

**FIRST RECORD OF LEAFHOPPER GENUS *APHELIONA* KIRKALDY, 1907
(HEMIPTERA: CICADELLIDAE: TYPHLOCYBINAЕ) FROM BANGLADESH**

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ABSTRACT: Hitherto the authors reported, a total of 3 genera *viz:* *Amrasca* Ghauri, 1967; *Distantasca* Dworakowska 1972; *Empoasca* Walsh, 1862 under the tribe *Empoascini* Distant, 1908 (Cicadellidae: Typhlocybinae) have been known to be reported in Bangladesh. In the course of the taxonomic survey on the empoascine leafhoppers from Bangladesh, we recorded another genus for the first time *Apheliona* Kirkaldy, 1907. The constituent species *Apheliona ferruginea* (Matsumura, 1931), is included in the faunal checklist of Bangladesh. Diagnostic descriptions, illustrations discriminating species and a revised checklist as well as the key to the genera under the tribe *Empoascini* from Bangladesh are also provided here.

Key words: Morphology, taxonomy, identification, *Empoascini*, new record, Bangladesh

INTRODUCTION

The microleafhopper under the tribe *Empoascini* Distant, 1908 (Cicadellidae: Typhlocybinae) is popularly known as jassid belongs to the subfamily Typhlocybinae, comprising more than 1000 described species in 67 genera worldwide (Qin and Zhang, 2008). Young (1952) considered *Empoascini* as a junior synonym of Typhlocybini in his comprehensive review of New World Typhlocybinae however, Mahmood and Ahmed (1968) considered those genera of *Empoasca* complex in the tribe *Empoascini*. Dworakowska (1979) further refined the definition of *Empoascini* to accommodate those genera lacking an appendix of the forewings and having the sub-marginal vein in the hindwings reaching but not exceeding the vein 'RP'+ 'MP' or 'RP'. Dietrich (2013) updated the taxonomic identification of Ahmed (1983), which recognized 5 tribes in the subfamily Typhlocybinae and distinguishes *Empoascini* from other leafhoppers under the subfamily by the absence of an appendix on the forewings and presence the sub-marginal vein between apices of veins 'MP' or 'RP'+ 'MP' and 'MP'+ 'CuA' in the hindwings.

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However, the empoascine fauna of Bangladesh have not yet studied, the number of reported genera and species likely represents only the diversity of the fauna. In Indian sub-continent, these are the key pest of vegetables and cotton chiefly amongst the crop family Malvaceae, Leguminosae and Solanaceae (Rahman, 2014; Hamilton, 1972). The nymphs and adults of jassid both directly harm to the plants by sucking sap, which causes stippling, cupping, puckering, and bronzing in the leaves as well as "hopper burn" symptoms that fall off (Kranthi *et al.*, 2009). Kranthi *et al.* (2009) also reported that transmitting the pathogens of different mycoplasmal/viral plant diseases results in indirect damage to plant by jassid.

The pest species order identification is crucial and important for proper pest management (Amin *et al.*, 2013). Therefore, the present study focuses on the identification of Typhlocybinae species in Bangladesh. Key to genera as well as a revised checklist under the tribe Empoascini in Bangladesh is also provided here.

MATERIAL AND METHODS

The study was carried out at Department of Entomology, Bangabandhu Sheikh Mujibur Rahman Agricultural University during November 2021 to October 2022. Microleafhopper specimens were collected from different parts of Bangladesh, which has been deposited at the Insect Museum, Department of Entomology, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur, Bangladesh.

The microleafhoppers were collected using a sweep net equipped with an extremely deep net bag, which was gradually opened and gathered using an aspirator as they made their way toward the opening. Then the specimen was then kept in an ethyl acetate-soaked cotton ball-filled falcon tube. Morphological terminology that used in the study follows Dietrich (2005). Specimen preparation, curation and male genital dissection were carried out by Kwon's procedure (Kwon, 1988). According to the methodology, taxonomic features were photographed using a digital camera and inspected using optical or stereo microscopes. The software Helicon Focus 5.1 was used to create images and was brought into Adobe Photoshop CS6 for plate composition and labeling. The whole body length measured in millimeters by used an ocular micrometer.

RESULTS AND DISCUSSION

Tribe Empoascini Distant, 1908

Type genus: *Empoasca* Walsh, 1862

Identifying characteristics: Ocelli well developed (except in *Paulomanus*); body moderately depressed; face in profile oblique, moderately horizontal.

Appendix of forewings absent; hindwings submarginal vein present between apices of veins 'MA' or 'RP'+ 'MA' and 'MP'.

