

## A new species of *Cofana* associated with grasses from India (Hemiptera: Cicadellidae: Cicadellinae)

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**Abstract.** A new species, *Cofana trilobata* sp. nov., is described and illustrated from Meghalaya, India along with illustrations of *Cofana lineata* (Distant, 1908) which it closely resembles. Diagnostic characters are given to separate these species, including a modified portion of the key by KRISHNANKUTTY & VIRAKTAMATH (2008) to *Cofana* of India.

**Key words.** Auchenorrhyncha, Cicadomorpha, Cicadellini, leafhoppers, sharpshooters, morphology, taxonomy, new species, India, Oriental Region

### Introduction

The subfamily Cicadellinae (Hemiptera: Auchenorrhyncha: Cicadomorpha: Cicadellidae) comprises two tribes, Proconiini (restricted to the Western Hemisphere) and Cicadellini (present in all zoogeographical regions), with around 2400 species under 330 genera (YOUNG 1968, WILSON et al. 2009). The name ‘sharpshooters’ has increasingly been used for this group of xylem-feeding leafhoppers, especially in the USA (WILSON & TAKIYA 2009).

One of the Oriental genera of Cicadellini, *Cofana* Melichar, 1926, with *Tettigonia quinquenotata* Stål, 1870 designated as the type species (CHINA 1938), belongs to the *Cicadella* genus group. Besides the Oriental Region, it also occurs in the Ethiopian and Australian Regions (YOUNG 1979, 1986). ISHIHARA (1971) established a related genus *Yasumatsuus* Ishihara, 1971 with the type species *Kolla mimica* Distant, 1908 which became later known as a misidentification of *Cofana yasumatsui* Young, 1979. Thus YOUNG (1979) suppressed *Yasumatsuus* as a junior synonym of *Cofana*. Among the *Cicadella* generic group, *Cofana* is very similar to *Plesiommata* Provancher, 1889, distributed in the Nearctic and Neotropical Regions (YOUNG 1977). *Cofana* is distinguished by the aedeagus lacking paraphyses and basal aedeagal processes and the hind wing lacking vein R2+3 (YOUNG 1986). Species of *Cofana* are commonly found on grasses and in rice fields (KRISHNANKUTTY & VIRAKTAMATH 2008). There are 24 described species of *Cofana* of which 7 are known from the Indian subcontinent to which the present study adds a new species, *Cofana trilobata* sp. nov. collected in Meghalaya, India.

## Material and methods

The type material is deposited in the National Pusa Collection, Division of Entomology, Indian Agricultural Research Institute, New Delhi, India (NPCI).

Line drawings were prepared using a drawing tube attached to a Leica MZ12 stereomicroscope and a Leica DM500 phase contrast compound microscope, measurements were taken with an ocular grid. Photographs were taken with a Leica DFC 425C digital camera on a Leica M205FA stereomicroscope. Male genitalia dissections were carried out according to protocols described by OMAN (1949) and KNIGHT (1965). Morphological terminology follows KRISHNANKUTTY & VIRAKTAMATH (2008).

## Taxonomy

### *Cofana trilobata* sp. nov.

(Figs 1–22)

