

NEW AND HITHERTO UNKNOWN NURSERY WEB SPIDER SPECIES (ARANEAE: PISAURIDAE) FROM THE RESERVE FORESTS OF DOOARS, WEST BENGAL, INDIA

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ABSTRACT: The paper deals with the taxonomy of a new species and a hitherto unknown species of Nursery web spider from the Reserve Forests of Dooars, West Bengal, India. The species *Thalassius pseudoalbocinctus* is recognized as new to science, and hence described and illustrated. Hitherto unknown species *Polyboea zonaformis* (Wang) is being reported for the first time from India.

KEY WORDS: *Thalassius*, *Polyboea*, new species, unknown species, Forests, West Bengal, India.

Indian nursery web spiders have previously been treated by Pocock (1900), Tikader (1970), Patel (1987), Patel & Reddy (1990), Reddy & Patel (1993), Jose *et al.* (2003, 2007) and Biswas & Roy (2005). The current World list of spiders include 339 pisaurid species under 53 genera (Platnick, 2009). In India they are represented by 20 species belonging to 9 genera (Sebastian & Peter, 2009). So far one *Polyboea* species *P. vulpina* Thorell and two *Thalassius* species *T. albocinctus* Thorell and *T. phipsoni* FOP Cambridge are known from India (Sebastian & Peter, 2009). Our attempt to assess the taxonomic diversity of spiders of Reserve Forests of Dooars and Darjeeling, West Bengal has resulted in the recognition of a new species, *Thalassius pseudoalbocinctus* and a hitherto unknown species, *Polyboea zonaformis* (Wang) (Zhang *et al.*, 2004) from India. These are described and illustrated.

MATERIALS AND METHODS

Collection and preservation of the spider specimens were done following Tikader (1987). The materials were studied using Stereo Zoom Binocular Microscope, model Zeiss SV- 11. The measurements indicated in the text are in millimeters, made with an eye piece graticule.

Abbreviations: AME= anterior median eyes, ALE= anterior lateral eyes, PME= posterior median eyes, PLE= posterior lateral eyes.

***Thalassius pseudoalbocinctus* sp. nov.**

Female (Holotype):

Total length- 11.79, carapace length- 4.46, carapace width-3.46, abdominal length- 7.1, abdominal width- 3.4. Cephalothorax (Fig. 1) brown, longer than wide, convex, medially wider, narrow and rectangular in front, covered with hairs and pubescence, with a broad midlongitudinal brown band, laterally with creamy white broad band extending throughout, anterolateral angles with brown patch, cephalic region high with deeply distinct cervical furrows; thoracic fovea longitudinal, deep, with distinct radii. Eyes 8, white, in 2 rows, all encircled by black rims, these broad on posterolaterals, anterolaterals and posterolaterals close, former smallest, later largest, anteromedians twice of anterolaterals, subequal to posteromedians, anterior row short, strongly recurved, posterior row recurved, ocular quad squarish. Inter ocular distance: AME-AME=0.33, ALE-AME=0.2, ALE-ALE=1.0, PME-PME=0.33, PLE-PME=0.33, PLE-PLE=1.33, ALE-PLE=0.2, AME-PME=0.26. Clypeus brown, broad. Chelicerae (Fig. 2) reddish brown, elongate, nearly as long as wide, each margin with 3 teeth, retromarginal teeth large and similar, one of the promarginal tooth minute, rest similar, fangs dark brown, robust, strongly curved. Both labium and maxillae (Fig. 3) brown, anteriorly scopulate, maxillae gauntlet, labium medially wide, basally notched; sternum (Fig. 4) yellow, wider than long, anterior margin concave, posteriorly produced and bluntly pointed, clothed with long brown hairs. Legs long, proximally yellow and distally yellow brown, clothed with hairs and spines, each tibia with 3 pairs of dorsal and 4 pairs of ventral long spines, each metatarsi with 6 pairs of spines, 3 dorsal and 3 ventral, tarsi and metatarsi scopulate, tarsal claw 3, 3rd claw toothless, rest with 8 teeth. Leg formula 2143.

Table 1: Length of legs of female holotype of *Thalassius pseudoalbocinctus* sp. nov. (in mm)

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	4.18	1.36	4.81	3.09	1.09	14.53
II	4.0	1.63	4.72	3.18	1.36	14.89
III	3.54	1.18	3.81	2.54	0.81	11.88
IV	3.54	1.18	3.81	2.54	1.36	12.43

Abdomen (Fig. 1) brown, cucumber like, posteriorly narrowing, medially wide, dorsum entirely margined by a creamy white broad band enclosing the brown one, this further basally enclosing a pale dagger shaped band, brown band with a small inward notch at the posterior 1/3, with 5 pairs of midlongitudinal sigilla, clothed with thin hairs; venter pale with a brown midlongitudinal band in between epigastric furrow and spinnerets, clothed with thick yellow and brown hairs, spinnerets basally brown and apically yellow.

