

A new species and new records of wolf spiders (Araneae: Lycosidae) from Laos

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Abstract. A new species, *Passiena bayi*, is described from Laos based on both sexes. The new species is related to *P. spinicrus* Thorell, 1890 and *P. torbjoerni* Lehtinen, 2005 occurring in Malaysia and Thailand, respectively. The first detailed, illustrated description of the male palp and endogyne of the *Passiena* species is provided. Four other species of wolf spiders, *Hippasa holmerae* Thorell, 1895, *Ovia macritchie* Lu, Koh, Zhang et Li, 2018, *Pardosa pseudoannulata* (Bösenberg & Strand, 1906), and *Pardosa pusiola* (Thorell, 1891) are reported from Laos for the first time.

Key words. Araneae, Lycosidae, Laos, southeastern Asia, new species, new records

INTRODUCTION

The Lycosidae is the sixth largest family of spiders with 2,439 species distributed worldwide (WSC, 2020). On a global basis the studies of this family have been uneven, with most taxonomic studies of Lycosidae focused upon Holarctic species. The Neotropical, Afrotropical, Notogean (Australia and New Zealand), and Oriental Realms remain poorly studied. This is true not only for taxonomy but also for faunistic data. Sixteen species of wolf spiders are known in Bangladesh, twelve in Malaysia, one species in Laos and Vietnam, and none reported from Cambodia (WSC, 2020). Recently the senior author had an opportunity to collect spiders in Laos and found five species belonging to the Lycosidae, including one new to science. The goals of this paper are to describe the new species and to report the remaining four species as newly recorded from Laos.

MATERIAL AND METHODS

Specimens were photographed using Nikon DS-Ri2 camera attached to Nikon SMZ25 stereomicroscope at the Laboratory

of Ecology and Evolutionary Biology of Aquatic Organisms of the Far Eastern Federal University. Photographs were taken in dishes with soft white paper on the bottom and filled with alcohol. The epigynes were macerated with NaOH solution. Lengths of leg segments were measured on the lateral side. All measurements are given in millimetres. Stacking of images was performed using Zerene Stacker software. Distribution data is given according to WSC (2020).

Spinination is given for legs I and II only which are involved in courtship behaviour.

The depositories of the studied material are the Far Eastern Federal University (FEFU) and the Zoological Museum of Moscow University, Moscow, Russia (ZMMU).

Abbreviations:

Copulatory organs. Ap – anterior apophysis of palea, Bc – base of copulatory ducts, Bs – base of septum, Em – embolus, Mh – membranous teeth, Ph – hood of anterior pocket, Pl – palea, Pp – posterior apophysis of palea, Pt – tip of posterior apophysis, Rh – head of receptacle, Ss – septal stem, Tg – tegular apophysis.

Legs and spination. Fe (fe) – femora, Pa (pa) – patella, Ti (ti) – tibia, Mt (mt) – metatarsus, Ta – tarsus; d – dorsal, p – prolateral, r – retrolateral, v – ventral.

TAXONOMY

Hippasa Simon, 1885

Type species. *Pirata agelenoides* Simon, 1884, from Myanmar.

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Comments. It is a large genus with 37 valid species names (WSC, 2020). *Hippasa* is restricted to the Old World and known from Africa to Japan, north to Tajikistan and south to South Africa and Singapore (WSC, 2020). It is relatively well studied due to series of recent publications dealing with African and Asian species (Alderweireldt & Jocqué, 2005; Wang et al., 2015).

***Hippasa holmerae* Thorell, 1895**
(Fig. 42)

H. holmerae: Feng, 1990: 145, fig. 120.1–6, male and female.
H. holmerae: Yin et al., 2012: 767, figs. 382a–e, 3–20a, b, male and female.
H. holmerae: Wang et al., 2015: 235, figs. 3A–D, 4A–G, male and female.

For the complete list of taxonomic references see WSC (2020).

Material examined. 4 males (FEFU), LAOS, Vientiane Prov., environs of Nam Lik Eco-village resort, 18°36'53.18"N 102°24'31.87"E, pitfall traps in meadow, coll. M.M. Omelko, 25–28 November 2013; 13 males (FEFU), same locality, pitfall traps at edge of rice field, coll. M.M. Omelko, 17 May–9 June 2016; 2 males (FEFU), same locality, coll. A.A. Komissarenko, 24–27 June 2017.

Note. *Hippasa holmerae* is a well-known species, it was recently redescribed in detail by Wang et al. (2015), and we therefore do not provide figures for this species.

Distribution. The species is known from Northern India to Taiwan and south to Singapore. It is reported from Laos for the first time.

***Ovia* Sankaran, Malamel & Sebastian, 2017**

Type species. *Pardosa procurva* Yu & Song, 1988, from China.

Comments. It is a small genus known from three species occurring from India to Taiwan and south to Singapore.

***Ovia macritchie* Lu, Koh, Zhang et Li, 2018**
(Fig. 42)

O. macritchie Lu et al., 2018: 347, figs. 2A–G, 5A–G, 8A–F, 11A–D, 13A–B, male and female.

Material examined. 3 males (FEFU), LAOS, Vientiane Prov., environs of Nam Lik Eco-village resort, litter, 18°36'53.18"N 102°24'31.87"E, coll. M.M. Omelko, 19–27 May 2016; female (FEFU), same locality and habitat, coll. M.M. Omelko, 12–13 June 2017; 6 males (FEFU), same locality, pitfall traps at edge of rice field, coll. M.M. Omelko, 22 May–9 June 2016; 1 male (FEFU), same locality, pitfall traps, coll. A.A. Komissarenko, 28 May 2016.

