



An unusual new genus and species of Hecalini leafhopper from southern China (Hemiptera: Cicadellidae: Deltocephalinae)

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Abstract

An interesting new genus and species of Hecalini leafhopper, *Hecalusina unispinosa*, sp. n., are described from southern China. The unusual features of the new genus, including the male and female genitalia, are discussed and compared to other Hecalini.

Key words: Homoptera, morphology, taxonomy, distribution

Introduction

Leafhoppers (Cicadellidae) are one of the most common insect groups and may be found on most vegetation types. Of the 40 subfamilies recognized by Oman et al (1990), the Deltocephalinae constitute by far the largest and most economically important group. The Hecalini, one of the 23 tribes in the subfamily, is found on grasses in all zoogeographic regions of the world. The group contains 28 genera and 180 species worldwide (excluding the five genera that Hamilton (2000) removed from Hecalini because of their different ocelli position).

Hecalini can be distinguished from other leafhoppers by a combination of the following characters: Usually stramineous to yellowish green, dorsum sometimes with coloured fasciae, rarely uniformly brown or black. Body slightly flattened dorso-ventrally. Head (Figs 1–6) usually subangularly produced to foliaceous in profile; vertex broad and flattish, smooth with rimlike or carinate anterior margin; length not more than 2× interocular width; anterior tentorium slender, furcate (Fig. 7); ocelli exposed on anterior margin of head between compound eye and end of laterofrontal sutures (Figs 2, 5); antennae short, located between facial suture and inner margin of eye in facial view (Figs 3, 6); antennal pits shallow; antennal ledges weak or absent; transclypeal suture complete; lateral frontal sutures extended through antennal pits to head margin, terminating distant from eye and anterior to ocelli (Figs 2, 5); gena broad, lateral margin strongly sinuate with notch below eye. Pronotum (Figs 1, 4) collar-shaped; anterior and posterior margins sub-parallel, usually with carina laterally; smooth without punctures and ridges. Hind femoral setal formula: 2-2-1 or 2-2-1-1-1. Forewings (Fig. 9) with apices rounded; venation complete. Male second sternal apodemes usually elongate, placed between broad apodemes of third sternite; without tergal apodemes.

In addition to the above characters, Zahniser & Webb (2004) identified a clade of grass-feeding groups, including Hecalini, based on the following characters of the female: 1st valvulae with a definitely delimited apicoventral sculptured area, subtriangular in shape; dorsal sculpturing pattern submarginal, maculose or scale

like, with scales not overlapping, second valvulae lacking large dorsal teeth; pygofer macrosetae absent or reduced in number.

Four genera, *Hecalus* Stål, *Glossocratus* Fieber, *Thomsoniella* Signoret and *Linnavuoriella* Evans, were previously recorded from the Oriental region (Morrison 1973, Kwon 1979, Dash and Viraktamath 1997, Rama 1990, Li Zizhong 1991). However, during examination of leafhopper specimens in the Entomological Museum of Northwest A & F University (NWAUFU), Yangling, China, a new genus and species of Hecalini were found. In addition to its general hecaline appearance, e.g. flattened form, head produced with vertex sexually dimorphic (Figs 1–6) and ovipositor long (Fig. 15), the new genus is placed in this tribe by virtue of the anterior carina on the foremargin of the head and distant position of the laterofrontal sutures from the ocelli and eye (Figs 2–3, 5–6). However, within the tribe it would seem to occupy an isolated position based on the following unique combination of characters: body slender (Figs 1, 4); forewing appendix relatively short, extending to Cu_{1a} (Fig. 9); male sternal abdominal apodemes with second short, third widely spaced and horn-like (Fig. 21); male valve fused to pygofer (Fig. 22); male pygofer sides with inner processes and few setae; (Figs 22–23), subgenital plate with mesal apical process (Figs 24–25); aedeagus with dorsal basal process (Fig. 17); female valvulae long and narrow (Figs 11–15), and 1st valvulae with sculpture comprising short vertical striations (Fig. 14). Of these, the last mention is perhaps the most significant as this sculpture pattern is unusual within the subfamily and sets the genus apart from the other members of the grass-feeding specialist clade, noted above. Other differences from the narrower definition of Hecalini by Hamilton's (2000) are that in the new genus the anal tube is not withdrawn into the pygofer, the male pygofer does not have broad ventral lobes that meet or cross at their lower edges and the ovipositor is not humpbacked near its midlength.

