

Description Update of A Rare Spider *Neoscona multiplicans* (Chamberlin, 1924) (Araneae, Araneidae) from Taiwan

台灣稀有種小青姬鬼蛛之描述 (蜘蛛目：金蛛科)

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Abstract

Neoscona multiplicans (Chamberlin, 1924) is widely distributed in Japan, Korea and China, but is rare and poorly understood in Taiwan. This paper provides an updated description and photographs of *N. multiplicans* based on specimens found in Taiwan, as well as a discussion of the species' distribution in Taiwan.

摘要

小青姬鬼蛛 (*Neoscona multiplicans* (Chamberlin, 1924)) 廣泛分布於日本、韓國和中國大陸等地區，但在台灣為稀有且尚未被描述的物種。本文根據台灣標本對雌蛛重新描述，並討論其在台灣之分布。

Key words: Araneae, Araneidae, *Neoscona*, Taiwan.

關鍵詞：蜘蛛目、金蛛科、姬鬼蛛屬、台灣

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Introduction

The genus *Neoscona* Simon, 1864 containing 114 species is one of the largest groups of the family Araneidae and has a worldwide distribution (World Spider Catalog 2016). Eleven species have been recorded from Taiwan (Chen 1996). Small to medium in size, members of the *Neoscona* have the following morphological characters: a median longitudinally thoracic groove, anterior median eyes largest and posterior lateral eyes smallest among eyes, both lateral eyes very close to each other and not on a prominent tubercle, chelicera with four promarginal and three retromarginal teeth, leg formula I-II-IV-III or I-IV-II-III, legs of male having a ventral hook at the distal margin of coxa I and many strong prolateral spines on tibia II, epigynum of female having a smooth triangular, ligulate, or elongated scape. They usually construct orb webs in grassland or between shrubs at night, and stay in the hub of snare. *Neoscona multiplicans* (Chamberlin, 1924) is widely distributed in East Asia, including Japan, Korea, and China but had never been recognized from Taiwan except by Tanikawa (2006), who documented a female museum specimen (UMUTZ-Aran-26-2) collected about one hundred years ago (i.e., 1899 A.D.) from Keelung, Taiwan, without description. However, his finding was ignored by recent researchers (e.g., Tanikawa 2009; World

Spider Catalog 2016; Zhu and Zhang 2011). Before Tanikawa (2006), *N. multiplicans* had been collected by the junior author in 1996 in Pinglin, Taipei County (now New Taipei City) in northern Taiwan. Until recent, it was re-discovered in neighboring regions, i.e., Hsintien and Wenshan (Fig. 1). Although no male was obtained, the morphology of these Taiwanese female specimens is undoubtedly identical to that of *N. multiplicans* described from neighboring countries in related literatures (e.g., Chamberlin 1924; Song et al. 1997; Namkung 2002; Tanikawa 2009). In this paper, we updated the description of this species based on specimen gathered from Taiwan.

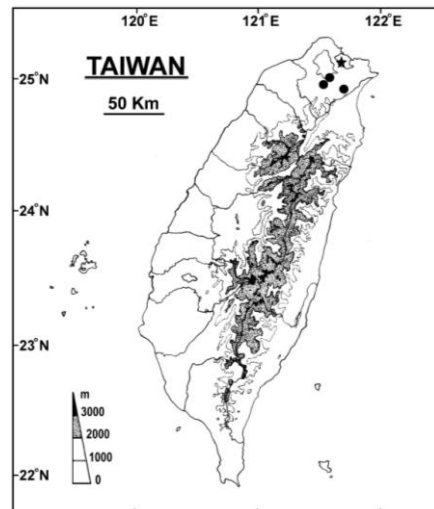


Fig. 1. Collect localities of *Neoscona multiplicans* in Taiwan. Data based on Tanikawa (2006; ★) and the present study (See the specimen examined in text; ●).

Materials and methods

Spiders were obtained by hand in the field. Alcohol-preserved specimens were examined, measured and photographed under a stereomicroscope (Leica M3Z) using an ocular micrometer with up to 80x magnification. Examined specimens were deposited in the Arachnological collection of the Department of Life Science, National Taiwan Normal University (NTNUB-Ar). All measurements given are in mm. Measurements of the palpus are shown as total length (femur, patella, tibia, tarsus). Measurements of legs are shown as total length (femur, patella and tibia, metatarsus, tarsus). Abbreviations used are AER, anterior eye row; ALE, anterior lateral eye; AME, anterior median eye; CO, copulatory opening; MOA, median ocular area; PER, posterior eye row; PLE, posterior lateral eye; PME, posterior median eye.

Results

Neoscona multiplicans (Chamberlin, 1924)
(Figs. 1–9)

Aranea multiplicans Chamberlin, 1924: 18, pl. 5, f. 35.

Neoscona scylla: Song, 1988: 129.

Neoscona minoriscylla Yin *et al.*, 1990: 123, f. 301–309.

Neoscona multiplicans: Song *et al.*, 1997: 1715, f. 17a–c.

Specimens examined.

