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RESEARCH PAPER

Taxonomic Identification of *Aulacophora* (Coleoptera: Chrysomelidae) Species in Cucurbits from the Southern part of Bangladesh

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ABSTRACT

Species of the genus *Aulacophora* Chevrolat, 1836 from Southern part of Bangladesh had been intensively studied in the field and in the Taxonomic Lab of Patuakhali Science and Technology University during the period from July, 2018 to June 2019 which caused serious damage to cucurbits. The following five species of *Aulacophora* were recognized morphologically with a newly recorded species for the first time in Bangladesh and an unidentified species wasn't confirmed yet at species level: *Aulacophora foveicollis*, *A. indica*, *A. abdominalis*, *A. lewisii* **rec. nov.** and *Aulacophora* sp.(?). Key to species of *Aulacophora* and redescription of all species were presented with proper illustrations. New locality records for *A. lewisii* were added herein. Morphological illustrations of all species were provided for correct identification and further comparison with other species of cucurbits in Bangladesh.

Key words: *Aulacophora*, Bangladesh, cucurbit vegetables, new record, pumpkin beetle

Introduction

Bangladesh is a humid and subtropical country which provides congenial environment compatible for the bountiful growth of insect pest. High incidence of insect pest is considered as the major common constraint in the successful production of cucurbitaceous vegetables in Bangladesh (Rahman and Uddin, 2016). Cucurbits are severely attacked by 12 insect pests (Ali et al,. 2016), where different species of *Aulacophora* Chevrolat (Coleoptera: Chrysomelidae: Galerucinae) are able to feed on leaves, flower buds, flowers voraciously which causes 30-100% losses in the field (Rashid et al., 2014). Both larval and adult stage of those beetles is injurious to crop and cause severe damage to almost all cucurbits from the seedling stage (Rahman and Prodhan, 2017). The adult beetles feed on the leaves making irregular holes and also attack the flowers and flower buds where larvae feed on root tissues (Guruswamy et al., 1995), stems and fruits touching to the ground. Thus taxonomic study on the species of *Aulacophora* is barely necessary before management of these notorious pests.

The genus *Aulacophora* Chevrolat was named in 1836 by the French entomologist Louis A. A. Chevrolat in Dejean's Catalogue des Coleopteres. This genus is fairly constant in its general form, and its characteristics can easily be recognized. The following combination of characters distinguishes the genus from other genera in the sub family Galerucinae: Body oblong, somewhat broadened posteriorly; antennal insertions generally separated, situated near but behind, anterior margins of eyes; vertex and pronotum not heavily puncture; anterior coxal cavities open behind; pronotum with a transverse depression, sometimes interrupted in the middle; elytra often pyriform, glabrous, the elytral epipleuron distinctly abbreviated behind middle; last abdominal sternite of male trilobed, with median lobe always distinct; tibiae distinctly spined apically; tarsal claws bifid (Mohamedsaid, 1994). The species of this genus are widely distributed including 186 species in the world and about 82 species in the Southeast Asia (Barroga and Mohamedsaid, 2006).

In Bangladesh one species, *Aulacophora (=Raphidopalpa) foveicollis* (Lucas, 1849), commonly known as Red pumpkin beetle was reported by many authors from cucurbitaceous vegetable crops. A blue colored species, *Aulacophora artipennis* as blue pumpkin beetle was recognized by Khan et al. (2010) based on body coloration in bitter gourd without providing any illustration of genitalia except adult. The

orange colored beetle, *A. abdominalis* was also reported as serious and major pest of those crops in Bangladesh (Alam, 1969; khan 2018). Ali et al. (2016) included cucumber beetle (*Aulacophora indica)* in the list of insect pests associated with cucurbits from Bangladesh. All the authors above were identified the species of *Aulacophora* based on the external coloration of the adult without considering the genitalia, whereas male genitalia is considered as morphological marker of species identification. Therefore, there is a high chance of misidentification if species are identified only based on coloration. Thus, the genus *Aulacophora* should be studied intensively on the basis of taxonomical characters to prepare a taxonomic key to available species for proper identification and confirmation of the species level of this genus in Southern part of Bangladesh.

Materials and Methods

This study was conducted for the taxonomic identification of *Aulacophora* from Southern part of Bangladesh in Systematic Entomology Laboratory, Department of Entomology, Patuakhali Science and Technology University, Dumki, Patuakhali, Bangladesh during the period from July 2018 to June 2019.

