

New data on the spitting spiders (Araneae: Scytodidae) of Southeast Asia

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A new species, *Dictis oranhutan* sp. n., is diagnosed and described from the Sumatra Island (Indonesia) based on a single male. The Pantropical *Scytodes fusca* Walckenaer, 1837 is recorded from this island for the first time. *Dictis elongata* Dankittipakul & Singtripop, 2010, initially described from Thailand, is redescribed and recorded from Laos for the first time, representing the first record of the genus in this country. Detailed descriptions, digital photographs and a map of distributional records of Scytodidae in the Indomalayan Realm are provided.

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Keywords

Aranei, biodiversity, *Dictis*, Indonesia, Laos, new species, *Scytodes*, Sumatra

Introduction

The family Scytodidae Blackwall, 1864, commonly known as spitting spiders, comprises 240 species assigned to four genera (WSC 2023). The family has a worldwide distribution, being absent only in the Boreal and Arctic zones of the Holarctic. The greatest species diversity of spitting spiders occurs in tropical regions (WSC 2023). All four currently valid genera of Scytodidae are recorded in Southeast Asia and in the Indomalayan Realm: *Dictis* L. Koch, 1872; *Scyloxes* Dunin, 1992; *Scytodes* Latreille, 1804; and *Stedocys* Ono, 1995 (WSC 2023). A total of 43 Scytodidae species, including many endemics, have been recorded/described from Southeast Asia (Dankittipakul & Singtripop 2010; Wu et al. 2017; Zamani et al. 2022; WSC 2023). While studying the unsorted material stored in the Institute of Systematics and Ecology of Animals SB RAS (Novosibirsk, Russia), we found many vials with spiders collected in Sumatra Island in 1988 by an unknown collector. Among these spiders there were a number of Scytodidae specimens belonging to two species. One of these species, belonging to *Dictis*, turned out to be undescribed, and the second species was identified as *Scytodes fusca* Walckenaer, 1837. To this material we have added

material collected in Laos by the junior author in 2017 which contains *Dictis elongata* Dankittipakul & Singtripop, 2010. This species is known by only one taxonomic entry from Thailand and is herein recorded for Laos for the first time. Representatives of the genus *Dictis* have never been reported from Laos before. The aims of the present paper are: (1) to describe a new *Dictis* species from Sumatra Island, (2) to redescribe and to illustrate the male of *D. elongata* and to provide the first record of this species in Laos, (3) to illustrate the female of *Scytodes fusca* and to provide the first record of this species in Sumatra Island, (4) to map all distributional records of Scytodidae in the Indomalayan Realm and to discuss the distribution of this family.

Materials and methods

Specimens were photographed using an Olympus DP74 camera attached to an Olympus SZX16 stereomicroscope at the Altai State University (Barnaul, Russia) and by a Nikon DSr2 camera attached to a Nikon SMZ25 stereomicroscope at the Far Eastern Federal University (Vladivostok, Russia). Photographs of macerated endogyne were prepared on slide. Photographs of male palps and habitus were prepared in dish with lubricant or in dish with white cotton on the bottom, filled with alcohol. Endogyne was cleared in a KOH/water solution until soft tissues were dissolved and painted with methylene blue. Digital images were montaged using “Zerene Stacker” image stacking software package. The distribution map was produced using the online mapping application SimpleMappr (Shorthouse 2010). All measurements are in millimeters (mm). The length of palp and legs segments was measured laterally. Length of palp and legs segments are given as: total (femur, patella, tibia, metatarsus (absent on palp), tarsus). Terminology and the format of descriptions follow Dankittipakul & Singtripop (2010) and Zamani et al. (2022), with modifications. The terminal part of the bulb is termed psembolus, following the proposal by Saaristo & van Harten (2006).

The studied material has been shared between the following museums: ISEA = Museum of the Institute of Systematic and Ecology of Animals, Novosibirsk, Russia (curator: G.N. Azarkina); FEFU = Far Eastern Federal University (curator: M.M. Omelko). Abbreviations: ALE - anterior lateral eye, Fo - fovea, GP - glandular pore, NP - needle-shaped process, PA - psembolic apex, Pc - paracymbium, PLE - posterior lateral eye, PME - posterior median eye, PR - positioning ridge, Ps - psembolus, RB - receptacle base, RH - receptacle head, RS - receptacle stem, SS - spiniform seta, Te - tegulum.

