Taiwania 66(1): 1–10, **2021**
DOI: 10.6165/tai.2021.66.1

A new species and five new records of bark beetles (Coleoptera, Curculionidae, Scolytinae) from Taiwan

Ching-Shan LIN[1,2,*], Roger A. BEAVER[3]

1. Department of Entomology, National Taiwan University, Taipei 10617, Taiwan.
2. Tsau-Hu Elementary School, Dali District, Taichung City 41263, Taiwan.
3. 161/2 Mu 5, Soi Wat Pranon, T. Donkaew, A. Maerim, Chiangmai 50180, Thailand. E-mail: rogerbeaver6@gmail.com
[*]Corresponding author's email: p92632001@ntu.edu.tw

(Manuscript received 5 November 2020; Accepted 8 December 2020; Online published 1 January 2021)

ABSTRACT: A new species of bark beetle *Acacicis aphananthe* Lin & Beaver (tribe Diamerini) from Taiwan is described, as well as its biology in the host plant, *Aphananthe aspera* (Cannabacaeae). Five species, *Eidophelus darwini* (Eichhoff, 1878), *Hylesinus tristis* (Blandford, 1894), *Phloeocranus bruchoides* Schedl, 1942, *Phloeosinus camphoratus* Tsai & Yin, 1964, and *Hypothenemus aulmanni* (Hagedorn, 1912) are reported in Taiwan for the first time. We provide brief diagnoses, proventricular characters, and biological information for the species.

KEY WORDS: *Acacicis*, bark beetles, biology, Diamerini, new species, proventriculus, Taiwan, taxonomy.

INTRODUCTION

Bark and ambrosia beetles in the weevil subfamily Scolytinae are important forest pests in both temperate and tropical forests (Ciesla, 1993; Raffa *et al.*, 2015). The majority of species attack dead or dying trees, but a few, often economically important, species attack apparently healthy trees and can cause die-back or mortality. In this paper, we use the term 'bark beetle' to include species of Scolytinae that feed and develop in the phloem (phloeophagous species) or the pith (myelophagous) of stems, as opposed to species that breed in seeds (spermatophagous) or ambrosia beetles (xylomycetophagous) that breed in the xylem using cultivated ambrosia fungi as food (Kirkendall *et al.*, 2015). Forty-six species of bark beetle have been recorded in Taiwan (Beaver and Liu, 2010; Lin, 2020). In this paper, we describe a new species of the genus *Acacicis* Lea, and record five more species of bark beetle for the first time in Taiwan. For each species, we provide a diagnosis, including for four of the species the form and features of the proventriculus, and information on distribution, host plants and biology.

MATERIALS AND METHODS

Specimens were collected from October 2013 to October 2020 using twelve-unit Lindgren multiple funnel traps (Contech Enterprises, Inc., Delta, British Columbia, Canada), baited with 95% ethanol, and 95% α-pinene (Merck, Germany), or reared from collected branches and logs. Beetles were identified to the species level using the keys of Yin *et al*. (1984), Beaver (1999), Maiti and Saha (2009), and Petrov (2018), and by comparison with verified specimens in R. A. Beaver's collection. Specimens were examined and identified using a Leica stereomicroscope (M 205-C) equipped with an eyepiece micrometer in a Pl 10x/22 eyepiece. Length was measured from the pronotal apex to the elytral apex in dorsal view.

The proventriculus is the terminal part of the fore intestine and situated between the crop and the cardiac valve of the mid-gut (Nobuchi, 1969). Its form and size differ in different genera, and it can be a useful aid in the classification of species into genera (Nobuchi, 1969; Johnson *et al*., 2020). It is comprised of eight chitinous plates arranged in a circle forming a tube for grinding and filtering food particles. It can be divided into an anterior plate and a posterior masticatory plate. The anterior plate is covered by sclerotized cuticle and armed with teeth, long bristle-like spines, or tubercles. The posterior plate is armed with closing teeth, a masticatory brush and masticatory teeth (Nobuchi, 1969; Yin *et al*., 1984). The proventriculus was extracted from the specimen under a microscope for study. It was unrolled onto a microscope slide with water and photographed from the internal face. Photographs of beetles and proventriculus were taken using a Canon 50D camera and macro lens MP-e65, and processed using the program CombineZP. Photos of beetles and proventriculus were typically stacked images (Helicon Focus V. 6.8, Helicon Soft.). All specimens of the newly recorded species are deposited in the collection of first author.

TAXONOMIC TREATMENT

New Species

Tribe Diamerini Hagedorn, 1909

Acacicis aphananthe Lin & Beaver, ***sp. nov.***

糙葉樹小球小蠹 Fig. 1A–F

urn:lsid:zoobank.org:pub:E7C65468-E0C1-4E40-BAB7-DFBC94C5E929

Fig. 1. ***Acacicis aphananthe*** Lin & Beaver, *sp. nov.*, female: **A**. dorsal view, **B**. lateral view, **C**. front view, **D**. male, front view, **E**. female abdominal tergum, **F**. male abdominal tergum, **G**. simple longitudinal parental gallery system, **H**. egg niches, I. larvae mined first subparallel to each other outward, **J**. larval galleries radiated and crossed over each other, **K**. deep pupal cells at the end of the larval galleries, **L**. Teneral adults emerged from the pupal chamber.

