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## A NEW SIX-EYED SPECIES OF *DOLICHOGNATHA* O. PICKARD-CAMBRIDGE, 1869 (ARANEAE: TETRAGNATHIDAE) FROM SOUTHEAST ASIA

A. A. Fomichev<sup>1, 2\*)</sup>, M. M. Omelko<sup>3)</sup>

1) Altai State University, Lenina Pr., 61, Barnaul, RF-656049, Russia. \*Corresponding author, E-mail: [a.fomichev@mail.ru](mailto:a.fomichev@mail.ru)

2) Tomsk State University, Lenina Pr., 36, Tomsk, RF-634050, Russia.

3) Federal Scientific Center of East Asia Terrestrial Biodiversity, Far Eastern Branch, Russian Academy of Sciences, Vladivostok 690022, Russia.

**Summary.** A new species, *Dolichognatha sumatrana* sp. n., is described from Sumatra Island based on both sexes. The new species is the fifth six-eyed member of the genus *Dolichognatha* specifically and of the family Tetragnathidae generally. New species differs from other six-eyed species of the genus by the cheliceral dentition and the shape of copulatory organs. Description, diagnosis, and illustrations of the new species are provided. Distributional records of all Asian species of *Dolichognatha* are mapped.

**Key words:** Aranei, Metainae, biodiversity, eye reduction, Indonesia, Sumatra Island.

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**Резюме.** С острова Суматра по обоим полам описан *Dolichognatha sumatrana* **sp. n.** Новый вид является пятым шестиглазым представителем рода *Dolichognatha* и семейства Tetragnathidae в целом. Новый вид отличается от других шестиглазых видов рода по зубцам хелицер и формой копулятивных органов. Приведены описание, диагноз и иллюстрации нового вида. Также представлена карта распространения всех азиатских видов *Dolichognatha*.

## INTRODUCTION

*Dolichognatha* O. Pickard-Cambridge, 1869 is a medium-sized genus of tetragnathid spiders, currently comprising 34 accepted species (WSC, 2024). The type species of the genus was described from Sri Lanka (O. Pickard-Cambridge 1869). *Dolichognatha* has a circumtropical distribution with the greatest species diversity found in South America and Southeast Asia (Dimitrov *et al.*, 2010). The neotropical representatives have been revised by Brescovit and Cunha (2001). Several species from Southeast Asia were redescribed by Smith (2008). Representatives of *Dolichognatha* have such unusual appearance that, in the past, they were even attributed to the Archaeidae. This unusual appearance is due to the large prominent anterior median eyes, a strongly elongated cephalic part, and elongated chelicerae in males (Smith, 2008). The reduction of the posterior median eyes in some *Dolichognatha* species, which is unknown in other genera of Tetragnathidae, also adds to the unique appearance of these spiders (Wang *et al.*, 2020). Till now *D. mandibularis* (Thorell, 1894) only is known from the Sumatra Island (Thorell, 1894). This species is eight-eyed (Smith, 2008). While studying unsorted material stored in the Institute of Systematics and Ecology of Animals SB RAS (Novosibirsk, Russia), we found many vials containing spiders collected on Sumatra Island in 1988 by an unknown collector. Among these spiders, there were several six-eyed *Dolichognatha* specimens. A study of these specimens has revealed that they belong to new species, which is described below.

## MATERIAL AND METHODS

The specimens were photographed using an Olympus DP74 camera attached to an Olympus SZX16 stereomicroscope at the Altai State University (Barnaul, Russia). Photographs were taken in an alcohol-filled dish with white cotton at the bottom. Digital images were montaged using Zerene Stacker software. The distribution map was produced using the online mapping application SimpleMappr (Shorthouse, 2010). All measurements are in millimeters. Length of leg segments were measured from the prolateral side. Leg measurements are shown as: femur, patella, tibia, metatarsus, tarsus (total length). Spination data are based on the examination of one side of the body. The terminology and format of description follows Wang *et al.* (2020) with modifications. The types of the new species are deposited in the Institute of Systematics and Ecology of Animals SB RAS (Novosibirsk, Russia; curator G.N. Azarkina).