Result

Scytodidae Blackwall, 1864

Dictis L. Koch, 1872

Dictis *oranhutan* sp. n.

<http://zoobank.org/229D98EC-9CEB-4BAB-A31F-B6714F7B9315>

Figures 1–16, 27

Type material. Holotype ♂ (ISEA, 9546), INDONESIA: Sumatra Island, North Sumatra Province, Bukit Lawang Village [3°33'N, 98°07'E], 250 m, 1988 (precise date unknown), unknown collector.

Etymology. The specific name is derived from the Malay name of orangutan [*Pongo* Lacépède] meaning “forest men”, reflecting the fact that the new species also occurs in the jungles around Bukit Lawang Village and has very long first pair of legs, similar to orangutan arms.

Diagnosis. In having striped body coloration and psembolus (Ps) with sharply pointed needle-shaped process (NP) the new species is similar to Thai *Dictis thailandica* Dankittipakul &

Singtripop, 2010. The male of *Dictis oranhutan* sp. n. can be easily distinguished from that of *D. thailandica* by the psembolus 2.2 times longer than tegulum (Te) (vs. 0.9 in *D. thailandica*), very large needle-shaped process 1.3 times longer than tegulum (vs. small needle-shaped process, 3.2 times shorter than tegulum) and by the psembolus starting from the anterior side of tegulum (vs. psembolus starting from the ventral side of tegulum) (cf. Figs 4–16 and figs 39–40 in Dankittipakul & Singtripop (2010).

Description. Male. Total length 3.8. Carapace: 2.0 long, 1.65 wide. Abdomen: 2.0 long, 1.05 wide. Eye diameters and interdistances: PME 0.13, ALE 0.13, PLE 0.14, PME–ALE 0.17.

Coloration. Carapace beige with black stripes: two longitudinal stripes running from clypeus to PLE; two longitudinal stripes running from PME to fovea. Coloration of lateral sides of pars thoracica asymmetrical: two longitudinal stripes on the left side and three on the right side. Posterior part of carapace with two encircling stripes. Chelicerae beige, each with one longitudinal black stripe. Sternum, labium and endites beige. Palp beige with longitudinal black stripe on the venter of femur.

Coloration of legs: I: yellow beige with black spots on distal part of patella, proximal, mesal and distal parts of tibia and proximal and distal parts of metatarsus. II: as in I, but femur with longitudinal black stripe on the venter. III: yellow beige, without any spots but with longitudinal stripe on the venter of femur. IV: as in II.

Abdomen beige with black stripes: one continuous stripe mesally and two intermittent stripes on each side of it; two longitudinal stripes on lateral sides of abdomen and two encircling stripes posteriorly. The venter of abdomen without any stripes. Palp and legs measurements: Palp: 2.3 (0.7, 0.3, 0.3, -, 1.0); I: 22.55 (6.75, 0.5, 6.95, 7.85, 0.5); II: 15.95 (4.6, 0.5, 4.8, 5.3, 0.75); III: 9.5 (3.0, 0.5, 2.6, 2.8, 0.6); IV: 15.35 (4.65, 0.5, 4.65, 4.85, 0.7).

Palp as shown in Figs 4–16. Femur 4 times longer than wide. Cymbium/bulb length ratio ca. 0.77. Paracymbium (Pc) with three spiniform setae (SS). Tegulum (Te) subglobular, as long as wide. Needle-shaped process (NP) 1.6 times shorter than psembolus (Ps), starting very close to tegulum. Distal part of needle-shaped process slightly curved retrolaterad. Psembolus sabre-shaped, straight proximally and curved retrolaterad in its distal part. Psembolic apex (PA) blunt and slightly widened.

Female unknown.

Distribution. Known from the type locality on Sumatra Island only (Fig. 27).

***Dictis elongata* Dankittipakul Singtripop, 2010**

Figures 17–19, 27

Dictis elongata Dankittipakul & Singtripop, 2010: 124, f. 5, 11, 13–16, 46, 51 (♂♀).

Material examined. 1♂, 1 subadult ♀ (FEFU), LAOS: Vientiane Province, env. of Nam-Lik Eco-Village, 18°36′53.18″N 102°24′31.87″E, 2.06.2017 (M.M. Omelko).