Type: Holotype, female, Taiwan: Taichung city, Heping Dist., alt. 654 m, 24°9.8210'N, 120° 57.4140'E, from *Aphananthe aspera* (Cannabaceae), 29 vii 2020, C. S. Lin, deposited in National Museum of Natural Science (NMNS), Taichung, Taiwan. ***Paratypes***: 51 males, 28 females; the same data as the holotype. Paratypes are deposited in National Museum of Natural Science (NMNS), Taichung, Taiwan, Michigan State University Arthropod Research Collection (MSUC), East Lansing, MI, USA, The Natural History Museum (NHML), London, UK, National Museum of Natural History (NMNH), Washington, DC, USA, Naturhistorisches Museum, Wien (NMW), Austria, Taiwan Agricultural Research Institute (TARI), Taichung, Taiwan, National Taiwan University Insect Museum (NTU), Taipei, Taiwan, National Chung Hsing University Museum of Entomology (NCHU), Taichung, Taiwan, A.V. Petrov's collection (AVP), Institute of Forest Science Russian Academy of Science, Russia, R. A. Beaver's private collection (RAB), Chiangmai, Thailand, 59 paratypes in the first author's collection.

Diagnosis. The species is perhaps most closely related to *Acacicis trahax* (Sampson) from Thailand, but is distinguished from that species by its smaller size (1.70–2.08 mm *vs* 2.3 mm), and even stouter facies (1.19–1.32 times as long as wide *vs* 1.35 times). The

small elevation present in *A. trahax* where interstriae 5–8 coalesce anterior to the elytral apex is absent in *A. aphananthe*, so that the apex of the elytra appears rounded rather than transverse.

Description. **Female**: Length 1.95 ± 0.08 mm (mean ± sd, n = 9), and ranging from 1.80–2.08 mm; 1.19–1.32 times as long as wide. Body globular, color of mature adults dark brown to black, shining, antennae reddish brown, tarsi yellowish brown. Frons plano-concave, surface weakly shining, evenly, moderately densely, granulate-punctate with weak, fine reticulation, the punctures bearing fine, yellowish-white, hair-like setae, deeply bifurcate in lower half of frons, simple, sharply pointed in upper part, setae directed medially and dorsally (Fig. 1C). Eyes elongate-oval and large. Antennal funicle seven-segmented (including pedicel), scape curved, distally widened, club elongate with two straight, transverse, septate sutures. Pronotum wider than long, 3.13 ± 0.23 (2.89–3.64) times wider than long, widest at base and gradually narrowing anteriorly, anterior margin nearly transverse, with a row of minute asperities, base strongly angularly produced in a V-shape; surface weakly shining, evenly, moderately densely, granulate-punctate, with weak, fine reticulation, the punctures bearing grey-white, sharply-pointed setae of moderate length, undivided on dorsal part of pronotum, but with an admixture of deeply bifid setae close to basal and lateral margins, and almost wholly bifid on the hypomeron, the dorsal setae directed posteriorly and towards the midline. Scutellum very small and knob-like. Elytra strongly globose 1.02 ± 0.03 (0.98–1.07) times wider than long; basal margin of each elytron moderately convex with 10–14 crenulations, a submarginal row behind them, and a third more irregular row on interstriae 1–5, lateral margins outcurved, then gradually narrowing posteriorly to a broadly rounded apex, discal striae indistinct, feebly impressed with minute punctures, the punctures with fine microhairs; interstriae flat, much wider than striae, and narrowing towards apex with 3–4 rows of small punctures, each bearing a short, flattened, semi-erect seta with pointed tip, the setae becoming narrower and more hair-like towards the sides of the elytra; declivity gradually sloping with convex face, striae and interstriae as on disc, but striae less impressed, lacking a tubercle or swelling at the apex of interstriae 5. The abdomen with five visible ventrites, ventrites 2–4 with a distinct row of bifid (occasionally trifid) setae on posterior margin (Fig. 1E). Proventriculus without median denticles. Lateral sides of anterior plate rather strongly sclerotized but nearly membranous in middle, with about 3–5 rows of weakly transverse rows of teeth. Posterior plate longer, about 2.5 times longer than the anterior, closing teeth short, not extending to middle of masticatory brush, neither serrated nor furcate (Fig. 7A).

Male: smaller than female, 1.89 ± 0.11 mm (mean ± sd, n = 9), and ranging from 1.70–2.05 mm; 1.22–1.29 times as long as wide. Similar to female except frons shallowly impressed from epistoma to upper level of eyes (Fig. 1D), the row of asperities on the anterior margin of the pronotum stronger, and the abdomen with six visible ventrites (Fig. 1F).

Etymology: The new species is named after its host plant, *Aphananthe aspera*.

Biology: *Acacicis aphananthe* is a phloeophagous bark beetle. Adults were found on twigs, branches and limbs of *Ap. aspera* with a diameter between 1.9 and 8.3 cm. Logs from the fallen tree were transported from mountain to laboratory on July 29, 2020, and kept in boxes at room temperature. The first generation was collected on September 15, 2020. The female initiates the boring of a new gallery with a short entrance tunnel (2.5–3.9 mm long) and a nuptial chamber. After a male has been attracted, and mating has occurred, the gallery system is then extended, parallel or nearly parallel to the long axis of the stem, to form a single longitudinal gallery, which usually engraves the wood rather deeply (Figs. 1G). The length of the egg gallery varied from 4.1 mm to 18.9 mm, and it is about 1.8–2.2 mm in width. Females usually stay in the galleries until death; males may leave earlier. The eggs were pearly white, translucent and oblong in shape, protected in the egg niches by a covering of frass (Fig. 1H). After hatching, the larvae mined first subparallel to each other, then radiated outwards. Larval galleries measured from 1.3 cm up to 4.0 cm in length and usually cross one another (Fig. 1I–J). The number of larval galleries varied from 7 to 61, being very crowded in the latter nest. Mature larvae prepared deep pupal cells at the end of the larval galleries (Fig. 1K). Teneral adults (Fig. 1L) emerged from the pupal chamber by tunneling straight through the bark over it. The life cycle was completed in about 1.5 months in the laboratory when the temperature of laboratory was about 30–31°C. The temperature range in the place of origin is about 25–35°C, so the time to complete one generation in the field is probably about the same as in laboratory.

