

**NEW SPECIES OF AULACOPHORA FROM SABAH, MALAYSIA  
(COLEOPTERA: CHRYSOMELIDAE: GALERUCINAE)**

by

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**ABSTRACT**

Three new species of *Aulacophora* are described from Sabah, Malaysia: *A. danumensis* n.sp., *A. irpa* n.sp. and *A. kinabaluensis* n.sp. *Aulacophora coffeae* and *A. indica* are reported as new records for Borneo.

**INTRODUCTION**

The new species of *Aulacophora* Chevrolat herein described are those with the elytra entirely brownish or yellowish. Presently, there are two species with the said elytral coloration recorded from Borneo (*Aulacophora cornuta* Baly, and a variety of *Aulacophora luteicornis* (Fabricius)). This paper presents three descriptions of new species of *Aulacophora* from Sabah, and an additional two species as new records for Borneo. All specimens, including holotype are deposited in the Insect Collection, Centre for Insect Systematics, University Kebangsaan Malaysia, Bangi (UKM). Some of the paratypes will be deposited elsewhere.

**SYSTEMATICS**

Key to species of *Aulacophora* from Borneo  
(with the elytra yellowish or brownish, not black)

1. Ventral surfaces of metathorax and abdomen black ..... 2  
   Ventral surfaces entirely brownish, not black ..... 5
2. Pronotum with transverse sulcus strongly curved at middle. In male, humerus covered with arect hairs. In female, pygidium sharply pointed at apex. Length 6.4-7.5 mm ..... *indica* (Gmelin)

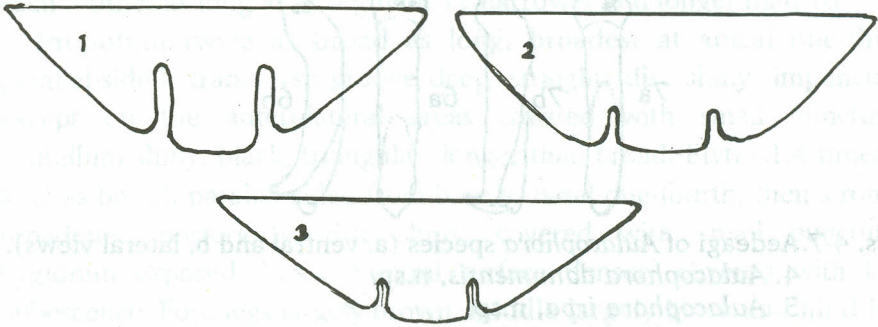
- Pronotum with transverse sulcus straight, not curved at middle. In male, humerus not covered with arect hairs. In female, pygidium not pointed at apex ..... 3
3. Head entirely brownish. Pronotum and elytra brownish. In male, eyes large, the interocular space as broad as the transverse diameter of each oculus. Length 8-9 mm ..... *irpa*, new species  
 Head yellowish, with labrum and vertex blackish. Pronotum and elytra yellowish. In male, eyes small to moderately large, the interocular spaces 1.5-2.0 times as broad as the transverse diameter of each acolus ..... 4
4. In male, first antennal segment broadened; head with internal space excavated, bounded anteriorly by prominences with sharp adges; antennae moderately long, extending the middle of elytra; apical sternite with median lobe deeply concave. Length 7.8-8.3 mm ..... *cornuta* Baly  
 In male, first antennal segment not broadened; head with interantennal space not excavated, antennae very long, extending the apex of elytra; apical sternite with median lobe not deeply concave.  
 Length 8.0-8.7 mm ..... *coffae* (Hornstedt)
5. Legs brownish, except for tibiae and tarsi black. In male, eyes large, the interocular space as broad as the transverse diameter of each oculus; apical sternite with median lobe oblong.  
 Length 7.5-8.5 mm ..... *danumensis*, new species  
 Legs entirely brownish. In male, eyes small, the interocular space twice as broad as the transverse diameter of each oculus; apical sternite with median lobe transverse ..... 6
6. Maxillary palpi with penultimate segment strongly enlarged, cup-shaped. In female apex of fifth abdominal segment trilobed. In male, antennal segment 11, excavated and ending with two sharp points; aedeagus very stout, its apex perpendicularly curved (Fig. 7b). Length 7.5-9.0 mm ..... *luteicornis* (Fabricius)  
 Maxillary palpi with penultimate segment enlarge, not cupshaped. In female, apex of fifth abdominal segment not trilobed. In male, antennal segment 11, not excavated but obliquely emarginate and ending with one sharp point; aedeagus not very stout, its apex not perpendicularly curved (Fig. 6b) ..... *kinabaluensis*, new species.



