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A new genus of agalliine leafhoppers (Hemiptera, Cicadellidae, Megophthalminae) from the Oriental Region, with description of a new species and proposal of a new combination

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Abstract

A new genus of agalliine leafhoppers, *Dianagallia* Zhang & Webb, **gen. nov.**, (Hemiptera, Cicadellidae, Megophthalminae, Agalliini) is established to accommodate one new species, *Dianagallia yunnanica* Zhang & Webb, **sp. nov.**, from Yunnan Province, China and one previously described species, *Dianagallia gladiota* (Meshram & Rai, 2021), **comb. nov.**, transferred from *Igerna* Kirkaldy, 1903. Diagnostic characters of the new genus are discussed and compared to those of similar genera.

Key Words

Auchenorrhyncha, China, leafhopper, morphology, new taxa

Introduction

The tribe Agalliini (Hemiptera, Cicadellidae, Megophthalminae) comprises rather homogeneous wedge-shaped leafhoppers with a worldwide distribution. In the Oriental Region, their host plants include monocotyledons (seven species in one family) and dicotyledons (41 species across 19 families) (Viraktamath 2011). In recent years, several taxonomic revisions of the tribe Agalliini have been conducted, based on material from the Oriental Region (Viraktamath 2011), China (Viraktamath et al. 2012) and Madagascar (Viraktamath and Gonçalves 2013).

Recently collected material from Yunnan, China revealed specimens that resemble *Igerna gladiota* Meshram & Rai, 2021, in general habitus and male genital morphology, yet represent a separate generic lineage from *Igerna* Kirkaldy, 1903. Based on detailed morphological comparisons, a new genus, *Dianagallia* gen. nov., is herein established to accommodate the new species and *I. gladiota* is transferred to this new genus.

Material and methods

Terminology used follows mainly that of Oman (1949) and Dietrich (2005), for the female genitalia Davis (1975) and for the leg chaetotaxy Rakitov (1997). Techniques for the preparation of genital structures follow Oman (1949). Holotypes and paratypes are deposited in the College of Life Sciences and Technology, Inner Mongolia Normal University (IMNU).

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Results

Dianagallia Zhang & Webb, gen. nov.

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Type species. *Dianagallia yunnanica* Zhang & Webb, sp. nov., here designated.

Description. ***Colouration.*** Colour ochraceous with dark brown to black markings. Vertex with two large, round black spots, closer to each other than to the eyes; antennal sockets dark brown; posterior half of pronotum with two irregular black markings.

Morphology. Head with posterior margin sinuately curved laterally behind eyes. Ocelli closer to eyes than to each other. Fore-wing venation without accessory cross veins; three ante-apical and four apical cells present; inner ante-apical cell open posteriorly; claval veins not connected by a cross vein. Hind tibial macrosetae arranged as PD 9, AD 6–7, AV 5. Hind basitarsus with one platella in distal transverse row.

Male genitalia. Pygofer with a single long, spine-like and strongly sclerotised process arising from the posterior margin, directed dorsally; dorsal bridge with anterior sclerotised area very narrow, membranous more caudal area, broad. Anal collar present with each lateral branch with a well-developed, elongate apical process. Subgenital plates lacking long and stout setae. Styles with inner arm longer than outer arm. Connective T-shaped, with lateral arms shorter than stem. Aedeagus symmetrical; shaft tubular, slightly curved dorsad, apically bearing two pairs of elongate lamellate processes, gonopore apical; pre-atrium poorly developed; dorsal apodeme well developed.

Female genitalia. Sternite VII transverse, rectangular; posterior margin oblique laterally, shallowly concave medially, bearing a small notch.

Distribution. Oriental Region.

Etymology. The generic name is derived from *Dian*, the Chinese abbreviation for Yunnan Province, combined with the Latin suffix *-agallia*, referring to the type genus (*Agallia* Curtis, 1833) of Agalliini. Gender feminine.

