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Notes on *Aulaconotus* Thomson, 1864 from China, with description of one new species (Coleoptera: Cerambycidae: Lamiinae: Agapanthiini)

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Abstract

The male of the little-known species *Aulaconotus incorrugatus* Gressitt, 1939 is reported for the first time, and its male genitalia compared with the most similar congener, *A. semiaulaconotus* (Hayashi, 1974). A few new provincial records for *A. incorrugatus* are given. A new species closely related to the above taxa, *A. yangi* Bi & Lin **sp. nov.**, is described from southeastern China. Illustrations of the habitus and major diagnostic characters, including endophallic structure, of these three species are provided.

Key words: taxonomy, endophallus, Oriental Region

Introduction

The genus *Aulaconotus* Thomson, 1864 was established based on *Aulaconotus pachypezoides* Thomson, 1864, and now it includes eight valid species distributed in the China-Indochina Peninsula (Tavakilian & Chevillotte 2023). Up to now, six species of the genus are known from China, viz. *A. atronotatus* Pic, 1927, *A. gracilicornis* Makihara & A. Saito, 1985, *A. incorrugatus* Gressitt, 1939, *A. pachypezoides* Thomson, 1864, *A. semiaulaconotus* (Hayashi, 1974), and *A. szetschuanus* Breuning, 1968 (Lin & Yang 2019). The genus can be distinguished among the Asian Agapanthiini by the head sub-retractile, frons deeply grooved medially, inferior eye-lobe deeper than wide, antennae relatively less slender, densely and briefly fringed with hair beneath, antennal scapes hardly reaching middle of prothorax; part of prosternum between anterior margin and coxae short; elytra ridged and swollen basally; first anterior tarsal segment shorter than following two united, and posterior femora reaching apex of abdominal ventrite II (Gressitt 1951: 53).

In the course of our study of material from several major collections and from several field surveys to southeastern China during the past decade, the male of *A. incorrugatus* Gressitt, 1939 was discovered for the first time, and the ninth species of the genus was recognized and is described herein.

Material and Methods

Material is deposited in the following institutional or private collections (referred to by abbreviations in the text):

CBWX Collection of Wen-Xuan Bi, Shanghai, China CCCC Collection of Chang-Chin Chen, Tianjin, China

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CZDY Collection of De-Yao Zhou, Shanghai, China IZCAS Institute of Zoology, Chinese Academy of Sciences, Beijing, China = NACRC National Animal Collection Resource Center SYSU Sun Yat-sen University, Guangzhou, China

Labels of the name-bearing type specimens are quoted verbatim; double quotation marks ("") are used for a single label, a slash (/) is used to separate lines on the same label, Chinese characters are transcribed in the modern system.

Habitus images were taken using a Canon EOS 60D camera equipped with a Canon EF 100mm f/2.8L Macro Lens. Images of the endophallus were produced using the same camera equipped with a Canon MP-E 65mm f/2.8 1-5X Macro Lens. Canon MT-24EX Macro Twin Lite Flash was used as the light source. CombineZM was used for image stacking. All images were edited and arranged in Adobe Photoshop CS3.

Taxonomy

Aulaconotus incorrugatus Gressitt, 1939

Chinese common name: 天目长额天牛 (Figs 1, 5, 10)

Aulaconotus incorrugatus Gressitt, 1939: 117, pl. I, fig. 10 (type locality: Tianmushan (= T'ien-mu Shan), Zhejiang, China);
Gressitt 1951: 537; Hua 2002: 197; Hua et al 2009: 451; Löbl & Smetana 2010: 217; Lin 2015: 162, figs on page 163; Lin & Yang 2019: 226; Danilevsky 2020: 305; Lin et al. 2023: 116, pl. V, fig. 16.

Type material examined. Holotype female, "T'ienmu Shan / Musée Heude", "21.6.36 / O. PIEL, coll.", "AULACONOTUS / INCORRUGATUS / GRESSITT", "HOLOTYPE / AULACONOTUS / INCORRUGATUS / J.L.Gressitt" (IOZ(E) 217564, IZCAS).

