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Rediscovery of endangered Salem ornamental tarantula *Poecilotheria formosa* pocock, 1899 (Aranae: Theraphosidae) from Southern Eastern Ghats of Tamil Nadu, India

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Abstract
Poeciiotheria formosa is an endangered theraposid known only from the type locality Kadiampatti and Mullapuram near Sheveroy Hills in the Salem District, Tamil Nadu. It was thought to be restricted to Sheveroy Hills in the Eastern Ghats. During a faunal survey in 2019, the Salem ornamental tarantula *P.formosa* was rediscovered outside of its known range from Madurai District about 265km south of the type locality. The present record extends its known distribution range further towards the southern part of India. They are scarcely recorded in their known type locality and have been pushed towards the edge of extinction due to habitat destruction and various anthropogenic activities.

Keywords: Salem ornamental tarantula, extinction, Eastern Ghats, anthropogenic activity

Introduction
The family Theraphosidae Thorell, 1869 is represented by 1034 species in 154genera (World Spider Catalogue, 2022) [13]. In India, it is represented by six subfamilies: Eumenophorinae, Ischnocolinae, Poecilotheriinae, Selenocosmiinae, Selenogyrinae and Thrigmopoeinae (Pocock, 1900a; Siliwal *et al.*, 2012) [6, 10]. Members of the family Theraphosidae mostly terrestrial, dwelling in burrows, beneath the rocks, and fallen logs (Nanayakkara *et al.*, 2012) [4]. To date 15 species the genus Poecilotheria have been recognized, of which seven are endemic to India (*P.formosa, P.metallica, P.miranda, P.regalis, P.rufilata, P.striata,* and *P.tigrinawesseli*) and six are endemic to Sri Lanka (*P.fasciata, P.ornata, P.rajaei, P.smithi, P.subfusca* and *P.srilankensis*) and two (*P.hanumavilasumica* and *P.vittata*) are found in both regions (World Spider Catalogue, 2022) [13].
The old- world genus Poecilotheria Simon, 1885 of the subfamily Poecilotheriinae is the only genus distinctively arboreal in habit, found in the dry deciduous and evergreen forests or wooded areas of peninsular India and Sri Lanka (Siliwal *et al.*, 2013) [11]. *P. formosa* is commonly known as the Salem ornamental tarantula or beautiful parachute spider. This species prefers dry deciduous forests of Eastern Ghats (Molur *et al.*, 2003) [2]. *P.formosa* is categorized as Critically Endangered according to the IUCN Red List of Threatened Species (IUCN 2008) [1] given its highly restricted distribution (less than 5000 sq.km) and small area of occupancy (less than 500 sq.km.) with the past and ongoing decline the in extent area, and quality of habitat (Molur *et al.*, 2008) [3].
There are only two confirmed records (Pocock, 1899) [5] and one unpublished record (Smith and Kirk 2001) [12] of *P.formosa* from two areas of the highly degraded Eastern Ghats. First record and morphological description of this species was given by Pocock in 1899 [5] rather the specimen was collected by H. R. P. Carter and H. C. West from the stacks of locomotive firewood (Pocock, 1899) [5] in Kadiampatti, Mullapuram (Sheveroy Hills) in Salem District, Tamil Nadu. About hundred years later in 2001, it was reported by Smith and Kirk from Renigunta station in Andhra Pradesh. Subsequently, Pocock (1900a, b) [6, 7] provided the first detailed description of its morphology and habitat. The species habitat heavily degraded due to firewood and timber extraction. According to Molur *et al.*, (2008) [3] the species has declined due to habitat degradation and loss.

Study Area
Kiluvamalai is situated in the northern part of Alagar Hills in the northeast of Madurai District, Tamil Nadu. Kiluvamalai has a continuous topography from lower slopes of the Alagar Hills R.F, with an elevation of approximately 350 m (Fig 1). Alagar Hills lay about 15 km from Sirumalai, one of the largest and highest hill ranges independent of the Western Ghats in Tamil Nadu (Santharam *et al.*, 2014) [9]. Kiluvamalai is one of the several ranges of discontinuous low hills forming the southernmost Eastern Ghats along with Sirumalai, Perumalai, Karandhamalai and the Natham Hills of southern Tamil Nadu. The hill comprises various forest types from dry deciduous to tropical thorn forests (Image 1) and hosts several native tree such as *Albizia amara* (Usilai), *Commiphora caudate* Mulkilluvai), *Acacia latronum* (Anaimullu), *Acacia sundra* (Karungali),*Bauhinia racemose* (Aathi),*Dichrostachys cinerea* (Vetuttalam), *Bauhinia racemose* (Sembulichan), *Wrightia tinctoria* (Veppaalai) and shrubs like *Ziziphus mauritiana* (Elanthai), *Capparis sepiaria* (Kattukathiri), *Carissa carandas*

(Kalakkai) and *Cassia auriculata* (Kadam). The vegetation in hills is renewed during the monsoon and post monsoon months from October to January.