Epigynum-Internal Genitalia (Fig.5 & 6): Epigynal lateral lobes posteriorly broad, converging, and anteriorly diverging; Copulatory duct bean shaped, horizontal; uterus rhomboid, fertilization duct and copulatory opening evident.

Material Examined: Holotype: ♀, Bichabhanga, Gorumara National Park, Jalpaiguri, West Bengal, 20.ix.2007, Coll. S. Saha. Paratype: 1♀, Rajabhatkhawa, Buxa Tiger Reserve, Jalpaiguri, West Bengal, 21.ii.2008, Coll. D. Raychaudhuri.

Type Deposition: Entomology Laboratory, Department of Zoology, University of Calcutta, Regn. No. EZC 0019-09.

Distribution: India: West Bengal.

Etymology: The species name is derived from its closest ally *Thalassius albocinctus* (Doleschall).

Remarks: The species appears to be closely allied to *Thalassius albocinctus* (Doleschall), but can be separated by i) Epigynal lateral lobes broad posteriorly; copulatory duct bean shaped, horizontal; uterus rhomboid; fertilization duct evident (epigynal lateral lobes long, posteriorly not so broad; copulatory duct elongate, perpendicular, sub parallel; uterus triangular; fertilization duct not evident in *T. albocinctus*), ii) sternum broad, wider than long (sternum longer than wide in *T. albocinctus*), iii) chelicerae nearly as long as wide (chelicerae more than twice longer than wide in *T. albocinctus*), iv) maxillae gauntlet (maxillae not gauntlet in *T. albocinctus*), v) abdominal dorsum with a median brown band, 5 pairs of sigilla and without white spots (abdominal dorsum with a median black band, 6 pairs of sigilla and white spots in *T. albocinctus*), vi) cephalothorax with a midlongitudinal brown band and anterolateral angle with a brown patch (cephalothorax with a midlongitudinal blackish brown band and anterolateral angle without any patch in *T. albocinctus*). Such differences appear to justify the erection of a new species.

Polyboea zonaformis (Wang)

Pisaura zonaformis Wang 1993, Acta zootaxon. sin. 18: 157.

Polyboea zonaformis (Wang); Zhang, J. X. & C. Zhang 2003, Acta arachnol. sin. 12: 15.

Female:

Total length-6.35, carapace length-2.11, carapace width-2.05, abdominal length-4.17, abdominal width-1.58. Cephalothorax (Fig. 7) yellowish brown, anteriorly narrowed and rectangular, posteriorly globose, broadest at middle, middorsally with a yellowish band extending from posterior eyes to base, sub dorsally and further marginally with similar parallel bands, clothed with hairs and pubescence; cephalic region raised with indistinct cervical furrows; thoracic fovea longitudinal, radii distinct. Eyes 8, pearly white, except anteromedians rest on tubercles, rimed with black, anteromedians smallest, anterolaterals larger than posteromedians, anterior row slightly procurved, posterior row strongly recurved, thus forming 3 rows of eyes, ocular quad anteriorly narrow, posteriorly broad, longer than wide. Inter ocular distance: AME-AME=0.11, ALE-AME=0.23, ALE-ALE=0.76, PME-PME=0.23, PLE-PME=0.35, PLE-PLE= 0.88, ALE-PLE=0.47, AME-PME=0.17. Clypeus yellowish brown, measurable. Chelicerae (Fig. 8) yellow, slender, long, anteriorly scopulate, promargin with 3 teeth, intermediate one larger and retromargin with 2 similar teeth, fangs brown, strongly curved. Both maxillae and labium (Fig.9) yellow, anteriorly scopulate, maxillae elongate, basally narrow, broadest at apex, labium slightly longer than wide, basally notched, apical margin nearly straight; sternum (Fig. 10) yellow, broadly cordate, anterior margin straight, posteriorly produced, clothed with black and brown hairs and pubescence. Legs yellowish brown, slender, clothed with hairs and spines, each femora with 10 dorsal and 7 ventral spines, each tibia except I with 3 dorsal, 2 dorsolateral, 3 ventral and 5 ventrolateral long spines, tibia I with 4 dorsal, 2

dorsolateral and 10 ventrolateral spines, tarsal claw 3, 3rd one toothless, rest with 10 teeth, 6 large and 4 small. Leg formula 2143.