Abbreviations: ALE – anterior lateral eye, AME – anterior median eye, d – dorsal, Fe – femur, Mt – metatarsus, p – prolateral, Pa – patella, PLE – posterior lateral eye, PME – posterior median eye, r – retrolateral, Ti – tibia, v – ventral.

## DESCRIPTION OF NEW SPECIES

### Family Tetragnathidae Menge, 1866

#### Subfamily Metainae Simon, 1894

#### Genus *Dolichognatha* O. Pickard-Cambridge, 1869

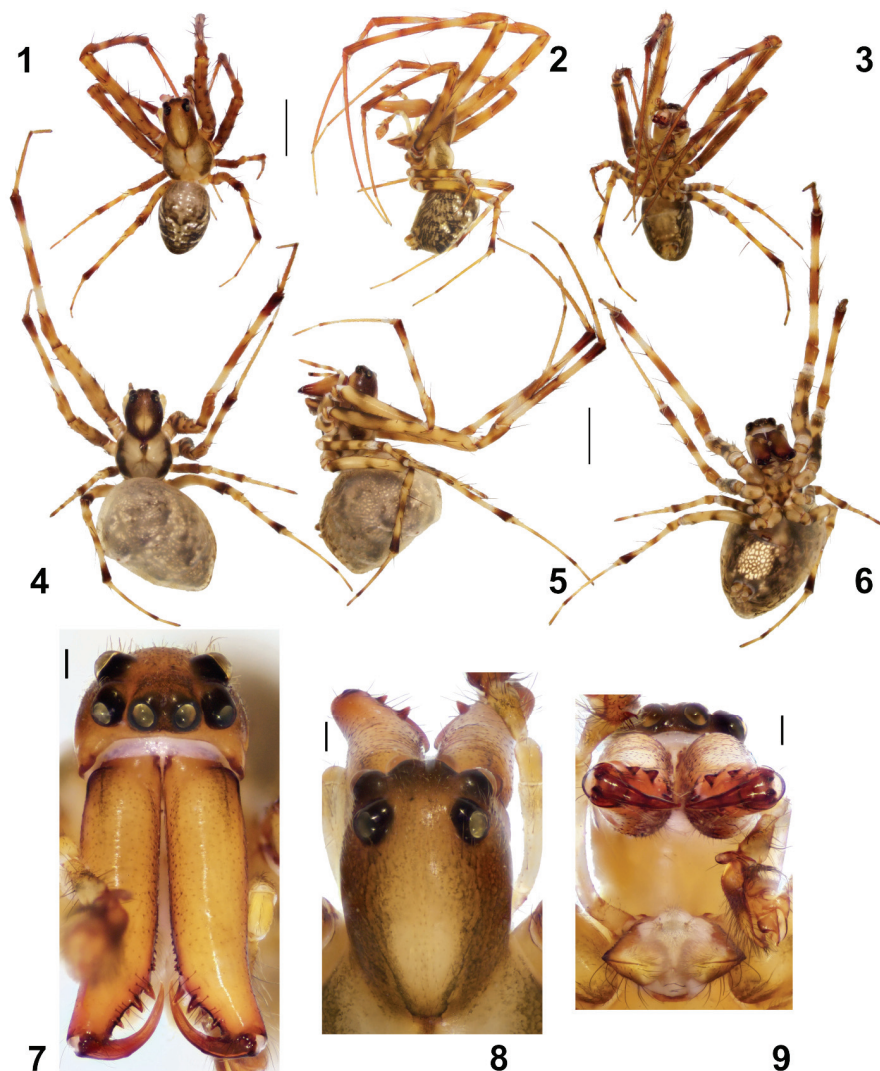
#### *Dolichognatha sumatrana* Fomichev et Omelko, sp. n.