*Aulacophora danumensis*, new species (Figs. 1, 4a, 4b)

Dorsal and Ventral surfaces entirely brown.

Head shiny, impunctate, the interocular space as broad as the transverse diameter of each oculus. Eyes large, protuberant.



Figs. 1-3. Male apical sternite of *Aulacophora* species.

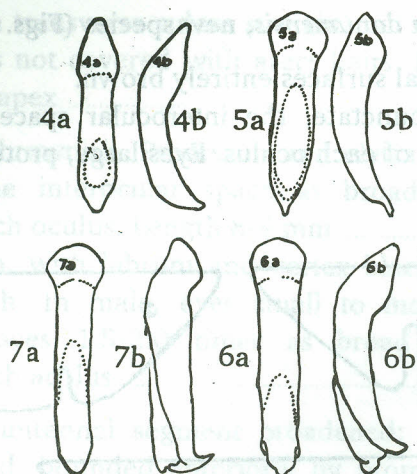
1. *Aulacophora danumensis*, n.sp.

2. *Aulacophora irpa*, n.sp.

3. *Aulacophora kinabaluensis*, n.sp.

Labrum transverse, sinuate at apex. Maxillary palpi with penultimate segment enlarged, the apical small, conical. Antennae moderately robust, extended slightly beyond the middle of elytra; segment 1 longest, club-shaped; segment 2 shortest, 1.5 times as long as broad; segment 3 twice as long as 2; segments 4-10 gradually shortened; segment 11 longer than 10, incrassate, its apex obliquely emarginate and pointed.

Pronotum transverse, twice as broad as long, broadest at apical one-third; transverse groove deep, straight; disc shiny, impunctate, except on the anterolateral areas covered with small punctures. Scutellum shiny, brownish, triangular, longer than broad. Elytra 1.3 times as long as broad, parallel-sided from base to basal one-fourth, then strongly broadened posteriorly; disc shiny, covered with small punctures. Pygidium exposed, brown. Ventral surfaces moderately densely covered with short pubescence. Legs brown, except tibia and tarsi black. Apical sternite (Fig.1) with median lobe oblong, its surface concave. Aedeagus (Fig.4) moderately curved, with apical piece blunt at apex basal piece narrowed towards base. Length 7.5-8 mm.



Figs. 4-7. Aedeagi of *Aulacophora* species (a. ventral and b, lateral views).

4. *Aulacophora danumensis*, n.sp.

5. *Aulacophora irpa*, n.sp.

6. *Aulacophora kinabaluensis*, n.sp.

7. *Aulacophora luteicornis* (Fabricius)

Female. Antenna slender, with terminal segment normal, not incrassate. Apical sternite sinuate at apex. Length 7.5-8.5 mm.

Holotype. Male MALAYSIA, SABAH, Lembah Danum, 16-19.v. 1991, Zaidi, Ismail & Ruslan (UKM).

Paratypes. MALAYSIA, SABAH, Lembah Danum, 5.iv.1989, Salleh, Ismail & Nor, male; 20.viii.1989, Salleh, Ismail & Nor, female; 16-19.v.1991, Zaidi, Ismail & Ruslan, male; 17-20.iv.1992, Ismail, Yusof & Razali, male. Tawau, Taman Bukit Tawau, 14.v.1992, Ruslan, male, 2 females.