Type specimens of the new species are deposited in the Entomological Museum of Northwest A & F University (NWAUFU), Yangling, China, and the Natural History Museum, London (BMNH).

Genus *Hecalusina* n. gen.

Type Species: *Hecalusina unispinosa*, n. sp.

Description

Colouration: greenish yellow.

Structure: Body slender. Vertex elongate subtriangular, with slight sexual dimorphism (compare Figs 1 and 4); anterior margin of head sharply rounded apically, anterior half slightly upturned, approximately 1.5 times as long as interocular width. Ocelli visible dorsally, situated mid-way between eyes and end of facial sutures. Face with lateral margin very weakly oblique from eye to anteclypeus, sinuate; anteclypeus broad at base, tapered to apex, with apex rounded and, in line with curve of face margin; postclypeus slightly convex. Pronotum slightly wider than head. Forewings (Fig. 9) with R and M fused basally, R un-branched; m-cu₂ absent; Cu₂ close to claval suture in anal area; claval veins separate; appendix short and narrow, extending to end of Cu_{1a}, apical and antepical cells elongate with sides nearly parallel. Profemur (Fig. 8) with three short and stout AV (anteroventral) setae and two apical dorsal setae; intercalary row with 11 setae; AM₁ (anteromedian) seta present. Hind tibia compressed, with setal formula R₁ 17–19, R₂ 12–14, R₃ 19–20; first tarsomere with 3–4 teeth, 5–6 platellae and 2 terminal lateral macrosetae. Hind femoral setal formula 2-2-1. Male second sternal abdominal apodemes short, lying between strongly developed and widely spaced, horn-like, third sternal apodemes (Fig. 21).

Male genitalia: Pygofer laterally fused with valve. Pygofer side and subgenital plate with inner processes. Segment X very large. Connective Y-shaped, dorso-ventrally flattened with arms parallel. Aedeagal shaft elongate, gonopore apical on ventral surface; dorsal apodeme weakly developed.

Female genitalia: Ovipositor extending well beyond pygofer. Valvulae long and narrow; first valvulae dorsal sculpture submarginal, occupying 2/3rd distal length, consisting of series of almost parallel short vertical lines, not extending to apico-ventral area; second pair of valvulae with dorsal margin separated over distal

1/3 , without teeth.

Remarks

Hecalusina resembles *Hecalus* Stål externally but differs from the latter together with other known genera of Hecalini in possessing the above unique combination of characters (see introduction).

Etymology

The name is derived from the type genus of Hecalini, *Hecalus*, and -sino, referring to its type locality, China.

Distribution

China (Yunnan, Hainan, Guangdong).

***Hecalusina unispinosa* sp. n. (Figs 1–25)**

Type material

Holotype: male, China, Yunnan Province, Mangshi, 19. viii. 2005, coll. Meng Li. Paratypes: China, 1 female, same data as holotype; 1 female, Yunnan province, Hekou, 8. vii. 1974, coll. Chou Io & Feng Yuan; 1 male, Qiongzong county of Hainan province, 4. vi. 1983, coll. Yalin Zhang; 2 male and 3 female, Guangdong province, Dinghu Mountain, 17/18. vii. 1985, coll. Yalin Zhang. All the types are deposited in NWAUFU except 1 male and 1 female paratypes from Guangdong in BMNH.

Description

Colouration: Pale yellow, vertex and thorax stramineous with two indistinct yellow longitudinal bands, two on vertex and pronotum and three on scutellum. Forewing with veins white, margined with deep yellow and a fine dark line.

Structure: Male 6.0–6.5mm, female 7.0–8.0mm, to tip of forewings. External features and abdominal apodemes as in generic description.

Male genitalia: Pygofer side with an internal mesal blade-like membranous process and a ventrally directed spine (Figs 22–23). Subgenital plate triangular, with a digitate sclerotized process arising from inner wall apically; laterally with 14 stout setae and number of hair-like setae (Figs 24–25). Aedeagus with shaft elongate, tapering to acute apex, compressed basally, cylindrical apically, curved caudo-dorsally in apical 1/3rd, a dorsocaudally curved spine arising dorsomedially from base of shaft, gonopore apical on ventral surface; dorsal apodeme short, one-fifth length of shaft (Fig. 17). Style subapical lobe weakly developed, apophysis digitate, slightly curved (Fig. 19).

