

NEW SYNONYMIES AND NEW COMBINATIONS FOR CHINESE ISSIDAE (HEMIPTERA: AUCHENORRHYNCHA: FULGOROIDEA)

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Eight new synonymies of taxa of different rank and six new combinations are proposed in members of the family Issidae (Hemiptera: Auchenorrhyncha: Fulgoroidea) occurring in China based on their original descriptions. New synonymies (senior first): *Hemisphaeriini* Melichar, 1906 = *Superciliarinae* Meng, Qin et Wang, 2020, syn. n.; *Pusulissus* Bourgoïn et Wang, 2020 = *Flatiforma* Meng, Qin et Wang, 2020, syn. n.; *Tetrichina* Chang et Chen, 2020 = *Lunatissus* Meng, Qin et Wang, 2020, syn. n.; *Microsarimodes* Chang et Chen, 2019 = *Eusarimodes* Meng, Qin et Wang, 2020, syn. n.; *Rhombissus harimensis* (Matsumura, 1913) = *Rh. brevispinus* Che, Zhang et Wang, 2020, syn. n.; *Celyphoma bifurca* Meng et Wang, 2012 = *C. gansua* Chan, Zhang et Wang, 2014, syn. n.; *Tetrichina fuscovinclum* Wang et Bourgoïn, 2020 = *Lunatissus brevis* Che, Zhang et Wang, 2020, syn. n.; *T. trihamulata* Chang et Chen, 2020 = *L. longus* Che, Zhang et Wang, 2020, syn. n. New combinations: *Pusulissus guizhouensis* (Meng, Qin et Wang, 2020), comb. n.; *P. menglaensis* (Meng, Qin et Wang, 2020), comb. n.; *P. ruiliensis* (Che, Zhang et Wang, 2020), comb. n.; *Microsarimodes maculosus* (Che, Zhang et Wang, 2020), comb. n.; *Kodaianella arcuata* (Chang et Chen, 2020), comb. n.; *K. trigona* (Chang et Chen, 2020), comb. n.

Key words: *Hemisphaeriini*, *Hysteropterinae*, *Issinae*, *Kodaianellini*, *Parahiraciini*, *Sarimini*, new synonym, new combination, Oriental Region, Palearctic Region, taxonomy.

INTRODUCTION

A series of papers and two monographs on the Chinese fauna of the family Issidae (Hemiptera: Auchenorrhyncha: Fulgoroidea), describing many new genera and species, were published during the past ten years, significantly contributing to the knowledge of Fulgoroidea of this country (MENG & WANG 2012, CHEN *et al.* 2014, BOURGOÏN & WANG 2020, CHANG *et al.* 2019, 2020a, b, WANG *et al.* 2020, ZHANG *et al.* 2020). A careful analysis of these descriptions and illustrations, however, revealed several synonymies at subfamily, genus and species rank. The present paper aims to discuss these taxonomic problems propose new synonymies and new combinations for the involved taxa.

MATERIAL AND METHODS

The higher classification of the family Issidae follows GNEZDILOV *et al.* (2020). Morphological terminology follows ANUFRIEV and EMELJANOV (1988) and GNEZDILOV *et al.* (2014).

TAXONOMY

Family Issidae Spinola, 1839
Subfamily Issinae Spinola, 1839

Tribe Hemisphaeriini Melichar, 1906

Hemisphaeridae Melichar, 1906: 3. Type genus: *Hemisphaerius* Schaum, 1850, by subsequent designation.

Superciliarinae Meng, Qin et Wang in ZHANG *et al.* 2020: 296, syn. n. Type genus: *Superciliaris* Meng, Qin et Wang, 2020, by original designation.

Notes. A close relationship of Hemisphaeriinae *sensu* ZHANG *et al.* (2020) and Superciliarinae is indicated by the hemisphaerical forewings possessing a reticulate venation, and particularly the evident similarity of the penis, style, and male anal tube in these two groups. The only differences between the two purported subfamilies are apparently the relative width of the head and the pronotum and the width of genae (ZHANG *et al.* 2020, p. 559), which are hardly of subfamily level significance and not a constant character among various hemisphaeriine taxa. The reticulate venation of *Superciliaris* (the single genus included in Superciliarinae) suggests a close relationship to the hemisphaeriine genus *Eusudasina* Yang, 1994, while the peculiar triangular subapical processes of the dorsolateral lobes of the phallobase and the lack of neck or short neck of the style of *Superciliaris* are potential synapomorphies shared with the hemisphaeriine genus *Epyhemisphaerius* Chan et Yang, 1994 (CHAN & YANG 1994, GNEZDILOV 2018: figs. 27–31, *sp.*). There seems to be no evidence supporting the removal of *Superciliaris* from Hemisphaeriinae and its placement into a subfamily of its own. Accordingly, Superciliarinae is hereby downgraded to a junior subjective synonym of Hemisphaeriini *sensu* GNEZDILOV *et al.* (2020).

Tribe Kodaianellini Wang, Zhang et Bourgoin, 2016

Genus *Kodaianella* Fennah, 1956

Kodaianella Fennah, 1956: 508. Type species: *Kodaianella bicinctifrons* Fennah, 1956, by original designation.