Other material examined. China (Anhui): 1 male, Yuexi, Yaoluoping, Hongshan, 570 m, 2021.VII.9, leg. Wen-Xuan Bi (CBWX). **China (Zhejiang)**: 1 female, Lin'an, Xitianmushan, 350 m, 2008.VI.5, leg. Jian-Qing Zhu (CBWX); 1 male, ditto except 510 m, 2021.IV.10, leg. Wen-Xuan Bi (CBWX); 1 male, Pan'an, Dapanshan, 750 m, 2023.V.18, leg. Wen-Xuan Bi (CBWX); 1 male, Pan'an, Dapanshan, 735–845 m, 2016.V.6–7, leg. De-Yao Zhou (CBWX); 1 female, Suichang, Xinluwanzhen, 300 m, 2023.V.23, leg. Wen-Xuan Bi (CBWX); 1 male, Qingliangfeng, Longtangshan, 600 m, 2023.VII.5, leg. Wen-Xuan Bi (CBWX); 1 male, Hangzhou, Chun'an, Wulongcun, 450–550 m, 2023.V.14, leg. Jin-Teng Zhao (CCCC). **China (Hunan)**: 1 female, Changning, 1981. VII.10, leg. Pei-Sheng He (SYSU).

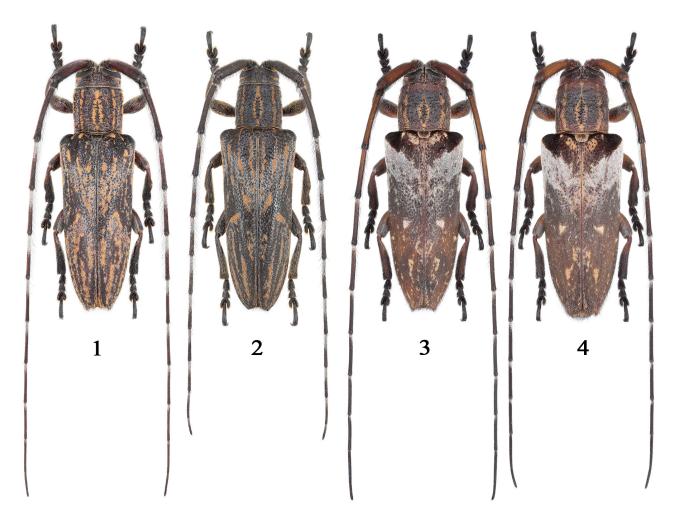
Complementary description to original description provided by Gressitt (1939). Male (Fig. 1). Body length 13.5–15.8 mm, humeral width 4.1–4.9 mm. Elytra 3.6–3.8 times as long as pronotal length, 2.3 times as long as humeral width.

Male endophallus (Fig. 10) moderately long and slender, strongly curved dorsally near apical third; basal phallomere well defined by the presence of a pair of crescent-shaped sclerites at basal one-fifth; distinctly swollen from apical one-fifth to near the apex; provided with one small dorsal tubercle and one small ventral tubercle on dorsal surface of basal phallomere or near apex separately; spicules mainly distributed on the subapical swelling or along the dorsal surface behind it; ejaculatory duct single; gonopore situated at apex.

Female. Body length 14.6–15.5 mm, humeral width 4.4–4.6 mm.

Distribution. China: Anhui (new Province record), Zhejiang, Hunan (new Province record).

Remarks. Gressitt (1939) differentiated this species from *A. pachypezoides* Thomson, 1864 "in being a little smaller, in having the antennae slenderer, the prothorax longer, more cylindrical and distinctly ridged, the elytra more acute apically and each with a large even swelling instead of longitudinal ridges, at base" and "much more glabrous dorsally and the pubescence is more broken up and more pinkish in color."



FIGURES 1–4. Habitus of *Aulaconotus* spp. (1–3, male; 4, female. 3–4, paratype). 1, *Aulaconotus incorrugatus* from Zhejiang, China; 2, *A. semiaulaconotus* from Taiwan, China; 3–4, *A. yangi* sp. nov. from Zhejiang, China.