New Records

Tribe Coriacephilini Johnson, 2020

Eidophelus darwini (Eichhoff, 1878)

厚鱗藤小蠹 Fig. 2A–D

Scolytogenes darwini Eichhoff, 1878: 387.

Diagnosis. **Female** (Fig. 2A–D): Length 2.7 mm (n = 1); stout and short, 1.54 times longer than wide; dark brown in color; pronotum 0.67 times as long as wide, strongly globose, anterior half with short tubercle-like asperities, posterior half rough reticulate with small thick scale-like setae; elytra 1.25 times longer than pronotum, discal striae with shallow minute punctures, interstriae much wider than striae, with dense coat of small thick scale-like setae, declivity plano-convex. This species can be distinguished from all other *Eidophelus* recorded in

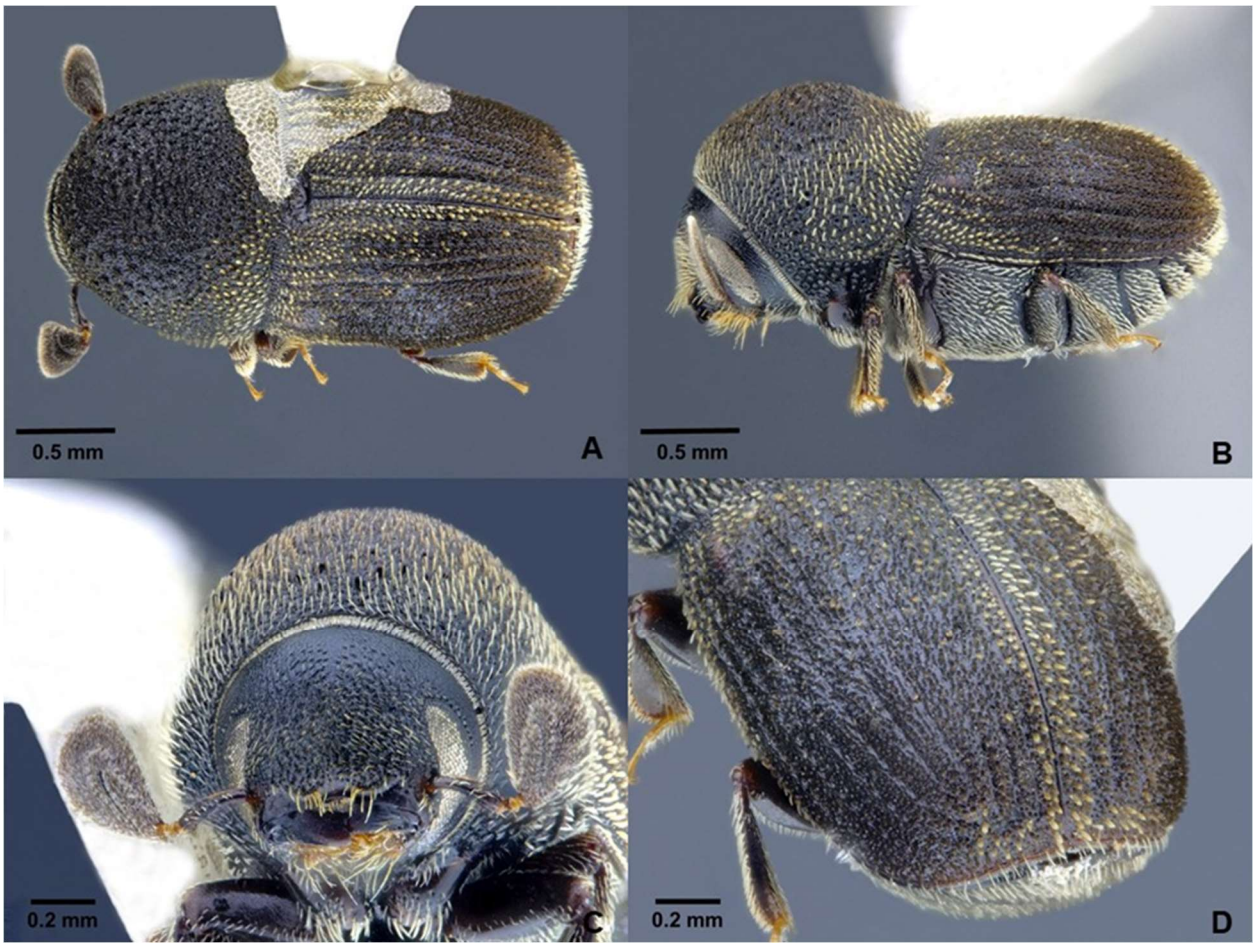

Fig. 2. ***Eidophelus darwini*** (Eichhoff), female: **A**. dorsal view, **B**. lateral view, **C**. front, **D**. elytral declivity.

Taiwan by large, stout body and covered with dense scale-like setae. Proventriculus not examined.

Male: Not available in the material studied.

Material examined. Nantou county, Yuchi Township (23°55.0670'N, 120°53.0880'E), 681 m, 10 iv 2015, H. H. Shih leg. in ethanol-baited trap.

Distribution. China, India, Indonesia (Java), Myanmar, New Guinea, Philippine Islands, Sri Lanka, Vietnam (Maiti and Saha, 2009; Wood and Bright, 1992). New to Taiwan.

Biology. The species commonly breeds in vines (Wood, 1985), but the only named hosts are *Cryptolepis buchanani* and *Parameria barbata* (Apocynaceae) (Kalshoven, 1958; Wood and Bright, 1992).

Tribe Hylesinini Erichson, 1836

Hylesinus tristis Blandford, 1894

黑鱗海小蠹 Fig. 3A–D

Hylesinus tristis Blandford, 1894: 66.

