A new species of the genus Macrosemia from Vietnam

Yen Hoang Luu^{1, 2}, Thai Hong Pham^{3*}, Hong Minh Bui⁴, Jérôme Constant⁵

¹Vietnam Forest Museum, Vietnam ²Graduate School of Science and Technology, VAST, Vietnam ³Mientrung Institute for Scientific Research, VAST ⁴Department of Biology, Hanoi National University of Education, Vietnam ⁵Royal Belgian Institute of Natural Sciences, Belgium

Received 2 June 2021; accepted 10 August 2021

Abstract:

A taxonomic study on the genus Macrosemia from Vietnam in which a new species *Macrosemia sapaensis* sp. nov. is described. This species was collected from Lao Cai province in north Vietnam. Information on the distribution, photos of an adult, and illustrations of the male genitalia are provided for the new species. Based on the male characteristics, we provide a key to the genus Macrosemia Kato, 1925 (Hemiptera: Cicadidae) of Vietnam.

Keywords: Auchenorrhyncha, cicadini, Hoang Lien National Park, morphology, taxonomy.

Classification number: 3.4

Introduction

The cicada genus *Macrosemia*, erected by Kato (1925) [1], contains eighteen species and is mainly distributed in the Oriental Region. It belongs to the tribe Cicadini of the subfamily Cicadinae with Platylomia hopponis Kato, 1925 as the type species [2]. Two additional species, Platylomia kareisana (Matsumura, 1907) and Platylomia matsumurai Kato, 1928, were transferred to Macrosemia by Matsumura (1930) [3] and Kato (1931) [4], respectively. Later, Kato (1932) [5] considered Macrosemia hopponis to be only a form of Platylomia kareisana. Two other species were later described in the genus: Macrosemia kiangsuensis Kato, 1938, and Macrosemia anhweiensis Ouchi, 1938. The uncertainty about the exact classification of Macrosemia and its close relationship with Platylomia was also illustrated by Duffels & Van der Laan's (1985) treatment of the two genera. They listed three species of Macrosemia: M. anhweiensis Hua 2000, M. kiangsuensis Hua 2000 (including the variety virescens Liu, 1940), and M. matsumurai (Kato, 1928). Oddly enough, the type species of Macrosemia, Platylomia hopponis, was listed as a synonym of *Platylomia kareisana* under *Platylomia* [6]. The species was placed in *Platylomia* following Hayashi

(1979) [7]. Five species: Platylomia divergens (Distant, 1917), Platylomia assamensis Distant, 1905, Platylomia diana Distant, 1905, Platylomia saturate (Walker, 1858), and Platylomia pieli Kato, 1938 were transferred to Macrosemia Kato, 1925 by Lee (2008) [8]. Pham, et al., 2016 described one new species, Macrosemia lamdongensis, from Lam Dong province, Tay Nguyen area, Vietnam and removed two species Macrosemia assamensis (Distant, 1905) and Macrosemia divergens (Distant, 1917) from the Vietnam cicada fauna [4]. Here, we describe one new species, Macrosemia sapaensis sp. nov., from Lao Cai province, north Vietnam. It is the sixth species of Macrosemia found and is described here as a new species from Vietnam.

Materials and methods

Two males of the new species *Macrosemia* were collected from Sa Pa, Hoang Lien National Park, Lao Cai province, north Vietnam, and the type specimen of this new species was deposited in the Vietnam National Museum of Nature, Vietnam (VNMN), and Naturalis Biodiversity Centre, Leiden, The Netherlands (NCB).

Morphological terminology follows that of Moulds (2005) [9]. The male genitalia of the holotype were

^{*}Corresponding author: phthai@misr.vast.vn

examined and photographed using a dissecting microscope (Leica MZ12 5). A distribution map and photos of habitus are provided.

Specimens examined are listed by province.

Results and discussion

Taxonomy

Family Cicadidae Latreille, 1802

Subfamily Cicadinae Latreille, 1802

Tribe Cicadini Latreille, 1802

Genus Macrosemia Kato, 1925 Macrosemia Kato, 1925b: 57.

Type species: Platylomia hopponis Kato, 1925 (Kato 1925a) (Formosa = Taiwan).

Remarks

According to Lee & Hayashi (2003) [10] and Lee (2008) [8], Genus Macrosemia Kato, 1925 is different from Platylomia Stål, 1870 by the following characteristics: robust and thick body; eyes not prominent laterally; head including eyes about as wide as or narrower than base of mesonotum; postclypeus a little prominent anteriorly, shorter than vertex in mid-dorsal length in dorsal view; ventral side of postclypeus, in many species, with distinct fuscous or black longitudinal central band which diverges at anterior end; pronotal collar well developed and broad; mid lateral tooth of pronotal collar produced laterally or posterolaterally, not anterolaterally; male operculum long with comparatively acute apex and swollen at about posterior 2/3; forewing slender with sharp tip, its length longer than 3.2 times its width [11].

