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A survey of Sumatran Ctenidae (Araneae). 2. Three new species of *Bowie* Jäger, 2022

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Abstract

Three new species, *Bowie beruang* **sp. nov.**, *B. binturong* **sp. nov.**, and *B. dhole* **sp. nov.**, are described from Sumatra (Indonesia). Each species description is based on both sexes. Detailed descriptions, digital photographs and a distributional map are provided.

Key words: Aranei, biodiversity, Sunda Islands, taxonomy, tropical wolf spiders

Introduction

The family Ctenidae Keyserling, 1877, commonly known as tropical wolf spiders or wandering spiders, currently contains 593 species from 48 genera worldwide (World Spider Catalog 2023). Ctenid spiders are distributed mainly in tropical and subtropical areas and lead a nocturnal lifestyle as free hunters, not using webs for catching their prey. The diversity of Sumatran ctenids is currently far from being studied in detail. This work constitutes the second in a series of our articles dedicated to the ctenids of this huge island. The first paper focuses on the spiders of the genus *Acantheis* Thorell, 1891 (Fomichev *et. al*. in press).

Bowie Jäger, 2022, with 112 species (World Spider Catalog 2023), is the second-largest genus of Ctenidae, after *Ctenus* Walckenaer, 1805. The genus was established by Jäger (2022) to accommodate species with males having fused palpal patellar crack, single *RTA*, non-filiform embolus and without palpal patellar apophyses. Females of the *Bowie* have two vulval folds covering copulatory ducts (see full diagnosis of the genus in Jäger 2022). *Bowie* is distributed almost exclusively in Indo-Malayan and Australasian Realms, with the only exception of *B. corniger* (F.O. Pickard-Cambridge) known from South Africa (World Spider Catalog 2023). However, such disjunction may be result of misinformation from the original label or human introduction (Jäger 2022). Most species (82) occur in Southeast Asia, 22 occur in South (India, Sri Lanka, Nepal) and seven in East Asia (China, Japan, Taiwan). One undescribed species is known from Northern Australia (Jäger 2022).

There are no regional revisions on this genus. Before Jäger's (2022) revision, data about Chinese and Indian *Bowie* species (sub *Ctenus*) were scattered across several papers (Bastawade & Borkar 2008; Chu *et al*. 2022a; Sankaran & Sebastian 2018; Tikader & Malhotra 1981). One Taiwanese species now included in *Bowie* (*B. yaeyamensis* (Yoshida)) was redescribed in detail by Marusik & Omelko (2016). In the same paper, the male of *Bowie yassassin* Jäger was depicted under the name *B. yaeyamensis* (Jäger 2022). Several species were described from Southeast Asia (Jäger & Minn 2015; Jäger 2012, Ono 2010; all sub *Ctenus*). The genus was globally revised recently by Jäger (2022), who described 55 species as new for science, transferred 49 species from *Ctenus* to *Bowie*, and arranged the majority of species into species groups. Soon after, another eight species from Malaysia, Vietnam and China were added to *Bowie* (Chu *et al*. 2022b; Lu *et al*. 2022). Thus, of the 112 species of *Bowie*, 63 species were originally described in the genus, and the remaining 49 were transferred from *Ctenus*.

The Sumatran diversity of *Bowie* is still poorly known. Of 19 species known from Indonesia, only 7 were

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recorded from this huge Island. While studying ctenids collected in Sumatra in 1988 by an unknown collector, we found three species belonging to *Bowie* that do not conform to any known species. The main goal of the present paper is to describe these new species.

Material and methods

Specimens were photographed using a Nikon DSRi2 camera attached to a Nikon SMZ25 stereomicroscope at the Far Eastern Federal University (Vladivostok, Russia) and an Olympus DP74 camera attached to an Olympus SZX16 stereomicroscope at the Altai State University (Barnaul, Russia). Photographs were taken in dishes filled with alcohol, with soft white paper or cotton at the bottom. Digital images were montaged using Zerene Stacker (https://zerenesystems.com/cms/stacker) software package. Epigynes were cleared in a boiling KOH/water solution. Distribution map was produced using SimpleMappr (Shorthouse 2010). All measurements are in millimeters. Length of leg segments were measured on the lateral side. Palp and leg spination is based on examination of one specimen of each species (one side of the body). Spination pattern is given in the following formula: the sum of all spines is listed for the dorsal, prolateral and retrolateral sides; ventral spines are counted including apical ones.

All examined material is deposited in the Zoological Museum of the Moscow State University, Moscow, Russia (ZMMU; curator K.G. Mikhailov), the Institute of Systematics and Ecology of Animals SB RAS, Novosibirsk, Russia (ISEA; curator G.N. Azarkina) and Far Eastern Federal University (FEFU; curator M.M. Omelko). Abbreviations used in text and the format of description follow Jäger (2022), with some modifications.

Abbreviations:

Eyes: ALE—anterior lateral eye, AME—anterior median eye, MOA—median ocular area, PLE—posterior lateral eye, PME—posterior median eye.

Leg segments: Fe—femur, Mt—metatarsus, Pa—patella, Ti—tibia, Tr—tarsus.

Spination: d—dorsal, p—prolateral, r—retrolateral, v—ventral.

Copulatory organs: *AW*—anterior width of *TA*, *C*—conductor, *CE*—cymbial extension, *CS*—cymbial spur, *EH*—embolus hook, *Em*—embolus, *FD*—fertilization duct, *LT*—lateral tooth, *MP*—median plate of epigyne, *PP*—prolateral part of embolic tip, *Pr*—median plate projection, *PW*—posterior width of *TA*, *RO*—retrolatero-proximal outgrowth, *RP*—retrolateral part of embolic tip, *RTA*—retrolateral tibial apophysis, *Sp*—spermatheca, *TA*—tegular apophysis, *TO*—tegular apophysis outgrowth, *VB*—ventrad bulge of embolus.

Taxonomy

Family Ctenidae Keyserling, 1877

Genus *Bowie* Jäger, 2022

Bowie beruang sp. nov.

(Figs 1–18, 55–57)

Type material. INDONESIA: *Sumatra*: Aceh Prov.: Holotype: ♂ (ZMMU) Ketambe Vil[lage]. [03°41′N, 97°39′E], 400–500 m, 1988 (precise date unknown), unknown collector. **Paratypes:** 3♂ 1♀ (ZMMU), 3♂ (ISEA) together with the holotype.

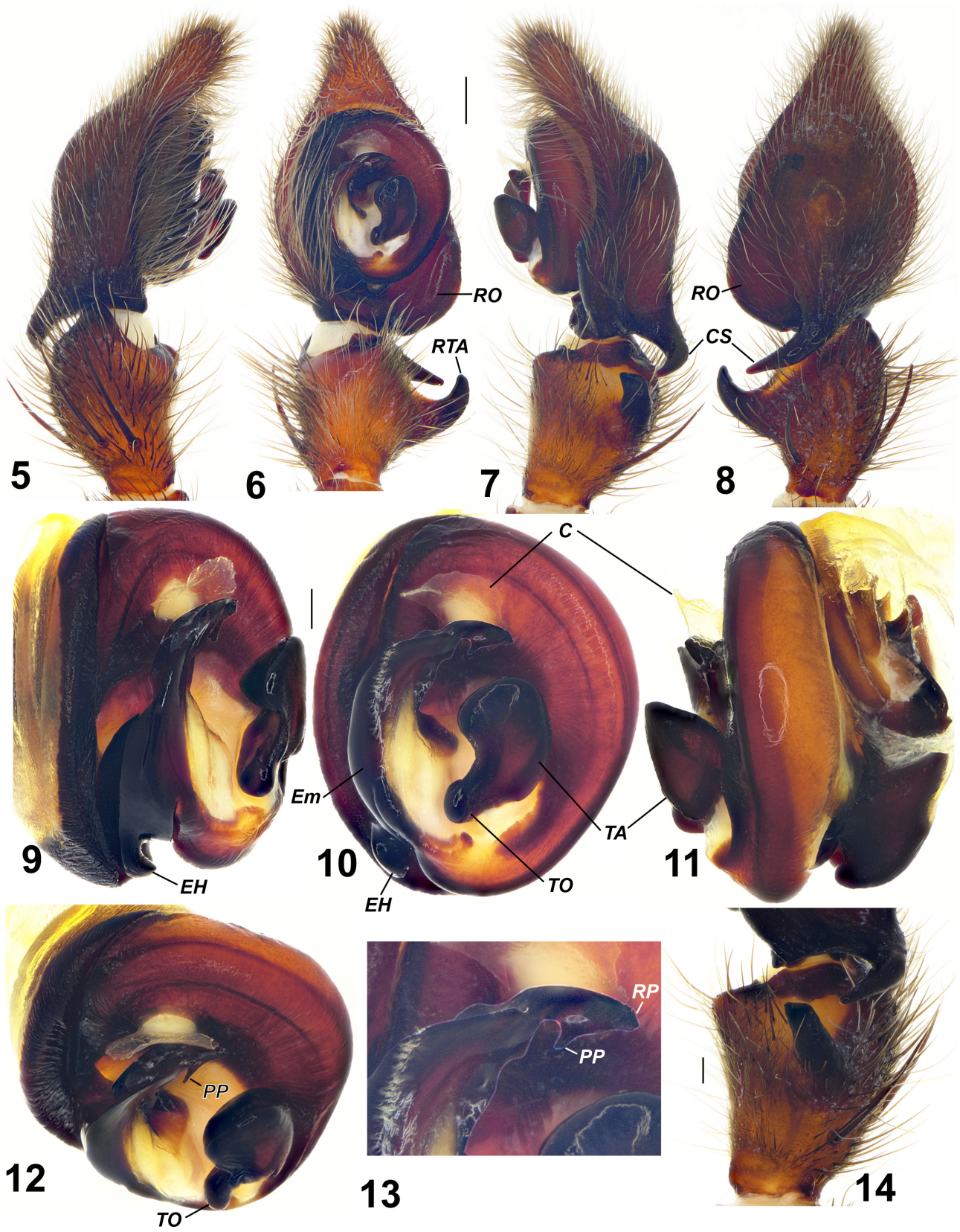
Etymology. The specific name is derived from the Indonesian name for the sun bear, “beruang” [*Helarctos malayanus* (Raffles)], reflecting the fact that the new species also occurs in the jungles of Sumatra Island.

