

New Records of *Chikunia subrapulum* (Zhu, 1998), n. comb., (Araneae: Theridiidae) from Japan, with Taxonomical and Nomenclatural Notes

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Abstract Specimens of 53 females and 11 males of an unknown spider species from the family Theridiidae in Japan were taxonomically studied. The spider is identified as *Chrysso subrapulum* Zhu, 1998 known only from males from China, which is recorded here from Japan for the first time. This species is described based on the Japanese specimens, including hitherto unknown females, and is transferred from the original genus *Chrysso* O. Pickard Cambridge, 1882 to the genus *Chikunia* Yoshida, 2009 via a comparative examination of morphological characteristics. A nomenclatural problem with the specific name of this spider is discussed and its original spelling must be used for it.

Key words: Taxonomy, spiders, *Chrysso*, new combination, new records, nomenclature.

Introduction

The theridiid genus *Chikunia* established by Yoshida (2009) contains three described species, *Chikunia albipes* (Saito, 1935) (= *Theridion rapulum* Yaginuma, 1960) from Japan, China, Korea and Russian Far East, *Chikunia bilde* Smith, Agnarsson & Grinstead, 2019 from Malaysia, Singapore and Indonesia and *Chikunia nigra* (O. Pickard-Cambridge, 1880) widely distributed from India to Indonesia and Taiwan (World Spider Catalog, 2023). Of these, only *Chikunia albipes*, the type species of the genus, was so far known from Japan (Yoshida, 2001, 2009b; Ono and Ogata, 2018; Tanikawa, 2023).

However, the first author, Kumada, had noticed, but not published, a different species of theridiid spider similar in appearance to the common *Chikunia albipes* in Japan about 30 years ago. The first specimen examined was a female

collected by Ms. Shigeyo Inaba during an excursion in Kagoshima Prefecture, Kyushu, held after the 21st annual meeting of the Arachnological Society of Japan at Miyazaki in the summer of 1989. Subsequently he collected females and males of this unknown species many times since in Kyushu, Shikoku, and Honshu. Although he reserved the records for a long time, he came to the conclusion that the unknown species is the same as *Chrysso subrapulum* described by Zhu (1998) based on a male specimen collected in Hubei, China.

After a careful examination based on sufficient materials, both the authors have discovered new data reported here. First, this species is recorded in Japan for the first time. Second, the previously unknown female of the species has been discovered and hereby described for the first time. Third, this species should be transferred from its original genus *Chrysso* O. Pickard Cambridge, 1882 to the genus *Chikunia* which was recently established by Yoshida (2009a). Finally, the spe-

cies epithet of the scientific name of this species should be returned to its original spelling.

Abbreviations used are as follows: ALE, anterior lateral eye; AME, anterior median eye; AME–AME: distance between AMEs; AME–ALE: distance between AME and ALE; PLE, posterior lateral eye; PME, posterior median eye.

Taxonomy

Chikunia subrapulum (Zhu, 1998), n. comb.

[Japanese name: Kabura-himegumo]

(Figs. 1–9)

Chrysso subrapulum Zhu, 1998, p. 47, 65, 361, 390, fig. 37 A–C, ♂ holotype from Hefeng County (29.48N, 110.00E), Hubei Province, China, 1–VI–1989, M.-S. Zhu leg., preserved in the Chinese Academy of Sciences, not examined. — Song, Zhu & Chen, 1999, p. 107, fig. 50 M–N; Zhu *et al.* 2005, p. 496.