Diagnosis. The male of *Dictis elongata* clearly differs from that of all congeners by the psembolus (Ps) without needle-shaped process (Figs 18–19). For diagnosis of the female see Dankittipakul & Singtripop (2010).

Description. Male. Total length 3.9. Carapace: 2.0 long, 1.65 wide. Abdomen: 2.0 long, 1.6 wide. Eye diameters and interdistances: PME 0.12, ALE 0.15, PLE 0.14, PME–ALE 0.19.

Coloration. Carapace light yellow with number of black stripes: two longitudinal stripes running from clypeus to ALE/PLE; three longitudinal stripes running from PME to fovea; two longitudinal stripes running from PLE to posterior part of carapace. Pars thoracica with three longitudinal stripes on each side. Posterior part of carapace with single encircling stripe. Chelicerae beige, each with one longitudinal black stripe. Sternum, labium and endites light yellow. Palp yellow with longitudinal black stripe on the venter of femur and black spots on lateral sides of patella and tibia.

Coloration of legs: I: yellow with black spots on distal part of patella, proximal and distal parts of tibia, distal part of metatarsus and black stripe on femur ventrally. II–IV: as in I, but tibia with short longitudinal black stripes mesally.

Abdomen almost white with black stripes: one continuous thin stripe mesally and two broken intermittent stripes on each side of it. Lateral sides and posterior half of abdomen with number of thin black strokes. The venter of abdomen light yellow with pair of tiny black spots on sides of spinnerets.

Palp and legs measurements: Palp: 2.6 (0.92, 0.3, 0.41, -, 0.97); I: 19 (5.01, 0.47, 5.73, 7.00, 0.79); II: 11.34 (3.48, 0.51, 3.75, 3.17, 0.43); III: 8.25 (2.47, 0.51, 2.30, 2.44, 0.53); IV: 12.55 (3.67, 0.52, 3.74, 3.89, 0.73).

Palp as shown in Figs 18–19. Femur 4.8 times longer than wide. Cymbium/bulb length ratio ca. 0.67. Paracymbium undeveloped. Tegulum (Te) elliptical, 1.5 times longer than wide. PseMBOLUS (Ps) smoothly curved posteriad. PseMBOLIC apex (PA) pointed.

Distribution. This species is currently known from northeastern Thailand (Dankittipakul & Singtripop 2010) and from northern Laos (present record). Both localities are in the mainland Southeast Asia (Fig. 27).

Scytodes Latreille, 1804

***Scytodes fusca* Walckenaer, 1837**

Figures 20–26

Scytodes fusca Walckenaer, 1837: 272 (♂♀).

Scytodes fusca Dankittipakul & Singtripop, 2010: 136, f. 31–33, 42–43, 56 (♀).

Scytodes fusca Šestáková et al., 2014: 1, f. 1, 2a–c, 3a–d, 4a–b, 5 (♂♀).

Scytodes fusca Sampathkumar et al., 2022: 348, f. 1A–D, 2A–D, 3A–B (♂♀). For the full list of 44 taxonomic entries see WSC (2023).

Material examined. 7♀ (ISEA, 9547), INDONESIA: Sumatra Island, North Sumatra Province, Bukit Lawang Village [3°33'N, 98°07'E], 250 m, 1988 (precise date unknown), unknown collector.

Diagnosis. The female of this species can be identified by the long cylindrical and strongly chitinized receptacle stalks (RS) combined with membranous receptacle heads (RH) (Figs 25–26).

Notes. Since we only have females of *S. fusca* at our disposal, we cannot provide a diagnosis for the male of this species. We were unable to find convenient diagnosis for the male of *S. fusca* in literature. In diagnoses in published papers the male of *S. fusca* compared with those of representatives of another genus (Sampathkumar et al. 2022) or with non-Indomalayan species (Šestáková et al. 2014). Dankittipakul & Singtripop (2010) provided a diagnosis only for the female.

Description. See full description in Šestáková et al. (2014) and in Sampathkumar et al. (2022). Epigastric area and endogyne as shown in Figs 24–26. Epigastric area brown, without any pattern. Foveae (Fo) triangular, separated by 1.8 of their maximum diameters. Positioning ridges (PR) wide. Receptacle bases (RB) smaller than receptacle heads (RH). Receptacle stalks (RS) covered with glandular pores (GP). Receptacle heads oviform.

