

## Contribution to knowledge of the genus *Agrilus* Curtis, 1825 of Taiwan. Part 3 (Coleoptera Buprestidae)

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### ABSTRACT

In this third additional contribution 11 new entities of the genus *Agrilus* Curtis, 1825 (Coleoptera Buprestidae) found in Taiwan are described: *Agrilus crusetosus* n. sp., *Agrilus chiachingae* n. sp., *Agrilus claudioi* n. sp., *Agrilus pullatus* n. sp., *Agrilus vicarius* n. sp., *Agrilus dulishan* n. sp., *Agrilus bocaki dimidiatus* n. ssp., *Agrilus inflammatus* n. sp., *Agrilus intimus* n. sp., *Agrilus lijia* n. sp., *Agrilus linctus* n. sp.

### KEY WORDS

Oriental Region; Agrilini tribe; taxonomy; new species; new subspecies; host plants; ecological records.

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### INTRODUCTION

In our last two contributions (Curletti & Ong, 2022a, b), we have described 22 species and 2 subspecies of the genus *Agrilus* Curtis, 1825 (Coleoptera Buprestidae) in Taiwan. Although the area of Taiwan is only about 36,000 square kilometers, nearly 100 species of *Agrilus* have been recorded or described at now. The density of species richness on this island is amazing, and the potential numbers are still far from exhausted. This is presumably due to the height of the mountains which reach nearly 4,000 meters, which have created insurmountable barriers for the Buprestidae, a family composed of notoriously heliophilic and thermophilic species, favoring ecological niches that over time have caused a further evolution of the populations of this island. In the previous exploration and collecting trips, we investigated central, southern, and eastern Taiwan. Although most of the unknown species have been described in this con-

tribution and the two previous ones, some are still pending, and await further investigation.

In this paper, we will present some species that are currently extremely rare, difficult to identify, and require careful comparison with their relatives from Japan and China.

### MATERIAL AND METHODS

As stated in the first two contributions (Curletti & Ong, 2022a, b) the specimens were prepared dried, and glued on cards by using common syndetic (Ong) or clear nail polish (Curletti) for further study, description and conservation.

The pictures (Ong) for the macro photography of specimens, have been taken with a Canon 80D and MP-E 65 mm macro lens combination. The Cognisys Stackshot automated macro rail is used for taking photos of different depths and then importing them into the Helicon Focus software for

focus stacking. For even smaller objects like aedeagus, a combination of Mitutoyo 10x M Plan APO objective with extension tubes connecting with the camera body has been used. The stacked photos were finally edited in Adobe Photoshop v.23.3.2. Figures have bodies scale 1.0 mm; aedeagi with scale 0.5 mm.

The species descriptions follow the procedure proposed by Curletti (2010) which allows, with the help of photography, to identify an appropriate habitus of the taxa, omitting most of the unnecessary, unimportant and subjective repetitive morphological descriptions, and dwelling in more detail on distinctive characters that cannot be assessed through the images. With regard to the subgenera employed, the classification proposed by Cobos (1986) based on the characters of female ovipositors has been partially adopted, re-evaluating the subgenus *Anambus* Thomson, 1864.

ACRONYMS. NMNST: National Museum of Natural Science, Taichung, Taiwan; UOTT: coll. Uitsiann Ong, Tainan, Taiwan; GCCI: coll. Curletti, Museo Civico di Storia Naturale, Carmagnola, Italy.

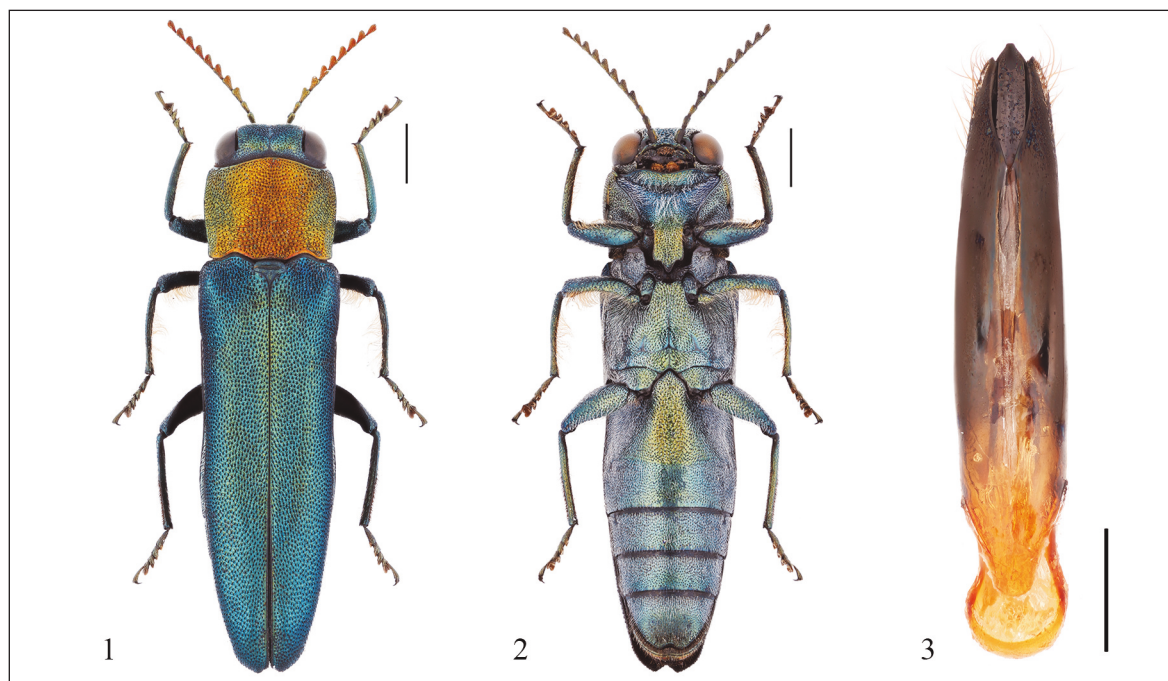
## RESULTS

## Systematics

*Agrilus (Anambus) crussetosus* n. sp. (Figs. 1–3)  
<https://zoobank.org/5bca3ddc-4eef-4ea5-b6fb-848e11a8fc1f>

MATERIAL EXAMINED. Holotype ♂: Taiwan, Pingtung County, Dahanshan, 26.V.2021, Chiamu Chen leg. (NMNST).

HOLOTYPE DESCRIPTION. Length 9.2 mm. Bicolored: golden pronotum, elytra and head green. Frons slightly sinuous longitudinally, with thin uniform pubescence visible only in profile. Epistoma carinate. Elytra serrate from the antennomere IV. Large, slightly protruding eyes. Pronotum widest anteriorly, with slightly curved lateral margins and right posterior angles. Disc regularly convex with transverse striae. Prehumeral carinulae short and interrupted. Marginal carinae joined posteriorly. Gular lobe broadly sinuous. Prosternal process broad, flat, parallel. Scutellum carinate. Elytra glabrous with separately rounded apices. Abdomen black / blue with long white pubescence on the sides of the penultimate visible ventrite and on the apical ventrite. Deeply sinuous margin of the apical



Figures 1–3. *Agrilus crussetosus* n. sp., holotype. Fig. 1: dorsal view; Fig. 2: ventral view; Fig. 3: aedeagus dorsal view, 2.5 mm.

ventrite. Legs: pro-claws with internal spur bifid and external dentate; meso-claws with the internal spur dentate and the external bifid; meta-claws all dentate. Metatarsus shorter than the metatibia. Metatarsal formula 1=2+3. Aedeagus 2.5 mm in length, symmetrical, wider at the base and regularly narrowing towards the front. The apex of the median lobe is subacuminate (Fig. 3).

ETYMOLOGY. From the union of the Latin words “*crūs*” = leg and “*sētōsus*” = hairy. For the long pubescence on mesotibiae and mesofemurs.