TAIWAN: TAIPEI CITY: Wenshan, Chihnkung, alt. 250 m., 1 female (NTNUB-Ar 48606), 20-VI-2011, Wen-Jean Huang leg.; 1 female (NTNUB-Ar 48813), 30-VI-2011, Wen-Jean Huang leg. NEW TAIPEI CITY: Hsintien, Ankeng, alt. 20 m., 1 female (NTNUB-Ar 48824), 29-VI-2011, Shyh-Hwang Chen leg.; Pinglin, near Pihu Bridge, alt. 300 m., 1 female (NTNUB-Ar 1525), 13-VIII-1996.

Diagnosis.

Neoscona multiplicans most closely resembles *N. scylla*, but can be distinguished from the latter (characters in parentheses) in having a smaller body length varying from 7 to 13 mm (larger, 12 to 15 mm), and epigynum with a scape broad anteriorly and a narrow tip (not broad anteriorly).

Description.

Female (NTNUB-Ar 48813). Total length 9.69; carapace length 4.00, width 3.08; abdomen length 5.69, width 4.46. Measurements of palpus and legs: palpus 3.23 (0.65, 0.35, 0.78, 1.45); legs I 14.62 (4.62, 5.23, 3.69, 1.08), II 13.77 (4.46, 4.77, 3.39, 1.15), III 8.23 (2.46, 2.92, 1.85, 1.00), IV 14.53 (4.92, 4.77, 3.69, 1.15). Diameters of eyes, AME: ALE: PME: PLE = 0.20: 0.18: 0.18: 0.13.

Carapace (Figs. 2–3) covered with moderately abundant appressed hairs; median groove, cervical grooves and radial grooves distinctive. AER and PER recurved when viewed dorsally. PER longer than AER. AME > ALE = PME > PLE. Distance between AMEs (0.25) shorter than

that of AME and ALE (0.43), distance between PME's (0.13) shorter than that of PME and PLE (0.50). MOA length 0.65, anterior width 0.60, posterior width 0.50. Height of clypeus nearly equal to diameter of AME. Chelicerae stout, geniculate anteriorly; fang groove armed with four promarginal and three retromarginal teeth, with a largest third promarginal one. Endite longer than width. Labium pentagonal in shape, wider than length. Sternum heart-shaped, margin concaved at base of coxa and intruding posteriorly to between coxae IV, and connected with carapace by sclerotized strips between coxae. Leg formula I-IV-II-III. Abdomen ovoid. Epigynum (Figs. 6–9) stout, with copulatory openings adjacent to anterior border of epigastric fold. Scape broad at base, gradually tapering posteriorly, and bent to dorsal side at tip.

Coloration. Carapace light brown, dark in margin; median groove, cervical grooves and radial grooves brown; a pair of white stripes in front of median groove and a large yellowish ivory marking on rear side. Chelicerae, fang, and labium dark brown; endite brown. Abdomen yellowish brown, dorsum with a pale brown folium mixed with five pairs of arch-shaped dark brown markings; venter grayish brown in center, with a pair of remarkable large white spots in between epigastric furrow and spinnerets, and an additional pair of small white spots located in between large spots and anterior spinnerets. Spinnerets brown, tip darker.

Variations.

A total of four females were measured.

Variations among females (with mean in parentheses) are: total length 9.69–13.39 (11.59); carapace length 4.00–5.11 (4.64), width 3.08–4.00 (3.62); Abdomen length 5.69–8.51 (6.95), width 4.46–7.02 (5.89). The coloration of abdomen and the folium marking become darker in larger individuals. The additional pair of small white spots in the venter of abdomen are not present in one female (NTNUB-Ar 1525, Fig. 5).

Distribution.

China, Japan, Korea and Taiwan.

Discussion

Neoscona multiplicans has been recorded from middle latitudes of Northeast Asia, i.e., Japan, Korea, and China (from Beijing and Henan to Yunnan and Hainan) (Song *et al.* 1999; Zhu and Zhang 2011). Taiwan is a large continental island very closed to Fujian of Southeast China. The Tropic of Cancer passes through both the middle of Taiwan and South China. The discovery of *N. multiplicans* in northern Taiwan is not a surprise. Tanikawa (2006) first discovered a female museum specimen that was collected in Keelung, Taiwan, in 1899. The specimen is now preserved in the Department of Zoology, the University Museum, University of Tokyo (UMUTZ-Aran-26-2) for more than one hundred years. The junior author re-discovered the second specimen (NTNUB-Ar 1525) two decade ago in 1996. Up to the present, a total of five Taiwanese specimens have been

recorded. However, *N. multiplicans* seems rare in Taiwan. In the field, *N. multiplicans* may easily be confused with *N. scylla*, another sympatric and much common species in Taiwan, due to similarities in external features and habit. *Neoscona multiplicans* was found in shrubs along the roadsides or small trails in the low mountain areas of northern Taiwan. As does in *N. scylla*, *N. multiplicans* usually spins a new orb web and stays in the hub to prey insects for food at night. The snare will be destroyed next morning, and the spider hides in foliage next to the destroyed snare during the daytime. Without close examination, *N. multiplicans* can hardly be recognized among large number individuals of *N. scylla*. Due to insufficient investigations and poorly taxonomic studies in Taiwan, it took nearly 20 years to recognize *N. multiplicans* since the first individual collected in 1996. Although *N. multiplicans* is only found in northern Taiwan now, we expect its distribution should include all low mountain areas below 1000 m above sea level. However, this needs to be confirmed by further investigations in the near future.

