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SHORT COMMUNICATION

A new species of the genus *Nenasa* (Hemiptera: Fulgoroidea: Caliscelidae) from mainland China

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Abstract. The planthopper genus *Nenasa* Chan & Yang, 1994 (Hemiptera: Fulgoroidea: Caliscelidae) is recorded for the first time from mainland China with *Nenasa ouchii* sp. nov. described from Fujian Province. A key to separate the new species from *Nenasa obliqua* Chan & Yang, 1994 is given. The fauna of Caliscelini from China is briefly discussed.

Key words. Hemiptera, Fulgoromorpha, Caliscelinae, Caliscelini, planthoppers, morphology, taxonomy, Oriental Region

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Introduction

The family Caliscelidae is a small group of planthoppers (Hemiptera: Fulgoroidea) distributed worldwide, with around 200 species in more than 70 genera classified in two subfamilies and five tribes (Gnezdilov 2013a). Caliscelidae inhabit different types of ecosystems and are known to feed on grasses, including cane and bamboo (Emeljanov 1969, Logvinenko 1975, Gnezdilov 2013b). Within Caliscelidae there are two main evolutionary trends – brachyptery and neoteny (Gnezdilov 2015a).

The caliscelid genus *Nenasa* Chan & Yang, 1994 was erected as monotypic for *Nenasa obliqua* Chan & Yang, 1994 endemic to Taiwan (Chan & Yang 1994). The genus belongs to the subfamily Caliscelinae, tribe Caliscelini (Gnezdilov 2013a). My study of unsorted Caliscelidae in the Alexander Koenig Research Museum in Bonn (Germany) discovered a male and a female of an undescribed species of *Nenasa* collected by Johann Friedrich Klapperich in Fujian Province of China.

Material and methods

Morphological terminology follows Gnezdilov (2003) and Gnezdilov et al. (2014a). Male genital segments were macerated for 1 min in boiling 10% KOH solution. Drawings were made using a Leica MZ 95 light microscope with a camera lucida. Photographs were taken using the same microscope and a Leica DFC 290 camera. Images were produced using Helicon Focus 5.3 image stacking software and composed into plates using Adobe Photoshop CS6 software.

The type specimens are deposited in the Alexander Koenig Research Museum, Bonn, Germany (ZFMK).

Taxonomy

Nenasa Chan & Yang, 1994

Nenasa Chan & Yang, 1994: 14.

Type species. *Nenasa obliqua* Chan & Yang, 1994, by original designation.

Amended diagnosis. Metope wide, with distinct median and sublateral carinae. Median carina extending from above middle of metope (near middle of compound eyes) through postclypeus. Sublateral carinae of metope extending from its upper margin nearly to metopoclypeal suture. Coryphe hexagonal, without carina. Forewings short, not exceeding hind margin of third abdominal tergite, venation obscure. Hind wings rudimentary. Legs not flattened or foliated.

Figs 1–8. *Nenasa ouchii* sp. nov. 1–4 – holotype male; 5–8 – paratype female. 1, 5 – dorsal view; 2, 6 – lateral view; 3, 7 – face; 4, 8 – labels.

Nenasa ouchii sp. nov.