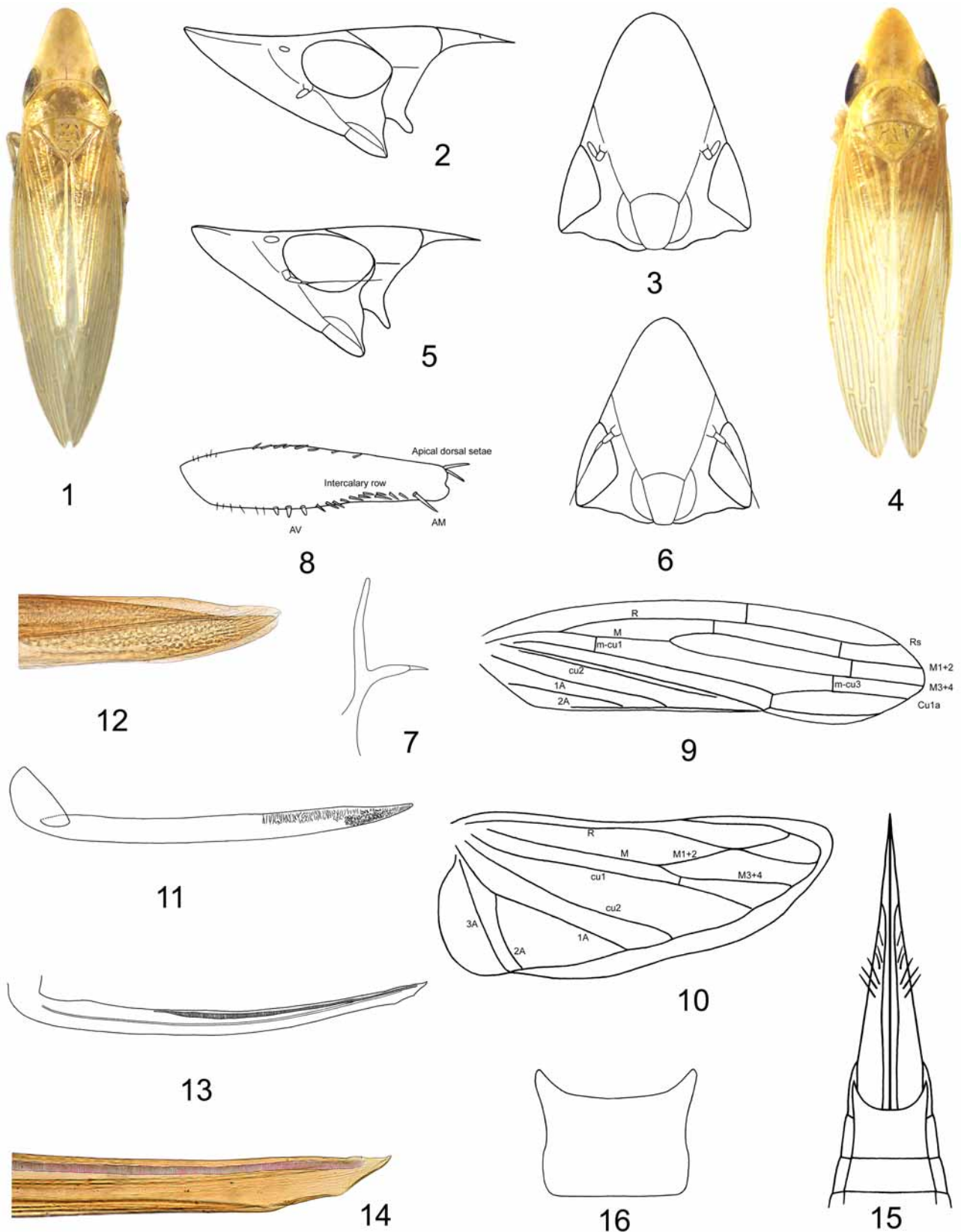
Female genitalia: Posterior margin of 7th sternite broadly concave with posterolateral corners extended posteriorly. Pygofer side with 2 rows of setae on posterior margin (Figs 15–16). Ovipositor extending approximately 2.5× its own width beyond pygofer. Valvulae as in generic description.

