

TWO TAILED SPIDERS (ARANEAE: HERSILIIDAE) FROM THE RESERVE FORESTS OF NORTH BENGAL, INDIA

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[Sen, S., Saha, S. & Raychaudhuri, D. 2010. Two tailed spiders (Araneae: Hersiliidae) from the reserve forests of North Bengal, India. Munis Entomology & Zoology, 5, suppl.: 1168-1175]

ABSTRACT: Taxonomy of 3 hersiliid species recorded from the Reserve Forests of North Bengal, India are dealt with. Of these *Hersilia longivulva* and *Murricia trapezodica* are recognized as new to science and *H. striata* Wang & Yin as new to India. They are described and illustrated.

KEY WORDS: Taxonomy, *Hersilia*, *Murricia*, new species, new record, reserve forests, India.

Globally, 169 species under 15 genera are included in the family Hersiliidae (Platnick, 2010). They in India are represented by 3 genera viz. *Hersilia* Audouin, *Murricia* Simon and *Neotama* Baehr & Baehr and are known by 3, 1 and 2 species respectively (Sebastian & Peter, 2009; Platnick, 2010). Earlier these two tailed spiders of India have received the attention of Pocock (1900), Gravely (1922), Tikader & Biswas (1981), Biswas & Biswas (1992), Baehr & Baehr (1993), Gajbe (2004), Rao et. al. (2005) and Majumder (2007).

However, the genus *Hersilia* represented by the only species *savignyi* Lucas is known to occur in North East India (Tikader & Biswas, 1981; Biswas & Biswas, 1992; Majumder, 2007).

Of the 3 genera *Murricia* is typically an Oriental one, while *Hersilia* is also distributed in Australian and Ethiopian regions and *Neotama* in Ethiopian and Neotropical regions (Baehr & Baehr, 1993; Rheims & Brescovit, 2004; Foord & Dippenaar-Schoeman, 2005, '06; Chen, 2007; Foord, 2008; Platnick, 2010).

A systematic survey is conducted since 2006 in the Reserve Forests of North Bengal to explore the diversity of spiders. In the process we came across with 3 hersilids. Of these *Hersilia longivulva* and *Murricia trapezodica* are recognized as new to science and *H. striata* Wang & Yin as new to India. They are described and illustrated hereunder.

MATERIALS AND METHODS

Spiders were collected and preserved following Tikader (1987) and Barrion & Litsinger (1995). 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. Leg measurements are shown as: total length (femur, patella and tibia, metatarsus I, metatarsus II, tarsus) for legs I, II and IV; total length (femur, patella, tibia, metatarsus, tarsus) for leg III; spination pattern are shown as: prolateral-dorsal-retrolateral-ventral.

Abbreviations: PL= prosomal length, PW= prosomal width, OL= opisthosomal length, OW= opisthosomal width, TL= total length, AME= anterior median eyes, ALE= anterior lateral eyes, PME= posterior median eyes, PLE= posterior lateral eyes; GNP= Gorumara National Park, CWLS= Chapramari WildLife Sanctuary, MWLS= Mahananda WildLife Sanctuary.

TAXONOMIC ACCOUNTS

Hersilia striata Wang & Yin, 1985

(Figs. 1-6, 19)

Hersilia striata Wang & Yin, 1985, Acta zootaxon. sin., 10: 45.

Female:

PL- 3.2, PW- 2.5, OL- 3.5, OW- 3.2, TL- 6.7.