Note. The species is known only from the original description. It was collected from several localities in Singapore and has

not since been collected from outside of the country. Thus, our find is the first record from a second country and the northernmost record of the species.

Distribution. Singapore, Laos (first record from the country).

***Passiena* Thorell, 1890**

Type species. *Passiena spinicrus* Thorell, 1890, from Malaysia.

Comments. The genus is currently known from four species. Two of them, including the type species *P. spinicrus* Thorell, 1890, occur in Southeast Asia, and two others (seemingly misplaced in the genus) are restricted to Africa (WSC, 2020). The type species is known by the holotype female. It was redescribed and illustrated for the first time by Lehtinen (2005). In the same work, Lehtinen (2005) described a new species, *P. torbjoerni* Lehtinen, 2005, based on both male and female. The palp of the new species was illustrated but lacked essential details, such as the shape of the intact palp and the shape of the embolic division. Nevertheless, it was the first description of the palp of a *Passiena* male.

We tried to compare the new species with two other congeners occurring in Asia, but failed to find types listed as deposited in the Natural History Museum in Stockholm and Zoological Museum University of Turku (Lehtinen, 2005). Fortunately, the junior author has the original illustrations of these species made for Pekka Lehtinen's publication.

***Passiena bayi*, new species**

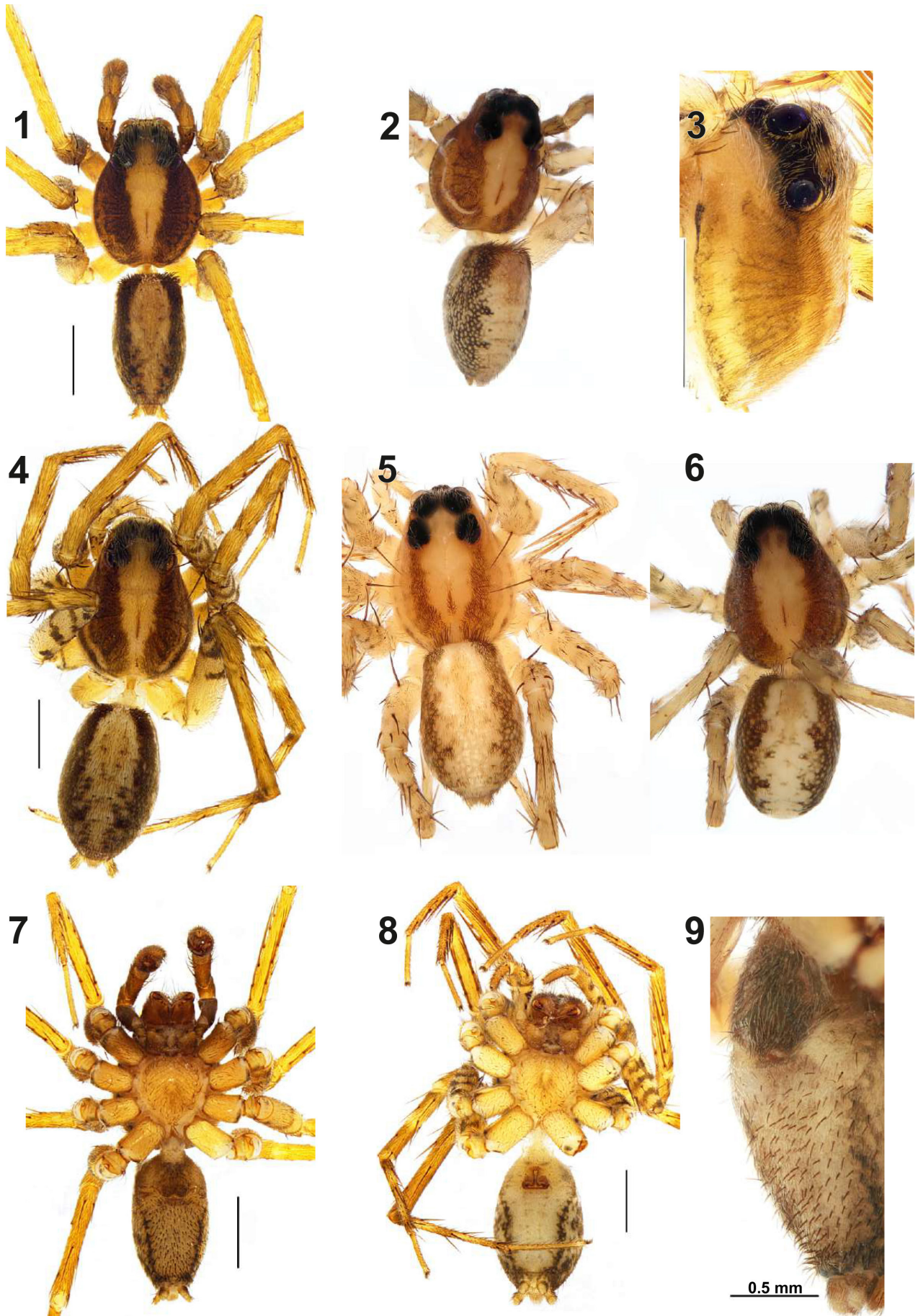
(Figs. 1, 3, 4, 7–12, 16, 19–28, 30–32, 42)

Material examined. Holotype male (ZMMU), LAOS, Champasak Prov., Bolaven plateau, environs of Tad E-Tu resort, 910 m, 15°11'35.56"N 106°6'8.11"E, coll. M.M. Omelko, 1–6 December 2013.