<https://zoobank.org/NomenclaturalActs/017694FB-A5A6-4F58-86A3-5F712ADA29E6>

Figs 1–19

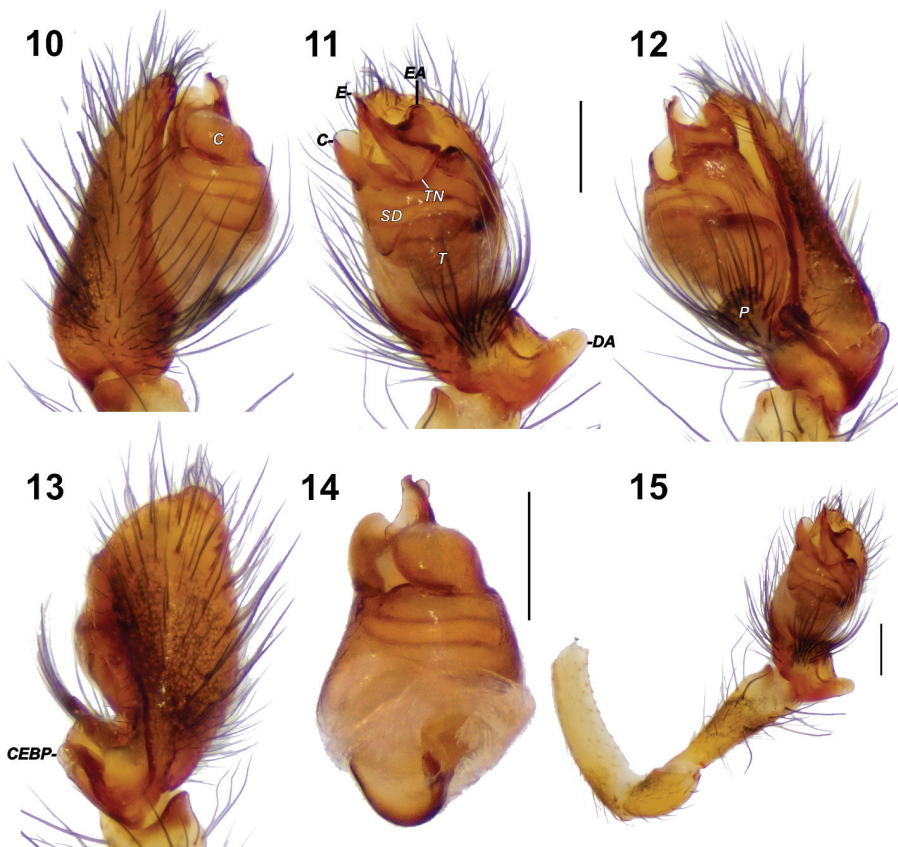
**MATERIAL.** Holotype: ♂, **Indonesia:** Sumatra Island, Aceh Prov., Ketambe Vill., 03°41'N, 97°39'E, 400–500 m, 1988 (precise date unknown), collector unknown (ISEA, 001.9163). Paratypes: together with the holotype, 1 ♀ (ISEA, 001.9164), 1 ♀ (ISEA, 001.9165).