Prosoma (Fig. 1) brown, cephalic region black, longer than wide, anteriorly narrowing, clothed with pubescence; cephalic region strongly raised, cervical furrows distinct, midlongitudinally with a ovoid marking; thoracic region flat with flowery decoration, radii marked by brown pubescence, fovea longitudinal. Ocular region blackish brown, elevated, eyes 8, pearly white, ringed with black, arranged in 2 strongly recurved rows, eye diameter AME>PME>PLE>ALE, ocular quad little wider than long. Inter ocular distance: AME-AME= 0.26, ALE-AME= 0.30, ALE-ALE=0.86, PME-PME= 0.33, PLE-PME=0.33, PLE-PLE= 0.93, ALE-PLE=0.10, AME-PME= 0.06. Clypeus greyish brown, height high. Chelicerae (Fig. 2) yellowish brown, promargin with 3 teeth, median one largest, retromargin with 7 very minute teeth, fangs brown, curved. Both maxillae and labium (Fig. 3) brownish yellow, apices paler, maxillae little wider than long, medially incurved, apical margin scopulate, labium wider than long, apically broad, distally narrowed. Sternum (Fig. 4) yellow, wider than long, anteriorly concave, posteriorly bluntly produced, clothed with few spine like brown hairs. Legs rusty brown, with dark annulations, ventrally off white, long, slender, clothed with small hairs, tarsal claw 3, each superior claw with 4 teeth, inferior claw toothless. Leg measurements: I 28.7 (7.8, 9.4, 7.2, 3.2, 1.1); II 27.2 (7.1, 9.0, 7.2, 3.0, 0.9); III 8.2 (2.4, 1.2, 2.1, 1.8, 0.7); IV 26.2 (6.8, 8.9, 6.8, 2.8, 0.9). Leg formula 1243.

Opisthosoma (Fig. 1) rusty brown, flat, little longer than wide, medially little broad, 4 pairs of midlongitudinal sigilla (muscular apodemes) in 2 parallel rows, a basal grey lanceolate marking extending nearly to 3rd sigilla, 2 lateral grey band joined together at both ends, inner margin broadly serrate at 2 points; venter off white, with silvery reticulations, posterolaterally with a grey band, spinnerets yellow, anterior spinnerets smaller, separated by distinct triangular colulus, posterior spinnerets annulate, spiny, nearly 10 times longer than anterior ones, apical segment long, 2 times longer than abdomen.

Epigynum-Internal genitalia (Figs. 5, 6): epigynum poorly sclerotised, with 2 vulval plate; spermatheca 2 pairs, elliptical, sub parallel; copulatory ducts long, copulatory openings 2, adjoining, small, circular.

Material examined: 1 female, Budhram, GNP, Jalpaiguri, West Bengal, India, 06.v.2008, coll. D. Raychaudhuri.

Distribution: China, Indonesia, Myanmar, Taiwan, Thailand (Chen, 2007; Platnick, 2010); India (New record): West Bengal.

***Hersilia longivulva* sp. nov.**

(Figs. 7-12, 20)

Female (Holotype):

PL- 2.8, PW- 3.4, OL- 6.0, OW- 4.9, TL- 8.8.

Prosoma (Fig. 7) yellowish brown, globose, wider than long, anteriorly narrowing, medially broad, clothed with pubescence and brown hairs; cephalic region strongly raised, cervical furrows deeply distinct; thoracic region flat with flowery decoration, medially with a deep longitudinal fovea, radii distinct, marked by brown pubescence. Ocular region black, eyes 8, pearly white, both rows strongly recurved, thus forming 3 rows of eyes, eye diameter AME>PME>PLE>ALE, ocular quad little wider than long. Inter ocular distance: AME-AME= 0.13, ALE-AME= 0.20, ALE-ALE=0.80, PME-PME= 0.20, PLE-PME=0.33, PLE-PLE= 0.93, ALE-PLE=0.13, AME-PME= 0.10. Clypeus raised, broader than the length of ocular quad. Chelicerae (Fig. 8) yellowish brown, long, robust, hairy, promargin with 3 teeth and retromargin with 9 minute teeth, fangs brown, strongly curved. Both maxillae and labium (Fig. 9) yellowish, apically strongly scopulate, maxillae medially incurved, apically broad, with few spine like hairs, labium wider than long, with a very short basal peduncle, medially broad, apically narrowed. Sternum (Fig. 10) yellowish, nearly cordate, both margins concave, posteriorly narrowed, clothed with small brown hairs. Legs yellowish brown, long, slender, each coxae with a ventral brown line, femora I and II with 2 longitudinal black bands, apices of femora, patella, tibia and metatarsi with a longitudinal black band, tarsal claw 3, each superior claw with 3 teeth, inferior claw toothless. Legs measurements: I 22.3 (5.6, 7.4, 5.5, 2.7, 1.1); II 23.1 (5.7, 7.5, 5.8, 2.9, 1.2); III 6.7 (1.5, 0.5, 2.2, 1.8, 0.7); IV 20.1 (5.0, 6.1, 5.4, 2.6, 1.0). Leg formula 2143; spinations: femora I-II=0050 and III-IV= 0030; tibia I-II= 0052 and III-IV= 0032; metatarsus I-IV= 0020.