This species resembles *Aulacophora luteicornis* (Fabricius) but differs in having interocular space as broad as the transverse diameter of each oculus; in male, the terminal antennal segment not excavated, and the median lobe of apical sternite oblong; and in female, the apical sternite sinuate, not trilobed.

*Aulacophora irpa*, new species

(Figs. 2, 5a, 5b)

Dorsal surface brown, ventral surfaces of meso, metathorax and abdomen black.



Head shiny, impunctate, the interocular space as broad as the transverse diameter of each oculus. Eyes large, protuberant. Maxillary palpi with penultimate segment enlarged, the apical segment small, conical. Labrum transverse, sinuate at apex. Antennae slender, long, extended to apical one-fifth of the elytra; segment 1 longest, club-shaped; segment 2 shortest, as broad as long; segments 3-10 subequal in length, each 3 times as long as 2; segment 11 narrower and longer than 10.

Pronotum twice as broad as long, broadest at apical one-third, parallel-sided; transverse groove deep, straight; disc shiny, impunctate, except on the anterolateral areas covered with small punctures. Scutellum shiny, black, triangular, longer than broad. Elytra 1.4 times as long as broad, parallel-sided from base to basal one-fourth, then strongly broadened posteriorly, disc shiny, covered with small punctures. Pygidium exposed, black. Ventral surface densely covered with long pubescence. Fore legs largely brown, middle largely black and hind legs entirely black. Apical sternite (Fig. 2) with median lobe transverse, its surface concaved. Aedeagus (Fig. 5) with apical piece recurved and pointed, the basal piece broadened. Length 8-8.5 mm.

Female. Externally identical except the apical sternite sinuate at apex. Length 9 mm.

Holotype. Male. MALAYSIA, SABAH, Taman Kinabalu, HQ, 13-15.xii.1990, Zaidi, Ismail & Ruslan (UKM).

Paratype : MALAYSIA, SABAH, Taman Kinabalu, Liwagu Trail, 17.xi.1981, Fatimah Abang, female. Gunung Kinabalu, Sayap, 9.v.1992, Zaidi & Nordin, female. Tuaran, Kg. Tudan (1400 m), 21.iv.1988, Akira Ueda, female.

Etymology : This species is named after the acronym of the Intensified Research in Priority Areas (IRPA), a programme under the Ministry of science, the Environment and Technology which provided grant for the revisionary study on the Malaysian Chrysomelidae.

This species resembles *Aulacophora mouhoti* Baly but differs in having the scutellum, fore and hind legs black; and in female the apical sternite sinuate, not trilobed. The species also resembles *Aulacophora semifusca* Jacoby but differs in having eyes large, with the interocular space as broad as the transverse diameter of each oculus, labrum and clypeus brownish and hind legs black.

*Aulacophora kinabaluensis*, new species

(Figs. 3, 6a, 6b)

Dorsal and ventral surfaces entirely brown.

Head shiny, impunctate, the interocular space twice as broad as the transverse diameter of each oculus. Eyes small. Maxillary palpi with penultimate segment enlarged, the apical segment small, conical. Labrum transverse, sinuate at apex. Antennae moderately robust, extended slightly beyond the middle of elytra; segment 1 longest, club-shaped; segment 2 shortest, 1.5 times as long as broad; segment 3, 2.5 times as long as 2; segments 4-10 gradually shortened; segment 11 dark brown, broader and longer than 10, its apex obliquely emarginate and pointed.

Pronotum transverse, twice as broad as long, broadest at apical one-third; transverse groove deep, straight; disc shiny, impunctate, except on the anterolateral areas densely covered with small punctures. Scutellum shiny, brownish, triangular, longer than broad. Elytra 1.4 times as long as broad, parallel-sided from base to basal one-third, then strongly broadened posteriorly; disc shiny, covered with small punctures. Pygidium exposed, brown. Ventral surface densely covered with long pubescence. Legs entirely brown. Apical sternite (Fig. 3) with median lobe transverse, its surface concave. Aedeagus (Fig. 6) with a pical piece strongly curved and blunt at apex, the basal piece broadened. Length 8-9 mm.