Notes. The two species listed below are transferred into the genus *Kodaianella* based on the 3-lobed hind wings with developed vannus and anal lobe, the presence of peculiar elongately triangular or spine-shaped processes of the dorsolateral lobes of the phallobase and the style possessing a strong process under the capitulum. The currently monotypic genus *Sivaloka* Distant, 1906, characterized by the rudimentary vannus and reduced anal lobe of the hind wing, is apparently endemic to India (GNEZDILOV 2013).

Kodaiianella arcuata (Chang et Chen, 2020), comb. n.

Sivaloka arcuata Chang et Chen in CHANG *et al.* 2020a: 96, figs 29–43.

Kodaiianella trigona (Chang et Chen, 2020), comb. n.

Sivaloka trigona Chang et Chen in CHANG *et al.* 2020a: 100, figs 44–55.

Tribe Parahiraciini Cheng et Yang, 1991

Genus *Pusulissus* Bourgoïn et Wang, 2020

Pusulissus Bourgoïn et Wang, 2020: 73. Type species: *Pusulissus phiaocensis* Bourgoïn et Wang, 2020, by original designation.

Flatiforma Meng, Qin et Wang in ZHANG *et al.* 2020: 353, syn. n. Type species: *Flatiforma guizhouensis* Meng, Qin et Wang, 2020, by original designation.

Notes. The original descriptions and illustrations of the habitus and male genitalia leave no doubt about the synonymy of these two genera. The genus is characterized by its relatively wide body in dorsal view, an elongate metope, with only median carina being distinct and with lateral tubercles, a transverse coryphe, the forewing with R 2 M 4 CuA 1, the male anal tube being wide in dorsal view, with its lateral margins corner-shaped and turned down, the dorsolateral lobes of the phallobase lacking processes, the ventral phallobase lobe bearing a small pointed process medially, and the ventral aedeagal hooks being strongly curved.

The date of publication of the work of BOURGOÏN et WANG (2020) is indicated on the first page of the article as 25th November, 2020. The copyright page on the verso of the title page of ZHANG *et al.* (2020) gives the date of publication as November 2020; Y. ZHANG (pers. comm.) informed me that the book was published on 26th of November, 2020. Thus, *Pusulissus* has priority over *Flatiforma*.

Pusulissus guizhouensis (Meng, Qin et Wang, 2020), comb. n.

Flatiforma guizhouensis Meng, Qin et Wang in ZHANG *et al.* 2020: 354, fig. 140, pl. 27 a–c.

Notes. This species is very close to *P. coronomensis* Bourgoïn et Wang, 2020 according to the structure of its male genitalia, but it is well distinguished from the latter species by the sternite VII of the female, which possesses a median process. These species were described from neighbouring administrative regions (Guangxi and Guizhou) in southern China (BOURGOÏN & WANG 2020, ZHANG *et al.* 2020).

Pusulissus menglaensis (Che, Zhang et Wang, 2020), comb. n.

Flatiforma menglaensis Che, Zhang et Wang in ZHANG *et al.* 2020: 355, fig. 141, pl. 27 d–f.

Pusulissus ruiliensis (Che, Zhang et Wang, 2020), comb. n.

Flatiforma ruiliensis Che, Zhang et Wang in ZHANG *et al.* 2020: 357, fig. 142, pl. 27 g–i.

Genus *Rhombissus* Gnezdilov et Hayashi, 2016

Rhombissus Gnezdilov et Hayashi, 2016: 47. Type species: *Issus harimensis* Matsumura, 1913, by original designation.

Rhombissus harimensis (Matsumura, 1913)

Issus harimensis Matsumura, 1913: 61.

Rhombissus brevispinus Che, Zhang et Wang in ZHANG *et al.* 2020: 359, fig. 143, pl. 27 j–l, syn. n.

Notes. All important features of the peculiar male genitalia of *Rh. harimensis*, with an anal tube turned downwards apically, ventral aedeagal hooks with short upper processes, and ventral phallobase lobe with small apical concavity (GNEZDILOV & HAYASHI 2016: figs 1–4) are readily recognizable in the illustrations accompanying the original description of *Rh. brevispinus*. The fact ZHANG *et al.* (2020) did not compare their new species with the evidently very closely related *Rh. harimaensis* suggests that they likely overlooked this species. Therefore, there is no reason to treat the Chinese continental population as a species distinct from the one occurring in the Japanese Islands, even if the latter population is characterized by a somewhat larger size which might be due to island isolation. The synonymy of these two names is accordingly proposed.

Tribe Sarimini Wang, Zhang et Bourgoin, 2016

Genus *Tetrichina* Chang et Chen, 2020

Tetrichina Chang et Chen in CHANG *et al.* 2020b: 39. Type species: *Tetrichina trihamulata* Chang et Chen, 2020, by original designation.

Lunatissus Meng, Qin et Wang in ZHANG *et al.* 2020: 496, syn. n. Type species: *Lunatissus brevis* Che, Zhang et Wang, 2020, by original designation.