Paratypes: 11 males 8 females (ZMMU), same data as the holotype; 6 males 2 females (FEFU), environs of Tad Fane resort, 950 m, dry meadow, 15°11'0.19"N 106°7'37.37"E, coll. M.M. Omelko, 8–12 December 2013.

Etymology. The specific name is a patronym in honour of Nicky Bay, the well-known Singaporean macro-photographer and co-author of *Borneo Spiders: A Photographic Field Guide* (Sabah Forestry Department).

Diagnosis. The new species is closely related to both *P. spinicrus* and *P. torbjoerni* occurring at Pinang Island (Malaysia) and in Thailand, respectively. Males of *P. bayi*, new species, can be distinguished from *P. torbjoerni* by the larger tegular apophysis, the tip of the embolus being slightly curved vs. strongly curved (cf. Figs. 23, 25 and Fig. 29); posterior apophysis (Pp) of palea (Pl) with tip (Pt) directed anteriorly vs. posterior apophysis with tip directed prolaterally (cf. Figs. 24, 25 and Fig. 29); cymbium of new species is straight while in *P. torbjoerni* it is distally screwed (cf. Fig. 27 and Fig. 36). Female chelicerae of *P.*



Figs. 1–9. *Passiena bayi*, new species (1, 3, 4, 7–9), *P. torbjoerni* (2, 5), and *P. spinicus* (6). 1, 2, general appearance of male, dorsal; 3, female carapace, lateral; 4–6, general appearance of female, dorsal; 7, 8, general appearance of female, ventral; 9, male abdomen, ventral. Scale = 1 mm (unless otherwise specified).

bayi, new species, are yellow, with thin brown stripes vs. brown with yellow lateral sides in *P. spinicrus*. Endogynes of *P. spinicrus* as well as *P. torbjoerni* are not illustrated by Lehtinen (2005) but it is notable that the receptacles in *P. spinicrus* are located more anteriorly than in the new species (cf. Fig. 35 and Figs. 31, 32). The new species can be easily distinguished from *P. torbjoerni* by a shorter epigyne (septal stem length/septal base width ratio 1.0 in new species vs. 1.2 in *P. torbjoerni*), significantly narrower median band on the carapace, darker dorsal sides of carapace, and darker dorsal side of abdomen. Females of the new species can be easily distinguished from females of *P. torbjoerni* and *P. spinicrus* by a higher “septum’s base height/septum’s height” ratio of 0.19 (vs. 0.11 and 0.13, respectively).

Description. Male. Total length 4.54–4.86. Carapace 2.20–2.40 long, 1.60–1.80 wide. Carapace dark brown with a yellow median band and narrow yellowish submarginal stripes. Eye area black. Chelicerae dark brown with thin longitudinal stripes, maxillae and labium brown. Sternum yellow, with an indistinct gray spot in the middle. Chelicerae with 3 promarginal and 3 retromarginal teeth. Abdomen dorsally brown with wide light median band and darker cardiac mark; venter light brownish with a pair of brown lateral stripes, covered with sparse modified spines (Fig. 9). Segments of legs uniformly yellow except for femur I (black with yellow tip [Fig. 10]) and femora II–IV having dark semi-rings.

Spination of legs: I – fe 3d 2p 1r, pa 1p 1r, ti 2p 2r 5-5v (ventral spines form 2 oblique rows extending to lateral sides of leg), me 3p 2r 2-2v; II – fe 3d 2p 3r, pa 2d 1p 1r, ti 2d 2p 2r 5-5v, me 3p 3r 2-2v.

Table 1. Legs segments length for *Passiena bayi*, new species (holotype, male). Measurements are in mm.

	Fe	Pa	Ti	Mt	Ta	Total
I	1.84	0.76	1.89	1.84	0.97	7.3
II	1.74	0.69	1.56	1.68	0.88	6.55
III	1.70	0.59	1.45	1.86	0.81	6.41
IV	2.38	0.77	2.05	2.95	1.28	9.43

Palp as in Figs. 19–28. Femur, patella, tibia, and base of cymbium brown, distal part of cymbium yellow with large claw on the tip. Femur relatively short, about the length of cymbium; tibia very long, longer than bulb. Subtegulum large, located medially, its width about 1/2 of bulb width. Tip of the retrolateral part of tegulum (*Rt*) stands more anteriorly than anterior edge of the prolateral part (*Tp*) and tegular apophysis, terminates at about 1.5 o’clock position; sperm duct wide, makes a right angle turn (in ventral view) and an U-shaped loop in retrolateral view (Fig. 21). Tegular apophysis (*Tg*) transversal, lacking an anterior arm, directed

antero-retrolaterally. Embolic division large, not hidden by tegular apophysis, embolus originating on the dorsal side of the bulb, long, prolaterally accompanied with a membrane, embolus filamentous, terminating at about 2 o’clock position; palea (*Pl*) with 2 apophyses, anterior (*Ap*) and posterior (*Pp*). Anterior apophysis sharply pointed (in ventral view, Fig. 24), and the posterior claw-like (in lateral view, Fig. 26); dorsoanterior part of palea with membranous teeth (*Mh*).

