

A new genus and species of Cicada from Vietnam:

Cochleopsaltria duffelsi gen. et sp. nov.

(Hemiptera: Cicadomorpha: Cicadidae)

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Abstract

A new genus and new species of Cicadidae, *Cochleopsaltria duffelsi* gen. and sp. nov., are described from northern Vietnam. This genus is allied to the genus *Orientopsaltria* Kato, 1944 but is distinguished by the broad and very convex distal two thirds of the male opercula, the uncal lobes that are fused at the base and the apically rounded upper pygofer lobes that have no protrusion. A distribution map and biological data for *Cochleopsaltria duffelsi* gen. and sp. nov. are provided.

Keywords: Cicada, *Cochleopsaltria*, Cicadinae, morphology

Introduction

The family Cicadidae comprises three subfamilies, i.e., the Cicadinae, Cicadettinae, and Tettigadinae (MOULDS, 2005). Cicadas are most abundant in tropical and subtropical regions of the world. All three subfamilies are now known to occur in Vietnam (PHAM & YANG 2009). LEE (2008) recorded 111 Cicadidae species from Vietnam, including an undescribed *Pomponia* species which was based on PHAM (2004). PHAM & YANG (2009; 2010; 2012), PHAM *et al.* (2010; 2012a,b; 2015), PHAM & CONSTANT (2013; 2014a,b,c) described an additional nine new species and recorded twenty one species as new country records for Vietnam.

While examining the undetermined material in the collections of the Vietnam National Museum of Nature (Hanoi, Vietnam – VNMN), a single male cicada was found, which represents a new genus (described below as *Cochleopsaltria* gen. nov.) and a new species, *Cochleopsaltria duffelsi* sp. nov. The specimen was collected in Thai Nguyen Province, in northern Vietnam. The new genus is placed in the subtribe Dundubiina of Dundubiini based on its body size, male operculum and structure of the male genitalia (see LEE & HAYASHI, 2003; LEE, 2008 and LEE & HILL, 2010). The tribe Dundubiini comprises five subtribes: Terpnosiina, Leptopsaltriina, Dundubiina, Cosmopsaltriina and Tosenina (MOULDS, 2005).

Material and methods

Morphological terminology follows that of MOULDS (2005). The genitalia of the male specimen were examined and photographed using a dissecting stereo-microscope (Leica MZ7 5). Images were enhanced using Photoshop CS3 software to increase the depth of field.

Taxonomy

Order **Hemiptera** Linnaeus, 1758
Suborder **Auchenorrhyncha** Duméril, 1806
Infraorder **Cicadomorpha** Evans, 1946
Superfamily **Cicadoidea** Latreille, 1802
Family **Cicadidae** Latreille, 1802
Subfamily **Cicadinae** Latreille, 1802
Tribe **Dundubiini** Atkinson, 1886
Subtribe **Dundubiina** Atkinson, 1886

***Cochleopsaltria* gen. nov.**

Type species: *Cochleopsaltria duffelsi* sp. nov.

ETYMOLOGY. The name is formed by the juxtaposition of *cochleo-*, from *cochlear* (Latin), meaning spoon and referring to the shape of the opercula, and *-psaltria* (Latin) which designates a cithara player (refers to the song of the cicada) and is a common ending for several generic names within the family Cicadidae.

DESCRIPTION OF MALE.

Head: Distance between lateral ocellus and corresponding compound eye about three times the distance between the two lateral ocelli. Postclypeus moderately swollen.

Thorax: Lateral angle of pronotal collar enlarged, lateral margin of pronotal collar slightly developed with a small pointed tooth.

Wings: Hyaline; fore wings slightly tinged and spotted with infuscations on m, r-m and m-cu.

Abdomen: Operculum long, reaching posterior margin of sternite VI, strongly swollen. Abdomen length almost equal to distance from head to cruciform elevation. Timbal cover large, completely covering timbal cavity.

Male genitalia: Pygofer slightly oblong in ventral view. Uncus large, bifurcate. Basal lobe of pygofer with converging parallel ridges.

***Cochleopsaltria duffelsi* sp. nov.**

(Figs 1–4)

ETYMOLOGY. The species is dedicated to Dr. Hans Duffels in acknowledgement for his considerable contributions to cicada systematics.

TYPE MATERIAL. VIETNAM: Holotype ♂: Hoa Binh 2, Quan Chu, Dai Tu, Thai Nguyen Province, 21.X.2004, 200–300m, light trap, coll. Pham Hong Thai (VNMN).

DESCRIPTION.

