

FIRST RECORD OF *NEOSCONA XISHANENSIS* YIN, WANG, XIE ET PENG, 1990 (ARANEAE: ARANEIDAE) FROM INDIA WITH DESCRIPTION OF HITHERTO UNKNOWN MALE

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Summary. *Neoscona xishanensis* Yin, Wang, Xie et Peng, 1990 is recorded from India (Himachal Pradesh: Lahaul) for the first time. Hitherto unknown male of this species is described. Variation of the female abdominal color patterns is also discussed.

Key words: spiders, fauna, new record, Himachal Pradesh, Himalayas.

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Резюме. Паук *Neoscona xishanensis* Yin, Wang, Xie et Peng, 1990 впервые указан из Индии (Химачал-Прадеш: Лахаул). Приводится описание до сих пор неизвестного самца этого вида. Также обсуждаются цветовые вариации брюшка самки.

INTRODUCTION

The third most diverse family of new world spiders, Araneidae Clerck, 1757, is globally represented by 3042 species in 177 genera (World Spider Catalog, 2023). Although members of this family are easy to locate and identify, several of them remain inadequately studied with incomplete or single gender descriptions (Šestáková *et al.*, 2009).

The genus *Neoscona* Simon, 1864 is a senior synonym to three genera, viz. *Chinestela* Chamberlin, 1924 (Archer, 1958), *Cubanella* Franganillo, 1926 (Franganillo, 1936), and *Afraranea* Archer, 1951 (Grasshoff, 1986). Currently, the genus consists of 125 species with a widespread cosmopolitan distribution, of which official Indian list account for 29 species (World Spider Catalog, 2023), although a review by Singh and Singh (2021) enlists 37 species. Western Himalayan records from the country account for 13 species, spanning the states of Uttarakhand and Jammu and Kashmir, with no prior record of the genus from the state of Himachal Pradesh (HP) (Singh & Singh, 2021).

During surveys in the Trans-Himalayan district of Lahaul and Spiti several specimens of the genus were collected and later identified as *Neoscona xishanensis* Yin, Wang, Xie et Peng, 1990. Since description of female from Yunnan (Yin *et al.*, 1990), the species has also

been reported by females from Shaanxi, Zhejiang, and Guizhou (Yin *et al.*, 1997), and has been presumed to be endemic to China. The male of this species is currently unknown. Here we describe and illustrate *N. xishanensis* from India with the first description of the hitherto unknown male.

MATERIAL AND METHODS

All specimens were actively hand collected from agricultural and anthropogenic localities from the villages of lower Keylong and Kwaring, Lahaul, HP. Specimens were preserved in 70% alcohol followed by examination under a stereomicroscope (Carton DSZ-45T) with MICAPS camera attachment. All measurements are in mm. Specimens are deposited at the Wildlife Information Liaison Development Society (WILD), Coimbatore, Tamil Nadu, India.

Abbreviations used in text and figures. ALE – anterior lateral eyes, AME – anterior median eyes, C – conductor, fe – femur, La- lamella, LL - lateral lobes, MA – median apophysis, Ms – spur of MA, mt – metatarsus, pa – patella, PLE – posterior lateral eyes, PME – posterior median eyes, S- scape, TA- terminal apophysis, ta – tarsus, ti – tibia, WILD – Wildlife Information Liaison Development Society.

RESULTS

Family Araneidae Clerck, 1757

Genus *Neoscona* Simon, 1864

Neoscona xishanensis Yin, Wang, Xie et Peng, 1990

Figs 1–3

MATERIAL EXAMINED. **India:** Himachal Pradesh, Lahaul and Spiti, Lower Keylong Village, 32°34'14.13"N, 77° 1'34.94"E, 3056m, 03.VIII 2021, 1♀ (WILD-ARA-21-1648), coll. Irina Das Sarkar; the same locality, 12.VIII 2021, 2♂ (WILD-ARA-21-1652, WILD-ARA-21-1653), coll. Irina Das Sarkar; Himachal Pradesh, Lahaul and Spiti, Kwaring Village, 32°34'53.73"N, 77° 7'2.17"E, 3478m, 11.VIII 2021, 2♀, 1♂ (WILD-ARA-21-1649, WILD-ARA-21-1650, WILD-ARA-21-1651), coll. Irina Das Sarkar.