Aulaconotus semiaulaconotus (Hayashi, 1974)

Chinese common name: 台湾长额天牛 (Figs 2, 6, 11)

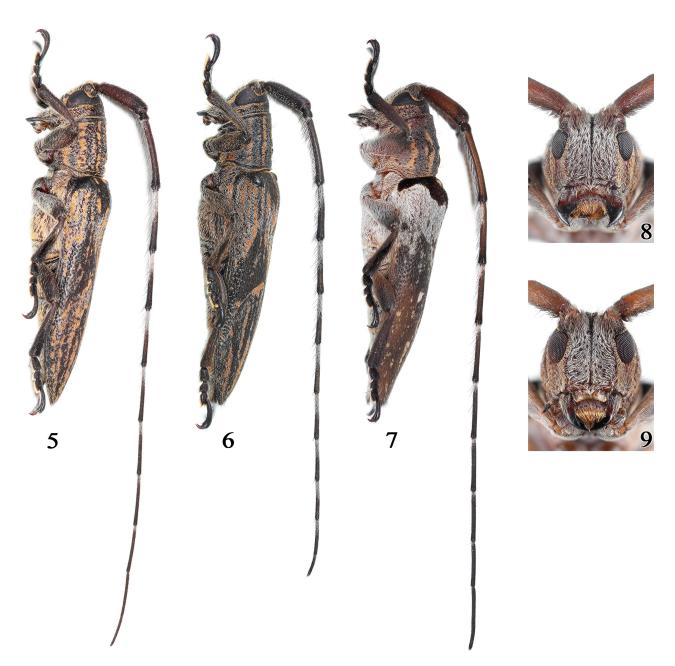
Pothyne semiaulaconotus Hayashi, 1974: 43 (type locality: Lushan or Hotso, Nantou Hsien, Taiwan, China).

Aulaconotus semiaulaconotus: Takakuwa & Kusama 1979: 11; Yu & Nara 1988: 54, 106, pl. 18, fig. 2; Nakamura *et al.* 1992: 67; Hua 2002: 197; Yu *et al.* 2002: 54, 106, pl. 18, fig. 2; Mizuno & Shiyake 2004: 44, pl. 16, fig. 399; Chou 2004: 254, fig.; Chou 2008: 254, fig.; Hua *et al.* 2009: 68, pl. LXVIII, fig. 784, 202, 341; Löbl & Smetana 2010: 217; Nakamura *et al.* 2014: 118; Lin & Yang 2019: 227; Danilevsky 2020: 305.

Material examined. China (Taiwan): 1 female, Nantou, Jenai, Nanfeng, Nanshanhsi, 2007.V.21, leg. C.-J. Chen (CCCC); 2 males, 1 female, Pingtung, Chun-jih, Ta-han-shan, 1,300 m, 2016.IV.8, leg. Y.-T. Chung (CCCC); 1 male, Pingtung, Chun-jih, Ta-han-shan, 1,300 m, 2016.V.9, leg. Y.-T. Chung (CCCC).

Complementary description to original description provided by Hayashi (1974). Male (Fig. 2). Body length 13.8–18.1 mm, humeral width 4.2–5.6 mm. Elytra 3.8–4.2 times as long as pronotal length, 2.3–2.4 times as long as humeral width.

Male endophallus (Fig. 11) almost identical to *A. incorrugatus* as described above, but the subapical swelling relatively less developed.



FIGURES 5–9. Habitus of *Aulaconotus* spp. (5–8, male; 9, female. 7–9 paratype. 5–7, lateral view; 8, 9, frontal view). 5, *Aulaconotus incorrugatus* Gressitt, 1939; 6, *A. semiaulaconotus* (Hayashi, 1974); 7–9, *A. yangi* sp. nov.

Female. Body length 17.7–17.8 mm, humeral width 5.2–5.5 mm. **Distribution.** China: Taiwan.

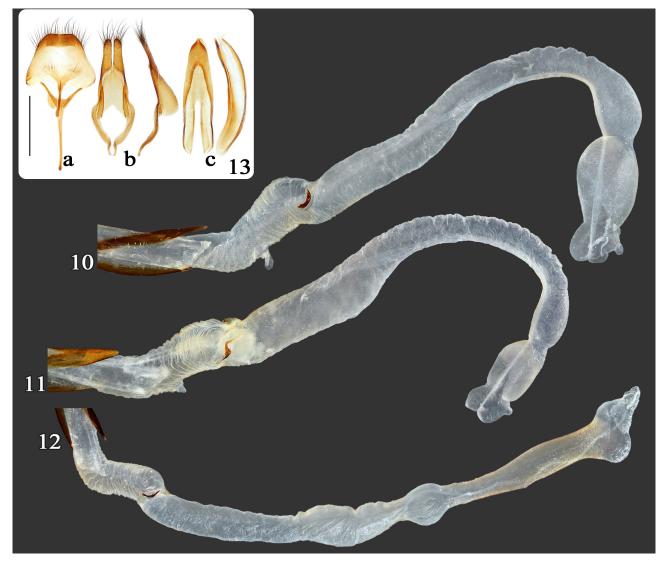
Remarks. This species was originally described under the genus *Pothyne* Thomson, 1864. Takakuwa & Kusama (1979) transferred it to *Aulaconotus* due to the following characteristics: body not much cylindrical; frons with many distinct granules just like in *A. pachypezoides* Thomson, 1864, not punctate (without any granules in *Pothyne*); each base of antennal 4th to 11th segments annularly clothed with white pubescence; elytra near base with a pair of rising (almost flat in *Pothyne*); elytral punctures extremely shallow (not so shallow in *Pothyne*).

