The first description of the female of *Myrmarachne uniseriata* Narayan, 1915 and the first report of *Myrmarachne spissa* (G. W. Peckham & E. G. Peckham, 1892) from India

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Abstract. The salticid species *Myrmarachne spissa* (G. W. Peckham & E. G. Peckham, 1892) is reported for the first time from India, and the unknown female of *Myrmarachne uniseriata* Narayan, 1915 is described and illustrated. Both species are redescribed using fresh specimens.

Keywords. Araneae, Astioida, ant-mimicking spider, distribution, first record, jumping spider, Kerala, Maharashtra, Salticidae, unknown sexes

Introduction

Myrmarachne MacLeay, 1839 is one of the richest salticid groups (Benjamin, 2015) with a cosmopolitan distribution and including 190 valid species, of which 24 species have been recorded from India (Caleb & Sankaran, 2023; WSC, 2023). The taxonomic position of the genus remained unresolved for a long time. Edwards and Benjamin (2009) placed it in the subfamily Myrmarachninae. Later Maddison (2015) placed it in the subfamily Salticinae: clade Salticoida: clade Astioida: tribe Myrmarachnini.

The present paper provides the first description of the female *Myrmarachne uniseriata* Narayan, 1915 and a detailed redescription of its male based on material collected during our routine survey in Pune, Maharashtra, India. Very little is known about *M. uniseriata*, as the species is known only by its male and remained unknown for a century after its original description. Later, Caleb & Benjamin (2017) synonymized *M. aurantiaca* Benjamin, 2015 with *M. uniseriata*, and redescribed the male. In addition, this paper contains the first report of *Myrmarachne spissa* (G. W. Peckham & E. G. Peckham, 1892) from India, previously known only from Sri Lanka (Benjamin, 2015), as well as a detailed description of the male and female based on specimens collected from the Western Ghats, India.

Materials and methods

The micrographic images were taken with a Leica DMC 4500 digital camera attached to a Leica M205A stereomicroscope with the software package Leica Application Suite (LAS, version 3.8) for stacking images taken at different focal planes. In addition, an extra male of *M. spissa* (KUDZEN2022.IV.18a) was imaged using a Zeiss EVO 18 Scanning Electron Microscope. All measurements are in millimeters (mm).

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Lengths of palp/pedipalp and leg segments are given as: total (femur, patella, tibia, metatarsus (except for palp/pedipalp), tarsus). Terminology of male genitalia mostly follows Sankaran et al., 2019. Abbreviations used in the text are as follows: ALE, anterior lateral eye; AME, anterior median eye; asl, above sea level; d, dorsal; pl, prolateral; PLE, posterior lateral eye; PME, posterior median eye; v, ventral; I–IV, 1st to 4th leg.

Repositories. Specimens examined or referenced are deposited in the following collections: CATE, Centre for Animal Taxonomy and Ecology, Christ College, Kerala, India; KUDZEN, Zoological Museum of the Department of Zoology, University of Kerala, Kariavattom; NCBS, National Centre for Biological Sciences Research Collections (NRC), Bengaluru, India.

Taxonomy

Salticidae Blackwall, 1841 *Myrmarachne* MacLeay, 1839

Type species. Myrmarachne melanocephala MacLeay, 1839, by original designation. *Diagnosis.* For a description and diagnosis of the genus, see Edwards & Benjamin, 2009 and Pekár et al., 2017. *Distribution.* Widespread (WSC, 2023)

Myrmarachne spissa (G. W. Peckham & E. G. Peckham, 1892) Figures 1–15

Salticus spissus Peckham & Peckham, 1892: 37, plate II, fig. 8 (**d**). Myrmarachne spissa Simon, 1901: 500. Myrmarachne spissa Benjamin, 2015: 2652, plate 32, fig. 32A-J, 33A-D, 34A-D, 35A-F, 36A-C, 37A-F (**d**, **Q**).

Type material. Syntypes (MCZ 23159): 4 males from SRI LANKA, leg. Green, GW and EG Peckham collection (Illustrations of this species given in Benjamin (2015: figs. 35–36).

Other material examined. 1 **d** and 1 **Q** (CATE9935) from INDIA: Kerala: Wayanad: Kattimoola (11°48'15.0"N, 75°55'37.0" E; 752 m alt.), 23 October 2021, A. Jose leg., from tree leaves, by hand. 1 **d** and 2 **QQ** (KUDZEN2022.IV.18a & 18b), same data as above except Alappuzha: Veeyapuram (9°18'00.41"N, 76°27'36.16" E, 3 m alt.), 29 April 2021. N. Babu leg., from rice agro-ecosystem.; 2 **QQ**, same data as above, 15 March 2020.

