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## RESEARCH ARTICLE

# Description of a new genus and two new species of Ornithoctoninae from Southeast Asia (Araneae: Theraphosidae)

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## Abstract

A new genus, *Aspinochilus* **gen. n.**, belonging to the subfamily Ornithoctoninae (Araneae: Theraphosidae) is described, with type species *Aspinochilus rufus* **sp. n.** from East Java. An additional new species, *Phormingochilus hatihati* **sp. n.**, is described from West Sulawesi. The external morphological characters and genitalia structures of the new taxa are illustrated and compared to those of closely related species.

Key words: Arachnida, Indonesia, *Lampropelma*, morphology, Mygalomorphae, *Omothymus*, *Phormingochilus*.

## Zusammenfassung

Eine neue Gattung, *Aspinochilus* **gen. n.**, die zur Unterfamilie Ornithoctoninae (Araneae: Theraphosidae) gehört, wird anhand der Typusart *Aspinochilus rufus* **sp. n.** aus Ost-Java beschrieben. Zudem wird eine neue Art, *Phormingochilus hatihati* **sp. n.**, aus West-Sulawesi beschrieben. Die äußeren morphologischen Merkmale und die Genitalstrukturen der neuen Taxa werden illustriert und mit denen von eng verwandten Arten verglichen.

## Introduction

The spider family Theraphosidae, which includes the largest representatives of arachnids (LÜDDECKE et al. 2018), occurs on every continent except Antarctica and comprises 14 subfamilies (KAMBAS 2024). The subfamily Ornithoctoninae is distributed throughout Southeast Asia (Cambodia, China, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam) and includes some of the largest species found in the region (KAMBAS 2024; WORLD SPIDER CATALOG 2024). Its representatives are either ground-dwelling or arboreal. They can be distinguished from other Theraphosidae subfamilies by the presence of a retrolateral cheliceral scopula equipped with feathered paddle setae on the lower surface (SCHMIDT 2003; VON WIRTH & STRIFFLER 2005; HAUKE 2017; SONGSANGCHOTE et al. 2022).

The subfamily Ornithoctoninae was established by POCKOCK (1895), and initially included the five genera *Citharognathus* Pocock, 1895, *Melopoews* Pocock, 1895, *Omothymus* Thorell, 1891, *Ornithoctonus* Pocock, 1892 and *Phormingochilus* Pocock, 1895. SIMON (1903) expanded the subfamily by assigning to it the genera *Cyriopagopus* Simon, 1887, *Haplopelma* Simon, 1892 and *Lampropelma* Simon, 1892, and synonymized *Omothymus* with *Cyriopagopus*. Later, the genus *Melopoews* was treated as a junior synonym of *Haplopelma*, as both genera share the same structure of the caput and eye tuber-

cle and the same clypeus size (RAVEN 1985). Furthermore, RAVEN (1985) synonymized the genus *Melognathus* Chamberlin, 1917 with *Cyriopagopus* due to the lack of diagnostic characters. SMITH & JACOBI (2015) synonymized *Haplopelma* with *Cyriopagopus* based on the shape of the caput, ocular tubercle and spermatheca. Moreover, they reinstated *Omothymus* as a valid genus and assigned the species *Cyriopagopus dromeus* (Chamberlin, 1917), the type species of the synonymized genus *Melognathus*, to *Omothymus*. This indirectly resulted in the synonymy of *Melognathus* with *Omothymus*, which was not followed in subsequent publications (GABRIEL & SHERWOOD 2019). Recently, a new genus, *Taksinus* Songsangchote, Sippawat, Khaikaew & Chomphuphuang, 2022, was added to the subfamily, resulting in a total of eight genera and 26 species (SONGSANGCHOTE et al. 2022; WORLD SPIDER CATALOG 2024).

Herein, we describe one new genus and two new species of Ornithoctoninae based on morphological data, and discuss their generic assignment.

## Material and methods

## Abbreviations of collections

[From EVENHUIS (2003).] MBBJ: Museum Zoologicum Bogoriense, Bogor, Indonesia; MCZ: Museum of Comparative Zoology, Harvard University, USA; MNHN: Muséum National d'Histoire Naturelle, Paris, France; MSNG: Museo Civico

di Storia Naturale “Giacomo Doria”, Genoa, Italy; MWNH: Museum Wiesbaden, Naturhistorische Landessammlungen, Germany; NHMUK: Natural History Museum, London, UK; NMW: Naturhistorisches Museum Wien, Austria; NUS: National University of Singapore, Singapore; SMF: Senckenberg Forschungsinstitut und Naturmuseum, Frankfurt, Germany; SMNK: Staatliches Museum für Naturkunde Karlsruhe, Germany; SMNS: Staatliches Museum für Naturkunde Stuttgart, Germany; UMZC: Cambridge University Museum of Zoology, UK; ZMUC: Natural History Museum of Denmark; ZMHB: Museum für Naturkunde der Humboldt-Universität, Berlin, Germany; ZRC: Raffles Museum of Biodiversity Research, Zoological Reference Collection, Singapore.

#### Abbreviations used for morphological characters

a: apical; d: dorsal; m: median; pd: prodorsal; pl: prolat-  
 eral; pv: proventral; rd: retrodorsal; RF: Leg Relation Factor  
 (VON WIRTH & STRIFFLER 2005); rl: retrolateral; rv: retroventral;  
 v: ventral.

#### Examined type material

*Citharognathus hosei* Pocock, 1895: holotype ♀, Malaysia, Baram, Sarawak (Borneo), BMNH 1894-9-19-1-2; in NHMUK.

*Cyriopagopus albostrigatus* (Simon, 1886): syntypes, 1 ♂, 1 ♀, Thailand and Phnom-Penh Cambodia, (♂) MNHN AR 4714/B (Simon No 4518), (♀) MNHN AR 4714/A (Simon No 4518); both in MNHN.

*Cyriopagopus doriae* (Thorell, 1890): holotype ♀, Malaysia, Sarawak (Borneo), leg. O. BECCARI & G. DORIA; in MSNG.

*Cyriopagopus lividus* (Smith, 1996): holotype ♂, Myanmar, Kawkaeet, NHM 1988-2-6; in NHMUK.

*Cyriopagopus longipes* (von Wirth & Striffler, 2005): holotype ♂, Thailand, Sai (Yoi) Yok, leg. V. SEJNA, NHM 2005-153; paratype, ♀, same data as holotype, NHM 2005-153; both in NHMUK.

*Cyriopagopus minax* (Thorell, 1897): holotype ♀, MSNG, Myanmar, Kawkaeet, leg. L. FEA; in MSNG.

*Cyriopagopus schmidti* (von Wirth, 1991): holotype ♀, Vietnam, Tam Dao Mountains, leg. I. SKLIBA, SMF 38049-84; in SMF.

*Cyriopagopus schmidti* (von Wirth, 1991): 1 ♂, 1 ♀, China, Guangxi Province, NHM 2000-121; both in NHMUK.