Taxonomic Identification

*Sample collection***-** Cucurbit beetles were collected with a sweep net and stored in a plastic bag containing cotton balls soaked in ethyl acetate. Sometimes light trap using white cloths was used for collecting beetle with aspirator.

Curating and specimen preparation- Collected specimens were killed in various ways by placing them directly into 70% ethyl alcohol or putting them in killing jars containing a cotton ball soaked in ethyl acetate or freezing the specimens. Adult specimens were kept by usual pinning or with glue to a point of triangle paper on the right side of the specimen. Then data was labeled including locality (country, province, nearest town, specific location, latitude etc.), date, collector and host plant (if possible).

Accurate species identification of cucurbit beetles requires examination of the structure of the male genitalia or in some cases female genitalia. To examine these structure distal abdominal or genital segments was removed with a pair of minute insect pins. After removal of these segments the remainder of the body parts was dipped into 99% ethyl alcohol again for several seconds to hasten dehydration, then carefully laid on filter paper to dry in open air. Once dry it may be remounted onto a card point. Then, the distal abdominal or genital segment was macerated keeping in a test tube filled with 6-7 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 ($80\text{-}90^0$) bath for 3-5 minutes for good observation. After thorough washing in distilled water the genital segment was transferred into a watch glass filled with a modifier Hood's solution (75% ethyl alcohol 70 parts: glycerin 25 parts: glacial acetic acid 5 parts) for further dissection. Then the segment was observed in glycerine gelly using a stereoscopic microscope (Optic Ivymen System). Photographs of the specimen were made using digital camera (SXY 150). After all examinations the genital structure was preserved in transparent plastic tubes filled with glycerin and capped the tube well, then the prepared tube was pinned under specimen.

Image and plate composition- Images were produced by multi-focus system using the software Helicon Focus 5.1 Line drawings was scanned with HP Scanjet 4850 and imported into Adobe Photoshop CS3 for labeling and plate composition (Rahman, 2012).

Results and Discussion

Taxonomic Identification

The insects under the genus *Aulacophora* is a serious pest of cucurbits which are distributed all over the world. There are several species under this genus. All over the world about 186 species are identified. In our country the most available species is *Aulacophora foveicollis* known as red pumpkin beetle. Another blue color beetle was also found in our country. Species of *Aulacophora* from different districts of southern part of Bangladesh had been collected and intensively studied in the field and in the Systematic Entomology Lab of Patuakhali Science and Technology University during the period from July, 2018 to June 2019. The following five species of *Aulacophora* were recognized taxonomically with one newly recorded and one unidentified species from Southern part of Bangladesh: *Aulacophora foveicollis*, *A. indica*, *A. abdominalis*, *A. lewisii* **rec. nov.** and *Aulacophora* sp.(?).

Among the five species the sample of *Aulacophora indica* was collected from the districts of Jessore, Khulna, Narail and Barishal. Sample of *Aulacophora abdominalis* was collected from Bauphal, Patuakhali. The sample of *Aulacophora lewesii* **rec. nov.** was collected from Narail and Barishal and sample of unidentified one was collected from Jessore and Dumki, Patuakhali.

Among the recognized species of *Aulacophora* from southern part of Bangladesh four species (*Aulacophora foveicollis, Aulacophora indica*, *Aulacophora abdominalis* and *Aulacophora ?*) was reddish to yellowish color elytra and *Aulacophora lewisii* **rec.nov.** was dark blue color elytra. In this research species were identified by observing their color, wing, aedeagus, gonocoxae, 5th abdominal sternite , abdominal ventrite etc. A taxonomic key was prepared and shown below with description of recognized species from Southern part of Bangladesh

Key to species of *Aulacophora* was presented from Southern part of Bangladesh

1. Elytra shinny dark blue color; Fig.1(1)……...*A. lewisii*
- Elytra light or dark reddish color; Fig. 1 (2-5) …… 2

2. Apex of aedeagus hook-like; Fig. 1 (8,9) …….. 3
- Apex of aedeagus not hook-like; Fig.1 (7,10)…….. 4

3. Middle lobe of 5th abdominal ventrite longer than side lobes; side lobes narrow with pointed apex; Fig. 1 (14). ……*A. indica*
- Middle lobe of 5th abdominal ventrite emarginated; side lobes with broader apex; Fig. 1 (13) …..... *A. abdominalis*

4. Apex of aedeagus V-shaped, short and stout; middle lobe of 5th abdominal ventrite longer than side lobes; Fig. 1 (7,12)…….. *A. foveicollis*
- Apex of aedeagus pointed, elongated and curved; middle lobe of 5th abdominal ventrite almost equal in length; Fig. 1 (10,15)…..... *Aulacophora* sp. (?)