Diagnosis. Males of *B. beruang* **sp. nov.** are similar to those of *B. argentipes* (van Hasselt), *B. angigitanus* (Roewer), *B. palembangensis* (Strand), *B. tonight* Jäger, 2022 and *B. dhole* **sp. nov.** in having a strong cymbial spur (*CS*) and a similar embolic tip with prolateral (*PP*) and retrolateral (*RP*) parts developed (Figs 12–13, 30–31). The new species can be distinguished from *B. argentipes* by 1) *RTA* long and strongly curved in ventral view (vs. short, slightly curved; cf. Fig. 6 and Jäger 2022: fig. 517); 2) cymbium with a large retrolatero-proximal outgrowth

(*RO*) (vs. small outgrowth; cf. Fig. 6 and Jäger 2022: fig. 517); 3) cymbial spur (*CS*) long and thin (vs. short and thick; cf. Fig. 7 and Jäger 2022: fig. 518); and 4) retrolateral part of embolus tip (*RP*) blunt (vs. sharply pointed; cf. Fig. 13 and Jäger 2022: figs 519, 522, 525). The new species differs from *B. angigitanus* by 1) cymbial spur pointed in ventral view (vs. abrupt; cf. Fig. 6 and Jäger 2022: fig. 542); and 2) tip of cymbial spur not reaching *RTA* in retrolateral view (vs. reaching *RTA*; cf. Fig. 14 and Jäger 2022: fig. 543). The new species can be differentiated from *B. palembangensis* by the pointed *RTA* (vs. slightly bifid; cf. Fig. 6 and Jäger 2012: fig. 171). It differs from *B. tonight* by cymbium with large retrolatero-proximal outgrowth (*RO*) (vs. small outgrowth; cf. Fig. 6 and Jäger 2022: figs 545–546). Lastly, it differs from *B. dhole* **sp. nov.** by 1) pointed *RTA* in dorsal view (vs. *RTA* bifurcated); 2) cymbium with large retrolatero-proximal outgrowth (*RO*) (vs. small outgowth); and 3) retrolateral part of embolic tip (*RP*) blunt (vs. sharp).

Species of the *argentipes*-group usually exhibit variable epigynes (cf. Jäger 2022: figs 527–541, 550–555). However, the epigyne of *B. beruang* **sp. nov.** is similar to that of *B. argentipes* and *B. tonight* in having the pronounced angular median plate projections (*Pr*) and simple kidney-shaped spermathecae (*Sp*). The new species can be distinguished from above-mentioned species only by the spermathecae sharply narrowed posteriorly (vs. spermathecae with nearly equal width throughout; cf. Fig. 17 and Jäger 2022: figs 537, 552).

FIGURES 1–4. *Bowie beruang* **sp. nov.**, male (1–2) and female (3–4) habitus. 1, 3—dorsal; 2, 4—ventral. Scale bars: 2 mm.



FIGURES 5–14. *Bowie beruang* **sp. nov.**, male palp (5–8), bulb (9–12), terminal part of embolus (13) and palpal tibia (14). 5, 9—prolateral; 6, 10, 13—ventral; 7, 11, 14—retrolateral; 8—dorsal; 12—anterior. Scale bars: 0.5 mm (5–8), 0.2 mm (9–14). Abbreviations: *C*—conductor, *CS*—cymbial spur, *EH*—embolus hook, *Em*—embolus, *PP*—prolateral part of embolic tip, *RO*—retrolatero-proximal outgrowth, *RP*—retrolateral part of embolic tip, *RTA*—retrolateral tibial apophysis, *TA*—tegular apophysis, *TO*—tegular apophysis outgrowth.

Description. *Male* (Figs 1–2, 37). Total length 18.0. Carapace 10.25 long, 7.7 wide. Opisthosoma 8.05 long, 5.05 wide. Carapace dark brown, almost black with broad, diamond-shaped, silver median band, and having two drop-shaped black spots in ocular area. Lateral bands absent. Fovea thin, black. Chelicerae dark brown, almost black, with two promarginal and four retromarginal teeth, denticles absent. Sternum light brown without pattern. Labium dark brown. Endites brown with yellow inner distal edge. Dorsal part of opisthosoma greenish gray with distinct yellowish serrated band covered with white setae. Ventral part of opisthosoma dark gray with yellowish spots forming two V-marks. Spinnerets yellowish, gray ectally.

Eye diameters: AME 0.45, ALE 0.30, PME 0.55, PLE 0.46; interdistances: AME–AME 0.19, AME–ALE 0.50, PME–PME 0.27, PME–PLE 0.46, AME–PME 0.10, ALE–PLE 0.23. Clypeus height at AME 0.29.

For palp and legs measurements see Table 1. Femora and patellae I–IV dark brown dorsally, light brown laterally and ventrally. Tibiae I–IV dark brown proximally and distally, light brown medially with silver setae. Metatarsi I–III brown, IV brown with silver setae. Tarsi I–IV brown. For palp and leg spination see Table 2.

TABLE 1. Palp and legs measurements of male of *Bowie beruang* **sp. nov.**

	Fe	Pa	Ti	Mt	Tr	Total
Palp	4.3	1.65	1.75	-	3.35	11.05
Leg I	8.65	3.9	8.8	8.25	2.7	32.3
Leg II	7.95	3.7	7.65	7.15	2.1	28.55
Leg III	6.6	3.2	5.35	6.05	1.9	23.1
Leg IV	8.95	3.3	8.1	10.7	2.45	33.5

TABLE 2. Palp and leg spination of male of *Bowie beruang* **sp. nov.**

	Fe	Pa	Ti	Mt
Palp	1p 5d 1r	1p	1p 2d	-
Leg I	3p 3d 4r	1p	1p 3d 2r + 5 paired v	3p 3r + 3 paired v
Leg II	4p 3d 4r	1p 1r	2p 3d 2r + 5 paired v	3p 3r + 3 paired v
Leg III	4p 3d 4r	1p 1r	2p 3d 2r + 3 paired v	4p 4r + 3 paired v
Leg IV	4p 3d 3r	1p 1r	2p 3d 2r + 3 paired v	6p 5r + 5 single and 1 paired v

Palp as shown in Figs 5–14. *RTA* long, strongly curved in ventral view. Cymbium with long, curved retro-dorsal spur (*CS*) with sharp tip and large retrolatero-proximal outgrowth (*RO*). Tegular apophysis (*TA*) large, with slightly curved prolatero-proximad outgrowth (*TO*). Conductor (*C*) large, membranous. Embolus (*Em*) with blunt retrolateral (*RP*) and long, sharp prolateral (*PP*) parts of its tip in ventral view and basal embolus hook (*EH*).

Female (Figs 3–4, 38). Total length 18.65. Carapace 9.1 long, 7.2 wide. Opisthosoma 9.5 long, 6.25 wide. Carapace dark brown (somewhat lighter than in males) with broad yellowish median band, diamond-shaped in ocular area. Lateral bands thin, divided into several stripes. Fovea thin, black. Chelicerae dark brown, almost black with one promarginal and four retromarginal teeth, denticles absent. Sternum light brown without pattern. Labium dark brown, almost black. Endites brown with yellow outer edge. Dorsal part of opisthosoma brown with distinct yellowish cardiac mark and a series of poorly visible gray spots. Ventral part of opisthosoma brown with yellowish spots forming two V-marks. Spinnerets light brown.

Eye diameters: AME 0.43, ALE 0.31, PME 0.47, PLE 0.44; interdistances: AME–AME 0.21, AME–ALE 0.61, PME–PME 0.30, PME–PLE 0.65, AME–PME 0.15, ALE–PLE 0.30. Clypeus height at AME 0.23.

