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A survey of the Sumatran Ctenidae (Araneae). 3. *Amauropelma mariae* sp. n., one of the tiniest species of the genus

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Abstract

A new species, *Amauropelma mariae* **sp. n.**, is described from Sumatra Island (Indonesia) on the basis of both sexes. The new species is illustrated and described in detail. The distribution map of all known *Amauropelma* species based on new and literature-derived records is given.

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

Introduction

The Ctenidae family, commonly referred to as tropical wolf spiders or wandering spiders, represents a diverse group, comprising 604 species across 48 genera globally (World Spider Catalog 2024). This family is most diverse in the Neotropical Realm but is also found in various tropical regions worldwide. Ctenids employ a nocturnal, free-roaming hunting strategy, without the use of webs for prey capture.

This work constitutes the third in a series of articles dedicated to the ctenids of Sumatra Island. The first paper focuses on the genus *Acantheis* Thorell, 1891 (Fomichev *et al.* 2023) and the second on *Bowie* Jäger, 2022 (Omelko & Fomichev 2023). To date, only 14 ctenid species have been known from Sumatra Island (World Spider Catalog 2024), belonging to three genera: *Acantheis* Thorell, 1891; *Anahita* Karsch, 1879, and *Bowie* Jäger, 2022.

Amauropelma Raven, Stumkat & Gray, 2001, with 28 named species (World Spider Catalog 2024), is the fourth-largest genus of Ctenidae, after *Ctenus* Walckenaer, 1805, *Bowie* Jäger, 2022 and *Anahita* Karsch, 1879 (157, 115 and 34 species, respectively). *Amauropelma* was described and revised by Raven *et al.* (2001) for 16 species from northern Australia (Queensland). Later, several species of the genus were described from India and Laos (Jäger 2012), one troglobitic species from Indonesia (Miller & Rahmadi 2012), three species from Thailand (Chu *et al.* 2022a), and two from southern China (Lin *et al.* 2022, Chu *et al.* 2022b). Thus, all species of the genus are restricted to only two biogeographic realms: Australasian (16 species) and Indomalayan (12 species). Ten species of *Amauropelma* are known from a single sex; seven species are described based on males, and three based on females. Almost all species (27 out of 28) are known only from the original descriptions.

While studying ctenids collected in Sumatra in 1988 by an unknown collector, we found a species belonging to *Amauropelma* that does not conform to any known species. The main goal of the present paper is to describe this new species.

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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 ethanol, with soft white paper or cotton at the bottom. Digital images were montaged using Zerene Stacker (https://zerenesystems.com/cms/stacker) software package. Epigyne was 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 a single specimen. 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 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: ALE—anterior lateral eye, AME—anterior median eye, *Cn*—conductor, *CO*—copulatory opening, d—dorsal, *Em*—embolus, *EE*—embolic extension, *EP*—epigynal plate, *IF*—internal fold, *FD*—fertilization duct, Fe—femur, *LM*—lateral margin, *LT*—lateral tooth, Mt—metatarsus, p—prolateral, Pa—patella, PLE—posterior lateral eye, *PCB*—prolateral cymbial bulge, PME—posterior median eye, r—retrolateral, *RTA*—retrolateral tibial apophysis, *SD*—sperm duct, *Re*—receptacle, *Te*—tegulum, *TA*—tegular apophysis, Ti—tibia, v—ventral, *VTA*—ventral tibial apophysis.

Taxonomy

Family Ctenidae Keyserling, 1877

Genus *Amauropelma* Raven, Stumkat & Gray, 2001

Type species. *Amauropelma trueloves* Raven & Stumkat, 2001, from Australia.

Amauropelma mariae sp. n.

Figs 1–20

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

Etymology. The specific name is a matronym in honor of Maria M. Omelko (Vladivostok, Russia), an elder daughter of the senior author on the occasion of her 10th anniversary.

