

A Rapid Survey on the Mangrove Jumping Spider fauna of Mandaitivu Island, Northern Sri Lanka

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Abstract- The mangrove spiders of Mandaitivu island had been assessed in preceding preliminary survey. This study aims to explore jumping spider fauna (Family Salticidae) in this island for the first time. Sample collection was done by sweep netting, hand picking, litter collection and beating of vegetation. Specimens were preserved in 70-80% ethanol. Spiders were identified up to species level based on morphology of epigyne and male palp structure, body shapes, colour patterns, abdominal markings. In the current study, a total of 12 salticid species belonging to 11 genera were identified as *Brettus adonis* Simon 1900, *Bianor angulosus* (Karsch, 1879) *Carrhotus atratus* Satkunanathan & Benjamin, 2022, *Carrhotus viduus* (C. L. Koch, 1846), *Cyrba ocellata* (Kroneberg, 1875), *Harmochirus brachiatus* (Thorell, 1877), *Hyllus semicupreus* (Simon, 1885), *Mogrus frontosus* (Simon, 1871), *Phintelloides jesudasi* (Caleb & Mathai, 2014), *Proszynskia diatreta* (Simon, 1902), *Rhene flavicomans* Simon, 1902, *Stenaelurillus lesserti* Reimoser, 1934. In addition, some morphospecies were identified up to genus level, *Rhene* sp, *Myrmarachne* sp and *Phintella* sp. As in the previous study, utmost species composition of jumping spiders was noticed from *Avicennia marina* compared with *Rhizophora mucronata* due to high abundance of insect prey in *A. marina*. Further studies incorporated with molecular analysis will be needed to figure out species composition of jumping spider fauna of this island with the description of new species to science.

Index Terms- Araneidae, salticids, mangrove, spiders, taxonomy.

I. INTRODUCTION

Sri Lanka with Western Ghats of Southern India is one of the global biodiversity hotspots [1]. The mangrove spiders of Mandaitivu island had been assessed in preceding preliminary survey [2]. In Northern Sri Lanka, Eugène Simon extensively explored the more new species and genera of salticids based primarily on body colouration and other somatic characters rather than detailed description of genitalia [3,4,5,6], it resulted misplacements of several species under erroneous genera. After that, some arachnologists transferred them in appropriate genera based on the comprehensive taxonomic survey as well as molecular analysis. Priyantha Wijesinghe conducted a preliminary survey on Sri Lankan spiders comprising of 402 species and also he continued his work on family Salticidae [7, 8, 9, 10]. However, the study of Sri Lankan spiders particularly from Northern part of the country is still in a neonate stage when compare with other provinces of the country [11], because of the long period of inaccessibility (nearly three decades) of this province due to civil war. Thus, the main purpose of this rapid survey is to describe salticid taxa from this island for the first time.

II. MATERIALS AND METHODS

Study site

The present study was conducted in selected mangrove wetland in Mandaitivu Island in Jaffna District which is located in Northern Province of Sri Lanka. Study areas were selected with different plant coverage including woody plants and shrubs to facilitate the collection of different varieties of spider fauna (Figure 1).

Sample collection and preservation

Visual searching and beating of vegetation were used for sample collection. Sampling was done during the morning and evening hours from August, 2019 to September 2021. On each sampling day, different areas with different microhabitat were chosen for sample collection. Spiders were mainly collected from the terminals of mangrove plants (*Avicennia marina*, *Rhizophora mucronata* and mangrove associates) and ground stratum by sweep netting, hand picking, litter collection and beating of vegetation. After careful assessment on the morphology of spiders under binocular microscope (Kyowa optical SE-L stereomicroscope), they were preserved in 70-80% ethanol or propanol for further analysis in taxonomy.



Figure 1: Major sampling localities of mangrove wetland in Mandaitivu Island

Identification of spiders

Genus and species identification was rapidly done in the field using field guide rather than genitalic dissection. Spiders were identified up to species level based primarily on morphology of epigyne and male palp structure, however body shapes, colour patterns, abdominal markings (blotches, dots) were also used for further identification (Kyowa optical SE-L stereomicroscope). They were classified up to possible taxa group using the available taxonomic keys and guides [12].