***Aulacophora lewisii* Baly, 1886 ; Fig. 2 (a-j)**

Aulacophora lewisii Baly, 1886: 24 (China); Baly, 1888: 179 (India, Malaysia); Duvivier, 1892: 430 (India: Mandar); Chen & Kung, 1959: 375 (China: Hong Kong); Gressitt & Kimoto, 1963: 489 (China: Sichuan, Hubei, Anhui, Fujian, Guandong, Guanxi, Hainan; Vietnam); Kimoto, 1964: 305 (Japan: Yakushima, Ryukyus); Kimoto, 1977: 354 (Bhutan); Kimoto, 1989: 59 (Thailand, Cambodia, Laos, Vietnam); Mohamedsaid, 1994: 382 (Malaysia); Mohamedsaid, 2000: 349 (Malaysia); Barroga & Mohamedsaid, 2002: 116 (Malaysia); Mohamedsaid & Constant, 2007: 166 (Thailand, Cambodia); Aston, 2009: 14 (China: Hong Kong).
Ceratia lewisii: Miwa, 1931: 189 (Taiwan).
Orthaulaca (Ceratia) cattigarensis Weise, 1892: 397 (China: Shanghai; Japan); Gressitt and Kimoto, 1963: 489 (as synonym of lewisii).
Aulacophora (Ceratia) cattigarensis: Laboissière, 1929: 258 (Vietnam); Chûjô, 1935b: 205 (Japan: Ishigaki island); Chûjô, 1935c: 160 (Taiwan).
Aulacophora cattigarensis: Ogloblin, 1936: 156 (Vietnam); Chen & Kung, 1959: 375 (China: Jiangsu, Zhejiang, Fujian)

Males: Length 5.6–6.6 mm, width 2.8–3.1 mm. General color yellowish brown except elytron black and shining. Antenna filiform, antennomere I not enlarged, III–V rather stout. Apex of abdominal tergite VIII forming one pair of wide processes, apex of process rectangular; weakly emarginated at middle; base weakly sclerotized. Median lobe of abdominal ventrite V rectangular, with longitudinal groove from base to apex, apically widened. Aedeagus slender, apically tapering, apex pointed; almost straight in lateral view; tectum well sclerotized, apex pointed, disc ventrally covered with two longitudinal rows of fine setae; endophallus with two longitudinal rows of stout setae at base of tectum, and two longitudinal rows of tingy setae above stout setae and with one longitudinal sclerite, apex curved and rounded, basally widened.

Females: Length 6.5–7.2 mm, width 3.2–3.6 mm. Similar to male, but antennomeres III–V slender; Apical margin of abdominal ventrite V sinuate. Gonocoxae slender, apex of each gonocoxa with seven or eight setae from apical 1/6 to apex; gonocoxae connected at middle, base widened. Ventrite VIII weakly sclerotized; apex narrow, apical margin a little emarginate at middle, surface with dense long setae along apical margin, spiculum short. Spermathecal receptaculum a little swollen, hardly separated from pump; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