Diagnosis. **Female** (Fig. 3A–C): Length 2.55–3.0 mm (mean = 2.85; n = 5); stout, 1.70–1.82 times longer than wide; blackish brown in color; head sexually dimorphic, frons somewhat flat to feebly impressed above epistomal margin; pronotum 0.46–0.50 times as long as wide, widest at base, anterolateral part of pronotum with several distinct crenulations, surface with more coarse punctures, median line indicated two-thirds of pronotum length from base; elytra 2.92–3.23 times longer than pronotum, each elytral base with about 11 crenulations, the striae narrow but well impressed, with sparse distinct punctures, interstriae much wider than striae, declivity convex, moderately steep, interstrial vestiture consisting of 2 to 4 rows scalelike setae. Proventriculus without median denticles. Anterior plate is short, posterior plate, with about 8–14 transverse rows weakly sclerotized teeth. Closing teeth short, not reaching middle of masticatory brush (Fig. 7B).

Male (Fig. 3D): Length 2.95–3.0 mm (mean = 2.97; n = 5); 1.79–1.84 times longer than wide; pronotum 0.50–0.55 times as long as wide, elytra 2.69–3.0 times longer than pronotum; similar to female except in having frons deeply impressed.

Material examined. Nantou county, Yuchi Township (23°55.1130'N, 120°53.0780'E), 656 m, 27♂20♀, 02 xii 2019, C. S. Lin leg. from *Fraxinus formosana* (Oleaceae).

Distribution. Japan, Russia (Far East), South Korea (Petrov, 2018). New to Taiwan.

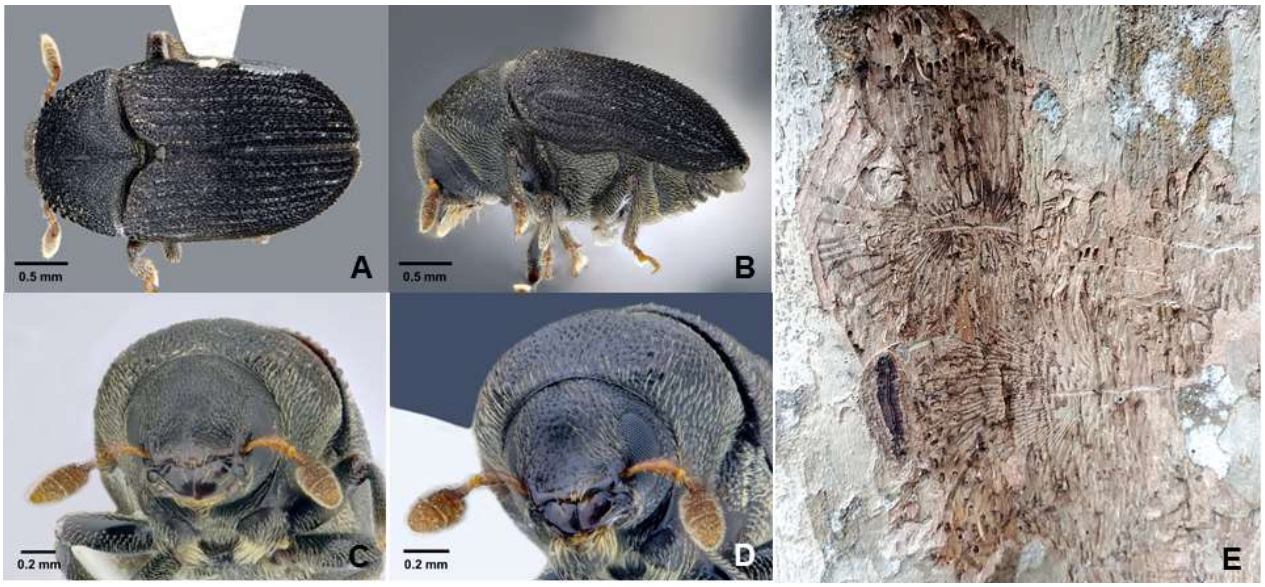

Fig. 3. ***Hylesinus tristis*** Blandford, female: **A**. dorsal view, **B**. lateral view, **C**. front view, **D**. male, front view, **E**. transverse biramous egg galleries.

Biology. Bred from the trunk of *Fraxinus formosana* (Oleaceae) with a diameter about 8 to 120 cm in Taiwan. The species normally breeds in species of *Fraxinus* (Oleaceae) (Mandelshtam *et al*., 2008), but is also recorded from *Ulmus davidiana* (Ulmaceae) in Korea (Choo and Woo, 1985). This monogamous species bores into the bark to form transverse biramous egg galleries (Fig. 3E). The total length of the gallery is from 1.2 cm up to 3.0 cm. The larval mines are numerous and crowded, with up to 77 in one nest. They radiate out from the maternal gallery. About 1.7 months were required to complete a generation in Taiwan.

Remarks. Beaver and Liu (2010) considered that the Taiwanese record of *H. tristis* was doubtful. The present find confirms the occurrence of the species in Taiwan and provides a new host species.

Tribe Phloeosinini Nüsslin, 1912

Phloeocranus bruchoides Schedl, 1942

鱗突肩小蠹 Fig. 4A–D

Phloeocranus bruchoides Schedl, 1942: 8.

Diagnosis. **Female** (Fig. 4A–C): Length 3.15–3.65 mm (mean = 3.41; n = 5); stout and ovoid, 1.88–1.90 times longer than wide; mature color dark brown; head sexually dimorphic, frons feebly impressed with a distinct median line; pronotum 0.45–0.53 times as long as wide, sides convergently arcuate on basal two thirds with a moderate constriction before broadly rounded anterior margin, posterolateral angles of pronotum concealed under a projection of the elytra, dorsal surface rough with dense minute punctures, vestiture short and coarse; elytra 3.06–3.71 times longer than pronotum, basal margin crenulations gradually increasing in size towards lateral margins, striae impressed with coarse, deep and sparse punctures, interstriae 2–3 times wider than striae, declivity weakly convex toward apex, interstriae with 2–5 rows scale-like setae. Proventriculus without median denticles. Membranous anterior plate is longer than posterior plate, with about 8–12 rows of transverse weakly sclerotized teeth. Posterior plate very short, closing teeth longer, extending to posterior end of masticatory brush (Fig. 7C).