TABLE 3. Palp and legs measurements of female of *Bowie beruang* **sp. nov.**

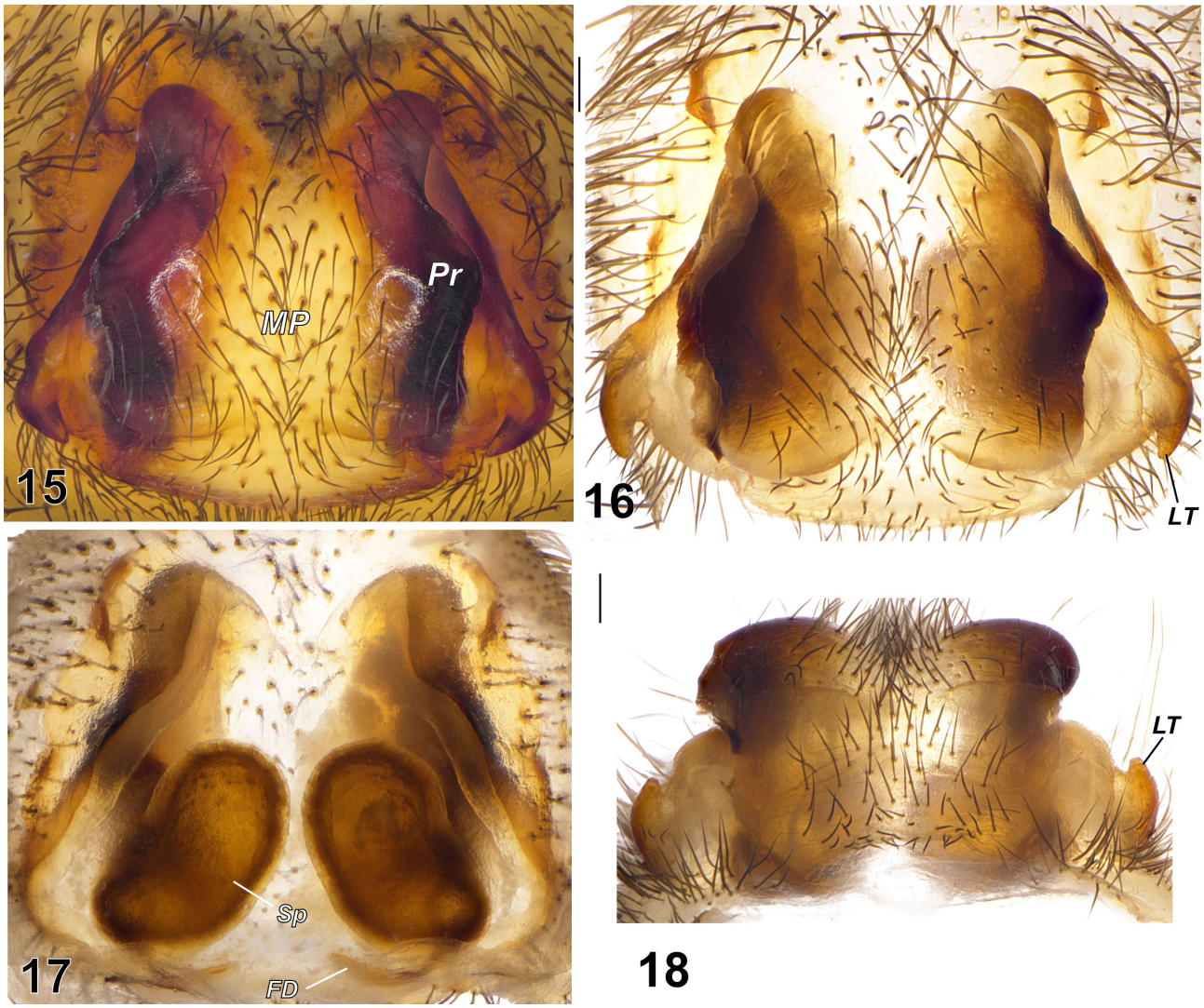
	Fe	Pa	Ti	Mt	Tr	Total
Palp	3.3	1.65	2.1	-	2.4	9.45
Leg I	6.7	3.7	6.3	4.95	2.0	23.65
Leg II	6.3	3.4	5.55	4.2	1.8	21.25
Leg III	5.4	2.9	4.3	4.45	1.65	18.7
Leg IV	6.95	3.0	6.3	8.3	2.2	26.75

TABLE 4. Palp and leg spination of female of *Bowie beruang* **sp. nov.**

	Fe	Pa	Ti	Mt
Palp	1p 3d 1r	1p	2p 1d 1r	–
Leg I	3p 3d 4r	1p 1r	5 paired v	3 paired v
Leg II	4p 3d 4r	1p 1r	4p 4r + 3 paired v	3 paired v
Leg III	4p 3d 4r	1p 1r	2p 3d 2r + 3 paired v	4p 4r + 3 paired v
Leg IV	4p 3d 2r	1p 1r	2p 3d 2r + 3 paired v	3p 3r + 5 single and 1 paired v.

For palp and legs measurements see Table 3. All leg segments brown with poorly visible annulation. For palp and leg spination see Table 4.

Female genitalia as shown in Figs 15–18. Epigyne 1.1 times wider than long. Median plate (*MP*) with two rounded projections (*Pr*) medially. Lateral teeth (*LT*) well developed, slightly curved in ventral view, with rounded tips. Spermathecae (*Sp*) large, kidney-shaped.



FIGURES 15–18. *Bowie beruang* **sp. nov.**, female genitalia, intact (15) and macerated (16–18). 15, 16—ventral, 17—dorsal, 18—posterior. Scale bars: 0.2 mm. Abbreviations: *MP*—median plate, *FD*—fertilization duct, *LT*—lateral tooth, *Pr*—median plate projection, *Sp*—spermatheca.

Notes. According to the structure of the male copulatory organs, including the distinct retro-proximal spur-like cymbial outgrowth and barb-shaped tip of embolus, *B. beruang* **sp. nov.** belongs to the *argentipes* species-group (Jäger 2022). Thus, with the description of the new species, this group now consists of 12 species: *B. angigitanus*, *B. argentipes*, *B. beruang* **sp. nov.** *B. catpeople* Jäger, 2022, *B. corniger* (F. O. Pickard-Cambridge), *B. crystaljapan*

Jäger, 2022, *B. dhole* **sp. nov.**, *B. hosei* (F.O. Pickard-Cambridge), *B. palembangensis*, *B. pulvinatus* (Thorell), *B. ricochet* Jäger, 2022 and *B. tonight*. Almost all species in this species group are limited in distribution to Southeast Asia (southern Malay Peninsula, Sumatra, Borneo/Kalimantan). The exceptions are two species: *B. angigitanus* and *B. corniger*. *Bowie angigitanus* is known from New Ireland (New Guinea), which is ca. 4000 kilometers away from the nearest habitats of other species in the *argentipes* group. However, it is highly likely that this disjunction is the result of mislabeling by Roewer in the species' collection data or accidental transportation on ships (Jäger 2022). *Bowie corniger* was described supposedly from South Africa. According to Jäger (2022) this disjunction, as in the previous example, is the result of mislabeling or accidental introduction.

It is important to note that one female of *B. argentipes* is known (Jäger 2022) from the vicinity of Ketambe Village, where *B. beruang* **sp. nov.** was collected. Since the females in this group are similar, and a reliable species identification is difficult without a male, it can be assumed with high probability that the mentioned female actually belongs to *B. beruang* **sp. nov.**

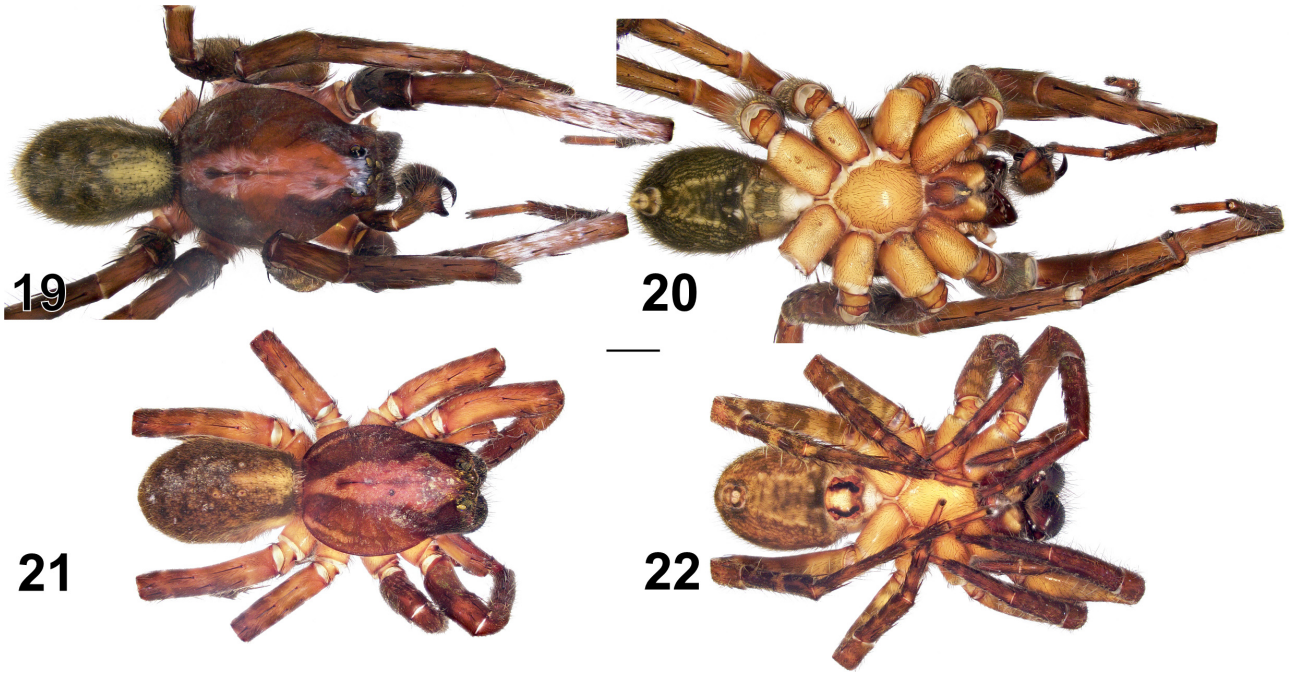
Distribution. Type locality only (Figs 55–57).