**DIAGNOSIS.** The new species differs from all congeners, except *D. bannaensis* Wang, Zhang et Peng, 2020 from China, *D. chimminiensis* Anju, Asha et Sudhikumar, 2024 from India, *D. junlitjri* (Barrion-Dupo et Barrion, 2014) from Philippines and *D. longiceps* (Thorell, 1895) from India, Burma and Thailand by total reduction of PME in both sexes. The male of *D. sumatrana* sp. n. differs from those of *D. bannaensis*, *D. chimminiensis* and *D. longiceps* by strongly elongated chelicerae: chelicera length/carapace height ratio = 3/1 (vs. 2/1–2.5/1). Additionally, the male of new species differs from those of *D. bannaensis*, *D. chimminiensis* and *D. junlitjri* by the presence of 2 promarginal cheliceral teeth (vs. 3) and by square ecto-basal cymbial process (*CEBP*) in dorsal view (vs. hook-shaped or triangular; cf. Wang *et al.*, 2020: Fig. 13, fig 3H), Anju *et al.*, 2024: fig. 1J and Barrion-Dupo & Barrion, 2014: fig. 1J). The male of *D. sumatrana* sp. n. can be distinguished from that of *D. longiceps* by short and straight conductor (*C*) (vs. long and curved) and by the presence of digitiform apophysis (*DA*) of *CEBP* in ventral view (vs. absence; cf. Dimitrov *et al.*, 2010: fig. 11 and 4A). The female of new species differs from those of *D. bannaensis* and *D. junlitjri* by crescent-shaped atrium (*At*) (vs. oval or heart-shaped; cf. Wang *et al.*, 2020: Fig. 16 and Barrion-Dupo & Barrion, 2014: fig. 3I and fig. 1D). Additionally, the female of new species differs from the female of *D. bannaensis* by globular *S* (vs. arcuate; cf. Wang *et al.*, 2020L: fig. 18 and fig. 3J). The female of *D. sumatrana* sp. n. can be distinguished from that of *D. longiceps* by fertilization ducts (*FD*) located between the spermathecae (*S*) (vs. *FD* located on the sides of *S*; cf. Dimitrov *et al.*, 2010: fig. 18 and fig. 4E). The female of *D. sumatrana* sp. n. can be distinguished from that of *D. chimminiensis* by *S* consisting of ca. 3 tightly fused chambers (vs. ca. 8 loose chambers; cf. Anju *et al.*, 2024: fig. 18 and fig. 1Q).



Figs 1–9. General appearance (1–6) and cephalic part (7–9) of *Dolichognatha sumatrana* sp. n., male (1–3, 7–9) and female (4–6). 1, 4, 8 – dorsal; 2, 5 – lateral; 3, 6, 9 – ventral; 7 – anterior. Scale bars: 1–6=2 mm; 7–9=0.2 mm.

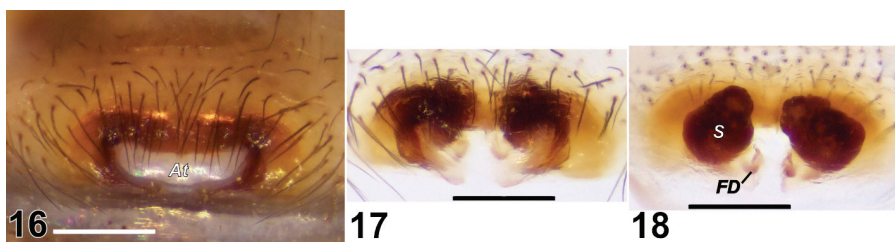
**DESCRIPTION.** Male. Total length 5.65. Carapace: 3.0 long, 1.85 wide. Abdomen: 2.75 long, 1.85 wide. Coloration. Carapace light yellow with wide gray lateral bands. Cephalic part with gray edges. Chelicerae and labium yellow. Endites yellow brown. Sternum yellow with eight gray spots: three paired spots near edges, one spot medially and one more posteriorly. Coxae yellow with gray spots. Palps light



Figs 10–15. Male palp of *Dolichognatha sumatrana* sp. n., terminal part (10–13), bulb (14), entirely (15). 10 – prolateral; 11 – ventral; 12, 15 – retrolateral; 13, 14 – dorsal. Scale bars: 0.2 mm. Abbreviations: *C* – conductor, *CEBP* – ecto-basal cymbial process, *DA* – digitiform apophysis of *CEBP*, *E* – embolus, *EA* – embolic apophysis, *P* – paracymbium, *SD* – spermatheca, *St* – subtegulum, *T* – tegulum, *TN* – tegular notch.

