

RESEARCH PAPER

## Two New Records of Cicadellid Leafhoppers (Hemiptera: Cicadellidae) in Rice Ecosystem at Dumki Upazila of Bangladesh

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### ABSTRACT

Laboratory studies on the leafhopper (Hemiptera: Auchenorrhyncha) associated with rice ecosystem in the different area of Dumki Upazilla in Patuakhali during the period from October 2013 to April 2014 were done to identify different species of rice leafhoppers. Results revealed that 5 genera with 8 leafhoppers species, *Coelidia brevis* (Walker, 1851), *Cofana spectra* (Distant, 1908), *Maiestas dorsalis* (Motschulsky, 1859), *Nephotettix cincticeps* (Uhler, 1896), *Nephotettix malayanus* (Ishihara & Kawase, 1968), *Nephotettix nigropictus* (Stål, 1870), *Nephotettix virescens* (Distant, 1908), *Orosius orientalis* (Matsumura, 1914) were recorded. Among them two leafhoppers, *Cofana spectra* and *Orosius orientalis*; were newly recorded from Bangladesh. All species of leafhoppers were redescribed with male genitalia and proper illustrations.

**Key words:** Leafhopper, rice, species, taxonomic key, male genitalia.

### Introduction

Cicadellid leafhoppers are highly diverse and of a great concern to agriculture because several species are significant pests of a number of important crop plants, and they reach high population densities thereby damaging crops and/ or they are vectors of bacteria, phytoplasma, or viral pathogens. In the field level of Bangladesh, people are treating such species as simply leafhopper without confirming their identity at species level. Therefore, before knowing ecology, physiology and management strategies, detailed taxonomic work of those species are barely necessary for correct identification. Leafhoppers are small wedge shaped insects of various forms, colours, and sizes and distinguished by having one or more rows of small spines extending the length of hind tibia. The effective management of pest species from damaging the crop cannot be undertaken without accurate identification. The literature dealing with the identification and taxonomy of insects is scattered in many journals and monographs published over many years and in many languages, many of these works are very difficult to obtain. The broad objective of this work is to give a comprehensive account of leafhoppers found in rice ecosystems of Dumki Upazilla and preparation of taxonomic key for the identification of common species found in rice ecosystem. Hafizal and Idris (2014) reported that Delphacidae (planthopper) and Cicadellidae

Cicadellidae (leafhopper) populations are main insect pests of rice plants. But still many more localities are out of concern like Dumki Upazilla where students of PSTU from different Department now-a-days are working on different crops in this Upazilla. But they are treating many species wrongly with many more misidentifications due to lack of proper taxonomic knowledge and keys to family, genus and species of such insects. Gnaneswaran *et al.* (2008) reported that the leafhoppers were generally considered as two species but some other working groups suggest it includes more than two. Their study revealed that green leafhopper community in Sri Lanka includes five members. They are *N. virescens* (Distant), *N. nigropictus* (Stal), *N. malayanus* Ishihara & Kawase, and *N. parvus* Ishihara & Kawase, & *N. sympatricus* Ghauri. Morphological characteristics and structures of the male genitalia were used to identify the species. Naresh *et al.* (2014) reported that a new species, *Cofana trilobata* sp. was described and illustrated from Meghalaya, India along with illustrations of *Cofana lineata* (Distant, 1908) which was closely resembles. Diagnostic characters were given to separate these species, including a modified portion of the key by Krishnankutty & Viraktamath (2008) to *Cofana* of India. Keeping in mind the above mentioned problem, research work has been carried out to collect and identify the leafhoppers for ensuring the distributional range with taxonomic importance and to revise and arrange of leafhoppers

taxonomically in accordance with the modern reasonable classification system.

### Materials and Methods

Taxonomic study on rice leafhoppers was done to identify, describe and illustrate the species in Bangladesh. The laboratory works were carried out in the Department of Entomology at Patuakhali Science and Technology University, Dumki, Patuakhali during the period from October 2013 to April 2014. Geographically, the area is covered Gangetic Tidal Floodplain and falls under Agroecological Zone (AEZ-13). The area lies at 0.9 to 2.1 meter above mean sea level (Iftekhar and Islam, 2004). This region occupies a vast area of tidal floodplain land in the south-west part of Patuakhali district.

#### Collection

Leafhoppers were collected by a sweeping net (30 cm diameter), from boro rice field. Sweeping was done from the plant canopy level including the interspaces between the plants as well as close to basal portion of the plants as far as possible. The leafhoppers of 10 sweeps from each field were collected separately in a plastic bag.

#### Curating and specimen preparation

Collected specimens were killed by placing them directly into 70% ethyl alcohol. Preserved specimen was dipped in 99% ethyl alcohol for 2-3 seconds to wet the specimen, the placed in distilled water for 3-5 minutes.