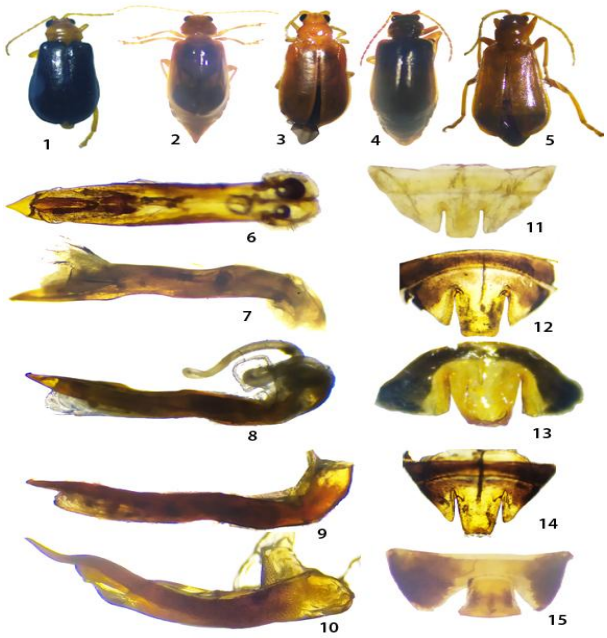

Fig. 1: Adult: (1) *Aulacophora lewisii* **rec. nov.,** (2) *Aulacophora foveicollis*, (3) *Aulacophora abdominalis*, (4) *Aulacophora indica*, (5) *Aulacophora* sp.(?); Aedeagus: (6) *A. lewisii* **rec. nov.,** (7) *A. foveicollis*, (8) *A. abdominalis*, (9) *A. indica*, (10) *Aulacophora* sp.(?); Male 5th abdominal ventrite: (11) *A. lewisii* **rec. nov.,** (12) *A. foveicollis*, (13) *A. abdominalis*, (14) *A. indica*, (15) *Aulacophora* sp.(?)

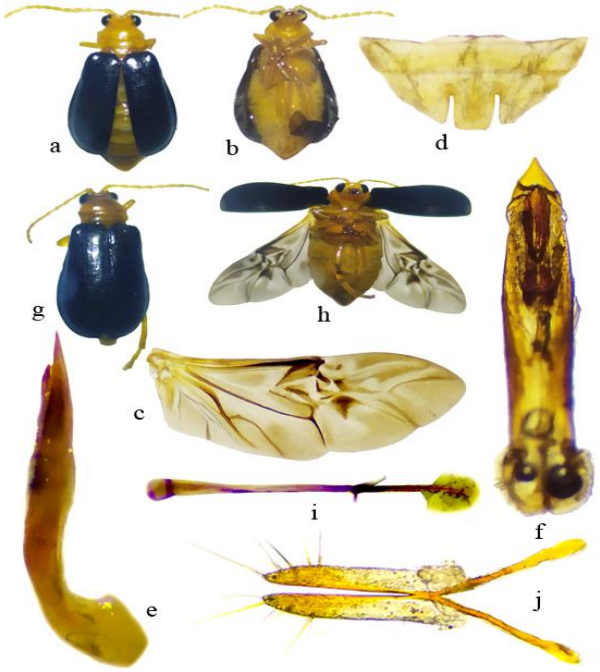

Fig. 2: *Aulacophora lewisii* Baly, 1886 (a) Dorsal view of adult male, (b) Ventral view of adult male, (c) Wing of adult male (d) 5th abdominal sternite of adult male, (e) lateral view of adeagus, (f) Dorsal view of adeagus, (g) Dorsal view of adult female, (h) Ventral view of adult female, (i) Abdominal ventrite (j) Gonocoxae

Material Examined: 1 female, Bauphal, Patuakhali, 5 Aug. 2019, Sarker D; 6 males, Narail sadar, Narail, 13 July 2019; 3 females , Narail sadar, Narail, 14 July 2019; 5 males, Barishal sadar, Barishal, 27 Aug. 2019; 2 females, Barishal sadar, Barishal, 27 Aug. 2019; all were collected by the same collector.

Distribution: Bangladesh **(new record)**, Bhutan, Cambodia, China, India, Indonesia, Japan, Laos, Taiwan, Thailand, Vietnam.

Remarks: In Bangladesh *Aulacophora artipennis* as blue pumpkin beetle was recognized by Khan et al. (2010) based on body coloration but we found *Aulacophora lewisii* Baly in bitter gourd which is dark blue colour on the basis of male and female genitalia. We could not compare the sample of *Aulacophora artipennis* collected by Khan (2010) with the genitalia of *A. lewisii* because they didn't provide any illustration of genitalia except adult. *A. lewisii* can easily be separated from *Aulacophora artipennis* by shape of aedeagus and 5th abdominal ventrite.

