



First description of the male of the type species *Meotipa picturata* Simon, 1895 and description of a new *Meotipa* species (Araneae, Theridiidae) from India

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Abstract

The present paper reports the first description of the type species of the theriid genus *Meotipa*, *Meotipa picturata* Simon, 1895 and redescrbe the female of the same species with one new species *Meotipa multuma* sp.nov. from India. The two species are described in detail and we provide digital images and illustrations. *Chryso makiling*, Barrion-Dupo & Barrion is transferred to *Meotipa* Simon, 1895 based on the presence of the generic characters of the last genus.

Key words: Comb-footed spider, Taxonomy, new combination, Western Ghats

Introduction

Meotipa Simon, 1894 is a poorly studied theridiid genus (Deeleman-Reinhold, 2009). Its type species, *Meotipa picturata* Simon, 1895, is known only from its female sex. Even though it has been more than a century since its description, the genus remains only with 11 species (WORLD SPIDER CATALOG 2017). Among these 11 species, *Meotipa picturata*, *Meotipa argyrodiformis* Yaginuma, 1952, *Meotipa sahyadri* Kulkarni *et al.*, 2017 and *Meotipa andamanensis* Tikader 1977 are so far known to India. During our survey of Indian spiders, we came across with the male and female of the *Meotipa picturata* and one new species of *Meotipa*. Since the diagnostic features (especially the structure of female genitalia) of the new species is distinctive, the identification of this species should not be problematic in the future. Furthermore, based on the generic characters, namely the position of spinnerets, the overall somatic and the genitalic morphology, *Chryso makiling*, Barrion-Dupo & Barrion, 2015 is transferred to *Meotipa*.

Material and methods

The specimens were studied under a LEICA S8AP0 stereomicroscope. All measurements are in millimeters (mm). Length of palp and leg segments are given as the total length (femur, patella, tibia, metatarsus (except palp), and tarsus). Drawings were made with the aid of a drawing tube attached to the microscope. The microphotographic images were taken by Leica DFC2900 digital camera attached to Leica M205A stereomicroscope with the software package Leica Application Suite (LAS), version 4.5.0. The specimens are deposited in a reference collection housed at the Division of Arachnology, Department of Zoology, Sacred Heart College, Thevara, Cochin, Kerala, India (ADSH). The map was produced with simplemapp.net.

Abbreviations used in the text: ALE—anterior lateral eye, AME—anterior median eye, do—dorsal, pl—prolateral, PLE—posterior lateral eye, plv—prolateral ventral, PME—posterior median eye, rl—retrolateral, rlv—retrolateral ventral, v—ventral, I–IV—1st to 4th leg, m. alt—meter altitude

Taxonomy

Theridiidae Sundevall, 1833

Meotipa Simon, 1895

Type species. *Meotipa picturata* Simon, 1895.

Diagnosis. For description and diagnostic features of the genus see Deeleman-Reinhold, (2009).

Meotipa picturata Simon, 1895

(Figs. 1A–J, 2A–F & 4A–D)

Redescription. Deeleman-Reinhold (2009)

Material examined. 3♂ (ADSH 101671A), 4♀ (ADSH 101671B) India, Kerala, Pathiramanal Island (9°37'07.11"N, 76°23'04.95"; 4 m. alt.) from foliage by hands; 20 April. 2015, 9 June. 2015, 11 July. 2015 and 27 Nov. 2015; Jobi M.J, Pradeep M.S & Prajapati D.A.

Diagnosis. *M. picturata* is more similar to *M. thalerorum* Deeleman-reinhold, 2009 with which shares characters such as absence of flattened abdominal spines (Fig. 1A); abdomen with faint grey spots (Fig. 1A & C); male palp with spoon shaped conductor (Fig. 1G, H & Fig. 4A, B); epigyne with deep round pit, in the middle of which a rod-shaped projection (Fig. 1I). It can be distinguished from the former species by the transparent palp, broad conductor, flat with retrolaterally folded sides; embolus narrow, spine like with a blunt tip separated from the conductor (Fig. 4A) (in *M. thalerorum*, conductor distally a membranous disc, distal edge partly aligned with chitinized arch. Embolus simple, straight, see in Deeleman-reinhold, 2009 Fig. 10 & 11); Fertilization duct basal to globular spermathecae, apically with a curve; widely placed copulatory duct (Fig. 4C).