Genital segment was separated by inserting a minute pin and kept in a test tube filled with 5-6 ml water, 1-2 pellets of 10% KOH, and 1-2 drops of filtered, saturated solution of Chlorazol black E powder in a hot water (80-90°C) bath for 3-5 minutes for clear observation. Then the segments were observed in glycerine jelly using a stereoscopic microscope (Zoom Stereo Microscope, BTB-3A).

#### Image and line drawing

Photographs of the specimen were made by using digital camera, and multifocusing system using software (Helicon Focus 5.1). The line drawings of the genital segment were prepared by using HP scanner and adobe photoshop CS<sub>3</sub>.

### Results and Discussion

The leafhoppers (Hemiptera: Cicadellidae) associated with rice ecosystem of Dumki Upazilla were collected and studied taxonomically at species level. The following five genera along with eight species belong to leafhoppers were recognized in current investigation: *Coelidia brevis* (Walker, 1851), *Cofana spectra* (Distant, 1908), *Maiestas dorsalis* (Motschulsky, 1859), *Nephotettix cincticeps* (Uhler, 1896), *Nephotettix malayanus* (Ishihara & Kawase, 1968), *Nephotettix nigropictus* (Stål, 1870), *Nephotettix virescens* (Distant, 1908), *Orosius orientalis* (Matsumura, 1914). These species were comprehensively studied, and taxonomic description with proper illustrations were provided here under.

***Nephotettix Virescens* (Distant, 1908); Figure 1(A-G)**  
*Selenocephalus virescens*: Distant, 1908: 290-291, 359-360.

*Nephotettix bipunctatus*: Kato, 1933: 29 (Korea).

*Nephotettix virescens*: Lee and Kwon, 1979: 856

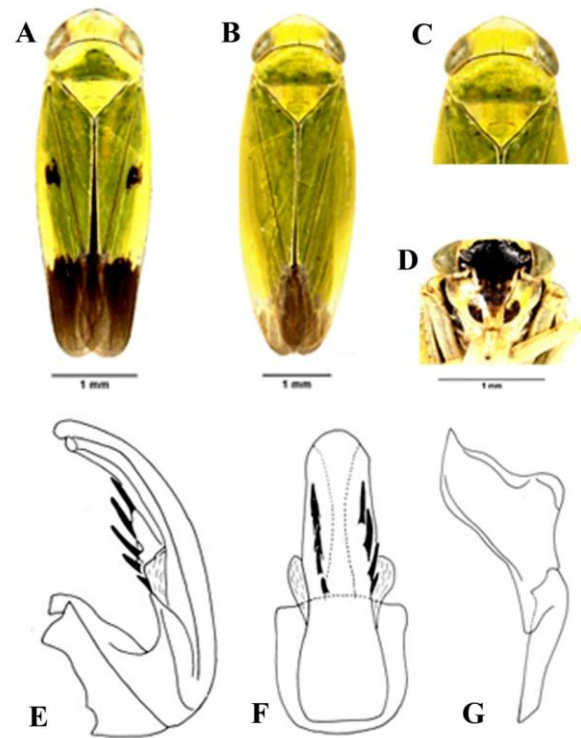


Figure 1. *Nephotettix virescens* (Distant, 1908): A. Male (Dorsal view); B. Female (dorsal view); C. Head and thorax; D. Frons; E. Aedeagus (left lateral view); F. Ditto (ventral view); G. Paramere

**Description** - Body length (including forewing): male 4-4.3mm (N= 22), female 5-5.5mm (N= 13); forewing length: male 3.5-3.8mm (N= 22) and female 4-4.5mm (N= 13)

**Coloration**- General color is greenish. Its vertex is with or without an anterior black band and a sub marginal black band extending beyond the ocelli to the inner margins of the eyes. The face is green. Its pronotum is smooth with or without a black anterior margin. A pair of black spots is either present on the forewings. It is transparent, white and shiny. As it matures, it turns yellowish to green with black markings on the head, thorax, and abdomen. As the insect matures, blackish markings on the abdomen become more prominent as well as the blackish band on the last abdominal segment.

**Head and thorax**- The body of adult is slender. Head is rounded. Vertex usually unmarked with distinct furrow, and longer in middle than next to eye, appearing quite pointed in most specimens. Vertex length more or less 1mm and wide more or less 1.5mm. Distance between two eyes is 1mm. Vertex tip to metanotum distance or length is 1.5mm. Length of frons is more or less 1mm. The length between two eyes is 1.5 times greater than the wide. Head, pronotum and scutellum usually green but some males have black markings adjacent to ocelli. Forewing usually no mark, submarginal band present, either complete or separate at the middle. Apical third of

tegmen black in males; females with unmarked head, pronotum and clavus.

