Taxonomy of *Aulacochilus* (Coleoptera: Erotylidae: Erotylinae) From China, with a Key Based on Adult Characters

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Subject Editor: Ted MacRae

Received 31 August 2017; Editorial decision 25 January 2018

Abstract

The history of taxonomy of *Aulacochilus* from China was reviewed. A key based on adult characters to separate the Chinese species of this genus is presented. A map of the collecting sites in China is given. One new species, *Aulacochilus xingtaiensis* sp. nov., from China is described and illustrated.

Key words: Coleoptera, Erotylidae, *Aulacochilus*, new species, key

Chevrolat (1836) established the genus *Aulacochilus* for *Erotylus quadrripustulatus* Fabricius, 1801. Lacordaire (1842) described eight species of *Aulacochilus* in his excellent monograph of the Erotylins. The genus was revised by Bedel (1871, 1872), who recognized the validity of 19 species. Since then, there were 56 species added to the genus (Chûjô and Chûjô 1989). Currently 5 subgenera and 84 species are known worldwide, of which 13 species were confirmed in China prior to this publication. Heller (1920) recorded *Aulacochilus luniferus* Guérin-Méneville (Coleoptera: Erotylidae: Erotylinae) for the first time in Taiwan. Achard (1923) described *Aulacochilus grousvelleii* Achard (Coleoptera: Erotylidae: Erotylinae) and *Aulacochilus taliensis* Achard (Coleoptera: Erotylidae: Erotylinae) from Yunnan. Miwa (1929) recorded *Aulacochilus janthinus* Lacordaire (Coleoptera: Erotylidae: Erotylinae) for the first time in Taiwan. Later, Chûjô (1936) recorded *Aulacochilus sibricus bedeli* Harold (Coleoptera: Erotylidae: Erotylinae) for the first time in Taiwan. Mader (1937) described *Aulacochilus sericeus* Bedel (Coleoptera: Erotylidae: Erotylinae) for the first time in Yunnan. Chûjô (1936) and Miwa and Chûjô (1939) described *Aulacochilus issikii* Chûjô (Coleoptera: Erotylidae: Erotylinae) and *Aulacochilus shinoharai* Miwa & Chûjô (Coleoptera: Erotylidae: Erotylinae) from Taiwan. Mader (1939) described *Aulacochilus reitteri* Mader (Coleoptera: Erotylidae: Erotylinae) from Henan. Mader (1941) then described *Aulacochilus klapperichi* Mader (Coleoptera: Erotylidae: Erotylinae) from Fujian. Chûjô (1968) recorded *Aulacochilus quadrripustulatus* (Fabricius) (Coleoptera: Erotylidae: Erotylinae) for the first time in Hainan. Recently, Li et al. (2013) recorded two species for the first time in China. One was *Aulacochilus tricoloratus* Gorham (Coleoptera: Erotylidae: Erotylinae) from Guangxi and the other was *Aulacochilus episcaphoides* Gorham (Coleoptera: Erotylidae: Erotylinae) from Yunnan and Guizhou. Here, we describe one new species from Laoye mountain in Xingtai city, Hebei province, bringing the number of *Aulacochilus* species in China to 14. Additionally, we include a key based on adult characters to separate the species from China. A map of the collecting sites in China is given (Fig. 1).

Materials and Methods

The material examined included specimens from the extensive collections maintained by the authors and their colleagues, as well as, some Chinese specimens of *Aulacochilus* from the Museum of Hebei University. The new species was collected in woodland fungus, killed by ethyl acetate, and taken to a laboratory in cotton bags. To examine male or female genitalia, the abdominal segments were detached from the body after softening in hot water. To clear the abdominal segments were boiled for 5 min in 5% potassium hydroxide solution, and then washed in distilled water. Morphological characters were studied and illustrated using a Nikon SMZ800N stereomicroscope. Photographs were taken with a Leica M205A camera. Measurements were taken with an ocular micrometer in millimeters. Morphological terminology follows Wegrzynowicz (1997) and Skelley and Leschen (2007). The specimens prepared in this study were deposited in the following public collections: AUHB: Agricultural University of Hebei; MHBU: The Museum of Hebei University.

Nomenclature

This paper and the nomenclatural act it contains have been registered in Zoobank ([www.zoobank.org](http://www.zoobank.org)), the official register of the International Commission on Zoological Nomenclature. The LSID (Life Science Identifier) number of the publication is urn:lsid:zoobank.org:pub:E173758C-C1BA-429C-B0B3-B08D2B77479A.
**Aulacochilus** (*Aulacochilus*) *xingtaiensis* Zhao et al. new species (Figs. 2, 3–12)  
(Zoobank LSID: urn:lsid:zoobank.org:act:86C55F03-3BC5-423E-81D0-9F06E7E4F95B)

**Type Material**
HOLOTYPE: male: 'CHINA: Hebei Province, Xingtai City, Shahe County, western valley, Laoye mountain, 3-IIV-2015, woodland fungi, Xing-long Bai and Ling Bai cols'.  
PARATYPES (3 males, 15 females) labeled: same data as holotype (1 male).