HOST PLANT. Unknown.

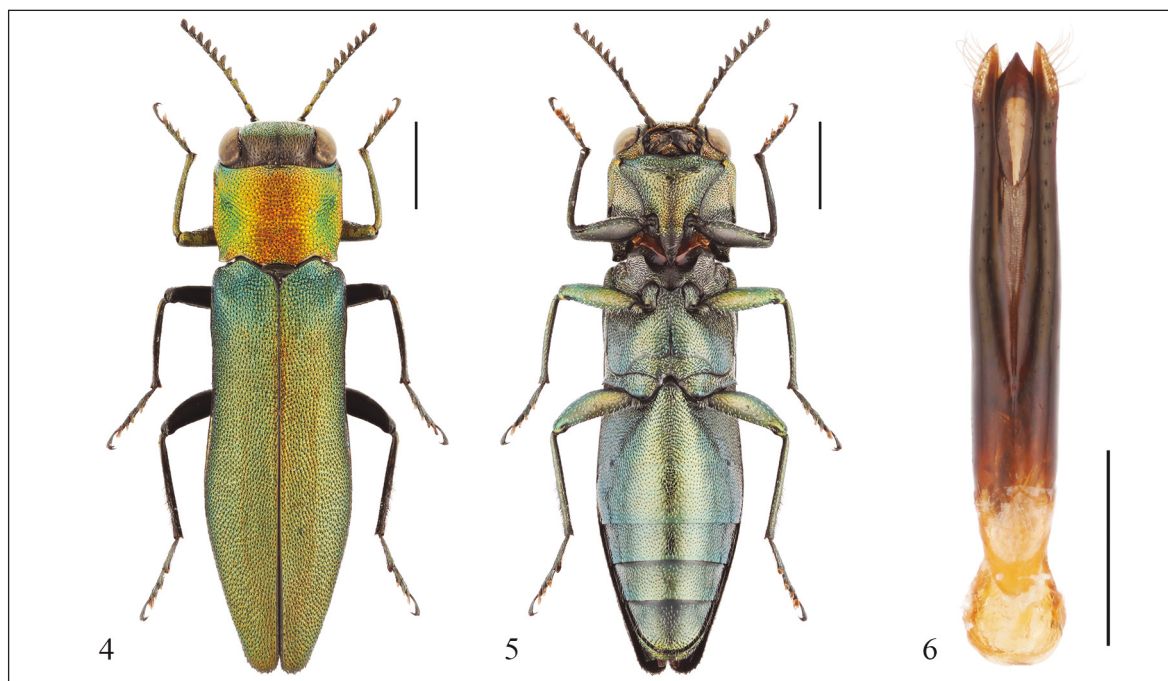
DIAGNOSIS. For the chromatic map, *A. crusetosus* n. sp. can be confused with *A. fongmuorum* Curletti et Ong, 2022. The substantial difference between the two species, in addition to the different conformation of the respective aedeagi, consists mainly in the long pubescence present in the median legs of *A. crusetosus* n. sp. It is difficult to find an explanation for this particular evolutionary character which is not isolated, but is also present in the Neotropical fauna for two sympatric species of French Guiana described respectively by Curletti & Brûlé (2011; 2017): *A. villus* and *A. lindae* which differ substantially due to the

presence of long and thickened pubescence on the median legs in the second species.

*Agrilus (Anambus) chiachingae* n. sp. (Figs. 4–6)  
<https://zoobank.org/ba0688ec-120b-45f6-b97f-7d5fb2173bc6>

MATERIAL EXAMINED. Holotype ♂: Taiwan, Chiayi County, Shihzihlu, 3.V.2016, U. Ong leg. (NMNST). Paratype: 1 ♀, idem, 11.V.2016, U. Ong leg. (GCCl).

HOLOTYPE DESCRIPTION. Length 6.3 mm. Body three-colored: head black, pronotum yellow, elytra green. Flat head with a slightly furrowed vertex, about half as wide as the anterior margin of the pronotum. Frons golden, bright, with white pubescence barely visible at the base. Wide and flat epistoma, not carinate, contiguous to the front line. Antennae with gilded basal articles, serrate from antennomere IV. Pronotum with non-arcuate lateral margins, practically parallel, but sinuous before the posterior angles which are straight. Almost straight anterior margin. Disc with slightly accentuated median depressions. Sculpture composed of strong



Figures 4–6. *Agrilus chiachingae* n. sp., holotype. Fig. 4: dorsal view; Fig. 5: ventral view; Fig. 6: aedeagus dorsal view, 1.6 mm.

transverse striae. The yellow color tends to be green on the sides and red in the center. Practically absent the prehumeral carinulae, barely hinted in the posterior angles. Marginal carinae in the norm. Gular lobe widely sinuous, prosternal process sharp. Scutellum carinate. Glabrous elytra, with separately rounded apices with evident denticulation. Ventrites with uniform and short pubescence. Posterior margin of the basal ventrite rounded. Legs with metatarsus shorter than the metatibia. Metatarsal formula 1=2+3+4. Anterior and median claws bifid, posterior dentate. Aedeagus 1.9 mm in length, symmetric, narrow and elongate; apex of the median lobe acuminate (Fig. 6).

PARATYPE DESCRIPTION. Length 6.4 mm. Apart from the size, there are no differences from the holotype.

SEXUAL DIMORPHISM. The male has the distal parts of the protibiae and more of the mesotibiae acutely dilated; vague green frontal reflections when viewed dorsally. No other secondary sexual characters are observable.

ETYMOLOGY. This species is dedicated to Mrs. Chiaching Lin, the wife of one of the AA.

HOST PLANT. Unknown. All specimens were collected by sweeping the leaves of *Quercus salicina* Blume (Fagaceae).

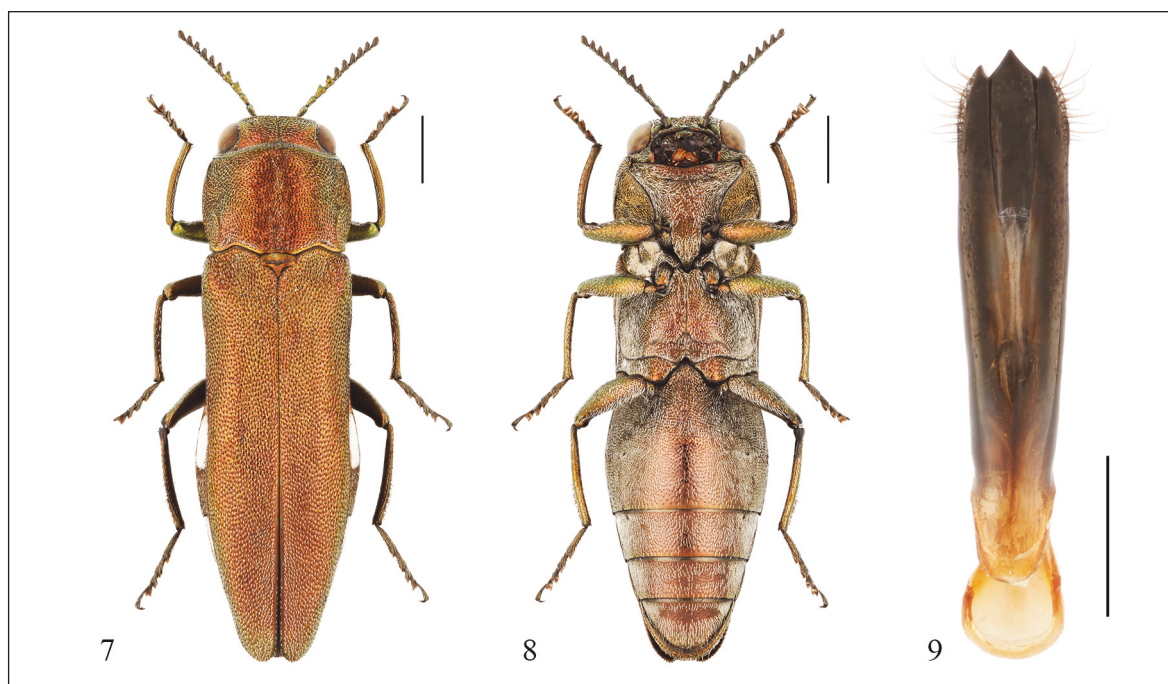
DIAGNOSIS. More similar species: *Agrilus smaragdifrons* Ganglbauer, 1889. In addition to the substantial differences in the aedeagus shape, *A. chiachingae* n. sp. is easily distinguished by the lack of prehumeral carinulae, the more rounded elytral apex, and the shorter basal metatarsomere.