Distribution. Pantropical: Northern to Southern America. Introduced to Europe, Africa, Seychelles, India, Myanmar, China, Japan, and Hawaii (WSC 2023).

Comments. This species is recorded for Sumatra Island for the first time (Fig. 27).

Discussion

All known genera of Scytodidae are present in the Indomalayan Realm: *Dictis*, *Scyloxes*, *Scytodes* and *Stedocys* (WSC 2023) (Fig. 27). However, no endemic genera have been described among spitting spiders of this realm. But at the same time three out of four known scytodid genera are most diverse in the Indomalayan Realm. Only two of five *Dictis* species go beyond this realm: pantropical *D. striatipes* L. Koch, 1872 and Seychellois *D. soeur* (Saaristo, 1997) (Zamani et al. 2022; WSC 2023). The only one of three *Scyloxes* species occurs outside of Indomalayan Realm in Central Asia, *S. asiatica* Dunin, 1992 (Fomichev & Marusik 2020). All species of *Stedocys* except one are restricted to the discussed realm (WSC 2023). Only *S. amamiensis* Suguro, 2019 was described from Japan (Suguro 2019). Thus, it can be assumed that the Indomalayan Realm is one of the diversity centers for Scytodidae. The number of species of spitting spiders in the Neotropical Realm is higher than that in the Indomalayan Realm, but this is achieved at the expense of diversity of exclusively one genus, *Scytodes* (Rheims & Brescovit 2006; 2009; Rheims et al. 2007). Among spitting spiders of the Indomalayan Realm, local endemics often coexist in the same locality with pantropical (*Dictis striatipes*, *Scytodes fusca* and *S. univittata* Simon, 1882) or cosmopolitan (*Scytodes thoracica* (Latreille, 1802)) species (Fig. 27). A part of Sunda Islands, belonging to the Indomalayan Realm (i.e., Sumatra, Java and Kalimantan (Borneo) islands) has the least studied fauna of Scytodidae. Only three species of spitting spiders are known from Sumatra Island: *Dictis oranhutan* sp. n., *Scytodes fusca* and *S. venusta* (Thorell, 1890) (Kulczyński 1911; present data). Three species are also known from Java Island: *Dictis striatipes*, *Scytodes fusca* and *S. venusta* (Kulczyński 1911). No species of Scytodidae is known from Kalimantan Island. Thus, just four species are known from Indomalayan Sunda Islands to date and only one of them is endemic. At the same time, dozens of scytodid species are known from the mainland Southeast Asia and the tropical latitudes of China (Fig. 27). This situation is a consequence of the inadequate exploration of the Sunda Islands and we expect to discover many new species from these islands in the future.