The holotype (1 male) and paratypes (2 males, 10 females) are deposited in MHBU and the other paratypes (1 male, 5 females) are keep in AUHB.

**Etymology**
The specific epithet was derived from Xingtai city, Hebei province, China where this species was collected, combined with the Latin suffix -ensis, meaning from a locality.

**Holotype male**
Total length: 7.5 mm, width: 4.0 mm. Body elongate-oval, strongly convex in lateral view, widest at basal fourth of elytra, general color black, lateral and basal areas of pronotum and underside of body deep red-black, moderately shining. Elytron with an orange mark occupying basal two thirds, leaving a black mark on humerus, one black spot near middle of the anterior border and two subbasal black spots at middle on disc; basal border of orange mark with two teeth along posterior border (Fig. 2).

Head (Fig. 3) coarsely and sparsely punctured on vertex, vertex puncture size= 0.5× facet, separated by 2–3 diameters, distinct depression each side along inner border of eye. Clypeus coarsely and closely punctured, clypeus puncture size= 0.5 × facet, nearly coalescing, anterior border feebly emarginate, a fovea on each side of the base. Eyes large, moderately prominent and coarsely faceted; interocular distance 0.65 times width of head. Antennae (Fig. 4) short, extending to basal two thirds of pronotum, with long golden setae; antennomere III nearly 2.5 times as long as IV; antennomere VIII slightly wider than VII; antennomere IX triangular; antennomere X semicircular; antennomere XI almost fan-shaped, narrower than antennomere X; relative lengths of antennomeres II—XI: 14: 40: 16: 16: 14: 16: 20: 34: 27: 28. The terminal segment of maxillary palp (Fig. 5) triangular, sides rounded, lateral angle blunt, medial angle 90° or more, length about 0.74 × as long as width. Mentum (Fig. 6) with plate triangular, both sides emarginate, with middle area depressed; submentum roundly and roughly punctured, with lateral border strongly margined.

Pronotum (Fig. 7) widest at basal third (pronotum length/width ratio = 0.54); lateral border slightly curved, strongly margined; anterior border straight opposite head, margined only behind eyes; basal border weakly sinuate, lacking margin in the middle. Pronotum distinctly punctured laterally, puncture size= 1× facet, separated by 1–2 diameters, decreasing in size and density toward median area, disc puncture size= 0.5× facet, separated by 3–4 diameters. Anterior angles projecting; posterior angles obtuse.
Prosternum (Fig. 8) with big punctures laterally, puncture size \(= 2 \times \text{facet} \), nearly coalescing; fine punctures medially, often obscured. Prosternal process triangular, produced into a blunt point anteriorly, and emarginated at posterior border; prosternal lines straight, converging anteriorly and exceeding the front edge of coxae, not attaining anterior margin.

Scutellum Pentagonal, with a Few Fine Punctures

Elytra widest at basal fourth, then gradually narrowing to apex, covered with short golden setae.

Elytron with seven striae; strial punctures stronger at base, gradually weakened apically and disappearing before apex; intervals finely punctured.

Mesoventrite (Fig. 9) broad, with a median transverse pentagonal depression; sternum with a few fine punctures, puncture size \(= 0.2 \times \text{facet} \).

Metaventrite distinctly punctured laterally, slightly decreasing in size medially; coxal lines long.

Abdomen coarsely and densely punctured laterally, puncture size \(= 1 \times \text{facet} \), nearly coalescing; punctures slightly smaller medially, puncture size \(= 0.5 \times \text{facet} \), with distinct coxal lines on first ventrite nearly attaining posterior border.

Male genitalia (Fig. 10) with median lobe weakly curved, narrowed to a point; median strut 2.3 times as long as median lobe; sclerite at anterior end of flagellum double hooked.

Paratypes (3 males, 15 females)

Total length: 6.9–7.6 mm; width 3.8–4.3 mm. There is no difference between males and females except regarding genitalia. Female genitalia (Fig. 11) with narrow styli at apex of coxite, covered with setae at apex. Female spermatheca (Fig. 12) with capsule almost ball shaped. The black markings within the orange elytral base can differ. One form is marked similarly to the holotype, or the two subbasal spots on the elytral disc can be enlarged, merging to form an irregularly shaped single spot (Fig. 13).