Female. Total length 5.46–5.73. Carapace 2.13–2.47, 1.71–1.80 wide. Colouration as in males but ventral side of prosoma and abdomen lighter, while, in contrast, leg segments are darker. Femora of all legs with up to 4 dark semi-circular rings. Chelicerae as in male. Venter of abdomen without modified setae. Book-lung covers yellowish.

Spination of legs: I – fe 3d 2p 2r, ti 1p 1r 5-5v (ventral spines form 2 oblique rows extending to lateral sides of leg), me 3p 3r 2-2v; II – fe 3d 2p 2r, pa 2d 1p 1r, ti 2d 2p 2r 5-5v, me 3p 3r 2-2v.

Table 2. Legs segments length for *Passiena bayi*, new species (female). Measurements are in mm.

	Fe	Pa	Ti	Mt	Ta	Total
I	2.01	0.84	2.02	1.80	0.96	7.6
II	2.00	0.80	1.71	1.72	0.89	7.12
III	1.79	0.71	1.46	1.79	0.86	6.61
IV	2.47	0.79	2.13	3.13	1.33	9.85

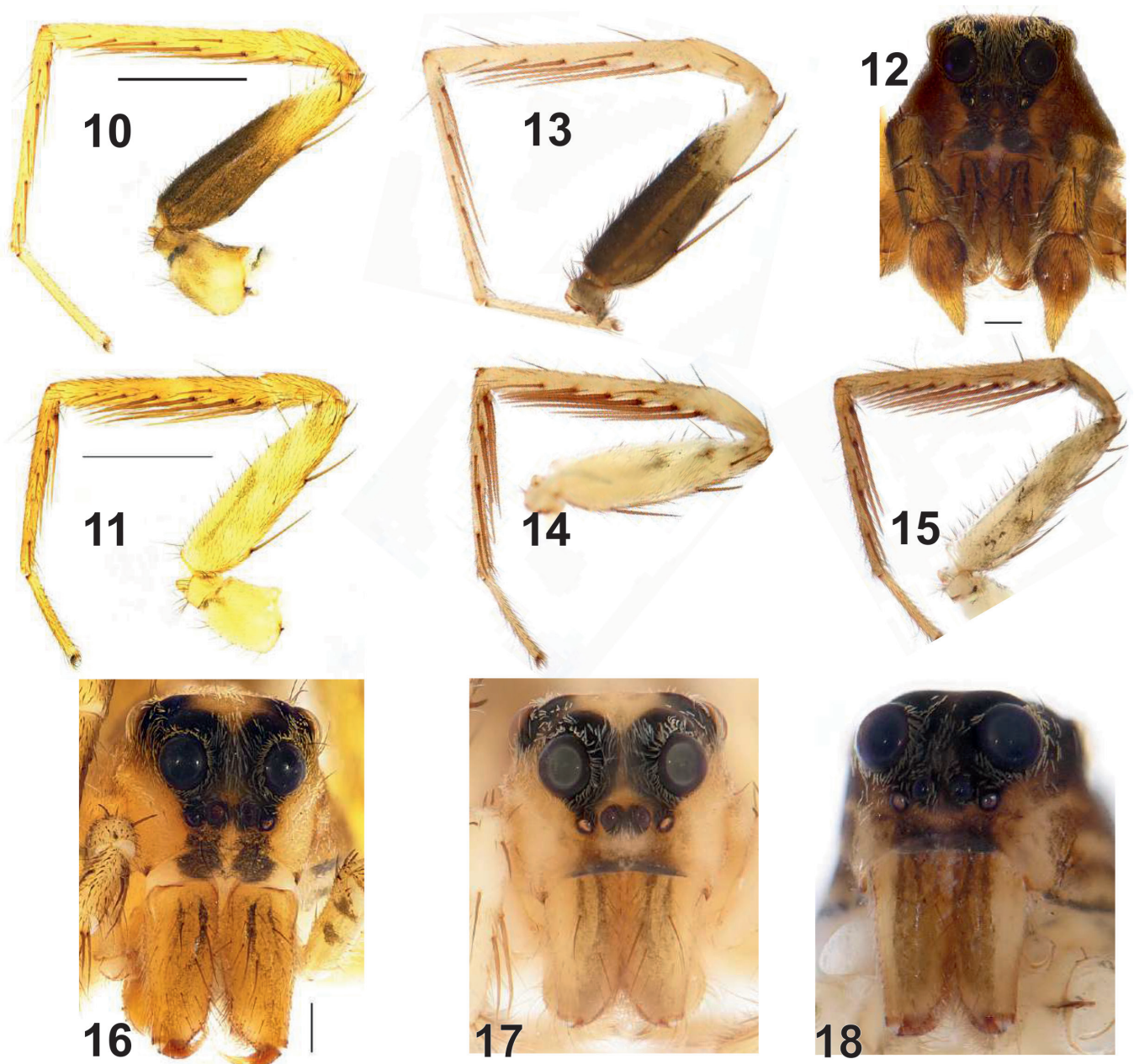
Epigyne as in Figs. 30–32. Anterior pocket with 2 hoods (*Ph*). Septum reversed T-shaped with distinct stem (*Ss*) becoming very thin in its anterior part and widened posteriorly; stem as long as base (*Bs*) wide; anterior hood as wide as septal base height; large receptacles and bases of copulatory ducts visible through integument. Receptacle with a large head (*Rh*), head suboval (transversal) with the antero-lateral part angled, head 1.5 longer than septal base height; heads separated by 1/3 of their length; base of copulatory ducts (*Bc*) heavily sclerotised, oval, tube-shaped part of copulatory duct very short, shorter than wide.

