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Additions to Genus *Scaphoideus* with Bicolored Forewings (Hemiptera: Cicadellidae: Deltocephalinae)

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ABSTRACT

A new species *Scaphoideus destitutus* sp. n. is described and illustrated from Guangxi Autonomous Region, China. A key based on the male genitalia is given to distinguish species with bicolored forewings of this genus. A map showing the geographic distribution of the species in China is also provided. The type specimen of the new species is deposited in the Institute of Entomology, Guizhou University, Guiyang, China (GUGC).

Key words: Hemiptera, leafhopper, morphology, taxonomy, distribution

INTRODUCTION

The genus *Scaphoideus* belongs to the tribe Scaphoideini of subfamily Deltocephalinae (Hemiptera: Cicadellidae), 197 species were described to date in the world and 65 species are known in China (Chen *et al.,* 2015; Chen and Dai 2015; Li *et al.,* 2011; Zahniser and Dietrich, 2013). Among them, only 4 species with distinctly bicolored forewings: *S. bicoloratus* Viraktamath and Mohan, 2004, *S. pingtungisis* (Dai and Li, 2011), *S. dinghuensis* Chen and Dai, 2015 and *S. taishanensis* Chen and Dai, 2015 (see Chen and Dai, 2015).

Here, a new species with bicolored forewings: *Scaphoideus destitutus* sp. n. is described and illustrated from Guangxi Autonomous Region, China. This color pattern in the genus *Scaphoideus* are now contains 5 species, and a key is given to separate these species. The type specimens of the new species are deposited in the Institute of Entomology, Guizhou University, Guiyang, China (GUGC).

MATERIAL AND METHODS

Dry male specimens were used for the description and illustration. External morphology was observed under a stereoscopic microscope and characters were measured with an ocular micrometer. Color pictures for adult habitus were obtained by KEYENCE VHX-1000 system. The genital segments of the examined specimens was macerated in 10% NaOH and drawn from preparations in glycerin jelly using a Leica MZ 12.5 stereomicroscope. Illustrations were scanned with Canon CanoScan

LiDE 200 and imported into Adobe Photoshop CS8 for labeling and plate composition. In the terminology of morphology and genital characters, Li *et al.* (2011) and Chen and Dai (2015) were followed.

RESULTS

Checklist of species of *Scaphoideus* with bicolored forewings in the world

S. bicoloratus Viraktamath and Mohan, 2004: 13 Distribution: India (Karnataka)

S. destitutus sp. n. Distribution: China (Guangxi)

S. dinghuensis Chen and Dai, 2015: 277 Distribution: China (Guangdong)

S. pingtungisis (Dai and Li, 2011) in Li, Dai and Xing, 2011: 49; Chen and Dai, 2015: 277 Distribution: China (Taiwan)

S. taishanensis Chen and Dai, 2015: 280 Distribution: China (Shandong)

Key to males of *Scaphoideus* with bicolored forewings

1. Style apophysis short and connective processes needle like (see Viraktamath and Mohan, 2004: Figs. 22, 24; Chen and Dai, 2015: Fig. 3 G, H) ……..…….2

-Style apophysis elongate and connective processes stout (see Li, Dai and Xing, 2011: plate 5-38, Figs. 7-9; Chen and Dai, 2015: Figs. 2 H, J; Figs 6, 9) ...…….…… 3

2. Aedeagus with a pair of apical processes, directed ventrally (see Viraktamath and Mohan, 2004: Figs. 25, 26)…….…….. ***S. bicoloratus***

- Aedeagus with a single process, strongly decurved and extended to left of aedeagalshaft (see Chen and Dai, 2015: Fig. 3. D, E)…….……***S. taishanensis***