Male (Fig. 4D): Length 3.05–3.40 mm (mean = 3.25; n = 5); stout, 1.79–1.85 times longer than wide; pronotum 0.47–0.55 times as long as wide; elytra 2.82–3.53 times longer than pronotum; similar to female except in having frons broadly impressed.

Material examined. Nantou county, Yuchi Township (23˚55.4240'N, 120˚53.1840'E), 727 m, 26♂23♀, 15 iii 2020, C. S. Lin leg. from *Lindera communis* (Lauraceae).

Distribution. India, Indonesia (Java), West Malaysia, Sri Lanka (Maiti and Saha, 2009; Wood and Bright, 1992). New to Taiwan.

Biology. Bred from *Lindera communis* (Lauraceae) with a diameter about 6 to 45 cm in Taiwan. Also recorded from *Cinnamomum cecidodaphne*, *Litsea amara*, *L. chinensis*, *L. polyantha* (Lauraceae) (Kalshoven, 1958; Browne, 1961, 1970; Saha and Maiti, 1996). This species is monogamous and phloeophagous. The male constructs a short, oblique entrance tunnel and nuptial chamber, the female extends the gallery parallel to the trunk upwards and downwards to form a longitudinal egg gallery. The length of egg gallery is from 1.9 cm up to 10.8 cm (Fig. 4E). After hatching, the larvae mine subparallel to each other outward from the egg gallery (Fig. 4F). Larval galleries in one nest are numerous and crowded, up to 211 in one gallery (C. S. Lin *pers. obs*.). The life cycle is completed in about 1.5 months in the laboratory when the temperature of laboratory was about 22–25°C.

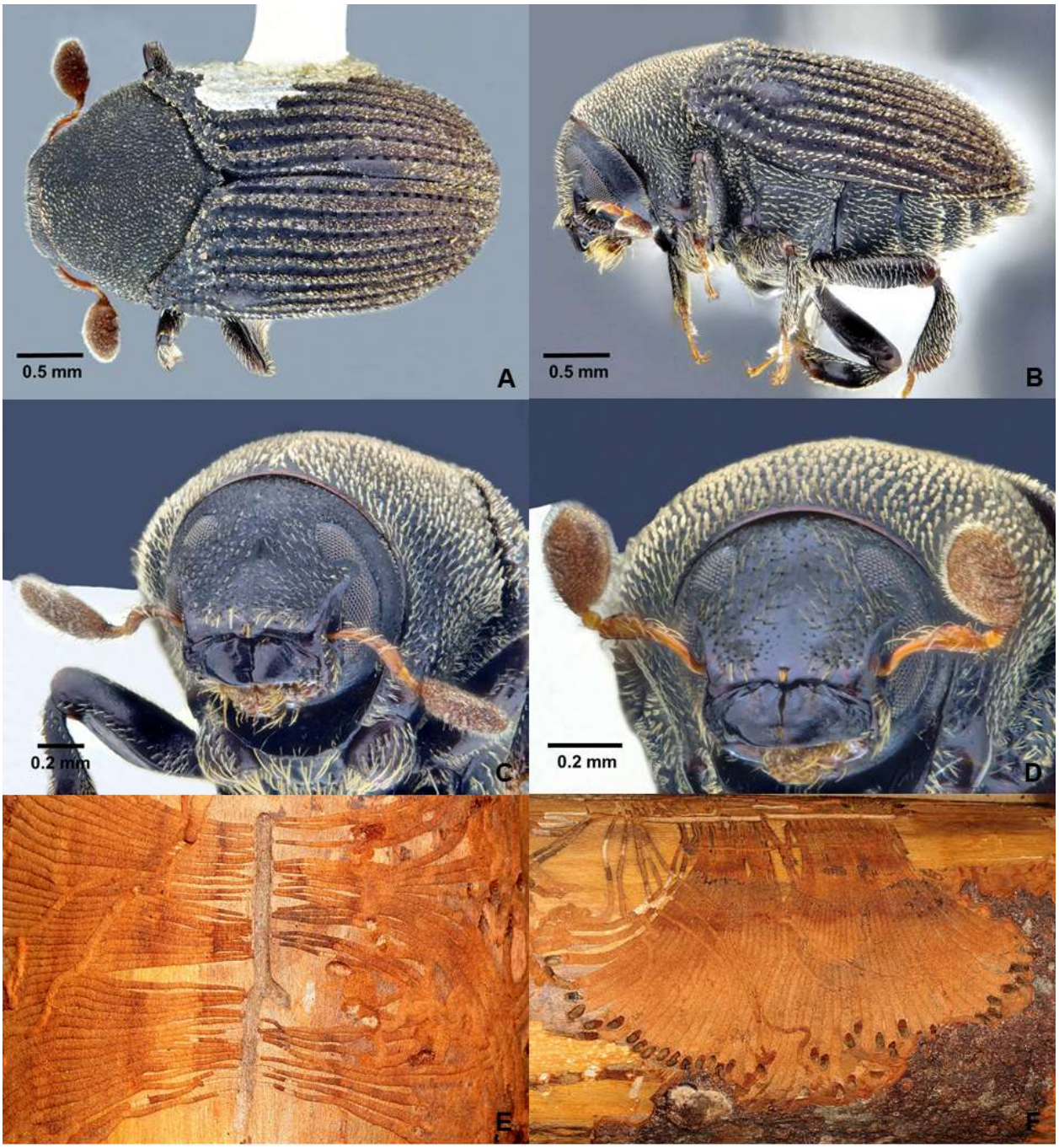

Fig. 4. ***Phloeocranus bruchoides*** Schedl, female: **A**. dorsal view, **B**. lateral view, **C**. front view, **D**. male, front view, **E**. egg gallery, **F**. larvae mined subparallel to each other outward from the egg gallery.