Diagnosis. Males of the new species might be easily distinguished from most congeners, except *A. saraburi* Li & Yao, 2022, *A. anzses* Raven & Stumkat, 2001, *A. monteithi* Raven & Stumkat, 2001, and *A. mossman* Raven & Stumkat, 2001 by the very short retrolateral tibial apophysis (*RTA*) (length ca. 1/5 of tibia width vs. 1/3–1/2). *Amauropelma mariae* **sp. n.** differs from the *A. saraburi* and *A. anzses* by the absence of retro-proximal cymbial outgrowth (vs. presence; cf. fig. 6 and 6b in Chu *et al.* 2022b, and fig. 9b in Raven *et al.* 2001); from *A. monteithi* and *A. mossman* by single tip of *RTA* (vs. bifurcated; cf. fig. 6 and figs 22d, 24d in Raven *et al.* 2001).

By general shape of its epigyne, the female of *Amauropelma mariae* **sp. n.** is similar to several Australian species such as *A. claudie* Raven & Stumkat, 2001, *A. leo* Raven & Stumkat, 2001, *A. monteithi* Raven & Stumkat, 2001, *A. mossman* Raven & Stumkat, 2001, *A. pineck* Raven & Stumkat, 2001, *A. torbjorni* Raven & Gray, 2001, *A. trueloves* Raven & Stumkat, 2001, and *A. wallaman* Raven & Stumkat, 2001. It is also similar to *A. annegretae* Jäger, 2012, known from Laos. The new species can be distinguished from all of those species except *A. claudie* and *A. leo* by the distance between the tips of the lateral teeth (*LT*) being greater than the width of the epigynal plate (vs. shorter). *A. mariae* **sp. n.** might be further differentiated from the two latter species by the straight anterior edge of its epigyne (vs. concave).

Description. Male (Figs 1–2), holotype. Total length 4.06. Carapace 2.17 long, 1.65 wide. Opisthosoma 1.85 long, 1.17 wide. Carapace light brown with dark brown edges, median band almost invisible. Lateral bands yellowish. Fovea thin, brown. Chelicerae light brown with 3 promarginal and 4 retromarginal teeth. Sternum light brown without pattern. Labium and maxillae light brown. Dorsum of opisthosoma grayish with a pattern consisting of yellow cardiac mark, a pair of longitudinal stripes next to it and series of transversal stripes. Lateral sides of abdomen yellow brown with light gray spots. Venter of opisthosoma yellow with indistinct grayish spots. Spinnerets light brown.

Eye diameters: AME 0.11, ALE 0.10, PME 0.14, PLE 0.13; interdistances: AME–AME 0.03, AME–ALE 0.07, PME–PME 0 (eyes touching each other), PME–PLE 0.11, AME–PME 0.02, ALE–PLE 0.03. Clypeus height at AME 0.05, at ALE 0.13.

For palp and leg measurements see Table 1. Palp joints light brown, cymbium somewhat darker than other segments. Segments of legs light brown (metatarsi III–IV slightly darker than other joints), without annulation. For palp and leg spination see Table 2.

TABLE 1. Palp and legs measurements of male of *Amauropelma mariae* **sp. n.**

	Fe	Pa	Ti	Mt	Tr	Total
Palp	0.79	0.34	0.40	-	0.84	2.37
Leg I	1.84	0.83	1.78	1.33	0.84	6.62
Leg II	1.54	0.77	1.42	1.24	0.69	5.66
Leg III	1.51	0.62	1.18	1.32	0.72	5.35
Leg IV	1.98	0.80	1.95	1.92	0.90	7.55