Head: Including eyes broader than mesonotum at base. Vertex pale yellow-brown, with pair of broad oblique brownish black fasciae between eyes and anterior arm of epicranial suture, fascia on posterior margin, pair of small spots medial of eyes against anterior margin of pronotum, two oblique large fasciae around ocelli brown-black. Eyes and supra-antennal plate pale yellow-brown. Frons dark brown to black (Fig. 2A). Genae pale yellow-brown with black fascia between eye and antenna. Postclypeus pale yellow-brown with brown-black longitudinal central fascia; area close to frons slightly prominent, pale brown; transverse groove distinct. Lorum and anteclypeus pale yellow-brown. Rostrum pale brown with longitudinal, brown streak, reaching posterior coxae; apex of rostrum brown-black (Fig. 2B).

Thorax: Pronotum pale yellow-brown, with pair of central longitudinal fasciae and fascia on anterior margin, black; pronotal collar slightly tinged with green, with small, distinct, tooth on lateral margin, black spot on lateral part, larger black spot on lateral angle and dark brown-black spot near posterolateral corner. Mesonotum pale yellow-brown, with five black fasciae; median fascia anteriorly narrowed and not reaching anterior margin of mesonotum or cruciform elevation; two longitudinal fasciae on parapsidal suture; two fasciae slightly curved close to inner margin of lateral sigilla; scutal depression with large black spot; two black markings on anterior margin of mesonotum; cruciform elevation pale yellow-brown with posterior margin black (Fig. 3A). Ventral side pale yellow-brown, with dense lanugo; basisterna 2 and 3 brown-black.

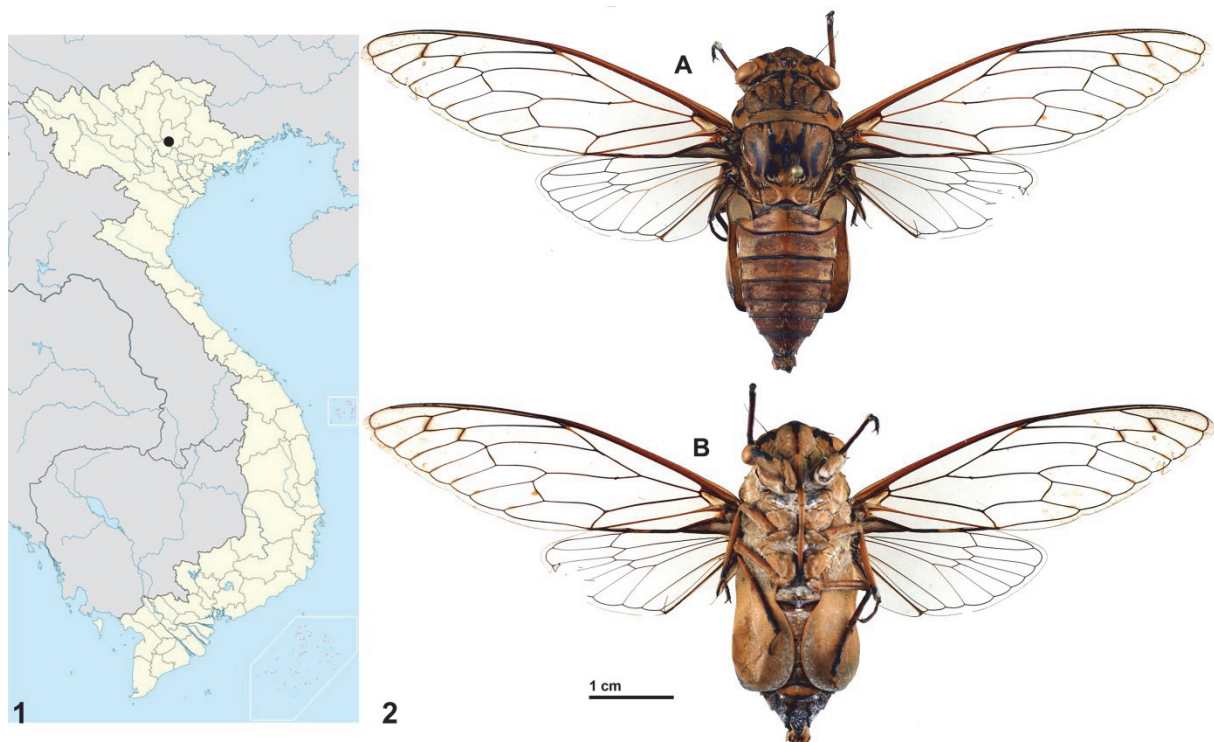


Fig. 1. Distribution of *Cochleopsaltria duffelsi* sp. nov. in northern Vietnam.