Phloeosinus camphoratus Tsai & Yin, 1964

鱗膚小蠹 Fig. 5A–D

Phloeosinus camphoratus Tsai & Yin, 1964: 93.

Diagnosis. **Female** (Fig. 5A–C): Length 1.58–1.95 mm (mean = 1.83; n = 5); stout, 1.81–1.92 times longer than wide; mature color dark brown; head sexually dimorphic, frons almost flat with a distinct median line, vestiture of sparse, hairlike, yellow, fine and short; pronotum 0.75–0.93 times as long as wide, lateral sides strongly arcuate and converging to a constriction just behind the broadly rounded anterior margin, surface finely reticulate with deep close punctures, each puncture bearing an erect, short, flattened bristle; elytra 2.15–2.50 times longer than pronotum, basal margin crenulations gradually increasing in size towards lateral margins, elytral striae deeply impressed, punctures coarse, deep and sparse, interstriae wider than striae and slightly convex, base with uniseriate granules and becoming

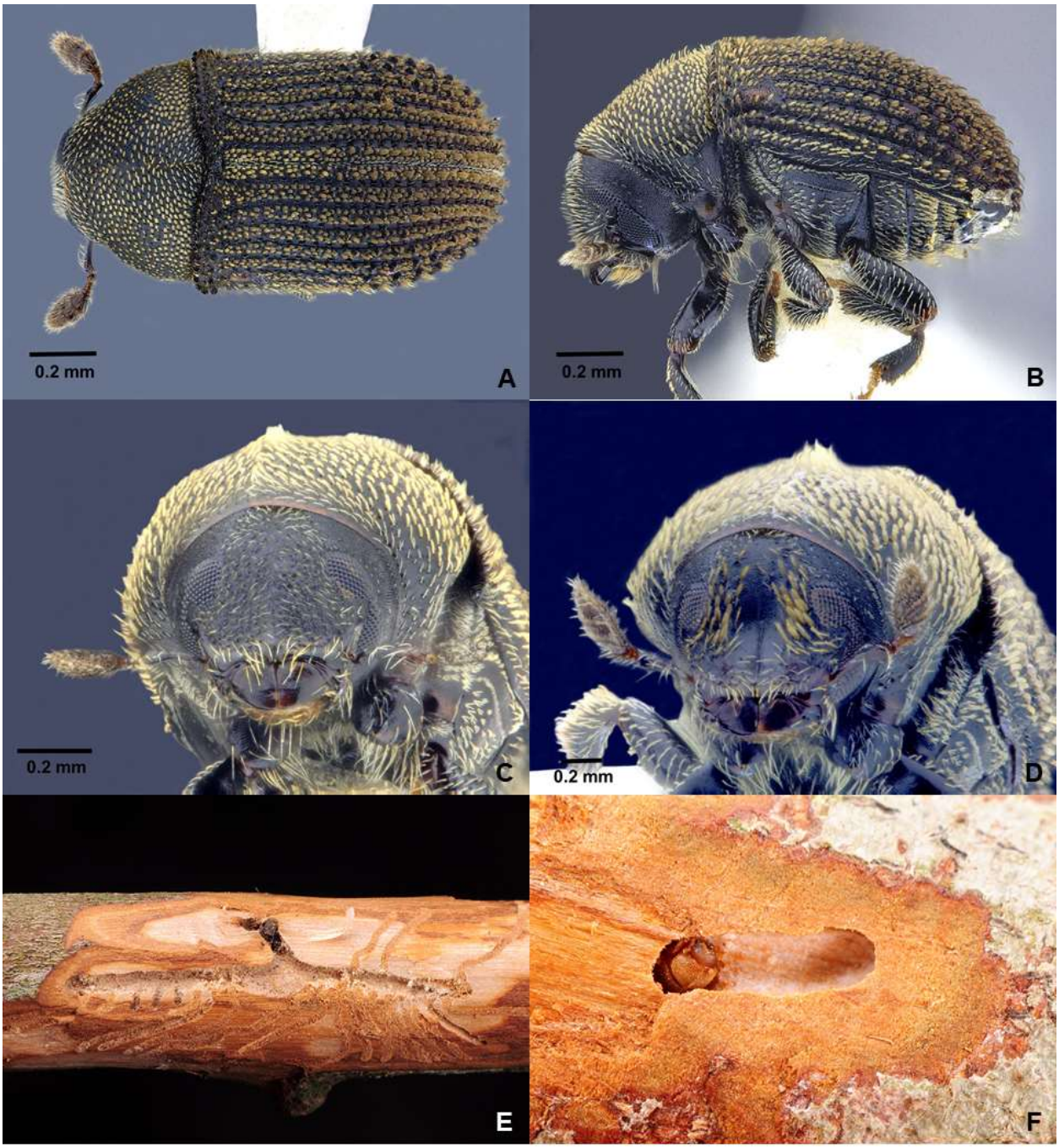

Fig. 5. ***Phloeosinus camphoratus*** Tsai & Yin, female: **A**. dorsal view, **B**. lateral view, **C**. front view, **D**. male, front view, **E**. single longitudinal egg gallery that usually engrave the wood rather deeply, **F**. young adults emerged from the pupal chamber and and fed on the xylem tissue under the thin bark to form a tunnel.

distinctly larger toward apex, declivity convex, steep, interstriae with 2–4 rows of scale-like setae. This species can be distinguished from all other *Phloeosinus* recorded in Taiwan by small body and pronotum only covered with scale-like setae. Proventriculus without median denticles. Membranous anterior plate is longer than posterior plate, with about 8–10 rows of transverse weakly sclerotized teeth, postero-lateral area moderately sclerotized. Posterior plate short, narrow closing teeth extending to the end of masticatory brush (Fig. 7D).