Notes. The presence of the peculiar moon-shaped processes of the dorsolateral lobes of the phallobase and the distinct process below the neck of capitulum of style in the species of *Tetrichina* and *Lunatissus* (CHANG *et al.* 2020b, figs 35, 38, ZHANG *et al.* 2020, figs 222e, 222h, 223e, 223h) leave no doubt about

the identity of these genera; therefore, their subjective synonymy is hereby proposed. According to the structure of the phallobase *Tetrichina* is closely related to the monotypical genus *Yangissus* Chen, Zhang et Chang, 2014 known from Guizhou (CHEN *et al.* 2014), but the latter is well distinguished by the presence of furcate ventral aedeagal hooks (CHEN *et al.* 2014, fig. 2-82M). The genus *Tetrichina* is apparently endemic to Hainan Island.

The date of publication of the work of CHANG *et al.* (2020b) is indicated in the first page of the article as 6th August, 2020. Thus, *Tetrichina* has priority over *Lunatissus*.

A comparison of the drawings of the male genitalia of *Tetrichina* and *Lunatissus* species in the original publications of CHANG *et al.* (2020b), WANG *et al.* (2020), and ZHANG *et al.* (2020) revealed the synonymies listed below.

Tetrichina fuscovinclum Wang et Bourgoïn, 2020

Tetrichina fuscovinclum Wang et Bourgoïn in WANG *et al.* 2020: 594, figs. 10–24.

Lunatissus brevis Che, Zhang et Wang in ZHANG *et al.* 2020: 497, fig. 222, pl. 39 d–f, syn. n.

Notes. The paper of WANG *et al.* (2020) was published on the 2nd of October 2020 as indicated on the first page and accordingly *T. fuscovinclum* has priority over *L. brevis*. The grammatical gender of the generic name *Tetrichina* is feminine (CHANG *et al.* 2020b); the epithet *fuscovinclum* is to be treated as a noun in apposition, therefore its ending is not to be changed.

Tetrichina trihamulata Chang et Chen, 2020

Tetrichina trihamulata Chang et Chen in CHANG *et al.* 2020b: 42, figs 28–48.

Lunatissus longus Che, Zhang et Wang in ZHANG *et al.* 2020: 498, fig. 223, Pl. 39 g–i, syn. n.

Notes. Publication dates are discussed above.

Genus *Microsarimodes* Chang et Chen, 2019

Microsarimodes Chang et Chen, 2019 in CHANG *et al.* 2019: 137. Type species: *Microsarimodes tumida* Chang et Chen, 2019, by original designation.

Eusarimodes Meng, Qin et Wang in ZHANG *et al.* 2020: 499, syn. n. Type species: *Eusarimodes maculosus* Che, Zhang et Wang, 2020, by original designation.

Notes. *Microsarimodes* and its single included species (*M. tumida* in its original description, here corrected to *M. tumidus*, because the grammatical gender of *Microsarimodes* is masculine, cf. ICZN (1999), Art. 30.1.4.4) were not treated by ZHANG *et al.* (2020). The peculiar ventral lobe of the phallobase (narrow basally, but strongly enlarged before apex), the dorsolateral lobes of

phallobase being provided with large semicircular processes ventrally covering ventral aedeagal hooks, and the massive styles, without neck, but with a comb before capitulum dorsally, clearly illustrated by both author groups (CHANG *et al.* 2019, figs 25, 27, 28; ZHANG *et al.* 2020, figs 224e, 224h, 224i), leave no doubt that the two genera are identical, therefore their subjective synonymy is hereby proposed, resulting in the following new combination:

Microsarimodes maculosus (Che, Zhang et Wang, 2020), comb. n.

Eusarimodes maculosus Che, Zhang et Wang in ZHANG *et al.* 2020: 500, fig. 224, Pl. 39 j–l.

Subfamily Hysteropterinae Melichar, 1906

Genus *Celyphoma* Emeljanov, 1971

Celyphoma Emeljanov, 1971: 625. Type species: *Hysteropterum fruticulinum* Emeljanov, 1964, by original designation.

Celyphoma bifurca Meng et Wang, 2012

Celyphoma bifurca Meng et Wang, 2012: 25, figs 6–10, 25–35.

Celyphoma gansua Chan, Zhang et Chang, 2014: 129, fig. 2-69, syn. n.

Notes. This species is readily distinguished by the long, apically bifurcate processes of the dorsolateral phallobase lobes (MENG & WANG 2012, fig. 42, CHAN *et al.* 2014, fig. 2-69K); there seems to be no difference between *C. bifurca* and *C. gansua*, hence their subjective synonymy is proposed.

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Acknowledgements – I am glad to thank Prof. Yalin Zhang (Northwest A&F University, Yangling, China) for his information on publication dates and Dr. Dávid Rédei (National Chung Hsing University, Taichung, Taiwan) and Prof. Dr. Hannelore Hoch (Berlin, Germany) for their review of the manuscript and valuable comments and corrections. My study was supported by the Russian State Research project No. 1021051302540-6.

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Received September 2, 2021, accepted January 24, 2022, published February 14, 2022