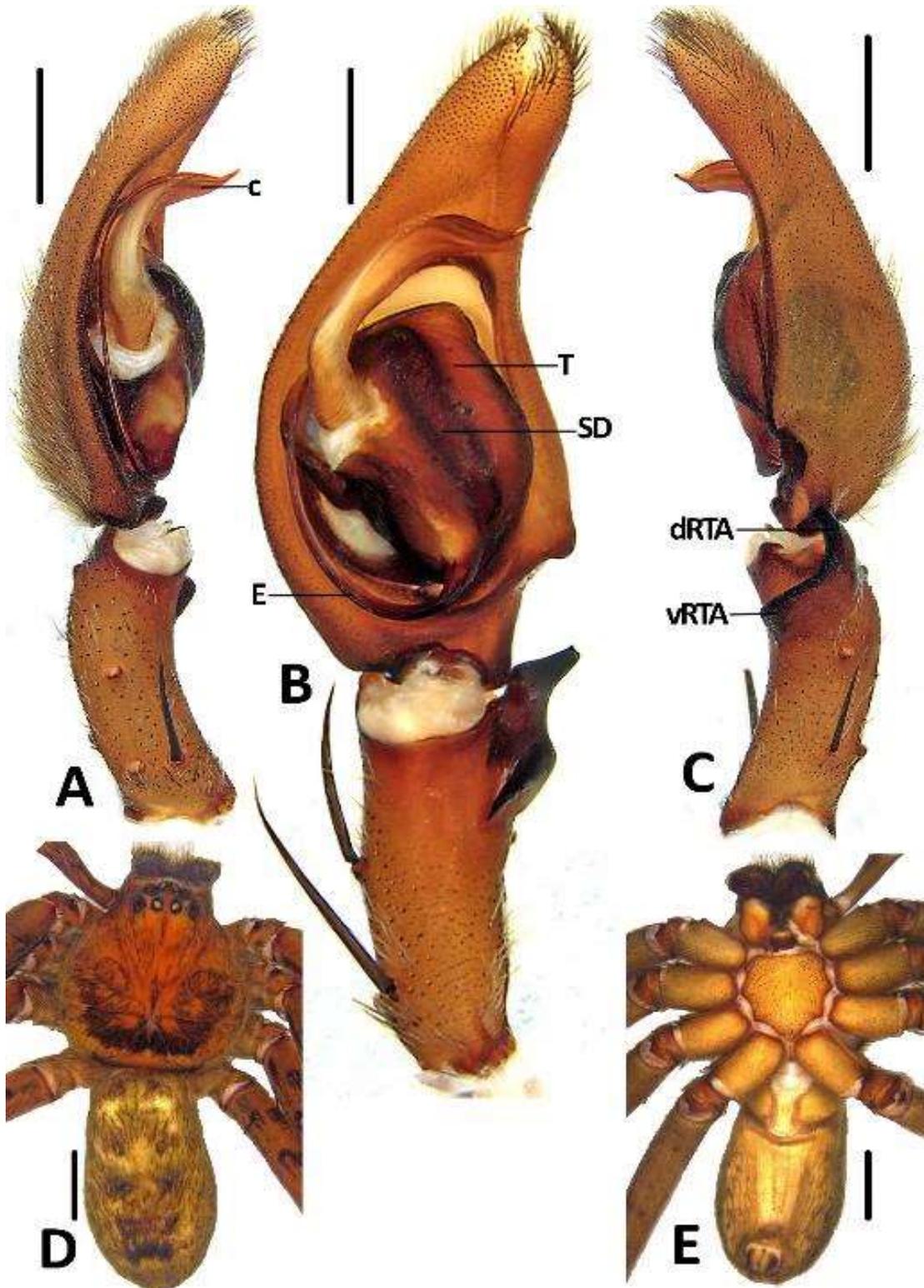


Figure 7: *Heteropoda tetrica* Thorell, 1897, male from Xishuangbanna Dai Autonomous Prefecture. A-C left male palp (A prolateral, B ventral, C retrolateral); D-E male habitus (D dorsal, E ventral). Abbreviations: C, conductor; dRTA, dorsal part of retrolateral tibial apophysis; E, embolus; SD, sperm duct; vRTA, ventral part of retrolateral tibial apophysis; T, tegulum. Scale bars: A-C 0.5 mm, D-E 2 mm.