**Male genitalia-** Subgenital plate off-white or partly black. Corners of male pygofer rounded with 1 long and 4 smaller spines. Aedeagus with 3-5 pairs of spines located in the middle of the shaft.

**Materials examined-** 16 male, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; M. A. Rahman; 11 female, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; 13 male, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 10 female, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 6 male, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; 8 female, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; all same collector.

**Host plants-** *Cynodon dactylon* (L.), *Eleusine indica* (L.), *Panicum ramosum* (L.), Rice, *Saccharum officinarum* (L.), Wild rices and *Zea mays* (L.)

**Distribution-** Bangladesh, Burma, Hong Kong, India, Indonesia, Laos, Malaysia, Pakistan, Philippines and Taiwan.

***Nephotettix nigropictus* (Stål, 1870); Figure 2 (A-G)**

*Nephotettix nigropictus*: Stål, 1870: 740

*Nephotettix nigropictus*: Gnaneswaran, 2008: 414-418

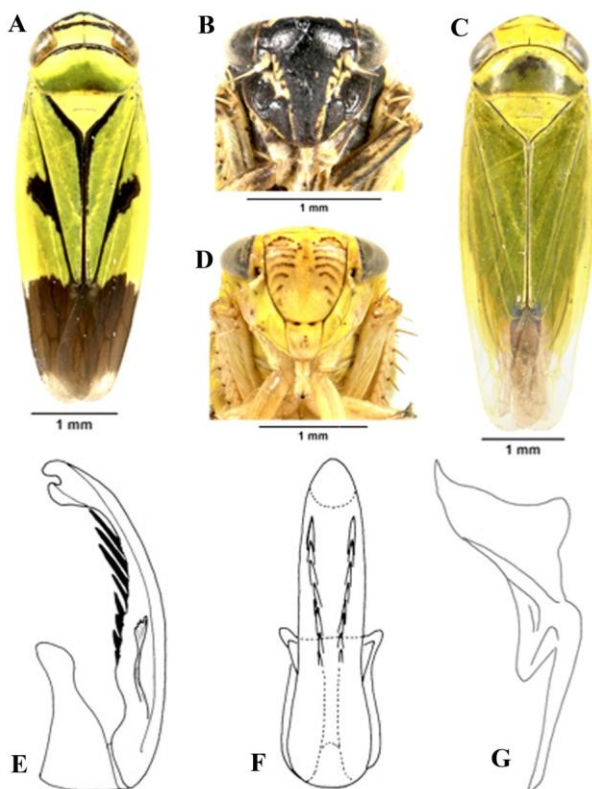


Figure 2. *Nephotettix nigropictus* (Stål, 1870); A. Male (Dorsal view); B. Frons (male); C. Female (dorsal view); D. Frons (female); E. Aedeagus (left lateral view); F. Ditto (ventral view); G. Paramere

**Description-** Body length (including forewing): male 4.5-5mm (N= 14), female 5-5.5mm (N= 16); forewing length: male 3.8-4mm (N= 14) and female 4-4.5mm (N= 16)

**Coloration-** Anterior margin of pronotum and scutellum black. Usually a well- marked species in both the male and female with well-developed black or dark brown marginal and submarginal bands on the head. The forewings are bright green with dark markings, mark touches claval suture, submarginal band complete. Front side of the abdomen is black and backside of the abdomen is brown in color.

**Head and thorax-** The body of adult is slender and head is more or less round. Vertex length more or less 2.5mm and wide more or less 1.5mm. Distance between two eyes is 1mm. Vertex tip to metanotum distance or length is 2.5mm. Length of frons is more or less 1.25mm. The length between two eyes is 1.5 times greater than the wide.

**Male genitalia-** Male genitalia with aedeagus bearing 8 pairs of spines on the shaft. Distoventral corner of pygofer with lobe bearing one long and four smaller spines.

**Materials examined-** 10 male, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; M. A. Rahman; 12 female, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; 8 male, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 6 female, , Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 7 male, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; 5 female, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; all same collector.

**Host plants-** *Echinochloa colona* (L.), *Eleusine indica* (L.), Rice, *Saccharum officinarum* (L.), Wild rices and *Zea mays* (L.)

**Distribution-** Australia, Bangladesh, Burma, China, Guinea, India, Indonesia, Malaysia, Nepal, New Hong Kong, Pakistan, Philippines, South Vietnam, Sri Lanka and Thailand

***Nephotettix cincticeps* (Uhler, 1896); Figure 3 (A-F)**

*Selenocephalus cincticeps*: Uhler, 1896: 292 (Japan).

*Nephotettix apicalis cincticeps*: Okamoto, 1924: 591-8.

*Nephotettix bipunctatus cincticeps*: Doi, 1933, 15: 9110.