Diagnosis. For a diagnosis of the species, see Benjamin, 2015.

Supplementary description. Male (Figures 1–3). Carapace, chelicera, clypeus, labium, endites and sternum metallic brown; legs golden-yellow; eye-field and opisthosoma black. Carapace covered with golden-white appressed hairs; two shallow circular depression present appear like fine dark brown spots at mid, laterally clothed with cluster of white hairs that appears like a spot; cephalic part remarkably higher than thoracic part. Cheliceral paturon almost twice as long as carapace. Opisthosoma oval; constricted at 1/3rd, with a scutum covering most of dorsum. Leg with black lines on lateral surfaces. Measurements: Body length 3.42. Carapace length 1.77, width 1.10. Opisthosoma length 1.56, width 0.94. Ocular area length 0.82, width 1.02. Eye diameters and interdistances: AME 0.33, ALE 0.16, PME 0.03, PLE 0.16; AME-AME 0.01, AME-ALE 0.02, PME-PME 0.84, ALE-ALE 0.70, PME-PLE 0.23, PLE-PLE 0.88, ALE-PME 0.16, ALE-PLE 0.41. Chelicera length 0.46. Clypeus height nought. Sternum length 0.85, width 0.30. Length of palp and legs: Palp 1.25 [0.46, 0.16, 0.27, 0.36], I 3.94 [1.20, 0.43, 1.29, 0.66, 0.36], II 2.62 [0.86, 0.30, 0.69, 0.51, 0.26], III 2.77 [0.87, 0.29, 0.66, 0.67, 0.28], IV 3.92 [1.29, 0.36, 1.01, 0.91, 0.35].

Myrmarachne from India

Leg formula: 4132. Spination of palp: femur pl 2 do 3 rl 2, patella do 1, tibia do 2, tarsus pl 1 do 3 rl 1;legs: femora I–III do 1 rld 1, IV pld 1 do 1 rld 1; patellae I–IV spineless; tibiae I plv 3 rlv 3, II plv 2 rlv 2, III–IV spineless; metatarsus I–II plv 2 rlv 2, III–IV pl d 1 pl 1 plv 2 rld 2 rl 2 rlv 2; tarsi I–IV spineless. Pedipalp (Figures 7–9, 13–15): Segments pale brown. Cymbium oval, with single apical macroseta. RTA short, thorn shape, sharp apex. Tegulum cylindrical; spermophore curved at anterior part of tegulum. Embolus thin, long, mediodistally originating, with one, prolaterally oriented coil, with broad transverse embolic base, with slightly blunt tip.



Figures 1-6. *Myrmarachne spissa* from Kerala, India (CATE9935). **1-3,** Dorsal, lateral and frontal views of adult male. **4-6,** Dorsal, lateral and frontal views of adult female.



Figures 7-12. *Myrmarachne spissa* from Kerala, India. **7-8**, Ventral and retrolateral views of right male pedipalp. **9**, Detail of retrolateral tibial apophysis, from (8). **10**, Ventral view of intact female epigyne. **11-12**, Ventral (11) and dorsal (12) views of cleared female epigyne.



Figures 13-15. SEM images of left pedipalp, male *Myrmarachne spissa* (KUDZEN2022.IV.18a) from Kerala, India. **13-14**, Ventral and retrolateral views. **15**, Retrolateral view of retrolateral tibial apophysis (arrows in 14-15).

Female (Figures 4–6). General aspects essentially as in male except for the following: Body colour lighter; opisthosoma covered with fine setae; anterior 1/3rd cream colour. Shorter chelicera. Measurements: Body length 3.96. Carapace length 1.81, width 0.92. Opisthosoma length 2.05, width 1.17. Ocular area length 0.75, width 0.84. Eye diameters and interdistances: AME 0.30, ALE 0.12, PME 0.02, PLE 0.15; AME–AME 0.01, AME–ALE 0.02, PME–PME 0.76, ALE–ALE 0.60, PME–PLE 0.19, PLE–PLE 0.80, ALE–PME 0.19, ALE–PLE 0.42. Chelicera length 0.52. Clypeus height 0.01. Sternum length 0.84, width 0.26. Length of palp and legs: Palp 1.11 [0.37, 0.16, 0.26, 0.32], I 2.55 [0.80, 0.35, 0.69, 0.43, 0.28], II unknown, III 2.35 [0.73, 0.30, 0.51, 0.53, 0.28], IV 3.45 [1.11, 0.39, 0.86, 0.80, 0.29]. Genitalia (Figures 10–12): Epigynum hirsute; copulatory openings wide, lying apart. Copulatory ducts long, with median bend. Spermathecae large; contiguous, kidney-shaped. Fertilization ducts narrow, diverging.