**DISCUSSION**

The special RTA with club-shaped dRTA and wide vRTA in the palp, the S-shaped conductor and the lateral lobes almost covering median septum, just showing anterior part only, copulatory openings located antero-laterally, the anterior part of vulva with three coils and the straight sperm duct in the female genital indicate our individuals should belong to *H. tetrica* though we did not check the syntype.

**Coloration**

Generally female reddish-brown to black and greyish-beige, without as such obvious markings, marbled in some individuals (Figure 12A–C). Male generally reddish-brown to yellowish beige, with black and brown markings (Figure 12D–G). Opisthosoma with black and brown-band markings located around the fovea. Two parallel, elongated black and brown markings located at posterior eyes (Figure 12D–F). Light transversal band located at posterior-abdomen, but not always distinct. The individuals of this species were collected on the ground, mountains, leaf litter, tree bark and old houses in Xishuangbanna Dai Autonomous Prefecture.

***Heteropoda venatoria* (Linnaeus, 1767)**

Figures 9–10, 13, 14

See World Spider Catalog Version 23.0 (2022) for detailed taxonomic history of this species.

**Material examined**

CHINA: Yunnan Province, 7 males and 17 females (CBEE), Xishuangbanna Dai Autonomous Prefecture, Mengla County, Menglun Town, Tropical Botanical Garden (21°55'41"N, 101°15'21"E, 550 m), 22–23 November 2019, J. Liu, Z.C. Li & B. Liang leg. (CBEE).

**Description**

We provided the illustration and field photos for this species (Figures 9A–C, 10A–B, 13E). Jäger (2014).

**Diagnosis**

For details see Jäger (2014).

**Distribution**

China (Figure 14), Tropical Asia, North to South and Central America, Europe and Africa.

**DISCUSSION**

The two teeth-like projections on the dRTA, the lateral lobes touching each other along the median line showing only very anterior and posterior part of median septum and the twisted glandular pores situated postero-laterally to first windings indicate our individuals should

belong to *H. venatoria* though we did not check the syntype. This species has a wide range of distribution and has been reported from six continents, including Asia, Africa, Europe, Oceania, and South and North America. It is widely distributed in Tropical Asia, especially in Southeast and Southern Asia (World Spider Catalog, 2022). The individuals of this species were collected on the ground, leaf litter and old houses from Tropical Botanical Garden, Xishuangbanna Dai Autonomous Prefecture.

***Heteropoda zuviele* Jäger, 2008**

Figures 11, 14

See World Spider Catalog Version 23.0 (2022) for detailed taxonomic history of this species.

**Material examined**

CHINA: Yunnan Province, 19 females (CBEE), Xishuangbanna Dai Autonomous Prefecture, Mengla County, Menglun Town, Bubang Village (21°55'05"N, 101°16'27"E, 587 m), 6 November 2015, Collector unknown. (CBEE).

**Description**

We provided the illustration for this species (Figure 11A–B). For more details see Jäger (2008d).

**Diagnosis**

For details see Jäger (2008b).

**Distribution**

China (Figure 14), Vietnam.

**DISCUSSION**

The elongated, roughly triangular median septum and the posterior part of the internal duct system completely covered by the first winding indicate our individuals should belong to *H. zuviele* though we did not check the holotype. Previously, this species was reported from Vietnam (Tonkin) and Taiwan (Jäger, 2008). This is the first record from Yunnan Province, China. The individuals of this species were collected on the ground, leaf litter and tree bark in Xishuangbanna Dai Autonomous Prefecture.

**ACKNOWLEDGEMENTS**

This study was financially supported by CAS Key Laboratory of Tropical Forest Ecology, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences (19CAS-TFE-3) and the National Natural Sciences Foundation of China (NSFC-31573236/31273268/31772420).