*Cyriopagopus vonwirthi* (Schmidt, 2005): paratype, ♀, Thailand, SMF 40598-84; in SMF.

*Lampropelma carpenteri* (Smith & Jacobi, 2015): holotype ♀, Indonesia, Kema, Sulawesi (formerly Celebes); in NHMUK.

*Lampropelma nigerrimum* Simon, 1892: syntype, ♀, Indonesia, Pulau Sangihe, MNHN AR 4720 (Simon No. 9652); in MNHN.

*Melognathus dromeus* Chamberlin, 1917: holotype ♂, East Indies? Philippines? leg. J. M. BARNARD, MCZ 96; in MCZ.

*Omothymus fuchsi* (Strand, 1906): holotype ♀, Indonesia, South Aceh, Sumatra, leg. Dr. FUCHS, MWNH 3/2; in MWNH.

*Omothymus schioedtei* Thorell, 1891: holotype ♂, Malaysia, Pulau Penang (= Pulo), West Malaysia, leg. S. WESTERMANN, ZMUC 6445; in ZMUC.

*Omothymus schioedtei* Thorell, 1891: holotype ♂, Malaysia, Ulu Selama, State of Perak, West Malaysia, CUMZ No 30 1899; in CUMZ.

*Omothymus violaceopes* (Abraham, 1924): holotype ♂, Malaysia, Penang Hill (Belle Vue Bungalow), West Malaysia, leg. Dr. G. D. FREER, NHM 301099.1924.10; paratype, ♀,

Kranji, Singapore, leg. H. C. ABRAHAM, NHM 301099.1924.11 (1924.27.19.1.37?); both in NHMUK.

*Ornithoctonus andersoni* Pocock, 1892: holotype ♀, Myanmar, Mergui, leg. Dr. ANDERSON, NHM 1891-10-15-3-5; in NHMUK.

*Ornithoctonus aureotibialis* von Wirth & Striffler, 2005: holotype ♂, Thailand, Krabi, leg. Thomas HEISSWOLF, NHM 2005-153; paratype, ♀, Thailand, Cha Am, Phetchaburi, leg. RAINER WESTHOLD, NHM 2005-153; both in NHMUK.

*Ornithoctonus costalis* (Schmidt, 1998): holotype ♀, Thailand, Erawan National Park, leg. F. KOVARIK, SMF 12-197; in SMF.

*Phormingochilus everetti* Pocock, 1895: holotype ♀, Malaysia, Borneo, leg. A. EVERETT, NHM 88.122; in NHMUK.

*Phormingochilus tigrinus* Pocock, 1895: holotype ♀, Malaysia, Kuala Lama, Borneo, leg. A. EVERETT, NHM 1894.6.27.1; in NHMUK.

*Phormingochilus arboricola* (Schmidt & Barensteiner, 2015): holotype ♀, Borneo, SMF 63573; in SMF.

#### Additional specimens examined

*Lampropelma nigerrimum* Simon, 1892: 1 ♂, Indonesia, Sulawesi, Sangir Island, XI.2007, SMNS-Aran-004020; 1 ♂, Indonesia, Sulawesi Sangir Island, 2021, SMNS-Aran-004021; 1 ♂, Indonesia, Sulawesi, Sangir Island, 2021, SMNS-Aran-004022; all in SMNS.

*Lampropelma carpenteri* (Smith & Jacobi, 2015): 1 ♂, Indonesia, Sulawesi, Tangkoko National Park, XI.2007, SMNS-Aran-004099; in SMNS.

*Omothymus schioedtei* Thorell, 1891: 1 ♀, Malaysia, IV.2003, SMNS-Aran-004023; 1 ♂, Malaysia, V.2020, SMNS-Aran-004024; 1 ♂, Malaysia, IX.2022, SMNS-Aran-004025; 1 ♀, Sungkai, Malaysia, SMNS-Aran-004026; 1 ♂, Malaysia, SMNS-Aran-004027; 1 ♂, Malaysia, SMNS-Aran-004028; 1 ♂, Indonesia, Sumatra, 2019, SMNS-Aran-004029; 1 ♀, unknown, SMNS-Aran-004121; all in SMNS.

*Omothymus violaceopes* (Abraham, 1924): 1 ♂, Malaysia, Kampung Jelu, Pahang, SMNS-Aran-004039; 1 ♂, Singapore, 28.X.2005, SMNS-Aran-004117; 1 ♀, Singapore, 28.X.2005; SMNS-Aran-004118; all in SMNS.

*Omothymus violaceopes* (Abraham, 1924): 1 ♀, Bukit Timah, Singapore; in NHMUK.

*Phormingochilus everetti* Pocock, 1895: 1 ♂, Malaysia, Borneo, 25.III.2017, SMNS-Aran-004013; 1 ♀, Malaysia, Borneo, Gandalf Bridge, 25.X.2008, SMNS-Aran-004014; 1 ♂, Malaysia, Borneo, Gandalf Bridge, 25.X.2008, SMNS-Aran-004015; 1 ♂, Malaysia, West Borneo, 18.IX.2018, SMNS-Aran-004016; 1 ♀, Malaysia, Sarawak, Borneo, 2018, SMNS-Aran-004017; all in SMNS.

*Phormingochilus pennellhewlettorum* Smith & Jacobi, 2015: 1 ♀, Malaysia, Bario, Kelabit, Sarawak, SMNS-Aran-004113; 1 ♀, Malaysia, Bario, Kelabit, Sarawak, SMNS-Aran-004114; 1 ♂, Malaysia, Bario, Kelabit, Sarawak, SMNS-Aran-004115.

*Phormingochilus arboricola* (Schmidt & Barensteiner, 2015): 1 ♀, Borneo, 28.XII.2021, SMNS-Aran-004030; 1 ♂, Borneo, 28.XII.2021, SMNS-Aran-004131; 1 ♂, Borneo, 28.XII.2021, SMNS-Aran-004032; all in SMNS.

*Cyriopagopus doriae* (Thorell, 1890): 1 ♂, Malaysia, Katai National Park, East Kalimantan, between Samarinda and Sangkulirang, 28.X.2006, SMNS-Aran-002010; 1 ♀, Malaysia, Bliwit, East Kalimantan, 28.X.2006, SMNS-Aran-002011; 1 ♂, Malaysia, 10.I.2006, SMNS-Aran-002012; 1 ♂, Malaysia, Malundik, Central Kalimantan, 01.III.2013, SMNS-Aran-002013; 1 ♀, Malaysia, Bliwit, East Kalimantan, 10.V.2006, SMNS-Aran-002014; all in SMNS.

*Cyriopagopus lividus* (Smith, 1996): 1 ♀, Thailand, leg. H. J. GÜNTHER, ZMHB 30327; in ZHMB.