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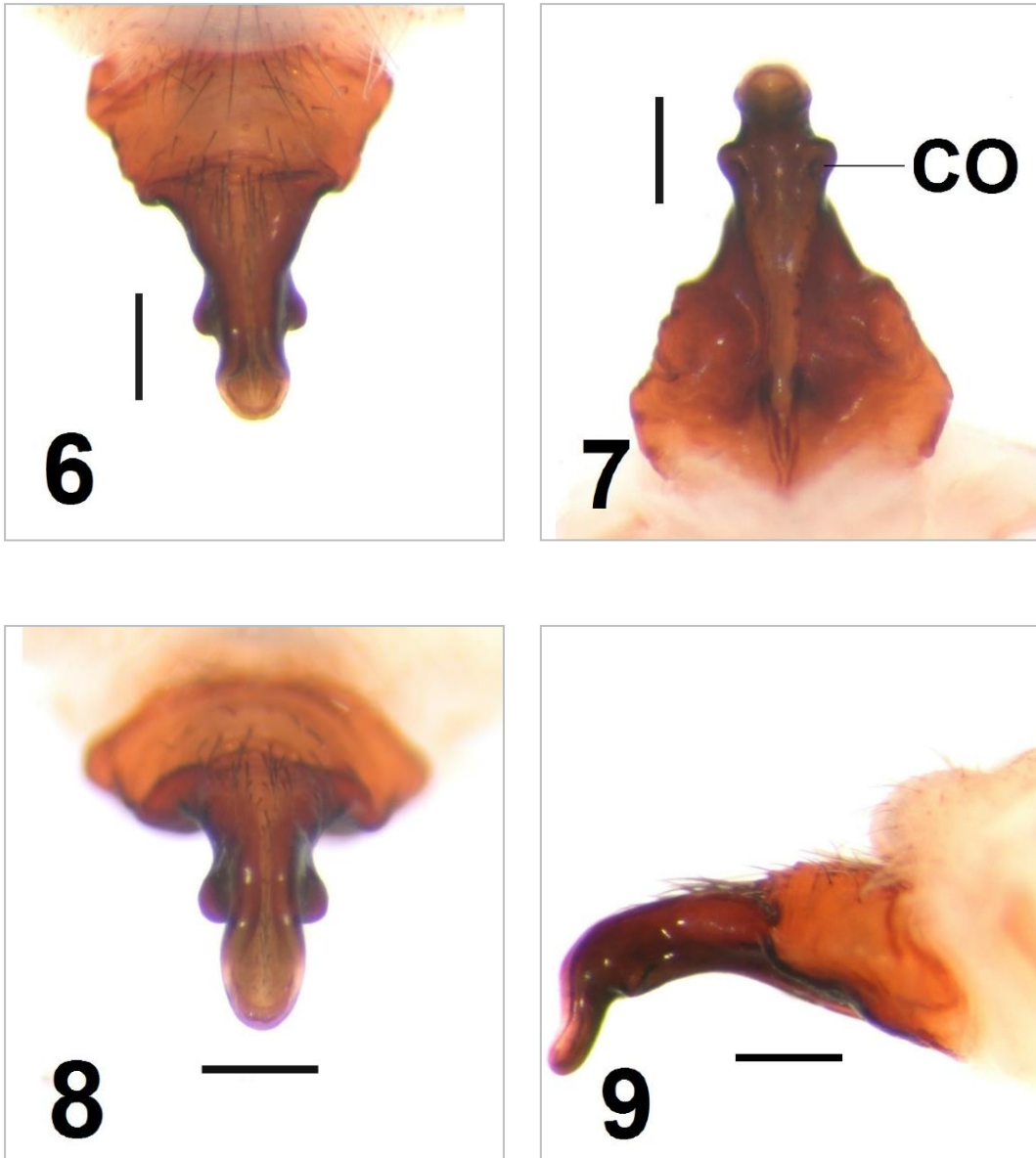
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Figs. 2–5. Habitus of *Neoscona multiplicans* (Chamberlin, 1924). 2–3, female from Chihnankung (NTNUB-Ar 48813), epigynum was removed; 4–5, female from Pinglin (NTNUB-Ar 1525). 2, 4, dorsal view; 3, 5, ventral view. Scales = 1 mm.



Figs. 6–9. Female epigynum of *Neoscona multiplicans* (Chamberlin, 1924), NTNUB-Ar 48813. 6, ventral view; 7, dorsal view; 8, ventro- posterior view; 9, lateral view. CO: copulatory opening. Scales = 0.2 mm.