This species is very similar to *A. incorrugatus* especially regarding the considerable similarities of their endophallic structures (Figs 10, 11). It can be preliminarily distinguished from the latter by the pronotum distinctly broader at base instead of cylindrical, by the elytra longer in relation to the pronotal length, and by the elytral humeri more prominent.

Aulaconotus yangi Bi & Lin sp. nov.

Chinese common name: 杨氏长额天牛 (Figs 3, 4, 7–9, 12, 13)

Type material. HOLOTYPE: CHINA: male, "China, Zhejiang, Lin'an / Xitianmushan, 510 m / 2016.VIII.5–6 em. 2017.VIII.1 / leg. Wen-Xuan Bi" (IZCAS). **PARATYPES: CHINA:** 1 female, same data as holotype (CBWX); 1 female, same locality as holotype, 2010.V.4 em. VII.1, leg. Wen-Xuan Bi (CBWX); 1 male, ditto except 2016. VIII.5 (CBWX); 1 male, ditto except 2016.VIII.5–6 em. IX.15 (CBWX); 1 female, ditto except em. 2017.VII.22 (CBWX); 4 females, ditto except 2017.IV.8 em. VII.21 (CBWX); 1 female, ditto except em. 2017.VII.22 (CBWX); 4 females, ditto except 2017.IV.8 em. VII.21 (CBWX); 1 female, ditto except em. 2017.VII.2 (CBWX); 1 male, ditto except 400 m, 2019.IV.11 em. VII.20 (CBWX); 1 male, ditto except em. 2020.VI.3 (CBWX); 1 female, China, Zhejiang, Lin'an, Xitianmushan, 410 m, 2024.IV.15, leg. Wen-Xuan Bi (CBWX); 2 males, China, Zhejiang, Pan'an, Dapanshan, 780 m, 2023.V.18–19, leg. Wen-Xuan Bi (CBWX); 1 female, ditto except 600 m, 2023.V.19 em. IX.10 (CBWX); 1 female, China, Zhejiang, Longquan, Fengyangshan, Luaocun, 1,080 m, 2023.V.26, leg. Wen-Xuan Bi (CBWX); 1 female, China, Zhejiang, Longquan, Fengyangshan, Shuangxicun, 1,170–1,200 m, 2023.V.28, leg. Jin-Teng Zhao (CCCC); 1 female, China, Jiangxi, Shangrao, Yiyang, Sanxianling, 640 m, 2023.V.15, leg. Meng-Yue Chen by FIT (Flight Interception Trap) (IZCAS); 1 male, Hunan, Yueyang City, Pingjiang County, Fushoushan, 28°28'27.49" N, 113°46'29.57" E, 1,380 m, 2016.VII.15, leg. De-Yao Zhou (CZDY).



FIGURES 10–13. Male terminalia of *Aulaconotus* spp. **10**, *Aulaconotus incorrugatus*; **11**, *A. semiaulaconotus*; **12**, **13**, *A. yangi* **sp. nov.** 10–12, endophallus in inflated and everted condition. 13a, Tergite VIII with sternites VIII & IX in ventral view; 13b, tegmen in ventral view and lateral view; 13c, median lobe in ventral view and lateral view. Scale = 1 mm (10–12 not to scale).