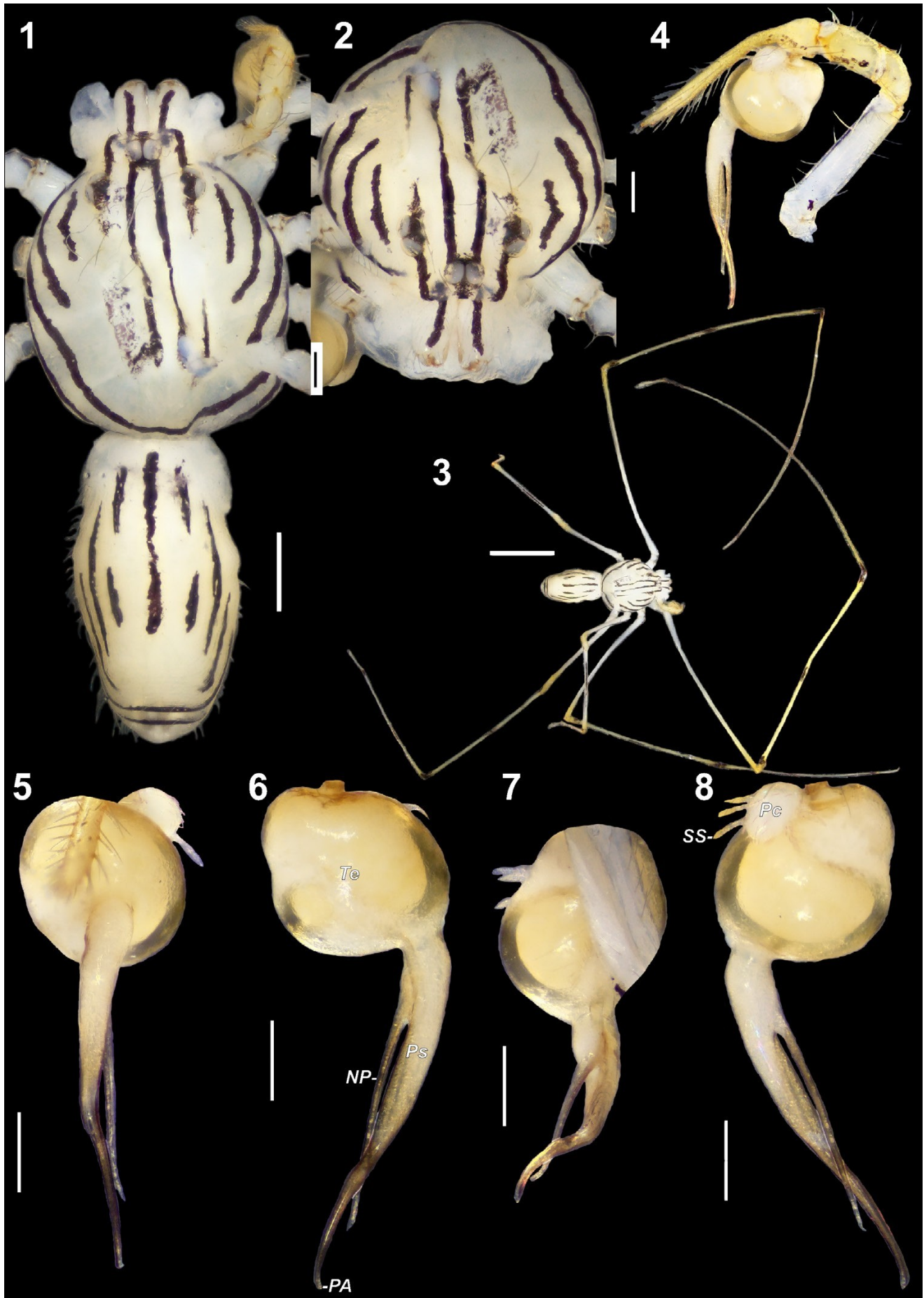


Figure 1. Figures 1-8. *Prosoma and abdomen (1), prosoma (2), whole habitus (3), whole palp (4) and bulb (5-8) of male of Dictis oranhutan sp. n. 1, 3 - dorsal; 2, 5 - anterior; 4, 8 - retrolateral; 6 - prolateral; 7 - posterior. Abbreviations: NP - needle-shaped process, PA - psembolic apex, Pc - paracymbium, Ps - psembolus, SS - spiniform seta, Te - tegulum. Scale bars: 1=0.5 mm; 2, 4-8=0.2 mm; 3=2 mm.*