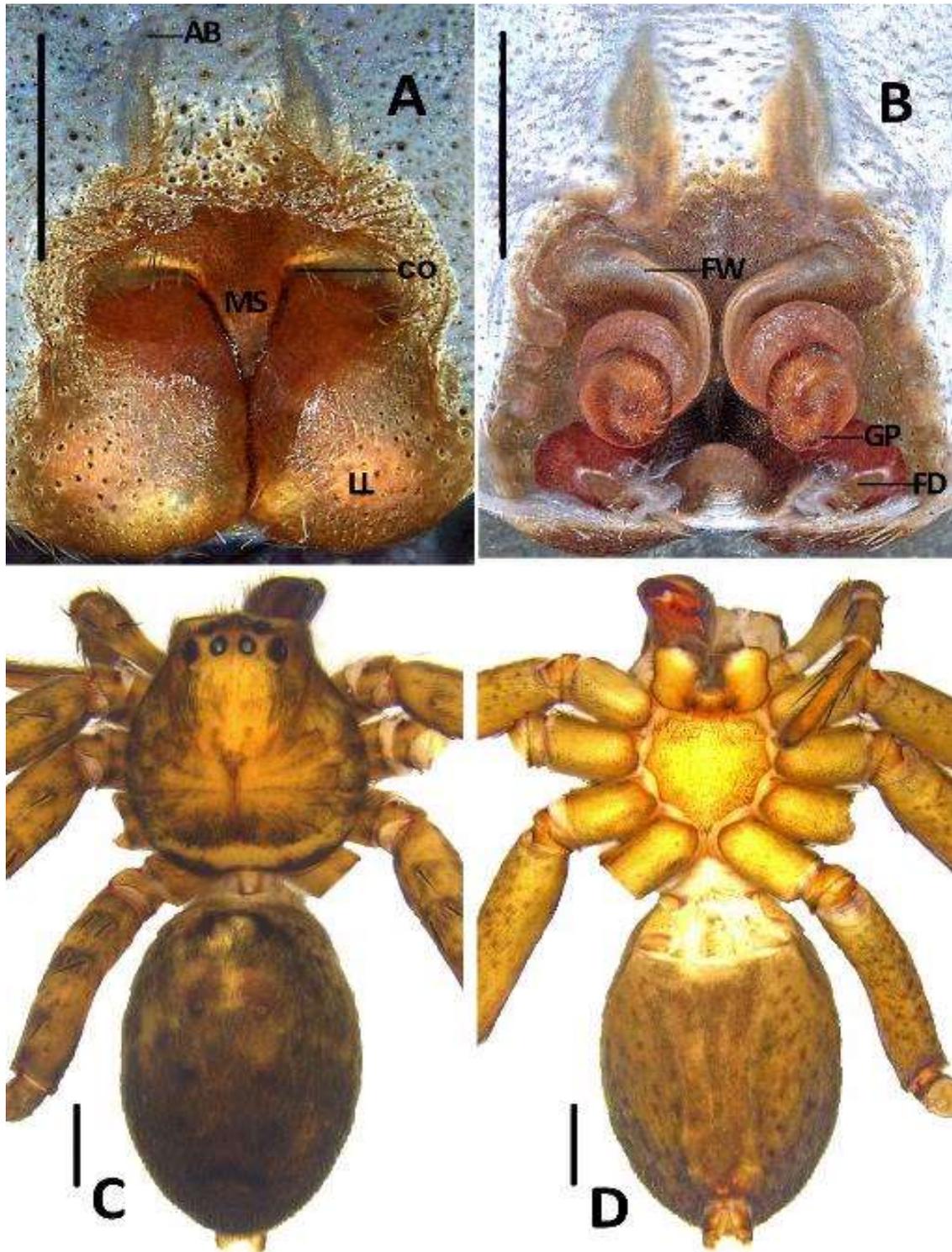


Figure 8: *Heteropoda tetrica* Thorell, 1897, female from Xishuangbanna Dai Autonomous Prefecture. A–B (A epigyne, ventral; B vulva, dorsal); C–D female habitus (C dorsal, D ventral). Abbreviations: AB, anterior bands; CO, copulatory openings; MS, median septum; LL, lateral lobes; FW, first winding; GP, glandular pores; FD, fertilization duct. Scale bars: A–B 0.5 mm, C–D 2 mm.