DESCRIPTION. Male (hitherto unknown). Total length 4.82. Cephalothorax length 2.67, width 2.29, red-orange, with slightly darker lateral margins, without any pattern, tapering anteriorly near ocular region. Fovea distinct, deep red, longitudinal, slit-like. Median eyes closer together than to laterals, laterals adjacent. Eye measurements: AME 0.10, ALE 0.07, PME 0.10, PLE 0.06. Inter-eye distances: AME-AME 0.06, AME-ALE 0.15, PME-PME 0.02, PME-PLE 0.14, ALE-PLE adjacent. Sternum length 1.61, width 1.07, brown with darker, wavy, margins, pointed posteriorly. Endites length 0.41, width 0.33. Labium length 0.23, width 0.39. Chelicerae length 0.77, width 0.31, promarginal 4 (1 large, 3 small), and 3 retromarginal teeth. Legs strong, yellow-brown, with numerous spines, darker anteriorly giving banded appearance. Anterior margin of coxa I with sclerotized and hooked projections. Ti II with over 30 spines of varying lengths. Leg measurements (fe, pa, ti, mt, ta, total): I fe 3.18, pa 1.08, ti 2.54, mt 1.99, ta 0.65 (9.44); II fe 2.91, pa 0.93, ti 1.99, mt 1.88, ta 0.77 (8.48); III fe 1.87, pa 0.76, ti 1.22, mt 1.24, ta 0.53 (5.62); IV fe 2.81, pa 0.94, ti 1.90, mt 2.12, ta 0.63 (8.4). Leg formula 1243. Abdomen length 2.82, width 1.69, brown with scattered long white setae, prominent darker folium covering two-third abdomen, four white spots on mid-longitudinal abdominal plane, one big, undivided covering one-third anterior abdomen, two pairs on anterior folium placed close to each other, and one small placed at slight distance

from paired spots. Median apophysis club-shaped, bulbous, sclerotized, with sharp spur pointed anteriorly; Conductor hooked, basally heavily sclerotized; Lamella weakly sclerotized, situated at base of lamella; Terminal apophysis weakly sclerotized, apically pointed, overhanging conductor.