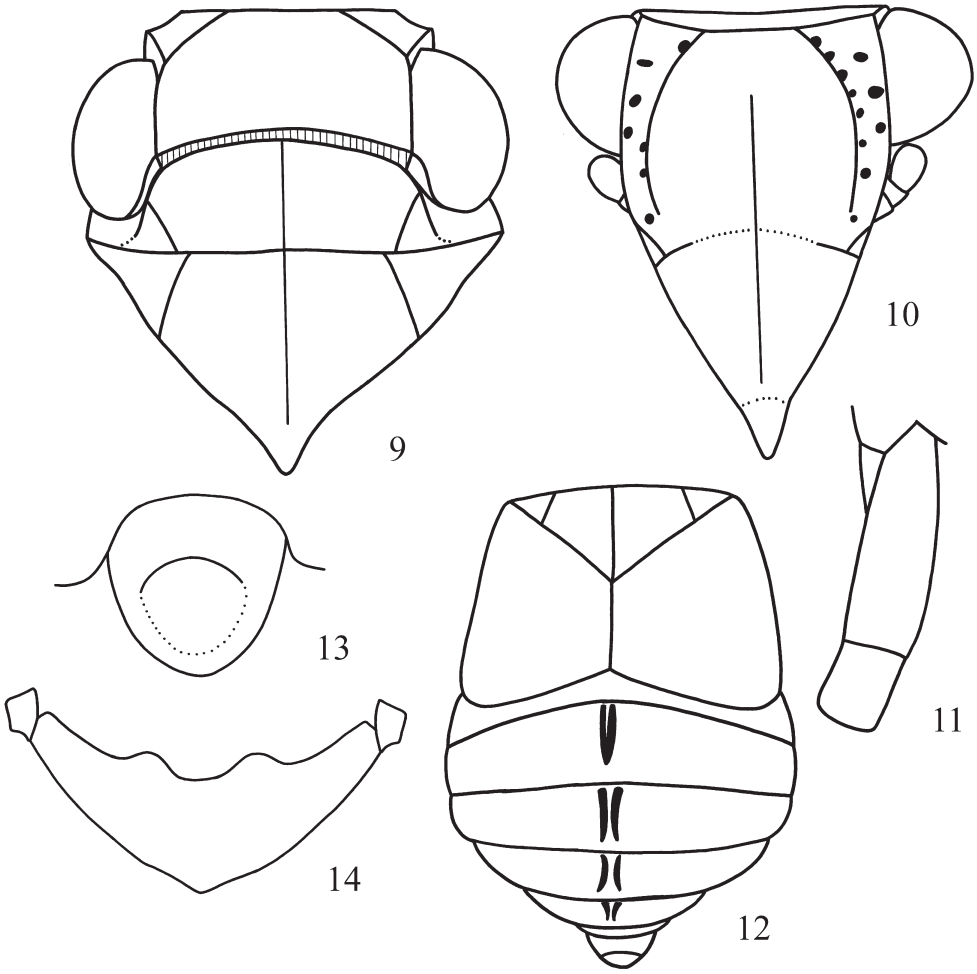
(Figs 1–22)

Type locality. China, Fujian (= Fukien) Province, Guangze (= Kwangtseh) County.

Type material. Holotype: ♂, 'Kwangtseh – Fukien / J. Klapperich 0 / 18.8 1937 // Museum / Koenig' (ZFMK, dry-mounted on a pin and placed on a card, genital segments detached, stored in glycerine in a glass microvial pinned under the specimen). Paratype: ♀, 'Shaowu – Fukien / (500 m) J. Klapperich / 15.7. 1937 // Museum / Koenig' (ZMFK, dry-mounted on a pin and placed on a card).

Description. ***Coloration.*** *Male.* Metope and postclypeus yellowish brown frontally, with light yellow pustules (traces of larval sensory pits) (Fig. 3). Coryphe yellowish light brown (Fig. 1). Postclypeus laterally and anteclypeus dark brown to black. Preocular fields yellowish (Fig. 2). Genae dark brown to black. Scapus dark brown. Pedicel dark brown, with yellow apex. Rostrum dark brown dorsally and yellowish ventrally, with dark brown band apically. Pronotum yellowish light brown, with dark brown to black paradiscal fields. Paranotal lobes largely whitish light yellow, dark brown to black below and behind eyes. Mesonotum yellowish light brown, with dark brown to black lateral parts. Forewings dark brown, each with large light yellow spot basally and light yellow inner margin (Figs 1, 2). Episternae and epimerae of thorax black. Coxae and trochanters dark brown, with yellow areas. Femora and tibiae brown to dark brown, with light yellow crossbands. Tarsi yellowish brown, with dark brown claws. Apices of leg spines black. Abdominal tergites dark brown, with light yellow median line and lateral parts. Abdominal sternites dark brown to black, with yellowish hind margins and large yellowish spots laterally. Lower part of pygofer and styles basally light yellow.