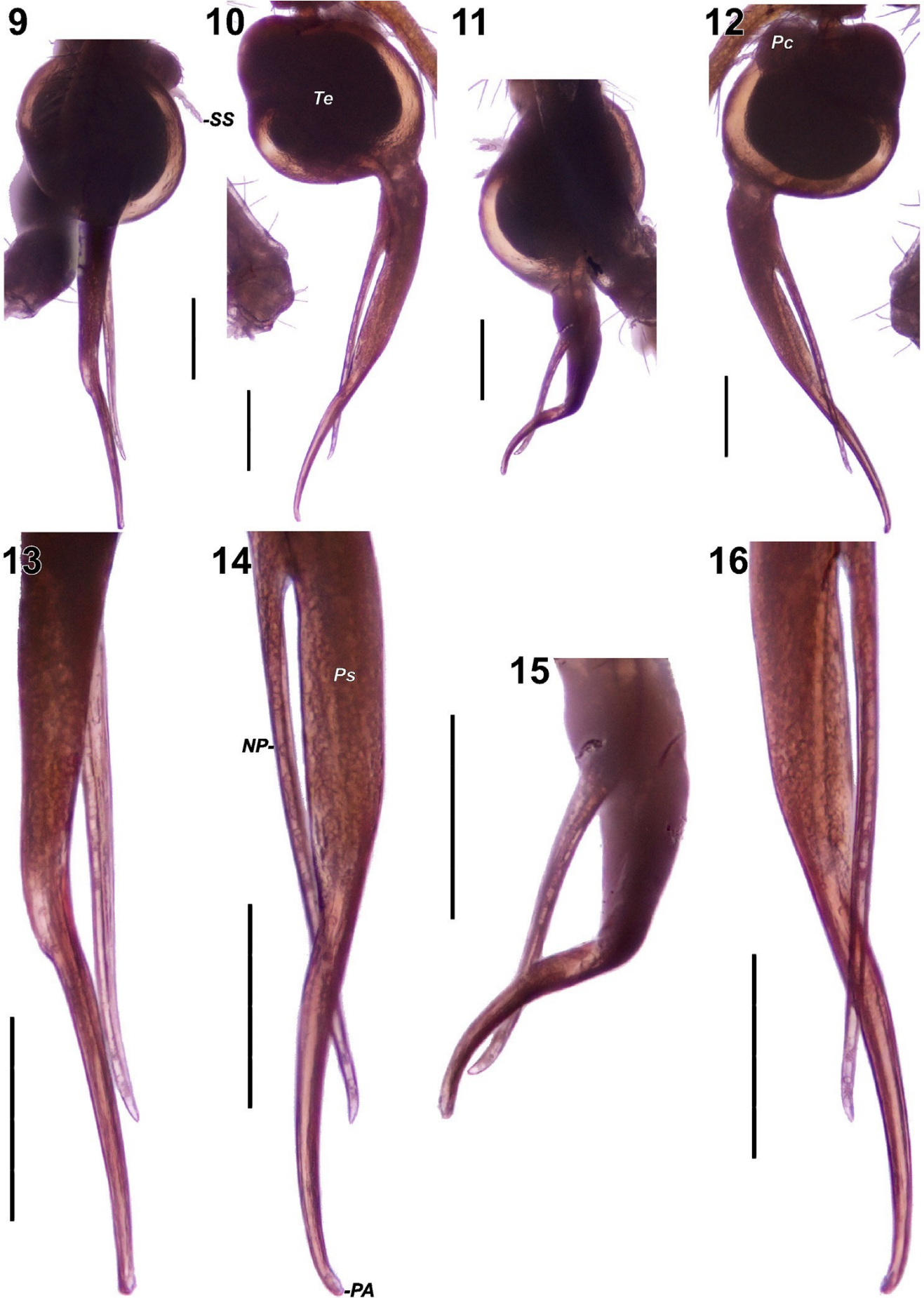


Figure 2. Figures 9-16. Bulb (9-12) and psempobolus (13-16) of *Dictis oranhutan* sp. n. in transmitted light. 9, 13 - anterior; 10-14 - prolateral; 11-15 - posterior; 12, 16 - retrolateral. Abbreviations: NP - needle-shaped process, PA - psempobolic apex, Pc - paracymbium, Ps - psempobolus, SS - spiniform seta, Te - tegulum. Scale bars: 0.2 mm.

17



18

PA-



19



Figure 3. Figures 17-19. Habitus (17) and male palp (18-19) of male of *Dictis elongata*. 17 - dorsal; 18 - prolateral; 19 - retrolateral. Abbreviations: Pa - psembolic apex, Ps - psembolus, Te - tegulum. Scale bars: 17=1 mm; 18-19=0.1 mm.



Figure 4. Figures 20-26. Prosoma and abdomen (20), prosoma (21), whole habitus (22), chelicerae (23), epigastral area (24), endogyne (25) and spermatheca (26) of female of *Scytodes fusca*. 20, 22, 25-26 - dorsal; 21, 23 - anterior; 24 - ventral. Abbreviations: Fo - fovea, GP - glandular pore, PR - positioning ridge, RB - receptacle base, RH - receptacle head, RS - receptacle stem. Scale bars: 20=0.5 mm; 21, 23-25=0.2 mm; 22=2 mm; 26=0.1 mm.