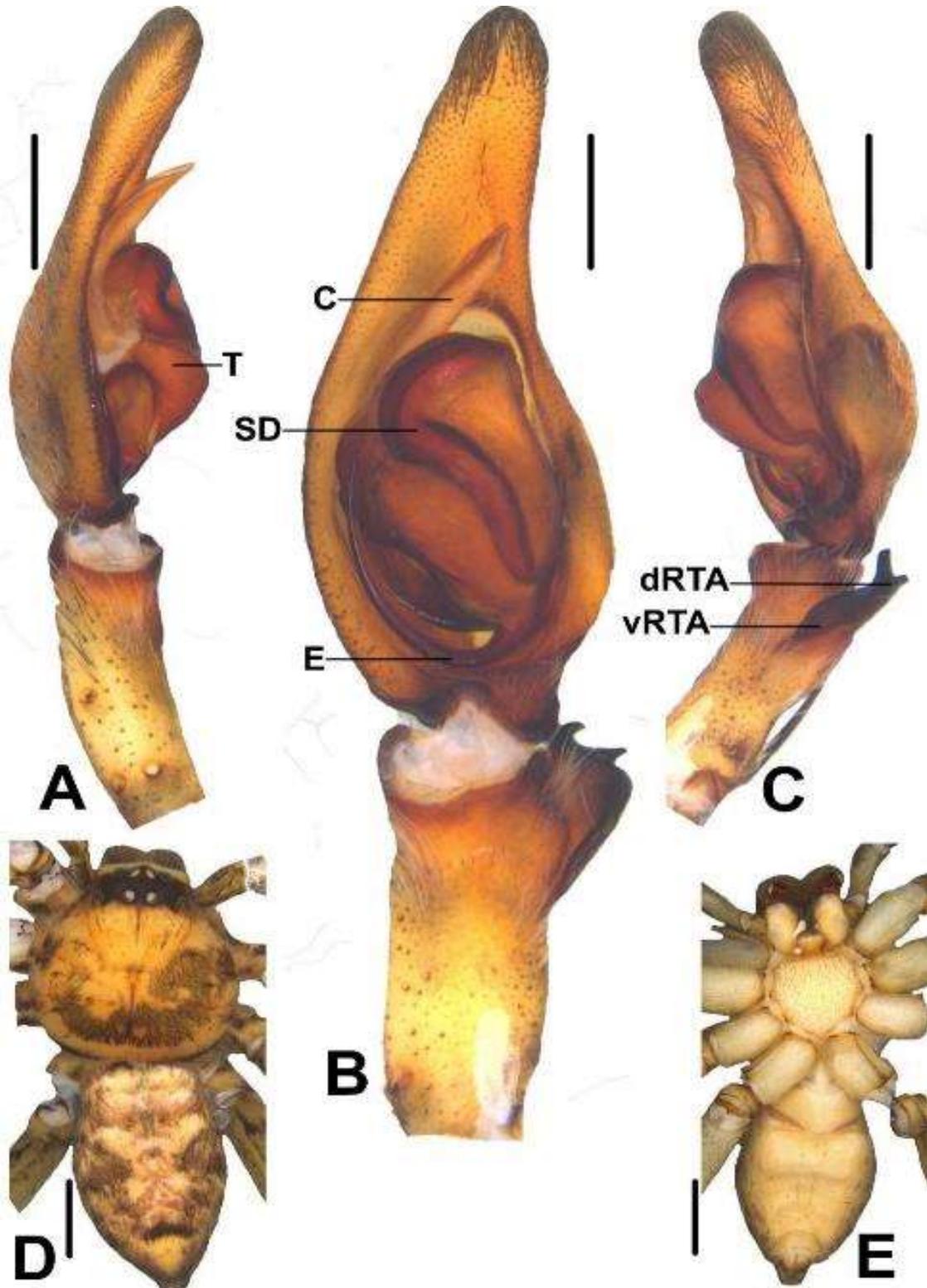


Figure 9: *Heteropoda venatoria* Linnaeus, 1767, male from Xishuangbanna Dai Autonomous Prefecture. A-C left male palp (A prolateral, B ventral, C retrolateral); D-E male habitus (D dorsal, E ventral). Abbreviations: C, conductor; dRTA, dorsal part of retrolateral tibial apophysis; E, embolus; SD, sperm duct; vRTA, ventral part of retrolateral tibial apophysis; T, tegulum. Scale bars: A-C 0.5 mm, D-E 2 mm.