TABLE 2. Legs spination of male of *Amauropelma mariae* **sp. n.**

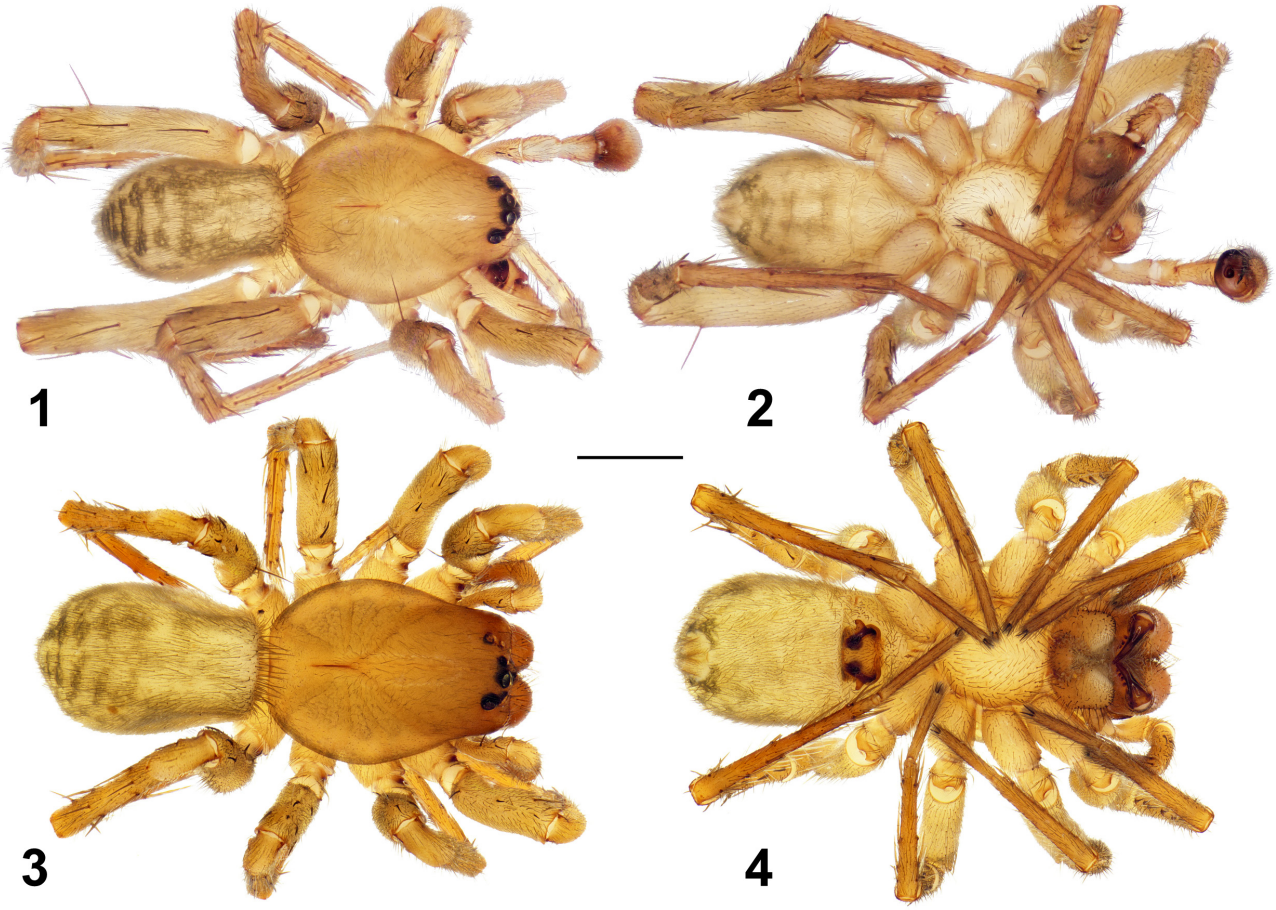
	Fe	Pa	Ti	Mt
Leg I	3d 2p	0	1p 2-2-2-2-2v	2-2-2v
Leg II	3d 1p 1(0)r	0	1p 2-2-2-2-2v	1p 2-2-2v
Leg III	3d 3p 1r	1r	2d 2p 2r 2-2-2v	4p 4r 2-2-2v
Leg IV	3d 3p 2r	1r	2d 2p 2r 2-2-2v	4p 5r 2-1-1-2v

