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## NEW RECORDS OF GENUS *ULOMA* DEJEAN (COLEOPTERA: TENEBRIONIDAE) FROM MALAYSIA

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### ABSTRACT

The species of the genus *Uloma* Dejean, 1821 (Coleoptera: Tenebrionidae) from two Malaysian regions i.e. Sabah and Selangor were explored. The diagnostic characteristics were figured and species key was provided for two newly recorded species including *U. sextuberosa* (Kaszab, 1980) and *U. excise* (Gebien, 1913). The species typically live under the barks of trees or rotten wood, even outside forests and in cultivated land. The insect species are common in nearly all zoogeographical regions of the Old and New World.

**Keywords:** Malaysia, new records, Sabah, Selangor, Tenebrionidae, *Uloma*

### INTRODUCTION

A stable classification scheme of the family Tenebrionidae contains especially three sub-families such as Stinochiinae, Tenebrioninae and Diaperinae with a synoptic classification of the world fauna. Furthermore, it summarized the recent knowledge about the relationships among suprageneric groups as well as a catalogue of family-group names particularly in Malaysian agro-ecosystem. It makes up the large group of nocturnal beetles and usually referred as "Darkling Beetles" that is a common name for this large family. Darkling beetles are probably fundamental in important processes of ecosystem function such as the indicators of environmental quality as their presence signifies that the localities in question are relatively undisturbed. A significant majority of these insects are scavengers and in the wild, they are quite content to feed on dried or rotting plant residue and some also move to grain storage places (Watt, 1974). In sub-family Tenebrioninae, the genus *Uloma* Dejean, 1821 is wide spread worldwide, mainly in the tropics and over than 200 species until have been described (Schawaller, 2015). The species are well famous to feed on rotten wood or under the barks of trees in the forests. Taxonomic work on this genus has been done by many researchers (Kaszab, 1982; Masumoto, 1986; Schawaller, 1996; Schawaller, 2000). However, due to their economic importance, it is essential to conduct a study for their proper identification because there is no depth study previously conducted regarding exploration and their taxonomical review in Malaysia.

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Therefore, the present study was attempted in order to identify these species as proper control measures in future could judiciously be devised.

## MATERIALS AND METHODS

The insects were large in size and collected by hand directly from different parts of Malaysia; however few species were also obtained from Universiti Putra Malaysia (UPM), Universiti Kebangsaan Malaysia (UKM) and Forest Research Centre Kinabalu National Park (KNP). The collected insects were brought at Department of Plant Protection, Faculty of Agriculture, UPM, Malaysia for further studies. We followed the similar procedure described by Darya *et al.* (2017) for killing and saving of specimen. A Dino Lite digital microscope (AnMo Electronic Corp, Taiwan) was used to observe the morphological characteristics of insect species except the tiny structure of the insect body which was examined through Dino-Eye digital microscope (5 MP, AnMo Electronic Corp, Taiwan). Meanwhile, the whole body image and scale characters of the insects were observed by using Canon DSLR Camera (EOS 70 D, 55-135mm lenses, Japan). The illustration was done through Adobe illustrator CC and Wacom Cintiq 13HD. Finally, the taxonomical key was constructed after observing all these insects.

## RESULTS AND DISCUSSION

The overall, eight genera *Leprocaulus*, *Derosphaerus*, *Pseudoblaps*, *Amarygmus*, *Gonocephalum*, *Alphitobius*, *Tribolium* and *Uloma* were identified from sub-family Tenebrioninae and their key was constructed. However, only two species from genus *Uloma* such as *U. sextuberosa* and *U. excise* were described.

### A. Key to sub-family Tenebrioninae

The general morphological characteristics of sub-family Tenebrioninae are usual transverse labrum. Maxilla with or without lacinialuncus, mandibular mola frequently finely striate, procoxal cavities open or closed in some tribes and claws simple.