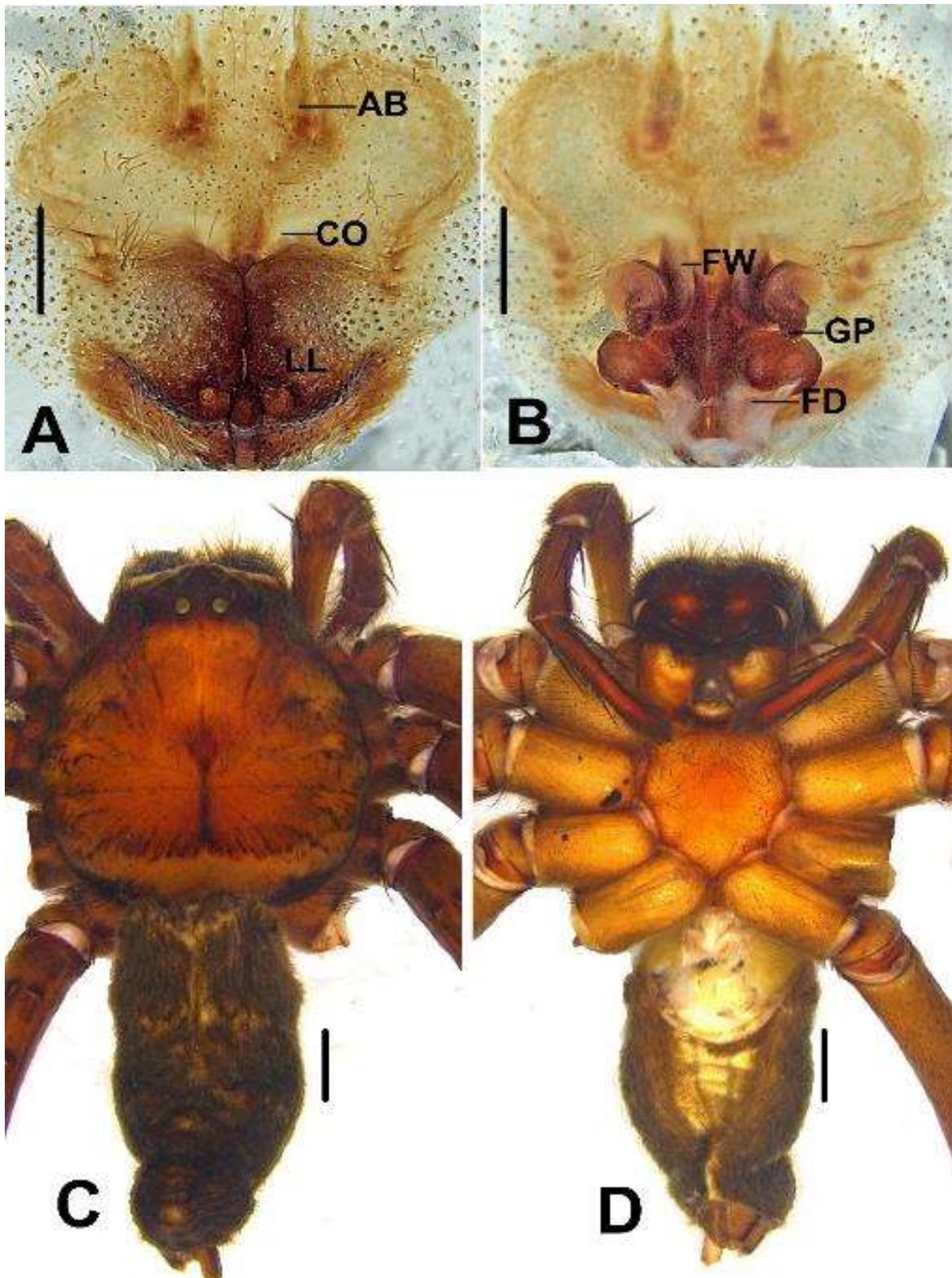


Figure 10: *Heteropoda venatoria* Linnaeus, 1767, female from Xishuangbanna Dai Autonomous Prefecture. A-B (A epigyne, ventral; B vulva, dorsal); C-D female habitus (C dorsal, D ventral). Abbreviations: AB, anterior bands; CO, copulatory openings; MS, median septum; LL, lateral lobes; FW, first winding; GP, glandular pores; FD, fertilization duct. Scale bars: A-B 0.5 mm, C-D 2 mm.

