

A new species of the genus *Macrosemia* from Vietnam

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Abstract:

Conducting a taxonomic examination of the *Macrosemia* genus in Vietnam, this study introduces a novel species, *Macrosemia sapaensis* sp. nov., discovered in Lao Cai Province in northern Vietnam. The research encompasses details on the species' distribution, accompanied by adult photographs and illustrations of male genitalia. A key to the *Macrosemia* genus in Vietnam is presented, primarily based on male characteristics, aiding in the identification of species within the genus. The study contributes to the broader understanding of the biodiversity of cicadas in Vietnam, specifically within the *Macrosemia* genus, and serves as a valuable resource for researchers and enthusiasts interested in the taxonomy and diversity of these fascinating insects in the region. 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.

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

Classification number: 3.4

1. Introduction

The cicada genus *Macrosemia*, erected by M. 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 pili* Kato, 1938 were transferred to *Macrosemia* Kato, 1925 by Y. Lee (2008) [8]. P. Thai, et al. (2016) [4] 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. 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.

2. 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

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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 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.

3. Results and discussion

3.1. 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).

3.2. Remarks

According to Y. Lee et al. (2003) [10] and Y. 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].

3.3. Key to the genus *Macrosemia* in Vietnam

1) Uncal lobes protruding obliquely and distinctly curved laterad, forming a V-shape with a right angle in ventral view.....*M. sapaensis* sp. nov.

- Uncal lobes not so.....2

2) Fore wing with widely spread or roundish infuscation on each apical portion of veins RA2, RP, M1, M2, M3, M4, and CuA1.....3

- Fore wing without widely spread or roundish infuscation on each apical portion of veins RA2, RP, M1, M2, M3, M4, and CuA1.....4

3) Tergite 3 with a transverse dense white hair fascia along anterior margin.....*M. lamdongensis*

- Tergite 3 without a transverse dense white hair fascia along anterior margin.....*M. saturata*

4) Fore and hind wings with basal cell blackish-brown; operculum with a black streak around.....*M. tonkiniana*

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

5) Male dull ochraceous; operculum reaching sternite VI, entirely ochraceous except extreme margins and apex, posteriorly globosely convex.....*M. diana*

- Male greenish ochraceous; operculum large and long reaching centre of sternite VII, widely apart from each other and occupying lateral abdominal areas, strongly sinuate on each side of base and suddenly convex on disk of posterior two-third, narrowed and a little rounded posteriorly.....*M. pieli*

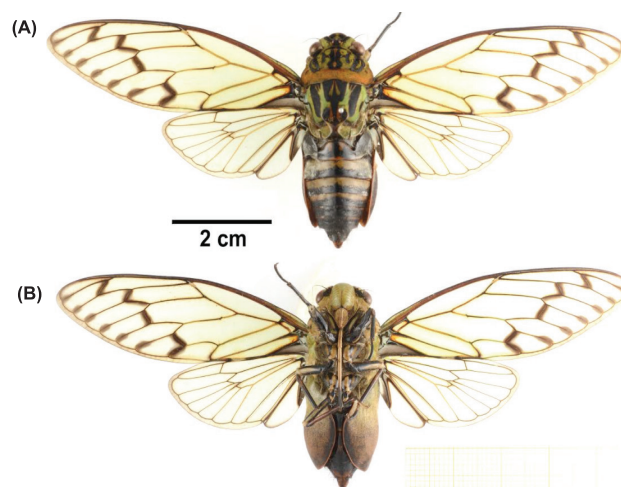


Fig. 1. *Macrosemia sapaensis* sp. nov.: A: dorsal view of male, B: ventral view of male.

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 past posterior coxae, longitudinal lines centre darker, apical rostrum brown-black (Fig. 2).

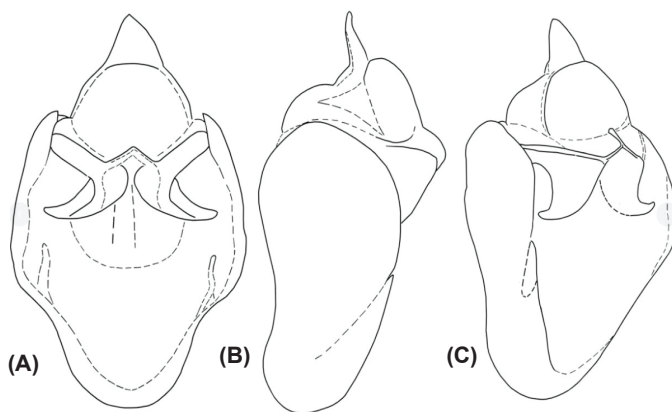


Fig. 2. *Macrosemia sapaensis* sp. nov.: (A) male genitalia in ventral view, (B) male genitalia in lateroventral view, (C) male genitalia in lateral view.

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 brown-black; 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 brown-black with apex opalescent, femur brown-black with a longitudinal fasciae opalescent in lateroventral view, primary spine larger than secondary spine, tibia brown-black, 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 ♂: 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)

4. 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.

CRedit author statement

Thai Hong Pham: Data analysis and Interpretation, Writing and Manuscript revising; Hong Minh Bui, Yen Hoang Luu, Jérôme Constant: Method, Data analysis and Writing.

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COMPETING INTERESTS

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

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