Female (the specimen examined with soil particles on head and body including forewings). Metope dark brown, with yellowish light brown areas and pustules (Fig. 7). Coryphe, pro- and mesonotum, and forewings dark brown (Fig. 5). Preocular fields yellowish light brown (Fig. 6). Scapus dark brown. Pedicel dark brown, with yellow apex. Rostrum brown to dark brown dorsally and yellowish ventrally, with dark brown to black band apically. Episternae and epimerae of thorax black. Coxae and trochanters dark brown, with yellow areas. Femora and tibiae dark brown, with light yellow crossbands. Tarsi yellowish brown, with dark brown claws. Apices of leg spines black. Abdominal tergites generally dark brown to black. Tergite III with light yellow lateral margins and tergites IV–VII each with two light yellow pustules on each lateral side and two closely situated light yellow carinae along midline (Figs 5, 12). Abdominal sternites dark brown, with yellowish light brown hind margins, each with yellowish brown areas medially and yellowish spots laterally. Sternite VII with yellowish



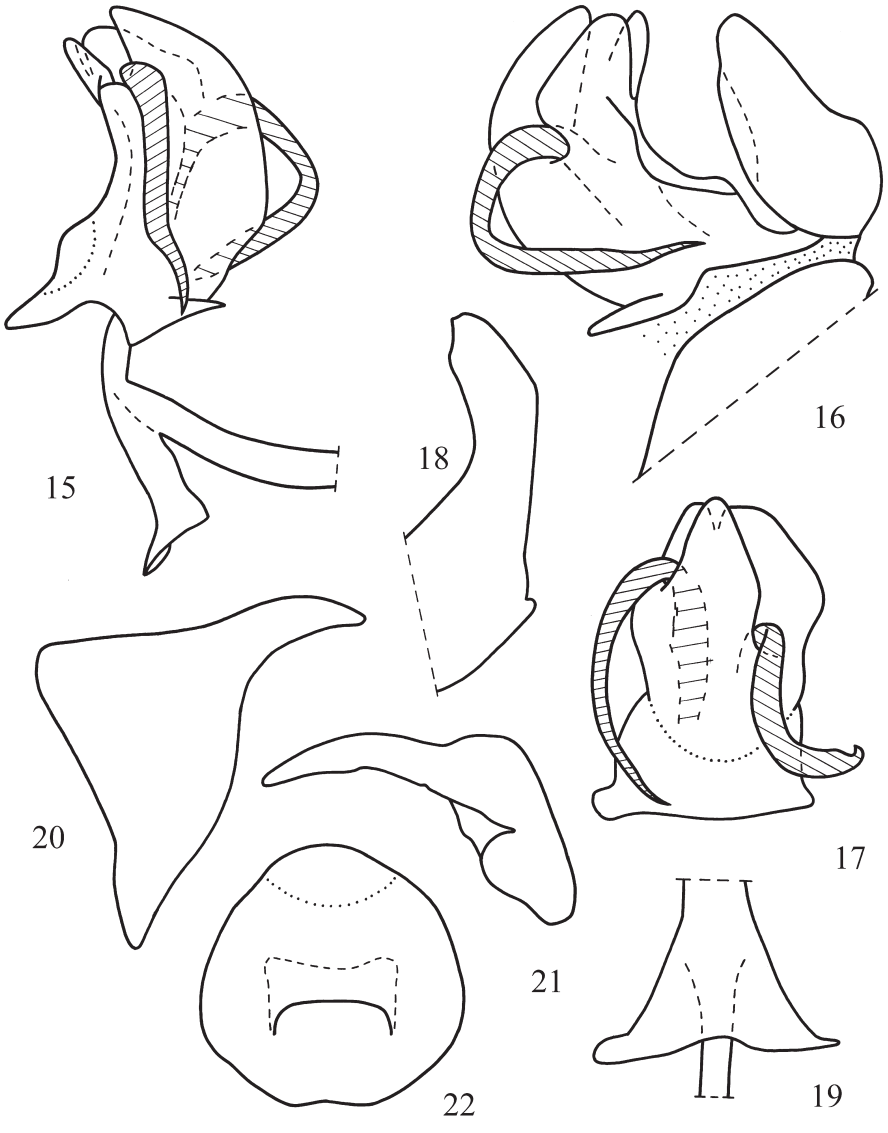
Figs 9–14. *Nenasa ouchii* sp. nov. 9–11 – holotype male; 12–14 – paratype female. 9 – head, pro- and mesonotum, dorsal view; 10 – head, frontal view; 11 – rostrum, lateral view; 12 – mesonotum, forewings, and abdomen, dorsal view; 13 – anal tube, dorsal view; 14 – sternite VII, ventral view.