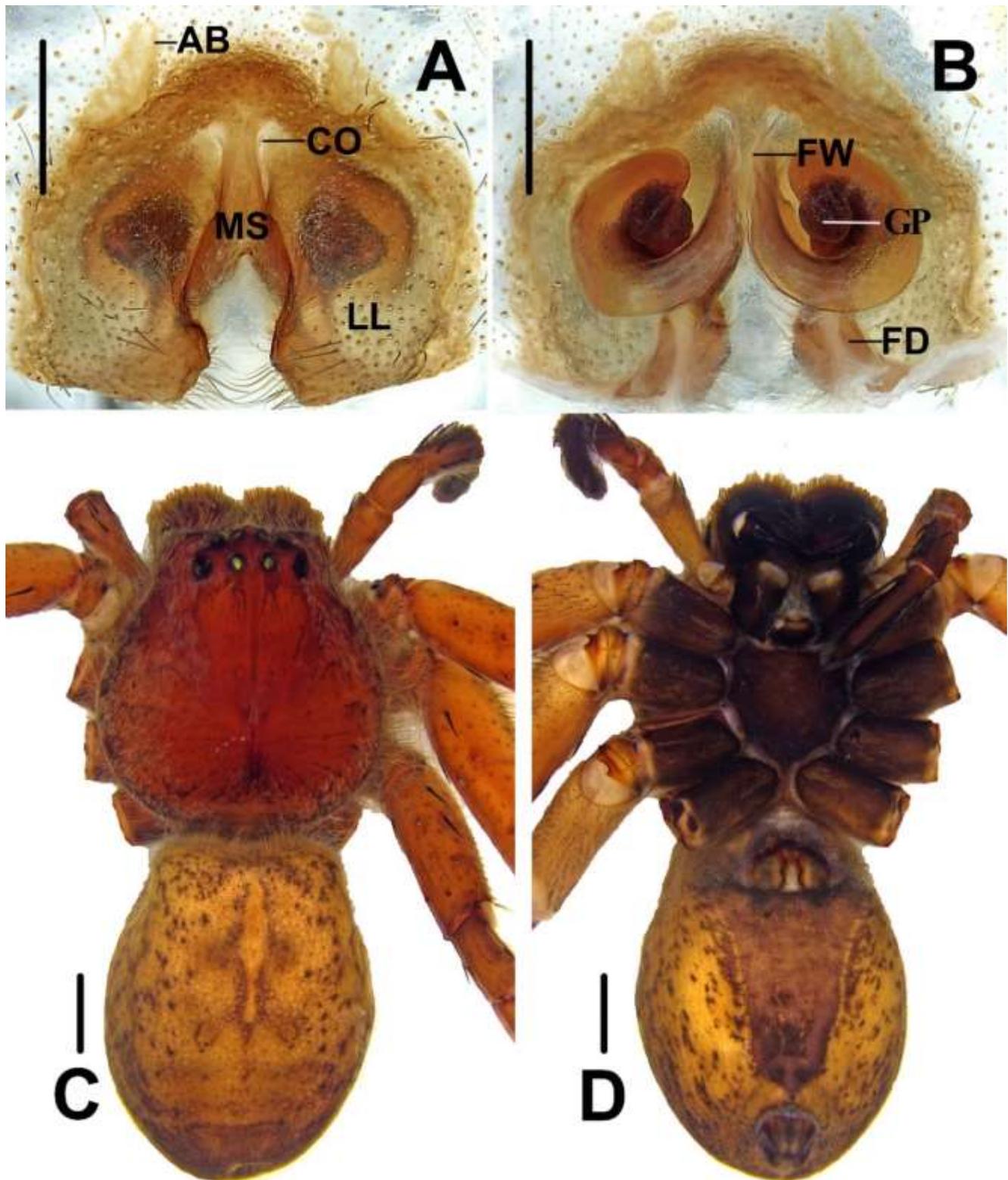


Figure 11: *Heteropoda zuviela* Jäger, 2008, female from Xishuangbanna Dai Autonomous Prefecture. A-B (A epigyne, ventral; B vulva, dorsal); C-D female habitus (C dorsal, D ventral). Abbreviations: AB, anterior bands; CO, copulatory openings; MS, median septum; LL, lateral lobes; FW, first winding; GP, glandular pores; FD, fertilization duct. Scale bars: A-B 0.5 mm, C-D 2 mm.