Distribution. Type locality only.

Pardosa C.L. Koch, 1847

Type species. *Lycosa alacris* C.L. Koch, 1833, from Germany.

Comments. This is the most speciose genus in Lycosidae with 542 species (WSC, 2020), and has a worldwide distribution. It is relatively well studied in the Northern Holarctic. Many species occurring in Asia have no illustrated descriptions or descriptions are too weak for species identification.



Figs. 10–18. *Passiena bayi*, new species (10–12, 16), *P. torbjoerni* (13, 14, 17), and *P. spinicrus* (15, 18). 10, 13, male leg I; 11, 14, 15, female leg I; 12, male carapace, frontal; 16–18, female, carapace. Scale = 1 mm (10, 11); 0.25 mm (12, 16).

***Pardosa pseudoannulata* (Bösenberg & Strand, 1906)**
(Figs. 37–39, 42)

P. pseudoannulata: Tanaka, 2009: 245, figs. 127–128, male and female.

P. pseudoannulata: Zhu & Zhang, 2011: 279, fig. 202A–D, male and female.

P. pseudoannulata: Yin et al., 2012: 852, figs. 427a–h, 3–16c, d, male and female.

P. pseudoannulata: Baba & Tanikawa, 2015: 74, 7 figs., male and female.

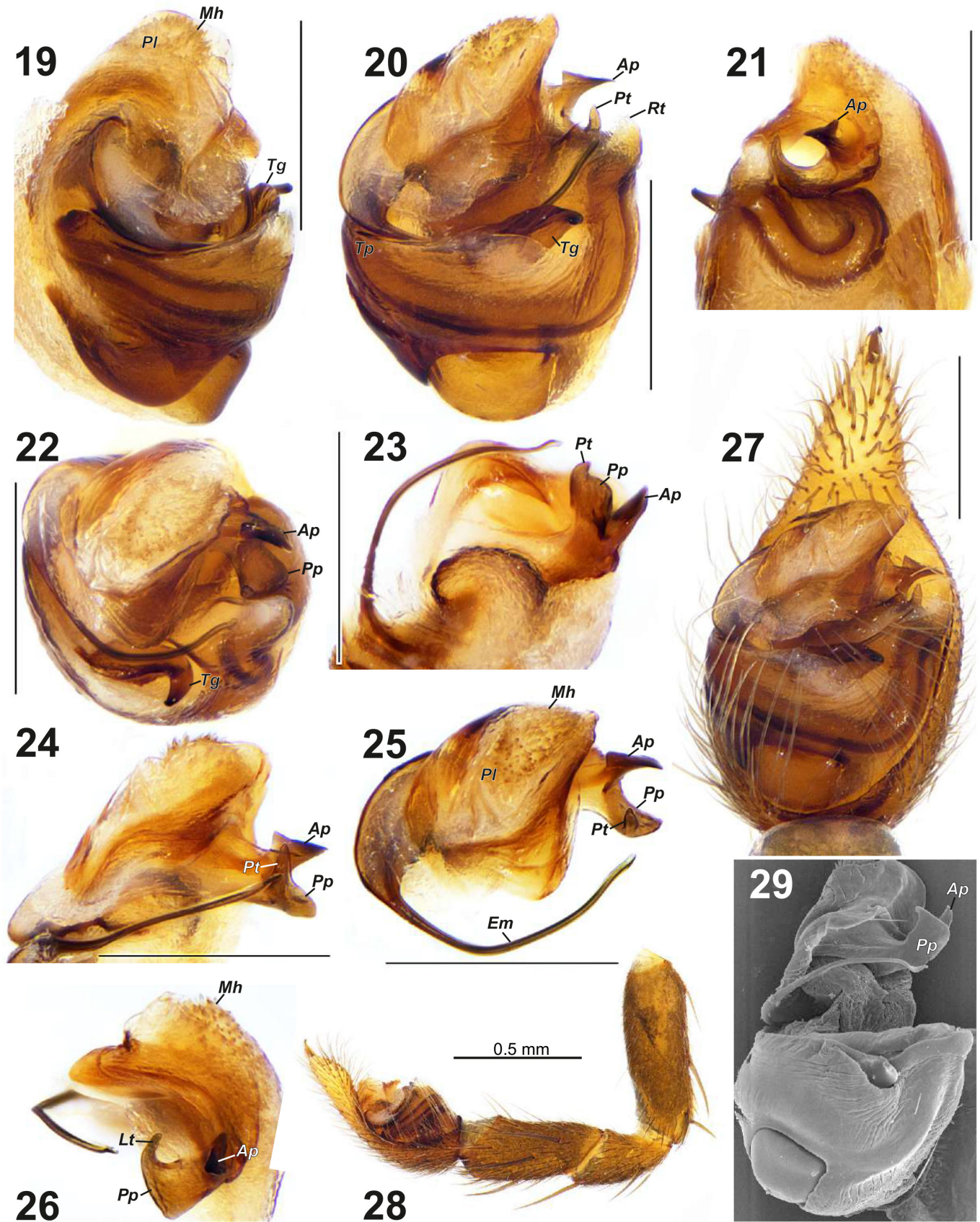
For the complete list of taxonomic references see WSC (2020).