Opisthosoma (Fig. 7) yellowish grey, flat, oval, medially broad, longer than wide, sub medially decorated with 3 pairs of irregular patch and 4 pairs of midlongitudinal sigilla (muscular apodemes), clothed with grey and black hairs, anteriorly with a tuft of spine like black hairs; venter yellowish, posterior half midlongitudinally with 'v' shaped brownish grooved marking, spinnerets yellowish brown, anterior spinnerets smaller, separated by distinct, yellowish brown, triangular colulus, posterior spinnerets very long, clothed with hairs and bristles, posterior spinnerets nearly 6 times longer than anterior, apical segment long, little longer than abdomen.

Epigynum-Internal genitalia (Figs. 11, 12): epigynum heavily sclerotised, with 3 long and broad vulval plate, median plate sub quadrate; 2 pairs of globular spermatheca, horizontally placed; copulatory ducts short, with 2 openings, widely separated, sub triangular; fertilization ducts distinctly long, directed downward.

Type material: Holotype: female, Chapramari, CWLS, Jalpaiguri, West Bengal, India, 03.xi.2007, coll. S. Sen.

Type deposition: Entomology Laboratory, Department of Zoology, University of Calcutta, registration no. EZC 0022-10.

Distribution: India: West Bengal.

Etymology: The specific epithet is derived from the long vulval plate.

Remarks: The species shows a close affinity to *Hersilia caudata* Audouin, 1826 but can be separated by i) vulval plate long and broad (vulval plate short and flat in *H. caudata*) ii) spermatheca globular, horizontal (spermatheca nearly sub triangular, vertical, sub parallel in *H. caudata*); iii) fertilization duct long, directed downward (fertilization duct short, directed upward in *H. caudata*). Such differences appear to justify the erection of a new species.

***Murricia trapezodica* sp. nov.**

(Figs. 13-18, 21)

Female (Holotype):

PL- 1.8, PW- 2.1, OL- 2.4, OW- 4.0, TL- 4.2.

Prosoma (Fig. 13) greyish yellow, globose, wider than long, anteriorly narrowed and produced, medially broad, marginally with grey band, with pubescence and hairs; cephalic region strongly gibbous, basally marked by a deep transverse brown groove, cervical furrows deeply distinct; thoracic region flat, posteromedially with distinct, longitudinal fovea, surrounded by pubescence, radii distinct. Eyes 8, pearly white, basally encircled by black bands, anterior row strongly recurved so that anterolaterals come in line with that of posteromedians, thus forming 3 rows of eyes, posterior row also strongly recurved, eye diameter PLE>AME>PME>ALE, ocular quad much wider than long. Inter ocular distance: AME-AME= 0.17, ALE-AME= 0.11, ALE-ALE=0.52, PME-PME=0.17, PLE-PME=0.23, PLE-PLE=0.47, ALE-PLE=0.05, AME-PME= 0.05. Clypeus height small, little broader than the length of ocular quad. Chelicerae (Fig. 14) yellow, short, stumpy, hairy, promargin with 3 teeth and retromargin with 6 minute teeth, fangs yellowish brown, strongly curved. Both maxillae and labium (Fig. 15) yellowish brown, apically weakly scopulate, maxillae short, apically broad, basally narrow; labium basally fused with sternum, with a short basal peduncle, wider than long, apically narrowed, medially broad. Sternum (Fig. 16) yellow, nearly cordate, anteriorly broad, posteriorly narrowed, clothed with few spine like hairs. Legs yellow, with few annular black bands, long, slender, each coxa ventrally with a brown longitudinal line, tarsal claw 3, each superior claw with 4 teeth, inferior claw toothless. Legs measurements: I 10.3 (3.0, 3.5, 1.7, 1.5, 0.6); II 11.2 (2.8, 3.9, 2.1, 1.7, 0.7); III 3.5 (1.3, 0.2, 0.9, 0.8, 0.3); IV 9.9 (2.8, 2.7, 2.1, 1.7, 0.6). Leg formula 2143; spinations: femora I= 4300 and II-IV= 2200; tibia I-IV=3000; metatarsus I-IV= 2000.