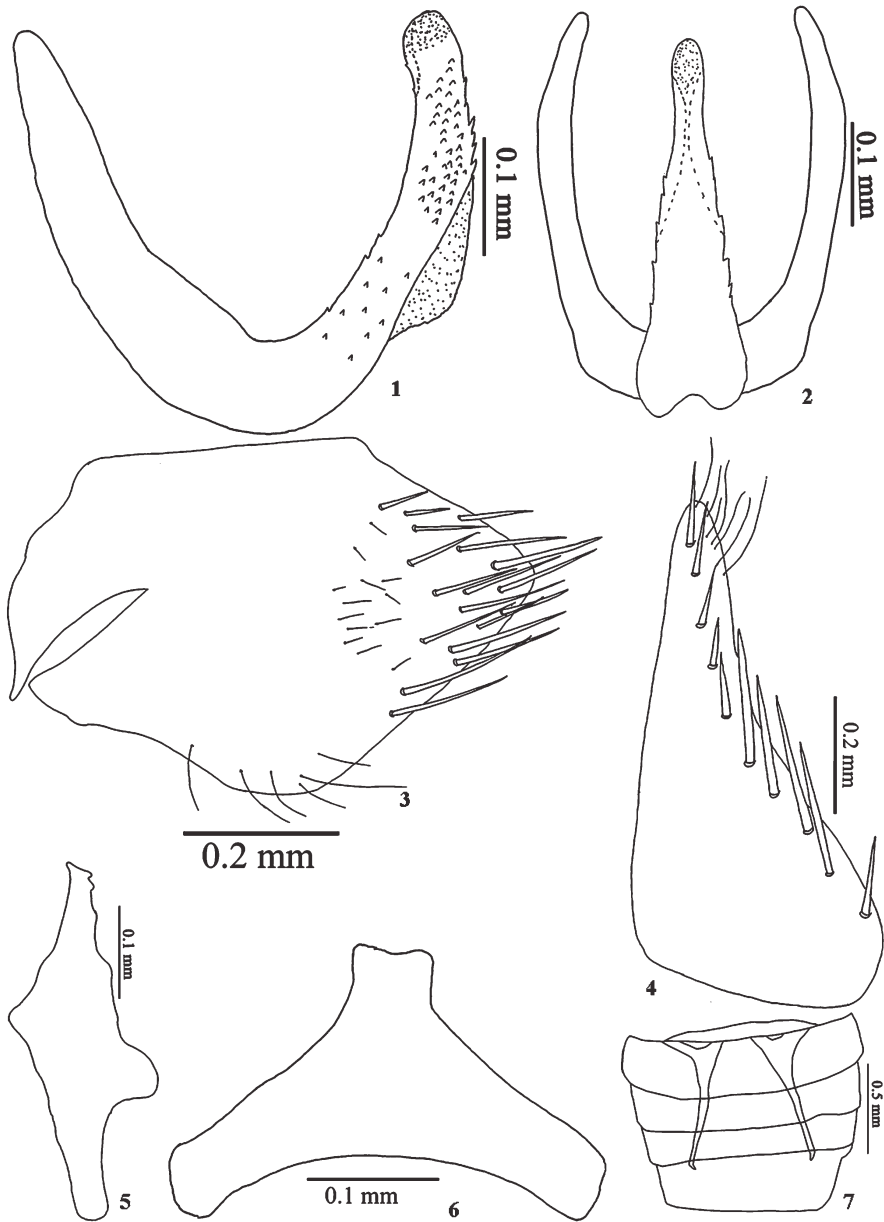
**Type locality.** India, Meghalaya, Barapani.

**Type material.** HOLOTYPE: ♂, INDIA: MEGHALAYA: Barapani, Ri-Bhoi, 25°39'9"N, 91°52'44"E, 1496 m a.s.l., 19.viii.2011, N. M. Meshram leg. (NPCI). PARATYPES: 2 ♂♂ 2 ♀♀, same data as holotype (NPCI).

**Description. Coloration** (Figs 8–10). Pale ochraceous. Crown with median apical black spot and two medium-sized elliptical spots each near lateral clypeal sutures extending to ocelli; disc of crown with central round large black spot. Pronotum with distinct central longitudinal dark brown stripe extending to scutellum. Anteclypeus dark brown in middle with pale yellow margin and white outer margin. Frontoclypeus with 11 dark brown transverse lines and pale yellow midline interrupted in the middle. Genae with pale brown marking. Forewing white, veins brownish.

**Structure.** Head including eyes 1.1× wider than pronotum, obliquely produced in front; crown length 0.2× width between lateral margins of eyes; pronotum not extending beyond eyes. Anteclypeus apically exceeding facial margin (Fig. 9). Frontal suture extending onto vertex, terminating laterad of ocelli. Ocelli placed near the hind margin of vertex next to corresponding eye, distance between eye and ocellus twice as large as diameter of ocellus. Antennae situated at mid-height of eye in facial view. Pronotum 0.6× as long as wide and 2.2× longer than crown. Scutellum 0.8× length of pronotum (Fig. 10). Forewing with appendix. Abdominal apodeme in male long, slender, just exceeding third segment (Fig. 7).

Male genitalia. Pygofer moderately produced with acutely rounded caudo-dorsal margin and obliquely truncate caudal margin (Figs 3, 15). Subgenital plate triangular, with 10 uniseriate macrosetae and numerous hairs along outer lateral margin (Figs 4, 12). Style with apex slender, smoothly curved laterally in dorsal view, bifid in lateral view (Figs 5, 11). Connective Y-shaped; stem narrowed, 1.6× smaller than arms (Figs 6, 16). Aedeagus, in lateral view (Figs 1, 14), broadly U-shaped, shaft uniformly broad throughout its length, with round membranous apex with serrated dorsal and ventral margins, shaft with minute spine-like spicules throughout length which are more numerous at apex laterally and triangular membranous region at midlength on ventral margin; apodeme as long as shaft (Fig. 7); in caudal view, shaft with broad base, gradually narrowed towards apex (Figs 2, 13).