*Nephotettix cincticeps*: Ko, 1969: 21 (Korea); Nast, 1972: 355; Kwon and Huh, 1995: 30-315.

**Description-** Body length (including forewing): male 4.3-4.5mm (N= 21), female 5-5.6mm (N= 11); forewing length: male 3.8-4mm (N= 21) and female 4-4.3mm (N= 11)

**Coloration-** General colour green to grey with brown or black band on tip of elytra in male. Crown light green with distinct black transverse line near anterior margin; pronotum with anterior half green, posterior half brown; scutellum green; elytra light green, broad brown or black band on apex in males; markings absent in females; green turns gray in old specimen. Males-head with black submarginal band between eyes, apical third of forewing black. Submarginal band of vertex often not touching inner margins of eyes, forewings without dark markings.

**Head and thorax-** The rounded head and black markings in the males. Submarginal band distinct, Vertex length more or less 2mm and wide more or less 1.5mm. Distance between two eyes is 1mm. Vertex tip to metanotum distance or length is 2.5mm. Length of frons

is more or less 1.25mm. The length between two eyes is two times greater than the wide.

**Male genitalia-** Pygofer with distoventral corner pointed, with one long spine and a group of 3.0-5.0mm small spines. Parameres with internal process curved and short in comparison with base of paramere. Aedeagus with shaft in ventral view constricted; apex in lateral view swollen; dorsal longitudinal carinae convex in lateral aspect with 5 pairs of spines located in middle of aedeagal shaft.

**Materials examined-** 10 male, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; M. A. Rahman; 5 female, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; 12 male, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 7 female, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 5 male, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; 5 female, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; all same collector.

**Host plants-** *Alopecurus aequalis* Sobol, *Avena fatua* (L.), *Leersia oryzoides* (L.), *Leersia japonica* Honda and Rice.

**Distribution-** Bangladesh, China, Japan, Korea and Taiwan.

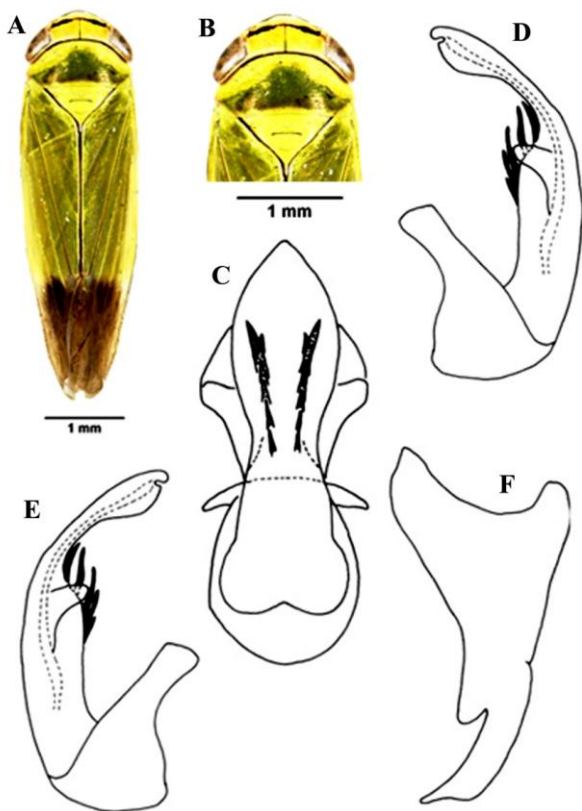


Figure 3. *Nephotettix cincticeps* (Uhler, 1896): A. Male (dorsal view); B. Head and thorax; C. Aedeagus (ventral view); D. Ditto (left lateral view); E. Ditto (right lateral view); F. Paramere

***Nephotettix malayanus* (Ishihara & Kawase, 1968); Figure 4(A-G)**

*Nephotettix malayanus*: Ishihara & Kawase, 1968: 119-123.