Opisthosoma (Fig. 13) grey, trapezoid, dorsum with 2 trapezoid greyish markings, midlongitudinally with a greyish band extending from base to apex, margins further with greyish band, in-between with yellow white reticulations and greyish spots, basal trapezoid marking enclosing 2 and the distal enclosing 3 pairs of sigilla (muscular apodemes), clothed with grey hairs; venter yellow with black lateral marking and chalk white reticulations, posterior half midlongitudinally with 'v' shaped black marking, spinnerets yellowish brown, anterior spinnerets smaller, separated by distinct yellowish brown, triangular colulus, posterior spinnerets very long, as long as abdomen, apical segment longer, but smaller than abdomen, clothed with spine like hairs and bristles.

Epigynum-internal genitalia (Figs. 17, 18): epigynum poorly sclerotised, with 2 longitudinal depressions; 1 pair of small, oval spermatheca; copulatory ducts long, highly convoluted, forming loop; copulatory openings small, widely separate.

Type material: Holotype: female, Sukhna, MWLS, Darjeeling, West Bengal, India, 07.iii.2009, coll. S. Saha.

Type deposition: Entomology Laboratory, Department of Zoology, University of Calcutta, registration no. EZC 0023-10.

Distribution: India: West Bengal.

Etymology: The species is so named because of the shape of abdomen.

Remarks: The species appears to be closely allied to *Murricia triangularis* Baehr & Baehr, 1993 but can be separated by i) spermatheca oval, copulatory ducts long, highly convoluted, forming loop (spermatheca and copulatory ducts never so in *M. triangularis*); ii) abdominal dorsum with 2 trapezoid greyish markings (such markings completely absent in *M. triangularis*); iii) legs with few annular black bands (legs devoid of any such band in *M. triangularis*); iv) each coxa ventrally with a brown longitudinal line (coxa without any such line in *M. triangularis*). Therefore, the present species is considered as new to science.

ACKNOWLEDGEMENTS

We thank Department of Biotechnology, Govt. of India (BT/PR6391/NDB/51/078/2005 dt. 20.11.2006) for sponsoring the project and Directorate of Forests, Govt. of West Bengal and the Head, Department of Zoology, University of Calcutta for necessary support.

LITERATURE CITED

- Baehr, M. & Baehr, B.** 1993. The Hersiliidae of the Oriental Region including New Guinea. Taxonomy, phylogeny, zoogeography (Arachnida, Araneae). Spixiana (Supplement), 19: 1-96.
- Barrion, A. T. & Litsinger, J. A.** 1995. Riceland spiders of South and Southeast Asia. CAB International UK & IRRI, Philippines: 716 pp.
- Biswas, B. K. & Biswas, K.** 1992. State Fauna Series 3: Fauna of West Bengal, Araneae: Spiders, part 3. Zoological Survey of India, : 357-500.
- Chen, S. H.** 2007. Spiders of the genus *Hersilia* from Taiwan (Araneae: Hersiliidae). Zoological Studies, 46: 12-25.
- Foord, S. H.** 2008. Cladistic analysis of the Afrotropical Hersiliidae (Arachnida, Araneae) with the first record of *Murricia* and the description of a new genus from Madagascar. Journal of Afrotropical Zoology, 4: 111-142.
- Foord, S. H. & Dippenaar-Schoeman, A. S.** 2005. First record of the genus *Neotama* Baehr & Baehr (Araneae: Hersiliidae) from the Afrotropical region. African Invertebrates, 46: 125-132.
- Foord, S. H. & Dippenaar-Schoeman, A. S.** 2006. A revision of the Afrotropical species of *Hersilia* Audouin (Araneae: Hersiliidae). Zootaxa, 1347: 1-92.
- Gajbe, P.** 2004. Spiders of Jabalpur, Madhya Pradesh (Arachnida: Araneae). Records of Zoological Survey of India, Occasional Paper, 227: 154 pp.
- Gravely, F. H.** 1922. Common Indian spiders. Journal of Bombay Natural History Society, 28: 1045-1050.
- Majumder, S. C.** 2007. Pictorial handbook on spiders of Sunderbans: WestBengal. Zoological Survey of India, : 138 pp.