Key to the genus Macrosemia in Vietnam

- - Fore wing without widely spread or roundish

- infuscation on each apical portion of veins RA2, RP, M1, M2, M3, M4, and CuA1.....4

- Fore and hind wings without basal cell blackish-brown; operculum without a black streak around.......5

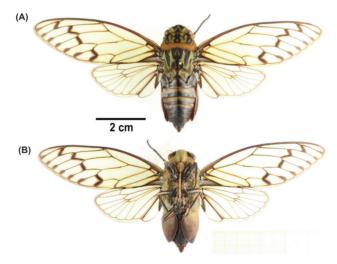


Fig. 1. *Macrosemia* sapaensis sp. nov.: A: dorsal view of male, B: ventral view of male.

Etymology: the species epithet refers to the locality of origin of the specimens: Sapa, Hoang Lien National Park, Lao Cai province in north Vietnam (Fig. 1).

Material examined: Holotype ♂: Hoang Lien National Park, Sapa, Lao Cai, 24.ix.2013, 1,900 m; coll. Pham Hong Thai (VNMN).

Paratype ♂: [Lao Cai province, Vietnam, 15 km W of Sapa, Tram Ton Pass, 1,900 m, 22.22N 103.50E, 15-

19.X.1999, light trap, VN99-1, coll. R. de Jong, (NBC).

Head: head including eyes slightly narrower than base of mesonotum; vertex pale green, with a large irregular marking at ocellar area, a broad pair of oblique spots between eyes and anterior arm of epicranial, two small fascia oblique against anterior margin of pronotum, fascia on posterior margin eyes against anterior margin of pronotum black; eyes brown-black, ocelli red; frons black with marking on posterior margin pale green; supra-antennal pale yellow-brown; antennae black; gena yellowish opalescent with large black marking around base antennae; lorum black; posclypeus greenish opalescent with transverse groove pale brown, margin against anteclypeus black; anteclypeus yellowish opalescent; rostrum yellowish opalescent, reaching pass posterior coxae, longitudinal lines centre darker, apical rostrum brown-black (Fig. 2).

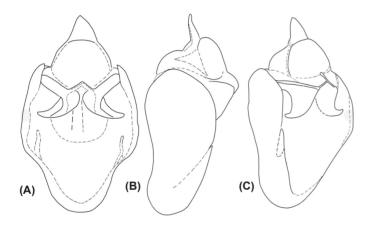


Fig. 2. *Macrosemia sapaensis* sp. nov.: (A) male genitalia in ventral view, (B) male genitalia in lateroventral view, (C) male genitalia in lateral view.

Thorax: pronotum pale green, with a surrounding line black, a pair of central longitudinal stripes, broadened both anteriorly and posteriorly, markings along furrows of inner area, and two spots at each posterolateral part of outer dilatation, black; pronotal collar pale green, margin and marking on lateral part of pronotal collar black, with dentate projection but not cute, apex brownblack; mesonotum pale green, with five black broad fasciae, a median fascia reaching from anterior margin of mesonotum to cruciform elevation, and ending in a black triangle on cruciform elevation, posterior half 1.5-3 times as wide as anterior part, paramedian suture extending to just beyond half-length of mesonotum, 1.5-5 times as wide as anterior part of median fascia, and about as broad as or somewhat broader than distance between

paramedian and median fasciae, pair of round black spots in front of anterior angles of cruciform elevation, lateral fasciae continuous from anterior to posterior margin of mesonotum and about as broad as distance between lateral and paramedian fasciae; two pair of small black triangles at anterior mesonotal margin between paramedian and lateral fasciae, cruciform elevation greenish opalescent with margin of posterior angles black, wing groove black; thorax greenish opalescent in ventral view, with episternum 2,3 black (Fig. 2).

Wings: fore and hind wings hyaline, fore wing venation pale yellow-brown basally and brown-black apically; fore wings slightly tinged and spotted with infuscations on r, r-m, m-cu, and CuA2, on RA, RP, M1, M2, M3, M4, CuA1, CuA2, on M3+4, CuP+1A, and on node, basal cell and clavus pale brown (Fig. 2).

Legs: foreleg with markings as follows: coxae brownblack with apex opalescent, femur brown-black with a longitudinal fasciae opalescent in lateroventral view, primary spine larger than secondary spine, tibia brownblack, tarsus black; middle leg, with coxae black with half inner and a longitudinal fasciae oblique yellowish opalescent, trochanter black, femur brown-black with apex and longitudinal fascia oblique yellowish opalescent, tibia with half brown-black at base and black at apex, tarsus black; hind leg, with coxae black with half inner and a longitudinal fasciae oblique yellowish opalescent, trochanter with half brown-black at base and yellowish opalescent at apex, femur brown with apex and a longitudinal yellowish opalescent in lateroventral view, tibia pale brown with marking brown-black at base and apex, tarsus brown (Fig. 2).