***Aulacophora indica* (Gmelin, 1790) ; Fig. 3 (a-j)**

Crioceris testacea Fabricius, 1787: 87 (India); Fabricius, 1792: 4 (redescription). *Aulacophora testacea*: Baly, 1879: 445 (India: Assam); Baly, 1886: 13; Allard, 1888: 320 *Rhaphidopalpa indica*: Laboissière, 1940: 10. *Aulacophora indica*: Kimoto, 1970: 416 (Nepal); Kimoto, 1977: 354 (Bhutan); Kimoto, 1989: 57 (India, including Andaman and Nicobar islands, Sri Lanka, Burma, Thailand, Cambodia, Laos, Vietnam, China, Taiwan, Philippines, Japan, including Ryukyu islands, Korea, Russia, Indonesia: Sunda islands, Micronesia, New Guinea, Samoa, Fiji)

Males: Length 6.5–8.0 mm, width 3.3–4.0 mm. General color yellowish brown but metathoracic and abdominal ventrites black except apex of fifth abdominal ventrite; middle and hind legs black; outer margins of femur and tibia of front legs black; labrum dark brown; antenna dark brown except three basal antennomeres yellowish brown. Antenna filiform and slender, antennomere I enlarged. Pronotum with deep, transverse groove. Elytra with cluster of erect hairs behind humerus.
Abdominal tergite VIII well sclerotized, apical margin bifurcate and apices cute; with one small process at lateral margin. Median lobe of fifth abdominal ventrite rectangular, disc depressed at left side. Penis slender, parallel-sided, asymmetric and abruptly narrowed at apical 1/7 and apically tapering, apex recurved; almost straight in lateral view; tectum medially sclerotized, apically tapering; endophallus with clusters of short setae, and with one longitudinal sclerite, apically tapering, apex strongly curved in lateral view, basally widened.

Females: Length 6.8–8.2 mm, width 3.4–4.1 mm. Similar to male, but pronotum with transverse groove shallow; cluster of erect hairs on elytra absent; antennomere I not enlarged; Pygidium projecting from elytral apex, apically tapering, apex pointed, or truncate, or emarginate. Middle of apical margin of abdominal ventrite V emarginate. Gonocoxae slender, apex of each gonocoxa with eight setae from apical 1/6 to apex; gonocoxae connected at middle, base slender. Ventrite VIII weakly sclerotized; apex narrowly rounded, with dense short setae along apex; spiculum short. Spermathecal receptaculum a little swollen; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Material Examined: 5 males, Monirampur, Jessore, 12 Jan. 2020, Sarker D; 4 females, Monirampur, Jessore, 15 Jan. 2020; 4 males, Dumuria, Khulna, 20 Sept. 2019; 4 females, Dumuria, Khulna 21 Sept. 2019; 3 males, Keshabpur, Jessore, 10 Aug. 2019; 2 female, Keshabpur, Jessore, 24 Dec. 2019; 3 males, Bakherganj, Barishal, 5 Oct. 2019; 2 females, Bakhergonj, Bariahal, 7 Oct. 2019; 4 males, Abhaynagar, Jessore, 16 Jan.2020; 2 females, Abhaynagar Jessore, 17 Jan 2020; all same collector.

Distribution: Bangladesh, Bhutan, Burma, Cambodia, China, Fiji, India, Indonesia, Japan, Korea, Laos, Malaysia, Micronesia, Nepal, Papua New Guinea, Philippines, Russia, Samoa, Sri Lanka, Taiwan, Thailand, Vietnam.

Remarks: Ali et al. (2016) included cucumber beetle (*Aulacophora indica*) in the list of cucurbitaceous insect pest without any taxonomic description with illustration.

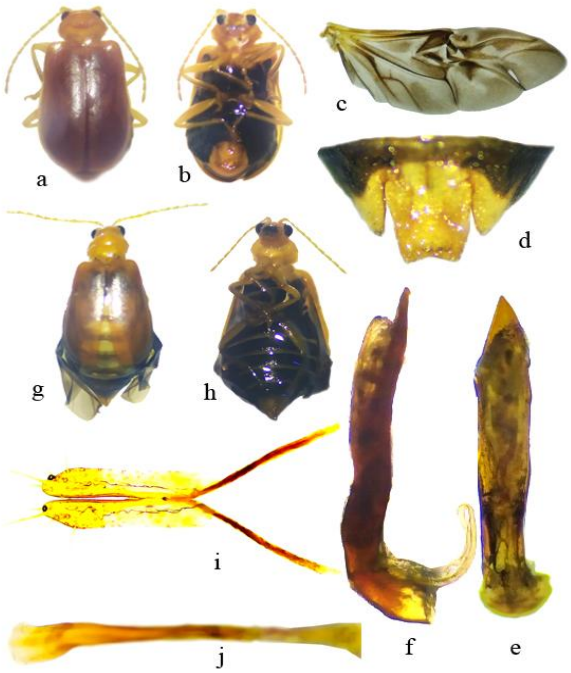

Fig. 3: *Aulacophora indica* (Gmelin, 1790) (a)) Dorsal view of adult male, (b) Ventral view of adult male, (c) Wing of adult male (d) 5th abdominal sternite of adult male, (e) lateral view of adeagus, (f) Dorsal view of adeagus, (g) Dorsal view of adult female, (h) Ventral view of adult female, (i) Gonocoxae, (j) Abdominal ventrite