Fig. 2. *Cochleopsaltria duffelsi* sp. nov., holotype ♂. A, dorsal view. B, ventral view.

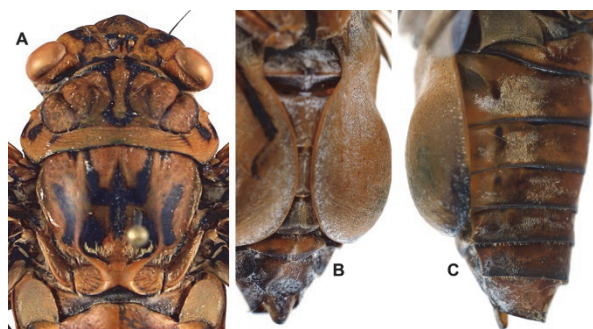


Fig. 3. *Cochleopsaltria duffelsi* sp. nov., holotype ♂. A, head and thorax, dorsal view. B, operculum, ventral view. C, operculum, laterodorsal view.

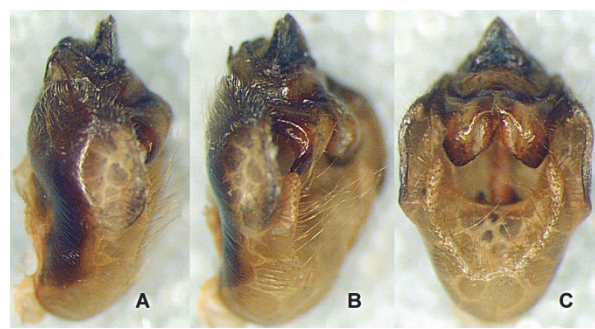


Fig. 4. *Cochleopsaltria duffelsi* sp. nov., holotype ♂, genitalia. A, lateral view. B, lateroventral view. C, ventral view.

Wings: Forewings and hindwings hyaline, with veins dark brown. Fore wings slightly tinged and spotted with brown-black infuscations on m, r-m and m-cu, on RA₂, RP, M₁, M₂, M₃, M₄, and CuA₁, 2A+3A. Hind wings with 3A brown-black (Fig. 2A).

Legs: All legs yellow-brown with apex and base of tibiae and pretarsal claws brown-black. Fore legs with tibiae brown, base of tibiae and apex of femora in ventral view, brown-black; longitudinal fasciae on coxae and femora brown-black in dorsal view. Mid legs with a brown-black longitudinal line on femora. Hind legs with tibial spur, tibial comb and thumb of tibial comb brown-black.

Abdomen: Pale brown in dorsal view. Tergite 1 brown-black. Anterior and posterior margins of tergites 2–8 black; three dark brown spots on tergites 3–5 in lateral view. Timbal cover large, pale green and covering timbal completely (Fig. 2A). Abdomen yellow-brown ventrally; sternite VI paler; posterior half of all sternites black; sternites VII and VIII, brown-black (Fig. 2B).

Operculum: Pale yellow-brown, with latero-proximal corner dark brown to black; distal two thirds broad and very convex; reaching posterior margin of sternite VI; lateral margin slightly concavely sinuate on basal third, apical part strongly convex toward broadly rounded apex; medial margin slightly concave on basal part and convex apically (Fig. 3B, C).

Genitalia: Pygofer pale yellow-brown, longer than broad. Uncus bifurcate, pale brown, with apex brown-black; lateral margin of uncus lobe slightly convex basally and weakly concave on basal third. Upper lobe of pygofer apically rounded without protrusion. Basal lobe of pygofer slightly curved in ventral view (Fig. 4C), with apex distinctly prominent, and rounded in lateroventral view (Fig. 4 B).

Measurements (in mm): Body length: 35.9; forewing length: 42.8; forewing width: 13; head width: 12.1; pronotum width: 12.6; mesonotum width: 10.6.

BIOLOGY. The species was collected by light trapping at night in secondary forest at an altitude between 200–300 meters.

DISTRIBUTION. Northern Vietnam (Thai Nguyen Province)