Description. Female in alcohol (Figs. 1D–F, 1I–J, 2A–F, 4C–D): Prosoma front and back truncated; medially flat; Cephalic area elevated; clypeus broad, bulged out; All eyes nearly uniform in size, AME black, rest pearly white; Cephalothorax with reddish stripes, medially radiating streaks; Prosoma glabrous; Eye field, clypeus with few short hairs; Fovea broad, smooth with distinct depression and irregular ridges; Sternum rebordered, brownish with black patches; Maxillae with short hairs and without scopulae; labium short with small hairs; Pedipalp long; Tibia dorsally with lanceolate spines, long proximally, distally small with swelling, apicoventrally reddish; Tarsus with a pectinate claw; Opisthosoma triangular, very broad in lateral view, its dorsum provided with long alternate red and black stripes, caudal region knobbed extending downwardly towards spinnerets, provided with lanceolate spines. Venter transparent, some small patches posteriorly; Body length 5.60; Prosoma length 1.80, width (at middle) 1.80, height (at middle) 0.50; Opisthosoma length 3.80, width (at middle) 2.03, height (at middle) 2.80; Eye diameter: AME 0.097, ALE 0.095, PME 0.100, PLE 0.092; Eye interdistances: AME–AME 0.10, PME–PME 0.09, PLE–ALE contiguous; AME–ALE 0.04, PME–PLE 0.07, PME–AME 0.06; Clypeus height at AMEs 0.36, at ALEs 0.48; Measurements of legs & palp; Palp 2.08 [0.79, 0.27, 0.23, 0.79]; leg I 17.36 [6.20, 0.76, 3.40, 6.00, 1.00], II 11.13 [4.00, 0.50, 2.30, 3.60, 0.73], III 7.38 [2.70, 0.48, 1.50, 2.10, 0.60], IV 16.06 [6.00, 0.56, 2.80, 5.80, 0.90]; Leg formula 1423; Femur, patella & tibia with lanceolate spines distally; Tibia with reddish black spot distally; Leg segments except tibia with short, fine, dense hairs; Femur IV with a row of lanceolate spines distoventrally; Metatarsus I blackish distally; *Epigyne* (Figs. 1I–J & 4C–D): very small having a broad atrium medially with a rod or scape like structure narrowing apically and flattened; Copulatory openings depressed, contiguous, medially placed, deeply rest inside the atrium (Fig. 4D); Copulatory ducts narrow, moderately long, tube like without convolution, having a single opening; Spermathecae globular (Fig. 4D); Fertilization duct relatively long, basal to spermathecae, proximal part confronting with an apical curve (Fig. 4C).

Males in alcohol (Figs. 1A–C, 1G–H, 4A–B). Like the female, except by the following. Dwarf, nearly ¼th smaller than female, without characteristic lanceolate spines; Prosoma smooth, creamy, strongly truncated anteriorly, two short setae medially; Clypeus slightly bulged with a median longitudinal patch; Eye field wide, slightly elevated, some short hairs, eyes uniform sized, rose coloured appearance except bulged out black anterior medians; Fovea indistinct with longitudinal patch; Sternum heart shaped; maxillae, labium without scopulae; Body length 1.88; Prosoma length 0.82, width (at middle) 0.50, height (at middle) 0.36; Opisthosoma length 1.06, width

(at middle) 0.48, height (at middle) 0.70; Eye diameter: AME 0.07, ALE 0.06, PME 0.06, PLE 0.06; Eye interdistance: AME–AME 0.04, PME–PME 0.05, PLE–ALE contiguous, AME–ALE 0.02, PME–PLE 0.01, PME–AME 0.02; Clypeus height at AMEs 0.07, at ALEs 0.12. Measurements of legs and palp: Palp 0.79 [0.23, 0.06, 0.17, 0.33]; Leg I 3.30 [1.30, 0.20, 0.10, 1.20, 0.50], II 2.65 [0.90, 0.10, 0.50, 0.75, 0.40], III 1.78 [0.60, 0.08, 0.30, 0.50, 0.30], IV 3.1 [1.10, 0.10, 0.70, 0.80, 0.40]; Leg formula 1423; Opisthosoma with irregular, alternate grey and white patches, slightly high, medially with indistinct humps; Caudal region lower, abruptly bent downwards, surface between caudal end and spinnerets concave with white patches; Legs with short, fine hairs, small grey spots ventrally; *Palp* (Figs. 1G–H & 4A–B): Simple, cymbium short with numerous setae; Tegulum small, without any apophysis (also in *M. bituberculata* and *M. impatiens*); Conductor broad, flat with retrolaterally folded sides, originating distoretrolaterally directed at 12’O clock (Fig. 4B); embolus long, narrow, spine like separated from the conductor, medially originate with a blunt tip, facing towards the apical part of the conductor (Fig. 4A).