Table 2: Length of legs of female of *Polyboea zonaformis* (Wang) (in mm)

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	3.63	0.81	4.0	3.54	1.54	13.52
II	3.72	0.81	4.0	3.45	1.63	13.61
III	2.90	0.63	2.90	3.09	1.18	11.51
IV	3.54	0.63	3.36	4.09	1.54	13.16

Abdomen (Fig. 7) yellow, elongate, anteriorly broad, posteriorly narrowing, dorsum medially with a longitudinal, broad, brownish black 'y' shaped band, further posteriorly decorated as in Fig.7, anteriorly clothed with spine like hairs, these posteriorly rather long, rest clothed with small hairs and pubescence; venter greyish brown with pale to dark brown longitudinal bands, clothed with variably developed brown and black hairs, spinnerets greyish brown.

Epigynum-Internal Genitalia (Fig. 11 & 12): Epigynal folds parallel, anteriorly divergent; lateral lobes of epigynum transverse, rectangular, anteriorly wide, both anterior and posterior margins incurved; carina lip like, incurved; fossae close. Copulatory duct of vulva wide, membranous, forming 2 sac like loops, 2nd loop shorter; head of spermatheca bifid, directed anteriorly and outwardly; spermathecal duct looped; base of spermatheca glandular; fertilization duct cylindrical, sub parallel.

Male:

Similar to female in general aspects and colour pattern. Slightly smaller than female and has smaller legs.

Total length-6.28, carapace length- 2.35, carapace width-2.4, abdominal length-3.88, abdominal width-1.58

Inter ocular distance: AME-AME=0.11, ALE-AME=0.23, ALE-ALE=0.76, PME-PME=0.23, PLE-PME=0.41, PLE-PLE= 0.94, ALE-PLE= 0.58, AME-PME= 0.23.

Table 3: Length of legs of male of *Polyboea zonaformis* (Wang) (in mm)

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	3.4	1.13	3.33	3.13	1.46	12.45
II	3.53	0.90	3.53	2.33	1.6	11.89
III	2.73	0.66	2.66	1.83	0.76	8.64
IV	3.46	0.73	3.13	3.60	1.46	12.38

Leg formula 1423.

Palp (Fig 13 & 14): Retrolateral tibial apophysis digitiform; median apophysis small, distal end with a small hook; conductor moderately long, twisted clockwise; tegulum with conspicuous retrolateral peak; distal tegular apophysis long, with a narrow base and broad tip, with a hook and a wing; embolus moderately long.

Material Examined: 1♀, 1♂ Sevok, Mahananda Wildlife Sanctuary, Darjeeling, West Bengal, 29.ix.2007; 2♀♀, Gorumara, 18.v.2007; 3♀♀ Murti, Gorumara National Park, Jalpaiguri, West Bengal, 28.x.2008; 1♀ Jayanti, 16.x.2007, 2♀♀, Gadadhar, Buxa Tiger Reserve, Jalpaiguri, West Bengal, 17.ii.2008, Coll. S. Sen.

Material Deposition: Materials are deposited in the collection of Entomology Laboratory, Department of Zoology, University of Calcutta.

Distribution: China (Zhang *et al.*, 2004; Platnick, 2009), Laos (Platnick, 2009), India (New record): West Bengal.

Remarks: The newly recorded species *P. zonaformis* (Wang) differs from the only known Indian species *P. vulpina* Thorell in the following characters:

Female: Head of spermatheca bifid, directed anteriorly and upwardly; spermathecal duct with a loop; fertilization duct cylindrical, sub parallel (head of spermatheca bent, pointing anteriorly; spermathecal duct with 4 loops; fertilization duct small and indistinct in *P. vulpina* Thorell).

Male: Conductor moderately long, twisted clockwise, without guiding lamellae; median apophysis small, distal end with a small hook; distal tegular apophysis long, with a narrow base and broad tip, with a hook and a wing; embolus moderately long (conductor long with a narrow base and broad tip, tip curved in a spiral, with 2 long guiding lamellae; median apophysis sub triangular with a large hook; distal tibial apophysis small with a fringed wing; embolus long in *P. vulpina* Thorell).