hind margin. Anal tube yellowish light brown medio-dorsally and dark brown laterally. Pygofer dark brown, with yellowish light brown areas. Gonoplacs yellowish light brown proximally and dark brown distally.

Structure. *Male.* Metope wide and flat, with two rows of pustules between lateral margins and sublateral carinae; lateral margins almost straight; upper margin slightly concave (Fig. 10). Metope with distinct median carina extending from above its middle through postclypeus across metopoclypeal suture (Figs 3, 10). Sublateral carinae of metope distinct, extending from its upper margin to lower metopial angles above metopoclypeal suture. Metopoclypeal suture distinct laterally, widely convex. Metope and coryphe, in lateral view, joined at right angle (Fig. 2). Coryphe transverse, with pair of lateral concavities; hind margin nearly straight (Fig. 9). Pedicel globular. Rostrum reaching hind coxae; third segment short, half length of second segment, cylindrical, not narrowing apically (Fig. 11). Pronotum as long as coryphe medially, with distinct median carina and two lateral carinae separating central disc from paradiscal fields (Fig. 9). Paranotal lobes wide (Fig. 2). Mesonotum 1.5 times as long as pronotum, with median and lateral carinae. Forewings reaching only hind margin of third abdominal tergite, venation obscure (Figs 1, 2). Hind wings rudimentary. Legs not flattened or foliated. Hind tibia with single lateral spine in its apical third and with 7 spines apically. First metatarsomere twice as long as second one, with two latero-apical and one intermediate spine. Second metatarsomere with only two latero-apical spines.

Female. As mentioned for the male, except for more relief forewing venation and abdominal tergites IV–VII each with two carinae closely situated along midline (Fig. 12).

Male genitalia (Figs 15–22). Hind margins of pygofer straight in lower two thirds, convex in upper third (Fig. 18). Anal tube, in dorsal view, wide, almost rounded, with weak apical concavity (Fig. 22). Phallobase wide, in lateral view slightly curved (Fig. 15), asymmetrical (Figs 15–17); dorsal lobe wide, with deep notch (Fig. 16); ventral lobe narrowing apically (Fig. 17). Aedeagus with two long ventral hooks, different in shape and length, curved and directed ventrally (Figs 15–17). Connective with a narrow cup and two deep lateral clefts (Figs 15, 19). Style with straight hind margin; caudo-dorsal angle right (Fig. 20); capitulum of style long and narrow, narrowing apically (Fig. 21).



Figs 15–22. *Nenasa ouchii* sp. nov., holotype, male genitalia. 15 – penis and connective, right lateral view; 16 – anal tube, apex of pygofer, and penis, left lateral view; 17 – penis, ventral view; 18 – pygofer, lateral view; 19 – connective, ventral view; 20 – style, lateral view; 21 – style, dorsal view; 22 – anal tube, dorsal view.

Female genitalia (Figs 13, 14). Sternite VII deeply concave medially, with two rounded projections (Fig. 14). Anal tube, in dorsal view, wide, slightly narrowing apically (Fig. 13).

Measurements. Body length (from apex of coryphe to apex of anal tube in male or to apex of gonoplacs in female): male – 4.7 mm, female – 5.2 mm.

Diagnosis. The new species differs from *N. obliqua* by coloration and structural details of the male genitalia (see the key below).

Etymology. The species is named in honor of Dr. Yoshio Ôuchi who described and illustrated *Caliscelis orientalis* Ouchi, 1940 and *Fortunia sinensis* (Ouchi, 1940) from Zhejiang (= Chekiang) Province of China.