### B. Key to the genera of subfamily Tenebrioninae

- 1- Elytra smooth or punctuate randomly, femur apex not wider in the posterior half..... 2
- 1`- Elytra punctate- striate, femur with apex half very thin then it becomes very wider in the posterior half..... **Leprocaulus**
- 1- Mandible pyramid shaped and mentum without lobe ..... 3
- 2`- Mandible squared shaped, mentum with clear lobe ..... **Derosphaerus**
- 2- Scutellum is triangle in shape very clear .....4
- 3`- Scutellum is almost cylinder in shape very small ..... **Pseudoblaps**
- 3- Antenna not reaching the middle of the body .....5
- 4`- Antenna very long and reaching almost the middle of the body .....**Amarygmus**
- 4- Pronotum with front edge straight slightly concave and the head is not declivous .... 6
- 5`- Pronotum with front edge strongly depressed and the head is deeply declivous (sloping downward) .....**Gonocephalum**
- 5- Elytral internals flat or convex .....7
- 6`- Elytral internals finely carinate .....**Tribolium**
- 6- Protibiae with external border pectinate, aedeagus with pointy basal part..... **Uloma**
- 7`- Protibiae with external border not pectinate, basal part of aedeagus is not pointy..... **Alphitobius**

**C. *Uloma sextuberosa* Kaszab, 1980**

**i. Type material examined**

Selangor: Universiti Kebangsaan Malaysia [UKM], 1998, Darya H., 2 female specimens. Selangor: Ayer hitam forest, [IMUPM], 1990, Darya H., 1 female specimen.

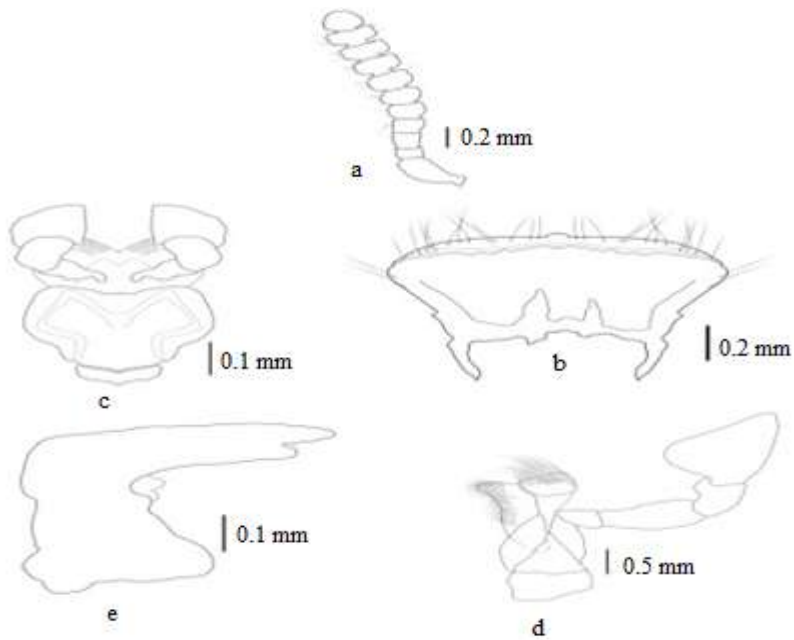
**ii. Additional material examined**

*Uloma* Cast. Hist. Nat. II, 1840, p. 219.— Redt. Gatt. 1845, p. 127; Fn. Austr. 1849, p. 52 u. 593; ed. II, 1858, p. CVII u. 606; ed. III, 1874, p. CXIX u. II, p. 111.— Muls. Col. Fr. Latigenes 1854, p. 231.— Bach. Käferf. III, 1856, p. 207. — Lacord. Gen. Col. V, 1859, p. 332. —Thoms. Skand. Col. I, 1859, p. 117; VI, 1864, p. 260. — Jacq. du Val, Gen. Col. d'Eur. III, 1861, p. 301. — Hörn, Revis. Tenebr. 1870, p. 370. — Bates, Ent. Monthly Mag. IX, 1873, p. 182.— Seidl. Fn. Balt. 1875. p. 97 (Gatt.); ed. II, 1891, p. 133 (Gatt.); Fn. Transsylv, 1891. p. 133 (Gatt.); Naturg. Ins. Deutschl. V, 1894, p. 591, 593. —J. Lee. and Hörn, Class. Col. N. Amer. 1883, p. 381.— Desbr. Frelon XI, 1902, p. 13.