*Citharognathus hosei* Pocock, 1895: 1 ♂, Malaysia, Miri District, Borneo, 21.IX.2001, SMNS-Aran-003500; 1 ♂, Malaysia, Miri District, Borneo, 21.IX.2010, SMNS-Aran-003501; 1 ♂, Malaysia, Sarawak, Borneo, 2009, SMNS-Aran-003559; 1 ♂, Malaysia, Sarawak, Borneo, 2009, SMNS-Aran-003560; 1 ♀, Malaysia, Miri District, Borneo, 21.IX.2010, SMNS-Aran-004104; all in SMNS.

*Taksinus bambus* Pocock, 1895: 1 ♂, Thailand, Mae Hong Son Province, 30.III.2003; 1 ♀, Thailand, Mae Hong Son Province, 23.IV.2003; 1 ♀, Thailand, Mae Hong Son Province, IX.2003; all in SMF.

#### Morphological examination

Morphological examinations were conducted using a NIKON SMZ-1270 stereomicroscope and the methods proposed by WANKE et al. (2019, 2021) and MÜLLER et al. (2024). Stridulatory organs and genitalia were exposed by using a scalpel and micro scissors. Spermathecae were boiled in 20% lactic acid (2-hydroxypropionic acid) for around 10 minutes to remove surrounding tissue (VON WIRTH 2006; VON WIRTH & HILDEBRANDT 2023).

Photographs of diagnostic characters were made using a Keyence VHX-5000 digital microscope or a Nikon SMZ-18 stereo microscope equipped with a 3.0 USB 20 MP C-mount Touptek microscope camera. Documentation of the prolateral surface of the palpal coxa was taken from the left palpus unless damaged or incomplete.

Measurements were made using a digital caliper with a resolution of 0.01 mm and an accuracy of  $\pm 0.03$  mm. Measurements were rounded to one decimal place. The Leg Relation Factor (RF) was calculated based on the method published by VON WIRTH & STRIFFLER (2005).

### Taxonomy

#### Mygalomorphae Pocock, 1892 Theraphosidae Thorell, 1869 Ornithoconinae Pocock, 1895

##### Included genera

*Aspinochilus* **gen. n.**; *Citharognathus* Pocock, 1895; *Cyriopagopus* Simon, 1887; *Lampropelma* Simon, 1892; *Melognathus* Chamberlin, 1917; *Omothymus* Thorell, 1891; *Ornithoconus* Pocock, 1892; *Phormingochilus* Pocock, 1895; *Taksinus* Songsangchote, Sippawat, Khaikaw & Chomphuphuang, 2022.

#### *Aspinochilus* **gen. n.**

Type species: *Aspinochilus rufus* **gen. et sp. n.**

##### Etymology

The name “*Aspinochilus*” (gender: masculine) refers to the lack of tibial spination, which distinguishes the type species *A. rufus* **sp. n.** from other genera within this subfamily, and to the close relationship with the genus *Phormingochilus*.

##### Diagnosis

*Aspinochilus* **gen. n.** differs from other genera of the subfamily Ornithoconinae by the absent or very sparse (at most only 1 spine on a single tibia of the palps or legs) spination of the tibiae of the palps and legs I–IV in both males and females. Furthermore, females of *Aspinochilus* **gen. n.** can be distinguished from female *Citharognathus* by the absence of incrassate tibiae and metatarsi IV (Fig. 2). Females can be distinguished from female *Cyriopagopus* and *Ornithoconus* by the low caput and clypeus narrower than width of median ocular quadrangle (Fig. 2), as well as by the clearly divided spermatheca with twin seminal receptacles (Fig. 14) (SMITH & JACOBI 2015; SONGSANGCHOTE et al. 2022). The new genus can be distinguished from *Taksinus* by the absence of tibial spines at the apex of the segments of the palps and legs I–IV. Furthermore, the RF of *T. bambus* has a value of around 90 (SONGSANGCHOTE et al. 2022), indicating noticeably longer hindlegs than in *A. rufus* **sp. n.**, where a value around 100 was measured. Females of the new genus can be distinguished from females of the genera *Lampropelma*, *Omothymus* and *Phormingochilus* by the absence of combs of spines at the apex of tibia I (Figs. 29–30).

##### Distribution

Only known from the type locality of the type species in Indonesia, East Java, at Argopuro Mountain.

#### *Aspinochilus rufus* **sp. n.**

(Figs. 1–4, 9–18, 29, 30; Tables 1–2)

##### Type material

**Holotype** ♂: Indonesia, East Java, Argopuro Mountain, 900 m, [8.061111°S, 113.527222°E], XII.2022, SMNS-Aran-004012 (SMNS).

**Paratypes** (same locality data as holotype; all SMNS except where stated otherwise): 3 ♂, 8 ♀, 24.X.2015, (♂) SMNS-Aran-003476 (to be deposited in SMNK), SMNS-Aran-004005 (to be deposited in SMF), SMNS-Aran-004006 (to be deposited in MBBJ), (♀) SMNS-Aran-003477, SMNS-Aran-004286, SMNS-Aran-004001, SMNS-Aran-004002 (to be deposited in MBBJ), SMNS-Aran-004003 (to be deposited in SMNK), SMNS-Aran-004004 (to be deposited in SMF), SMNS-Aran-004007, SMNS-Aran-004008; 1 ♂, 14.IX.2022, SMNS-Aran-004009; 1 ♂, 31.VII.2021, SMNS-Aran-004010; 1 ♂, IX.2021, SMNS-Aran-004011; 1 ♀, 2020, SMNS-Aran-004316 (to be deposited in ZMHB); 1 ♂, 2020, SMNS-Aran-004317 (to be deposited in ZMHB).

**Remarks.** Specimens collected in 2015 originated from the type locality, while the others were bred from specimens from the type locality. In bred specimens, the date marks the date of preservation.

##### Etymology

The specific epithet “*rufus*” refers to the distinctive red color of the body, especially in females.

**Table 1.** *Aspinochilus rufus* gen. et sp. n., holotype ♂ (SMNS-Aran-004012), measurements of leg segments (in mm).

Holotype ♂	palp	I	II	III	IV
Femur	6.3	11.2	9.5	8.5	10.9
Patella	3	4.2	4.8	3.4	3.6
Tibia	5.6	9.9	8.7	6.7	9.5
Metatarsus	x	8.6	7.5	6.7	9.7
Tarsus	3.4	6.1	5.1	4.6	5.2
Total	18.3	31.4	28.1	23.2	29.2

**Table 2.** *Aspinochilus rufus* gen. et sp. n., paratype ♀ (SMNS-Aran-004001), measurements of leg segments (in mm).

Paratype ♀	palp	I	II	III	IV
Femur	10.4	13.1	11.8	9.3	11.6
Patella	5.6	6.9	6.7	5.1	6.3
Tibia	6.4	10.9	10.3	7	10.4
Metatarsus	x	8.5	9.3	6.9	11.5
Tarsus	6.6	6.8	6	5.7	6.2
Total	29	46.2	44.1	34	46

### Diagnosis

See generic diagnosis.