Figs 1–7. *Cofana trilobata* sp. nov., male. 1 – aedeagus, lateral view; 2 – aedeagus, caudal view; 3 – pygofer, lateral view; 4 – subgenital plate, ventral view; 5 – style; 6 – connective; 7 – male abdominal apodemes.

Female genitalia. Hind margin of seventh sternite convex with caudal projection feebly trilobed (Fig. 20). Second valvulae in lateral view broad in the middle with irregular sculpturing in distal two thirds and bearing dorsal teeth, each tooth subtriangular with denticles throughout its length (Figs 21, 22).

**Measurements** (in mm, 3 ♂♂ 2 ♀♀). Male: body length: 5.81–5.87, body width across eyes: 1.3–1.5, body width across hind margin of pronotum: 0.68–0.72. Female: body length: 6.93–6.95, body width across eyes: 1.4–1.6, body width across hind margin of pronotum: 0.78–0.79.

**Differential diagnosis.** *Cofana trilobata* sp. nov. resembles *Cofana lineata* (Distant, 1908) in coloration but can be distinguished from it by the following characters (features of *C. lineata* in parentheses): Head with blunt anterior margin (head with anterior margin narrowly pointed); anterior portion of pronotum without any spots (anterior portion with 5–6 small brown spots arranged transversely); pygofer moderately produced with acutely rounded caudo-dorsal margin (pygofer trapezoidal with rounded caudo-dorsal margin); aedeagal shaft, in lateral view, uniformly broad throughout length with round membranous apex and serrated dorsal and ventral margins, with minute spine-like spicules throughout length which are more numerous at apex laterally and triangular membranous region mid-ventrally (aedeagal shaft, in lateral view, bulbous, apex slightly narrowed, not membranous); apodeme of aedeagus as long as shaft (apodeme longer than shaft); hind margin of female seventh sternite convex with caudal projection feebly trilobed (hind margin of seventh sternite convex and feebly bilobed); abdominal apodeme in male long, slender, just exceeding third segment (abdominal apodemes slender, extending to mid length of fourth segment). From *C. nigrilinea* (Stål, 1870), also similar in body shape and coloration, *C. trilobata* sp. nov. can be distinguished by its aedeagal shaft uniformly broad throughout its length (broadest near base in *C. nigrilinea*), size of abdominal apodemes, and trilobed female seventh sternite (undulate in case of *C. nigrilinea*).

**Etymology.** The species name alludes to the feebly trilobed posterior margin of the female seventh sternite. Adjective.