Bowie dhole **sp. nov.**

(Figs 19–36, 55–57)

Types. INDONESIA: ***Sumatra***: North Sumatra Prov.: Holotype: ♂ (ZMMU), Bukit Lawang Vil[lage]. [03°32′N, 98°7′E], 200–250 m, 1988 (precise date unknown), unknown collector. **Paratype:** 1♀ (ZMMU), together with the holotype.

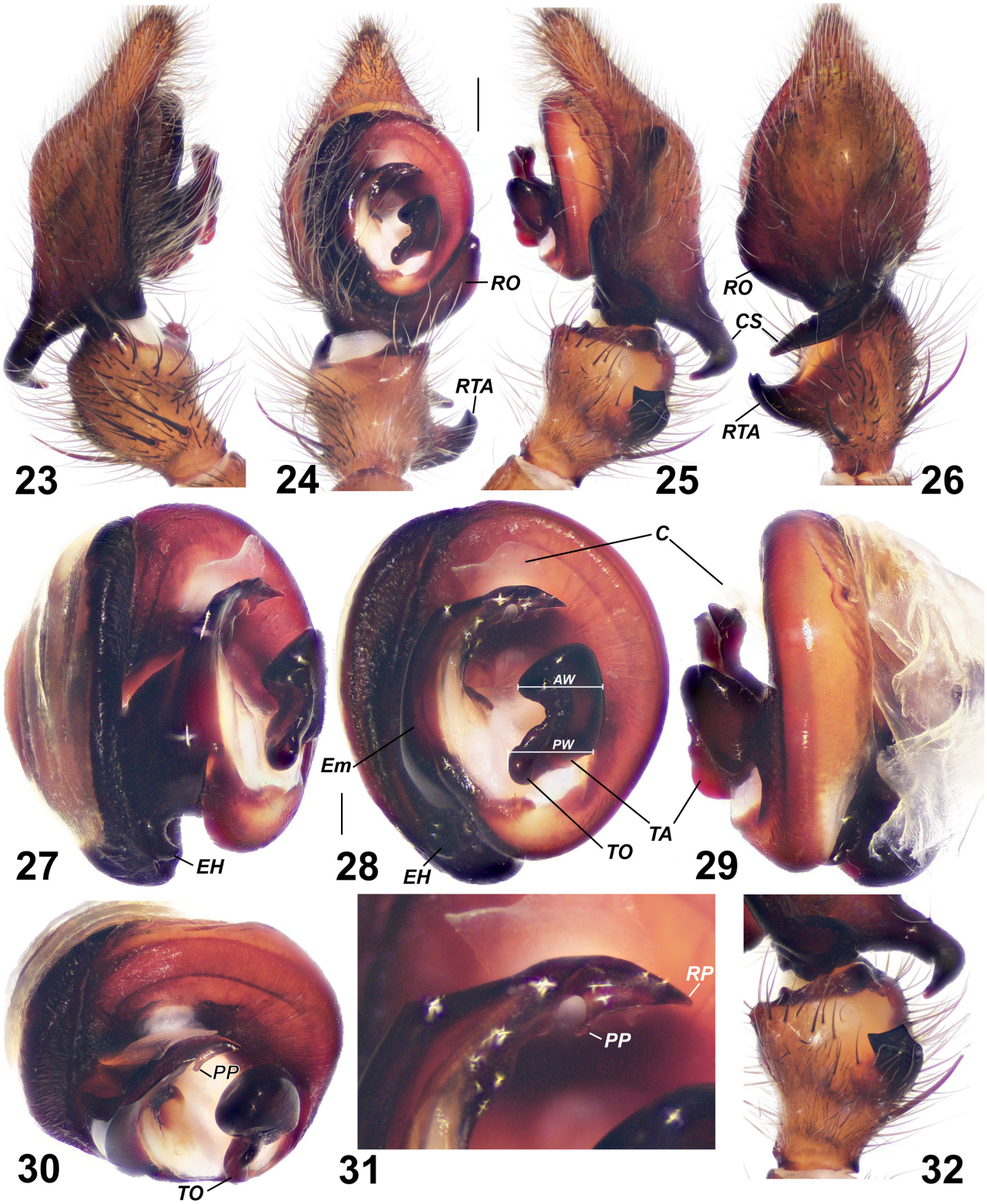
Etymology. The specific name is derived from the local name of the red wolf [*Cuon alpinus* (Pallas)], a predatory beast that inhabits the mountainous regions of Sumatra Island.



FIGURES 19–22. *Bowie dhole* **sp. nov.**, male (19–20) and female (21–22) habitus. 19, 21—dorsal; 20, 22—ventral. Scale bars: 2 mm.

Diagnosis. Males of *Bowie dhole* **sp. nov.** resembles *B. argentipes*, *B. angigitanus*, *B. palembangensis*, *B. tonight* and *B. beruang* **sp. nov.** by palp structures, such as embolus (*Em*), tegular apophysis (*TO*) and cymbial spur (*CS*). It can be differentiated from *B. argentipes* by long and thin cymbial spur (*CS*) (vs. shortened and thick; cf. Fig. 25 and Jäger 2022: fig. 518). The new species differs from *B. angigitanus* by 1) small cymbial retrolatero-proximal outgrowth (*RO*) (vs. large; cf. Fig. 24 and Jäger 2022: fig. 542), and 2) cymbial spur (*CS*) not reaching *RTA* in retrolateral view (vs. extending behind RTA; cf. Fig. 25 and Jäger 2022: fig. 543). The new species can be distinguished from *B. palembangensis* by the cymbial spur (*CS*) not reaching *RTA* in retrolateral view (vs. extending

behind *RTA*; cf. Fig. 25 and Jäger 2012: fig. 172). *Bowie dhole* **sp. nov.** differs from *B. tonight* by the tegular apophysis (*TA*) with anterior width (*AW*) equal to posterior width (*PW*) (*AW*/*PW* ratio = 1) (vs. ratio = 1.14; cf. Fig. 28 and Jäger 2022: figs 545–546). For differences with *B. beruang* **sp. nov.** see diagnosis of this species above.



FIGURES 23–32. *Bowie dhole* **sp. nov.**, palp (23–26), bulb (29–30), terminal part of embolus (31) and palpal tibia (32), male. 23, 27—prolateral; 24, 28, 31—ventral; 25, 29, 32—retrolateral; 26—dorsal; 30—anterior. Scale bars: 0.2 mm.
Abbreviations: *AW*—anterior width of *TA*, *C*—conductor, *CS*—cymbial spur, *EH*—embolus hook, *Em*—embolus, *PW*—posterior width of *TA*, *PP*—prolateral part of embolic tip, *RO*—retrolatero-proximal outgrowth, *RP*—retrolateral part of embolic tip, *RTA*—retrolateral tibial apophysis, *TA*—tegular apophysis, *TO*—tegular apophysis outgrowth.

The epigyne of *Bowie dhole* **sp. nov.** is similar to that of *B. tonight* by the shape of its median plate (*MP*), but can be distinguished by the absence of transversal fold (vs. presence) and the distance between the lateral teeth (*LT*) being greater than the width of the medial plate (vs. distance is equal to plate width; cf. Fig. 33 and Jäger 2022: figs 552–553).

Description. *Male* (Figs 19–20). Total length 14.4. Carapace 7.9 long, 6.3 wide. Opisthosoma 6.2 long, 4.1 wide. Carapace brown with broad silver median band, diamond-shaped in ocular area. Lateral bands absent. Fovea thin, black. Chelicerae dark brown, with three promarginal and four retromarginal teeth, denticles absent. Sternum yellow without pattern. Labium and endites yellow brown. Dorsal part of opisthosoma greenish gray with distinct yellowish band covered with white setae. Ventral part of opisthosoma greenish gray with light spots forming two V-marks. Spinnerets yellow proximally, dark gray distally.

Eye diameters: AME 0.36, ALE 0.24, PME 0.44, PLE 0.39; interdistances: AME–AME 0.17, AME–ALE 0.36, PME–PME 0.3, PME–PLE 0.41, AME–PME 0.07, ALE–PLE 0.26. Clypeus height at AME 0.29.

For palp and legs measurements see Table 5. Legs brown. Tibiae I–IV with silver setae which is more pronounced on tibia I. For palp and leg spination see Table 6.