Discussion

The genus *Cochleopsaltria* gen. nov. differs from all other genera of the subtribe Dundubiina except *Dundubia* Amyot & Audinet-Serville, 1843, *Macrosemia* Kato, 1925, *Orientopsaltria* Kato, 1944, and *Platylomia* Stål, 1870, in having well developed male opercula extending far beyond the posterior margin of sternite IV. It differs from *Dundubia* by the markings on the fore wings, which are completely lacking in *Dundubia*, and the size of the pronotum which is as long as the mesonotum in *Dundubia* and shorter than the mesonotum in *Cochleopsaltria*. *Cochleopsaltria* is distinguished from *Macrosemia* by the width of head including eyes which is about as wide as or narrower than base of mesonotum in *Macrosemia*, and broader than the mesonotum at base in *Cochleopsaltria*, and shape of male operculum long with comparatively acute apex in *Macrosemia*. *Cochleopsaltria* is similar to *Platylomia* in the head that is wider than the base of the mesonotum, and the apices of the uncus lobes that are not pointed but the two genera differ in the length of the abdomen which is longer than the distance between head and cruciform elevation in *Platylomia* but almost as long as the distance between the head and cruciform elevation in *Cochleopsaltria*. The two genera also differ in the shape of the operculum which is strongly convex in *Cochleopsaltria* (Fig. 3B-C), and elongate in *Platylomia*. *Cochleopsaltria* is similar to *Orientopsaltria* in the width of the head that is narrower than the pronotum but broader than the mesonotum, and in the rostrum reaching the posterior coxae.

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References

- LEE Y.J., 2008. - A checklist of Cicadidae (Insecta: Hemiptera) from Vietnam, with some taxonomic remarks. *Zootaxa*, 1787: 1–27.
- LEE Y.J. & HAYASHI M., 2003. - Taxonomic review of Cicadidae (Hemiptera, Auchenorrhyncha) from Taiwan, part 1. Platyleurini, Tibicenini, Polyneurini, and Dundubiini (Dundubiina). *Insecta Koreana*, 20: 149–185.
- LEE Y.J. & HILL K.B.R., 2010. - Systematic revision of the genus *Psithyristria* Stål (Hemiptera: Cicadidae) with seven new species and a molecular phylogeny of the genus and higher taxa. *Systematic Entomology*, 35: 277–305.
- MOULDS M.S., 2005. - An appraisal of the higher classification of cicadas (Hemiptera: Cicadoidea) with special reference to the Australian fauna. *Records of the Australian Museum*, 57: 375–446.
- PHAM H.T., 2004. - The cicada genera *Pomponia* Stal, 1866; *Dundubia* Amyot & Serville, 1843 and *Platylomia* Stal, 1870 (Cicadidae: Cicadinae) from some national parks and nature reserves in Vietnam. *Journal of Biology, Hanoi*, 26: 61–65. (In Vietnamese with English summary).
- PHAM H.T. & YANG J.T., 2009. - A contribution to the Cicadidae fauna of Vietnam (Hemiptera: Auchenorrhyncha), with one new species and twenty new records. *Zootaxa*, 2249: 1–19.
- PHAM H.T., TA H.T. & YANG J.T., 2010. - A new cicada species (Hemiptera: Cicadidae), with a key to the species of the genus *Euterpnosia* Matsumura, 1917 from Vietnam. *Zootaxa*, 2512: 63–68.
- PHAM H.T., HAYASHI M. & YANG J.T., 2012. - First record of the cicada genus *Semia* Matsumura (Hemiptera, Cicadidae) from Vietnam, with description of one new species and a key to species. *Zookeys*, 174: 31–40.

- PHAM H.T., SCHOUTEN M. & YANG J.T., 2012. - A new cicada species of the genus *Purana* Distant, 1905 (Hemiptera: Cicadidae), with a key to the *Purana* species from Vietnam. *Zootaxa*, 3580: 83–88.
- PHAM H.T. & CONSTANT J., 2013. - A new species of the genus *Chremistica* Stal, 1870 (Hemiptera: Cicadidae) from Vietnam. *Journal of Biology*, 35(1): 32–36.
- PHAM H.T. & CONSTANT J., 2014a. - The cicada genus *Karenia* Distant, 1888 (Hemiptera: Cicadidae), with description of a new species. *Zootaxa*, 3852 (5): 579–584.
- PHAM H.T. & CONSTANT J., 2014b. - The cicada genus *Semia* Matsumura, 1917 (Hemiptera: Cicadidae) from Vietnam, with new records and a key to species. *Journal of Biology*, 36(1): 39–45.
DOI: 10.15625/0866-7160.2014-0003.
- PHAM H.T. & CONSTANT J., 2014c. - The genus *Platylomia* Stål, 1870 (Hemiptera: Cicadidae) from Vietnam, with description of one new species and key to species. TAP CHI SINH HOC 2014, 36(4): 416–422.
DOI: 10.15625/0866-7160/v36n4.6171.
- PHAM H.T., LEE Y.J. & CONSTANT J., 2015. - Cicada genus *Pomponia* Stål, 1866 (Hemiptera: Cicadidae) from Vietnam and Cambodia, with a new species, a new record, and a key to the species. *Zootaxa* 3925 (4): 562–572.