Male (Fig. 5D): Length 1.73–1.80 mm (mean = 1.78; n = 5); stout, 1.89–1.97 times longer than wide; pronotum 0.56–0.66 times as long as wide; elytra 2.13–2.83 times longer than pronotum; similar to female except in having frons concavely impressed from epistomal margin to above upper level of eyes, rather strongly concave on the

Fig. 6. ***Hypothenemus aulmanni*** (Hagedorn), female: **A**. dorsal view, **B**. lateral view, **C**. front, **D**. elytral declivity.

median fovea, epistomal margin smooth, remaining surface finely reticulate, short and golden vestiture of sparse above epistomal margin but with coarse scalelike hairs on each side of the impressed area.

Material examined. Nantou, Sun Moon Lake, funnel trap (all by C. S. Lin), 23°50.5366'N, 120°55.7133'E, 804 m, 6 ii 2014 (1), 5 iii 2014 (2); 23°50.6083' N, 120°55.1983'E, 890 m, 6 ii 2014 (2), 5 iii 2014 (1); 23°51.0683'N, 120°55.3516'E, 812 m, 6 ii 2014 (1), 3 iv 2014 (2); 23°50.6016'N, 120°55.1833'E, 887 m (1), 6 ii 2014, 5 iii 2014 (2), 19 iii 2014 (2); 23°51.4733N, 120°56.6733'E, 824 m, 3 iv 2014 (1); 23°52.1433'N, 120°55.8950'E, 842 m, 3 iv 2014 (1). Taichung City, Heping Dist. (24°13.5410'N, 120°57.8580'E), 1968 m, 15♂18♀, 13 vi 2020, C. S. Lin leg. from *Cinnamomum subavenium* (Lauraceae).

Distribution. China (Yunnan), Thailand (Wood and Bright, 1992). New to Taiwan.

Biology. Bred from *Cinnamomum subavenium* with a diameter about 1.2 to 3.3 cm in Taiwan. It has been recorded only from *C. camphora* and *C. iners* (Lauraceae) (Wood and Bright, 1992), and is probably host-specific to that family. The twigs and branches of *C. subavenium* are selected for attack in Taiwan. The male constructs a short, oblique entrance tunnel and nuptial chamber, the female extends the gallery parallel to the trunk both upwards and downwards to form a longitudinal egg gallery that usually engraves the wood rather deeply (Fig. 5E). The egg niches are usually rather large and conspicuous. The larvae mine outward from the parental gallery and the mines rarely cross one another. In small stems, larvae near maturity bore into the wood and pupate in the wood. Young adults emerged from the pupal chamber and fed on the xylem tissue under the thin bark to form a tunnel. They stayed in the tunnel until mature (C. S. Lin *pers. obs.*). (Fig. 5F).

Tribe Trypophloeini Nüsslin, 1911

Hypothenemus aulmanni (Hagedorn, 1912)

斜平胸咪小蠹 Fig. 6A–D

Cryphalus aulmanni Hagedorn, 1912. Berliner Ent. Zeit. 15: 41.

Diagnosis. **Female** (Fig. 6A–D): Length 2.0 mm (mean = 2.0; n = 2); slender, 2.67 times longer than wide; brown in color, pronotum comparatively lighter; pronotum 0.93–1.03 times as long as wide, anterior slope steep, the upper part and sides with asperities, the anterior slope transversely flattened, smooth medially, anterior margin prolonged forward as a shelf over the head, bearing 8–10 triangular, forwardly directed and slightly upcurved teeth apically, posterior half shining and granulately punctate; elytra 1.58–1.86 times longer

Fig. 7. Proventriculus of **A**. ***Acacicis aphananthe***, **B**. ***Hylesinus tristis***, **C**. ***Phloeocranus bruchoides***, **D**. ***Phloeosinus camphoratus***.

than pronotum, discal striae feebly impressed, interstriae smooth with fine uniseriate punctures, declivity uniformly convex, strial punctures with minute hair-like setae, interstriae with long and recumbent hairs. This species can be distinguished from all other *Hypothenemus* recorded in Taiwan by the pronotum with anterior transversely flattened area. Proventriculus not examined.

Male: Not available in the material studied.

Material examined. Nantou county, Yuchi Township, Sun Moon Lake (23° 51.4733' N, 120° 56.6733'E), 824 m, 2 females, 11 ix 2014, C. S. Lin leg. in funnel trap.

Distribution. Brazil, Mexico, Mozambique, Republic of the Congo, South Africa, Tanzania, Thailand, Uganda, Zambia (Atkinson, 2020). New to Taiwan.

Biology. Recorded from *Bauhinia variegata* and *Sesbania grandiflora* (Fabaceae), *Gossypium* sp. (Malvaceae), *Artocarpus heterophyllus* (Moraceae) (Atkinson, 2020). The species breeds in small stems and seeds (Beaver, 1999).

ACKNOWLEDGMENTS

We would like to thank Dr. Alexander V. Petrov (Institute of Forest Science Russian Academy of Science) for species confirmation. We also thank Dr. You Li (School of Forest Resources and Conservation, University of Florida, Gainesville) for providing photos of the holotype of *Phloeosinus camphoratus*, Dr. Chi-yu Chen (Department of Plant Pathology, National Chung Hsing University) for host tree confirmation, and Dr. Chung-Chi Lin (Department of Biology, National Changhua University of Education) for providing photography equipment.

LITERATURE CITED

Atkinson, T.H. 2020. "Bark and Ambrosia Beetles" https://www.barkbeetles.info/regional_chklist_target_species.php?lookUp=9046.

Beaver, R.A. 1999. *Hypothenemus aulmanni* (Hagedorn) (Col., Scolytidae) is a good species: A sexual mix-up. Entomologist's Mon. Mag. **135**: 197–200.