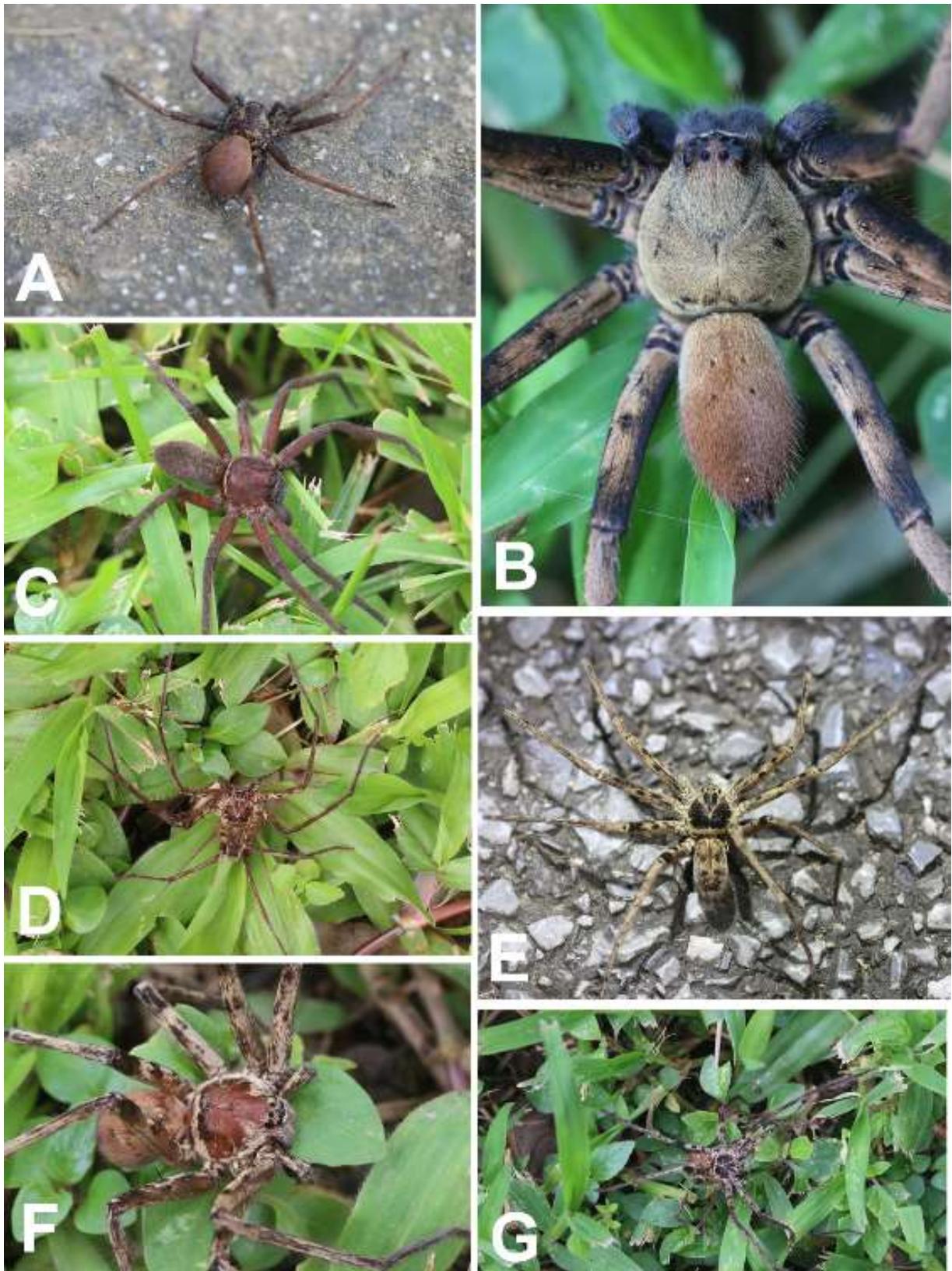


Figure 12: *H. tetrica* Thorell, 1897 from Xishuangbanna Dai Autonomous Prefecture, Tropical Botanical Garden, Yunnan, China. Habitus: female (A-C); male (D-G), photos by Liang Bing.