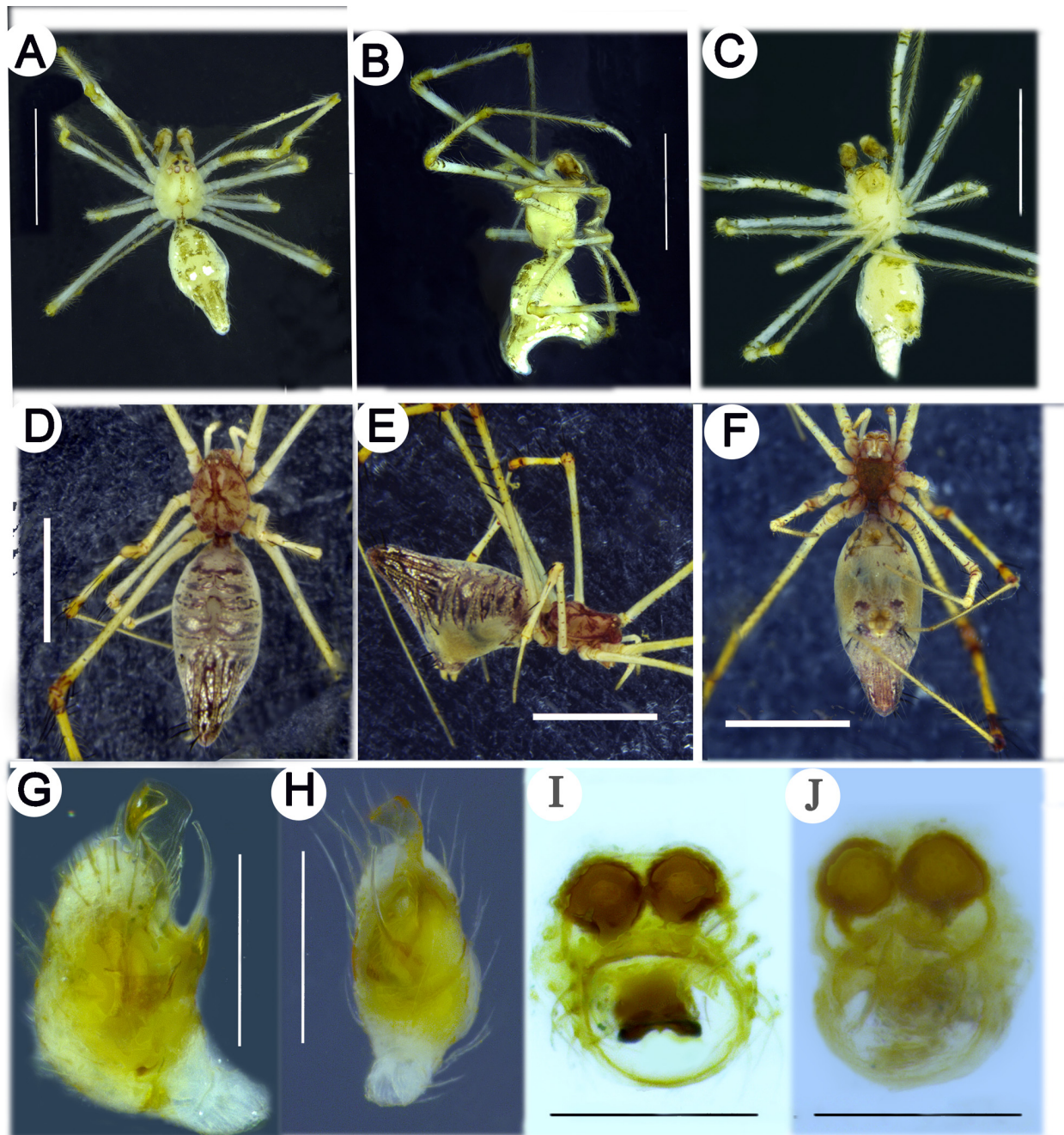


FIGURE 1A–J. *Meotipa picturata*. A Male habitus, dorsal view, B same prolateral view, C same ventral view; D Female habitus, dorsal view, E same prolateral view, F same ventral view; G Male left palp prolateral view, H same ventral view; I Female Epigyne, ventral view; J same dorsal view; Scale bars: A, B, C, 1 mm; D, E, F, 2 mm; G, H, I, J, 0.02 mm.