3. Aedeagus without apical process (Figs 7, 8)……..***S. destitutus* sp. n.**

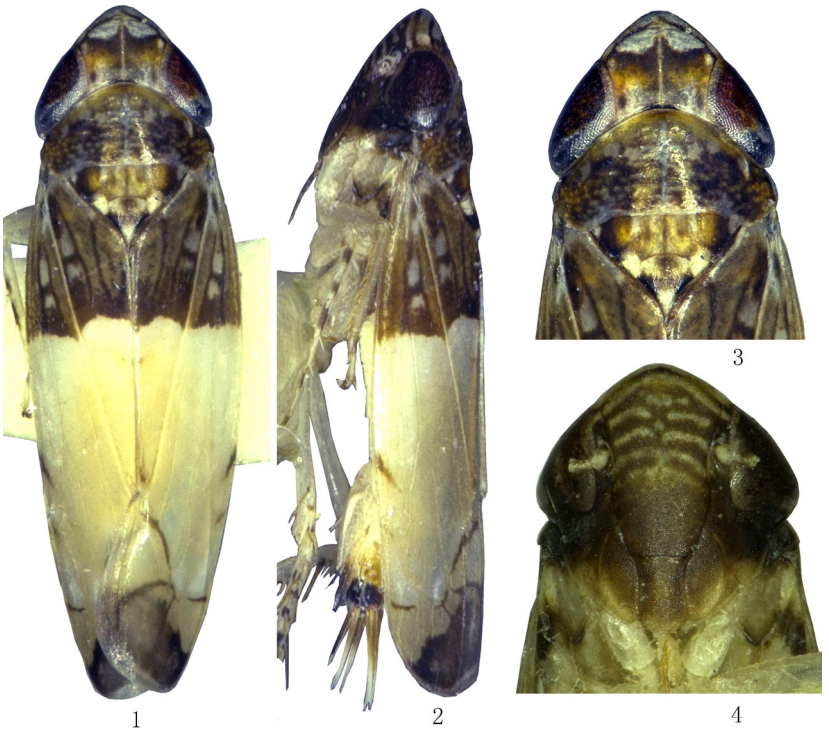
- Aedeagus with a pair of apical processes, directed dorsally (see Li, Dai and Xing, 2011: plate 5-38, Figs. 2-3; Chen and Dai, 2015: Fig2 E-G;) .....….4

4. Aedeagal processes longer and slender (see Li, Dai and Xing, 2011: plate 5-38, Figs. 2-3) ……..…… ***S. pingtungisis***

- Aedeagal processes shorter and broader……..…… ***S. dinghuensis***

***Scaphoideus destitutus* sp. n.**

Description: Coloration ochraceous with well-expressed brown or black pattern (Figs. 1-4). Vertex yellow with brown angular submarginal stripe and broad brown transverse band across eyes slightly produced medially. Face chocolate brown, clypellus, gene and lora ventrally yellow, with transverse whitish stripes on upper part of frontoclypeus. Pronotum marbled with yellowish brown, with several indistinct brown spots at anterior margin. Scutellum pale yellow with triangular marginal spot on each side of anterior margin and posterior to scutellar suture, brown. Forewing transparent with basal third brownish; remainder of forewing whitish, with black to dark-brown veins and darkening in apical cells.



Figs. 1-4. *Scaphoideus destitutus* sp. n., ♂. 1. Dorsal view. 2. Lateral view. 3. Head and thorax, dorsal view. 4. Face.

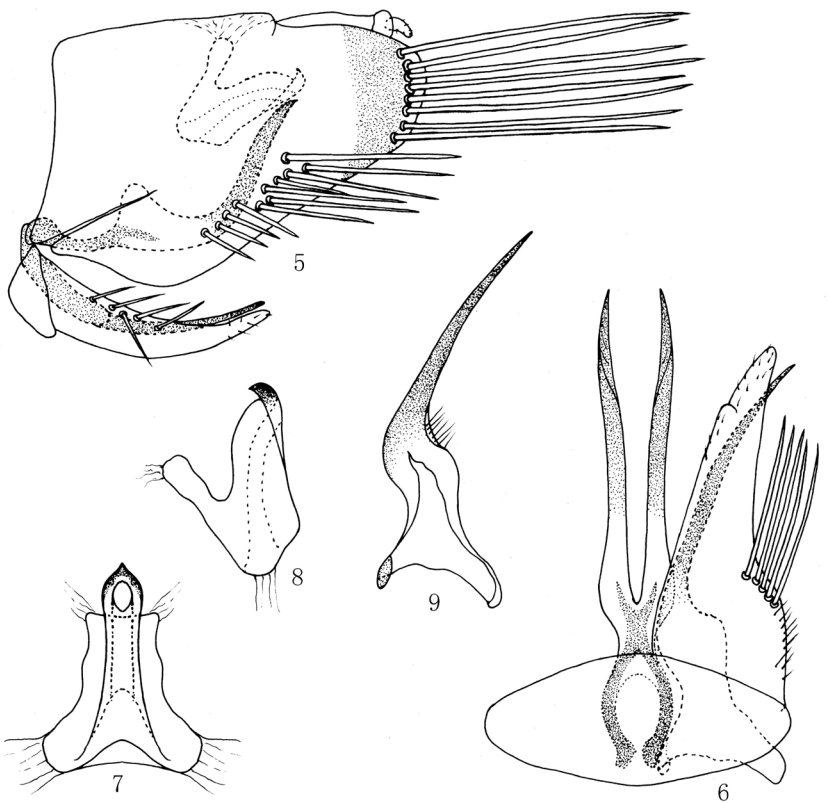
Head including eyes slightly narrower than pronotum. Vertex as long as pronotum, longer medially than next to eye, anterior margin of head mostly shagreen, narrowly rounded to face. Eyes fairly large, ocelli on anterior margin. Frontoclypeus very long and narrow, longer than width between eyes. Clypellus expanded apically. Lorum wider than clypellus at base. Pronotum wide, its length slightly shorter than width, anterior margin roundly produced and posterior margin slightly concave. Scutellum triangular, its length slightly longer than length of pronotum, with transverse suture curved and depressed. Forewings semi-transparent, with four apical cells and three subapical cells; veins R1 and R2+3 reflexed; appendix wide.

