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Chrysilla volupe spider spotted in Eastern Ghats, India

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Abstract
A rare jumping spider, *Chrysilla volupe* (Karsch 1879) belonging to the family Salticidae, was thought to be extinct for 150 years and was rediscovered at Western ghats of India in 2018. We had surveyed for this species, in the region of Gerigadona forest which is located in between Karvetinagaram and Pachikapalyam region, Andhra Pradesh. We had successfully spotted its presence in this region, there by confirming the occurrence of *Chrysilla volupe*. Thus indicating *Chrysilla volupe* is found in both Western and Eastern ghats, which makes its not rare species to South India. In this study we carefully observed and noted morphological characters and their measurements of *Chrysilla volupe*.

Keywords: Jumping spider, Chrysilla volupe, Karvetinagaram

Introduction
Jumping spiders are the most beautiful creatures which are highly adaptable with advanced vision, and can be found from the freezing cold to hot deserts. These jumping spiders belong to Salticidae family. Salticids are most diverse family of spiders with 600 genera and over 5760 species in worldwide are known to till date (World Spider Catalog 2018) [10]. Nearly 73 genera and 207 species in India are known upto now. Salticids are the largest family of spiders which makes up 13% of the order Aranea. Salticids are least studied spider group and facing more extinction problems due to their rareness. Salticids are having best vision among arthropods; it uses it in hunting, navigation, and courtship purposes. *Chrysilla volupe* is a jumping spider species unseen for over 150 years and it was thought to be extinct, as it was not found nowhere. It was first recorded by Karsch (1879) [4] from an unknown locality in Srilanka, it was described first as *Attus volupe* (Karsch, 1879) [4]. A century later, this species was placed in Phintella based on the holotype (Żabka, 1988; Caleb, Mathai, 2014) [2]. It was then transferred to the genus Chrysilla (Caleb, 2016) [11, 1].
After One and half century, both male and first female *Chysilla volupe* species discovered at Wayanad Wildlife Sanctuary near Puttenhali lake in Kerala from a Lemon tree in a forest patch (Caleb JTD, 2018) [14]. Now we had recorded the presence of Chrysilla volupe in Karvetinagaram forest for the first time (3-August-2021) through traditional search methods. Karvetinagar or Karvetinagaram is a village in Chittoor district, Andhra Pradesh. This forest has potential for preserving diversed biodiversity with its dense thick forest and lush flora.

Materials and Methods
Sample Collection
Chrysilla volupe specimen is collected by hand picking method by using hand gloves and net in Karvetinagaram forest (13°24'49.3"N 79°24'53.1"E) as part of our spider diversity study over a period of three years from 2018- 2021.
We searched for its other female spiders but just we found only male spiders. About 28 Live Spiders were photographed in their natural habitats and we studied their behavior. Some of the specimens were collected and preserved in 5-10 percent formalin solution.
Descriptions and measurements are based on fresh specimens by arresting their movement by lowering temperature. All measurements were taken by vernier caliper. Leg measurements were taken as total length (femur, patella, tibia, metatarsus and tarsus).

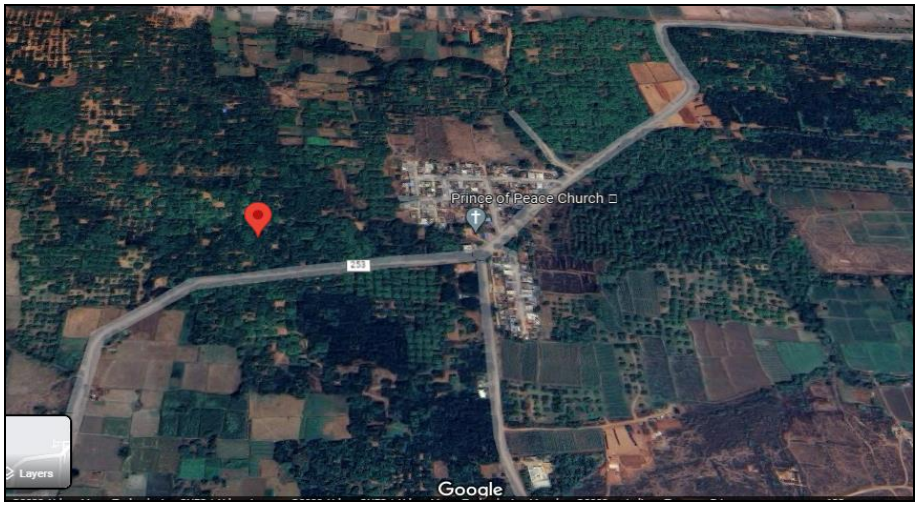

Fig 1: Karvetinagaram forest, where we found the spiders

Result

Taxonomy

Chrysilla volupe is closely related to *Chrysills lauta* (Thorell, 1887) based on the diagnosis of somatic morphology and their palpal structure. Chrsilla volupe is also similar to *Chrysilla guineensis* (Wesolowsia & wisniewkshi, 2013) [6]. We carefully compared with other taxa, thereby confirming it. We found about 28 male spiders of this species.