Platnick, N. I. 2010. The World spider catalog, version 11.0. American Museum of Natural History. Available from: <http://research.amnh.org/entomology/spiders/catalog/index.html>. (accessed on 5th September, 2010).

Pocock, R. I. 1900. The fauna of British India, Arachnida. Taylor & Francis, London,: 153-279.

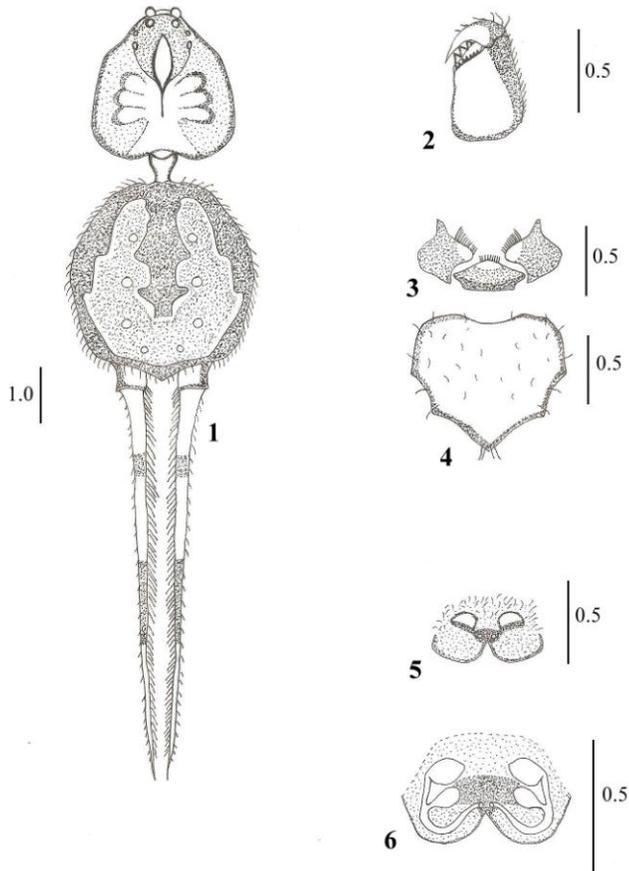
Rao, K. T., Bastawade, D. B., Javed, S. M. M. & Krishna, I. S. R. 2005. Arachnid Fauna of Nallamalai Region, Eastern Ghats, Andhra Pradesh, India. Zoological Survey of India,: 42 pp.

Rheims, C. A. & Brescovit, A. D. 2004. Revision and cladistic analysis of the spider family Hersiliidae (Arachnida, Araneae) with emphasis on Neotropical and Nearctic species. Insects Systematics and Evolution, 35: 189-239.

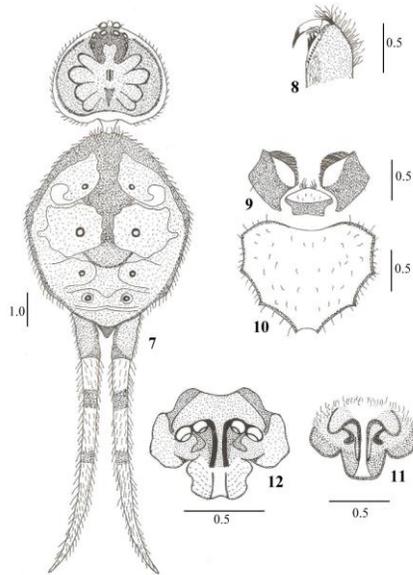
Sebastian, P. A & Peter, K. V. 2009. Spiders of India. Universities Press (India) Pvt. Ltd.,: 614 pp.

Tikader, B. K. 1987. Hand book of Indian spiders. Zoological Survey of India,: 251 pp.