yellow, cymbium brown. Legs yellow brown with vague dark annulations. Abdomen yellow gray dorsally and laterally. Venter of abdomen yellow. Dorsum of abdomen with pattern formed by silver dots. Spinnerets yellow gray. Eye sizes and interdistances: AME 0.17, ALE 0.16, PME lost, PLE 0.17, AME–AME 0.14, AME–ALE 0.14, PLE–PLE 0.67, ALE–PLE 0.31. Clypeus height at AME 0.09. Clypeus height at ALE 0.16. Leg measurements: I: 5.2, 1.25, 4.9, 5.0, 1.45 (17.8); II: 3.7, 1.1, 3.15, 3.4, 1.1 (12.45); III: 1.95, 0.65, 1.25, 1.55, 0.7 (6.1); IV: 3.0, 0.75, 2.15, 2.65, 0.9 (9.45). Leg spination: I: Fe d4 p4 r5 v8; Pa d1; Ti d2 p3 r3; Mt d1 p1 r1 v2. II: Fe d4 p4 r4 v5; Pa d1; Ti d2 p2 r2; Mt d1 p1 r1 v2. III: Fe d4 p3 r2 v1; Pa d1; Ti d1 p1 r1 v1; Mt d1 p2 r1 v2. IV: Fe d4 p2 r2; Pa d1; Ti d2 p1 r1 v1; Mt d1 p2 r1. Chelicerae with 2 promarginal teeth and 3 retromarginal teeth.

Male palp as shown in Figs 10–15. Femur 2 times longer than patella. Tibia 1.5 times longer than patella. Cymbium inverted teardrop-shaped, 2.3 times longer than wide. Ecto-basal cymbial process (*CEBP*) square in dorsal view. Digitiform apophysis (*DA*) of *CEBP* as long as paracymbium (*P*). *P* equal in size to *DA*, elongated, covered with long black setae. Tegulum (*T*) eight-shaped, 2 times wider than long. Subtegulum (*St*) oval, as wide as long. Anterior edge of *T* with deep notch (*TN*). Sperm duct (*SD*) transversal. Conductor (*C*) short, elliptical in prolateral view. Embolic apophysis (*EA*) poorly sclerotized, with blunt apex. Embolus (*E*) straight, 1.5 times longer than *C*.



Figs 16–18. Epigyne of *Dolichognatha sumatrana* sp. n. 16–17 – ventral, 18 – dorsal. Scale bars: 0.2 mm. Abbreviations: *At* – atrium, *FD* – fertilization duct, *S* – spermatheca.

Female. Total length 7.7. Carapace: 3.3 long, 2.1 wide. Abdomen: 5.15 long, 3.3 wide. Coloration. Pars cephalica brown with yellow median spot. Pars thoracica light yellow with wide gray lateral bands. Chelicerae yellow brown. Labium yellow gray. Endites dark brown posteriorly, yellow anteriorly. Sternum yellow with three pairs of dark gray spots near edges and median stripe. Coxae yellow. Palps and legs yellow brown with vague dark annulations. Abdomen (damaged) yellow gray with silver dots. Spinnerets yellow gray. Eye sized and interdistances: AME 0.2, ALE 0.17, PME lost, PLE 0.17, AME–AME 0.14, AME–ALE 0.14, PLE–PLE 0.79, ALE–PLE 0.31. Clypeus height at AME 0.16. Clypeus height at ALE 0.23. Leg measurements: I: 5.2, 1.3, 4.5, 4.25, 1.35 (16.6); II: 3.75, 1.2, 2.95, 3.05, 1.1 (12.05); III: 2.0, 0.75, 1.2, 1.5, 0.7 (6.15); IV: 3.45, 0.85, 2.25, 2.8, 0.9 (10.25). Leg spination: I: Fe d3 p4 r6 v9; Ti d2 p3 r3; Mt d1 p1 r1 v2. II: Fe d4 p4 r4 v5; Pa d1; Ti d1 p2 r2 v1; Mt d1 p1 r1 v2. III: Fe d3 p1 r1 v1; Pa d2; Ti d1 p1 v1; Mt d1 p2 r1 v2. IV: Fe d4 p2 r1; Pa d2; Ti d1 p1 r1 v2; Mt d1 p2 v1. Chelicerae with 2 promarginal teeth and 5 retromarginal teeth.

Epigyne as shown in Figs 16–18. Atrium (*At*) crescent-shaped, 4 times wider than long. Spermathecae (*S*) small and globular. Fertilization ducts (*FD*) parallel to each other, pointed anteriorly.