Description

Chrysilla volupe is a beautiful looking colorful spider with orange, bluish stripes; black, reddish orange, shiny grey colours are present on the surface of the body. These spiders have four pairs of eyes, with the anterior median eye pair is particularly large. orange carapace with a pair of broad bluish iridescent transverse stripes, It has reddish anterior eyes surrounded with reddish orange setae in the upper half and white orbital setae in the lower half, clypeus is covered with bluish iridescent scales which diverges lateral, one below the lateral eyes approximately reaching the posterior patch, the other runs along the outer edge of the carapace.

Fig 2: *Chrysilla volupe* in its natural habitat

Fig 3: *Chrysilla volupe*

Eye Measurements

The measurements were taken from field and represented in average.

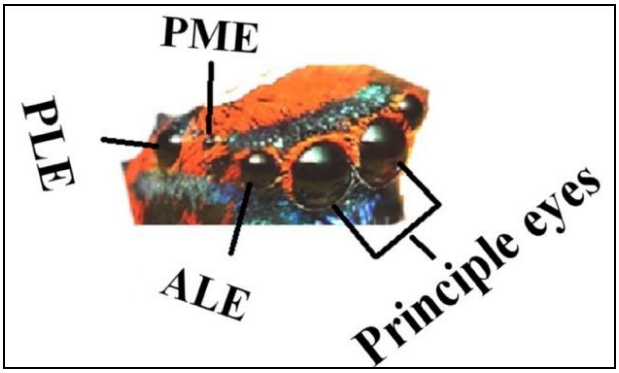

Fig 4: *Eyes of Chrysillia volupe*

Eye measurements
Posterior Median Eyes = PME; Posterior Lateral Eyes = PLE; Anterior Lateral Eyes = ALE

Table 1: Average measurements of the *Chrysilla volupe*

Sl. No	Name of the organ of spider	Measurement (cm/mm/number) (average of 28 spiders)
1	Total length without legs	4.85mm
2	Total length with stretched legs	5.44mm long
3	Carapace	1.54mm long, 1.74mm wide
4	Abdomen	3.31 mm long, 0.83mm wide
5	Clypeus height	0.15mm
6	Principle eye	1.59 mm
	ALE	0.44mm
	PME	0.07mm
	PLE	0.73mm
7	Leg	4 1(robust) Leg 2- 3 yellow with black tips; tarsus – silvery white;
8	Chelicera	unidentate, reddish brown

Sternum is oval, brownish covered with iridescent scales, all the legs are covered with iridescent scales reflecting metallic shades of shiny golden and shiny purplish tinge. Abdomen elongated and narrow; covered with fine iridescent hairs; reddish orange scales present mid - dorsally, spinnerets are blackish.

Discussion
Jumping spiders are very small, day active stalkers with their excellent vision and variety of body forms (Land 1969; Blest, O'Carroll and Carter 1990) [8, 12]. This group of jumping spiders was initially identified as members of the genera Chrysilla Thorell, 1887 and Phintella Strand, in Bösenberg and Strand 1906, both are members of the tribe Chrysillini Simon, 1901. Chrysilla and Phintella are widely distributed, encircling abundant species mainly from Indomalayan and Palaearctic regions (Wesołowska 2010; Wesołowska and Wiśniewski, 2013; Żabka, 2012) [11, 6, 5]. Male Chrysilla volupe are very bright with metallic coloration of body having narrower as well as longer abdomen (Ahmed *et al*. 2014) [13], which are scattered and rare in distribution. These spiders are the most colorful with iridescent scales of purple bluish stripes and M shaped marking present on their abdomen. They had green iridescent thick band above eyes.
These can be found in wide variety of natural habitats, as in rocks and bushy plants. We waited to spot these colorful creatures in their habitat as they camouflage efficiently with surroundings. It took some years for us to spot it in this biogeographical area, where we need to sit idly for hours to take a picture or capture it. These spiders are good hunters which can hop long distances by stalking their prey with a clear plot. These are very sensitive organisms, which make them indicators of biodiversity status in that zone. These micro habitants can be traced for the biodiversity richness in that biogeographically area. Salticidae spiders are least studied family by researchers and need to fill the gaps in their evolution before their extinction. So these findings underline the urgent need to conduct more exploratory survey on spider diversity. Spiders are extremely important to agriculture and horticulture . They are basically stalkers and their main preys are insects, many of which eat our crops and pester our livestock. Their populations can be increased by taking conservative steps thereby having an enormous impact on agricultural productivity and are essential natural pest controllers. We need to study on their venom and hemolymph which may hold key components for pest control. It's need of hour to evaluate conservative methods for these beautiful spiders, which inhabited the earth long than us.

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