Remarks. The new genus runs to *Austroagallia* Evans, 1936 in the key to Oriental Agalliini (Viraktamath 2011), but can be readily distinguished from that genus in having the ocelli closer to the eyes than to each other (rather than distinctly closer to each other), aedeagus symmetrical (as opposed to strongly asymmetrical) and with a well-developed dorsal apodeme and pre-atrium absent. It is also similar to *Ianagallia* Viraktamath, 2011 and *Igerna*, but can be distinguished from these genera by the following characters. It differs from *Ianagallia* in having a less robust, tubular aedeagal shaft bearing paired lamellate apical processes (rather than a strongly developed, asymmetrically bifurcate pre-atrial process) and in lacking the highly modified aedeagal configuration characteristic of that genus. *Dianagallia* differs from *Igerna* Kirkaldy, 1903 in having the ocelli closer to the eyes than to each other (in *Igerna sensu stricto*, the ocelli are slightly closer to each other than to the eyes), a well-developed and strongly sclerotised anal collar (Fig. 2a–d) with an elongate process (anal collar simple or reduced in *Igerna*), a T-shaped connective with lateral arms shorter than the stem (in *Igerna*, the lateral arms are subequal in length to the stem) and the aedeagal shaft curved dorsad and aedeagal base not sunken into the dorsal apodeme (usually shaft curved ventrad and aedeagal base sunk into dorsal apodeme basally in *Igerna* (see Viraktamath (2011), fig. 355, for exceptions, see Viraktamath (2011), figs 329, 337, 348, 365 and 371 and *I. tenuicaula* Li, Dai & Li, 2012, figs 12, 13).

Dianagallia yunnanica Zhang & Webb, sp. nov.

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Description. Male. Face yellow-brown; lateral margins of anteclypeus and inner margins of lora dark brown; a reversed Y-shaped dark brown macula between ocelli on upper part of the face, with tiny dark brown maculae scattered around ocelli. Pronotum yellow-brown with a broad median longitudinal band, contiguous with irregular maculae on both sides. Mesoscutum with a pair of dark brown maculae on latero-basal portions and a small median macula, all contiguous.

Male genitalia. Pygofer lobe produced caudodorsally and rectangular; caudoventral margin distinctly curved inwards medially; a spine-like process arising from posteroventral margin of pygofer, exceeding posterodorsal margin and slightly curved dorsad. Anal collar with lateral arms with a long apical process bearing a small, medially directed spiniform process near mid-length. Subgenital plates elongate, triangular, basally fused and separated from valve. Styles with outer arm bearing a sharp tooth at apex. Aedeagal shaft of uniform width in lateral view, slightly broadened subapically in ventral view; apex with two pairs of apical processes, inner pair about two-thirds shorter than outer pair; gonopore apical.

Female. Similar in overall colouration to male.

Female genitalia. First valvulae, in lateral view, slightly dorsally curved from the base; dorsolateral surface with oblique rows of scale-like processes on the distal half of the shaft; ventroapical region bearing additional scale-like processes; apex acute. Second valvulae, in lateral view, dorsally curved from base, dorsal hyaline area present, small teeth along apical half of dorsal margin.

Measurements. Male: body length 3.57–372 mm. Female: body length 3.87–4.06 mm.

Type material. • ***Holotype*****:** ♂, China: Yunnan Province, Lincang, Cangyuan, County, Nangunhe National Natural Reserve, Yakou, 7 June 2021, collected by B. Zhang (IMNU); • ***paratypes*****:** 3 ♂♂, 5 ♀♀, same date as holotype; • 2 ♀♀, China: Guizhou Province, Mt. Leigongshan, 9 July 2022, collected by Y.S. Yu (IMNU).

Etymology. The species epithet *yunnanica* refers to Yunnan province, China, where the type material was collected; an adjective.