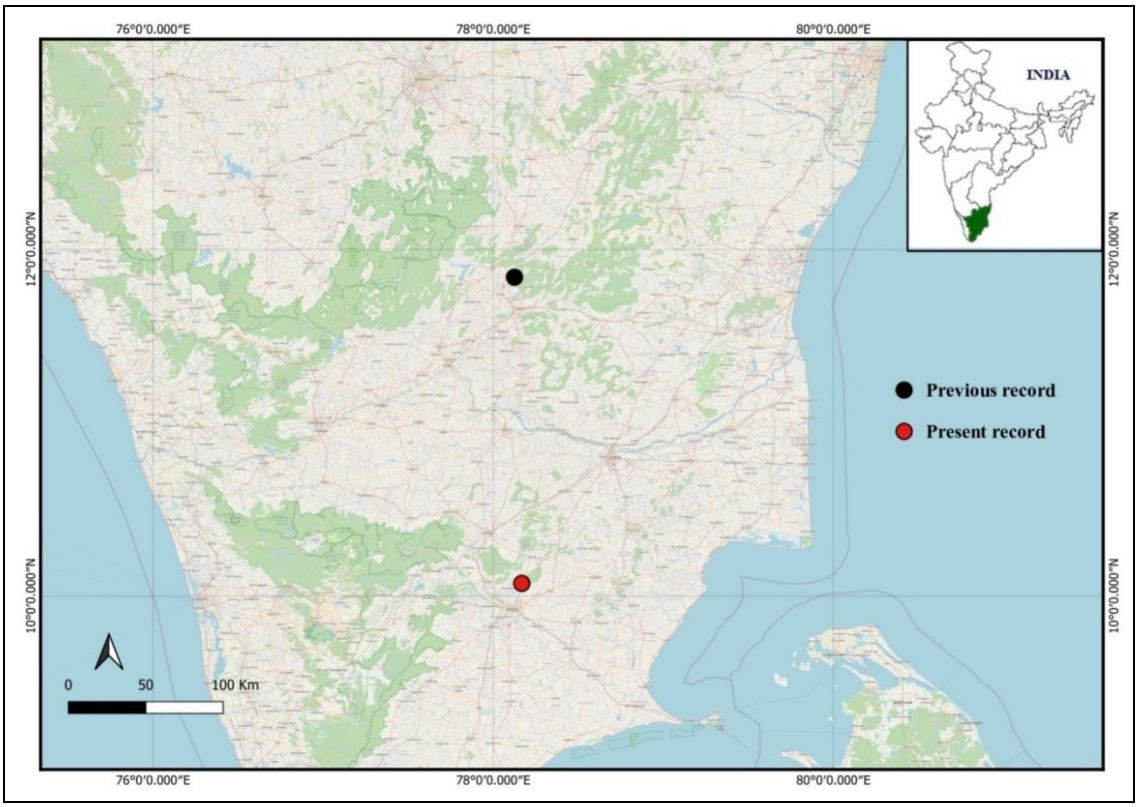

Fig 1: Map of southern India illustrating the previous record (black dot) and Present sighting (red dot) of *P. formosa*.

Fig 2: Habitat of *P. formosa* at Kiluvamalai Reserve Forest, Madurai District, Tamil Nadu.

Observation

Surveys were carried out in Kiluvamalai, Madurai, Tamil Nadu from 2019 onward to document faunal diversity. During the survey on 10 January 2020, we encountered a grey-coloured hairy juvenile spider just near well-established naturally occurring tree hole on *Commiphora caudata*. As we approached it closely, the individual (Image 2a) retreated into the tree hole. We saw a cluster of seven juveniles hiding in the cervices of the tree hole. We photographed them with a DSLR camera (Cannon 200D mark ii) without much disturbance and observed them for an hour (Image 2 b, c).We could not find any adult individual near the nest.

Later the spider was identified as *P.formosa* with the help of descriptions in the literature (Pocock 1900b) [7]. They have brown bands on the thorax much wider than *P.regalis* and spreading more over towards the margin.

The pale band on the dorsal side of abdomen is less noticeably lobate posteriorly with the brown band that circumscribes it and the brown stripes that radiate from its less clearly defined. There is also a larger pale area at the extremities of the tibiae and protarsi of legs. The lower sides of the legs are strongly striped. The legs are much more of a uniform dirty white in the anterior pairs. Dark stripes are too blacker and narrower and there is no white distal band on the lower side of the femora of the third and fourth legs. The bands on the patella of the third and fourth legs are broader than in *P.regalis.* Legs of first and second pairs shorter than in *P.regalis.*

Fig 3: *P. formosa* in life: A – Dorsal aspect of *P.formosa.*

Fig 4: B & C - Cluster of *P.formosa* juveniles hiding in the tree hole of *C. caudata.*

P. formosa is a highly endangered theraphosid known only from its type locality. It is sighted for the first time outside of its known distribution. The present sighting of this species after a long decade extends its geographical range along the Eastern Ghats by approximately 265km south from its previous record (Pocock, 1899) [5] making this is the southernmost record of its occurrence in southern India. We have previously recorded the red backed spider *Latrodectus hasselti* in Kiluvamalai RF (Roopha *et al.,* 2021) [8] and the addition of *P.formosa* from the same locality indicates the faunal significance of thorn forests.

Conclusion

The Salem ornamental tarantulas are scarcely recorded in their known type locality and have been pushed towards the edge of extinction due to habitat destruction and various anthropogenic activities. The present study area is highly prone to anthropogenic activities like firewood collection and cattle grazing. Severe steps should be taken to curb the poachers from illegal collection of this species from wild by the law enforcement authorities for the conservation of these endangered species. Public awareness should be made to educate the local villagers

and authorities regarding the identification and importance of this species in an ecosystem. Due to lack of biodiversity assessments and exploration of tropical thorn forests, they are least considered in the conservation perspective. Our study highlights the urgent need to conserve all these ecosystems for further existence of these endangered species in future.

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