TABLE 5. Palp and legs measurements of male of *Bowie dhole* **sp. nov.**

	Fe	Pa	Ti	Mt	Tr	Total
Palp	3.3	1.55	1.7	-	2.85	9.4
Leg I	7.25	3.45	7.2	6.5	2.0	26.4
Leg II	6.65	3.25	5.85	5.55	1.7	23.0
Leg III	5.8	2.75	4.45	4.8	1.5	19.3
Leg IV	7.8	2.95	6.8	9.15	2.0	28.7

TABLE 6. Palp and leg spination of male of *Bowie dhole* **sp. nov.**

	Fe	Pa	Ti	Mt
Palp	p1 d6 r1	p1	p1 d1 r1	-
Leg I	p3 d3 r4	p1 r1	p2 d3 r2 + 5 paired v	p3 r3 + 3 paired v
Leg II	p4 d3 r4	p1 r1	p1 d3 r2 + 5 paired v	p4 r3 + 3 paired v
Leg III	p4 d3 r4	p1 r1	p2 d3 r2 + 3 paired v	p3 d3 r3 + 3 paired v
Leg IV	p4 d3 r3	p1 r1	p2 d3 r2 + 3 paired v	p3 d3 r3 + 1 single and 3 paired v

Palp as shown in Figs 23–32. *RTA* large, hook-like, bifurcated in dorsal view. Cymbium with long, curved, sharply pointed retro-dorsal spur (*CS*), retrolatero-proximal outgrowth (*RO*) comparatively small. Tegular apophysis (*TA*) with large prolatero-proximad outgrowth (*TO*). Conductor (*C*) large, membranous. Embolus (*Em*) with sharp retrolateral (*RP*) and prolateral (*PP*) parts of its tip in ventral view and basal embolus hook (*EH*).

Female (Figs 21–22). Total length 12.9. Carapace 6.7 long, 5.0 wide. Opisthosoma 6.1 long, 3.9 wide. Carapace dark brown (somewhat lighter than in males) with broad yellowish median band, diamond-shaped in ocular area. Lateral bands thin, divided into several irregular spots. Fovea thin, black. Chelicerae dark brown, almost black with 3 promarginal and 4 retromarginal teeth, denticles absent. Sternum yellow. Labium and endites dark brown. Dorsal part of opisthosoma brown gray with distinct yellowish cardiac mark. Ventral part of opisthosoma brown gray with light spots forming two V-marks. Spinnerets dark gray.

Eye diameters: AME 0.31, ALE 0.23, PME 0.39, PLE 0.41; interdistances: AME–AME 0.16, AME–ALE 0.39, PME–PME 0.26, PME–PLE 0.4, AME–PME 0.11, ALE–PLE 0.09. Clypeus height at AME 0.23.

For palp and legs measurements see Table 7. Legs brown with gray annulations, which is more distinct in legs III–IV. For palp and leg spination see Table 8.

Epigyne as shown in Figs 33–36. Epigyne as wide as long. Median plate (*MP*) with two rounded projections (*Pr*) medially. Lateral teeth (*LT*) small with sharp tips. Spermathecae (*Sp*) large, kidney-shaped.

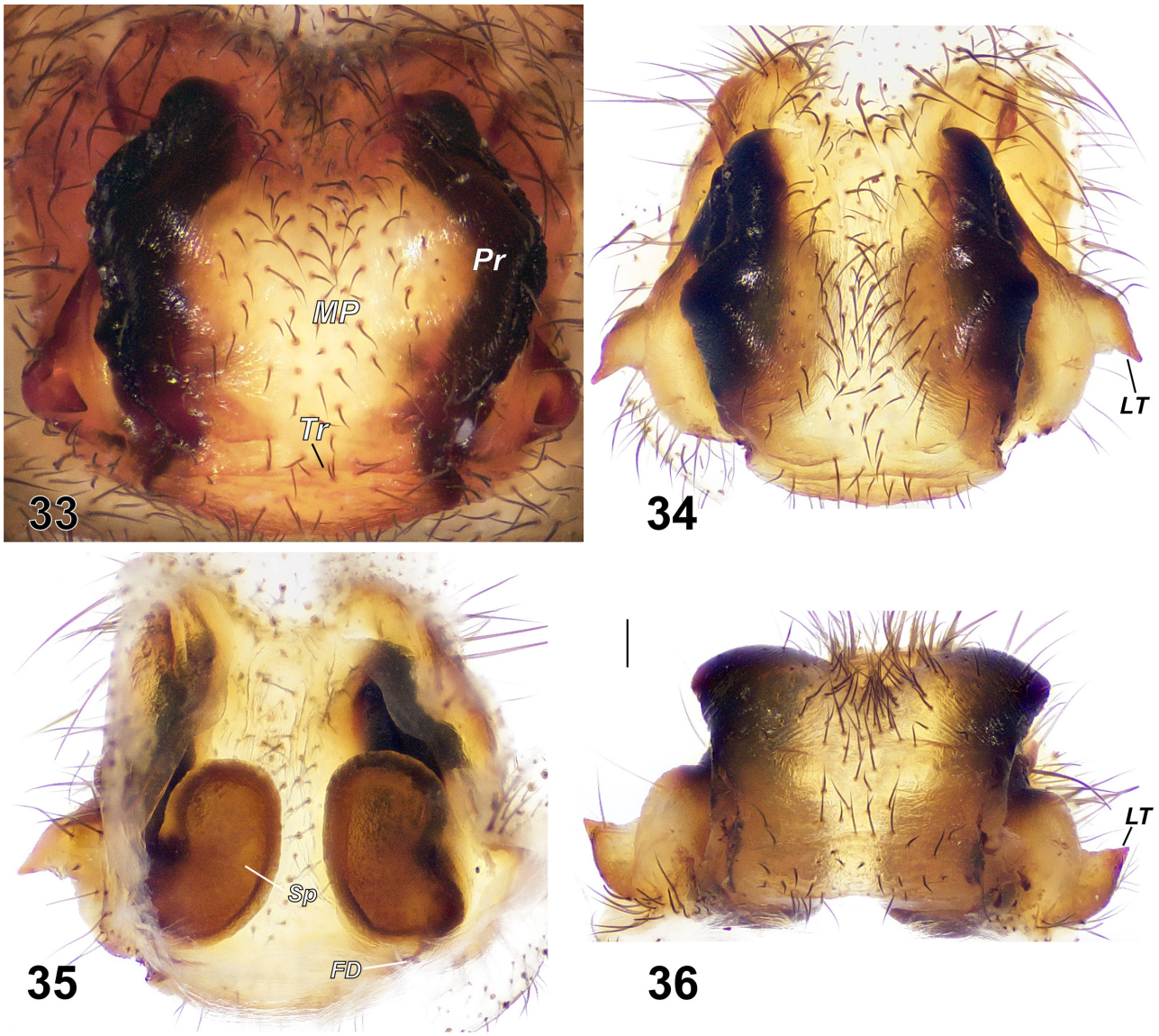
Distribution. Type locality only (Figs 55–57).

TABLE 7. Palp and legs measurements of female of *Bowie dhole* **sp. nov.**

	Fe	Pa	Ti	Mt	Tr	Total
Palp	2.35	1.25	1.5	-	1.7	6.8
Leg I	4.65	2.55	4.4	3.6	1.15	16.35
Leg II	4.5	2.4	3.75	3.4	1.1	15.15
Leg III	3.95	2.05	2.85	3.2	1.1	13.15
Leg IV	5.35	2.25	4.55	6.05	1.5	19.7

TABLE 8. Palp and leg spination of female of *Bowie dhole* **sp. nov.**

	Fe	Pa	Ti	Mt
Palp	p1 d3 r1	p1	p2 d1 r1	-
Leg I	p3 d3 r3	spineless	5 paired v	3 paired v
Leg II	p4 d3 r3	spineless	5 paired v	3 paired v
Leg III	p3 d3 r4	p1 r1	p2 d3 r2 + 3 paired v	p3 d3 r3 + 3 paired v
Leg IV	p4 d3 r2	p1 r1	p2 d3 r2 + 3 paired v	p3 d3 r3 + 1 single and 3 paired v



FIGURES 33–36. *Bowie dhole* **sp. nov.** female genitalia, intact (33) and macerated (34–36). 33, 34—ventral, 35—dorsal, 36—posterior. Scale bars: 0.2 mm.