Description. Male (Fig. 3). Body length 11.6–14.8 mm, humeral width 3.6–4.7 mm. Integument of body and elytra reddish brown to brown; appendages mostly brown, except for the apical 5 or 6 antennomeres and tarsi which are dark brown to blackish. Head with frons densely covered with yellowish pubescence; genae clothed with intermixed yellowish and tawny pubescence; occiput mostly covered with brown pubescence, except for two narrow longitudinal vittae of tawny pubescence along midline, sometimes very vague; antennomeres V-X narrowly ringed with pale pubescence at each extreme base. Pronotum mostly covered with fine yellowish pubescence; with dense tawny pubescence forming five narrow longitudinal strips, reaching from the base to near the anterior margin, distinctly narrowed anteriorly, of which the middle strip somewhat fusiform, widest near basal third, interrupted by a glabrous midline. Scutellum covered with yellowish pubescence on outer margin. Elytra predominantly covered with fine yellowish to brownish pubescence, not obscuring integument, with dense dark brown pubescence forming a triangle macula on basal one-fifth, posterior border slightly poorly defined, with one V-shaped macula of pale pubescence abutting behind the triangle macula, vaguely reaching basal two-fifths, with two same colored small rounded to triangle spots slightly behind midlength near suture, as well as same irregularly shaped tawny spots scattered mainly surround the scutellum and on apical one-third near suture. Ventral surface, coxae, trochanters and most of femora covered with pale to yellowish pubescence; tibiae and tarsi clothed with dark brown to blackish pubescence.

Head with frons slightly longer than width, finely punctate; vertex narrow, grooved; eyes weakly emarginated; lower eye lobe 1.7 times as long as width, nearly as tall as gena. Antennae 1.7–1.8 times as long as body length; scape finely punctate; antennomere III 1.2 times as long as scape, 1.3 times as long as antennomere IV, antennomeres IV–X successively shortened, last antennomere 1.4 times as long as penultimate segment.

Pronotum subcylindrical, length subequal to basal width; disk moderately convex, weakly rugose, sparsely granulated. Scutellum semicircular.

Elytra elongate, about 3.5–3.8 times as long as pronotal length, 2.2 times as long as humeral width; gradually convergent toward obliquely truncate apices with short subacute marginal teeth; humeri moderately prominent; disk coarsely punctate, which are becoming shallower near apical one-third. Each elytron provided with a median oval swelling subbasally, distinctly elevated in lateral view (Fig. 7). Legs short and thick; metatibiae hardly exceeding abdominal ventrite IV in ventral view.

Male genitalia. Tergite VIII (Fig. 13a) trapezoidal, gently emarginate, with moderately long setae. Tegmen (Fig. 13b) in lateral view moderately curved, rhombic in shape and widest near basal one-third in ventral view; lateral lobes moderately long, about one-fourth of total length of tegmen, which moderately provided with long setae on apices. Median lobe (Fig. 13c) subequal to tegmen, moderately curved in lateral view; apex acute in ventral view. Endophallus in everted condition (Fig. 12) gently curved ventrally in lateral view, mostly slender except for two weak swellings situated slightly before and behind the midlength separately, and one strong dorsal swelling near apex; crescent-shaped sclerites well developed; spicules mainly distributed from apical two-fifths to near apex; ejaculatory duct single; gonopore situated at apex.

Female (Fig. 4). Body length 12.8–16.9 mm, humeral width 4.0–5.1 mm. Almost identical to male in general appearance. Antennae 1.6–1.7 times as long as body length; elytra 2.2–2.3 times as long as humeral width.

Etymology. The new species is dedicated to Prof. Xing-Ke Yang (杨星科), a leading coleopterist in China, who supports the corresponding author in many ways.

Distribution. China: Zhejiang, Jiangxi, Hunan.

Remarks. *Aulaconotus yangi* Bi & Lin **sp. nov.** is morphologically close to *A. incorrugatus* and *A. semiaulaconotus* in the similar body proportions and shape of elytral subbasal swellings. However, the new species can be easily distinguished by the frons lacking distinct granules, the antennal rings of light pubescence much narrower, the subbasal swellings of elytra comparatively more elevated (Fig. 7 vs. Figs 5, 6), as well as the significant differences in the elytral pubescent patterns and endophallic structures (Fig. 12 vs. Figs 10, 11).

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中国长额天牛属Aulaconotus研究及一新种描述(鞘翅目:天牛科:沟胫天牛亚科:多节天牛族)

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摘要: 首次报道了天目长额天牛*Aulaconotus incorrugatus*的雄虫,与台湾长额天牛*A. semiaulaconotus*的雄性外生殖器进行了对比;报道了天目长额天牛的数个省级新分布记录。描述了产自中国东南部一新种—杨氏长额天牛*A. yangi* sp. nov.。展示了三种长额天牛的整体图、主要鉴别特征图及雄性外生殖器图。

关键词: 分类; 内囊; 东洋区