***Aulacophora abdominalis* (Fabricius, 1781); Fig. 4 (a-j)**

Crioceris abdominalis Fabricius, 1781: 151 (Pacific islands); Fabricius, 1787: 87 (redescription).

Cryptocephalus abdominalis: Gmelin, 1790: 1719.
Galeruca abdominalis: Olivier, 1791: 590; Olivier, 1808: 623.
Galleruca abdominalis: Fabricius, 1792: 23; Fabricius, 1801: 483.
Rhaphidopalpa abdominalis: Dejean, 1837: 402; Weise, 1892: 395.
Aulacophora abdominalis: Baly, 1886: 14.

Males: Length 6.5–7.1 mm, width 3.5–3.8 mm. General color yellowish brown but ventral portion black. Labrum dark brown; antenna yellowish brown. Antenna filiform and slender, antennomere I enlarged. Pronotum with deep, transverse groove; one pair of tubercles behind groove. Elytra with cluster of erect hairs behind humerus. Abdominal tergite VIII has a semicircular incision and lateral processes and basal margin convex with rounded corners. Median lobe of abdominal ventrite V rectangular, with median, longitudinal, wide groove and abbreviated near apex. Penis slender, parallel-sided, abruptly narrowed at apical 1/7 and apically tapering, apex of pennies hook like; lateral excavation present at the middle; tectum laterally sclerotized; endophallus with clusters of short setae, and with one longitudinal sclerite, apically tapering, apex strongly curved in lateral view, basally widened.

Female: Length 7.2 mm, width 3.9 mm. Similar to male but pronotum with transverse groove shallow, and without tubercles; cluster of erect hairs on elytra absent; antennomere I not enlarged. Pygidium projecting from elytral apex, parallel-sided, slender, and apex rounded. Middle of apical margin of abdominal ventrite V emarginate, weakly convex at middle of emargination. Gonocoxae slender, apex of each gonocoxa with seven or eight setae from apical 1/6 to apex; gonocoxae connected at middle, base slender. Ventrite VIII weakly sclerotized; apex narrow, apical margin emarginate at middle, with dense short setae along apex; spiculum short. Spermathecal receptaculum a little swollen; pump strongly curved; spermathecal duct short, stout, shallowly projecting into receptaculum.

Material examined: 5 males, Bauphal , Patuakhali, 23 Feb. 2020, Sarker D; 5 females, Bauphal, Patuakhali, 24 Feb. 2020; 5 males, Dumki, Patuakhali, 16 Aug. 2019; 3 females, Dumki, Patuakhali, 17 Aug. 2019; 3 males and 1 female, Banaripara, Barisal, 6 Jun. 2019; all same collector.

Distribution: *Aulacophora abdominalis* is widely distributed across the southern pacific, stretching from Timor in the west to Niue in the east, Taiwan, Bangladesh.

Remarks. Khan (2018) and Alam (1969) reported *Aulacophora abdominalis* as a serious major pest of Bangladesh but they didn't recognize taxonomically as compare with other genitalia. They listed the species only based on body coloration.

***Aulacophora foveicollis* (Lucas, 1849); Fig. 5 (a-j)**

Galleruca foveicollis Lucas, 1849: Beenen, 2010:443-491.