DISTRIBUTION. Only known from the type locality (Fig. 19).

ETYMOLOGY. The specific name derived from Sumatra Island, adjective.



## DISCUSSION

Besides *Dolichognatha sumatrana* sp. n., only four other six-eyed species of the genus are known: *D. bannaensis*, *D. chimminiensis*, *D. junlitjri* and *D. longiceps*. All these species have been described exclusively from Southeast Asia or India (Fig. 19). *Dolichognatha longiceps* was originally described in a separate genus, *Prolochus* Thorell, 1895, which was established, among other criteria, based on having only six eyes (Thorell, 1895). The genus *Prolochus* was subsequently treated as a junior synonym of *Dolichognatha* by Levi (1981). Levi justified his decision by noting that in some *Dolichognatha* species, the posterior median eyes are reduced in size. Barrion-Dupo and Barrion opposed this decision, describing *D. junlitjri* from the Philippine Islands as part of *Prolochus* (Barrion-Dupo & Barrion, 2014). They emphasized that the total loss or reduced size of posterior median eyes are distinctive separable features useful for distinguishing taxa at the generic level. Kallal and Hormiga concluded this discussion by reaffirming the synonymy of *Prolochus* with *Dolichognatha* in their molecular phylogenetic analysis of metaine Tetragnathidae (Kallal & Hormiga, 2018).

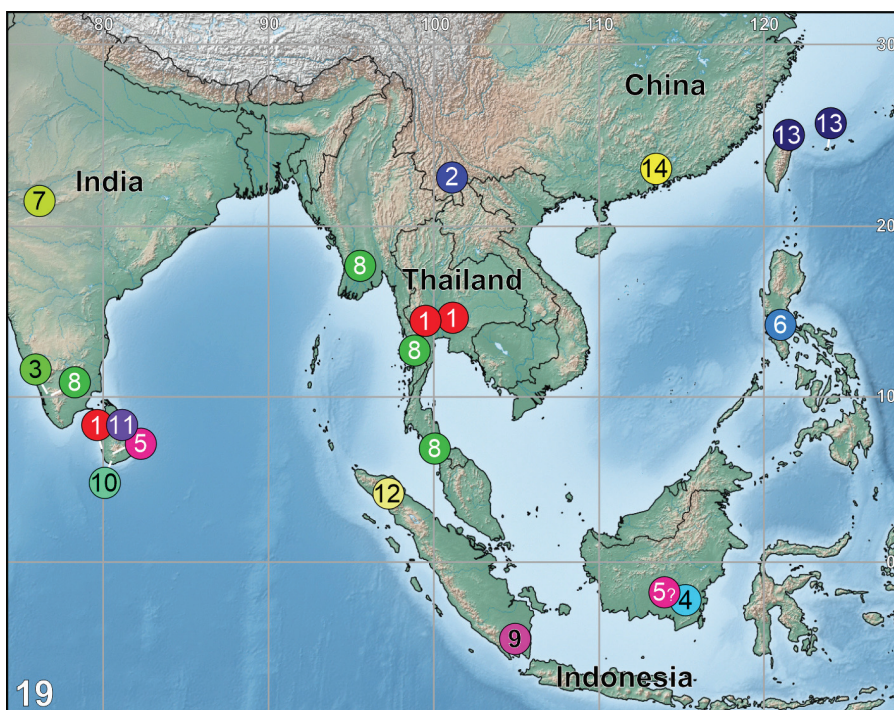


Fig. 19. Distribution map of *Dolichognatha* spp. in Asia. *D. albida* (1), *D. bannaensis* (2), *D. chimminiensis* (3), *D. deelemanae* (4), *D. incanescens* (5), *D. junlitjri* (6), *D. lonarensis* (7), *D. longiceps* (8), *D. mandibularis* (9), *D. nietneri* (10), *D. quinquemucronata* (11), *D. sumatrana* sp. n. (12), *D. umbrophila* (13), *D. yue* (14).

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