Variation: Male (n=2): body length 2.50–3.42. Female (n=5): body length 2.90–3.96.

Distribution. India, Sri Lanka (WSC, 2023; present data). This is the first record of the species from India.

Myrmarachne uniseriata Narayan, 1915

Figures 16–30

Myrmarachne uniseriata Narayan, 1915: 402, plate 32, fig. 6 (**d**). *Myrmarachne aurantiaca* Benjamin, 2015: 2613, fig. 1A-D (**d**). *Myrmarachne uniseriata* Caleb & Benjamin, 2017: 294, fig. 1-6 (**d**, syn. of *M. aurantiaca*).

Type material. Holotype (ZSI-2372/17): 1 **d** from India, leg. Narayan, K. collection (illustrations and description of **d**) kept at the National Zoological Collection, Zoological Survey of India, Kolkata. 1 **d** from Sri Lanka, North Western Province, Kurunegala District, Kurunegala, Ethagala Range, 20 September 2009, leg. Ziyard Jaleel et al (misidentification; description & illustration of **d**). Type kept at the Muséum d'Histoire Naturelle, Geneva, Switzerland (MHNG).

Other material examined. 1 **d** and 1 **Q**, designated paratype (NRC-AA-4165, NRC-AA-4166) from INDIA: Maharashtra: Pune: Urli-Kanchan (18°28'31.1"N 74°08'12.3"E; 560 m alt.), 14 Aug 2018, R. Tripathi leg., from ground, by hand.

Diagnosis. For the diagnosis of the male, see Benjamin (2015). Female *M. uniseriata* are similar to the females of *M. formicaria* (De Geer, 1778) as both share an epigyne with a large, more or less triangular depression, and spermathecae with diverging fertilization ducts. *M. uniseriata* can be distinguished from the latter by a copulatory duct with 6 turns (vs. 4 turns in *M. formicaria*) and the presence of a sizeable transparent coil (vs. absent or not presented in any images drawn for *M. formicaria*). Compare Figures 25–30 with Żabka, 1997: figs. 215–221.

Description. Female (designated paratype, Figures 19–21). Carapace, chelicera, clypeus, labium, endites and sternum yellowish orange, eye-field darker; legs golden-yellow and opisthosoma cream. Carapace without hair, smooth and glossy; numerous shallow circular depression present around eye-field and two at mid of carapace; lateral margin with narrow dark brown lines, thoracic region with light brown striae radiating from the centre to lateral margins. Cheliceral promargin with six teeth, 1st and 2nd small and lying away from remaining four closely spaced teeth; retromargin with five subequal and closely spaced teeth. Opisthosoma elongate-oval; medially with six small sigillae, posterior half darker with cream chevron pattern. Measurements: Body length 5.30. Carapace length 2.22, width 1.12. Opisthosoma length 2.97, width 1.48. Ocular area length 0.95, width 1.16. Eve diameters and interdistances: AME 0.35, ALE 0.17, PME 0.03, PLE 0.20; AME-AME 0.02, AME-ALE 0.03, PME-PME 0.90, ALE-ALE 0.72, PME-PLE 0.23, PLE-PLE 1.03, ALE-PME 0.22, ALE-PLE 0.49. Chelicera length 0.66. Clypeus height 0.01. Sternum length 1.06, width 0.36. Length of palp and legs: Palp 1.34 [0.45, 0.17, 0.22, 0.50], I 3.26 [1.04, 0.47, 0.90, 0.50, 0.35], II 2.35 [0.76, 0.32, 0.59, 0.42, 0.26], III 2.62 [0.79, 0.36, 0.57, 0.60, 0.30], IV 3.92 [1.18, 0.49, 0.97, 0.94, 0.34]. Leg formula: 4132. Spination of palp: femur pl 1 do 2 rl 2, patella do 2, tibia do 2, tarsus pl 1 do 3 rl 2; legs: femora I–IV spineless; patellae I rlv 1, II–IV spineless; tibiae I plv 4 rlv 4, II plv 3 rlv 3, III-IV spineless; metatarsus I-II plv 2 rlv 2, III plv 6 rlv 6, IV plv 9 rlv 9; tarsi I-IV spineless. Genitalia (Figures 25–30): Epigynum hirsute, with sclerotised inverted V-shaped depression at posterior margin. Copulatory openings wide, mediolaterally placed, widely spaced. Copulatory ducts long parallel, anteriorly coiled. Spermathecae long and oblong, contiguous. Fertilization ducts L-shaped, diverging.