Key to the genera of the tribe Empoascini Distant, 1908 in Bangladesh

1. Coronal suture long, extended onto face and terminating at level of antennal bases *Apheliona* Kirkaldy
- Coronal suture short, at most reaching anterior margin of crown 2
2. Forewing with vein 'MP' arising from 'm' cell *Amrasca* Ghauri
- Forewing with vein 'MP' arising from 'r' cell 3
3. Aedeagal shaft with appendages *Distantasca* Dworakowska
- Aedeagal shaft without appendages *Empoasca* Walsh

Genus *Apheliona* Kirkaldy, 1907

Type species: *Heliona bioculata* Melichar, 1903

Type locality: Ceylon

Identifying characteristics: Body rather robust; vertex approximately as long medially as next to eye, distinctly shorter than width between eyes. Head distinctly wider than maximum width of pronotum, with dark brown eyes except brownish-beige margins at their setting, coronal suture extended to face as median suture that passes level of bases of antennae. Anteclypeus flat or slightly convex; rostrum not extended to hind coxae. Forewings with stalked third apical cell, all main veins of hindwings pigmented and prominent. In male, second abdominal sternal apodeme with posterior lobes nearly parallel, extended well past posterior margin of sternite III but little or no beyond posterior margin of sternite IV.

Male genitalia: Anal tube processes well-developed, but not extended more than half distance to ventral margin of genital capsule, simple, smooth, curved anterad. Subgenital plates basal, depressed section subequal to or longer than distal, compressed section, apex compressed. Ventral process of pygofer lobes evenly curved upward, simple, acuminate, apex reaching or slightly surpassing posterior margin. Connective well sclerotized, not elongate, with distinct median lobe. Styles apophysis much longer than apodeme, preapical lobe absent, preapical setae sparse, inner margin of subapical part denticulate, apex tapered. Aedeagus with long base, rather often bearing processes near base of shaft, and with comparatively short, straight or weakly bent tubular shaft often compressed laterally; gonopore subapical, ventral.

***Apheliona ferruginea* (Matsumura, 1931) (Fig. 1-11)**

Identifying characteristics: Body robust, cylindrical; general color sordid ochre to fuscous. Vertex yellowish orange, short, approximately as long medially

as next to eyes, distinctly shorter than width between eyes; two pale brownish spots on lateral sides of midline. Head distinctly wider than maximum width of pronotum, coronal suture prominent; face broad, slightly shorter than median length. Pronotum anterior portion yellowish orange, with irregular pale brownish stripe laterally, posterior portion pale brownish orange, anterior margin rounded, posterior margin almost straight; scutellum also yellowish orange without any conspicuous spot or stripe, scuteller suture prominent. Forewings narrow, rounded apically, semitransparent, pale brownish, veins brown, third apical cell stalked; hindwings semitransparent, 'Cu_a' unbranched, all main veins pigmented and prominent. Second abdominal sternal apodeme in male with posterior lobes developed, parallel-sided.

Male genitalia: Pygofer lobes angularly pointed at apex, with very long awl-like process on ventral side. Subgenital plates with row of microsetae on ventral and caudal surfaces, row of macrosetae along dorsal margin and numerous long hairs near apex and at middle part. Anal tube processes massive on each side, connected with aedeagus base. Styles with row of teeth on inner margin near apex. Connective well sclerotized, not elongate, with distinct median lobe. Aedeagal shaft truncate at apex, semimembraneous, ornamented with papillae on sides at ventral margin near base, sclerotized ventral thickening.

Length: Male 3.2–3.4mm, female 3.9–4.1mm.

Materials examined: 3 males & 5 females, Bandarban, Bangladesh, on *Pueraria lobate*, 27.IX.2022, M.S. Hossain.

Distribution: India, **Bangladesh (New distribution)**, China, Korea, Japan, Taiwan.

Host plant: *Pueraria lobate* (Observed) (Figure 12).

Checklist of the tribe Emposcini from Bangladesh

A. Genus *Amrasca* Ghauri (1967)

Type species: *Amrasca splendans* Ghauri (1967)

Type locality: India

Recorded species

Amrasca (Amrasca) biguttula (Ishida, 1913)

Amrasca (Amrasca) biguttula (Ishida, 1913): Ahmed and Samad (1972)

Amrasca (Amrasca) biguttula (Ishida, 1913): Lu and Qin (2014)

B. Genus *Apheliona* Kirkaldy, 1907 (New record)

Type species: *Heliona bioculata* Melichar, 1903

Type locality: Ceylon

Recorded species

Apheliona ferruginea (Matsumura, 1931) (New record)