### Description

Holotype ♂ (SMNS-Aran-004012). Total length (including chelicera, excluding spinnerets): 26.9 mm. Carapace: 11.3 mm (length), 10.1 mm (width), caput profile low, not elevated above carapace surface. Ocular tubercle 2.6 mm (width); clypeus absent. Fovea straight to slightly procurved and narrow, width: 1.3 mm. Sternum: 5.5 mm (length), 5.0 mm (width), with three pairs of sternal sigilla and two adjacent mounds at the labiosternal suture. RF = 107. Legs: I, IV, II, III, moderately large, legs I and IV almost equal in length. Spination: apex of tibiae of legs I, II, III and IV without spines; apex of metatarsi III and IV with three ventral (1 m, 1 pv, 1 rv) and two dorsal (1 pd, 1 rd) spines. Tibial apophysis (pv) on leg I present (Figs. 17, 18). Stridulatory organ on prolateral face of palpal coxa consisting of two rows with a total of 11 spines almost parallel to the suture (Fig. 16); 5 additional spines above the suture in one row parallel to the suture.

Coloration. Specimen of an indistinct pale brownish coloration, with indistinct fishbone patterns, less prominent than those observed in the female (compare Figs. 1 and 2).

Genitalia. Palpal bulb slender and twisted, embolus slightly curved inwards, with no apical swelling or pointed apex (Figs. 9–13).

Paratypes (♂♀). Total length (including chelicera, excluding spinnerets): 27.9–38.8 mm in males; 37.9–57.5 mm in females. Carapace: 11.3–15.0 mm (length) x 11.0–13.3 mm (width) in males, 15.9–21.3 mm (length) x 12.8–16.0 mm (width) in females; caput profile low in both sexes. Ocular tubercle: 2.6–3.3 mm width in males, 3.1–3.9 mm width in females; clypeus absent in both sexes. Fovea straight to slightly procurved and narrow, 1.3–1.8 mm width in males, 1.8–3.8 mm width in females. Sternum length: 5.3–7.4 mm in males, 6.3–10.0 mm in females; sternum 4.2–6.2 mm in males (width), 5.8–8.1 mm in females (width); with three pairs of sternal sigilla and two adjacent mounds at the labiosternal suture in both sexes. RF = 100. Legs: (I–IV) II, III/I, IV, II, III, moderately large, legs I and IV almost equal in length. Apex of tibiae of legs I, II, III and IV without spines. Spination: apex of metatarsi III with two ventral (1 m, 1 pv) spines in both sexes; apex of metatarsi IV with two ventral (1 m, 1 pv) spines, one additional retroventral spine observed in two male specimens. Stridulatory organ on prolateral face of palpal coxa consisting of two rows with a total of 12–15 spines almost parallel to the suture in both sexes; 5–7 additional spines above the suture in one row parallel to the suture in both sexes.

Coloration. Sexual dichromatism observable. Female body reddish-brown, with femora covered with hairs of an intensive red colour; abdomen with a clear fishbone pattern and carapace pale with radial stripes (Fig. 2). In alcohol, the coloration of males is indistinctive brown. Sexual dichromatism is observable, with males exhibiting less defined fishbone patterns than females. In alcohol, the coloration of specimens is indistinctive brown.

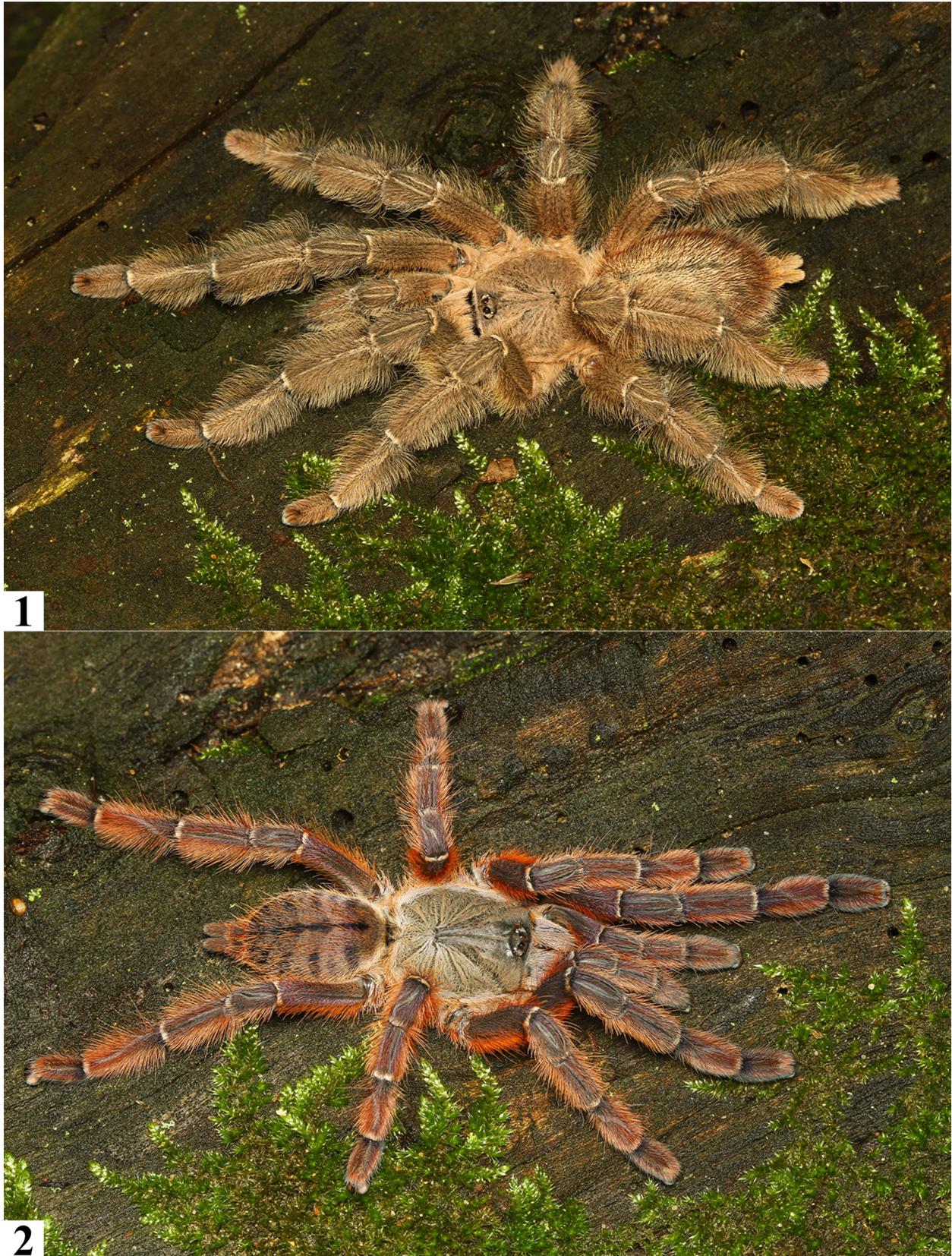
Genitalia. Female: spermatheca clearly divided into two drumstick-shaped seminal receptacles, with an apical swelling (Fig. 14). Male genitalia as in holotype.