*Agrilus (Anambus) claudioi* n. sp. (Figs. 7–9)

<https://zoobank.org/f8f1b57d-4ee4-4fd8-829b-fa9489dcb5e7>

MATERIAL EXAMINED. Holotype ♂: Taiwan, Taichung City, Derfland, 12.VIII.2021, U. Ong leg. (NMNST). Paratypes: 1 ♀, Taiwan, Nantou County, Pine Tree Mountain, 10.VI.2021, U. Ong leg. (GCCl).

HOLOTYPE DESCRIPTION. Length 8.1 mm. Uniformly bright bronze dorsal color. Vertex about half the width of the anterior margin of the pronotum. Eyes not bulging. Frons with vague green reflections, flat, glabrous. Epistoma wide and carinated.



Figures 7–9. *Agrilus claudioi* n. sp., holotype. Fig. 7: dorsal view; Fig. 8: ventral view; Fig. 9: aedeagus dorsal view, 1.9 mm.



Antennae serrate from antennomere IV. Pronotum with lateral margins slightly arcuate with basal angles right. Anterior margin with moderate median lobe. Disc convex, with a slight median longitudinal depression. Sculpture composed of dense and thin transverse striae. Prehumeral carinae not entire, short, curved. Marginal carinae posteriorly joined. Gular lobe little and broadly sinuous. Prosternal process wide, flat and parallel. Scutellum carinate. Elytra with diffuse and uniform pubescence. Elytral apices are slightly rounded and microdentate. Distal lateroterga covered with white pruinose pubescence covering the integuments. Same pubescence, but in the form of an elongated spot in the median part of the basal laterotergum. Pruinosity pubescence is also visible on mesoepimeron and mesoepisternum. Ventrites with long and regular pubescence, not pruinose. Edge of the apical visible ventrite is rounded. Legs with metatarsus shorter than the metatibia. Metatarsal formulae:  $1 < 2 + 3 + 4$ ;  $2 = 2 + 3$ . Anterior claws bifid; median claws bifid, but a with slightly shorter internal spur, posterior dentate. Aedeagus 1.9 mm in length, symmetrical. Apex of the median lobe is acute (Fig. 9).

PARATYPE DESCRIPTION. Length 8.2 mm. Excluding the sexual characters, the only difference consists in the lower pruinosity of the spots on lateroterga.

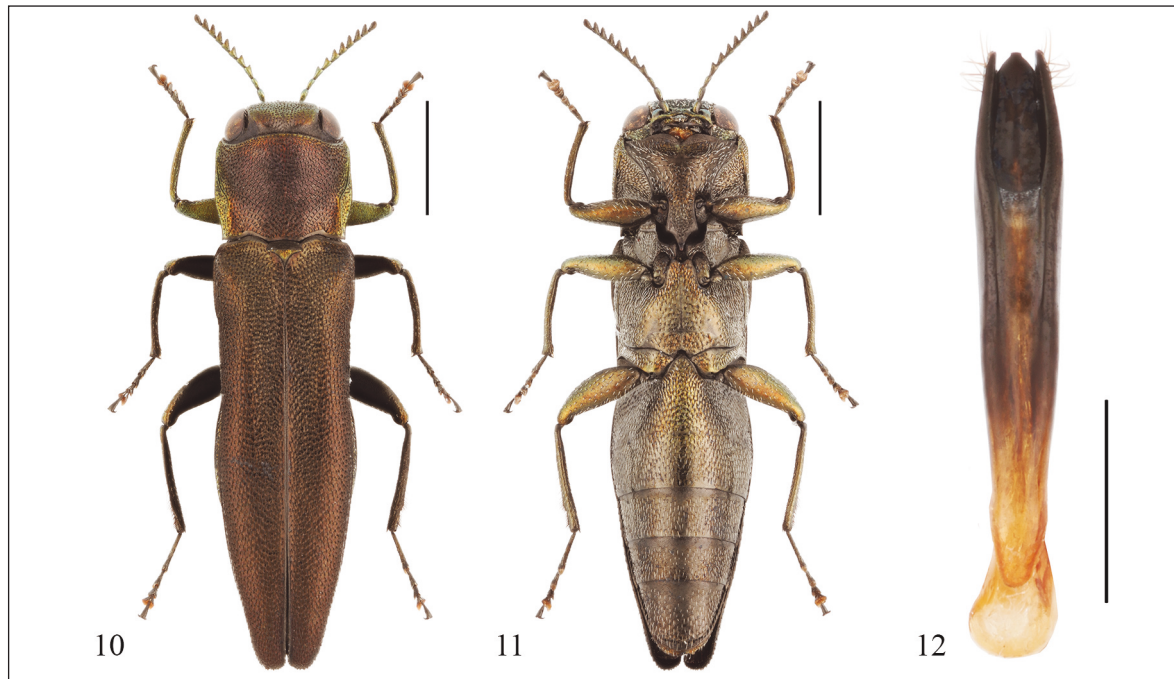
SEXUAL DIMORPHISM. The female has a more coppery vertex. The metatarsomeres, especially the second, are shorter. All claws are dentate.

ETYMOLOGY. The species is named after Claudio Appendino (Carmagnola, Italy), pharmacist doctor, attentive and passionate naturalist, friend of one of the AA.

HOST PLANT. Unknown.

DIAGNOSIS. *Agrilus claudioi* n. sp. is homomorphic with *A. speculum* Jendek, 2011 and with several other oriental species, from which it differs not only for the shape of the aedeagus but also for the large white spots on the lateroterga and for the conformation of the metatarsus.

*Agrilus (Anambus) pullatus* n. sp. (Figs. 10–12)  
<https://zoobank.org/9e918743-a099-42aa-b179-975a5bafc89b>



Figures 10–12. *Agrilus pullatus* n. sp., holotype. Fig. 10: dorsal view; Fig. 11: ventral view; Fig. 12: aedeagus dorsal view, 1.5 mm.

MATERIAL EXAMINED. Holotype ♂: Taiwan, Chiayi county, Shihzhihu, 2.VII.2021, U. Ong leg. (NMNST).

HOLOTYPE DESCRIPTION. Length 5 mm. Color black with bronze reflections especially on the sides of the pronotum. Head with a sinuous vertex, broad, wide the half anterior margin of the pronotum. Frons flat, green reflections, long white pubescence at the base and on the epistoma. Antennae serrate from the antennomere IV. Elongated eyes, small cheeks with white pubescence. Pronotum with slightly arched lateral margins, slightly convex, with median depressions; right posterior angles. Sculpture composed of regular transverse striae. Prehumeral carinulae entire. Marginal carinae joined posteriorly. Gular lobe large, strongly incised, forming rounded lobes at the edge of the incision. Prosternal process slightly trapezoidal. Scutellum transversely carinate. Elytra with separately rounded and micro-denticulate apices. Short and regular white pubescence, visible only with strong magnification. Abdomen with pubescence similar to the elytral one, but slightly longer, barely visible. Apical ventrite with rounded margin. Legs with elongated metatarsus. Metatarsal formula 1=2+3+4. Anterior claws bifid. Aedeagus 1.5 mm in length, elongated, parallel, symmetrical; Median lobe with truncate apex (Fig. 12).