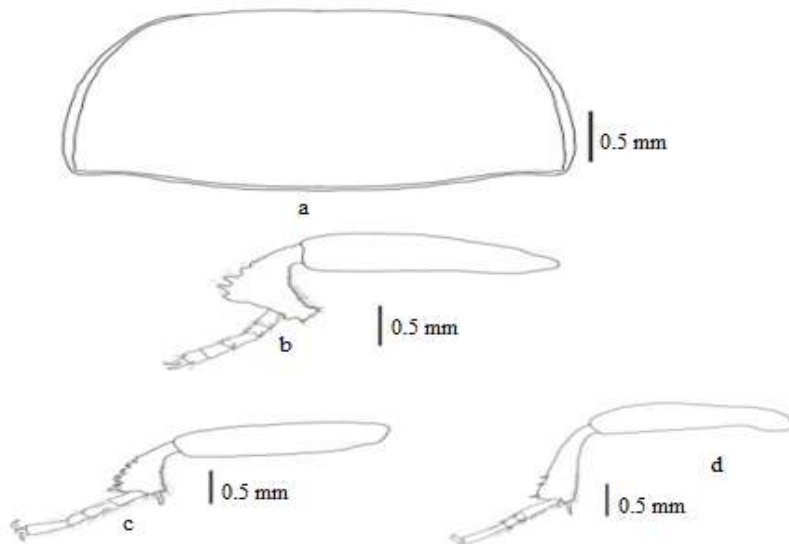
**iii. Description**

Body was short and stout, oval, convex with total length of 7-8mm and maximum width was at elytra of 3mm and black in colour. In head, front was flattened, with clypeus gently sinuate, compound eyes oval prominent, distance between the eyes about 0.5-0.6mm. Antennae and mouth parts have been displayed in Plate 1.

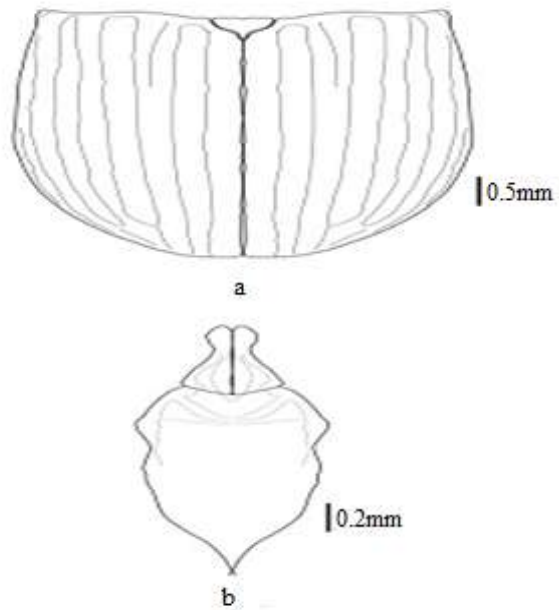
Antennae were with 11 antennomeres, filiform in shape, about 1.6-1.9mm in length, antennomeres from five to nine with somewhat pointed sharp distal border at inner side and they were gradually enlarged. The last segment was circular in shape and in the labrum the tormal arms mesal were not extended. Epitorma was absent and ciliate by black setae on the anterior margin. Labium was mentum with three segmented palps, maxilla with single lacinialuncus, palpi consisted of four segments and mandibles were bi-dentat. The thorax including pronotum with legs as described in Plate 2 in which pronotum was convex and transverse. The anterior borders were fine, lateral, basal borders were strongly margined, and the lateral borders were rounded, and distinctly margined. The surface was smooth and prosternum was flat. In fore-leg, protibiae were distinctly dilated apically, the external border were pectinate and had dense fine setae on the ventral border. All segments of the tarsus were almost same in the size and the last segment carried two strong claws. In, mid-leg, mesotibiae bearded some spurs and the first and the last segments of the tarsus were same in the length. Metatibiae in hind leg was cylindrical in shape and in the four segmented tarsus, the first and the last segments were almost same in the length. The illustration of elytra and aedeagus are presented in Plate 3. The length of elytra was 4.5-4.7 mm, obovate and convex in structure. Puncture of elytral rows was on disc smaller than convex intervals, but nearly as broad as intervals laterally. Lateral border in dorsal view was visible only at base however the scutellum was triangular in shape with some minute punctures. The length of aedeagus was 1.1-1.4 mm.