Taxonomic Remarks

Because *A. xingtaiensis* has a small and elongate-oval body, elytra basal width nearly equal to width of pronotal base, and having all three sets of coxal lines, it is placed into the subgenus *Aulacochilus*, as defined by Lacordaire (1842). *A. xingtaiensis* is most similar to *A. issikii*. However, these two species can be distinguished by the following combination of characters: *A. xingtaiensis* antennae extending two-thirds the length of pronotum have long golden setae, and antennomere III is nearly 2.5 times as long as IV, whereas *A. issikii* antennae extending to the posterior border of pronotum have long gray setae and antennomere III is nearly 1.57 times as long as IV; *A. xingtaiensis* lacks a shallow depression from anterior border to posterior border on lateral areas, whereas *A. issikii* has a shallow depression from anterior border to posterior border on lateral areas of pronotum; *A. xingtaiensis* has elytron with seven striae, whereas on *A. issikii* elytron has nine; *A. xingtaiensis* has a median transverse pentagonal depression on mesoventrite, whereas *A. issikii* has a median transverse triangular depression; *A. xingtaiensis* has the median strut of the male genitalia 2.3 times as long as median lobe, whereas *A. issikii* has the median strut 2.0 times as long as median lobe.

Distribution

*A. xingtaiensis* is found western valley of Laoye mountain in Shahe county, Xingtai city, Hebei province, China, at elevations between 850 and 950 m. This species inhabits woodland fungus.
Fig. 13.  A. xingtaiensis sp. nov. paratype. Dorsal habitus. Scale line: 1.00 mm.

Key to the Subgenera of Aulacochilus Chevrolat (Modified From Chûjô 1987)

1 Pro-, meso-, and metacoxal lines present......................................
   - Pro- or mesocoxal lines present, metacoxal lines absent........2

2 Elytral punctuation confused, no striae evident..........................3
   - Elytron with striae obvious in rows....................................4

3 Body rather elongate-oval, mesocoxal lines absent.....................
   - Body oval and very wide, mesocoxal lines present................
     - Aulacochilus (Lacucaochilus) Chûjô

4 Body oblong, mesocoxal lines absent........................................
   - Body oval, mesocoxal lines present....................................
     - Aulacochilus (Lacucaochilus) Chûjô

Key to the Species of Aulacochilus Chevrolat from China Based on Adult Characters

1 Body coloration uniformly deep blue or black ............................2
   - Body coloration not monochrome, with color pattern...............5

2 Antennomere III about 2.0 times as long as IV.........................4
   - Antennomere III about 2.5 times as long as IV.......................3

3 Submentum concaved medially...................................................
   - Submentum concaved laterally..........................................4

4 The basal two thirds of metasternum with a vertical depression in the middle.........................................................5
   - The basal four fifths of metasternum with a vertical depression in the middle..........................................................4

5 Elytral mark multicolored, changing from orange to yellow across mark.........................................................6
   - Elytral mark uniformly colored.........................................

6 Orange elytral mark lacking black spots in the middle...............7
   - Orange elytral mark with black spots in the middle.............10

7 Elytron with one orange mark................................................
   - Elytron with two orange marks.........................................8

8 The terminal four abdominal sternites brown............................8
   - The terminal four abdominal sternites black-blue...............9

9 Elytral basal orange mark curved toward the middle, c-shaped...
   - Elytral basal orange mark not curved toward the middle, more quadrate.................................................................12

10 Elytron with one orange mark.............................................11
    - Elytron with two orange marks........................................

11 Terminal segment of maxillary palp length <0.5 times as long as width.................................................................13
    - Terminal segment of maxillary palp length ≥0.5 times as long as width.................................................................

12 Antennomere III about 2.5 times as long as IV, elytron with seven striae, a median transverse pentagonal depression on mesoventrite.................................................................12
    - Antennomere III about 1.6 times as long as IV, elytron with nine striae, a median transverse triangular depression on mesoventrite.........................................................13

13 Male genitalia with median lobe truncate at apex in lateral view...
   - Male genitalia with median lobe hooked at apex in lateral view
     - Aulacochilus (Lacucaochilus) Chûjô

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Acknowledgments

We thank the help from Xing-long Bai and Ling Bai (both MHBU) with specimen collection. We are grateful to the anonymous reviewers for critically reading the manuscript and providing useful comments. The work was supported by the State Natural Sciences Foundation Monumental Projects of China (No. 31750002), the National Natural Science Foundation of Hebei (No. C2015204078), and Outstanding Talents of Agricultural University of Hebei (No. 0318011).

Journal of Insect Science, 2018, Vol. 18, No. 2
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