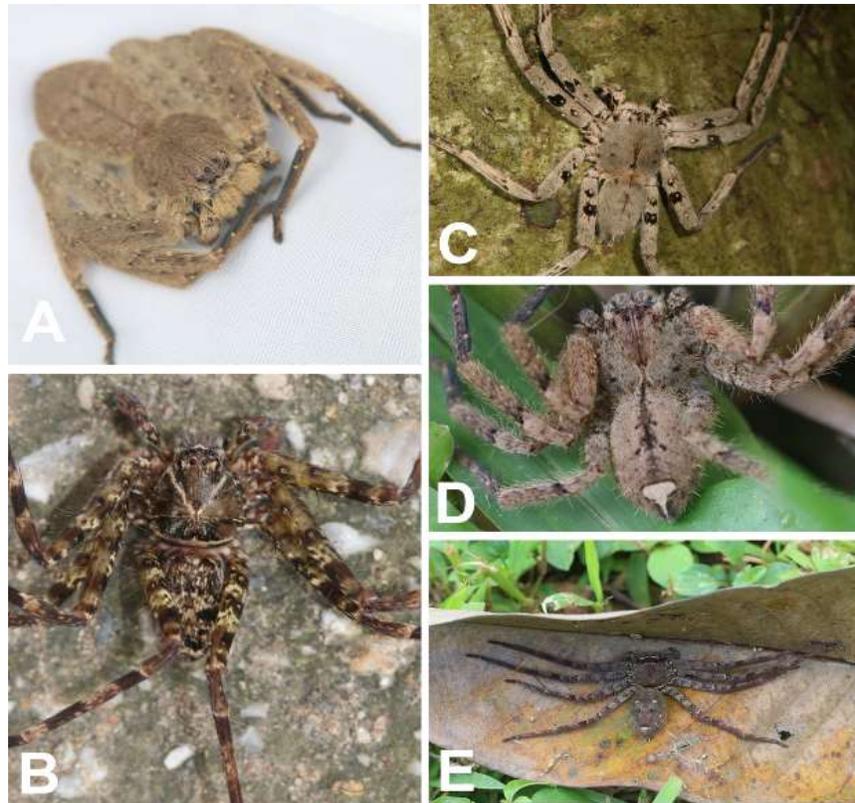


Figure 13: *H. dagmarae* Jäger and Vedel, 2005 habitus: female (A); *H. simplex* Jäger and Ono, 2000 habitus: male (B); *H. onoi* Jäger, 2008. Habitus: male (C); female (D); *H. venatoria* (Linnaeus, 1767). Habitus: female (E) from Xishuangbanna Dai Autonomous Prefecture, Tropical Botanical Garden, Yunnan, China, photos by Liang Bing.

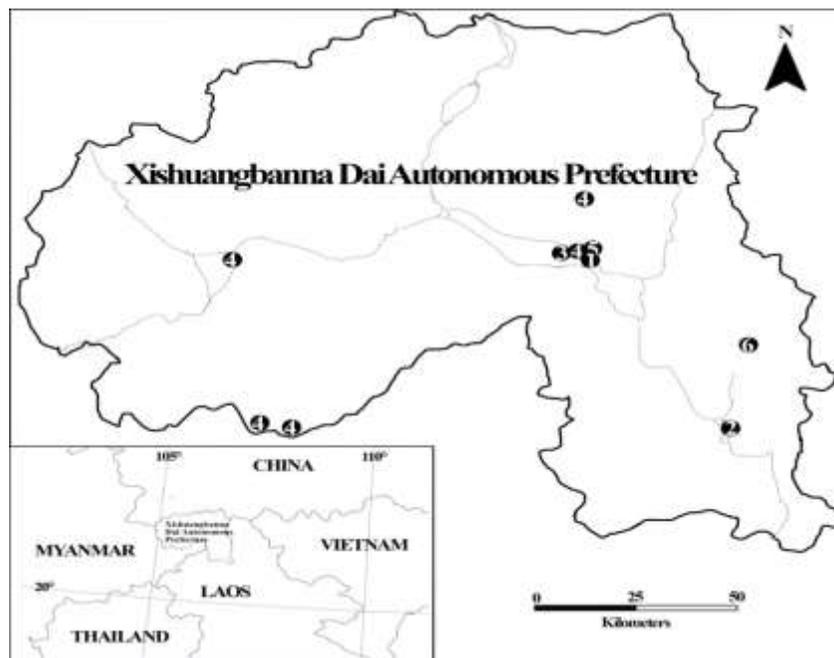


Figure 14: Locality records for six species of *Heteropoda* from Xishuangbanna Dai Autonomous Prefecture: 1. *H. dagmarae* Jäger and Vedel, 2005; 2. *H. onoi* Jäger, 2008; 3. *H. simplex* Jäger and Ono, 2000; 3. *H. tetrica* Thorell, 1897; 5. *H. venatoria* (Linnaeus, 1767); 6. *H. zuvielle* Jäger, 2008.

**AUTHORS' CONTRIBUTION**

SKK design the experiments, illustration, and prepared the initial manuscript draft. KW wrote the methodology, revised and finalized the manuscript draft.

**CONFLICTS OF INTEREST**

The authors declare no conflict of interest.

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