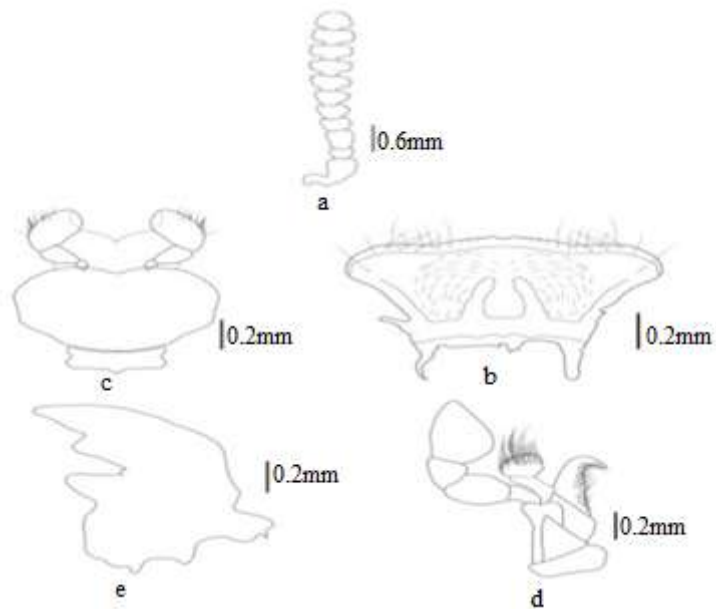
**Plate 1.** Antenna and mouth parts of *U. sextuberosa* (a) Antennae (b) Labrum (c) Labium (d) Maxilla (e) Mandible



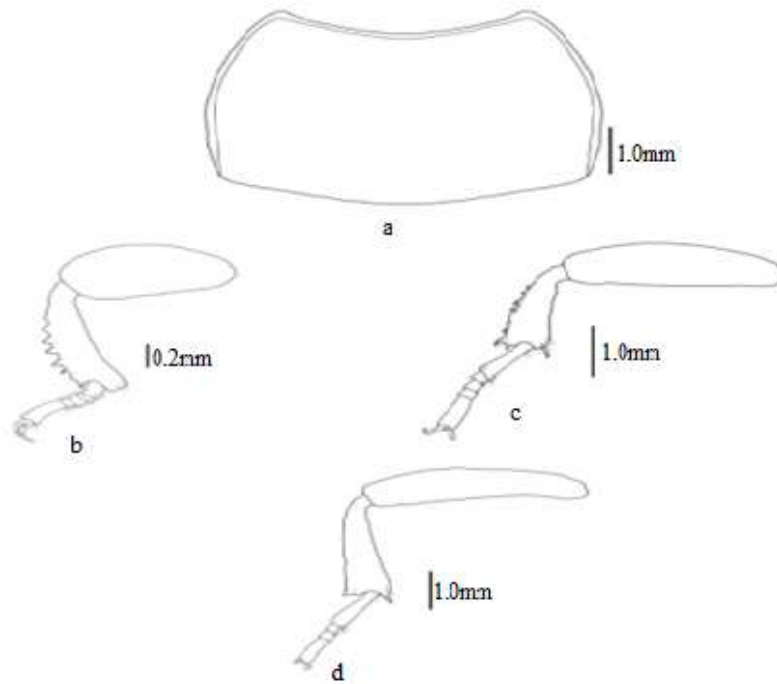
**Plate 2.** Thorax and legs of *U. sextuberosa* (a) Pronotum (b) Foreleg (c) Midleg (d) Hindleg



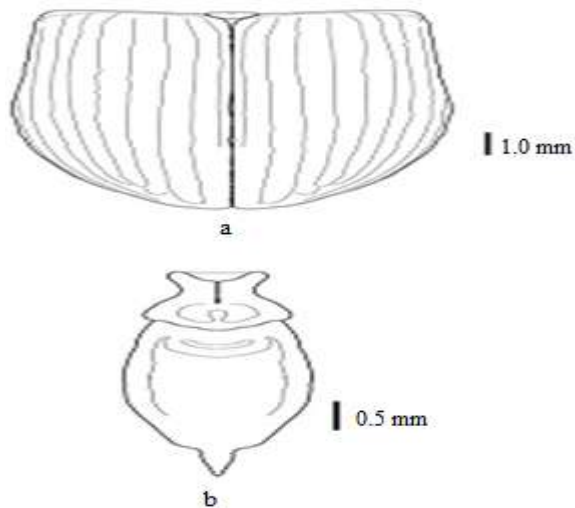
**Plate 3.** Elytra and Aedeagus of *U. sextuberosa* (a) Elytra (b) Aedeagus