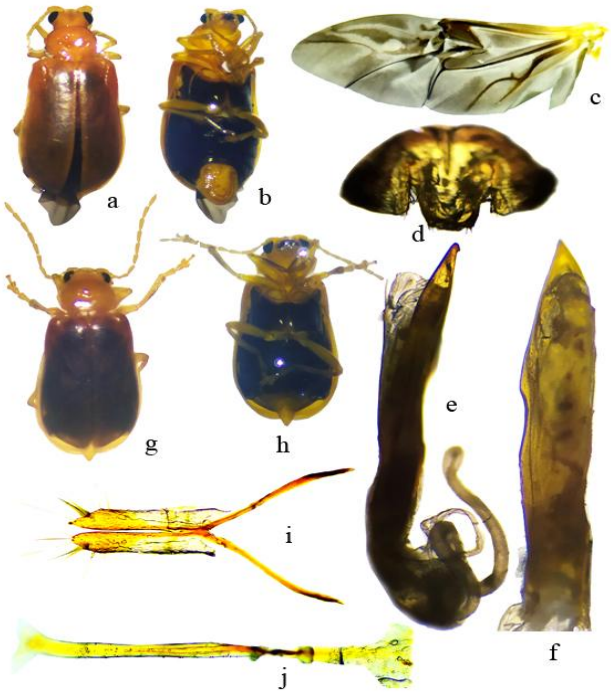

Fig. 4: *Aulacophora abdominalis* (Fabricius, 1781) (a)) Dorsal view of adult male, (b) Ventral view of adult male, (c) Wing of adult male (d) 5th abdominal sternite of adult male, (e) lateral view of adeagus, (f) Dorsal view of adeagus, (g) Dorsal view of adult female, (h) Ventral view of adult female, (i) Gonocoxae, (j) Abdominal ventrite

Raphidopalpa foveicollis (Lucas, 1849): Chandravadana 1983: 87-88.
Galleruca nigriventris Rosenhauer, 1850: Beenen, 2010:443-491.
Rhaphidopalpa africana Weise, 1903: Beenen, 2010:443-491.
Aulacophora africana (Weise, 1903): Beenen, 2010:443-491.

Males: A. foveicollis male are oblong in shape with 5-8 mm length and 3.5-3.75 mm width in size. The head, antennae and legs were yellow, the throax was brownish yellow, elytra reddish orange, ventral side of the abdomen was black with shining small hairs. The head was hypognathus and strongly sclerotized. Antennae filliform type. Apex of aedeagus V-shaped and straight without any hook, short and stout; middle lobe of 5th abdominal ventrite longer than side lobes.

Females: Body shape and size and color is more or less same to the male. Gonocoxae slender, apex of each gonocoxa with seven or eight setae from apical 1/6 to apex; gonocoxae connected at middle, base slender.

Material examined: 2 males, Barishal sadar, Barishal, 5 Aug. 2019, Sarker D; 3 females, Barishal Sadar, Barishal, 6 Jul. 2019; 3 males, Dumki, Patuakhali, 20 May. 2019; 2 femalrs, Dumki, Patuakhali, 22 Jun. 2019; 4 males, Chitalmari, Bagerhat, 16 Aug..2019; 2 females, Chitalmari, Bagerhat, 17 Aug. 2019; 3 males, Narail, 1 Jul. 2019; 2 female, Lohagora, Narail, 2 Apr. 2019; all same collector.

Distribution: This pest is widely distributed in different part of the world including Asian country like Bangladesh, India, Pakistan, Nepal, Afganistan, Iran, Iraq, Indonesia, Malaysia, Thailand, Sri-Lanka etc. Also present in African and European country like Cyprus, France, Croatia, Greece, Italy, Russia, Spain, Algeria, Angola, Benin, Egypt, Ethiopia etc. This species also distributed in Australia and Oceania.