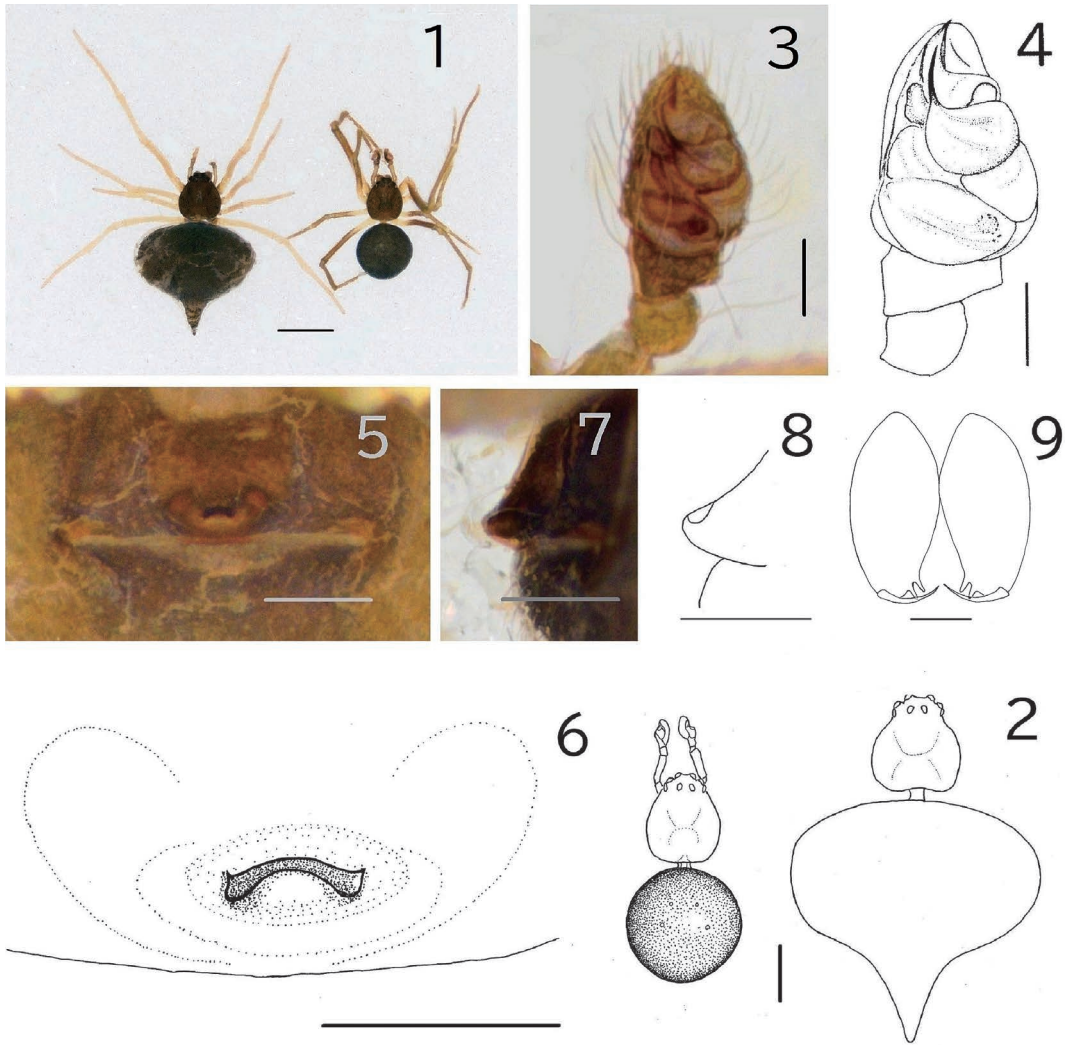
Chrysso subrapula Zhu and Zhang, 2011, p. 88, fig. 49 A–C; WSC, ver. 24, 2023, the list for Theridiidae. — Incorrect emendation of the species name. New synonymy.

Theridiidae sp.: Bando, 2021, p. 3, fig. 14, 1 ♀, Nakao, Funatsu, 30–VII–2020, 1 ♀, Kamikaitsu, Aikawa, 3–VIII–2020, both from Kaiyo-cho, Kaifu-gun, Tokushima Prefecture, Shikoku, Japan, H. Bando leg., preserved in the Tokushima Prefectural Museum (TKPM), not examined.