**Plate 4.** Antenna and mouth parts of *U. excise* (a) Antennae (b) Labrum (c) Labium (d) Maxilla (e) Mandible



**Plate 5.** Thorax and legs of *U. excise* (a) Pronotum (b) Foreleg (c) Midleg (d) Hindleg



**Plate 6.** Elytra and Aedeagus of *U. excise* (a) Elytra (b) Aedeagus

#### **iv. Distribution**

Malaysia: (Selangor, Sabah, preserved in UKM Insect museum)

#### **A. *Uloma excise* (Gebien, 1913)**

##### **i. Type material examined**

Selangor: Universiti Kebangsaan Malaysia [UKM], 1991, Darya H., 1male specimen.

##### **ii. Additional material examined**

*Uloma* Cast. Hist. Nat. II, 1840, p. 219. — Redt. Gatt. 1845, p. 127; Fn. Austr. 1849, p. 52 u. 593; ed. II, 1858, p. CVII u. 606; ed. III, 1874, p. CXIX u. II, p. 111. — Muls. Col. Fr. Latigenes 1854, p. 231. — Bach. Käferf. III, 1856, p. 207. — Lacord. Gen. Col. V, 1859, p. 332. — Thoms. Skand. Col. I, 1859, p. 117; VI, 1864, p. 260. — Jacq. du Val, Gen. Col. d'Eur. III, 1861, p. 301. — Hörn, Revis. Tenebr. 1870, p. 370. — Bates, Ent. Monthly Mag. IX, 1873, p. 182. — Seidl. Fn. Balt. 1875. p. 97 (Gatt.); ed. II, 1891, p. 133 (Gatt.); Fn. Transsylv., 1891. p. 133 (Gatt.); Naturg. Ins. Deutschl. V, 1894, p. 591, 593. — J. Lee. AndHörn, Class. Col. N. Amer. 1883, p. 381. — Desbr. Frelon XI, 1902, p. 13.

##### **iii. Description**

Body was oval, convex, total length of 14-16 mm, maximum width at elytra of 5 mm and reddish brown in colour. In head, front was spherical with clypeus gently sinuate, compound eyes oval prominent and the distance between eyes were about 1.1-1.3 mm. Antennae and mouth parts are presented in Plate 4 in which antennae with 11 antennomeres, filiform in shape, about 1.6-1.9 mm in length, antennomeres from four to nine with somewhat pointed sharp distal border at inner side, they were gradually enlarged and the last segment was circular in shape.

In labrum, the tormal arms mesal were not extended, epitorma was appeared and ciliate by black setae on the surface. Labium was mentum with three segmented palps, maxilla with single lacinialuncus, palpi consisted of four segments, and mandibles were with one apical tooth. The illustration of thorax including pronotum and legs have been described in Plate 5.

The pronotum was slightly convex and transverse. Anterior and lateral borders were strongly margined, the lateral borders were rounded and distinctly margined, the surface was smooth and prosternum was flat. Protibiae fore legs was distinctly dilated apically, the external border were pectinate and bearing dense fine setae on the ventral border. All segments of the tarsus were almost same in the size and the last segment carried two strong claws. Mesotibiae in mid leg had some spurs, the first and the last segments of the tarsus were same in the length. Metatibiae in hind leg was cylindrical in shape and in four segmented tarsus, the first and the last segments were almost same in the length. The elytra and aedeagus are presented in Plate 6.

The length of elytra was 8.4-8.7 mm, obovate and convex in structure. Puncture of elytral rows on disc smaller than convex intervals but nearly as broad as intervals laterally. Lateral border in dorsal view was visible only at base. The scutellum was oblong with some minute punctures. The length of aedeagus was 3.4-3.7 mm.

#### iv. Distribution

Malaysia: (Borneo, Sabah: preserved in CIS Insect museum).

#### CONCLUSION

Two new species such as *U. sextuberosa* and *U. excise* were recorded from Malaysia. All morphological characteristics and taxonomical key were constructed. The obtained information will be useful to control and manage this pest.

#### ACKNOWLEDGMENTS

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