*Nephotettix malayanus*: Gnaneswaran, 2008: 414-418

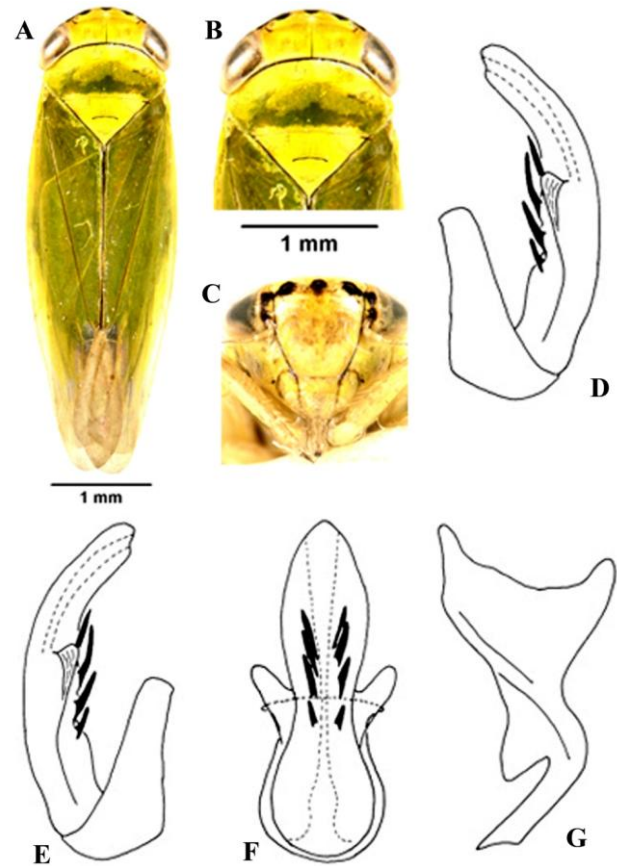


Figure 4. *Nephotettix malayanus* (Ishihara & Kawase, 1968): A. Male (dorsal view); B. Head and thorax; C. Frons (male); D. Aedeagus (left lateral view); E. Ditto (right lateral view); F. Ditto (ventral view); G. Paramere

**Description-** Body length (including forewing): male 4.5-5mm (N= 13), female 4.8-5.5mm (N= 15); forewing length: male 3.5-4mm (N= 13) and female 4-4.5mm (N= 15)

**Coloration-** Overall pale green Pronotum, scutellum and clavus unmarked in male and female. In the female there are fine lines on anterior margin inwards of ocelli. In the male the apical margin of vertex is finely marked black with remnants of the submarginal band behind ocelli only. Vertex rounded in both sexes; frons with two black spots and transverse lines. Apical third of tegmen black in male.

**Head and thorax-** The body length of adult is slender. Submarginal band reduced to posterior to ocelli. Vertex length more or less 1.5mm and wide more or less 1.5mm. Distance between two eyes is 1mm. Vertex tip to metanotum distance or length is 2mm. Length of frons is more or less 1.5mm. The length between two eyes is 1.5 times greater than the wide.

**Male genitalia-** Subgenital plates black. Posteroventral corner of pygofer rounded and distoventral corner pointed with 1 large black pygofer spine present. Aedeagus with shaft in ventral view constricted in middle, median paraphyses short, dorsal longitudinal carinae in lateral view slightly concave with 4 pairs of separated spines located in middle.

**Materials examined-** 13 male, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; M. A. Rahman; 9 female, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; 11 male, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 6 female, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 3 male, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; 5 female, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; all same collector.

**Host plants-** Barley, Citrus, Maize (Corn), Other (grasses/cereals), Rice, Sorghum, Sugarcane and Wheat.

**Distribution-** Bangladesh, Burma, China, India, Malaysia, Philippines, Sri-Lanka and Taiwan

***Maiestas dorsalis* (Motschulsky, 1859); Figure 5(A-G)**  
*Deltocephalus dorsalis*: Motschulsky, 1859: 114 (Ceylon).

*Inazuma dorsalis*: Nast, 1972: 343 (Korean peninsula).

*Recilia (Inazuma) dorsalis*: Lee and Kwon, 1979: 802-5.

*Recilia dorsalis*: Kwon, et al., 1996: 122 (Korea).

*Maiestas dorsalis*: Webb and Viraktamath, 2009: 1-64.

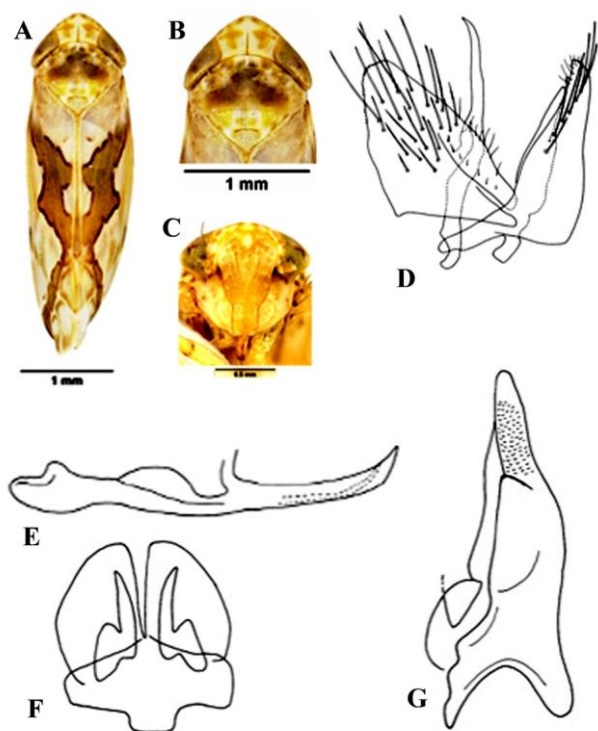


Figure 5. *Maiestas dorsalis* (Motschulsky, 1859): A. Male (dorsal view); B. Head and thorax; C. Frons (male); D. Male genitalia (lateral view); E. Aedeagus (lateral view); F. Subgenital plates (ventral view); G. Paramere