### Biology

Juvenile specimens were found both near the roots and higher up in trees, building silken tubes inside the root network. The tubes were well camouflaged and covered with soil, leaves and mosses. Adult females were found in tree hollows or branch forks at heights of around two meters. At night, the spiders are easier to locate using a powerful flashlight, though they often retreat into their burrows upon disturbance. These observations were made by FRANK SCHNEIDER during specimen collection.

### Habitat

Mount Argopuro (3,088 m; 10,131 ft.) is a stratovolcano complex located in East Java, Indonesia. The area surrounding the mountain is constituted of rough landscape



**Figs. 1–2.** *Aspinochilus rufus* gen. et sp. n. in its natural habitat. 1. Male. 2. Female. (Photos: FRANK SCHNEIDER)



**Figs. 3–4.** *Aspinochilus rufus* gen. et sp. n., type locality. **3.** Habitat at Mount Argopuro (photo: FRANK SCHNEIDER). **4.** Entrance of silken tube on the side of a fallen tree (photo: NOORMA INDRA).



**Figs. 5–6.** *Phormingochilus hatihati* sp. n. in its natural habitat. 5. Male. 6. Female. (Photos: FRANK SCHNEIDER)



**Figs. 7–8.** *Phormingochilus hatihati* sp. n., type locality. 7. Habitat near Tammajarra. 8. Entrance of silken tube on the side of a living tree. (Photos: NOORMA INDRA)

and primary montane rainforest (Figs. 3, 4). Due to deforestation and agricultural cultivation, the habitat of this species is strongly threatened. It is therefore more urgent than ever to describe the unknown biodiversity of this region, as only then it can contribute to informing conservation measures aimed at counteracting the habitat loss.

#### Distribution

Mount Argopuro, East Java, Indonesia.

#### Remark

This species is already widespread in the tarantula community, as it is known to be easy to rear in captivity.

### *Phormingochilus Pocock, 1895*

*Phormingochilus* Pocock, 1895: 180 (type species: *Phormingochilus everetti* Pocock, 1895; gender masculine; Indonesia). References: STRAND (1906: 6; description of *Phormingochilus fuchsi* Strand, 1906 [Sumatra]); SMITH (1986: 107; identification key for *Ornithoctoninae*); SMITH (1994: 19; redescription of *Phormingochilus tigrinus* Pocock, 1895); SCHMIDT (2003: 253; identification key for *Ornithoctoninae*); SCHMIDT & BARENSTEINER (2015: 4–9; description of *Lampropelma nigerrimum arboricola* Schmidt & Barensteiner, 2015 [unknown]); SMITH & JACOBI (2015: 30; revision of the genus *Phormingochilus* and description of *Phormingochilus pennellhewlettorum* Smith & Jacobi, 2015 [as “*pennellhewletti*”, see WORLD SPIDER CATALOG 2024]); GABRIEL & SHERWOOD (2019: 141; transfer of *Lampropelma nigerrimum arboricola* Schmidt & Barensteiner, 2015).

#### Remarks

The genus *Phormingochilus* was described by POCOCK (1895) based on the type species *Phormingochilus everetti* Pocock, 1895. POCOCK (1895) described *Phormingochilus tigrinus* Pocock, 1895 as a new species for this genus. SMITH & JACOBI (2015) described *Phormingochilus pennellhewlettorum*. GABRIEL & SHERWOOD (2019) raised the subspecies *Lampropelma nigerrimum arboricola* to species rank and transferred it to *Phormingochilus*. The validity of the genus was questioned by SMITH & JACOBI (2015), who stated that it could be a synonym of *Omothymus*.

POCOCK (1895) separated the genus *Phormingochilus* from *Omothymus* by the shape of the sternum, which, according to POCOCK, should be narrowed anteriorly in *Phormingochilus* but oval and as wide between the first as between the third pair of legs in *Omothymus*. According to our investigations, no clear differences could be observed among specimens of both genera regarding this feature.

### *Phormingochilus hatihati* sp. n.

(Figs. 5–8, 19–28, 31, 32; Tables 3–4)

#### Generic placement

The comb of spines at the apex of tibia I distinguishes females of *P. hatihati* sp. n. (Figs. 31, 32) from

**Table 3.** *Phormingochilus hatihati* sp. n., holotype ♂ (SMNS-Aran-004051), measurements of leg segments (in mm).

Holotype ♂	palp	I	II	III	IV
Femur	8.3	13.9	12.6	10.3	13.3
Patella	3.8	5.6	5.5	5.4	5.4
Tibia	8.2	12.8	9.8	8.3	11.8
Metatarsus	x	10.5	9	9	12
Tarsus	2.9	6.9	6.5	6.6	6.8
Total	23.2	49.7	43.4	39.6	49.3

**Table 4.** *Phormingochilus hatihati* sp. n., paratype ♀ (SMNS-Aran-004053), measurements of leg segments (in mm).

Paratype ♀	palp	I	II	III	IV
Femur	10.2	15.7	14.1	12.7	14.1
Patella	5.6	8.3	7.5	5.8	6.2
Tibia	7.3	12.7	11.1	9.2	12.1
Metatarsus	x	9.7	8.6	7.9	12.8
Tarsus	8.7	7.7	7.6	7.9	7.8
Total	31.8	54.1	48.9	43.5	53