III. RESULTS AND DISCUSSION

In this survey, a total of 12 salticid species belonging to 11 genera were identified up to species level; *Brettus adonis* Simon 1900, *Bianor angulosus* (Karsch, 1879) *Carrhotus atratus* Satkunanathan & Benjamin, 2022, *Carrhotus viduus* (C. L. Koch, 1846), *Cyrba ocellata* (Kroneberg, 1875), *Harmochirus brachiatus* (Thorell, 1877), *Hyllus semicupreus* (Simon, 1885), *Mogrus frontosus* (Simon, 1871), *Phintelloides jesudasi* (Caleb & Mathai, 2014), *Proszynskia diatrete* (Simon, 1902), *Rhene flavicomans* Simon, 1902, *Stenaelurillus lesserti* Reimoser, 1934. In addition, some morphospecies were identified up to genus level, *Rhene* sp, *Myrmarachne* sp and *Phintella* sp. Three unknown genera were also noticed and are yet to be identified up to species level.

As in the previous study [2], utmost species composition of jumping spiders was noticed from *Avicennia marina* compared with *Rhizophora mucronata* due to high abundance of insect preys in *A. marina* and also species composition of salticids varied according to different tidal fluctuation. In this island, mangrove plants are distributed as patches rather than continuous forest. In each patch, different salticid species composition was noticed.

Mangrove ecosystem provides home for immense numbers of invertebrates and vertebrates including spiders, insects, crabs, mollusks fish, crustaceans and acts as nesting ground for fingerlings and endemic birds to the island. In addition, it protects coastal region from erosion by hurricanes and waves. The recent field visit shows that this mangrove habitat was severely fragmented and

degraded in some places for timber production, house building and dumping of plastic garbage due to tourism activities. Thus conservation measures should be undertaken in order to protect these productive habitats and their dependents.

IV. CONCLUSION

Further studies incorporated with molecular analysis will be needed to figure out species composition and identification of unknown genera of jumping spider fauna of this island with the description of new species to science.

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REFERENCES

- [1] [1] Myers, N., Mittermeier, R.A., Mittermeier, C.G., Fonseca, G.A.B., and Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, 403: 853-858
- [2] [2] Nilani, K. and R. Gnaneswaran. (2013). Spider fauna in the mangrove ecosystem of Mandaitivu island. *Indian Journal of Arachnology*, 2(2), 53-60
- [3] [3] Simon, E. (1901). *Histoire Naturelle des Araignées*. Deuxième édition. Tome 2, fasc. 3. Roret, Paris, 381–668.
- [4] [4] Simon, E. (1902a). Description d'araignées nouveaux de la famille des Salticidae (Attidae) (suite). *Annales de la Société Entomologique de Belgique*, 46: 24-56, 363-406.
- [5] [5] Simon, E. (1902b). *Etudes arachnologiques*. 31e Mémoire. LI. Descriptions d'espèces nouvelles de la famille des Salticidae (suite). In *Annales de la Société entomologique de France* 71: 389-421.
- [6] [6] Simon, E. (1903). *Histoire Naturelle des Araignées*. Deuxième édition. Tome 2, fasc. 4. Roret, Paris, 669-1080.
- [7] [7] Wijesinghe, D.P. (1987). The present status of spider taxonomy in Sri Lanka. Proceedings of the workshop on "Present Status of Faunal Taxonomy in Sri Lanka", Sri Lanka Association for the Advancement of Science, pp 7-19.
- [8] [8] Wijesinghe, D.P. (1990). Spartaeine salticids: A summary and request for specimens. *Peckhamia*, 2(6): 101-103.
- [9] [9] Wijesinghe, D.P. (1992). A new genus of jumping spider from Borneo with notes on the spartaeine palp (Araneae: Salticidae). *The Raffles Bulletin of Zoology*, 40(1): 9-19.
- [10] [10] Wijesinghe, D.P. (1993). *Cyrba simoni*, replacement name for *Cyrba bimaculata* Simon, 1886 (Araneae: Salticidae). *Bulletin of the British Arachnological Society*, 9: 136.
- [11] [11] Nanayakkara, R. and Vishvanath, N. (2011). Hitherto unrecorded species of Poecilotheria, (Tarantula) from Sri Lanka. *ScinnoTech-Alert*, [e-journal] 2(7), Available through: National Science Foundation Sri Lanka.
- [12] [12] Levi, H.W. (2002). Keys to the genera of araneid orbweavers (Araneae: Araneidae) of the Americas. *The Journal of Arachnology*, 30: 527-562.
- [13] [13] Okuma, C. (1983). New synonymies and new records of some cosmopolitan species of the genus Tetragnatha (Araneae: Tetragnathidae) *Esakta*, 20: 69-80.
- [14] [14] Sebastian, P.A., and Peter, K.V. (2012). *Spiders of India*. Edn, vol, Universities Press (India) Private Limited, Himayatnagar, Hyderabad 500 029 (A.P.), India, 614 pages, ISBN 13: 978-81-7371-6416, ISBN 10: 81-7371-6412

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