**Biology.** *Cofana trilobata* sp. nov. was collected by net sweeping on the grass (unidentified Poaceae).

**Distribution.** India: Meghalaya.

### *Cofana lineata* (Distant, 1908)

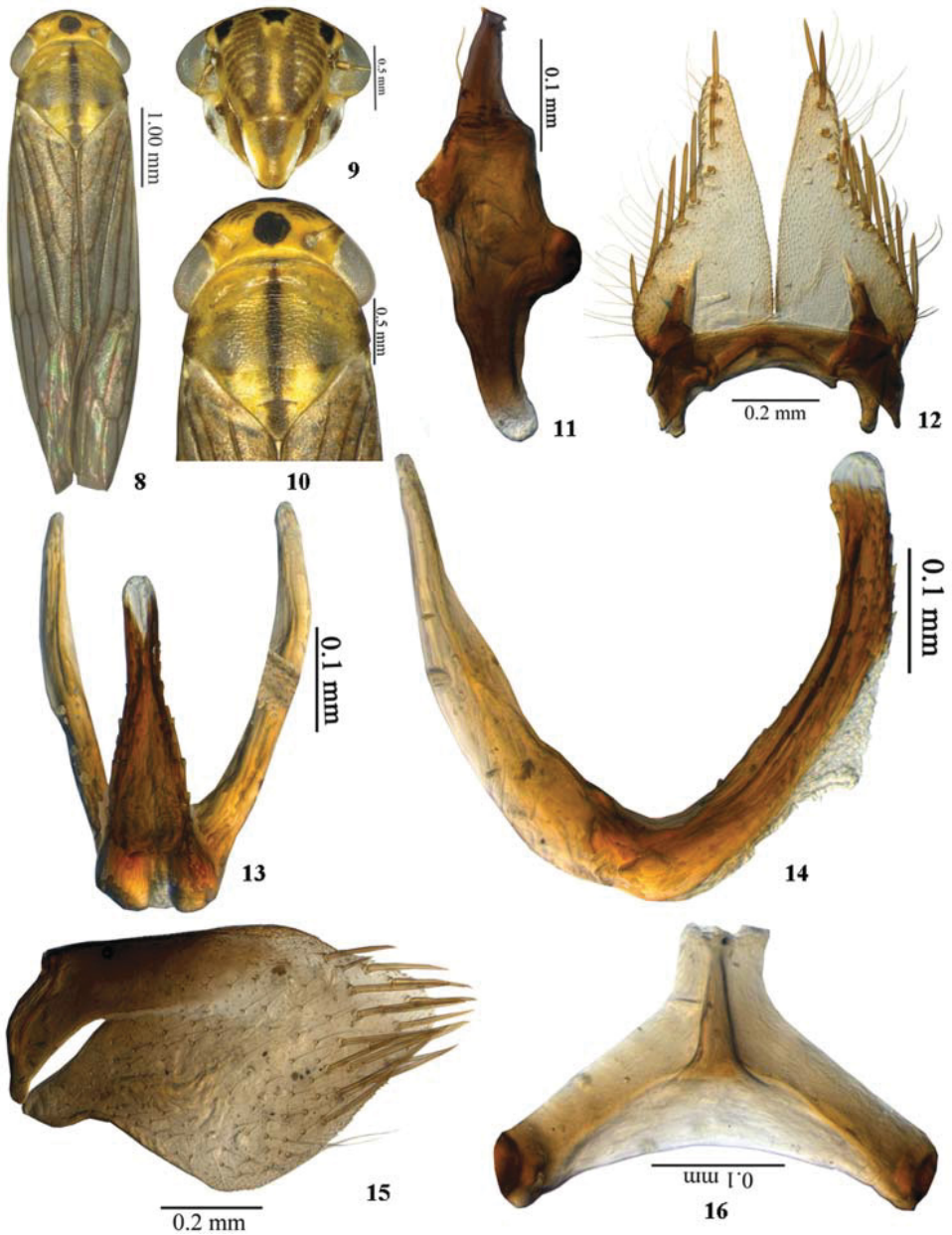
(Figs 23–28)

*Kolla lineata* Distant, 1908: 224.

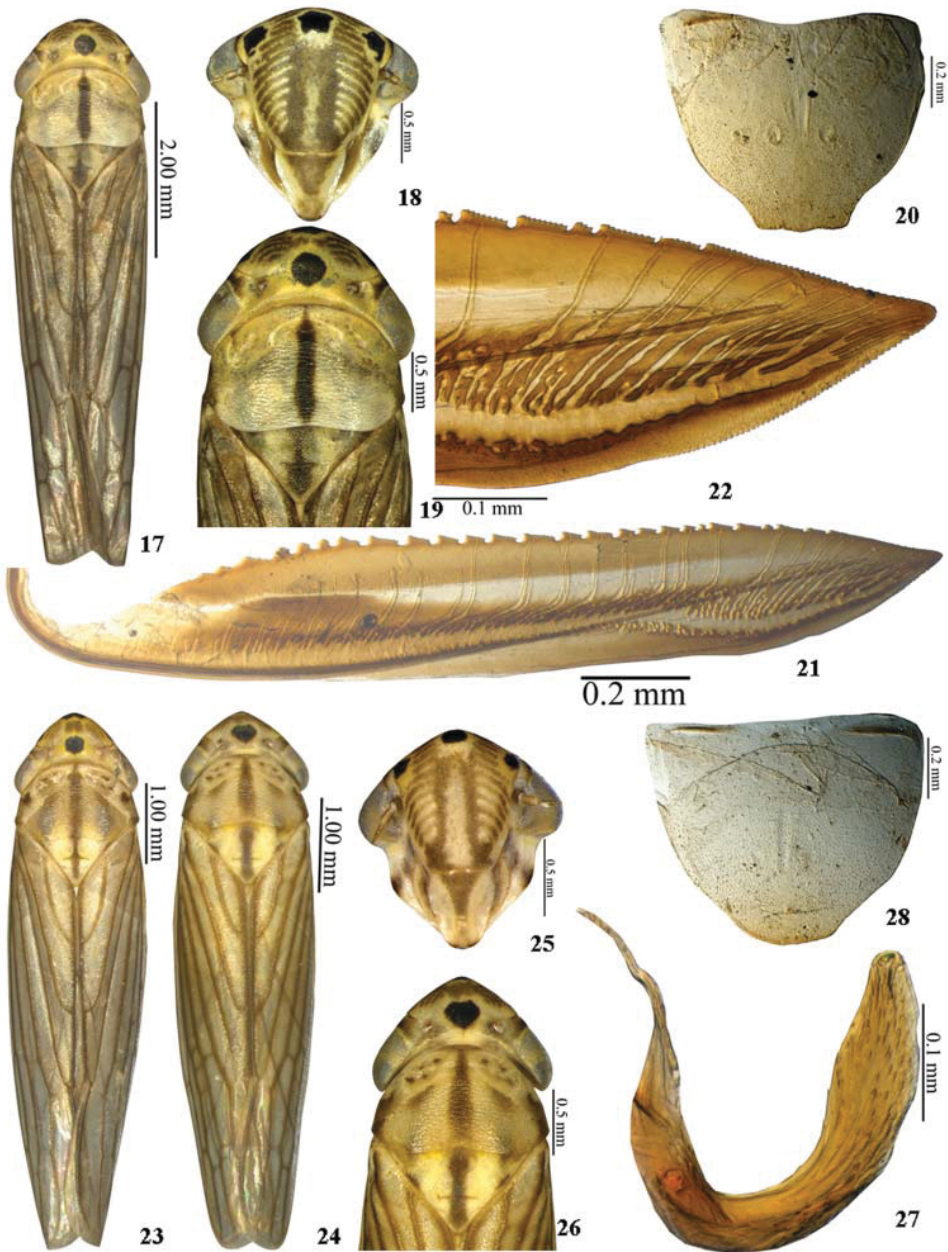
*Cofana lineata*: YOUNG (1979: 7).