Female. Antennal segment 11 normal, not incrassate. Apical sternite sinuate at apex. Length 8-9.5 mm.

Holotype. Male. MALAYSIA, SABAH, Taman Kinabalu, Sayap, 3-8.vi. 1992, Zaidi, Ismail & Ruslan (UKM).

Paratype. Same data as the holotype, 7 males, 18 females.

This species resembles *Aulacophora danumensis*, n.sp. but differs in having the eyes small, with interocular space twice as broad as the transverse diameter of each oculus.

*Aulacophora coffeae* (Hornstedt)

*Chrysomela coffeae* Hornstedt, 1788, Schrift. Ges. Naturf. Freunde Berlin, 8 : 5 (Java).



*Aulacophora coffeae*: Baly, 1886, J. Linn. Soc., Zool., 20: 3,4, 18 (Java, Sumatra, Phillipines, Tondano, Trigane, Cambodia, India).- Kimoto, 1989, Esakia, Kyushu Univ., 27 : 25 (Thailand, Laos, Vietnam).

Specimens examined. SABAH: Lembah Danum, 4-7.xii.1990, Zaidi, Ismail & Ruslan, 2; 17-20.iv 1992, Ismail, Yusuf & Razali, 1; 22 - 25.viii.1992, Ismail, Yusuf & Sham, 2; 5-8.xii.1992, Ismail, Yusuf & Razali, 26. Gunung Kinabalu, Sayap, 3-8.vi. 1992, Zaidi, Ismail & Ruslan, 3. Tambunan, Trus Madi, 30.i.1993, Zaidi, 5 SARAWAK; Taman Negara Lambir, 1-4.ix. 1993, Ismail, Sham & Zaidi, 1.

This is a new record for Borneo. This species can be separated from other species of *Aulacophora* by its coloration; head, labrum, ventral surfaces and legs black, and pronotum and elytra brownish.

*Aulacophora cornuta* Baly

*Aulacophora cornuta* Baly, 1879, Cist. Ent., 2 : 445 (Assam); 1886, J. Linn. Soc. London, 20: 3, 5, 15 (Assam, Siam, Celebes, Ceram, Timor, Sulu Is., Flores).- Maulik, 1936, Fauna India, Galeruc.: 186 (Malacca, Celebes, Siam).- Chujo, 1964, Nature and Life in SE Asia, Kyoto, 3:286 (Thailand, Brunei).- Kimoto, 1989, Esakia, Kyushu Univ., 27 :53 (Thailand, Laos).

Specimens examined. SARAWAK : Lanjak Entimau, 28-29.ii.1992, Zaidi,2.

This is a new record for Sarawak. The species resembles *Aulacophora coffeae* but differs in the male characteristics, where its interantennal space excavated, with very thick tufts hairs in the middle, and the exavation is bounded anteriorly by tubercles with sharp edges.

*Aulacophora indica* (Gmelin)

*Crioceris indica* Gmelin, 1790, ed. Linnaeus, Syst. nat., ed. 13, 1, 4: 1720 (India).

*Aulacophora indica*: Kimoto, 1970. Khumbu Himal, 3: 416 (Nepal); 1989, Esakia, Kyushu Univ., 27 : 56 (Thailand, Cambodia, Laos, Vietnam).