Etymology. The modification of the ending of the species name made by Zhu and Zhang (2011) was grammatically incorrect and was regarded as the suggestion of a new name by an incorrect emendation. The present authors have changed the species name back to the original spelling in accordance with the terms (article 11.9, 33.2 and others) of the International Code of Zoological Nomenclature (ICZN). In detail, Zhu (1998) named it *sub+rapulum* because of its resemblance to *Theridion rapulum* Yaginuma, 1960, originally described from Japan. However, the Japanese spider has a different name (a senior synonym), *Chikunia albipes* (Saito, 1935), at the present, and its distributional range extends to Korea, China and the Russian Far East as well as Japan. *Theridion rapulum* was transferred from its original genus *Theridion* Walckenaer, 1805 to

Chrysso O. Pickard-Cambridge, 1882 by Yoshida (1993) and synonymized with *Theridula albipes* Saito, 1935 by Yoshida (2001), and finally, further transferred to the genus *Chikunia* established with this species as the type species by Yoshida (2009 a). Although the motive for naming of *Theridion rapulum* was not stated in the original description, Yaginuma explained its etymology on another occasion. In Yaginuma, Hirashima and Okuma (1990), p. 142, they stated that *rapulum* is a Latin word (a neuter noun) meaning a little turnip (*rapum* with diminutive) because the shape of the abdomen of the spider resembled the shape of the vegetable. Therefore, the species name made by a noun in apposition does not change its ending when the gender of the genus changes. The problem would not have arisen if the genitive case of the noun, *rapuli*, or the adjective *rapinus*, *-a*, *-um* or *rapiformis*, *-is*, *-e* had been used, but the word used in reality is clearly the nominative of a noun. Moreover, because Latin grammar indicates that the prefix *sub-* changes to *sur-* when attached to a word beginning with *r*, the species name made by *sub+rapulum* should be expressed as *surrapulum* in the nominative case, and *surrapuli* in the genitive case. Unfortunately, this grammatically correct change is not permissible under the agreement of ICZN, thus the original spelling *subrapulum* has to be maintained.

Specimens examined. 1 ♀, 10–IX–2015, 1 ♀ 1 ♂, 11–VIII–2016, 2 ♂, 12–VI–2017, 3 ♀, 24–VIII–2017, 1 ♀, 7–IX–2018, 1 ♂, 3–VI–2020, Ikenotaira, Tatsue, Iida-shi, Nagano Pref., Honshu, Japan (35.4502N, 137.8422E); 1 ♂, 17–VI–2021, Shimo-hisakata-kakinosawa, Iida-shi, Nagano Pref., Honshu, Japan (35.4607N, 137.8499E); 1 ♀, 21–VIII–1990, Sagasawa, Kadonohara, Amagi-yugashima-cho, Tagata-gun, Shizuoka Pref., Honshu, Japan (34.9007N, 138.9239E); 7 ♀, 7–IX–2013, Taki-taniike, Makiyama, Iga-shi, Mie Pref., Honshu, Japan (34.8840N, 136.1117E); 7 ♀ juv. 2 ♂ juv., 12–IV–2008, 1 ♀, 27–IV–2008, 1 ♀ 1 ♂, 9–V–2008, 6 ♀ 1 ♂, 23–V–2008, 1 ♀, 12–VI–2009,



Figs. 1–9. *Chikunia subrapulum* (Zhu, 1998). 1–2, female and male, dorsal view; 3–4, male left palp, ventral view; 5–6, epigynum, ventral view; 7–8, epigynum, lateral view; 9, chelicerae, ventral view. Scales: 1–2: 1 mm; 3–9: 0.1 mm.

8 ♀, 13–VI–2009, 9 ♀ 1 ♂, 9–VII–2010, Higashi-iketani, Hojo-cho-higashitakamuro, Kasai-shi, Hyogo Pref., Honshu, Japan (34.9159N, 134.8485E); 1 ♀ 1 ♂, 13–VIII–2011, Tsurarakannon, Wajikigo, Naka-cho, Naka-gun, Tokushima Pref., Shikoku, Japan (33.8672N, 134.4962E); 3 ♀, 19–IX–2011, Oto, Kitagawau-chi, Minami-cho, Kaifu-gun, Tokushima Pref., Shikoku, Japan (33.7669N, 134.5400E); 1 ♀, 30–IX–2013, Ikenouchi, Awai-cho, Kanonji-shi, Kagawa Pref., Shikoku, Japan (34.0711N,

133.7136E), all the above specimens were collected by K. Kumada; 1 ♀, 21–VIII–1989, Imuta-ike, Imuta, Kedoin-cho, Satsuma-gun, Kagoshima Pref., Kyushu, Japan (31.8144N, 130.4659E), S. Inaba leg. Of these, voucher specimens are deposited in the arachnid collection of the Department of Zoology, National Museum of Nature and Science, Tsukuba, Japan.