**Description-** Body length (including forewing): male 3.5-4mm (N= 11), female 4-4.5mm (N= 14); forewing length: male 3-3.5mm (N= 11) and female 3.5-3.8mm (N= 14)

**Coloration-** Dorsum yellow or white. Color pattern red or orange or brown. Ocelli black, Vertex with orange parallel submedial lines. Vertex midline pale. Anteclypeus brown or black. Pronotum dark with pale lateral margins or pale with two longitudinal stripes.

Mesonotum pale, with dark lateral triangles, apex concolorous with rest of mesonotum. Thoracic venter with dark mesosternum, remainder pale. Forewings without oblique vittae or with oblique vittae usually forming continuous zigzag pattern, without cross bands or with 3 narrow cross bands.

**Head and thorax-** Vertex as long as wide with a median sulcus at base, anteriorly acutely angled in male and less so in female; disc shagreened. Face convex, shagreened as long as wide; clypeus longer than wide. Pronotum 2.15 times as wide as long and 1.2 times as long as vertex, with convex anterior margin and concave posterior margin; basal 0.25 shagreened and the remaining rugulose. Scutellum as long as pronotum, shagreened, with a median transverse line. Tegmina 3.95 times as long as wide.

**Male genitalia-** Pygofer lobe angulate. Pygofer dorsal appendage bifurcate near base, branches widely separated, extended beyond pygofer apex, straight or very slightly curved in dorsal view, straight in lateral view. Dorsal branch of pygofer dorsal appendage shorter than ventral branch. Aedeagus ventral processes placed basally, well separated from shaft, shorter than shaft, parallel to each other on ventral side of shaft, simple. Aedeagus distal processes short, apical, tooth-like.

**Materials examined-** 20 male, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; M. A. Rahman; 12 female, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; 10 male, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 5 female, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 8 male, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; 5 female, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; all same collector.

**Host plants-** *Cynodon dactylon* (L.), *Cyperus rotundus* (L.), *Echinachloa colona* (L.), *Hordeum vulgare* (L.), *Oryza sativa*, *Saccharum officinarum* (L.) and *Triticum aestivum* (L.)

**Distribution-** Australia, Bangladesh, Bhutan, Burma, China, India, Indonesia, Japan, Kampuchea, Korea, Laos, Malaysia, Pakistan, Philippines, Sri Lanka, Taiwan, Thailand and Vietnam.

***Cofana spectra* (Distant, 1908); Figure 6(A-G)**

*Tettigoniella spectra* Distant, 1908: 1-501

*Cofana* Melichar, 1926: 273-394

**Description-** Body length (including forewing): male 8.5-11.8mm (N= 05), female 8.3-13mm (N=07); forewing length: male 7.5-10.5mm (N= 05) and female 7.2-12mm (N= 07)

**Coloration-** The body of *Cofana spectra* is yellowish, the forewings grey-white with prominent veins and the head bear four black spots.

**Head and thorax-** Head not strongly produced, anterior margin varying from narrow to broadly round in dorsal view; ocelli usually aligned with anterior eye angles, or slightly more posteriorly each closer to adjacent anterior eye angle than to median line of crown. Crown with or without a concavity across ocelli. Vertex length more or less 2mm and wide more or less 2.5mm. Distance between two eyes is 2mm. Vertex tip to metanotum distance or length is 3mm. Length of frons is more or less 2mm. The length between two eyes is two times

greater than the wide. Thorax with pronotal width varying in comparison to transocular width of head. Forewing usually hyaline and without a membrane, veins usually distinct.

**Male genitalia-** Male genitalia with pygofer moderately produced with posterodorsal margin convex, posteroventral margin oblique, with a number of large macrosetae near apex and parallel to posteroventral margin, usually with a group of microsetae parallel to ventral margin, without setae on disk, pygofer processes absent; pygofer without more lightly sclerotized areas of flexion.

**Materials examined-** 5 male, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; M. A. Rahman; 2 female, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; 3 male, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 4 female, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 4 male, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; 2 female, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; all same collector.