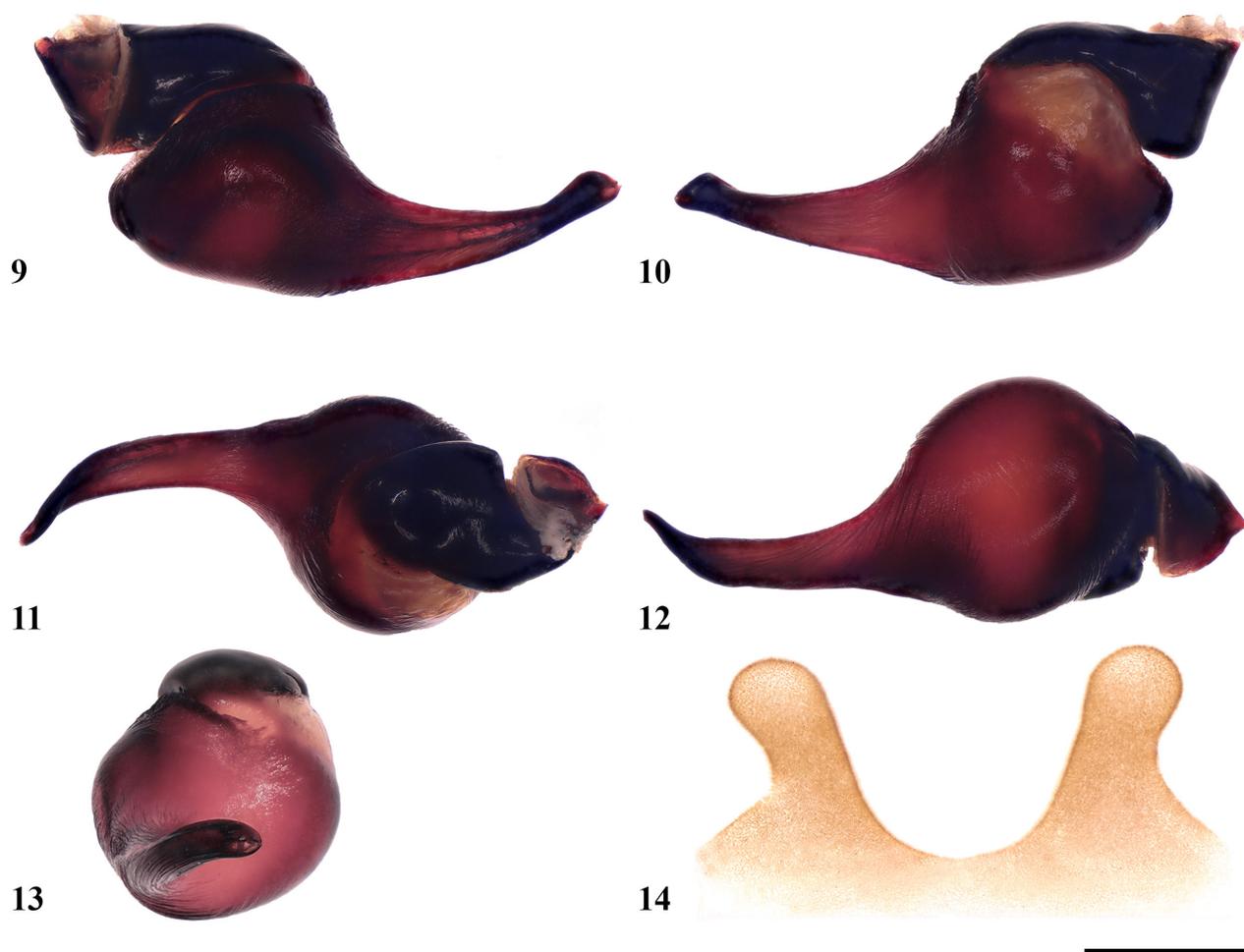
those of *Aspinochilus* gen. n. *Phormingochilus hatihati* sp. n. could be assigned to any one of the arboreal genera *Lampropelma*, *Omothymus* or *Phormingochilus* by having clypeus small, leg IV not incrassate (Fig. 6) and spermatheca clearly divided into two seminal receptacles (Fig. 24) (SCHMIDT 2003). However, it can be excluded from *Lampropelma* and *Omothymus* by the absence of an apical swelling and the absence of a pointed apex on the male palpal bulb (Figs. 19–23), and must therefore be assigned to the genus *Phormingochilus* (see GABRIEL & SHERWOOD 2019).

#### Taxonomic remark

The applicability of characters for the delineation of the tree-dwelling genera *Lampropelma*, *Omothymus* and *Phormingochilus* needs to be re-evaluated, as a high degree of morphological similarity between the three genera suggests a closer relationship than previously assumed. Due to this high morphological similarity, the relationship between these three genera must be investigated within the framework of a comprehensive molecular analysis of the entire subfamily, which is beyond the scope of the present work but already in preparation.

#### Type material

Holotype ♂: Indonesia, West Sulawesi, Tammajarra, Polewali Mandar [3.4825°S, 119.031944°E], 28.XII.2021, SMNS-Aran-004051 (SMNS).



**Figs. 9–14.** *Aspinochilus rufus* gen. et sp. n., genitalia. 9–13. Holotype ♂ (SMNS-Aran-004012). – 9. Palpal bulb, pl. 10. Palpal bulb, rl. 11. Palpal bulb, d. 12. Palpal bulb, v. 13. Palpal bulb, a. 14. Female paratype (SMNS-Aran-004001); spermatheca, d. Scale bar: 1 mm.

**Paratypes** (all SMNS except where stated otherwise): 1 ♂, SMNS-Aran-004033; 1 ♂, SMNS-Aran-004034 (to be deposited in MBBJ); 1 ♂, 12.V.2020, SMNS-Aran-004035 (to be deposited in SMF); 1 ♂, 31.VII.2020, SMNS-Aran-004054 (to be deposited in ZMHB); 1 ♀, 2018, SMNS-Aran-004052; 1 ♀, 31.VII.2020, SMNS-Aran-004053; 1 ♂, 2022, SMNS-Aran-004036; 5 ♂, 2013, SMNS-Aran-004280, SMNS-Aran-004281, SMNS-Aran-004282 (to be deposited in SMNK), SMNS-Aran-004283, SMNS-Aran-004284, 1 ♀, SMNS-Aran-004285; 1 ♀, 2023, SMNS-Aran-004042 (to be deposited in SMF).

**Remarks.** All specimens originated from the type locality or were bred from specimens from the type locality. In bred specimens, the date marks the date of preservation.

#### Etymology

The specific epithet “*hatihati*” (a noun in apposition) refers to the general Indonesian translation of the word “caution”, as found in dictionaries.

#### Description

**Holotype** ♂ (SMNS-Aran-004051). Total length (including chelicera, excluding spinnerets): 37.6 mm. Carapace: 14.9 mm (length), 13.6 mm (width), caput profile low. Ocular tubercle: 3.3 mm (width); clypeus absent. Fovea straight to slightly procurved and narrow: 1.5 mm (width). Sternum: 7.2 mm (length), 6.9 mm (width), with three pairs of sternal sigilla and two adjacent mounds at the labiosternal suture. Legs: RF = 100. (I–IV)II, III; moderately large, legs I and IV almost equal in length. Legs with moderate spination: apex of tibiae II, III and IV armed with a pair of spines (1 pv, 1 rv); apex of metatarsi III and IV with three ventral (1 m, 1 pv, 1 rv) and two dorsal (1 pd, 1 rd) spines, apex of tibia I with a tibial apophysis (pv) and one rv spine (Figs. 27, 28). Stridulatory organ on the prolateral face of the palpal coxa consisting of two rows with a total of 11 spines parallel to the suture; with six additional spines above the suture (Fig. 26).

**Coloration.** Hairs on legs and abdomen of a less intense blackish coloration than in females; faint fishbone patterns on the abdomen (see Fig. 5). In alcohol, the coloration is an indistinct brown.