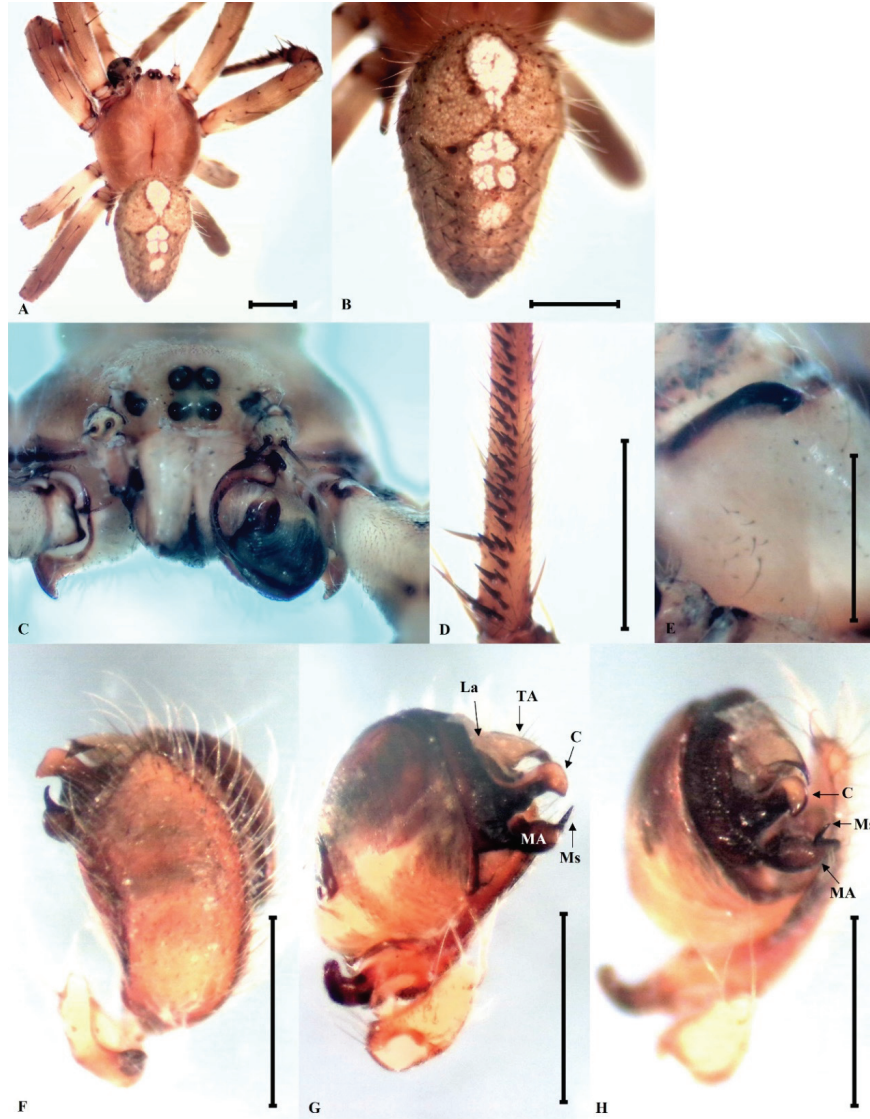


Fig. 1. *Neoscona xishanensis*, male. A – habitus, dorsal view; B – abdomen, dorsal view; C – coxa I projections, frontal view; E – same, ventral view; D – Ti I spines; F–H – palp, prolateral, retrolateral, and ventral views respectively. Scale = 0.5mm.

Female. Total length 3.71. Cephalothorax length 1.91, width 1.58, yellow-brown with darker lateral margins, without any pattern, tapering anteriorly near ocular region. Fovea small, slit-like, with branching darker bands running in V-shaped pattern anteriorly. Median eyes closer together than to laterals, laterals adjacent. Eye measurements: AME 0.07, ALE 0.06, PME 0.09, PLE 0.06. Inter-eye distances: AME-AME 0.07, AME-ALE 0.17, PME-PME 0.02, PME-PLE 0.20, ALE-PLE adjacent. Sternum length 0.80, width 0.82, dark brown with slightly wavy margins and faint white discontinuous median band, blunt posteriorly. Endites length 0.32, width 0.27. Labium length 0.21, width 0.40. Chelicerae length 0.65, width 0.35, promarginal teeth 4 on right (1 large, 3 small) and 3 on left (1 large, 2 small), 3 retromarginal teeth. Legs strong, yellow-brown, with numerous spines. Leg measurements (fe, pa, ti, mt, ta, total): I fe 1.17, pa 0.86, ti 1.65, mt 1.68, ta 0.75 (6.11); II fe 1.82, pa 0.81, ti 1.49, mt 1.37, ta 0.70 (6.19); III fe 1.37, pa 0.58, ti 0.75, mt 0.82, ta 0.53 (4.05); IV fe 2.05, pa 0.72, ti 1.42, mt 1.52, ta 0.56 (6.27). Leg formula 4123. Abdomen length 2.34, width 1.62, brown, prominent darker folium covering two-third abdomen, five white spots on mid-longitudinal abdominal plane, one big, undivided covering one-third anterior abdomen, two on anterior folium placed close to each other, rest smaller placed at slight intervals. Epigyne with short, blunt and spoon-shaped scape with constriction at about two-third anterior length; one pair of small lateral lobes protruding just prior to constriction; spermathecae visible in ventral view, located at base of scape in two defined pockets; copulatory ducts run longitudinal till lateral lobes.