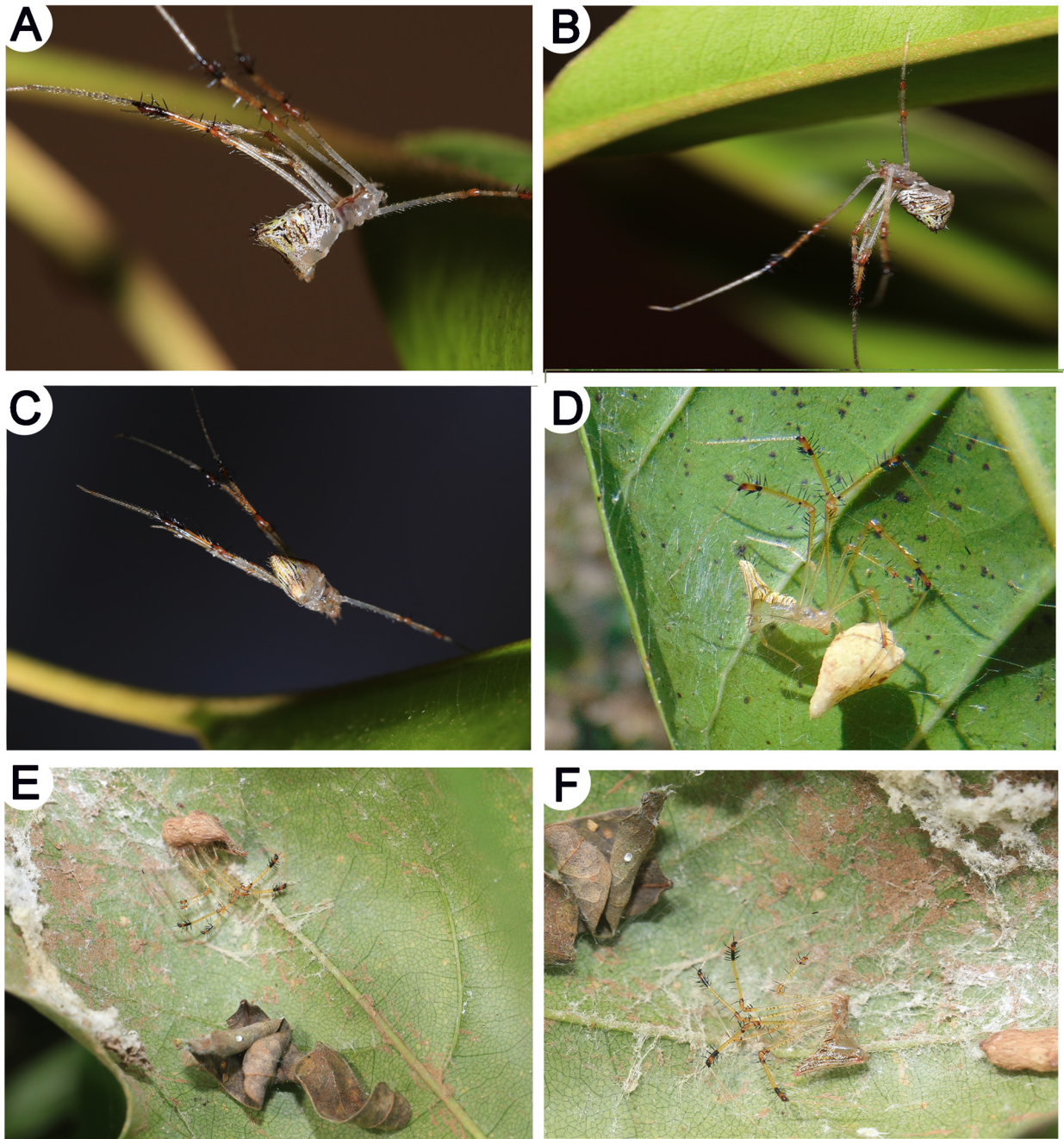


FIGURE 2A–F. Field photographs of *Meotipa picturata*. The different specimens collected from Pathiramanal Island shows variation in the shape, structure and pattern of their opisthosoma.

Variation: Spiders are notable for intra specific variation and it is proved that specimens collected from the same area show variation in their morphological and copulatory structures (Malamel *et. al*, 2013). In our study also the different specimens collected from Pathiramanal Island show variation in the caudal region short to moderately long; white patches to yellow stripes on their opisthosoma (Fig. 1 D–F & Fig. 2A–F).