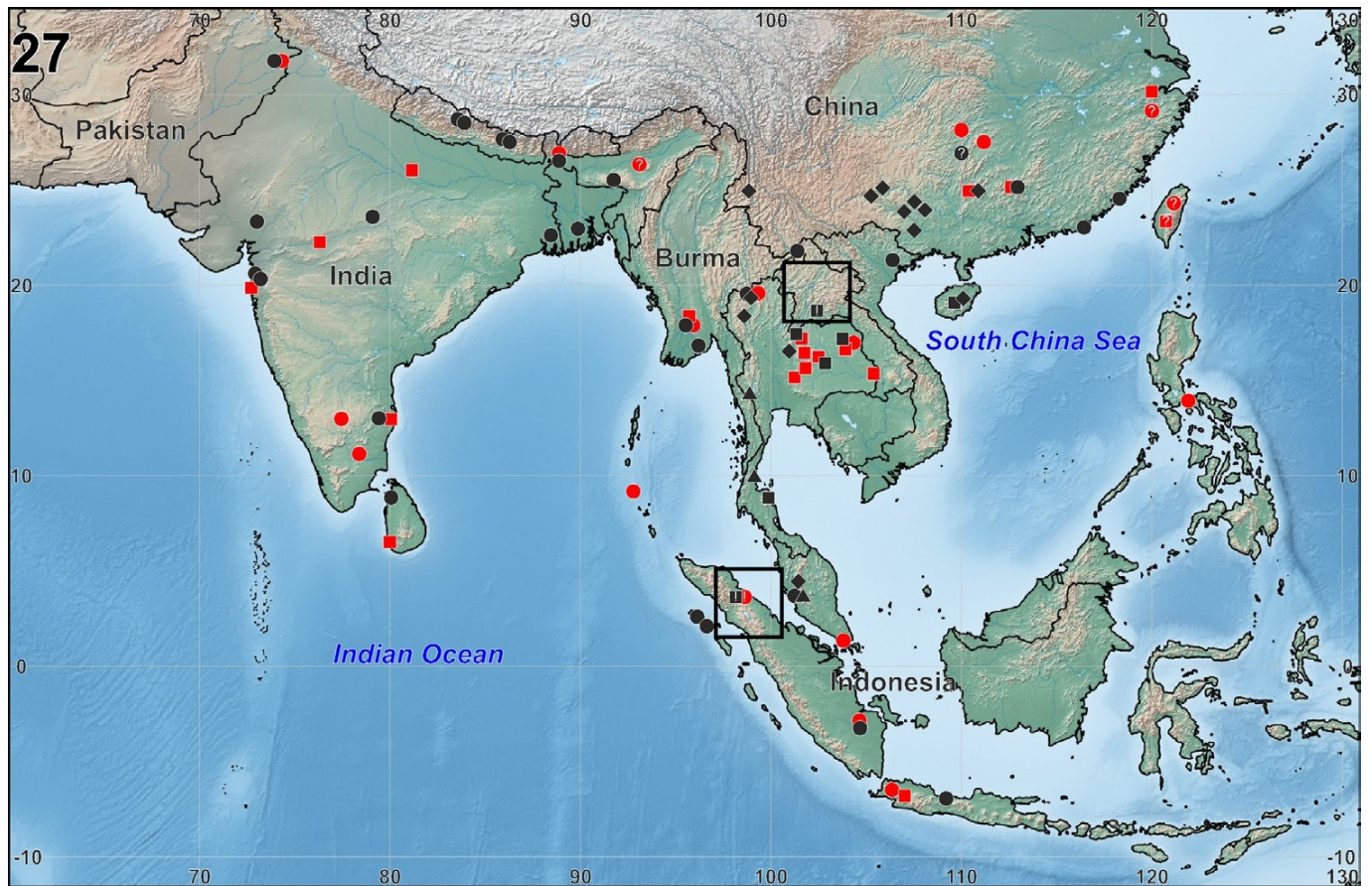


Figure 5. Figure 27. Distributional records of Scytodidae in the Indomalayan Realm. Square – *Dictis*; triangle – *Scyloxes*; circle – *Scytodes*; diamond – *Stedocys*. Red symbols refer to invasive species or species with cosmopolitan or pantropical ranges (*Dictis striatipes*, *Scytodes fusca*, *S. thoracica* and *S. univittata*). Black symbols refer to native species. ! – new records, ? – records without precise location. Frames refer to studied areas in Laos and Indonesia.

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