**Material examined.** INDIA: KERALA: 4 ♂♂ 3 ♀♀, Naikutti, 19.viii.2011; 2 ♂♂, Nelliampathy, 15.viii.2010. All specimens N. M. Meshram leg. (NPCI).

**Comments.** The illustrations given herein will add to the earlier descriptions by DISTANT (1908), YOUNG (1979) and KRISHNANKUTTY & VIRAKTAMATH (2008).



Figs 8–16. *Cofana trilobata* sp. nov., male. 8 – habitus, dorsal view; 9 – face; 10 – pronotum and scutellum; 11 – style; 12 – subgenital plate, ventral view; 13 – aedeagus, caudal view; 14 – aedeagus, lateral view; 15 – pygofer, lateral view; 16 – connective, dorsal view.



Figs 17–27. 17–22 – *Cofana trilobata* sp. nov., female. 17 – habitus; 18 – face; 19 – pronotum and scutellum; 20 – seventh sternite, ventral view; 21–22 – second gonapophysis, lateral view. 23–27 – *Cofana lineata* (Distant, 1908). 23 – habitus, female; 24 – habitus, male; 25 – face, male; 26 – pronotum and scutellum, male; 27 – aedeagus, lateral view; 28 – seventh sternite, female, ventral view.

## Discussion

In the key to the species of *Cofana* from India by KRISHNANKUTTY & VIRAKTAMATH (2008), the new species runs to *Cofana lineata*, but the male genitalia characters differ. The couplet 4 is to be modified as follows to include the new species:

4. Aedeagal shaft broadest near base, strongly tapering distally, dorsal apodeme separated from shaft by less than maximum width of shaft in lateral aspect (KRISHNANKUTTY & VIRAKTAMATH 2008: Fig. 28); female seventh sternite with caudal projection undulate (KRISHNANKUTTY & VIRAKTAMATH 2008: Fig. 34). ..... *C. nigrilinea* (Stål, 1870)
- Aedeagal shaft not as above. .... 5
- 4a. Aedeagal shaft, in lateral view, gradually broadened towards apex and then narrowed, without triangular membranous region mid-ventrally (this paper: Fig. 27; KRISHNANKUTTY & VIRAKTAMATH 2008: Fig. 19); female seventh sternite with caudal projection bilobed (this paper: Fig. 28; KRISHNANKUTTY & VIRAKTAMATH 2008: Fig. 26). ..... *C. lineata* (Distant, 1908)
- Aedeagal shaft, in lateral view, uniformly broad throughout length with round membranous apex and triangular membranous region mid-ventrally (Figs 1–2, 13–14); female seventh sternite with caudal projection feebly trilobed (Fig. 20). ..... *C. trilobata* sp. nov.

## Acknowledgements

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