Abdomen: longer than distance from head to cruciform elevation, black in dorsal view, tergite 3 with a transverse fascia of dense white hairs along the anterior margin, with the fascia enlarged at the lateral margins; tergites 4-6 with edges of lateral margins pale brown; timbal cover black, distinctly covering timbal; pale yellow-brown in ventral view, posterior margin of sternite II and anterior margin of sternite III black, posterior margin of sternite IV-VI and sternite VII dark brown, area close to posterior margin of sternite VII with brownish black X-shaped marking, apex of sternites VIII brownish black (Fig. 2).

Operculum: elongate, fairly broad, and reaching to posterior margin of segment 7; length about as 1.5X width. Pale yellow-brown, with one fifth of length from base black, rim along operculum margin pale yellow-brown except basal part of outer margin black; lateral

margin slightly concavely sinuates on basal third, medial margin slightly concave on basal part and convex apically (Fig. 2).

Genitalia δ : basal pygofer lobes angular, well separated from lateral margin of pygofer. Basal part of uncus globose, broad and almost semi-circular. Uncus bifurcated, castaneous, with uncal lobes protruding obliquely and distinctly curved laterad, forming a V-shape with a right angle in ventral view, and quarter round in lateral view.

Measurements of one male (in mm): body length: 40.2; fore wing length: 51.1; fore wing width: 17; head width: 12.2; pronotum width: 16.6; mesonotum width: 13.3.

Remarks: this species was collected by light trapping at high mountain (1,900 m).

Distribution: north Vietnam (Lao Cai province)

Conclusions

The new species differs from all species of the genus Macrosemia from Vietnam (exclude in the species M. lamdongensis) in the markings of forewings that are widely spread or roundish infuscation on each apical portion of veins RA2, RP, M1, M2, M3, M4, and CuA1, which form a series along the subapical margin of the forewing. Meanwhile, the rest have forewings without widely spread or roundish infuscation on each apical portion of veins RA2, RP, M1, M2, M3, M4, and CuA1 forming a series along the subapical margin of the forewing. Macrosemia sapaensis, is distinguishable from M. lamdongensis by the markings on the third abdominal tergite, with a transverse fascia densely covered with white hair along anterior margin in M. sapaensis, and without such fascia along anterior margin in M. lamdongensis; M. sapaensis, with uncal lobes protruding obliquely and very curved laterad and uncus lobe on ventral (outer) surface.

ACKNOWLEDGEMENTS

The present study was supported by Vietnam Academy of Science and Technology, under the grant number (QTBY01.08/22-23 and QTKR01.02/22-23).

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

REFERENCES

- [1] M. Kato (1925), "The Japanese Cicadidae, with descriptions of some new species and genera", *Transactions of the Natural History Society of Formosa*, **15(1)**, pp.1-47.
- [2] M. Yang, C. Wei (2013), "On the cicada genus Nipponosemia Kato, with description of one new species from China (Hemiptera, Cicadidae)", *Zookeys*, **1(1)**, DOI: 10.3897/zookeys.293.464649.
- [3] https://hemiptera-databases.org/cool/database.php?db=cool&lang=Zh&card=publication&id=2118.
- [4] H.T. Pham, M.H. Bui, J. Constant (2016), "The cicada genus Macrosemia Kato, 1925 (Hemiptera: Cicadidae) from Vietnam, with the description of a new species and key to species", *Academia Journal of Biology*, **38(3)**, DOI:10.15625/0866-7160/v38n3.6632.
- [5] www.sciencedirect.com/science/article/abs/pii/S1226861508602009
- [6] J. Duffels, J.P. Laan (2013), "Catalogue of the Cicadoidea (Homoptera, Auchenorhyncha), 1956-1980", *Food and Agriculture Organization of the United Nations*, **34(1)**, pp.333-388.
- [7] Y. Lee, M. Hayashi (2004), "Taxonomic review of cicadidae (Hemiptera, Auchenorrhyncha) from Taiwan, part 3. Dundubiini (two other genera of cicadina), moganiini, and huechysini with a new genus and two new species", *Journal of Asia-Pacific Entomology*, 7(1), pp.45-72.
- [8] Y. Lee (2008), "A checklist of Cicadidae (Insecta: Hemiptera) from Vietnam, with some taxonomic remarks", *Zootaxa*, **1787(1-9)**, pp.1-27.
- [9] M. Moulds (2005), "An appraisal of the higher classification of cicadas (Hemiptera: Cicadidae) with special reference to the Australian fauna", *Records of the Australian Museum*, **57(3)**, pp.375-446.
- [10] Y. Lee, M. Hayashi (2003), "Taxonomic review of cicadidae (Hemiptera, Auchenorrhyncha) from Taiwan, part 1. Platypluerini, Tibicenini, Polyneurini, and Dundubiini (Dundubiina)", *Insecta Koreana*, **20(3-4)**, pp.149-185.
- [11] G. Liu (1940), "New oriental cicadidae in the museum of comparative zölogy". *Bulletin of the Museum of Comparative Zoölogy*, **87(1)**, pp.73-117.