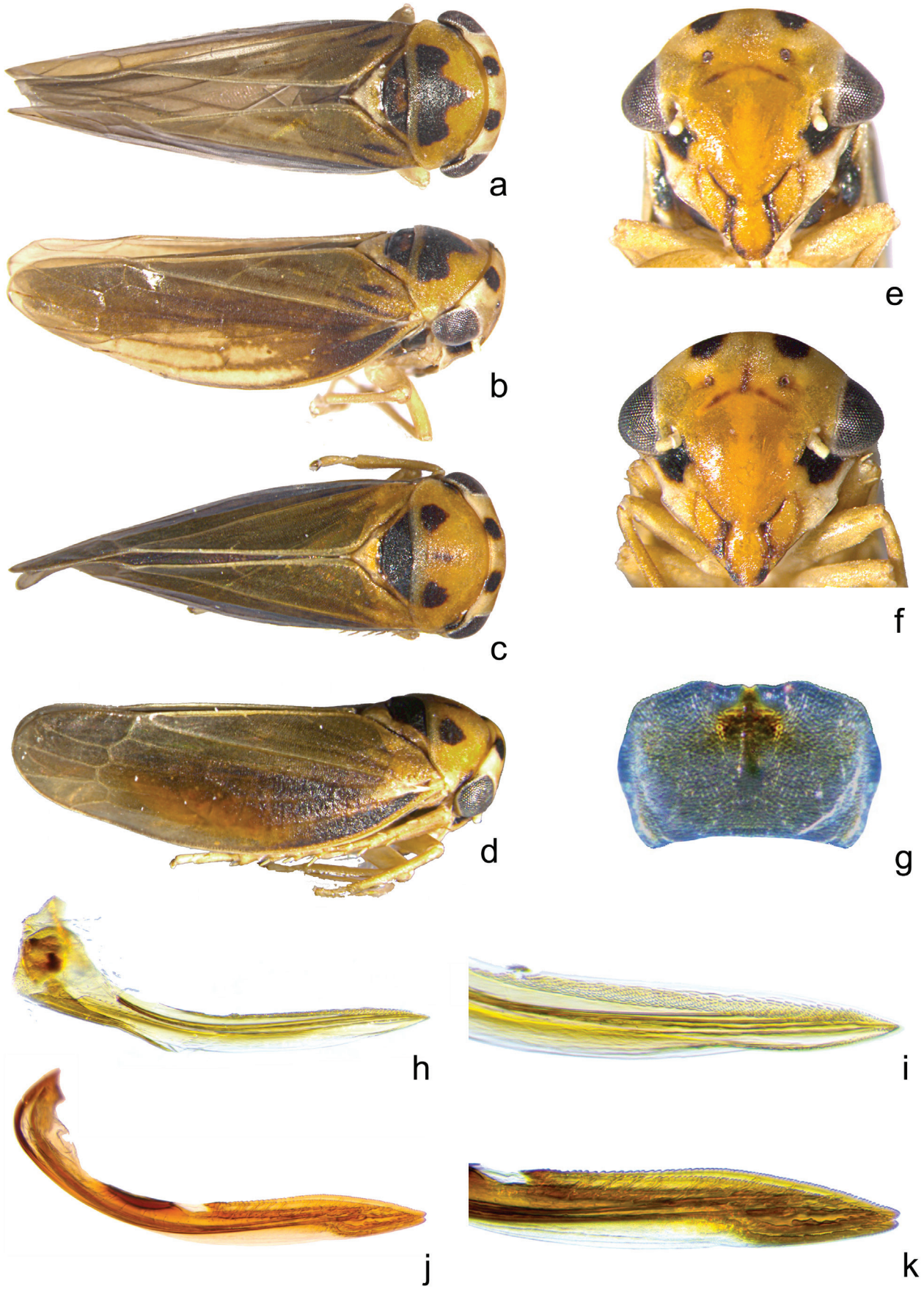

Figure 1. *Dianagallia yunnanica* Zhang & Webb, sp. nov. **a–c.** Dorsal habitus; **b–d.** Lateral habitus; **e, f.** Face; **g.** Female seventh sternite, ventral view; **h.** First valvulae; **i.** Apex of first valvulae; **j.** Second valvulae; **k.** Apex of second valvula; **a, b, e.** Male; **c, d, f.** Female.

Figure 2. *Dianagallia yunnanica* Zhang & Webb, sp. nov. **a–d.** Male genital capsule. **a.** Lateral view; **b.** Caudolateral view; **c.** Caudal view; **d.** Caudodorsal view; **e.** Subgenital plates; **f.** Aedeagus and connective, lateral view; **g.** Aedeagus, ventral view; **h.** Apex of aedeagal shaft, posterior view; **i.** Connective, dorsal view; **j.** Style, lateral view.

Remarks. This new species is similar to *D. gladiota* (Meshram & Rai, 2021), sharing a similar colour pattern on the head and thorax, as well as the general structure of aedeagus, pygofer processes and anal tube. However, it can be readily distinguished from *D. gladiota* by the following characters: male pygofer lobe with rectangular projection on caudodorsal margin (pygofer lobe rounded in *D. gladiota*); anal collar

process (Fig. 2a–d) bearing a sub-basal spur (absent in *D. gladiota*); and inner apical process of the aedeagal shaft (Fig. 2f–h) approximately two-thirds length of outer process (less than or equal to one-half length in *D. gladiota*).

Dianagallia gladiota **(Meshram & Rai, 2021), comb. nov.**

Igerna gladiota Meshram & Rai, 2021: 3721, figs 1, 2.

Remarks. This species was described from the Oriental Region. No material of this species was examined in the present study, but it was adequately described and illustrated by Meshram and Rai (2021).

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Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Artificial Intelligence (AI) use

The authors accept full responsibility for the content of the manuscript, including the disclosure of any use of AI.
No AI tools were used in the preparation of this manuscript.

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Author contributions

Bin Zhang: data curation, investigation, resources, writing – original draft, writing – review and editing and funding acquisition. Yangsheng Yu: investigation, resources, writing – original draft. M. D. Webb: data curation, supervision, writing – original draft, writing – review and editing.

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Data availability

All of the data that support the findings of this study are available in the main text.