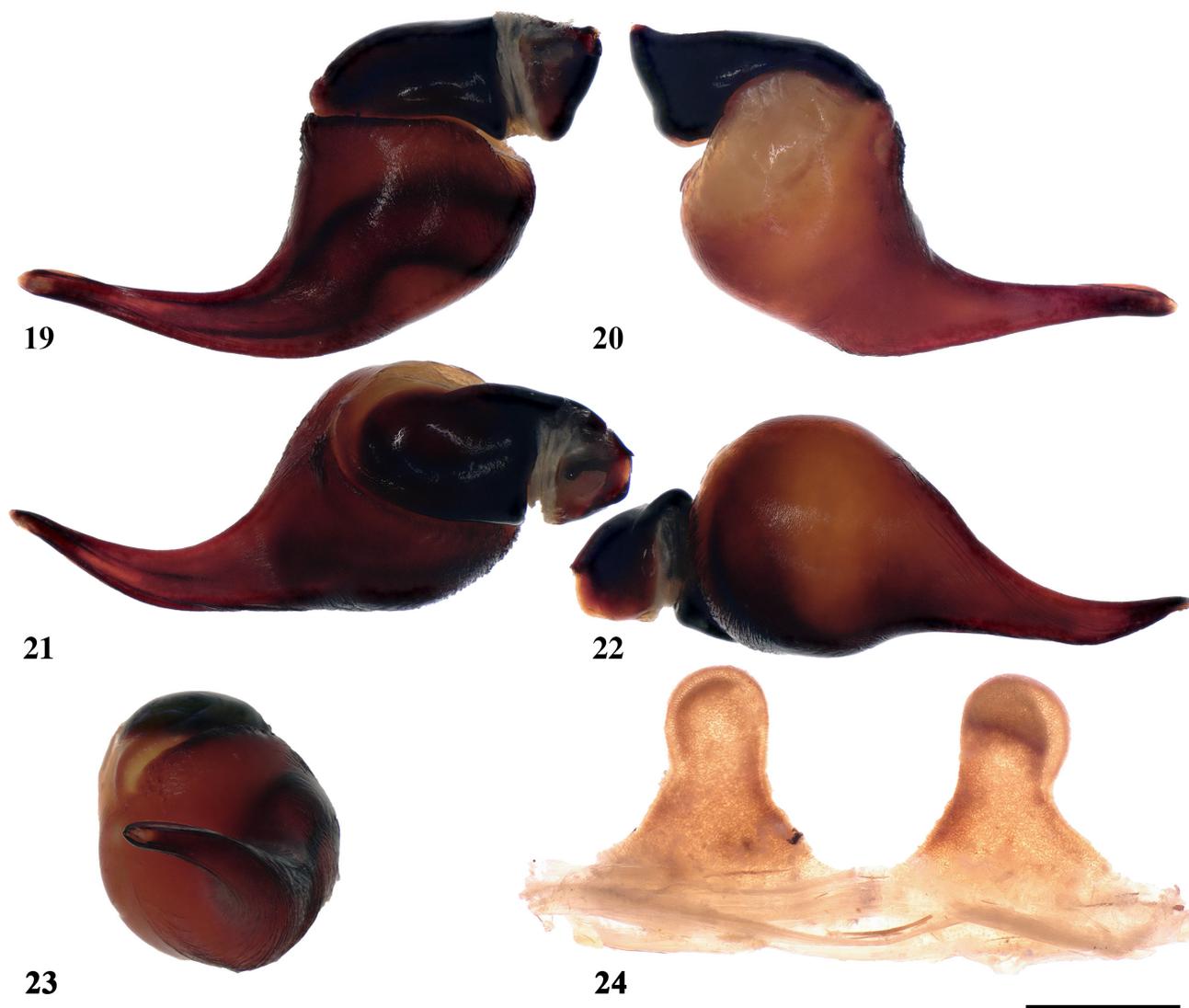
**Genitalia.** Palpal bulb slender and twisted, embolus slightly curved inwards, without an apical swelling or pointed apex (Figs. 19–23).

**Paratypes** (♂♀). Total length (including chelicera, excluding spinnerets): 29.0–37.6 mm in males, 31.7–53.5 mm in females. Carapace: 9.9–13.6 mm (length) x 11.5–16.1 mm (width) in males, 13.8–21.2 mm (length) x

12.9–17.4 mm (width) in females; caput profile low in both sexes. Ocular tubercle: 2.4–3.3 mm (width) in males, 3.3–3.8 mm (width) in females; clypeus absent in both sexes. Fovea straight to slightly procurved and narrow, 0.8–1.5 mm wide in males, 1.2–2.3 mm wide in females. Sternum length: 5.5–7.5 mm in males, 6.8–11.2 mm in females; sternum width 4.1–6.9 mm in males, 5.5–7.5 mm in females; with three pairs of sternal sigilla and two adjacent mounds at the labiosternal suture in both sexes. Legs: (I=IV) II, III / I, IV, II, III, moderately large, legs I and IV almost equal in length. RF = 100 (99–106). Legs with



**Figs. 15–18.** *Aspinochilus rufus* gen. et sp. n., holotype ♂ (SMNS-Aran-004012). 15. Chelicera, rl. 16. Palpal coxa, pl. 17. Tibial apophysis, v. 18. Tibial apophysis, pl. Scale bars: 1 mm.



**Figs. 19–24.** *Phormingochilus hatihati* sp. n., genitalia. 19–23. Holotype ♂ (SMNS-Aran-004051). – 19. Palpal bulb, pl. 20. Palpal bulb, rl. 21. Palpal bulb, d. 22. Palpal bulb, v. 23. Palpal bulb, a. 24. Female paratype (SMNS-Aran-004053); spermatheca d. Scale bar: 1 mm.

moderate spination: apex of tibiae II, III and IV with a pair of spines (1 pv, 1 rv) in both sexes; apex of metatarsi III and IV with three ventral (1 m, 1 pv, 1 rv) and two dorsal (1 pd, 1 rd) spines in both sexes; apex of tibia I with 1 pv tibial apophysis and 1 rv spine in males; with 3–5 pv and 2 rv spines in females. Stridulatory organ on pro-lateral face of palpal coxa consisting of two parallel rows below the suture with a range of 7–12 spines in both sexes; 5–9 additional spines above the suture and scattered on the whole surface in both sexes.

**Coloration.** Sexual dichromatism observable. In females, the legs and abdomen are dark greyish except for blackish femora; abdomen with a clear fishbone pat-

tern and carapace pale with radial stripes (Fig. 6). In male, hairs on legs and abdomen of a less intense blackish coloration, with less clear abdominal fishbone patterns in the females (Fig. 5).

**Genitalia.** Female: spermatheca clearly divided into two drumstick-shaped seminal receptacles, with an apical swelling (Fig. 24).