TABLE 3. Palp and legs measurements of female of *Amauropelma mariae* **sp. n.**

	Fe	Pa	Ti	Mt	Tr	Total
Palp	0.86	0.45	0.59	-	0.73	2.63
Leg I	1.78	0.81	1.66	1.22	0.66	6.13
Leg II	1.75	0.87	1.55	1.19	0.68	6.04
Leg III	1.48	0.74	1.37	1.34	0.73	5.66
Leg IV	2.06	0.85	1.98	2.14	1.02	8.05

TABLE 4. Legs spination of female of *Amauropelma mariae* **sp. n.**

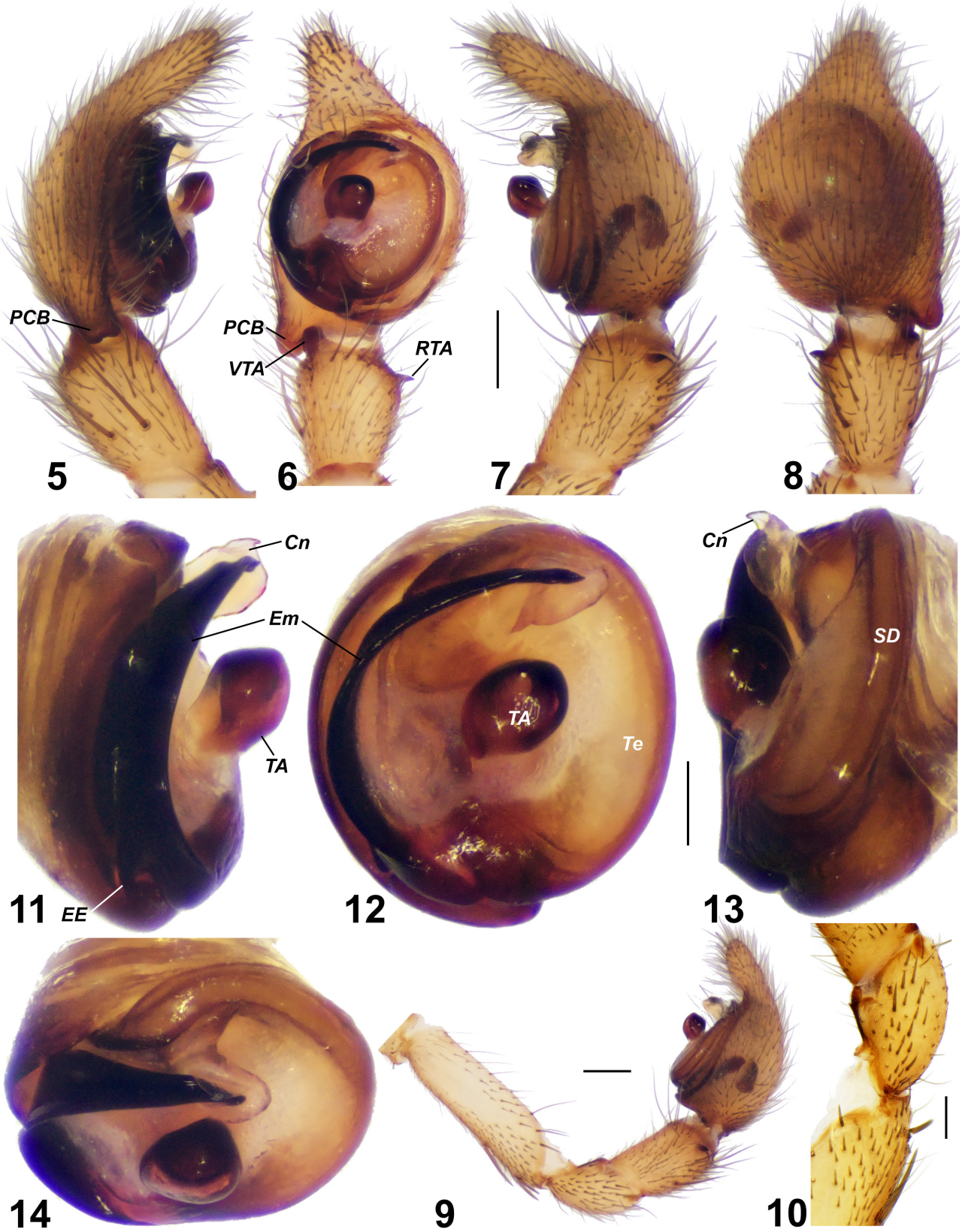
	Fe	Pa	Ti	Mt
Leg I	3d 2p	-	2-2-2-2-2-2v	2-2-2v
Leg II	3d 1p	-	2-2-2-2-2v	2-2-2v
Leg III	3d 3p 1r	1r	2d 2p 3r 2-2-2v	4p 5r 2-2-2v
Leg IV	3d 1(3)p 1r	1r	2d 2p 3r 2-1-2-2v	4p 4r 2-2-2v