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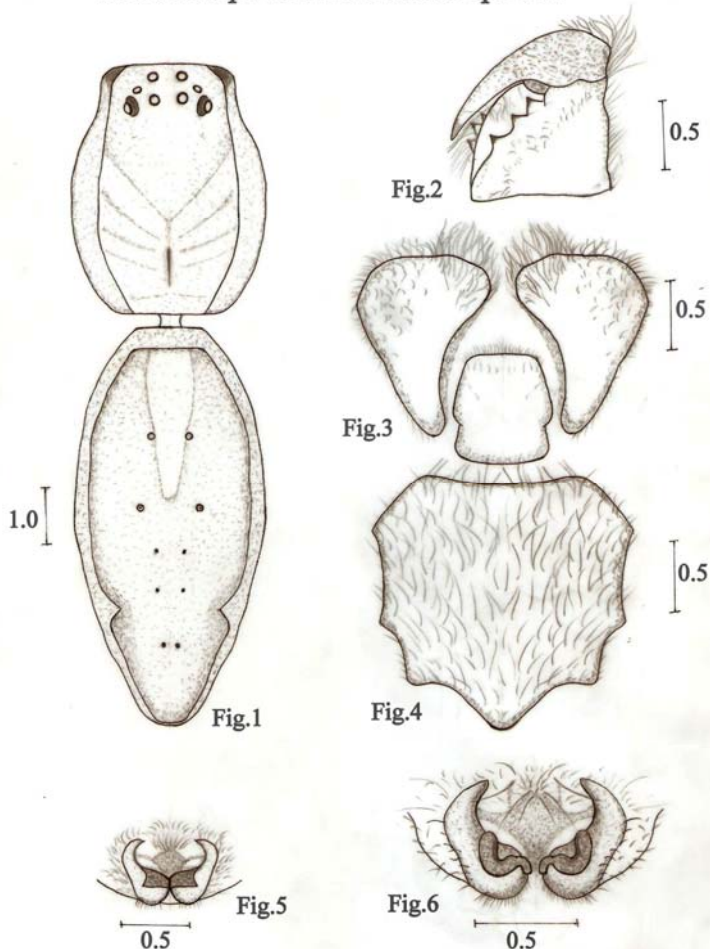
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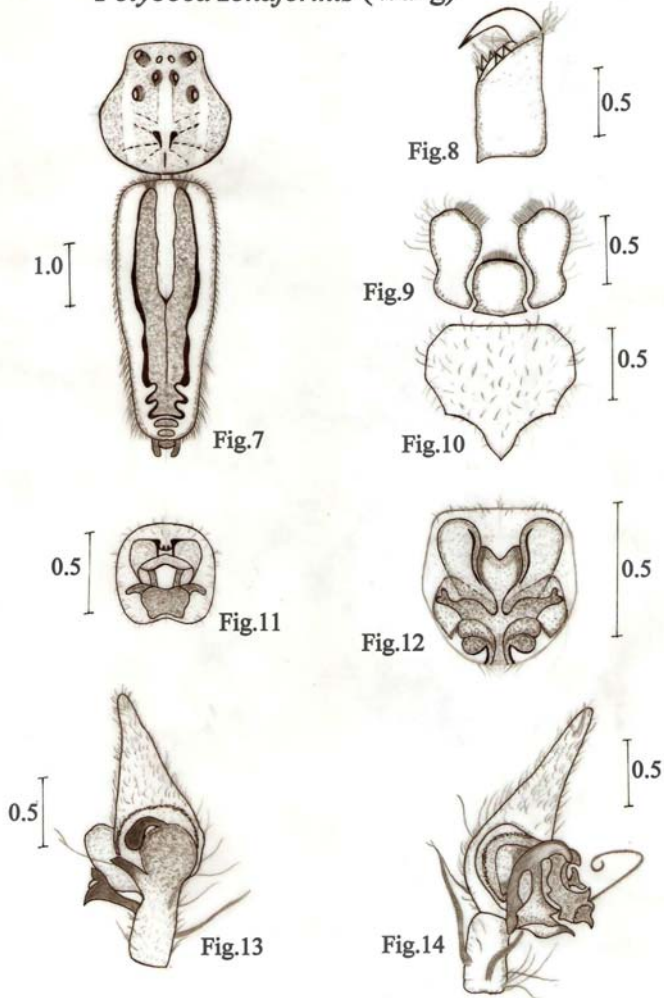
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Thalassius pseudoalbobocinctus sp. nov.



Figures 1-6: *Thalassius pseudoalbobocinctus* sp. nov.: Female: 1. Whole body, 2. Chelicerae, 3. Maxillae and labium, 4. Sternum, 5. Epigynum, 6. Internal genitalia

Polyboea zonaformis (Wang)

Figures 7- 14: *Polyboea zonaformis* (Wang): Female: 7. Whole body, 8. Chelicerae, 9. Maxillae and labium, 10. Sternum, 11. Epigynum, 12. Internal genitalia. Male palp: 13. Ventral view, 14. Lateral view.