ETYMOLOGY. From Latin “*pullātus*” = dress in black. For the integuments color.

HOST PLANT. Unknown.

DIAGNOSIS. *Agrilus pullatus* n. sp. is doubtfully attributed to the subgenus *Anambus* sensu Cobos, 1986; the lack of female specimens and consequently of the ovipositor would have allowed a certain attribution. The most similar species is *Agrilus muongoides* Jendek, 2011. *Agrilus pullatus* n. sp. substantially differs from the completely glabrous elytra, in having the external tips of the prosternal process not facing downward, for the more deeply incised gular lobe and with more rounded edges of this incision, for the smaller cheeks; the aedeagus (Fig. 12) is more parallel, less fusiform.

*Agrilus (Anambus) vicarius* n. sp. (Figs. 13–15)  
<https://zoobank.org/d8679343-a1cf-4b08-a4db-2a2c9a55a725>

MATERIAL EXAMINED. Holotype ♂: Taiwan, Taichung City, Guguan, 16.VII.2021, U. Ong leg. (NMNST). Paratypes: 1 ♂ - 7 ♀♀, idem, U. Ong leg.; 3 ♂♂ - 5 ♀♀, idem, 20~21.VII.2021, U. Ong leg.; 3 ♂♂ - 1 ♀, idem, 11.VIII.2021, U. Ong leg.; 1 ♂ - 1 ♀, Taiwan, Nantou Co., Meiyuan, 1.V.2017, U. Ong leg.; 2 ♀♀, idem, 7.IV.2020, U. Ong leg.; 1 ♀, Taiwan, Nantou Co., Guantoushan, 9.VII.2021, U. Ong leg.; 2 ♀♀, Taiwan, Nantou Co., Changxing Trail, 1.VII.2020, U. Ong leg. (NMNST, UOTT, GCCI).

HOLOTYPE DESCRIPTION. Length 5.7 mm. Color bronze, more brilliant anteriorly. Vertex wide about half of the anterior margin of pronotum. Frons flat, green, with barely visible pubescence limited to the basal part. Wide epistoma, coplanar to the frons, without carina. Antennae serrate from antennomere IV. Pronotum with lateral margins slightly curving and posterior angles a little acute. Disc with two slight median depressions, respectively behind the vertex and in front of the scutellum. Sculpture with regular striae. Prehumeral carinulae entire. Marginal carinae joined posteriorly. Gular lobe sinuate. Prosternal process just dilated, not forming lateral points. Scutellum carinate. Elytra uniformly pubescent; short pubescence even if clearly visible. Elytral apices slightly elongated, jointly rounded and micro-denticulated. Ventrites with the same dorsal pubescence. Margin of the apical ventrite rounded. Legs with metatarsus shorter than the metatibia. Tarsal formula 1=2+3+4. Anterior and median claws bifid, posterior dentate. Aedeagus 1.4 mm in length, symmetrical; apex of the median lobe is acute (Fig. 15).

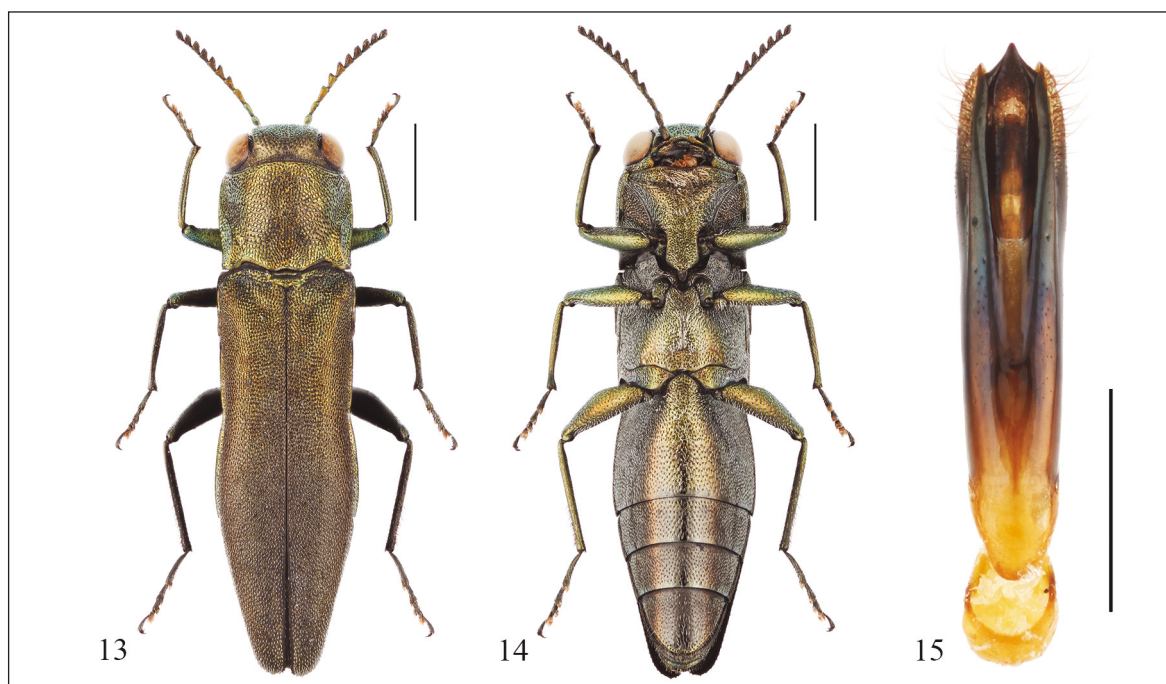
PARATYPE DESCRIPTION. Length from 5.7 to 7.8 mm. Some specimens are less bright and darker, brown in color. The ovipositor is elongate.

SEXUAL DIMORPHISM. The females have copper frons and all claws simply dentate.

ETYMOLOGY. From Latin “*vicāriūs*” = substitute. As stated in the diagnosis this new species is considered as vicariant Taiwanese species of *A. ciping* from China.

HOST PLANT. Unknown. Adults can be found on the leaves of *Quercus variabilis* Blume (Fagaceae).

DIAGNOSIS. *Agrilus vicarius* n. sp. is very similar to *A. ciping* Jendek et Grebennicov, 2011 from con-



Figures 13–15. *Agrilus vicarius* n. sp., holotype. Fig. 13: dorsal view; Fig. 14: ventral view; Fig. 15: aedeagus dorsal view, 1.4 mm.

tinental China. It differs from Chinese species for having a bronze color, a less elongate body, elytral apex more rounded, prosternal process narrowed, just dilated and no lateral obtuse angles. The aedeagus is less lengthened and more enlarged in the distal part.

***Agrilus (Anambus) dulishan* n. sp.** (Figs. 16–18)  
<https://zoobank.org/24019fea-b0b7-403a-9399-2fea603826a9>

**MATERIAL EXAMINED.** Holotype ♂: Taiwan, Chiayi County, Dulishan, 8.IV.2015, U. Ong leg. (NMNST). Paratypes: 4 ♀♀, idem, U. Ong leg.; 1 ♀, Taiwan, Kaohsiung City, Baolai, 29.III.2018, U. Ong leg.; 1 ♀, idem, 25.V.2019, U. Ong leg.; 1 ♀, Taiwan, Pingtung County, Shouca, 20.IV.2021, Chiamu Chen leg.; 1 ♀, Taiwan, Pingtung County, Dahanshan, 3.V.2021, Chiamu Chen leg.; 1 ♀, Taiwan, Nantou County, Chientai Trail, 2.VI.2019, Sinyan Shih leg. (NMNST, UOTT, GCCI).