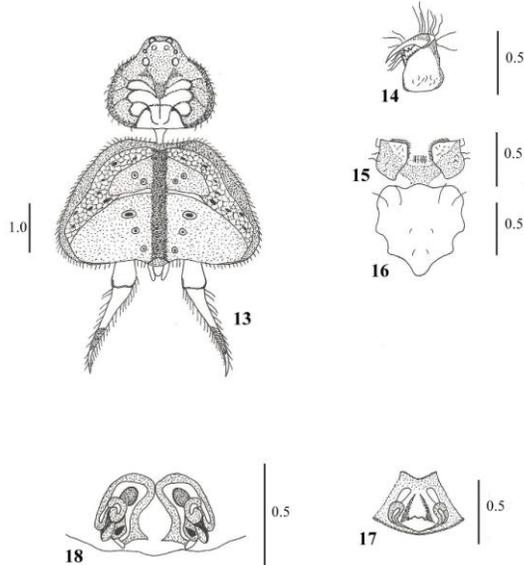
Tikader, B. K. & Biswas, B. 1981. Spider fauna of Calcutta and vicinity. Records of Zoological Survey of India, Occasional Paper, 39: 149 pp.



Figures 1-6. *Hersilia striata* Wang & Yin: Female: 1. Prosoma and opisthosoma, dorsal view; 2. Chelicerae, ventral view; 3. Maxillae and labium, ventral view; 4. Sternum, ventral view; 5. Epigynum, ventral view; 6. Internal genitalia, dorsal view.



Figures 7-12. *Hersilia longivulva* sp. nov.: Female (holotype): 7. Prosoma and opisthosoma, dorsal view; 8. Chelicerae, ventral view; 9. Maxillae and labium, ventral view; 10. Sternum, ventral view; 11. Epigynum, ventral view; 12. Internal genitalia, dorsal view.



Figures 13-18. *Murrcia trapezodica* sp. nov.: Female (holotype): 13. Prosoma and opisthosoma, dorsal view; 14. Chelicerae, ventral view; 15. Maxillae and labium, ventral view; 16. Sternum, ventral view; 17. Epigynum, ventral view; 18. Internal genitalia, dorsal view.



Figures 19-21. Photographic Images: General Habitus: 19. *Hersilia striata* Wang & Yin, 20. *Hersilia longivulva* sp. nov., 21. *Murricia trapezodica* sp. nov.

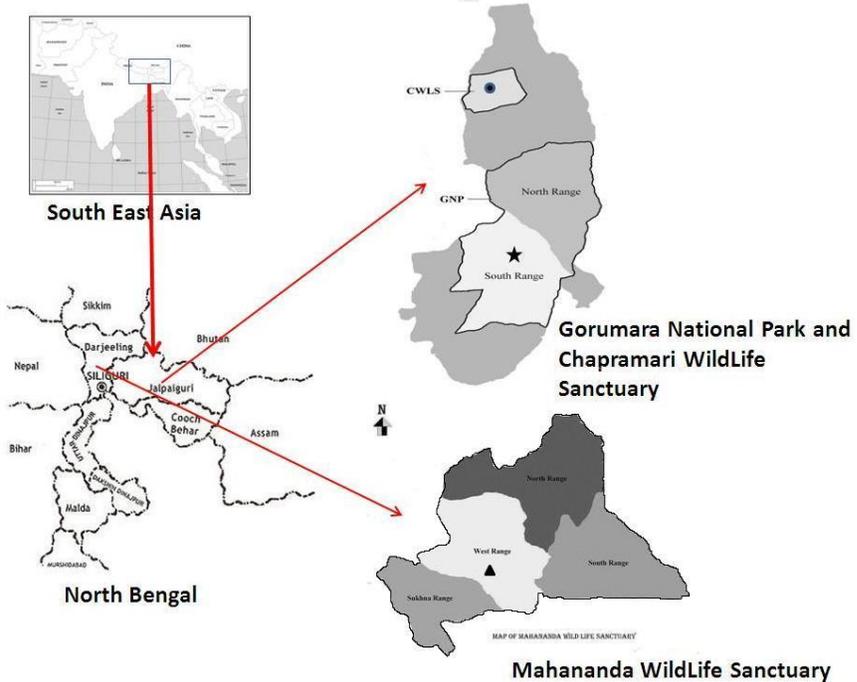


Figure 22. Distribution of three heresiids in North Bengal: ★ *Hersilia striata* Wang & Yin, ● *Hersilia longivulva* sp. nov., ▲ *Murricia trapezodica* sp. nov.