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Review of the Oriental genus *Neunkanodes* Yang (Hemiptera: Fulgoromorpha: Delphacidae) with descriptions of two new species

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Abstract

The Oriental planthopper genus *Neunkanodes* Yang, 1989 (Hemiptera: Fulgoromorpha: Delphacidae: Delphacinae: Delphacini) is reviewed to include three species: *N. bispinatus* **sp. nov.** (China: Yunnan), *N. formosana* Yang, 1989 (China: Taiwan, Guizhou, Yunnan) and *N. unispinatus* **sp. nov.** (China: Yunnan). The generic characteristics are redefined. The main morphological characters and male genitalia of three species are described or redescribed and illustrated. A key to the known species in the genus is provided.

Key words: Fulgoroidea, morphology, planthopper, taxonomy

Introduction

The Oriental delphacid genus *Neunkanodes* was erected by Yang (1989) with *N. formosana* Yang, 1989 (China: Taiwan) as type species. It belongs to the tribe Delphacini within the subfamily Delphacinae (Hemiptera: Fulgoroidea: Delphacidae) (Yang, 1989; Ding, 2006) and is easily separated from other members in Delphacini by the following characters: median line of frons, vertex, pro- and mesonotum white, frons between areas of carinae with narrow black stripe; frons longer in middle line than wide at widest part about 2.4–2.8:1, widest at apex or median; anal segment of male ring-like, lateroapical angles large and widely separated, each produced in a spinose process; phallus simple, tubular-shape, with processes. Currently, this genus is only known to occur in southern China. It has been a monobasic genus since 1989.

During on-going studies on the delphacid species in China, two new species of the genus *Neunkanodes* were found. The purpose of this paper is to review the genus, to describe two new species and to provide an identification key to the known species of the genus. The generic characteristics are redefined. The main morphological characters and male genitalia of three species are described or redescribed and illustrated.

Materials and methods

The methods and morphological terminology used in this study follows that of Yang & Yang (1986) and Ding (2006). The genital segments of the examined specimens were macerated in 10% KOH and drawn from preparations in glycerin jelly aid of a light microscope. Illustrations of the specimens were made with a Leica MZ 12.5 stereomicroscope. Spinal formula means the numbers of apical spines of the hind tibiae and 1st and 2nd hind tarsomeres. The specimens examined are deposited in the Insect Collection at the Institute of Entomology, Guizhou University, Guiyang, Guizhou Province, China (IEGU).

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***Neunkanodes unispinatus* sp. nov.**
(Figs 26–38)

Measurement. Length of body 2.35–2.60 mm (male), 2.80 mm (female); including forewing 4.15–4.50 mm (male), 5.05 mm (female); forewing length 3.95 mm (male), 4.20 mm (female).

Coloration. General color reddish brown. Median line of frons, vertex, pro- and mesonotum, commissural suture white. Areas between carinae of frons somewhat blackish brown. Abdomen somewhat dirty yellow to reddish brown. Pygofer brown.

Head and Thorax. Vertex longer submedially than wide at base about 1.1:1, apical margin distinctly emarginate at both sides of median point, lateral carinae concave, submedian carinae not really uniting at apex, basal compartment greatest longer than width at base about 0.9:1. Frons longer in middle line than wide at widest part about 2.5:1, widest at level of ocelli, median carina simple. Post-clypeus wider at base than frons at apex, moderately long, longer than half of frons. Antennae reaching over frontoclypeal suture, basal segment longer than wide, shorter than second about 1:3.5. Post-tibial spur with 23–25 teeth. Tegmina longer than widest part about 3.7:1.

Male genitalia. Anal segment of male with lateroapical angles widely separated, each produced in a huge, stout spinose process. Pygofer in profile distinctly wider ventrally than dorsally, at caudal margin strongly produced caudodorsad in a large plate-like process, with 2 small tooth at apex, in caudodorsal view opening longer than width, with a long, spinous process at medioventral, apical margin slightly concave medially. Phallus somewhat compressed, long and tubular, L-shaped and strongly bent ventrad, broad at base, abruptly narrowing to apex, with one slender, long process arising from dorsal margin at basal 1/3, directed ventral. Diaphragm broad, dorsal margin with a node protruding cephalad to supporting phallus, ventral margin with a thumb-like process directed caudad. Genital styles very long, slender, sinuate, divergent apically, quadrate at base, abruptly narrowing at basal 1/3, laterobasal angle with short, spine-like process, distinct at lateral view.

Type material. Holotype ♂, CHINA: Yunnan Province, Pianma (26°03'N, 98'24'E), Lushui, Nujiang, 17–19 Jun. 2011, lamping, collected by J.-K. Long. Paratypes: 1♂, 3♀♀, same data as holotype.

Host plant. Unknown.

Distribution. South China (Yunnan).

Remarks. This new species is similar to *N. bispinatus* sp. nov., but can be distinguished from the latter by the following features: anal segment each produced in a shorter and slender process; pygofer at plate-like process of caudal margin with 2 small teeth-like processes at apex, with a spine-like medioventral process; phallus with one slender and longer process at basal 1/3; genital styles basal angle with shorter process. The structural features of male genitalia of this species are distinctly different from other known species in this genus.

Etymology. The specific name refers to the pygofer with a long, spinous process at medioventral margin.

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