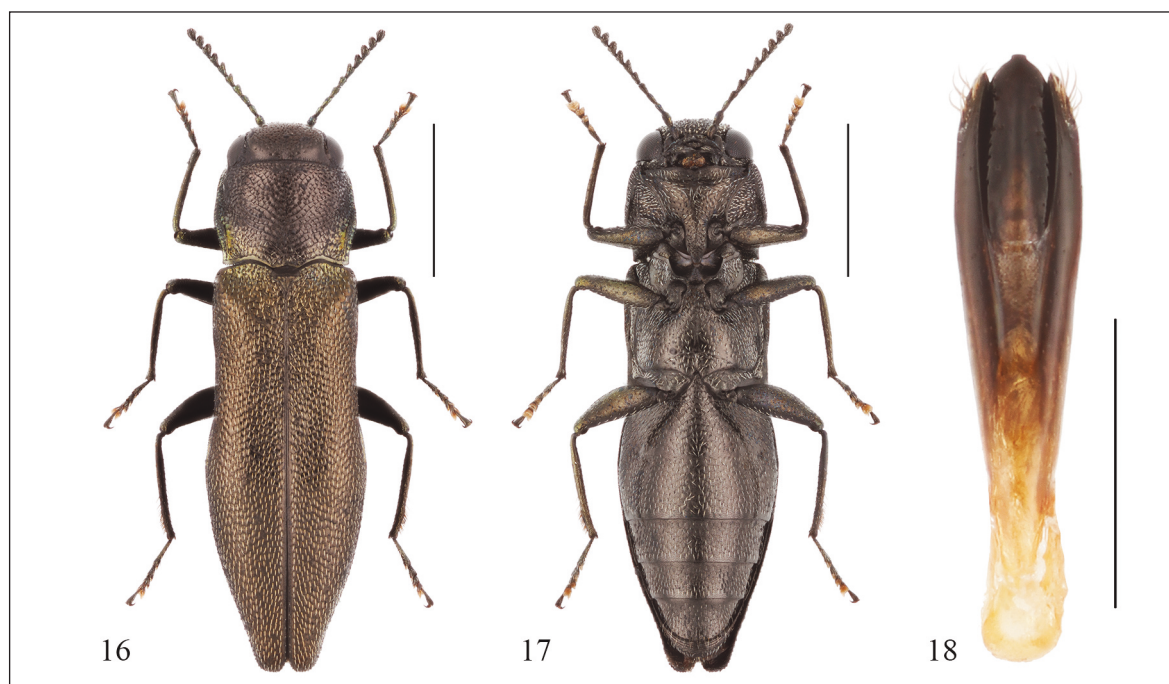
**HOLOTYPE DESCRIPTION.** Length 3.6 mm. Slightly bronzed black color, slightly elongated shape, sharp posteriorly. Vertex not flattened; half

as wide as the anterior margin of the pronotum. Frons flat, covered with yellow pubescence at the base and on the epistoma, covering the integuments. Antennae black, serrate from the antennomere IV. Eyes large, slightly protruding. Pronotum larger at mid-length; lateral margins rounded, sinuous before the posterior angles which are straight. Anterior margin regular, without median lobe advanced. Superficial sculpture arranged in oblique striae. Prehumeral carinula entire. Marginal carinae joined posteriorly. Gular lobe sinuate. Prosternal process parallel. Scutellum carinate. Elytra with uniform ivory pubescence. Elytral apices separately rounded and micro-denticulated. Abdomen practically glabrous or better with short and not very visible pubescence. Apex of the distal ventrite rounded. Legs with anterior claws bifid, median and posterior dentate. Metatarsal formula 1=2+3+4. Aedeagus 1.05 mm in length, flat and symmetrical. The apex of the median lobe is rounded (Figure 18).

**PARATYPES DESCRIPTION.** Length from 3.6 to 4.1 mm. Some specimens have a shorter and more stumpy form. Ovipositor narrow and elongate.

**SEXUAL DIMORPHISM.** Females all have dentate





Figures 16–18. *Agrilus dulishan* n. sp. Fig. 16: paratype ♀ dorsal view; Fig. 17: paratype ♀ ventral view; Fig. 18: holotype, aedeagus dorsal view, 1.05 mm.

claws. The frontal pubescence in some specimens is less thickened and reveals a transverse carina on the epistoma.

**ETYMOLOGY.** From the type locality. Noun in apposition.

**HOST PLANT.** Unknown. Adults can be found on the leaves of Fagaceae trees.

**DIAGNOSIS.** Two species can be confused with *A. dulishan* n. sp.: *A. samuelsoni* Tôyama, 1985 from Japan and *A. arisanus* Miwa et Chûjô, 1940 from Taiwan. From *samuelsoni* it differs for having the pronotum with more rounded lateral margins and for having a very different shape in aedeagus. *A. arisanus* is the nearest species: *A. dulishan* n. sp. differs for having black color instead of brown, on average a less elongated shape, sculpture of the pronotum composed of more superficial and obliquely arranged striae, more sinuous gular lobe, more oval and less claviform aedeagus. It seems to be a vicariously lowland species living on average at an altitude of between 450 and 700 m, while *arisanus* lives between 1,000 and 2,300 m in altitude. Both species, *A. arisanus* and *A. dulishan* live in Chiayi County.

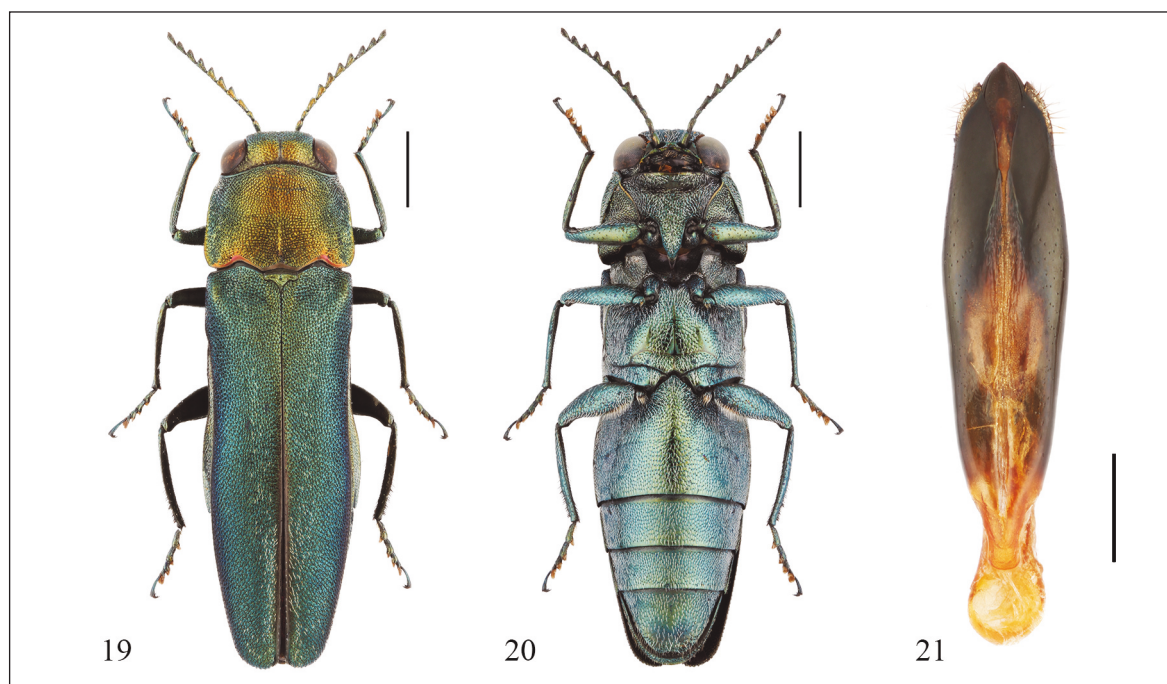
*Agrilus (Agrilus) lijia* n. sp. (Figs. 19–21)