Specimens examined. SABAH: Lembah Danum, 5.iv. 1989, Salleh, Ismail & Nor, 1; 27-31.viii.1991, Salleh, Zaidi. Mail & Lan, 2; 22-25.viii. 1992, Ismail, Yusuf & Sham, 3; 5-8.xii.1992, Ismail, Yusuf & Razali, 1. Taman Kinabalu, Poring, 20-24.v.1991, Zaidi, Ismail & Ruslan, 1. Sayap, 9.v. 1992, Zaidi & Nordin, 1; 3-8 .vi.1992, Zaidi, Ismail & Ruslan, 1.. K Kinabalu, Tambunan. 7.viii.1989, B.H. Lee, 1. Tawau, Taman Tawau, 4-12.v.1992, Ruslan, 1. SARAWAK; Taman Negara Lambir, 4-8.ii.1993, Salleh & Ismail, 1; 25-29.vi.1993, Ismail, Ruslan & Zabidi, 2. Limbang, Mendamit, 18-21.ii.1991, Zaidi, 3.

Although this species is common in Southeast Asia and Pacific, it has not been recorded for Borneo. The species can easily be separated from other species from the following combination of characteristics.: pronotum with transverse groove strongly curved in the middle; in male, the first antennal segment broadened, the humeral area of the elytra covered with erected hairs; in female, the pygidium strongly produced and pointed.

*Aulacophora luteicornis* (Fabricius) (Figs. 7a,7b)

*Galleruca luteicornis* Fabricius, 1801, Syst. Eleu., 1: 482 (Sumatra)

*Aulacophora luteicornis* : Jacoby, 1884, Notes Leyden Mus., 6: 40 (Sumatra).- Bally, 1886, J. Linn. Soc., Zool., 20 : 22 (Malay Peninsular, Sarawak, Sumatra).- Allard, 1889, Ann. Soc. Ent. France, ser.6, 8: 310, 321 (Malacca, Borneo).- Kimoto, 1989, Ekasia, Kyushu Univ., 27:60.

*Aulacophora dilatata* Jacoby, 1886, Ann. Mus. Civ Genova, 24:49 (Sarawak).- Baly, 1887, Ent. Monthly Mag., 23: 268 (as var. of *luteicornis*).- Allard, 1889, Ann. Soc. Ent. France, ser. 6,8:307,308 (Borneo).

Specimens examined. SABAH: Gunug Kinabalu, Sayap, 3-8.vi.1992, Zaidi, Ismail & Ruslan, 1. Papar, Ulu Kinamis, 6.xii. 1991, Zaidi, Is. Lan & Yus., 1. Tawau, Taman Tawau, 4-12.v.1992, Ruslan, 1. SARAWAK: Taman Negara Lambir, 4-8.ii.1993, Salleh & Ismail, 1; 25-29.vi.1993, Ismail, Ruslan & Zaidi, 1; 1-4.ix.1993, Ismail, Sham & Zaidi, 1.

The species herein recorded are the one with the dorsal and ventral surfaces entirely brownish. In the above bibliographic



citations, species recorded by Baly (1886) and Allard (1889) under the *luteicornis* possess the elytra reddish brown, with the apex black. However, species recorded by Jacoby (1886) and Allard (1889) under the *dilatata* possess the elytra entirely brownish. *Aulacophora luteicornis* can be separated from the other species of *Aulacophora* from its male characteristics, where the terminal segment of the antennae excavated and bifurcate at apex, the aedeagus as in Fig. 7.

#### ABSTRACT

#### ACKNOWLEDGEMENTS

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#### INTRODUCTION

The establishment of Sabah National Park is aimed at conserving the uniqueness of the island's ecosystem that have outstanding unique properties, accommodating a high degree of endemism. Among birds, there have been recorded one species and 12 subspecies which are endemic to the island (Hasnain & Kloss, 1960; Whitten, 1960).

However, ornithological observations in the island have been very sporadic. The first ornithological expedition was made by Chasen & Kloss (1956), and the second was 54 years later which was conducted by Whitten (1960). Chasen & Kloss registered 87 bird species, while Whitten's study recorded 18 more bird species into the list, giving 105 bird species altogether recorded from the island. Made & Vong (1988) added more records from various specimens to the list and come up with 124 species. The genera *Syrnium* and *Corvus* which were not recorded previously were added to the list, giving three other genera remained unidentified: *Accipiter*, *Saracostomus*, and *Picodula*.