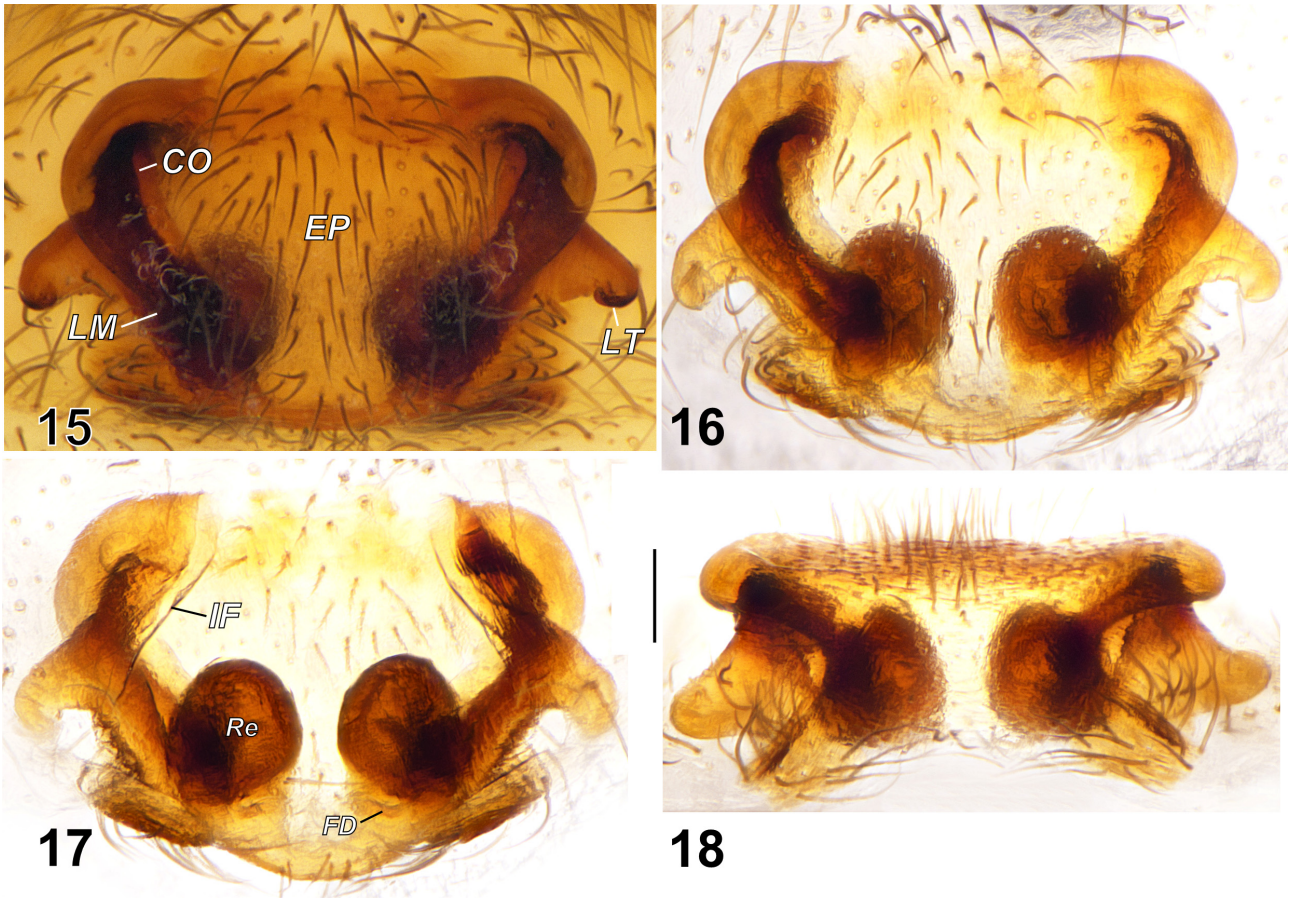
FIGURES 1–4. Habitus of *Amauropelma mariae* **sp. n.**, male (1–2), female (3–4). 1, 3—dorsal; 2, 4—ventral. Scale: 1 mm.