<https://zoobank.org/72f9a28e-1a74-48d2-94d5-2338dfde46c3>

**MATERIAL EXAMINED.** Holotype ♂: Taiwan, Taitung County, Lijia, 18.VII.2017, Chiamu Chen leg. (NMNST).

**HOLOTYPE DESCRIPTION.** Length 7.1 mm. Short and stocky shape. Two-tone: golden vertex and pronotum, green elytra. Green head, longitudinally furrowed, with white pubescence at the base. Epistoma small and narrow, keeled. Antennae with metallic reflections, serrated from the antennomere IV. Big, bulging eyes. Trapezoidal pronotum, wider at the base. Straight lateral margins, posterior angles obtuse and rounded. Anterior margin with advanced lobe. Disc regularly convex. Thin, transverse striae. Prehumeral carinulae practically absent, barely visible, and limited to the basal angle. Marginal carinae joined before the basal apex. Gular lobe practically entire. Prosternal lobe acute. Scutellum transversely carinate. Elytra with thick, separately rounded apices with barely visible micro-denticulation. A stripe of perisutural white pubescence in the posterior third. Ventral side blue, with short,





Figures 19–21. *Agrilus lijia* n. sp., holotype. Fig. 19: dorsal view; Fig. 20: ventral view.; Fig. 21: aedeagus dorsal view, 2.7 mm.

dense and uniform white pubescence. Same pubescence on the lateroterga, but with a yellowish color. Margin of the apical ventrite widely sinuous. All legs with bifid claws. Metatarsus shorter than the metatibia. Metatarsal formula  $1<2+3$ . Aedeagus 2.7 mm in length, symmetrical, fusiform. Apex of the median lobe as shown in Fig. 21.

ETYMOLOGY. From the holotype locality. Noun in apposition.

HOST PLANT. Unknown.

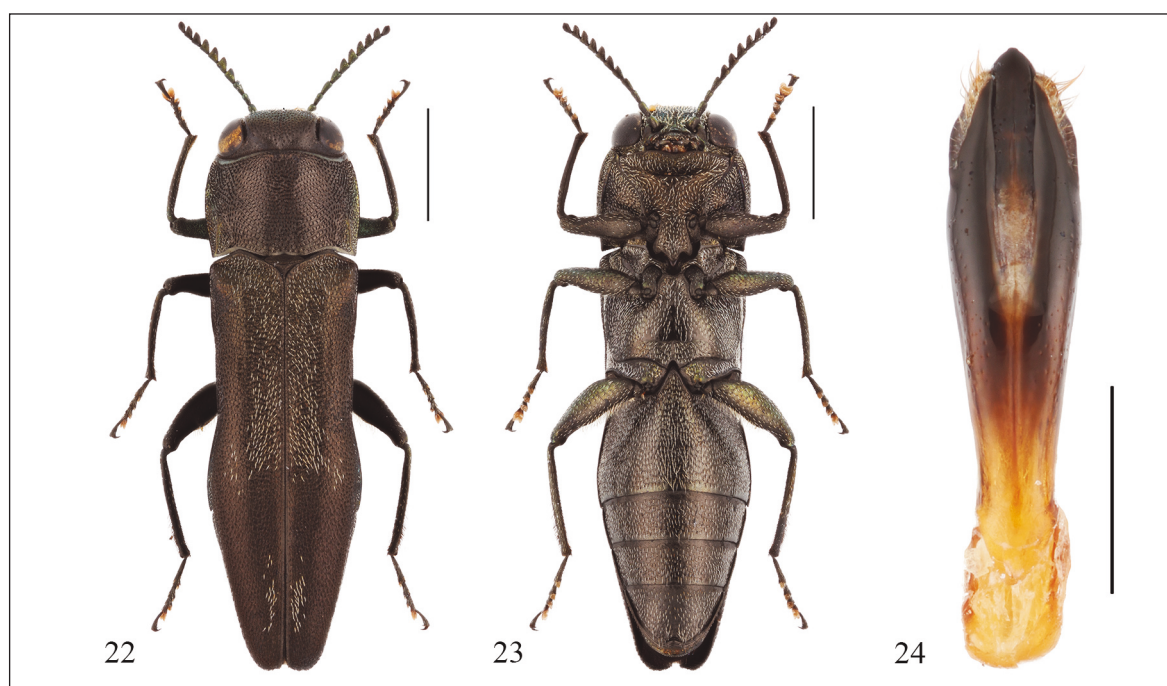
DIAGNOSIS. For the color mapping, *A. lijia* n. sp. can be compared to *A. fongmuorum* Curletti et Ong, 2022 from which it is easily distinguished by its smaller size, the stumpy form, the rounded apex of the elytra, the presence of elytral pubescence, and the trapezoidal conformation of the pronotum. This new species is provisionally attributed to the nominal subgenus pending examination of a female specimen.

*Agrilus (Agrilus) linctus* n. sp. (Figs. 22–24)

<https://zoobank.org/5d3a6699-9498-4cf9-8be6-58d897769aa8>

MATERIAL EXAMINED. Holotype ♂: Taiwan, Nantou County, Chientai Trail, 5.VI.2018, U. Ong leg. (NMNST).

HOLOTYPE DESCRIPTION. Length 5.0 mm. Short and stocky shape, wider anteriorly. Black colour. Slightly furrowed vertex, about half as wide as the anterior margin of the pronotum. Frons flat, pale green, with longer and thickened white pubescence at the base. Epistoma carinate. Standard antennae, serrated by the antennomer IV. Pronotum transverse, wider than long, wider in the middle part; lateral margins regularly arcuate with posterior angles obtuse. Anterior margin with lobe moderately advanced between the eyes. Disc regularly convex, with striae arranged transversely. Prehumeral carinulae not entire, arcuate, and interrupted at mid-length of the pronotum. Marginal carinae not joined posteriorly, even if very close together, starting from  $3/4$  of the total length. Gular lobe broadly sinuous. Prosternal process dilated, with lateral points pointing downwards, similar to *A. nasutus* Curletti et Ong, 2022. Scutellum transversely carinate. Elytra narrower than the pronotum, slightly elongated, with apices separately rounded, and vague, obsolete and blunt den-



Figures 22–24. *Agrilus linctus* n. sp., holotype. Fig. 22: dorsal view; Fig. 23: ventral view; Fig. 24: aedeagus dorsal view, 1.5 mm.

ticulation. Disc with a wide band of perisutural white pubescence in the anterior half, which widens to the sides at the two ends, anterior and posterior. A further small and short white perisutural pubescent stripe before the apex. Ventral side with short and regular pubescence, more visible on the metaepisternum and on the metacoxa. Margin of the apical ventrite sinuous. Legs with anterior and median claws bifid, posterior dentate. Metatarsus shorter than the metatibia. Metatarsal formula  $1 > 2 + 3$ . Aedeagus 1.5 mm in length, symmetrical, claviform; apex of the median lobe is shown in Fig. 24.

ETYMOLOGY. From Latin “*linctus*” = licked, due to the visual effect provided by the large anterior pubescent stripe on the elytra.