Distribution. India, Thailand, Indonesia. In India, known from Goa, Kerala and Tamil Nadu (Fig 5).

***Meotipa multuma* sp. nov.**

(Figs. 3A–E & 4E–F)

Type material. Holotype: ♀ with left leg I missing (ADSH 101672A), **INDIA: Karnataka:** Chickamagalur:

Tarikere: Sunnadahalli, 13°39'43.89"N, 75°51'20.56"E, 743 m.alt., S.M. Prashanthakumara leg., 1 Nov 2015, by hand from the underside of the green leaf.

Etymology. The specific epithet is an adjective and refers to the length of the copulatory duct Latin *multum* = long.

Diagnosis. *Meotipa multuma* sp. nov. is similar to *Meotipa bituberculata* Deeleman-reinhold, 2009 by shared characters such as raised eyes and slanting clypeus. It can be distinguished from latter species by the following combination of characters: Carapace without any markings, Opisthosoma with a median black patch without lateral humps, 12–15 lanceolate spines posteriorly (Fig.3A) (in *M. bituberculata*, carapace with dark red parallel-sided central band, opisthosoma short, with one pair of lateral humps, see Deeleman-reinhold, 2009: Fig. 22); epigyne with very long, more convoluted copulatory duct around spermathecae; large copulatory openings (Figs. 3D, 4F); fertilization duct placed posteriorly to the spermathecae, twisted, facing each other (Figs. 3E, 4E) (in *M. bituberculata* less convoluted copulatory duct, fertilization ducts longer than spermathecae, see Deeleman-reinhold, 2009: fig. 27 & 29).

