

A new species of *Alebroides haculus* group (Hemiptera: Cicadellidae: Typhlocybinae) from China, with a key to species of this group worldwide

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Abstract: Prior to this study, the *Alebroides haculus* group was comprised of three species distributed in India and Indonesia. This paper adds a new species, *Alebroides paraxanthus* sp. nov., to this group based on the specimens from Shaanxi and Yunnan (China). Habitus photos and illustrations of the male genitalia of this new species are given. A key to all species in the *Alebroides haculus* group is also provided.

Key words: Auchenorrhyncha; Empoascini; taxonomy

哈长柄叶蝉种团一新种及该种团分种检索表（半翅目：叶蝉科：小叶蝉亚科）

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摘要：哈长柄叶蝉种团 *Alebroides haculus* group 此前仅知 3 种，分布于印度及印度尼西亚。本文记述采自中国陕西及云南的该种团 1 新种：拟菱长柄叶蝉 *Alebroides paraxanthus* sp. nov.，提供了新种的成虫外部形态及雄性外生殖器特征图。文中还提供了该种团的分种检索表。

关键词：头喙亚目；小绿叶蝉族；分类

Introduction

The empoascine genus *Alebroides* (Auchenorrhyncha: Cicadellidae: Typhlocybinae) was established by Matsumura in 1931 based on the type species *A. marginatus* Matsumura. It is comprised of 74 species in the world (Dworakowska 1997; Qin & Zhang 2011; Yu & Yang 2014; Xu *et al.* 2017) which most occurs in the temperate zone of the Oriental Region and in the adjacent part of the Palaearctic Region (Dworakowska 1997). All documented host plants belong to the Compositae (especially *Artemisia*) and Urticaceae (Dworakowska 1997).

Thirteen species groups were defined mainly based on the characters of male genitalia (Dworakowska 1997). One of them, the *Alebroides sohii* group, was elevated to an independent genus, *Inflatopina* Lu, Dietrich & Qin (Xu *et al.* 2017, 2021). The *Alebroides haculus* group is a small group in the remaining 12 species groups in the genus *Alebroides*. Three known species (*A. xanthus* Dworakowska, *A. haculus* Dworakowska and *A. joannae* Dworakowska) that occur in India and Indonesia were known so far. This paper adds a new species in this group from Shaanxi and Yunnan (China). A key to known species in this group is also provided.

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Material and methods

Morphological terminology used in this study mainly follows Zhang (1990) except for the nomenclature of the wing veins and groups of setae of the subgenital plate that follow Dietrich & Dmitriev (2006) and Dworakowska (1994), respectively.

The entire male abdomens of the examined specimens were dissected and macerated in 10% NaOH solution for about 12 h, then rinsed 1–2 times with pure water to clear the digested soft tissues, and then transferred into glycerin for identification and comparative study. Male habitus photos of the specimens were made using a Leica M205A microscope with a Leica DFC camera and processed using the Leica Application Suite (LAS) V3.7. The body measurements are from apex of vertex to tip of forewing. Drawings of male genitalia were made using a drawing tube attached to an Olympus BX40 microscope. Final pictures were edited and improved using Adobe Photoshop CC 2020.

The specimens examined in this study are deposited in the Entomological Museum, Northwest A&F University, Yangling, Shaanxi, China (NWAUFU).

Taxonomy

Alebroides haculus group

Diagnosis refers to Dworakowska (1997).

Distribution. China (Shaanxi, Yunnan); India; Indonesia.

Key to species of the *Alebroides haculus* group (male)