Key to species of *Nenasa*

1 Male forewing with an oblique pale yellow stripe from its base to the middle (Chan & Yang 1994: fig. 4D). Rostrum with third segment longer than wide. Hind margins of male pygofer concave (Chan & Yang 1994: Fig. 4E). Phallobase narrow (Chan & Yang 1994: Figs 4G, H). Male anal tube, in dorsal view, elongate, narrowing apically, without apical concavity (Chan & Yang 1994: fig. 4F). Taiwan. .... ***N. obliqua*** Chan & Yang, 1994

– Male forewing with a large light yellow spot basally and a light yellow inner margin (Figs 1, 2). Rostrum with third segment as long as wide (Fig. 11). Hind margins of male pygofer straight in lower two thirds, convex in upper third (Fig. 18). Phallobase wide (Figs 15–17). Male anal tube, in dorsal view, wide, almost rounded, with weak apical concavity (Fig. 22). Fujian. ..... ***N. ouchii* sp. nov.**

Discussion

The tribe Caliscelini, comprising currently 31 genera distributed in the Old World (Gnezdilov 2013a, 2015a, 2015b; Gnezdilov et al. 2014b; Bourgoin 2018), has been recorded from China by only four genera: *Bambusicaliscelis* Chen & Zhang, 2011; *Caliscelis* Laporte, 1833; *Gelastissus* Kirkaldy, 1906 (= *Conocaliscelis* Matsumura, 1916); and *Nenasa* Chan & Yang, 1994 (Matsumura 1916, Ôuchi 1940, Chan & Yang 1994, Gnezdilov 2008, Chen & Zhang 2011, Che et al., 2011, Chen et al., 2014).

The first representative of Caliscelini from China was recorded by Melichar (1906) who described *Caliscelis sinensis* Melichar, 1906 after two females without type locality provided except for "China". Ten years later Matsumura (1916) erected the genus *Conocaliscelis* for *Conocaliscelis hokutonis* Matsumura, 1916 and *C. koshunensis* Matsumura, 1916 from Taiwan. Gnezdilov (2008) suggested that *Conocaliscelis* is a junior synonym of *Gelastissus* and also synonymized *C. koshunensis* under *C. hokutonis*. Ôuchi (1940) described *Caliscelis orientalis* Ôuchi, 1940 from Zhejiang Province. Recently the genus *Caliscelis* in China was reviewed with five species recorded from Anhui, Beijing, Guangxi, Hunan, Shandong, Xinjiang, and Zhejiang Provinces (Che et al. 2011; Chen et al. 2014). A subgeneric division of *Caliscelis* was proposed by Emeljanov (2015) who placed *Caliscelis triplicata* Che, Wang & Zhang, 2011 in synonymy with *C. wallengreni* Stål, 1863. Finally, the genus *Bambusicaliscelis* was described with four species from Guizhou, Guangxi, and Yunnan Provinces (Chen & Zhang 2011, Gong et al. 2018). Thus, including the new species described above and synonymies listed, there are 12 species of the tribe Caliscelini known from China including Taiwan. Apparently one more species, *Caliscelis zarudnyi* Mitjaev, 1971, was illustrated by Chen et al. (2014) under the name of *Caliscelis affinis* (Fieber, 1876) (Gnezdilov 2015c).

Externally, *Nenasa* species are very similar to the members of *Bambusicaliscelis* particularly in the shape and carination of the metope, coryphe, pro-, and mesonotum, legs not foliate, and the presence of yellow spots at the forewing base and on lateral parts of abdominal tergites. However, *Nenasa* can be well distinguished by the sublateral carinae of the metope extending from its upper margin to its lower corners (Figs 3, 7, 10) whereas *Bambusicaliscelis* is characterized by these carinae turned to the median carina of the metope above the metopoclypeal suture (Chen et al. 2014: Figs 2-89E, 2-90E) and by a different structure of the phallobase which is tubular in *Bambusicaliscelis* (Chen & Zhang 2011, Gong et al. 2018).

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