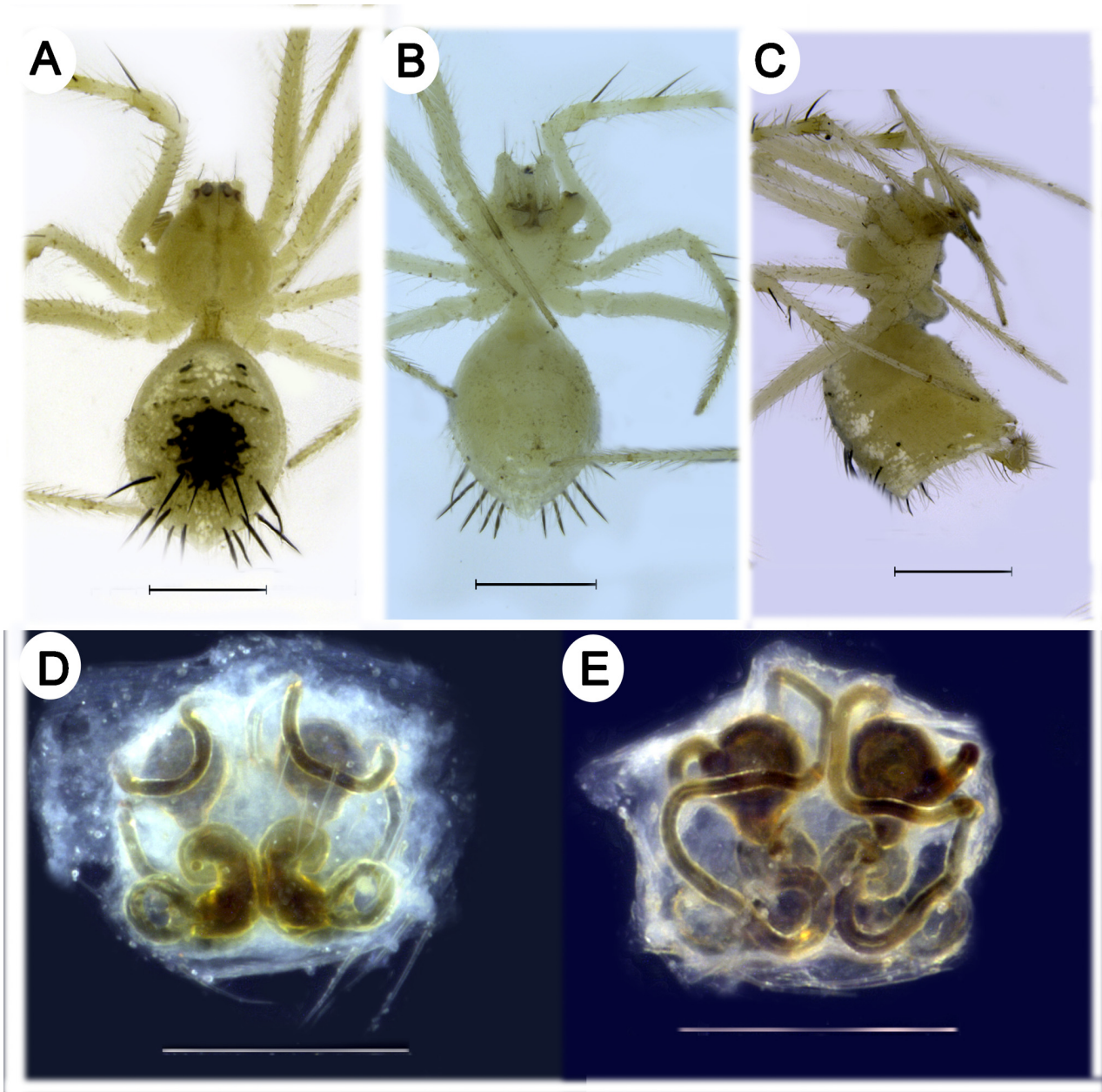


FIGURE 3A–E. *Meotipa multuma* sp. nov. A Female (holotype) habitus, dorsal view; B same ventral view, C same prolateral view; D Female epigyne ventral view; E same dorsal view; Scale bars: A, B, C, 1 mm; D–E, 0.02 mm.

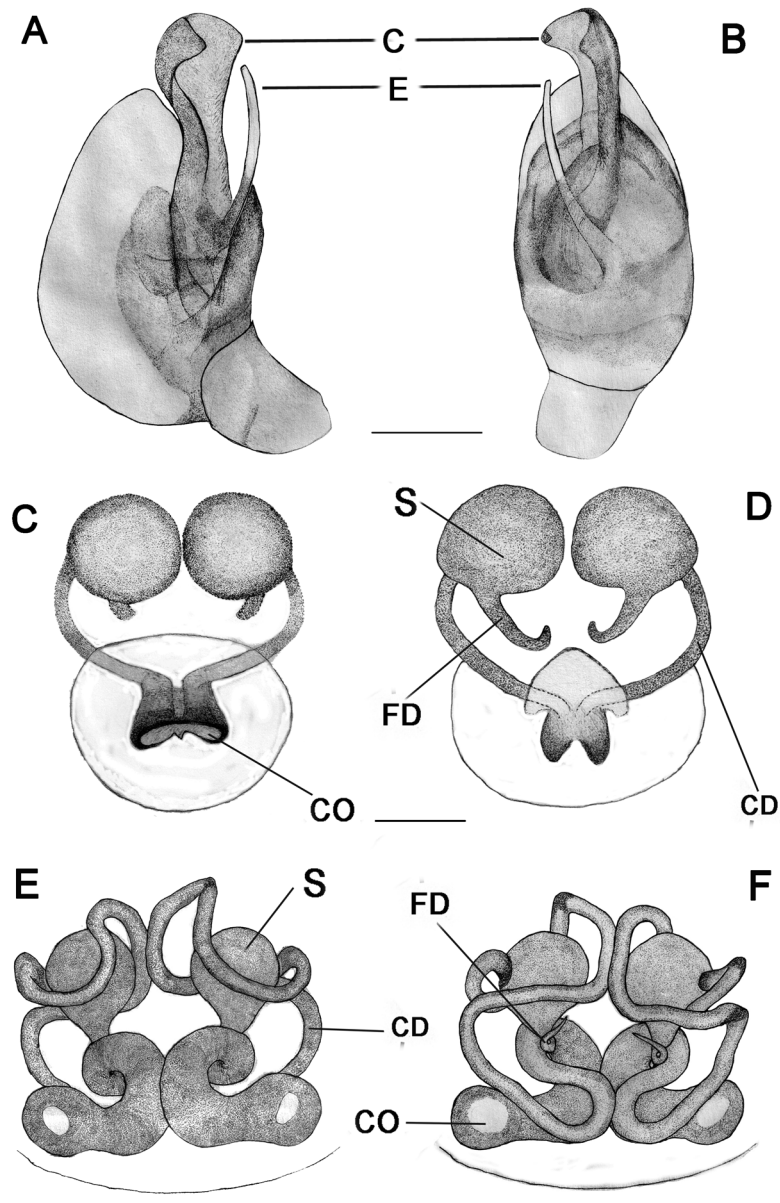


FIGURE 4A–F. A–E: *Meotipa picturata*. A Male left pedipalp prolatral view, B same ventral view; C female Epigyne dorsal view, D same ventral view; E–F: *Meotipa multuma*, E female epigyne dorsal view; F same ventral view; Abbreviations: C conductor, E embolus, S spermathecae, FD fertilization duct, CD copulatory duct, CO copulatory opening. Scale bars: A–D 0.05 mm, E–F 0.1 mm.