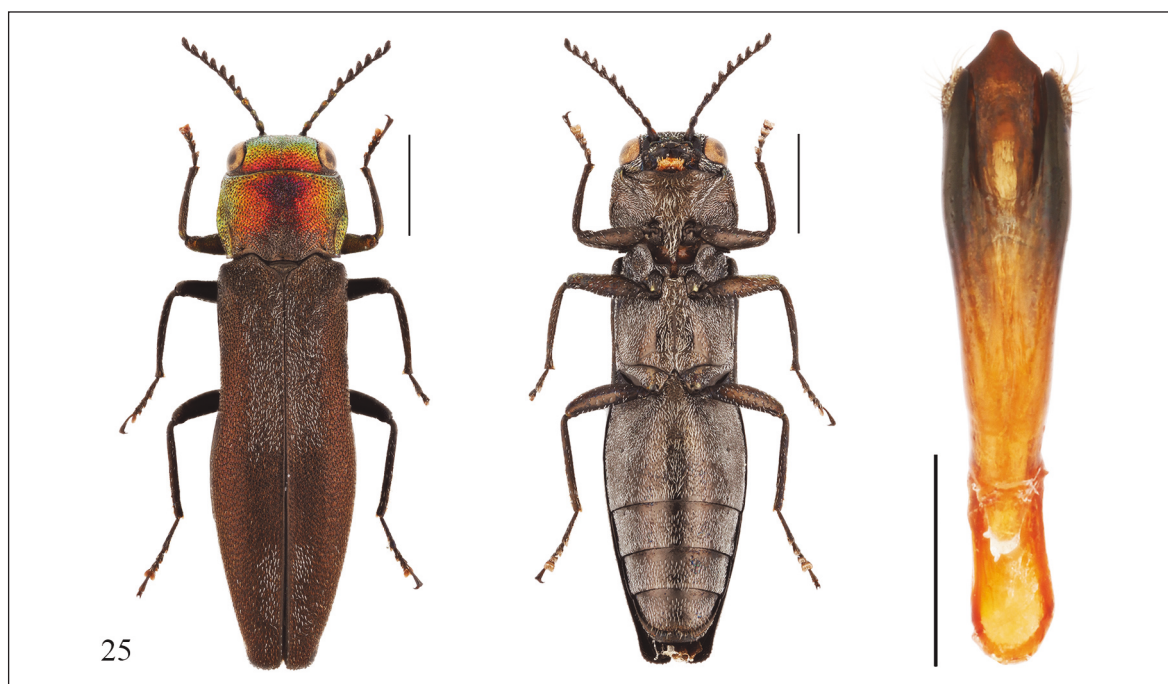
HOST PLANT. Unknown.

DIAGNOSIS. *Agrilus tsushmanus* Kurosawa, 1963 is the closest species. *Agrilus linctus* n. sp. differs for the stumpy form, for the pronotum more transverse and wider than the elytra. This new species is provisionally attributed to the nominal subgenus pending examination of a female specimen.

*Agrilus (Agrilus) inflammatus* n. sp. (Figs. 25–27) <https://zoobank.org/3fb2e849-6091-4baa-84f0-1ff53399b987>

MATERIAL EXAMINED. Holotype ♂: Taiwan, Chiayi County, Shihzihlu, 3.IX.2020. U. Ong leg. (NMNST). Paratypes: 2 ♀♀, idem, U. Ong leg. (GCCl, UOTT).

HOLOTYPE DESCRIPTION. Length 5.3 mm. Elongated shape. Bicolor: red vertex and pronotum, black elytra. Vertex wide over half of the anterior margin of the pronotum. Green and glabrous frons. Epistoma without carina. Antennae serrate from the antennomere IV. Pronotum larger at mid-length, with regularly rounded lateral margins and right posterior angles. Anterior margin without an advanced lobe. Disc slightly depressed posteriorly before the scutellum. Disc with transverse striae. The red color is more intense in the center, while it takes on a yellow / green color on the sides. Prehumeral carinulae not entire, but almost anteriorly joined at the margins in mid-length. Marginal carinae joined posteriorly before the angle. Gular lobe broadly sinuous. Prosternal lobe acute. Scutellum carinate. Elytra with a broad and flat apex, slightly rounded



Figures 25–27. *Agrilus inflammatus* n. sp., holotype. Fig. 25: dorsal view; Fig. 26: ventral view; Fig. 27: aedeagus dorsal view, 1.5 mm.

and micro-denticulated. White perisutural dorsal pubescence, interrupted after half-length in a large glabrous area; the pubescence in the apical part is narrowest and sparsest. Ventral side with regular white pubescence. Margin of the apical ventrite rounded. Legs: pro-claws with internal spur bifid and external dentate; meso-claws with the internal spur dentate and the external bifid; meta-claws all dentate. Metatarsus shorter than the metatibia. Metatarsal formula  $1>2+3+4$ . Aedeagus 1.5 mm in length, symmetrical, widened towards the distal part. Apex of the median lobe as shown in Fig. 27.

**PARATYPES DESCRIPTION.** Length from 5.3 to 6.0 mm. Ovipositor square, uritiform.

**SEXUAL DIMORPHISM.** Females have apical elytral pubescence spread over the entire surface and not limited to the perisutural area, red frons, less elongated antennae and all claws simply dentate.

**ETYMOLOGY.** From Latin “*inflammātus*” = inflamed, irritate. For reddish color on the anterior body.

**HOST PLANT.** Unknown. All specimens were collected on the leaves of *Carpinus kawakamii* Hayata (Betulaceae).

**DIAGNOSIS.** Homomorphic species: *A. imasakai* Tôyama, 1985 described from Japan. *A. inflammatus* n. sp. is easily separable due to the color of the pronotum and the slenderer shape.

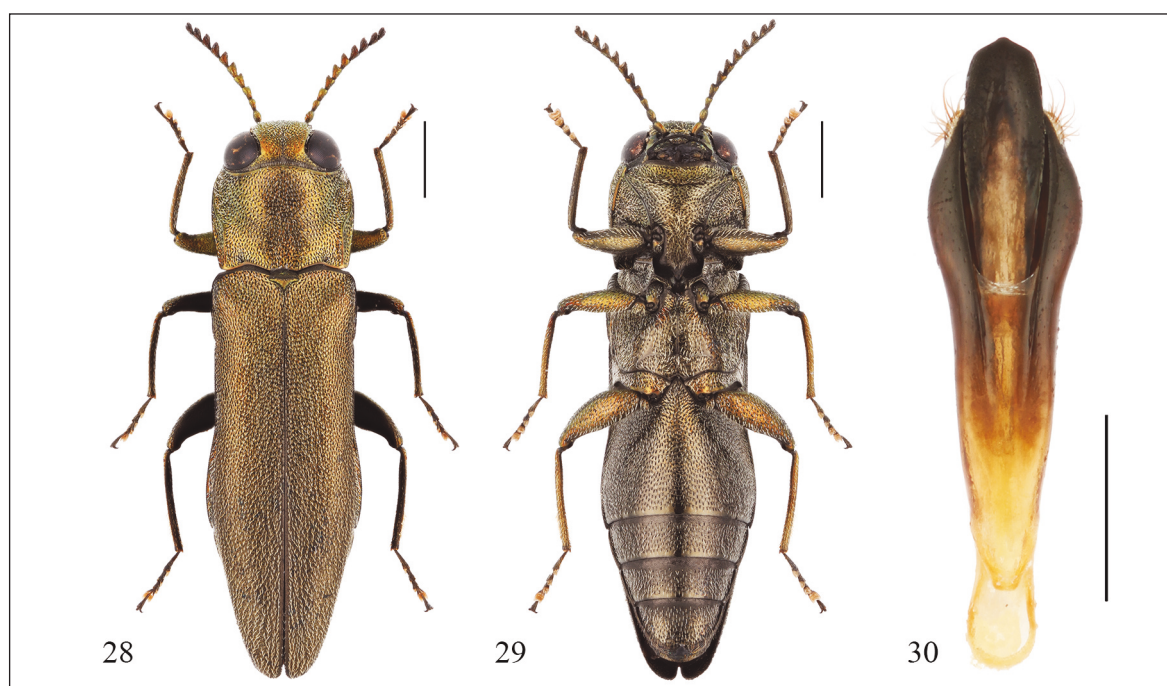
***Agrilus (Agrilus) intimus* n. sp.** (Figs. 28–30)