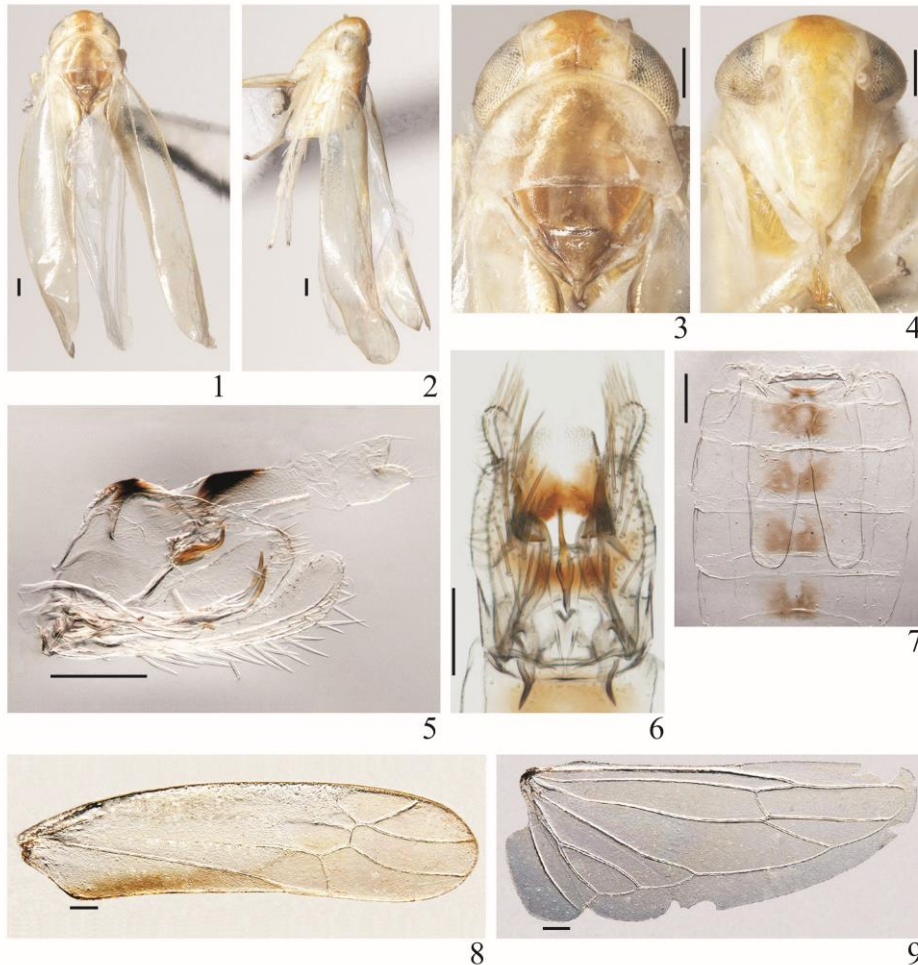
1. Ventral pygofer appendage bifurcated in apical 2/5; aedeagus shaft distinctly longer than preatrium
.....*A. joannae* Dworakowska
- Ventral pygofer appendage not branched in apical part; aedeagus shaft nearly as long as preatrium2
2. Aedeagus shaft in ventral aspect with the apical processes asymmetrical; anal tube process curved to a bluntly terminated hook apically*A. haculus* Dworakowska
- Aedeagus shaft in ventral aspect with the apical processes symmetrical; anal tube appendage not hook-shaped apically3
3. Preatrium smooth, without ventro-basal process in profile; basal setae group of the subgenital plate situated in distal 2/5; paramere apophysis almost straight in apical part*A. xanthus* Dworakowska
- Preatrium with a ventro-basal process in profile (Fig. 16); basal setae group of the subgenital plate situated in basal 2/5 (Fig. 13); paramere apophysis slightly curved in apical part (Fig. 14) ...*A. paraxanthus* sp. nov.

Alebroides paraxanthus sp. nov. (Figs 1–19)

Description. Length: male 4.3–4.8 mm.

Colour of body yellowish brown, with brown pattern (Figs 1–4). Crown with pair of irregular dark yellow spots on each side of coronal suture (Figs 1, 3). Coronal suture brownish, not reaching apex of crown. Anterior margin of vertex slightly produced medially. Eyes yellowish-brown (Figs 1–4). Ocelli surrounded with yellow-brown patch ring pattern (Figs 3, 4). Face and basal antennal segments whitish yellow; frontoclypeus and anteclypeus golden-yellow (Fig. 4). Centre of pronotum with large ochre-brown patch and fascia dark brown on its hind margin. Scutellum brownish, scutoscuteellar sulcus blackish brown (Figs 1, 3). Forewing semi-transparent, slightly yellowish, wax field tan; hindwing off-white, hyaline

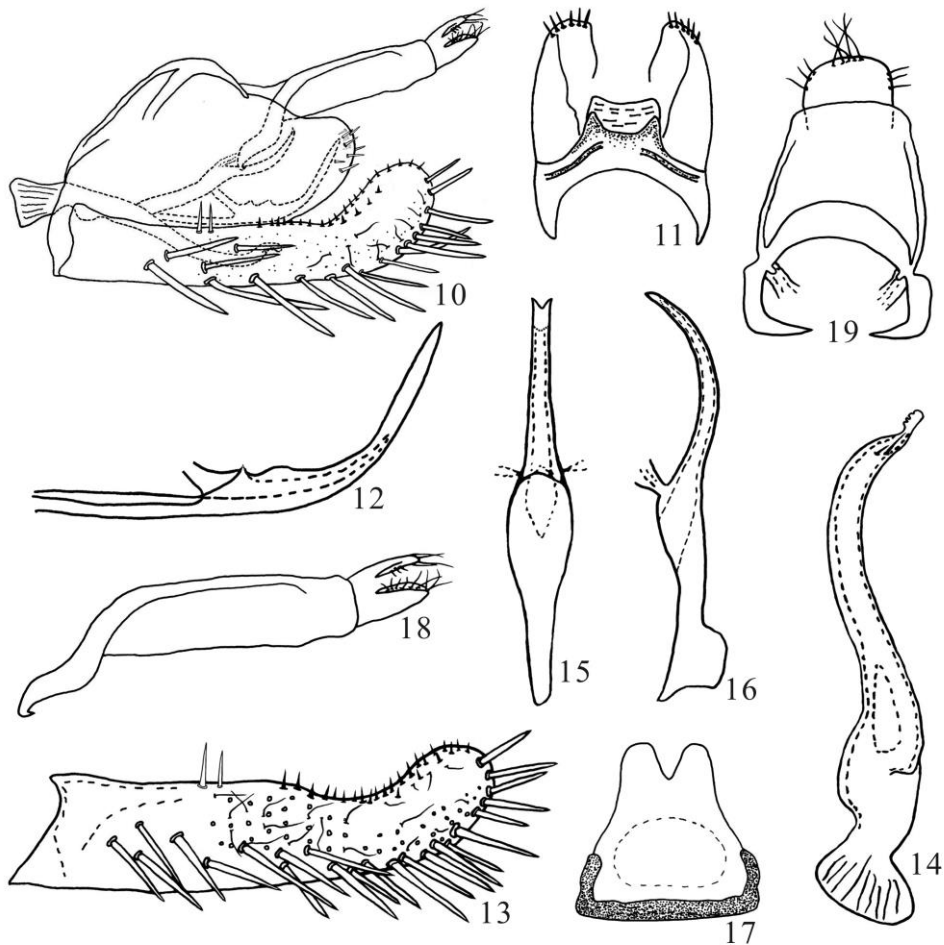
(Figs 1, 2, 8, 9). Abdomen slightly brown infuscated in midline dorsally (Figs 1, 2). Legs sordid yellowish (Fig. 2).