Beaver, R.A. and L.Y. Liu. 2010. An annotated synopsis of Taiwanese bark and ambrosia beetles, with new synonymy, new combinations and new records (Coleoptera: Curculionidae: Scolytinae). Zootaxa **2602(1)**: 1–47.

Blandford, W.F.H. 1894. The rhynchophorous Coleoptera of Japan. Part III. Scolytidae. Trans. Entomol. Soc. London, **1894**: 53–141.

Browne, F.G. 1961. The biology of Malayan Scolytidae and Platypodidae. Malay. For. Rec. **22**: 1–255.

Browne, F.G. 1970. Some Scolytidae and Platypodidae (Coleoptera) in the collection of the British Museum. J. Nat. Hist. **4(4)**: 539–583.

Choo, H.Y. and K.S. Woo. 1985. A list of Korean bark and ambrosia beetles and their host plants. Korean J. Plant Prot. **24(4)**: 163–167.

Ciesla, W.M. 1993. Recent introductions of forest insects and their effects: a global overview. – FAO, Plant Prot. Bull. **41(1)**: 3–13.

Eichhoff, **W.J.** 1878. Neue oder noch unbeschreibene Tomicinen. Stettin Entomol. Ztg. **39**: 383–392.

Erichson, **W.F.** 1836. Systematische Auseinandersetzung der Familie der Borkenkäfer (Bostrichidae). Arch. Naturgesch. **2(1)**: 45–65.

Hagedorn, M. 1909. Diagnosen bisher unbeschriebener Borkenkäfer (Col). Dtsch. Entomol. Z. **1909(6)**: 733–746.

Hagedorn, M. 1912. Ipidae als Kaffeeschädlinge. Entomol. Blätt. **8**: 33–43.

Johnson, A. J., J. Hulcr, MKnížek, T. H. Atkinson, M. Yu. Mandelshtam, S. M. Smith, A. I. Cognato, S. Park, Y. Li, and B. H. Jordal. 2020. Revision of the bark beetle genera within the former Cryphalini (Curculionidae: Scolytinae). Insect Syst. Diversity. **4(3)**: 1–81.

Kalshoven, L.G.E. 1958. Studies on the biology of Indonesian Scolytoidea. 4. Data on the habits of Scolytidae. First part. Tijdschr. Ent. **101**: 157–180.

Kirkendall, L.R., P.H. Biedermann and B.H. Jordal. 2015. Evolution and diversity of bark and ambrosia beetles. In: Vega, F.E. and R.W. Hofstetter (eds), Bark Beetles: Biology and Ecology of Native and Invasive Species. 85–156. Academic Press, London, U.K.

Lea, A.M. 1910. Australian and Tasmanian Coleoptera, with descriptions of new species. Part I. Proc. Roy. Soc. Victoria **22**: 137–152.

Lin, C.S. 2020. A new species of *Xylechinus* Chapuis (Coleoptera: Curculionidae: Scolytinae: Hylurgini) from Taiwan, with notes on its biology. Taiwania **65(2)**:172–175.

Maiti, P.K. and N. Saha. 2009. Fauna of India and the Adjacent Countries: Scolytidae: Coleoptera (Bark and Ambrosia Beetles) Vol. I, Part II, Zoological Survey of India, Kolkata. 245 pp.

Mandelshtam, M.Y., A.V. Petrov, M.V.L. Barclay, M. Knížek and R.A. Beaver. 2008. Taxonomic changes in Scolytinae (Coleoptera: Curculionidae) from Eastern Asia. Russ. Entomol. J. **16**(2007): 459–464.

Nobuchi, A. 1969. A comparative morphological study of the proventriculus in the adult of the superfamily Scolytoidea (Coleoptera). Bull. Govt Forest Exper. Stat. **224**: 39–110 + Plates 1–17.

Nüsslin, O. 1911. Phylogenie und System der Borkenkäfer. Z. wiss. Insektenbiol. **7**: 372–378.

Nüsslin, O. 1912. Zur Phylogenie und Systematik der einheimischen Hylesinen. Die Gattungen. Naturw. Z. Forst. u. Landw. **10**: 267–290.

Petrov, A.V. 2018. A key to genera and species of the tribe Hylesinini Erichson, 1836 (Coleoptera: Curculionidae: Scolytinae) from Russia and adjacent countries. Russ. Entomol. J. **27(2)**: 179–189.

Raffa, K.F., J.C. Gregoire and B.S. Lindgren. 2015. Natural history and ecology of bark beetles. In: Vega, F. E. and R. W. Hofstetter (eds), Bark Beetles: Biology and Ecology of Native and Invasive Species. 1–40. Academic Press, London, U.K.

Saha, N. and P.K. Maiti. 1996. Insecta: Coleoptera: Scolytidae. Fauna of West Bengal, State Fauna Series, **3 (part 6B)**: 775–866.

Schedl, K.E. 1942. Neue Scolytidae aus Java 76 Beitrag. Tijdschr. Ent. **85**:1–49.

Tsai, P.H. and H.F. Yin. 1964. A study of Chinese *Phloeosinus* Chap. (Coleoptera: Ipidae), with descriptions of new species. Acta Zootaxon. Sinica **1**: 84–97.

Wood, S.L. 1985. New synonymy and new species of bark beetles (Coleoptera: Scolytidae) Gt Basin Nat. **45**: 266–275.

Wood, S.L. and D.E. Bright. 1992. A catalog of Scolytidae and Platypodidae (Coleoptera), Part 2. Taxonomic Index. Gt Basin Nat. Mem. **13**: 1-1553.

Yin, H.F., F.S. Huang, and Z.L. Li. 1984. Coleoptera: Scolytidae. Economic Insect Fauna of China, Fasc. 29. Science Press, Beijing. 205 pp.