Material examined. 11 males 11 females (FEFU), LAOS, Vientiane Prov., env. of Nam-Lik Eco-Village, 18°36'53.18"N 102°24'31.87"E, hand picking at bank of

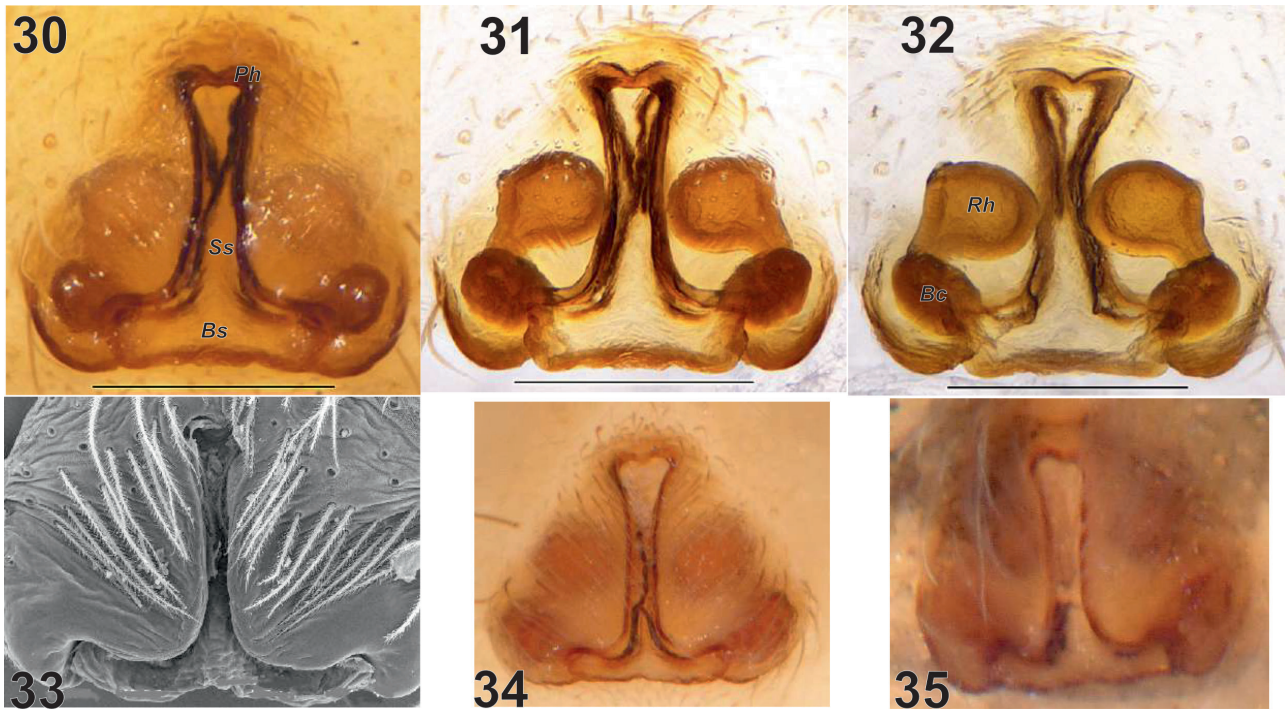
lake, coll. M.M. Omelko, 19–20 November 2013; 6 males 2 females (FEFU), same locality, pitfall traps at river bank, coll. M.M. Omelko, 21–25 November 2013; 2 males (FEFU), same locality, pitfall traps at meadow, coll. M.M. Omelko, 19–24 November 2013; 1 male (FEFU), same locality, pitfall traps, coll. A.A. Komissarenko, 23 May 2016.

Notes. This species belongs to the speciose species group – *nebulosa*. Although this species was treated in a number of taxonomic publications (WSC, 2020) its copulatory organs have never been illustrated in detail. Therefore, we provide photos of the male palp and female epigyne here.