Figures 16-21. *Myrmarachne uniseriata* (NRC-AA-4165, NRC-AA-4166) from Maharashtra, India. **16-18**, Dorsal, lateral and frontal views of adult male. **19-21**, Dorsal, lateral and frontal views of adult female.



Figures 22-27. *Myrmarachne uniseriata* (NRC-AA-4165, NRC-AA-4166) from Maharashtra, India. **22-23**, Ventral and retrolateral views of left male pedipalp. **24**, Detail of retrolateral tibial apophysis, from (23). **25**, Ventral view of intact female epigyne. **26-27**, Ventral (26) and dorsal (27) views of cleared female epigyne.



Figures 28–30. Diagrams of the epigyne of a female *Myrmarachne uniseriata* (NRC-AA-4166) from Maharashtra, India. **28**, Ventral view (see Figures 25-26). **29**, Dorsal view (see Figure 27). **30**, Dorsal view of insemination ducts on left side.

Supplementary description. Male (Figures 16–18). General aspects essentially as in female except for the followings: Body colour slightly darker, cephalic region with few black blotches, cheliceral paturon almost size of carapace, promargin with 10 teeth; retromargin without tooth; fang long, with tooth-like apophysis. 1/3rd of the opisthosoma black, chevron pattern absent; with anterior and posterior scutum, sigilla indistinct. Measurements: Body length 4.55. Carapace length 2.30, width 1.20. Opisthosoma length 2.16, width 1.09. Ocular area length 0.97, width 1.07. Eve diameters and interdistances: AME 0.34, ALE 0.18, PME 0.03, PLE 0.22; AME-AME 0.02, AME-ALE 0.01, PME-PME 0.96, ALE-ALE 0.71, PME-PLE 0.21, PLE-PLE 1.02, ALE-PME 0.25, ALE-PLE 0.50. Chelicera length 1.86. Clypeus height nought. Sternum length 1.19, width 0.40. Length of palp and legs: Palp 1.48 [0.53, 0.18, 0.21, 0.56], I 3.85 [1.19, 0.57, 1.08, 0.64, 0.37], II 2.86 [0.90, 0.46, 0.67, 0.54, 0.29], III 2.88 [0.92, 0.40, 0.63, 0.65, 0.28], IV 4.16 [1.30, 0.57, 1.01, 0.95, 0.33]. Leg formula: 4132. Spination of palp: femur pl 2 do 2 rl 1, patella do 1, tibia do 2, tarsus pl 1 do 3 rl 2; legs: femora I do 1, II –IV spineless; patellae I rlv 1, II–IV spineless; tibiae I plv 3 rlv 3, II plv 2 rlv 3, III-IV spineless; metatarsus I-II plv 2 rlv 2, III plv 3 rlv 3, IV plv 4 rlv 4; tarsi I-IV spineless. Pedipalp (Figs 22-24): Segments pale brown. Cymbium oval, with two apical macroseta. RTA short, thumb shape, tapering, fairly round apex, slightly bent at base. Tegulum circular; U-shaped spermaphore in the 11–12 o'clock position. Embolus thin, long, with two coils around tegulum, mediodistally originating.

Distribution. India, Sri Lanka (WSC, 2023). In India: Pune, Maharashtra and Chennai, Tamil Nadu (Caleb, & Benjamin 2017; present data).

Acknowledgements

The authors acknowledge the NCBS, Bangalore, India, CATE lab, Christ College Irinjalakuda and Zoological Museum, Department of Zoology, University of Kerala, Kariavattom for the deposition of voucher specimens. Nishi Babu (NB) is thankful to Dr. G Prasad, Professor and Head, Dept. of Zoology, University of Kerala, Kariavattom for providing guidance and facilities for completing this work. NB is grateful to University Grants Commission (UGC), New Delhi, for financial support. Mrs. Soumya from The Central Laboratory for Instrumentation, University of Kerala, Kariavattom is acknowledged for help with SEM images and would like to extend gratitude to Ms. Kripa Mariam Mammen for her assistance and continual support throughout the field collections.

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