Description. Female in alcohol (holotype, Figs. 3A–E, 4E–F). Body clothed with white setae; Prosoma, chelicerae, clypeus, creamy-white; Fovea extended; All eyes raised, white surrounded by brown rings except large, dark AME; Chelicerae without teeth; Fangs, labium, maxillae light-brown; Maxillae, labium with scopulae; Sternum white, triangular; Coxae, femora white; Patella, tibia I, II & IV with light brown band, tibia I with a darkened tip; Metatarsi, tarsi considerably thinner than tibia; Opisthosoma oval, posteriorly pointed, black patch medially, dorsolaterally snowy white patches, dorsally 12–15 lanceolate spines (Figs. 3A); Spinnerets placed downwards; Body length 2.59; Prosoma length 1.03, width (at middle) 0.88, height (at middle) 0.55; Opisthosoma length 1.56, width (at middle) 1.20, height (at middle) 1.30; Eye diameters: ALE 0.06, AME 0.08, PLE 0.15, PME 0.07; Eye interdistances: AME–AME 0.04, ALE–ALE 0.26, PLE–ALE contiguous, ALE–PME 0.08, PLE–PLE 0.34, PME–PME 0.07, PME–PLE 0.05, AME–ALE 0.01, AME–PME 0.05; Clypeus height at ALE 0.22, at AME 0.20; Chelicerae length 0.36; Measurements of palp and legs: Palp 0.93 [0.19, 0.14, 0.21, 0.37]; Leg I (right) 9.56 [2.83, 0.31, 2.37, 3.17, 0.86], II 5.64 [1.91, 0.19, 1.30, 1.60, 0.60,], III 3.62 [1.15, 0.10, 0.91, 0.96, 0.48], IV 6.57

[2.28, 0.39, 1.43, 1.83, 0.64]; Leg formula 1423; Spination; Palp: patella do 1, tibia do 1; legs: femora: I (right)–IV spineless; patellae: I do 2, II do 2, III do 2, IV do 2; tibiae: I (right) do 2, do 2, III do 1, IV do 2; metatarsi & tarsi: I–IV spineless; *Epigynum* (Figs. 3D–E, 4E–F): Spermathecae inflated balloon shaped; Copulatory duct very long, prolaterally originated, convoluted, runs around the spermathecae (Fig. 4E), distally reaches copulatory pores; Epigynal ridges circular with distal openings; Fertilization duct twisted anteriorly, apically sharp, facing each other (Fig. 4E).

Distribution. South India (Fig. 5).