**Host plants-** *Cyperus rotundus* (L.), *Echinochloa colona* (L.), *Hordeum vulgare* (barley), *Oryza sativa* (rice), *Pisum sativum* (pea), Poaceae (grasses), *Saccharum officinarum* (sugarcane), *Sorghum bicolor* (sorghum) and *Triticum* (wheat)

**Distribution-** Africa, Australia, Bangladesh (new record) and Oriental region

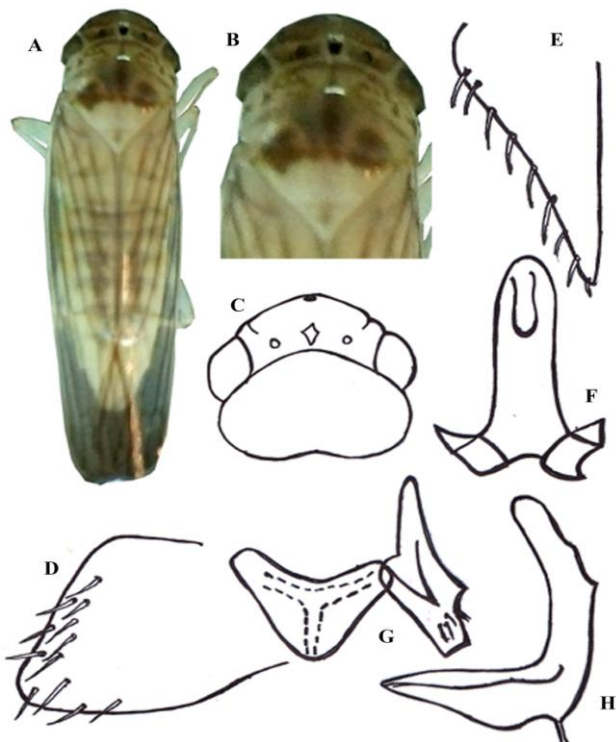


Figure 6. *Cofana spectra* (Distant, 1908): A. Male (dorsal view); B. Head and thorax; C. Head and pronotum; D. Male pygofer (lateral view); E. Male plate (ventral view); F. Aedeagus (caudoventral view); G. Style and connective (dorsal view); H. Aedeagus (lateral view)

***Coelidia brevis* (Walker, 1851); Figure 7(A-F)**

*Tettigonia brevis*: Walker, 1851:774

*Coelidia brevis*: Metcalf, 1964: 43

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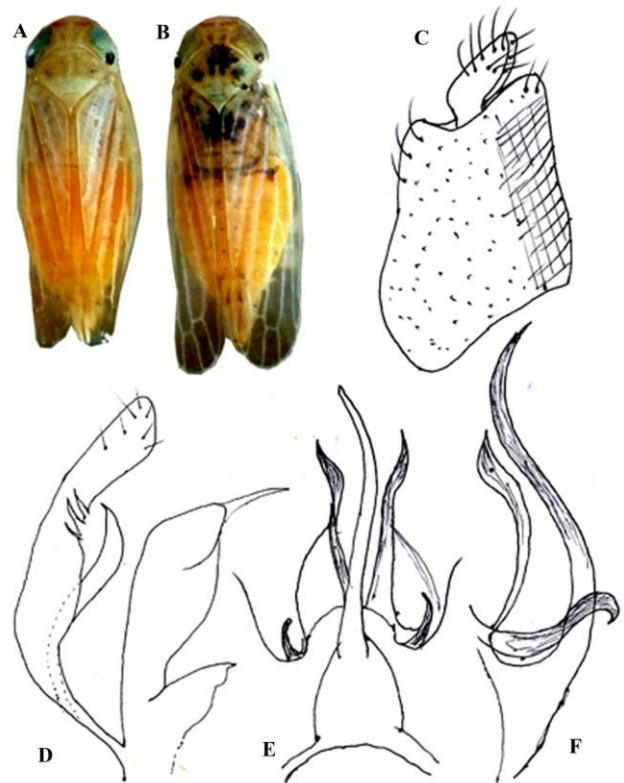


Figure 7. *Coelidia brevis* (Walker, 1851): A. Male (dorsal view); B. Female (dorsal view); C. Anal segment (ventral view); D. Paramere (right lateral view); E. Aedeagus (ventral view); F. Ditto (left lateral view)

**Description-** Body length (including forewing): male 3-3.5mm (N= 08), female 3.5-4.3mm (N= 11); forewing length: male 2.8-3mm (N=08) and female 3.2-4mm (N= 11)

**Coloration-** Head of the adult is red or deep orange color. Both pair of eyes is black in color. Thorax and abdomen are brown in color. Both pair of wing is transparent i.e. wing venation is transparent.

**Head and Thorax-** Body small and slender. Vertex rounded, length of the vertex more or less 1mm and wide more or less 1mm. Distance between two eyes is 0.80mm. Vertex tip to metanotum distance or length is 1.5mm. Length of frons is more or less 1mm. The length between two eyes is 1.25 times greater than the wide.

**Male genitalia-** Anal tube contains anal style which bears hair like process. Paramere bears 3-4 pairs of spine and also contain sigmoid shape process, at the tip of paramere contains beak like process. Aedeagus have 3 process, largest one is main genital process another 2 small process arises from basal portion of aedeagus.