Figures 1–9. *Alebroides paraxanthus* sp. nov. 1. Male adult (abdomen removed), dorsal view; 2. Male adult (abdomen removed), left lateral view; 3. Head and thorax, dorsal view; 4. Face; 5. Male genitalia, left lateral view; 6. Male genitalia, dorsal view; 7. Abdominal apodeme; 8. Forewing; 9. Hindwing. Scale bars = 0.2 mm.

Male 2S abdominal apodemes exceeding end of segment V but not reaching segment VI, basal apodemes broad, parallel-sided, rounded terminally (Fig. 7). Male pygofer nearly triangular, with 10–12 rigid setae on outer and inner surface of lobe, dorsal bridge extended to almost two-thirds length of lobe; ventral pygofer appendage tapered to a narrow pointed tip, smooth, extended to apex of lobe, apex curved caudo-dorsad, slightly sinuate in apical half (Figs 5, 6, 10–12). Subgenital plate surpassing pygofer lobe, slightly expanded medially, apex rounded and apical 1/3 slightly curved caudo-dorsad; 2 well-defined setae forming the basal group, situated on widest point of plate; 22–24 marginal microsetae occupying nearly half length of anterior margin, arranged in 1–2 rows; ca. 23 macrosetae setae uniseriate apically, arising near basal 1/4 of plate with 4–5 setae biserial, reaching apex; 4 irregular rows of feeble microsetae (Figs 5, 6, 10, 13). Paramere sinuate, base broadened, distal part evenly curved

laterad, apex hooked, 2–3 fine setae present near apical, dentifer adorned with small evenly spaced teeth (Figs 5, 6, 10, 14). Aedeagal shaft tubular, in profile nearly as long as preatrium, broad at base and narrowing apicad, medially slightly curved at obtuse angle; with no flanges in dorsal aspect, both margins of shaft smooth, gonopore ventrad near apex (Figs 5, 6, 10, 15, 16). Connective longer than wide, with posterior V-shaped emargination (Fig. 17). Anal tube appendage developed, broad at base and gradually narrowing to pointed, posteriorly curved apex (Figs 5, 6, 10, 18, 19).



Figures 10–19. *Alebroides paraxanthus* **sp. nov.** 10. Male genitalia, left lateral view; 11. Pygofer, dorsal view; 12. Ventral pygofer appendage, left lateral view; 13. Subgenital plate; 14. Paramere; 15. Aedeagus, dorsal view; 16. Aedeagus, left lateral view; 17. Connective; 18. Anal tube appendage, left lateral view; 19. Anal tube appendage, dorsal view.

Holotype. ♂ (NWAUFU), **China**, Shaanxi, Taibai, Qingfeng Gorge, 19-IX-2020, Yan MA.
Paratypes. 3♂, same data as holotype (NWAUFU); 1♂, **China**, Yunnan, Kunming, Xishan, 07-VIII-2011, Huining ZHANG (NWAUFU).

Etymology. The species epithet is derived from the combination of “*para-*” and “*xanthus*” which refers to the similarity of this new species to *A. xanthus* Dworakowska.

Remarks. This new species is placed in the *A. haculus* species group based on the following combination of features: colouration with brownish shades and a medium-size darkening in midline dorsally (Figs 1, 3); subgenital plate almost parallel-sided, bent about 1/4 from apex (Figs 10, 13); apical part of paramere slightly sinuate, with long dentifer (Figs 10, 14); aedeagal shaft elongate and apically curved cephalo-dorsad in profile (Figs 10, 15). This new species differs from other species as noted in the characters in the key.

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