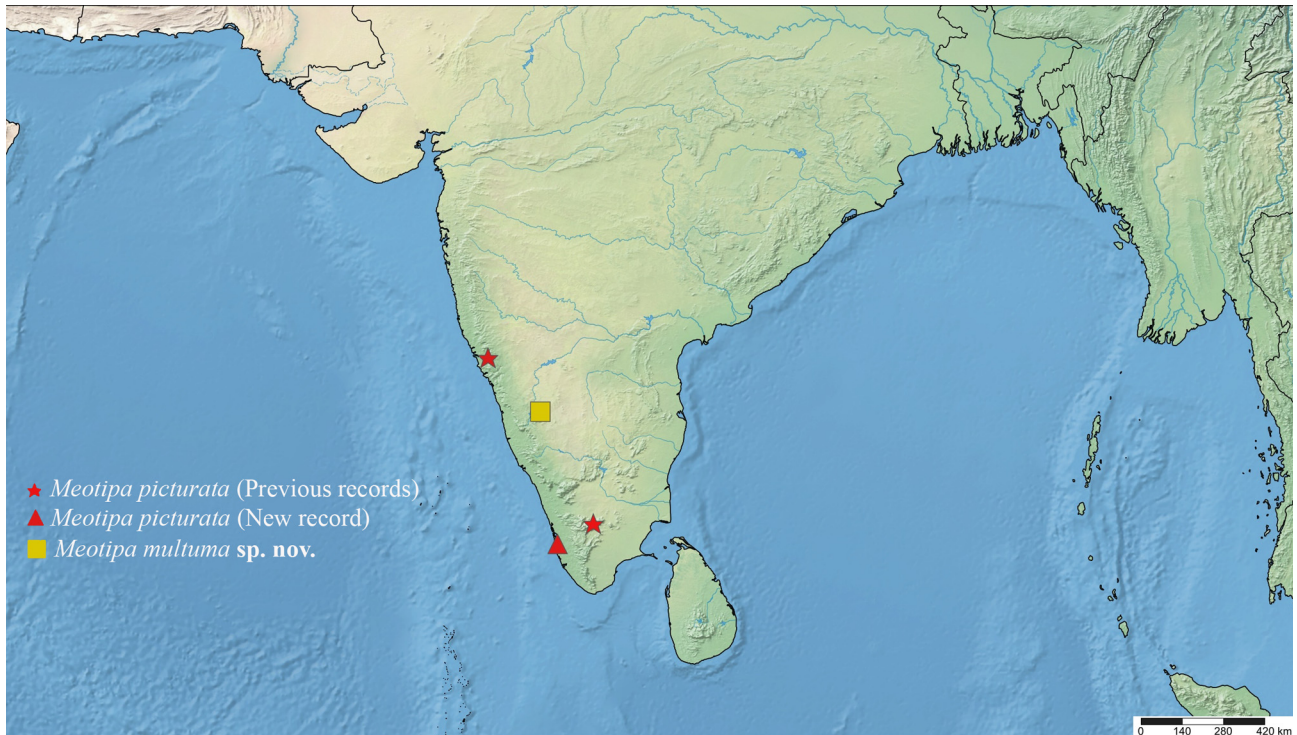


FIGURE 5. Distribution records of *Meotipa* species in India.

***Chryso makiling* (Barrion-Dupo & Barrion, 2015) comb. nov.**

Chryso makiling Barrion-Dupo & Barrion, 2015; Figs. 1A–D (Generic name misspelled; description and illustration of ♀ [Type from Mt. Makiling Forest Reserve, Los Banos, Laguna, Philippines; A.T Barrion leg.; repository Arachnological collection of the UP Los Banos Museum of Natural History (UPLBMNH), College, Laguna, Philippines- Not examined]).

Justification for the transfer. Barrion-Dupo & Barrion, (2015) described this species only from the female specimen. The original drawings and descriptive characters given by Barrion-Dupo & Barrion, (2015; Figs. 1A–D) indicate that this species shares the characteristic features of *Meotipa* rather than *Chryso*: Opisthosoma with black lanceolate spines dorsally, long legs with lanceolate spines (in *chryso* spines are sharp or needle like) middorsally and anteriodorsally. All these characters clearly suggest the evidence for the transfer and hereby we transfer this species from *Chryso* to *Meotipa*.

Discussion

Even though *Meotipa* Simon (1894) was established long back ago, the male identity of the type species remained unknown to date. The present paper reports the male of the type species for the first time along with a new species known only by its female sex. The genus, recently removed from the synonymy of the genus *Chryso* (Deeleman-Reinhold 2009), can be diagnosed by the conspicuous, black, leaf-like spines on the abdomen, the triangular-

shaped abdomen in lateral view, the tip of the abdomen extended upward and backward over the spinnerets and the femur and tibia of leg I and IV with a brush like setae and darkened tip (Deeleman-Reinhold 2009). The revision of the descriptions of all *Meotipa* species led us to establish shared characters among some of the *Meotipa* species, that are not unique to the genus and hence may be used for further grouping species within the genus. Among the 13 (including *Meotipa multuma* sp. nov. and *Meotipa makiling*) *Meotipa* species, *M. bituberculata* and *M. impatiens* share the absence of apophyses in the palp. *M. picturata*, *M. sahyadri*, *M. vesiculosa* and *M. thalerorum*, on the other hand, share the presence of a spoon shaped conductor in the male palp. Other characters shared only by some species of the genus include: the occurrence of epigynal pit in *M. bituberculata*, *M. picturata*, *M. sahyadri* and *M. thalerorum*, the presence of a convoluted copulatory ducts in the species *M. bituberculata*, *M. multuma* and *M. makiling* (transferred species from *Chrysso*), and the median epigynal rod in *M. picturata* and *M. sahyadri*. Since the presence and absence of these characters is clearly a derived state only shared by some of the species within the genus, these characters may hint to the existence of an independent evolutionary lineage within the genus. The present work represents a starting ground for future revisionary studies that may establish the limits, external relationships and internal phylogenetic structure of this remarkable theridiid genus.

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