**Materials examined-** 10 male, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; M. A. Rahman; 5 female, PSTU farm, Dumki, Patuakhali, BD, 14 January, 2014; 8 male, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 4 female, Jhatra, Dumki, Patuakhali, BD, 9 Nov, 2013; 5 male, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; 5 female, Rajakhali, Dumki, Patuakhali, BD, 19 Nov, 2013; all same collector.

**Host plants-** Barley, Grasses, Rice, Sugarcane and Wheat

*Distribution*- Bangladesh, Burma, China, Laos and Vietnam.

***Orosius orientalis* (Matsumura, 1914); Figure 8(A-G)**

*Eutettix orientalis*: Matsumura, 1914: 192 (Japan).

*Nesophrosyne orientalis*: Lee and Kwon, 1977: 791.

*Orosius orientalis*: Lee and Kwon, 1979: 921-3.

*Description*- Body length (including forewing): male 4-4.5mm (N=01), female 4.5-5.3mm (N= 01); forewing length: male 3.3-3.8mm (N= 01) and female 4-4.5mm (N= 01)

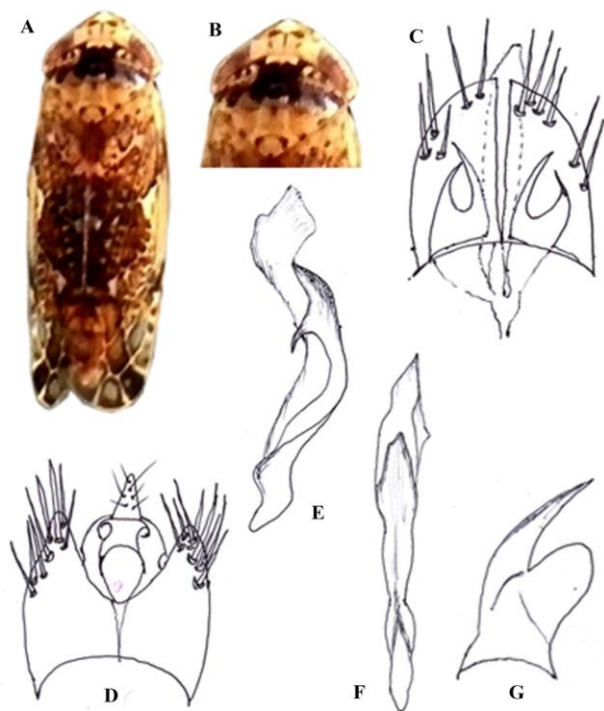


Figure 8. *Orosius orientalis* (Matsumura, 1914): A. Male (dorsal view); B. Head and thorax; C. Pygofer (ventral view); D. Ditto (dorsal view); E. Aedeagus (left lateral view); F. Ditto (ventral view); G. Paramere

*Coloration*- General body color is creamy white color with brown spots. Forewing also creamy color with brown spot. Ocelli creamy white in color. Vertex contain brown band. Pronotum and metanotum contain brown spot. Scutellum brown color with 2 prominent white spot

*Head and thorax*- Vertex round shape. Vertex length more or less 1.5mm and wide more or less 2.5mm. Distance between two eyes is 1mm. Vertex tip to metanotum distance or length is 2.5mm. Length of frons is more or less 1.7mm. The length between two eyes is 1.5 times greater than the wide. Numerous spine present on the legs. Anal tube contains anal style which bears hair like process. Paramere bears 3-4 pairs of spine and also contain sigmoid shape process, at the tip of paramere seems beak like process. Aedeagus have 3 process, largest one is main genital process another 2 small process arises from basal portion of aedeagus.

*Male genitalia*- Pygofer symmetrical. Anal tube contains anal style. Paramere bears a pair of processes

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with numerous hair like spines, at the tip of the processes seems beak like structure, numerous hair like spines. Aedeagal with ventral pair of Processes. Aedeagus slightly curve shape.

*Materials examined*- 1 male, PSTU farm, Dumki, Patuakhali, BD, 13 Nov, 2013; M. A. Rahman; 1 female, PSTU farm, Dumki, Patuakhali, BD, 13Nov, 2013; all same collector.

*Host plants*- Bean, Grasses, Potato, Rice and Tomato

*Distribution*- Australia, Bangladesh (new record), India, Japan, Myanmar and Taiwan.

## Conclusion

From the findings of the present research work it can be concluded that eight leafhoppers species were recognized from Dumki Upazilla. Among them two leafhoppers (*Cofana spectra* and *Orosius orientalis*) were newly recorded from Bangladesh. Description with genital photographs of other six leafhoppers were not available in Bangladesh previously, those are now available in this work for further advanced research.

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