TABLE 5. Troglobiotic and species with reduced eyes of *Amauropelma*

	Species	Lifestyle/Locality	Eyes
1	*Amauropelma undara*	Cave dweller/Undara Lava Tubes, Bayliss Cave (Australia)	Completely missing
2	*Amauropelma matakecil*	Cave dweller/Anjani Cave (Indonesia)	Strongly reduced
3	*Amauropelma ekeftys*	Cave dweller/West Khasi Hills and Jaintia Hills (India)	Strongly reduced
4	*Amauropelma leo*	Litter dweller?	ALE, PME and PLE are strongly reduced
5	*Amauropelma guangxi*	Cave dweller/Longgong Cave (China)	Normally developed
6	*Amauropelma krabi*	Cave dweller/Klang Cave (Thailand)	Normally developed
7	*Amauropelma phangnga*	Cave dweller/Tapan Cave (Thailand)	Normally developed
8	*Amauropelma saraburi*	Cave dweller/Tham Bo Pla Cave (Thailand)	Normally developed



FIGURES 5–14. Male palp (5–9), palp patella (10) and bulb (11–14) of *Amauropelma mariae* **sp. n.** 5, 11—prolateral; 6, 12—ventral; 7, 9, 10, 13—retrolateral; 14—anterior. Scale: 0.2 mm (5–9), 0.1 mm (10–14). Abbreviations: *Cn*—conductor, *EE* –embolic extension, *Em*—embolus, *PCB*—prolateral cymbial bulge, *RTA*—retrolateral tibial apophysis, *SD*—sperm duct, *Te*—tegulum, *TA*—tegular apophysis, *VTA*—ventral tibial apophysis.



FIGURES 15–18. Epigyne of *Amauropelma mariae* **sp. n.**, intact (15) and macerated (16–18). 15, 16—ventral; 17—dorsal; 18—posterior. Scale bar: 0.1 mm. Abbreviations: *CO*—copulatory opening, *EP*—epigynal plate, *IF*—internal fold, *FD*—fertilization duct, *LM*—lateral margin, *LT*—lateral tooth, *Re*– receptacle.

Palp as shown in Figs 5–14. Distal part of femur and retrolateral side of patella covered with numerous, tiny spines. Retrolateral patellar apophysis absent. Tibia 1.91 times longer than wide. Tibia with tiny, spine-like retrolateral tibial apophysis (*RTA*), positioned at right angle to longitudinal axis of tibia and ventral tibial apophysis (*VTA*). Cymbium length/width ratio 1.64. Cymbium with large bilobated (in prolateral view) prolateral cymbial bulge (*PCB*). Retrolateral cymbial bulge absent. Tegular apophysis (*TA*) small, cup-shaped, located almost in middle of bulb. Sperm duct (*SD*) long, starts at 12 o'clock. Embolus (*Em*) flat in prolateral view, starting at 8-o'clock-position from tegulum (*Te*), with small extension (*EE*) basally. Conductor (*Cn*) membranous, with its base at 12:30 position.