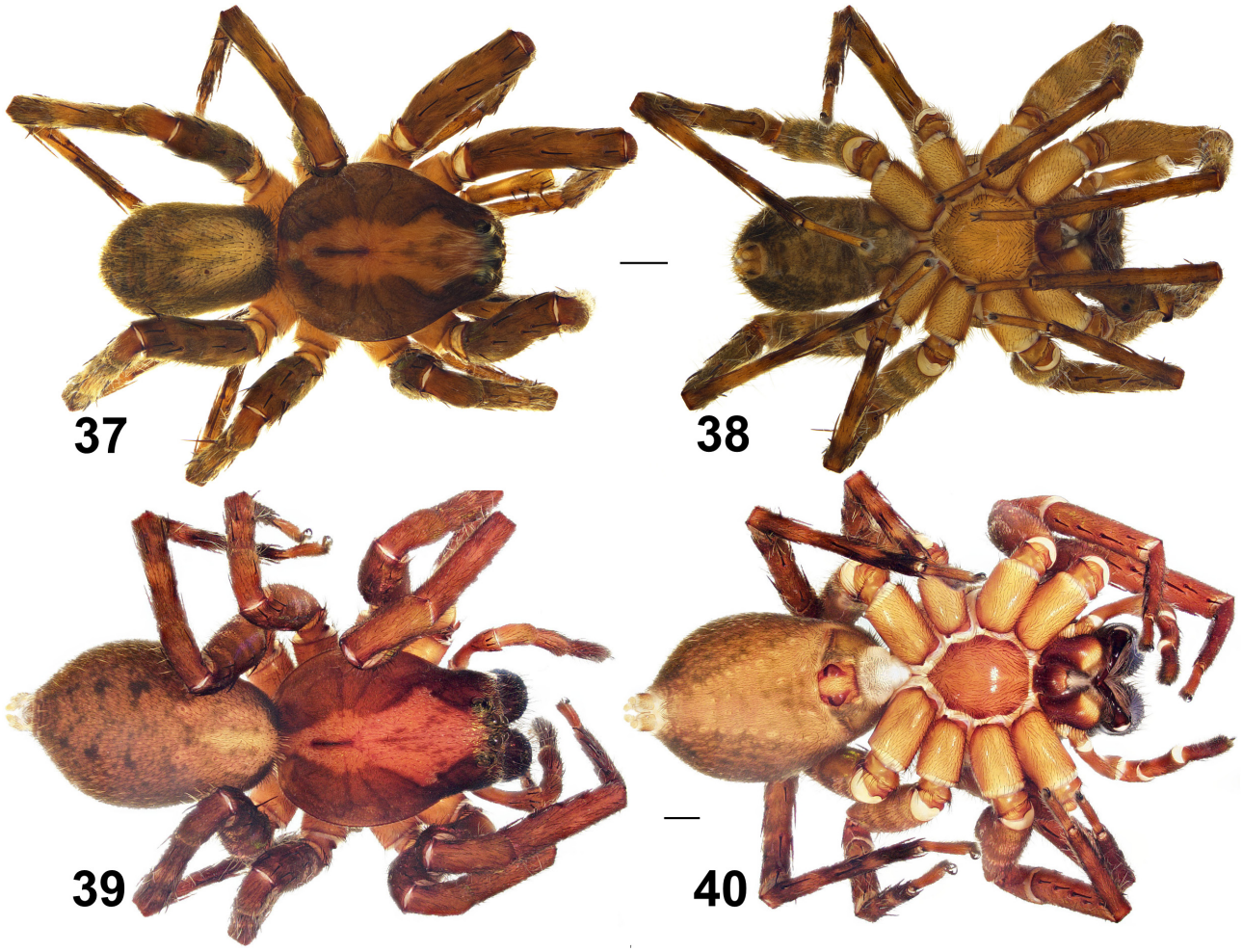
Abbreviations: *MP*—median plate, *FD*—fertilization duct, *LT*—lateral tooth, *Pr*—median plate projection, *Sp*—spermatheca

***Bowie binturong* sp. nov.**
(Figs. 37–54, 55–57)

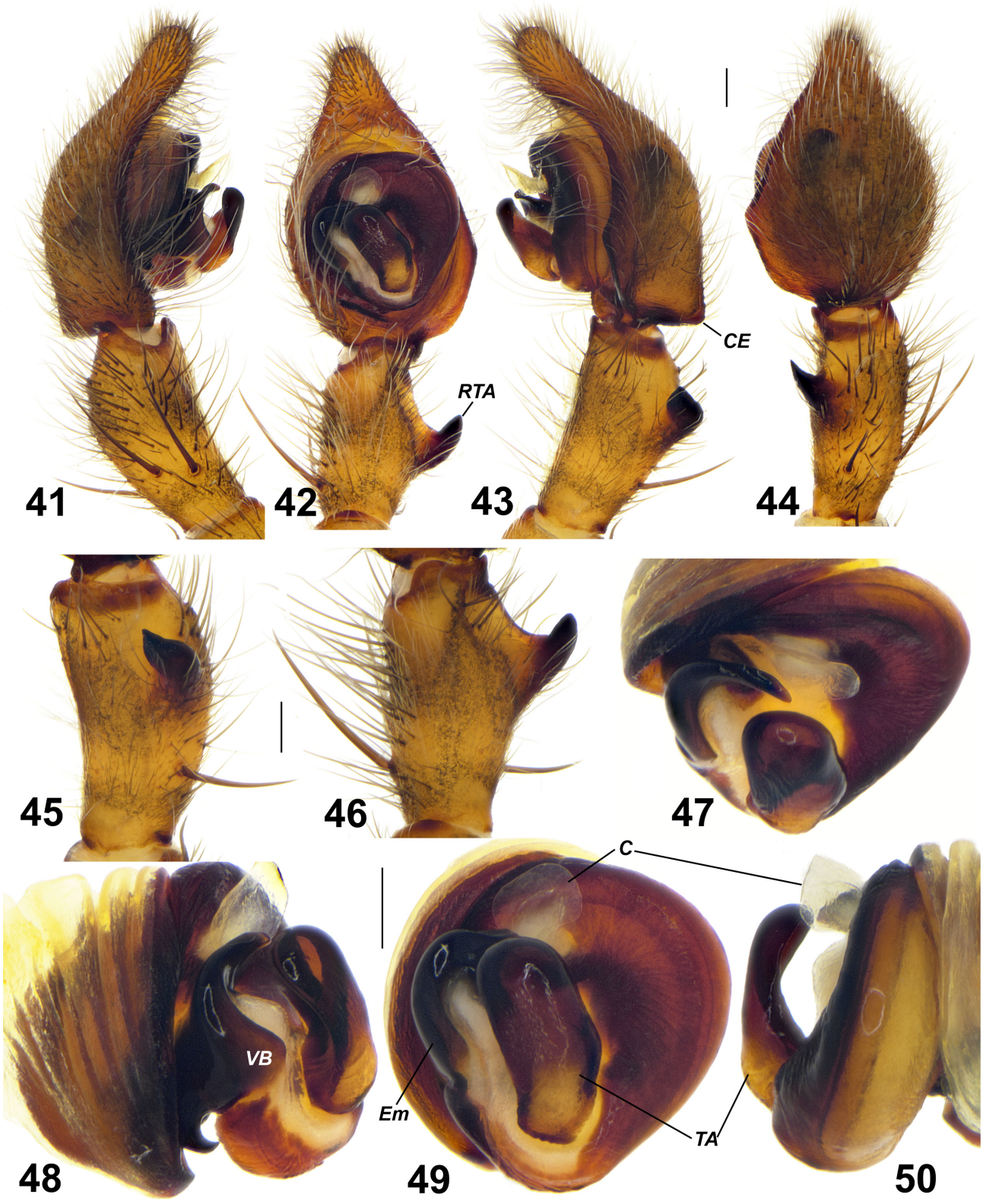
Type material. INDONESIA: *Sumatra*: Holotype: ♂ (ZMMU), Kedah Vil[lage]. [03°59′N, 97°15′E], 1300–1500 m, 1988 (precise date unknown), unknown collector. Paratypes: ♂ (FEFU), 4♂ 2♀ (ISEA), together with the holotype.

Etymology. The specific name is derived from the Malayo-Polynesian name of the bearcat, "binturong" [*Arctictis binturong* (Raffles)], reflecting the fact that the new species also occurs in the jungles of Sumatra Island.

Diagnosis. Males of *B. binturong* **sp. nov.** are similar to those of *B. neukoeln* Jäger, 2022 and *B. scarymonsters* Jäger, 2022 by a diagonally orientated tegular apophysis (*TA*, Figs 42, 49), an embolus with a basal, ventrad bulge (*VB*) and a retrolateral tibial apophysis (*RTA*) subdistally arising and apically pointed (Figs 42, 46). Males of *B. binturong* **sp. nov.** can be distinguished from both species by 1) *RTA* shifted proximally and arising medially from tibia (vs. retrolateral tibial apophysis arising more distally from tibia cf. Figs 44, 46 and Jäger 2022: figs 448, 461); and 2) the tip of the embolus (*Em*) reaching the conductor (*C*) (vs. not reaching; cf. Fig. 49 and Jäger 2022: figs 449, 462). Additionally, the new species can be distinguished from *B. neukoeln* by the wide gap between the base of embolus and the prolateral margin of tegular apophysis in ventral view (vs. no gap; cf. Fig. 49 and Jäger 2022: fig. 448), and from *B. scarymonsters* by the tegular apophysis (*TA*) covering the tip of the embolus (vs. not covering; cf. Fig. 49 and Jäger 2022: fig. 461) and the small dorso-proximal cymbial extension (*CE*) (vs. large; cf. Fig. 43 and Jäger 2022: fig. 462). From both other species of this group, it differs by strongly concaved ventral margin of embolus in ventral view (vs. almost flat; cf. Fig. 48 and Jäger 2022: figs 450, 463).



FIGURES 37–40. *Bowie binturong* **sp. nov.**, male (37–38) and female (39–40) habitus. 37, 39—dorsal; 38, 40—ventral. Scale bars: 1 mm.



FIGURES 41–50. *Bowie binturong* **sp. nov.**, male palp (41–44), palpal tibia (45–46) and bulb (47–50). 41, 48—prolateral; 42, 46, 49—ventral; 43, 45, 50—retrolateral; 44—dorsal; 47—anterior. Scale bars: 0.2 mm.

Abbreviations: *C*—conductor, *CE*—cymbial extension, *Em*—embolus, *RTA*—retrolateral tibial apophysis, *TA*—tegular apophysis, *VB*—ventrad bulge of embolus.