#### Diagnosis

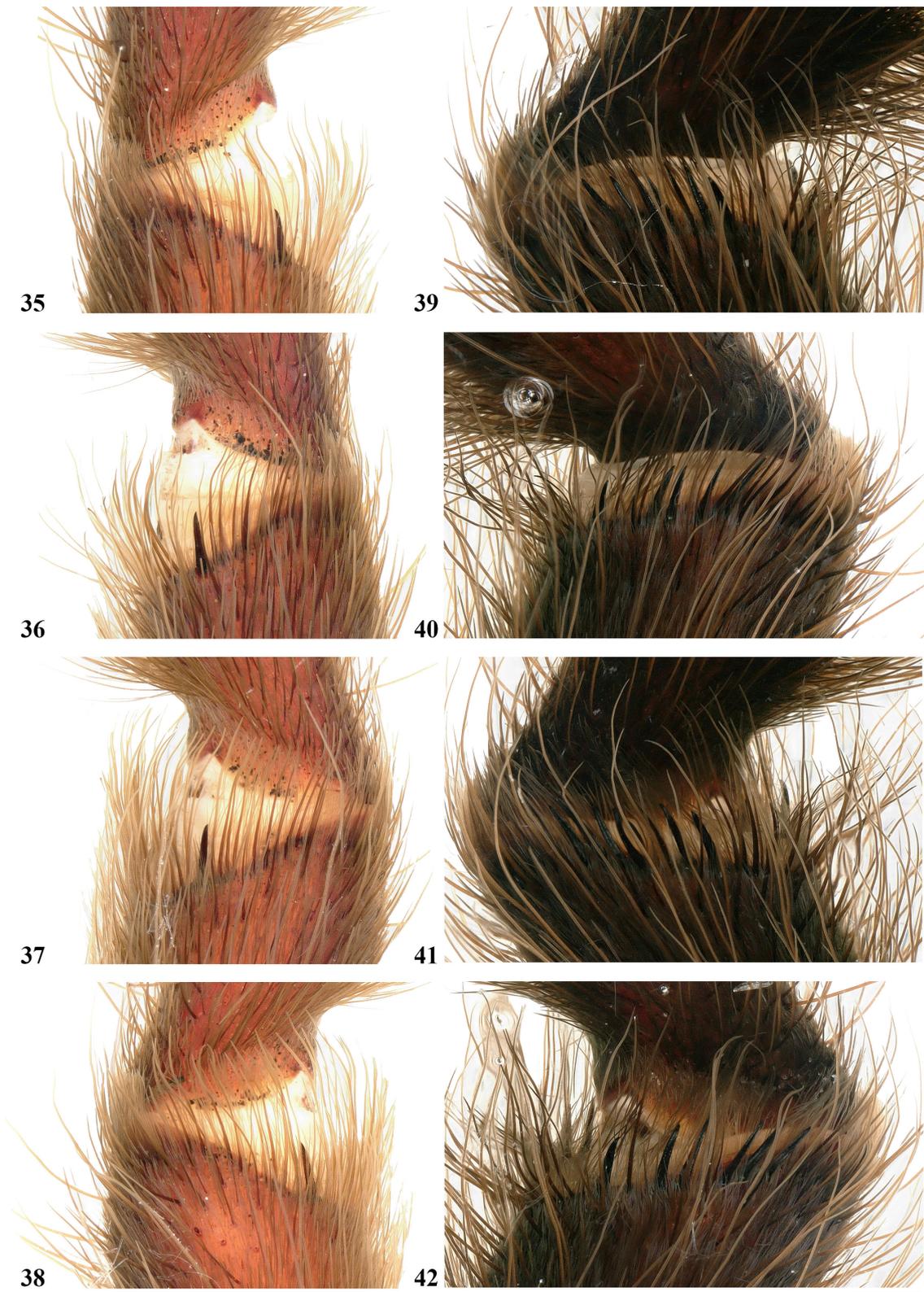
Females of *Phormingochilus hatihati* sp. n. can be distinguished from those of *P. everetti* by the absence of combs of spines at the apex of tibiae III and IV (Figs. 35–42). Males of *P. hatihati* sp. n. can be distinguished from those



**Figs. 25–28.** *Phormingochilus hatihati* sp. n., holotype ♂ (SMNS-Aran-004051). 25. Chelicera, rl. 26. Palpal coxa, pl. 27. Tibial apophysis, v. 28. Tibial apophysis, pl. Scale bars: 1 mm.



**Figs. 29–34.** *Aspinochilus* and *Phormingochilus* spp. **29, 30.** *Aspinochilus rufus* gen. et sp. n. (paratype; SMNS-Aran-004001). – **29.** Tibia I, rl. **30.** Tibia I, pl. **31, 32.** *Phormingochilus hatihati* sp. n. (paratype; SMNS-Aran-004053). – **31.** Tibia I, rl. **32.** Tibia I, pl. **33, 34.** *Phormingochilus everetti* Pocock, 1895 (SMNS-Aran-004016). – **33.** Tibia I, rl. **34.** Tibia I, pl. Scale bar: 1 mm.



**Figs. 35–42.** *Phormingochilus* spp. **35–38.** *Phormingochilus hatihati* sp. n. (paratype; SMNS-Aran-004053). – **35.** Tibia III, pl. **36.** Tibia III, rl. **37.** Tibia IV, pl. **38.** Tibia IV, rl. **39–42.** *Phormingochilus everetti* Pocock, 1895 (SMNS-Aran-004016). – **39.** Tibia III, pl. **40.** Tibia III, rl. **41.** Tibia IV, pl. **42.** Tibia IV, rl. Scale bar: 1 mm.

of *P. everetti* by the absence of a ventral angular mound on the palpal bulb, which forms a notch at the base of the embolus (Figs. 19–23). *Phormingochilus pennellhewlettorum* was described as a new species mainly based on coloration patterns. The distinct pale band at the apex of all leg segments mentioned by SMITH & JACOBI (2015) is absent in *P. hatihati* sp. n. and is therefore seen as a feature distinguishing these two species. Furthermore, males of *P. pennellhewlettorum* have an additional rv spine on the apex of tibia I, which is absent in *P. hatihati* sp. n. males. Further investigation of the morphology of *P. pennellhewlettorum* is required to improve the delineation from its congeners. *Phormingochilus hatihati* sp. n. can be distinguished from *P. arboricola* by the absence of a comb of spines at the apex of metatarsi III and IV. *Phormingochilus hatihati* sp. n. can be distinguished from *P. tigrinus* Pocock, 1895 by the presence of one pl and one rl spine at the apex of the tibia of the palps in females, where *P. tigrinus* only has one pl spine. Further morphological investigations of *P. tigrinus* Pocock, 1895 are required to assess its delineation.

#### Biology

Adults were found by FRANK SCHNEIDER in knotholes or forks in trees (Figs. 7, 8). After hatching, the juveniles disperse throughout the tree and are easy to recognize due to their light-colored appearance. However, many of them also prefer to stay close to the ground for several molts, moving to a different tree as adults.

#### Habitat

The specimens were found in secondary lowland rainforests and mango plantations on the outskirts of Tammajarra (Figs. 7, 8).

#### Distribution

Only known from the type locality in Tammajarra, Polewali Mandar, West Sulawesi, Indonesia.

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