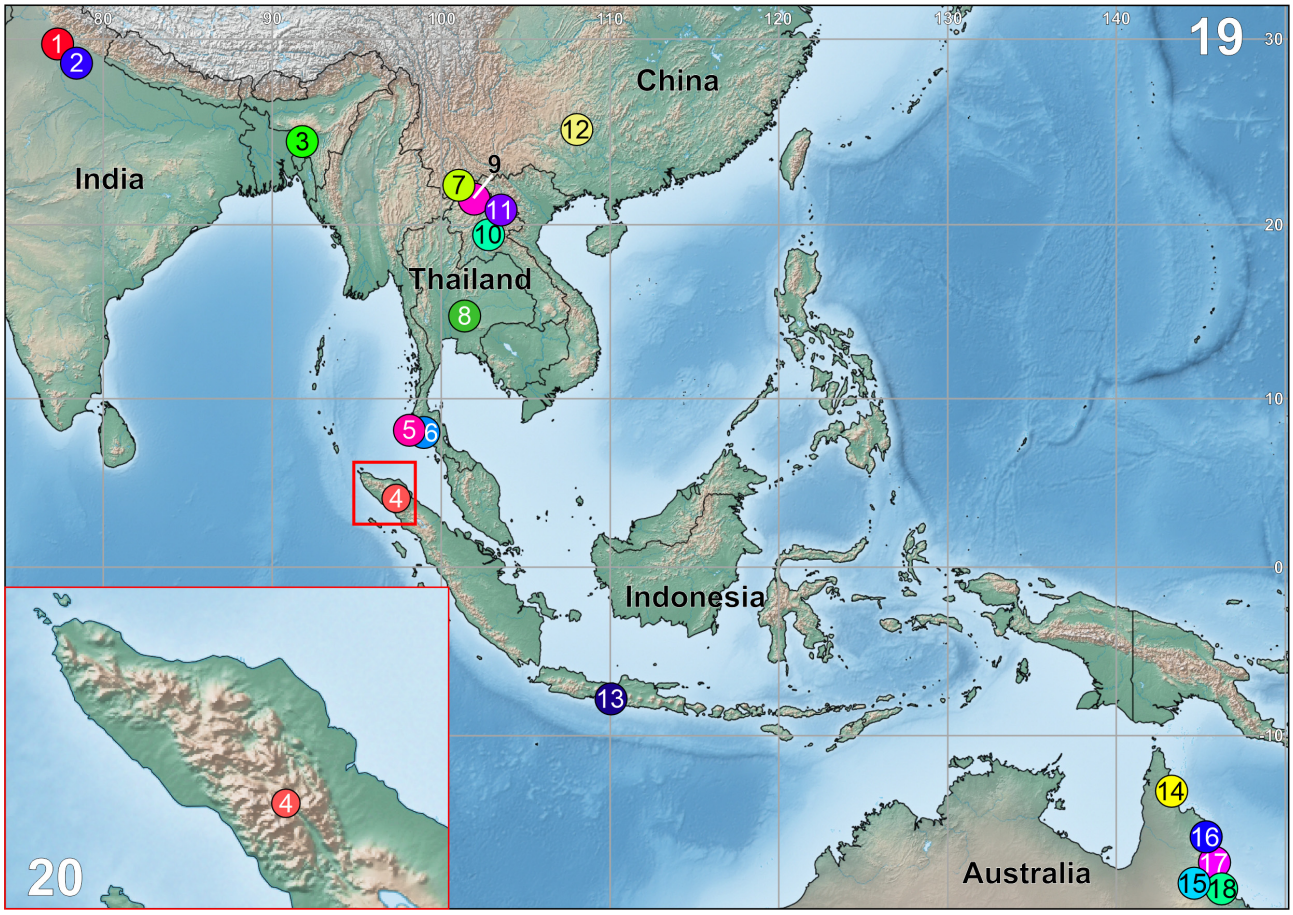
Female (Figs 3–4). Total length 4.58. Carapace 2.28 long, 1.76 wide. Opisthosoma 2.19 long, 1.40 wide. Coloration as in the male. Chelicerae with 3 promarginal and 5 (1 of them tiny, poorly visible) retromarginal teeth.