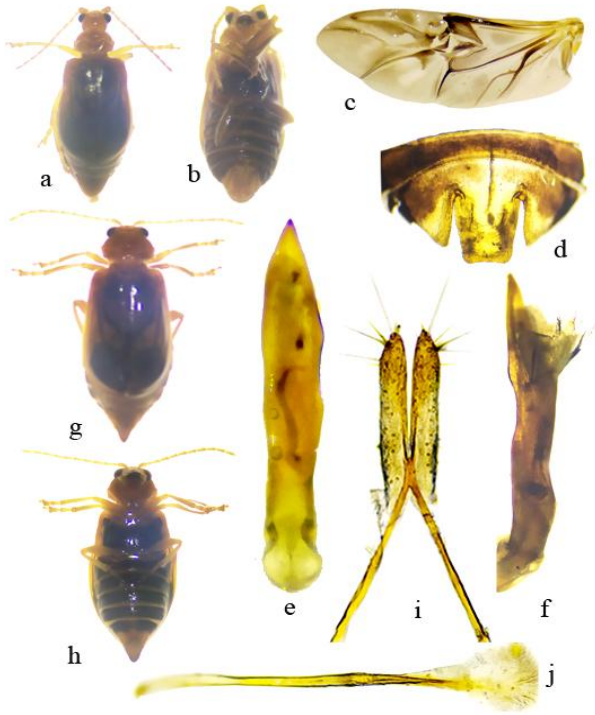

Fig. 5: ***Aulacophora foveicollis*** (a)) Dorsal view of adult male, (b) Ventral view of adult male, (c) Wing of adult male (d) 5th abdominal sternite of adult male, (e) lateral view of adeagus, (f) Dorsal view of adeagus, (g) Dorsal view of adult female, (h) Ventral view of adult female, (i) Gonocoxae, (j) Abdominal ventrite

***Aulacophora* sp(?) ; Fig. 6 (a-j)**

Male: Length 6–7 mm, width 2.5-3.0 mm, body narrow and cylindrical. General color black but elytra raddish yellow. Labrum dark brown; antenna yellowish color. Antennomeres also yellowish. Antenna filiform and slender. Apex of aedeagus pointed, elongated and curved; middle lobe of 5th abdominal ventrite almost equal in length. A pair of hollow hairy elongation present at ventral side of the middle of abdomen. Abdominal tergite VIII well sclerotized.

Female: Gonocoxae slender, apex of each gonocoxa with ten to eleven setae from apical 1/6 to apex; gonocoxae connected at middle, base widened. Ventrite VIII strongly sclerotized;

Material examined: 6 males, Dumki, Patuakhali, 27 Feb. 2019; 4 females, Dumki, Patuakhali, 28 Feb. 2019; 4 males, Manirampur, Jessore, 1 Mar. 2019; 2 females, Monirampur, Jessore, 2 Mar. 2019; all same collector.`

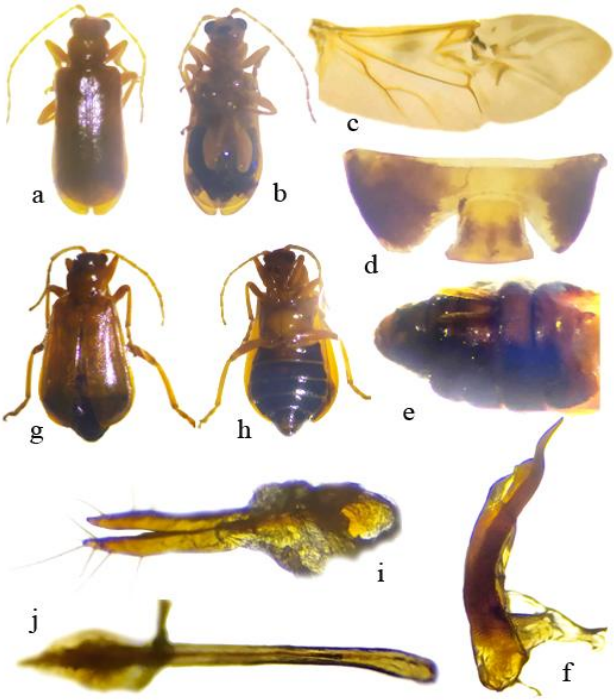

Fig. 6. ***Aulacophora* sp. (?)** (a)) Dorsal view of adult male, (b) Ventral view of adult male, (c) Wing of adult male (d) 5th abdominal sternite of adult male, (e) lateral view of adeagus, (f) Dorsal view of adeagus, (g) Dorsal view of adult female, (h) Ventral view of adult female, (i) Gonocoxae, (j) Abdominal ventrite

Remarks: This species was collected from the wild shrubs from road side where consuming leaves severely. It may be a new species but we need to more information to compare with other species of *Aulacophora* in the world and confirm it at species level.

Conclusion

Species of Aulacophora were studied intensively on the basis of morphological characters in different cucurbits field of Southern part of Bangladesh and recognized the following five species with a newly recorded and one unidentified species for the first time in Bangladesh: *Aulacophora foveicollis*, *A. indica*, *A. abdominalis*, *A. lewisii* **rec. nov.** and *Aulacophora* sp.(?). Further survey of these pests on cucurbits vegetables in entire Bangladesh including unidentified one should be needed further identification molecularly.

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