Females of *B. binturong* are similar to those of *B. neukoeln* and *B. scarymonsters* by a median plate (*MP*) transversally oval (Fig. 51), lateral teeth (*LT*) situated at posterior margin of epigyne and bottle-shaped spermathecae (*Sp*) (Figs 53–54). Females of the new species differ by 1) median plate (*MP*) widest posteriorly (vs. medially; cf. Fig. 51 and Jäger 2022: figs 453, 456, 459, 466), and 2) spermathecae separated by a gap equal to 0.3 their width (vs. 0.8 and 1 of width, respectively) (cf. Fig. 51 and Jäger 2022: figs 459–460, 466, 468).

Description. *Male* (Figs 37–38). Total length 11.2. Carapace 6.1 long, 4.65 wide. Opisthosoma 5.0 long, 3.25 wide. Carapace brown, with broad yellow median band, diamond-shaped in ocular area. Lateral bands absent. Fovea thin, black. Chelicerae dark brown, almost black with 2 promarginal and 4 retromarginal teeth, without denticles. Sternum light brown with barely visible longitudinal stripe. Labium dark brown. Endites brown with yellowish outer edge.

Dorsal part of opisthosoma greenish gray with distinct yellowish cardiac mark and two stripes besides it. Ventral part of abdomen dark gray with poorly visible yellowish spots forming V-mark. Spinnerets yellowish with gray on the external sides.

Eye diameters: AME 0.27, ALE 0.17, PME 0.36, PLE 0.33; interdistances: AME–AME 0.16, AME–ALE 0.37, PME–PME 0.17, PME–PLE 0.38, AME–PME 0.08, ALE–PLE 0.18. Clypeus height at AME 0.07.

For palp and legs measurements see Table 9. Femora I–IV dark brown dorsally, light brown laterally and ventrally. Remaining segments brown with inconspicuous annulation. Tibiae I with short golden setae. For palp and leg spination see Table 10.

TABLE 9. Palp and legs measurements of male of *Bowie binturong* **sp. nov.**

	Fe	Pa	Ti	Mt	Tr	Total
Palp	2.4	1.1	1.2	-	1.95	6.65
Leg I	5.15	2.6	5.05	4.6	1.35	18.75
Leg II	4.65	2.35	4.45	4.1	1.35	16.9
Leg III	4.1	2.05	3.25	3.7	1.2	14.3
Leg IV	5.55	2.25	4.85	6.3	1.75	20.7

TABLE 10. Palp and leg spination of male of *Bowie binturong* **sp. nov.**

	Fe	Pa	Ti	Mt
Palp	1p 5d 1r	1p	2p 1d	-
Leg I	3p 3d 4r	1p 1r	1p 3d 2r + 5 paired v	2p 2r + 3 paired v
Leg II	4p 3d 5r	1p 1r	2p 3d 2r + 5 paired v	3p 3r + 3 paired v
Leg III	4p 3d 4r	1p 1r	2p 3d 2r + 3 paired v	4p 4r + 3 paired v
Leg IV	4p 3d 3r	1p 1r	2p 3d 2r + 3 paired v	6p 5r + 5 single and 1 paired v

Palp as shown in Figs 41–50. *RTA* arising from the middle of tibia, short with pointed tip. Dorso-proximal cymbial extension (*CE*) short, forming a right angle. Tegular apophysis (*TA*) elongated, originating in a 5:30 o'clock-position. Conductor (*C*) large, almost circular. Embolus (*Em*) originating from tegulum in 8-o'clock-position, tip simple, pointed.

Female (Figs 39–40). Total length 12.6. Carapace: 6.2 long, 4.9 wide. Opisthosoma: 6.6 long, 4.6 wide. Coloration as in male. Chelicerae with 3 promarginal and 4 retromarginal teeth, without denticles.

TABLE 11. Palp and legs measurements of female of *Bowie binturong* **sp. nov.**

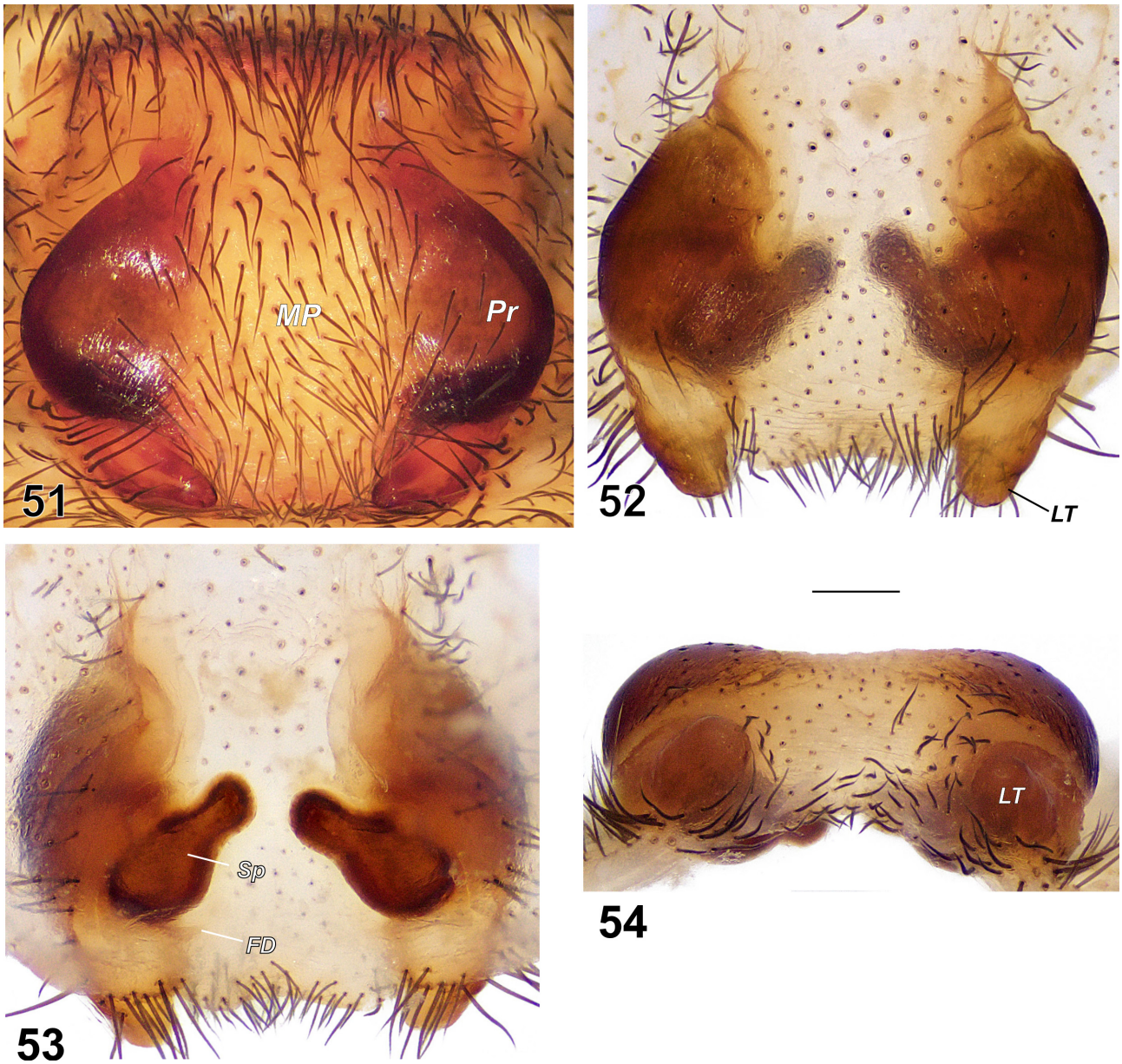
	Fe	Pa	Ti	Mt	Tr	Total
Palp	2.4	1.25	1.35	-	1.6	6.6
Leg I	4.5	2.65	4.1	3.4	1.15	15.8
Leg II	4.4	2.45	3.45	3.15	1.1	14.55
Leg III	3.85	2.1	2.65	3.1	1.05	12.75
Leg IV	5.2	2.2	4.1	5.5	1.4	18.4

TABLE 12. Palp and leg spination of female of *Bowie binturong* **sp. nov.**

	Fe	Pa	Ti	Mt
Palp	1p 3d 1r	1p	2p 2r	–
Leg I	3p 3d 3r	spineless	5 paired v	3 paired v
Leg II	4p 3d 3r	spineless	5 paired v	3 paired v
Leg III	4p 3d 4r	1p 1r	2p 2d 2r + 3 paired v	3p 3d 3r + 3 paired v
Leg IV	4p 3d 3r	1p 1r	2p 2d 2r + 3 paired v	3p 3d 3r + 1 single and 3 paired v

Eye diameters: AME 0.27, ALE 0.23, PME 0.34, PLE 0.37; interdistances: AME–AME 0.21, AME–ALE 0.41, PME–PME 0.29, PME–PLE 0.44, AME–PME 0.11, ALE–PLE 0.17. Clypeus height at AME 0.23. For palp and legs measurements see Table 11. Leg coloration like in males, but tibiae I without short golden setae. For palp and leg spination see Table 12.

Epigyne as shown in Figs 51–54. Epigynal field slightly wider than long (ratio width/length = 1.07). Median plate (*MP*) widest in its posterior part. Lateral teeth (*LT*) large. Spermathecae (*Sp*), bottle-shaped.