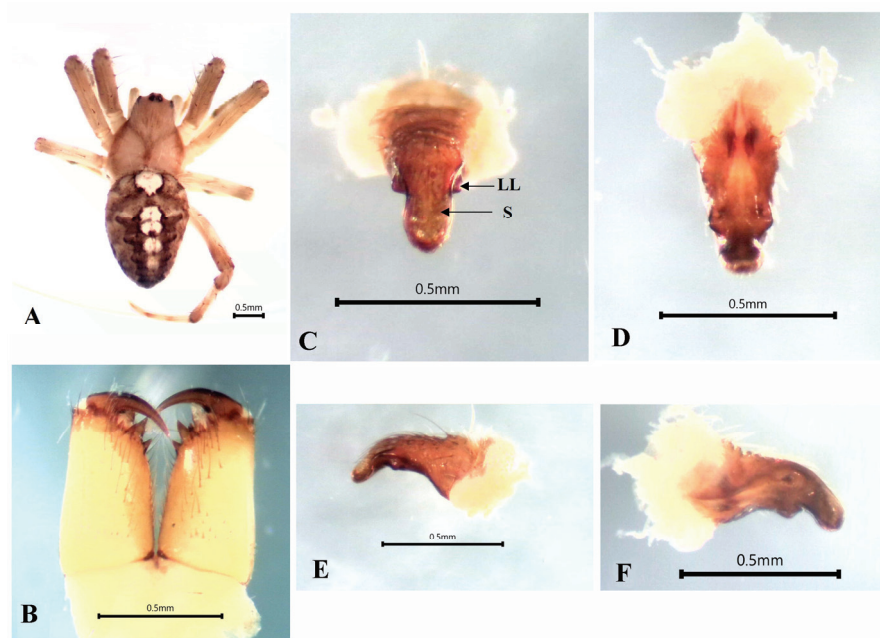


Fig. 2. *Neoscona xishanensis*, female. A – habitus, dorsal view; B – chelicerae, ventral view; C – epigyne, dorsal view; D – the same, ventral view; E, F – the same, lateral view. Scale = 0.5mm.

Variation of female. There are three distinct variants of abdominal patterns in Indian specimens. The first variant can be differentiated based on the distinct white spots on the mid-longitudinal plane of the abdomen (Fig. 3A). The second variant can be identified based on a light brown abdomen with slightly darker folium, which extends anteriorly in faint off-white color, and sometimes hosts expanded bulges anteriorly (Fig. 3B). The third variant hosts a distinct white band that runs longitudinal on mid-abdominal plane, with the folium similar to the first (described) variant (Fig. 3C); the band is broader anteriorly than posteriorly and is sparsely interspersed with small black hair. Females of first variant were commonly found in anthropogenized landscapes at elevation 3000 m, while females of second and third variants were collected on the fields of peas and potato at elevation 3500 m.

HABITAT. All specimens were collected from agricultural fields of the villages of Lower Keylong and Kwaring, Lahaul and Spiti, Himachal Pradesh with a predominant cultivation of potatoes, cabbage, and peas.

DISTRIBUTION. China, India (new record).



Fig. 3. Variation in abdominal patterns of *Neoscona xishanensis* from India. Scale = 0.5mm.

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REFERENCES

- Archer, A.F. 1958. Studies in the orbweaving spiders (Argiopidae). *American Museum Novitates*, 1922: 1–21.
- Franganillo, B.P. 1936. *Los arácnidos de Cuba hasta 1936*. La Habana, Cultural. 183 pp.
- Grasshoff, M. 1986. Die Radnetzspinnen-Gattung *Neoscona* in Afrika (Arachnida: Araneae). *Annalen Zoologische Wetenschappen*, 250: 1–123.

- Šestáková, A., Krumpál, M. & Krumpálová, Z. 2009. *Araneidae (Araneae) of Central Europe: I. Genus Araneus*. Faculty of Natural Sciences of Comenius University, Bratislava, 151 pp.
- Singh, R. & Singh, G. 2021. Faunal diversity of orb-weaver spiders (Araneidae: Araneomorphae: Araneae: Arachnida) in India. *International Journal of Biological & Environmental Investigations*, 1(2): 62-133.
- World Spider Catalog. 2023. *World Spider Catalog. Version 24*. Natural History Museum Bern. Available at: <http://wsc.nmbe.ch> (Accessed 12 September 2023). DOI: 10.24436/2
- Yin, C.M., Wang, J.F., Xie, L.P. & Peng, X.J. 1990. *New and newly recorded species of the spiders of family Araneidae from China (Arachnida, Araneae)*. *Spiders in China: One Hundred New and Newly Recorded Species of the Families Araneidae and Agelenidae*. Hunan Normal University Press, China, 171 pp.
- Yin, C.M., Wang, J.F., Zhu, M.S., Xie, L.P., Peng, X.J. & Bao, Y.H. 1997d. *Fauna Sinica: Arachnida: Araneae: Araneidae*. Science Press, Beijing, 460 pp.

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