

## Additional information on *Nasoona crucifera* (Thorell, 1895) from western Ghats in Kerala

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### Abstract

New distributional record of *Nasoona crucifera* from Cheruthoni, Idukki district, Kerala, India is reported. The previous record of the species was from Pathiramanal Island, Kerala. Diagnostic characters, distribution map and diagnostic images are provided.

**Keywords:** linyphiidae, *Nasoona*, *crucifera*, idukki, cheruthoni, postocular

### 1. Introduction

The spider family Linyphiidae has a worldwide distribution and includes 4644 described species in 617 genera (World Spider Catalog, 2020) <sup>[1]</sup> making it the second most species-rich spider family after the Salticidae. A total of 68 species of 36 genera are reported from India so far (Keswani et al. 2012) <sup>[2]</sup>.

Linyphiids are known as sheet web spiders that spin webs which are flat, domed shaped with isolated threads above the sheet forming a scaffolding. These spiders hang upside down and the webs are found in almost any habitat, between the branches of trees or shrubs, in tall grass and occasionally close to the ground (Benjamin and Zschokke, 2004) <sup>[3]</sup>. Spiders of the genus *Nasoona* are dwarf and medium-sized spiders with variegated abdomen. They are characterized by a postocular elevation on the male carapace and by a large shallow epigynal cavity in females (Tanasevitch, 2018) <sup>[4]</sup>. Several researches have contributed immensely to the study of spiders of Western Ghats like Patel (2003) <sup>[5]</sup>, Sebastian et al (2005) <sup>[6]</sup>, Jose et al. (2008) <sup>[7]</sup>, Sankaran et al, (2016) <sup>[8]</sup> and Alex et al. (2018) <sup>[9]</sup>. But the spiders of linyphiidae remain largely unknown in Kerala.

### 2. Materials and Methods

Specimen was collected by hand collection method from Cheruthoni, Idukki district. Identification was done in the laboratory by referring Tanasevitch (2018) <sup>[4]</sup> and Malamel (2018) <sup>[10]</sup>. The specimen was preserved in 70% ethyl alcohol. Microphotographs were taken by Olympus digital camera attached to an Olympus Magnus Stereozoom Microscope as described by Sekhar Reshmi and Jose K Sunil (2019) <sup>[11]</sup>. The measurement and illustration of the specimen was done using drawing tube. Leg and pedipalp measurements were taken from the dorsal side of the body and are given in the order: Total, Femur, Patella, Tibia, Metatarsus (except palp) and Tarsus. The eye measurements were taken with calibrated ocular micrometer. Female epigyne was cleared insitu with clove oil. The description was done by immersing the spider in a petri dish containing 70% ethyl alcohol. All measurements are in millimeters. Map was prepared using online tool available at www.mapcustomizer.com.



Fig 1: Habitat of *Nasoona crucifera* (Cheruthoni, Idukki)



Map 1: Distribution map- Cheruthoni. Idukki

Abbreviations: CL-Cephalothorax length, CW- Cephalothorax width, AL-Abdomen length, AW- Abdomen width, TL-Total length, AME- anterior median eyes, ALE- anterior lateral eyes, PME- posterior median eyes, Fig-Figure, N-North, E-East, mm-millimeters, MOQ-Median Ocular Quadrate, Ant.W- Anterior width, Post. W- Posterior width.

### 3. Results and Discussions

#### 3.1 Taxonomy *Nasoona crucifera* (Thorell, 1895) <sup>[12]</sup>

**3.2 Material examined:** One female. Cheruthoni (9° 51' 36.1656" N, 76° 57' 35.9424" E). Idukki district, Kerala, India.

**3.3 Diagnosis:** Abdomen blackish with a cream patch at the posterior end. The male is recognized by its cephalic lobe, bearing a prominent forward-directed spine with a hooked tip at top and bending bristles behind. Female is diagnosed by the bird mouth-like epigynum in lateral view (Tu & Li, 2004) <sup>[13]</sup>.