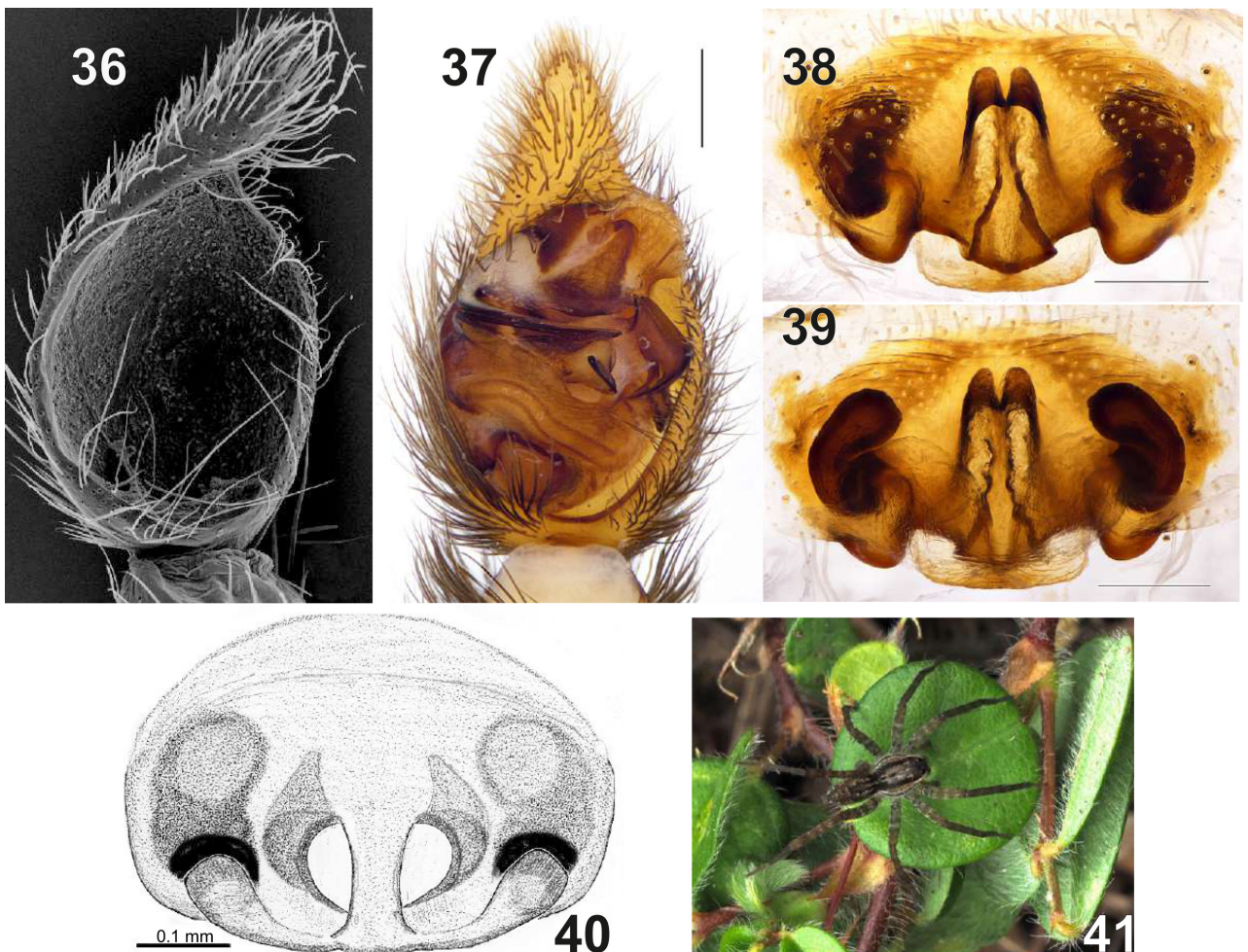
Distribution. It is distributed from India to Japan south to Java and is known from India, Pakistan, Myanmar, China (south, south-east and east provinces), South Korea, Japan, Philippines, Indonesia (Java), and Laos (first record).



Figs. 19–29. *Passiena bayi*, new species (19–28), and *P. torbjoerni* (29). 19, bulb, prolateral; 20, bulb, ventral; 21, bulb, retrolateral; 22, bulb, anterior; 23, embolic division, posterior; 24, embolic division, ventral; 25, embolic part, anterior; 26, embolic division, prolateral; 27, palp, ventral; 28, whole palp, prolateral; 29, SEM photograph of bulb. Scale = 0.25 mm (unless otherwise specified). Abbreviations: Ap—anterior apophysis, Em—embolus, Mh—membranous teeth, Pl—palea, Pp—posterior apophysis, Pt—tip of posterior apophysis, Rt—retrolateral part of tegulum, Tg—tegular apophysis, Tp—prolateral part of tegulum.



Figs. 30–35. *Passiena bayi*, new species (30–32), *P. torbjoerni* (33, 34), and *P. spinicrus* (35). 30, 34, 35, intact epigyne; 31, macerated epigyne; 32, endogyne; 33, SEM photograph of epigyne. Scale = 0.25 mm. Abbreviations: Bs–base of septum, Bc–base of copulatory ducts, Ph–pocket hood, Rh–receptacles head, Ss–septum stem.



Figs. 36–41. Copulatory organs of *Passiena torbjoerni* (36), *Pardosa pseudoannulata* (37–39); epigyne and habitus of *P. pusiola* (40–41). 36, cymbium with bulb removed, ventral; 37, palp, ventral; 38, macerated epigyne; 39, endogyne, 40, drawing of epigyne (syntype); 41, living specimen from Singapore (photo taken by David Court). Scale = 0.25 mm (unless otherwise specified).