Male genitalia: Pygofer in lateral view longer than broad, tapering posteriorly, posterior margin conically rounded, with two tufts of long macrosetae aligned subapically and scattered shorter macrosetae more basad to middle (Fig. 5). Subgenital plate long, triangular, broad basally, lateral margin concave, with 5 uniseriate macrosetae laterally in addition to few hairlike setae (Fig. 6). Aedeagus with well-developed dorsal apodeme, with base broad in lateral view, strongly tapered to apical region; shaft without process at apex, gonopore apical on caudal surface (Figs. 7, 8). Connective Y-shaped, arms well-developed, its stem slightly shorter than arms;

gradually narrowed to apex; in lateral view slightly curved dorsally (Figs. 5, 6). Style preapical lobe distinct, with several long setae; apophysis elongate, bent laterad near base and tapering to acute apex (Fig. 9).

Measurement. Length (including tegmen): ♂, 4.0-4.2mm.

Type Material. Holotype ♂, China: Guangxi Autonomous Region, Shangsi County, Shiwadashan, 9 April 2012, coll. Zaihua Yang ; Paratype: 3♂♂, data same as holotype (GUGC).



Figs. 5-9. *Scaphoideus destitutus* sp. n., 5. Male genital, lateral view. 6. Valve, subgenital plate, style and connective, ventral view. 7. Aedeagus, ventral view. 8. Aedeagus, lateral view. 9. Style, dorsal view.

Distribution. China (Guangxi) (Fig. 10).

Remarks. This new species is similar to *S. taishanensis* Chen and Dai, but can be distinguished from the latter by the apical of aedeagal shaft without process, style apophysis elongate and connective processes stout, not needle like.

Etymology. The new species name is derived from the Latin words "*destitutus*", indicating the apical of aedeagal shaft without process.

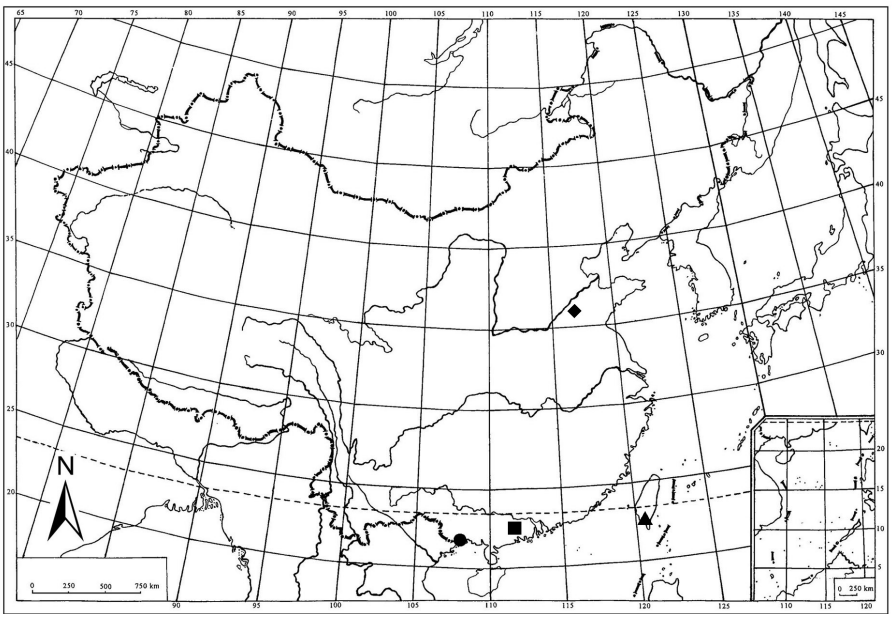


Fig. 10. Geographic distribution of *Scaphoideus* species with bicolored forewings in China: *S. destitutus* sp. n. (●); S. dinghuensis (■); S. pingtungisis (▲); S. taishanensis(◆).

DISCUSSION

Chinese species of *Scaphoideus* with bicolored forewings are mainly distributed in southern China (*S. destitutus* sp. n., *S. dinghuensis* and *S. pingtungisis*) with *S. taishanensis* distributed in northern China (Fig. 10). Among them, the species distributed in China (Oriental Region) with common type characters: style apophysis elongate; connective processes stout and subgenital plate long, triangular, broad basally, lateral margin concave. Contrarily, the species distributed in China (Palaearctic Region) with another type characters: style apophysis short; connective processes needlelike and subgenital plate slender, elongate.

However, Indian species *S. bicoloratus* is consistent with the type characters of *S. taishanensis* (North China). It is highly likely that there are undiscovered species in China, perhaps two type characters species are all found in the Oriental Region and Palaearctic Region.

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