Diagnosis. The species is transferred from its original genus *Chrysso* O. Pickard Cam-

bridge, 1882 to the genus *Chikunia* Yoshida, 2009 based on the following characteristics: Legs of the females of this species are short, the total length of the first patella and tibia of the palp is 1.4 times the length of the carapace in dorsal view, whereas that of *Chrysso* species is more than 1.8 times. The shoulders of each side of the female abdomen are rounded, projected and expanded horizontally, the posterior end (tail) of the abdomen is long, pointed and projecting beyond the spinnerets. The male abdomen is ovoid, unscaled, and the shape of embolic part with the embolus and the conductor is triangular. This species is closest to *Chikunia albipes*.

Description based on the Japanese specimens (1 ♀ 1 ♂ from Higashi-iketani, Hojocho-higashitakamuro, Kasai-shi, Hyogo Pref., Honshu, Japan, 9–VII–2010). Female (Fig. 1, left): total length 2.78 mm. Carapace 0.84 mm long and 0.76 mm wide. Abdomen 2.10 mm long and 2.24 mm wide. Length of leg segments (in mm): [femur+patella+tibia+metatarsus+tarsus = total]: I, $1.28+0.32+0.84+0.96+0.40 = 3.80$; II, $0.86+0.28+0.44+0.58+0.34 = 2.50$; III, $0.56+0.24+0.24+0.34+0.28 = 1.66$; IV, $1.10+0.30+0.62+0.66+0.40 = 3.08$. Leg formula: 1-4-2-3. Prosoma oval. Eyes almost same in size except PLE smaller than the others. AME = ALE = PME > PLE (5:5:5:4). AME–AME > AME–ALE (3:1), PME–PME > PME–PLE (4:5). The anterior eye row recurved and the posterior eye row slightly recurved in dorsal view. Median ocular area: anterior side > posterior = length (6:5:5). Clypeus longer than AME–AME (2:1). Chelicerae not very long and thick (1.90 mm), with two projections (possibly teeth) near the apex. Labium transverse, longer (5:3), fused with sternum. Sternum inverted triangular, equal in length and width. Shoulders on both sides of abdomen rounded, swollen and expanded laterally; abdomen with long caudal end, projecting beyond the spinnerets and pointed. The length of first patella and tibia 1.4 times the carapace length. Epigynum (Figs. 5–8) expanded and protruding ventrad.

Male (Fig. 1 right): total length 1.81 mm. Carapace 0.80 mm long and 0.66 mm wide. Abdomen 1.00 mm long and 1.02 mm wide. Length of leg segments (in mm): I, $1.50+0.36+0.94+1.18+0.41 = 4.39$; II, $1.05+0.32+0.59+0.73+0.38 = 3.07$; III, $0.60+0.24+0.33+0.46+0.26 = 1.89$; IV, $1.18+0.28+0.75+0.82+0.40 = 3.43$. Leg formula: 1-4-2-3. Prosoma oval. Eyes almost equal in size except PLE smaller than the others. AME = ALE = PME > PLE (5:5:5:4). AME–AME > AME–ALE (4:1), PME–PME > PME–PLE (3:4). The anterior eye row recurved and the posterior eye row slightly recurved in dorsal view. Median ocular area: anterior side > posterior side = length (6:5:5). Clypeus longer than AME–AME (2:1). Chelicerae not very long and thick (1.90 mm), with two projections (possibly teeth) near the apex. Labium transverse, longer (2:1), fused with sternum. Sternum inverted triangular, equal in length and width. Abdomen spherical. The conductor of palp and embolus forming a triangle (Figs. 3–4).

Distribution. Japan (Honshu, Shikoku and Kyushu), China (Hubei, Henan, Guizhou and Yunnan).

Remark. By the reviewer's suggestion, the authors confirmed that the unknown theridiid spider recorded by Bando (2021) from Tokushima Prefecture was the same species as the present one. Its collection record has been added to the transition list of scientific names above.

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