Eye diameters: AME 0.10, ALE 0.10, PME 0.14, PLE 0.14; interdistances: AME–ALE 0.11, PME–PLE 0.14, AME–PME 0.04, ALE–PLE 0.08; AME–AME and PME–PME are not measured, because some eyes of the single female are underdeveloped due to deformity. Clypeus height at AME 0.05, at ALE 0.14.

For palp and legs measurements see Table 3. For leg spination see Table 4.

Epigyne as shown in Figs 15–18. Epigynal field with two slit sense organs anterior to epigynal plate. Epigynal plate (*EP*) width/length 0.58/0.41, anterior width/posterior width 0.40/0.22; posterior part with almost straight lateral margins (*LM*). Lateral tooth (*LT*) large with wide base, its distal part of posteriorad. Epigyne with two diagonal internal folds (*IF*). Receptacles (*Re*) round, separated from each other by somewhat less than half of their diameter. Fertilisation ducts (*FD*) laminar, mediad.

Distribution. Type locality only (Figs 19–20).



FIGURES 19–20. Distribution records of *Amauropelma* spp. (nearby localities in Australia are combined). The frame on Fig. 19 refers to the content of Fig. 20. *A. beyersdorfi* (1); *A. staschi* (2); *A. ekeftys* (3); *A. mariae* sp. n. (4); *A. phangnga* (5); *A. krabi* (6); *A. yunnan* (7); *A. saraburi* (8); *A. hoffmanni* (9); *A. annegretae* (10); *A. jagelkii* (11); *A. guangxi* (12); *A. matakecil* (13); *A. claudie*, *A. gordon*, *A. leo*, *A. mcilwraith* (14); *A. undara* (15); *A. anzses*, *A. monteithi*, *A. mossman*, *A. pineck*, *A. rifleck*, *A. torbjorni*, *A. trueloves* (16); *A. hasenpuschi*, *A. pineck* (17), *A. bluewater*, *A. gayundah*, *A. wallaman* (18).

Discussion

Amauropelma mariae **sp. n.** is the first and as yet only record of this genus in Sumatra. The nearest known localities of the genus are located ca. 500 km northward in Thailand. In terms of size (carapace length), the new species is one of the smallest in the genus. Only the male of *A. gayundah* Raven & Stumkat, 2001 is smaller than the male of the new species, and the size of the female *A. mariae* **sp. n.** is equal to the smallest known female in the genus, *A. claudie* Raven & Stumkat, 2001.

Several spiders of the genus *Amauropelma* inhabit caves, displaying characteristics typical of troglobiotic inhabitants, such as a light body coloration and reduction of eyes (Raven *et al.* 2001, Miller & Rahmadi 2012). Among the seven species in the genus known from caves, only one (*A. undara* Raven & Gray, 2001) has completely reduced eyes (Table 5). Additionally, two species (*A. matakecil* Miller & Rahmadi, 2012 and *A. ekeftys* Jäger, 2012) exhibit significantly reduced eyes. It is important to note that one species in the genus with highly reduced eyes, namely *A. leo* Raven & Stumkat, 2001, is not a cave dweller and was apparently collected from the leaf litter of a rainforest (Raven *et al.* 2001). Four cave-dwelling species from southern China and Thailand have well-developed eyes. We do not have reliable data on the presence of caves near the type locality of *Amauropelma mariae* **sp. n.** However, judging by the normal development of its eyes and the cryptic (non-light) body coloration, the new species appears to be a typical inhabitant of the leaf litter.

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