**3.4 Cephalothorax:** Carapace brown in shade. CL-1.12mm. CW-0.84mm. Wider posteriorly. Ocular region elevated.

**3.5 Eyes:** Heterogeneous with a black ring. Eight eyes arranged in two rows; anterior row recurved; posterior row straight. The anterior and posterior eyes are in close proximity. Anterior and posterior lateral eyes are juxtaposed. Distance between eyes; AME-AME 0.04mm, AME- PME 0.04mm, PME-PME 0.05mm, PME- PLE 0.06mm. MOQ: L-0.04mm, Ant W-0.04mm, Post W-0.05mm.

**3.6 Chelicerae & fangs:** Chelicera diaxial. Simple and small. Colouration similar to cephalothorax. Fangs darker in

colour. Chelicerae with six promarginal and five retromarginal teeth.

**3.7 Legs:** Long, slender, light yellowish in colour with black hairs. Legs with three tarsal claws. Tibia IV with two dorsal spines.

Measurements of palp and legs (Total, Femur, patella, tibia, metatarsus (except palp) and tarsus): Palp:1.45 [0.46,0.23,0.31,0.45], 14.04 [1.06,0.32,0.90,1.04,0.72], II3.86 [1.03,0.29,0.85,0.98

,0.71], III3.48 [0.90,0.27,0.83,0.81,0.67, IV 4.33 [1.12,0.38,1.10,1.08,0.65] Leg Formula: 4123.

Palp with tarsal claw.

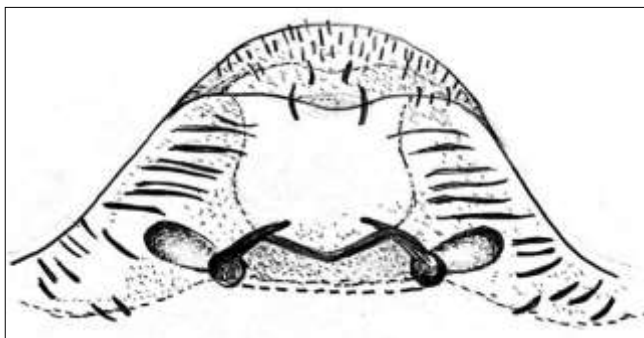
**3.8 Sternum:** Heart shaped, lighter than cephalothorax, longer than wide, wider near first coxa. Darker along the margins.

**3.9 Abdomen:** Light blackish in shade. Black hairs all over body. White patch at the posterior end. Light grey, long and wide patches on the lateral margins. Female reproductive part protrudes outward from the ventral portion of abdomen. Dorsal and ventral plates are well developed. Spermatheca sclerotized. Copulatory duct is long and thick whereas fertilization duct is short and thin. Cribellum and calamistrum absent. Spinnerets, three pairs and different in size. AL-1.87mm, AW-1.03mm.

**3.10 Habitat:** Collected from the leaf of a shrub. (Fig.1)



**Fig 2:** *Nasoona crucifera* female. (A) Dorsal view (B) Ventral view (C) Ventro- lateral view with Sternum (D) Eyes



**Fig 3:** *Nasoona crucifera* female. Epigyne – Ventral view

**3.11 Distribution:** India, China, Taiwan, Hong Kong, Myanmar, Laos, Vietnam, Thailand, Singapore, Malaysia, Borneo, Indonesia, Sumatra, Indonesia.

#### 4. Conclusion

Though genus *Nasoona* is represented by 17 species, distributed across the world, only four species has been recorded from India so far, namely *Nasoona asocialis*, *Nasoona crucifera*, *Nasoona Indiana* and *Nasoona Orissa*. The present discovery of the species from Cheruthoni extends the distribution of the species to higher altitudes in the Western Ghats. This indicates the possibility of wider distribution of the species in India. The first record of

*Nasoona crucifera* from India was by Joby Malamel (2018)<sup>[10]</sup>. The dearth of studies in linyphiid species diversity leaves many species unrecorded.

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