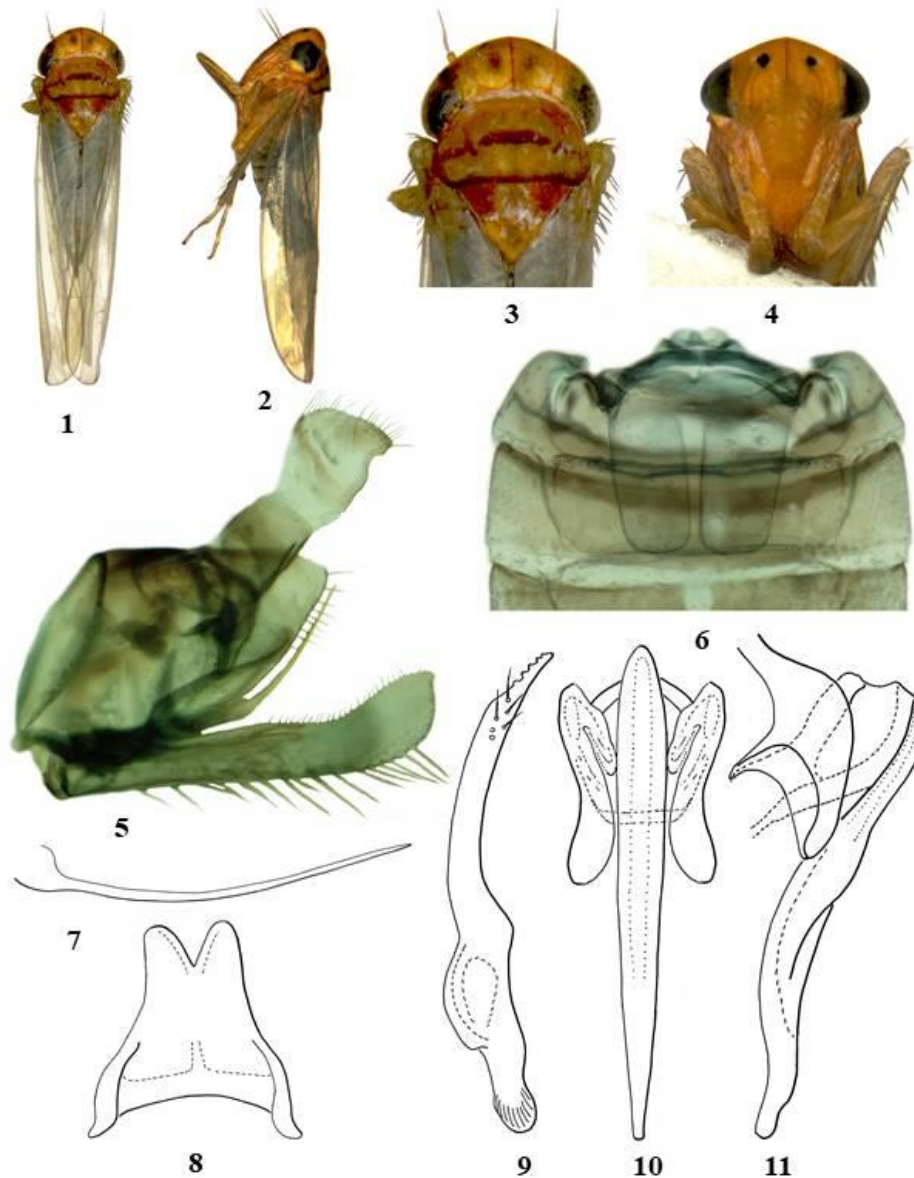


Fig. 1-11. *Apheliona ferruginea* (Matsumura, 1931): 1. Dorsal habitus; 2. Lateral habitus; 3. Head; 4. Face; 5. Pygofer lobe, lateral view; 6. Male abdominal apodemes; 7. Pygofer process, lateral view; 8. Connective; 9. Style; 10. Aedeagus (ventral view); 11. Aedeagus (lateral view).

C. Genus *Empoasca* Walsh, 1862

Type species: *Empoasca viridescens* Walsh, 1862

Type designation: Distant, 1908

Type locality: USA

Recorded species

Empoasca kerri Singh-Pruthi, 1940

Empoasca kerri Singh-Pruthi, 1940: DAE (2019)

Empoasca kerri Singh-Pruthi, 1940: Hossain et al. (2023)

Recorded species

Empoasca motti Singh-Pruthi, 1940

Empoasca motti Singh-Pruthi, 1940: Hossain et al. (2023)

Recorded species

Empoasca (Matsumurasca) onukii Matsuda, 1952

Empoasca (Matsumurasca) onukii Matsuda, 1952: Hossain et al. (2023)

Recorded species

Empoasca vitis (Göthe, 1875)

As synonym, *Empoasca flavescens* Fabricius: DAE (2019)

D. genus *Distantasca* Dworakowska 1972

Type species: *Empoasca terminalis* Distant (1918)

Type locality: India

Recorded species

Empoasca terminalis Distant (1918)

Empoasca terminalis Distant (1918): Ahmed and Samad (1972)

Empoasca terminalis Distant (1918): DAE (2019)

Empoasca terminalis Distant (1918): Hossain et al. (2023)



Fig. 12. *Pueraria lobate*, collection site with host plant (Bandarban District, Bangladesh)

CONCLUSION

As a result of this faunistic survey on the empoacine leafhoppers species from Bangladesh, the genus *Apheliona* Kirkaldy, 1907 has been reported for the first time from Bangladesh and the constituent species *Apheliona ferruginea* (Matsumura, 1931), is included in the checklist. In an agro-ecosystem, leafhoppers must be regularly observed and correctly identified in order to predict infestations and create management plans.

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