Etymology

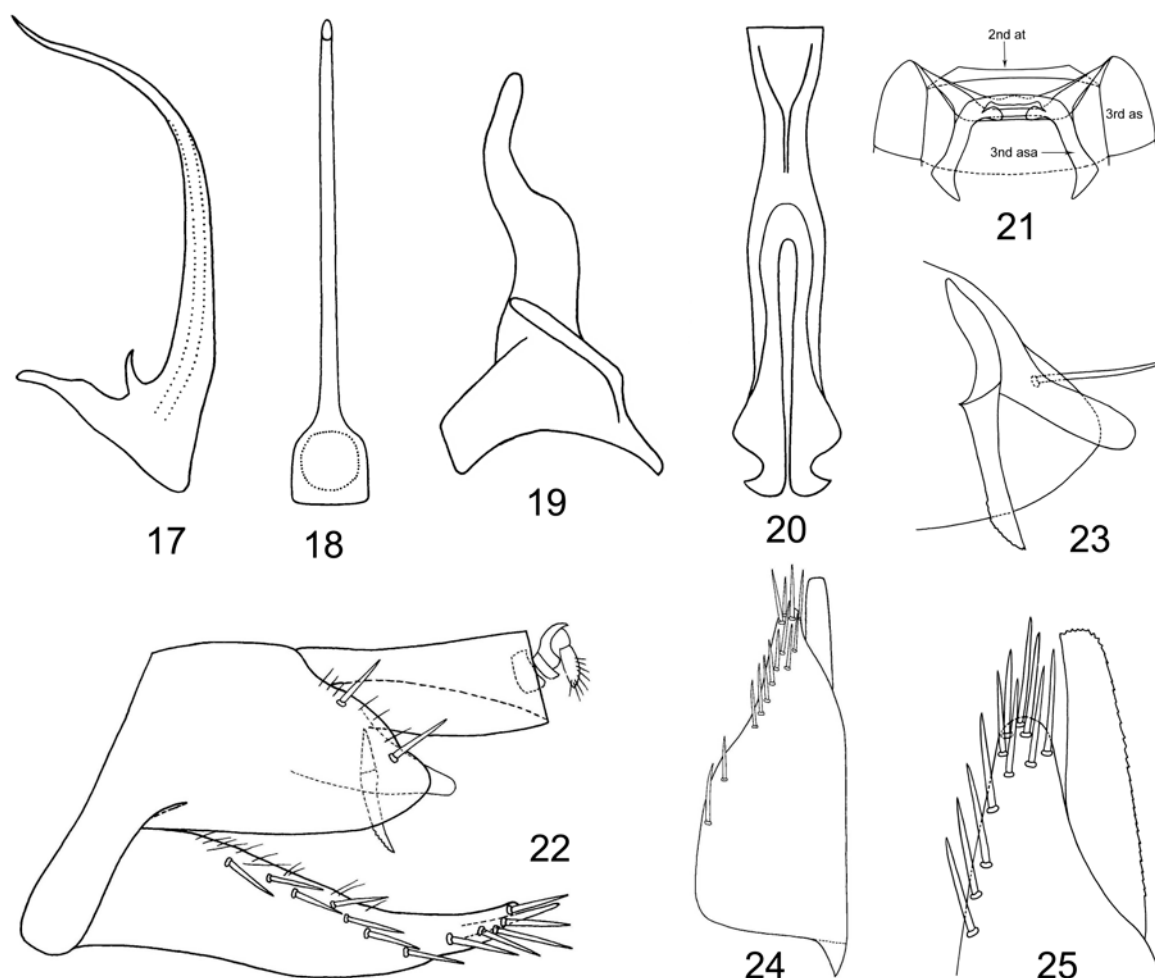
The name of species is derived from the Latin words “uni” and “spinosa”, referring to the single basal aedeagal spine.

Distribution

Hainan, Yunnan and Guangdong provinces, China.



FIGURES 1–16. *Hecalusina unispinosa* sp. n. 1, female adult, dorsal view; 2, female head and thorax, lateral view; 3, female face; 4, male adult, dorsal view; 5, male head and thorax, lateral view; 6, male face; 7, anterior tentorium; 8, male left fore femur; 9, male right forewing; 10, male right hindwing; 11, 2nd valvulae; 12, apical part of 2nd valvulae; 13, 1st valvulae; 14, apical part of 1st valvulae; 15, female 7th abdominal sternite; 16, female abdominal sternum, ventral view.



FIGURES 17–25. *Hecalusina unispinosa* sp. n. 17–18, aedeagus, lateral and ventral view; 19, style, dorsal view; 20, connective, dorsal view; 21, male 3rd abdominal sternal apodeme (asa=abdominal sternal apodeme, at=abdominal tergite, as=abdominal segment); 22, male pygofer, lateral view; 23, apical part of pygofer side, inner view; 24, plate; 25, apical part of plate.

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