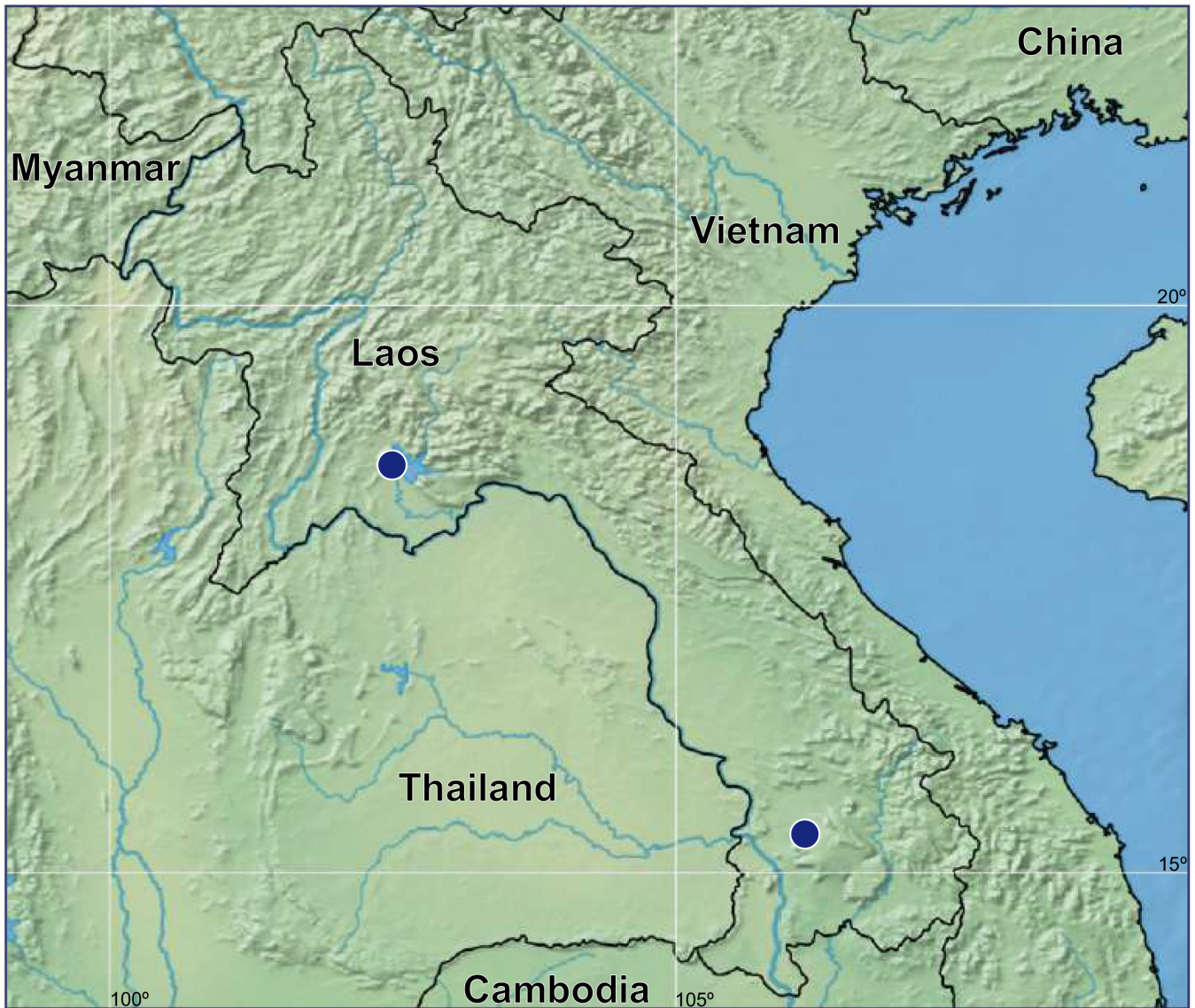


Fig. 42. Map of collecting localities.

***Pardosa pusiola* (Thorell, 1891)**
(Figs. 40–42)

P. pusiola: Yin et al., 1997: 252, fig. 119a–k, male and female.
P. pusiola: Song et al., 1999: 333, fig. 197G, M, male and female.
P. pusiola: Wang & Zhang, 2014: 233, figs. 5A–D, 6A–J, 7A–B, male and female.

For the complete list of taxonomic references see WSC (2020).

Material examined. 205 males 85 females (FEFU), LAOS, Vientiane Prov., env. of Nam-Lik Eco-Village, 18°36'53.18"N 102°24'31.87"E, coll. M.M. Omelko, November 2013, June 2016, June 2017; 3 males 4 females (FEFU), Champasak Prov., Bolaven plateau, env. of Tad E-Tu resort, 910 m, 15°11'35.56"N 106°6'8.11"E, coll. M.M. Omelko, 1–6 December 2013.

Note. This species belongs to the *Pardosa nebulosa*-group, the most species rich group within the genus. Most of species have very similar male palps and epigynes. *Pardosa*

pusiola is a common species in Laos. It inhabits mostly dry habitats like meadows, litter near forest edges, etc. It is worth mentioning that we found two different types of carapace pattern among material studied. Most specimens have a dark carapace with faint lateral bands while some of them are much lighter, with the carapace bearing wide, yellow lateral bands. However, the copulatory organs for all specimens are identical and this leads us to believe that these forms are the result of intraspecific variability. Because type specimens of this species were never illustrated and existing figures are lacking fine details, we provide a figure of the epigyne, which was drawn on the request of Pekka Lehtinen a long time ago. It seems the syntype was taken from Natural History Museum in Stockholm and probably lost. Details of the label are unknown to us.

It is worth noting that Tikader & Malhotra (1980) indicated that they examined syntype female of *P. pusiola* stored in Paris (#5578). Search of the museum database reveals no such species in the Muséum national d'Histoire naturelle and the given number refers to several other species.

Distribution. This species is distributed from India to Southeast China, Laos (first record), and south to Sri Lanka and Indonesia.

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