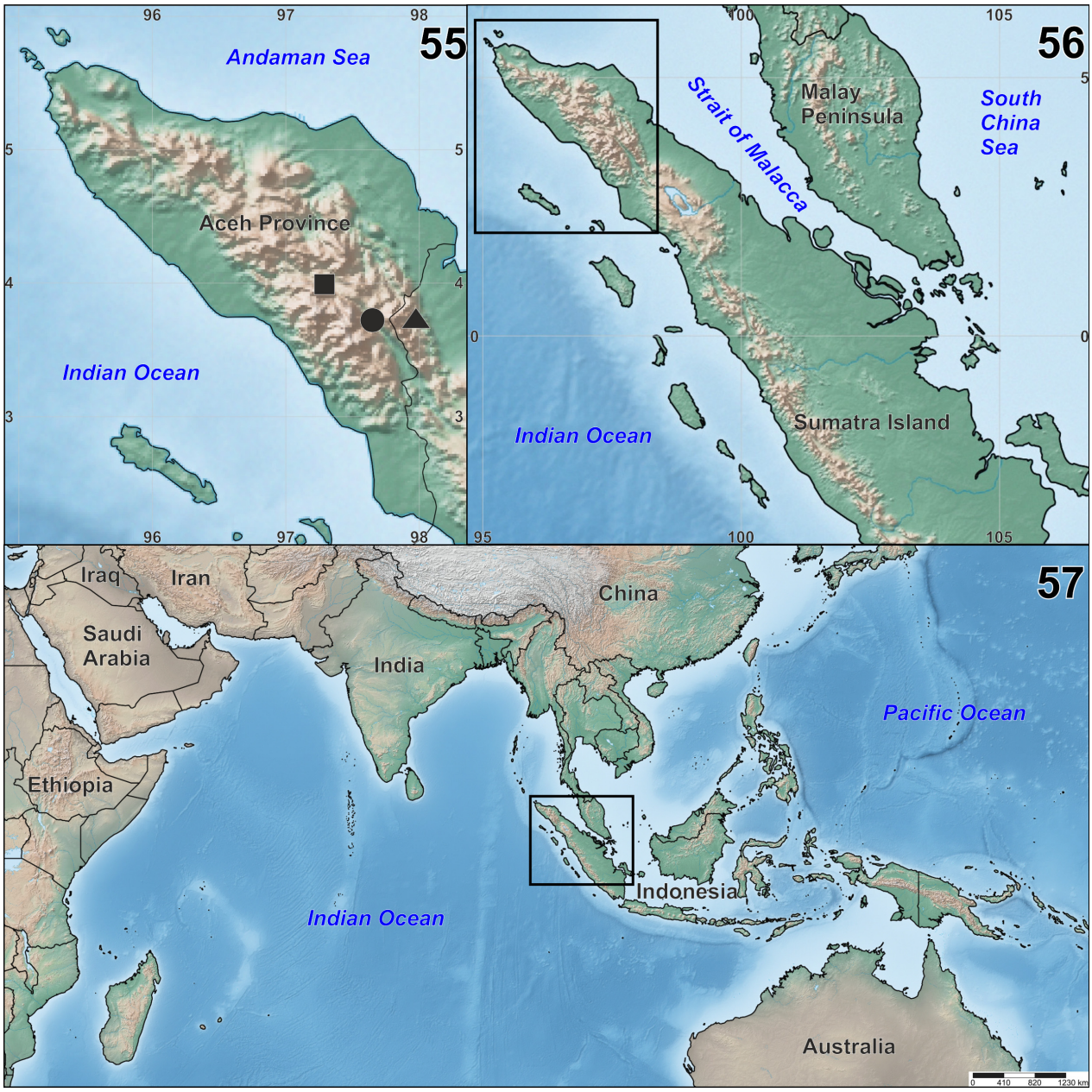


FIGURES 51–54. *Bowie binturong* **sp. nov.**, female genitalia, intact (51) and macerated (52–54). 51, 52—ventral, 53—dorsal, 54—posterior. Scale bars: 0.2 mm.

Abbreviations: *FD*—fertilization duct, *LT*—lateral tooth, *MP*—median plate, *Pr*—median plate projection, *Sp*—spermatheca.

Notes. According to the structure of the copulatory organs (such as diagonally oriented tegular apophysis, embolus with a basal bulge, and subdistally arising, pointed *RTA* in males and transversally oval median plate, lateral teeth situated at posterior margin of epigyne etc. in females) *Bowie binturong* **sp. nov.** belongs to the *scarymonsters* species-group (Jäger 2022). Therefore, with description of the new species, this group now consists of 4 species: *B. neukoeln* (Malaysia Peninsula), *B. scarymonsters* (Sumatra), *B. sabah* Li & Yao (Kalimantan) and *Bowie binturong* **sp. nov.**

Distribution. Type locality only (Figs 55-57).



FIGURES 55–57. Collecting localities of studied *Bowie* species. Circle—*Bowie beruang* **sp. nov.**, triangle—*B. dhole* **sp. nov.**, square—*B. binturong* **sp. nov.** The frame on Fig. 57 refers to the content of Fig. 56 and the frame on Fig. 56 refers to the content of Fig. 55.

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References

Bastawade, D.B. & Borkar, M. (2008) Arachnida (orders Scorpiones, Uropygi, Amblypygi, Araneae and Phalangida). *Fauna of Goa, State Fauna Series. Zoological Survey of India, Kolkata*, 16, 211–242.

Chu, C., Lu, Y., Yao, Z.Y. & Li, S.Q. (2022a) A survey of ctenid spiders (Araneae, Ctenidae) from Xishuangbanna Tropical Botanical Garden, Yunnan, China. *Biodiversity Data Journal*, 10 (e87597), 1–18. https://doi.org/10.3897/BDJ.10.e87597

Chu, C., Lu, Y., Li, S.Q. & Yao, Z.Y. (2022b) Taxonomic notes on eleven species of the subfamily Cteninae (Araneae, Ctenidae) from Asia. *Biodiversity Data Journal*, 10 (e96003), 1–46. https://doi.org/10.3897/BDJ.10.e96003

Fomichev, A.A., Omelko, M.M. & Marusik, M.M. (2023) A survey of the Sumatran Ctenidae (Araneae). 1. Two new *Acantheis* species. *Zootaxa.* [in press]

Jäger, P. (2012) Asian species of the genera *Anahita* Karsch 1879, *Ctenus* Walckenaer 1805 and *Amauropelma* Raven, Stumkat & Gray 2001 (Arachnida: Araneae: Ctenidae). *Zootaxa*, 3429 (1), 1–63. https://doi.org/10.11646/zootaxa.3429.1.1

Jäger, P. (2022) *Bowie* gen. nov., a diverse lineage of ground-dwelling spiders occurring from the Himalayas to Papua New Guinea and northern Australia (Araneae: Ctenidae: Cteninae). *Zootaxa*, 5170 (1), 1–200. https://doi.org/10.11646/zootaxa.5170.1.1

Jäger, P. & Minn, M.Z. (2015) New species in the family Ctenidae Keyserling, 1877 from high altitude habitats in Myanmar, with the first case of penetration of the female's cuticle by a male in the RTA-clade (Arachnida: Araneae: Ctenidae). *Zootaxa*, 3994 (2), 235–252. https://doi.org/10.11646/zootaxa.3994.2.4

Lu, Y., Chu, C., Yao, Z.Y. & Li, S.Q. (2022) Four new species of ctenid spiders (Araneae, Ctenidae) from Southeast Asia, with the first description of the female of *Sinoctenus zhui* Marusik, Zhang & Omelko, 2012. *Biodiversity Data Journal*, 10 (e91350), 1–20. https://doi.org/10.3897/BDJ.10.e91350

Marusik, Y.M. & Omelko, M.M. (2016) Redescription of two Ctenidae (Araneae) from Taiwan. *Zootaxa*, 4173 (2), 155–162. https://doi.org/10.11646/zootaxa.4173.2.6

Ono, H. (2010) Four new spiders (Arachnida, Araneae) of the families Liphistiidae, Ctenizidae, Araneidae and Ctenidae from Vietnam. *Memoirs of the National Museum of Nature and Science Tokyo*, 46, 1–12.

Sankaran, P.M. & Sebastian, P.A. (2018) First record of *Africactenus* Hyatt, 1954 and redescriptions of two poorly known species of *Ctenus* Walckenaer, 1805 (Araneae, Ctenidae, Cteninae) from India. *Zootaxa*, 4388 (3), 395–406. https://doi.org/10.11646/zootaxa.4388.3.5

Shorthouse, D.P. (2010) SimpleMappr, an online tool to produce publication-quality point maps. Available from: http://www.simplemappr.net (accessed 9 September 2023)

Tikader, B.K. & Malhotra, M.S. (1981) Revision of spiders of the genus *Ctenus* Walckenaer from India (Araneae: Ctenidae). *Records of the Zoological Survey of India*, 79 (1–2), 105–124. https://doi.org/10.26515/rzsi/v79/i1-2/1981/161759

World Spider Catalog (2023) *World Spider Catalog. Version 24*. Natural History Museum Bern, Bern. Available from: http://wsc.nmbe.ch (Accessed April 2023) https://doi.org/10.24436/2