<https://zoobank.org/90bec8b4-af57-4cc8-bc16-df9fb4f5af24>

**MATERIAL EXAMINED.** Holotype ♂: Taiwan, Pingtung County, Shouco, 23.VIII.2022. U. Ong leg. (NMNST).

**HOLOTYPE DESCRIPTION.** Length 7.3 mm. Bright color, uniformly copper bronze. Vertex narrowed, approximately 1/4 of the anterior margin of the pronotum wide. Eyes large, slightly protruding. Flat frons with thin white pubescence more visible in the basal part. Epistoma carinate. Antennae dentate from the antennomere IV. Pronotum wider in the anterior half, lateral margins slightly arcuate and posterior angles obtuse. Anterior margin with median lobe moderately advanced between the eyes. Sculpture composed of striae arranged transversely. Pronotum with two vague median depressions,





Figures 28–30. *Agrilus intimus* n. sp., holotype. Fig. 28: dorsal view; Fig. 29: ventral view; Fig. 30: aedeagus dorsal view, 1.7 mm.

placed respectively behind the vertex and in front of the scutellum. Prehumeral carinulae thickened, robust, entire. Marginal carinae joined before the posterior angle. Gular lobe broadly sinuous. Prosternal process dilated, with sharp and horizontal tips. Scutellum carinate. Elytra with white and uniform tomentum. Elytral apices jointly rounded. Ventrites regularly pubescent. Margin of the apical ventrite is sinuous. Legs with metatarsus shorter than metatibia; metatarsal formula  $1 > 2 + 3$ . Anterior and median claws bifid, posterior dentate. Aedeagus symmetric, claviform, 1.7 mm in length. Apex of the median lobe obtuse (Fig. 30).

**ETYMOLOGY.** From Latin “*intimus*” = intimate, as opposed to “*intrusus*”, the term that was chosen for the morphologically most similar species.

**HOST PLANT.** Unknown.

**DIAGNOSIS.** Homomorphic and sympatric species: *A. intrusus* Kerremans, 1914. *Agrilus intimus* n. sp. differs for having smaller and less convex eyes, widest pronotum, lobe of the anterior margin of the pronotum practically absent, stronger and entire prehumeral carinulae, disc of the pronotum with longitudinal median depression not entire,

elytral pubescence longer and uniformly wide-spread, the prosternal process with more pointed lateral angles, the male with basal metatarsomeres shorter, aedeagus more claviform with the apex of the median lobe obtuse and not acute.

### Species incertae sedis

*Agrilus bocaki dimidius* n. ssp. (Figs. 31–33)

<https://zoobank.org/588df96c-f07e-4c8a-81cf-5fe9c0c5fedd>

**MATERIAL EXAMINED.** Holotype ♂: Taiwan, Taitung County, Kinchenshan, 26.VII.2018, Chiamu Chen leg. (NMNST). Paratypes: 1 ♂, idem, 2.VI.2019, Chiamu Chen leg.; 1 ♀, idem, 8.VI.2019, Chiamu Chen leg.; 1 ♀, idem, 20.VI.2019, Chiamu Chen leg.; 1 ♀, idem, 26.VII.2019, U. Ong leg.; 1 ♂, idem, 9.VII.2020, Chiamu Chen leg.; 2 ♂♂, idem, 9.VII.2022, Jiafong Chen leg.; 1 ♀, Taiwan, Taichung City, Dasyueshan, 15.VII.2021, U. Ong leg.; 1 ♂, Taiwan, Taichung City, Kayo, 10.VI.2020, U. Ong leg.; 1 ♂, Taiwan, Pingtung County, Dahanshan, 19.VI.2019, U. Ong leg. (NMNST, UOTT, GCCI).



**HOLOTYPE DESCRIPTION.** Length 4.7 mm. Shape, color and structure similar to the typical form. The elytral pubescence is however interrupted at 2/3, while in *A. bocaki bocaki* Jendek, 2011 it is given in full. Claws: anterior and median ones are bifid; the posterior ones are dentate.

**PARATYPES DESCRIPTION.** Length from 4.3 to 5.0 mm. Conventional ovipositor, but less elongated than the norm.

**SEXUAL DIMORPHISM.** Females on average have a more rounded vertex, an almost glabrous pubescence and a bronze-golden color. All claws are simply dentate.

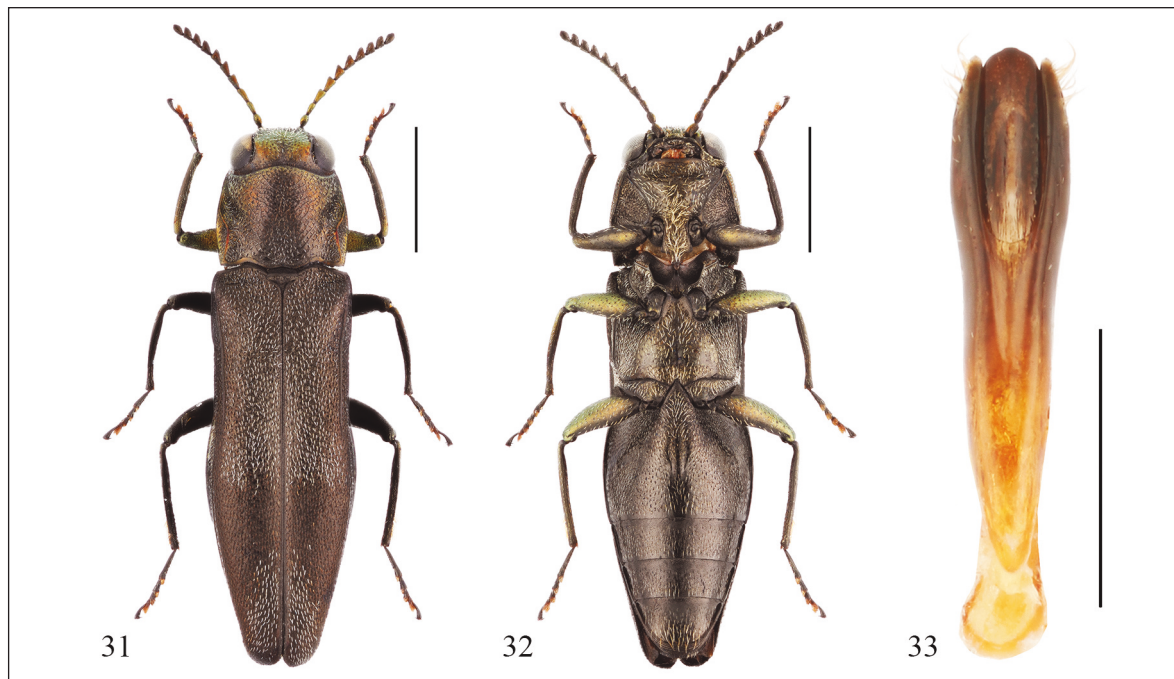
**ETYMOLOGY.** From Latin “*dīmidius*” = half. For the presence of the elytral carinae that place this taxon between the genera *Agrilus* and *Neotropicantius*.

**HOST PLANT.** Unknown. Adults can be found on the leaves of *Castanopsis cuspidata* (Thunb.) Schottky, (Fagaceae).

**DIAGNOSIS.** In addition to the conformation of the elytral pubescence, *A. bocaki dimidius* n. ssp. differs from *A. bocaki bocaki* Jendek, 2011 for hav-

ing frons more protruding from the head outline, edges of the pronotum more arcuate, the anterior margin of the gular lobe less sinuous and almost entire, the prosternal process more waisted and more angularly dilated, forming acute angles. The aedeagus (Fig. 33) is less sclerified at the base, and has a more claviform profile.

**REMARKS.** As stated by one of the AA. (Curletti, 2020), the genus *Agrilus* is considered one of the most numerous currently living genera, with over 4,000 known and widespread species on all continents except the Antarctic. The reason for this prolificacy is still unknown, as this worldwide diffusion in evolutionary dynamics has yet to be explained. There are those who believe that the Agrilini appeared in more recent periods, an opinion supported by the fact that there are practically no species related to Gymnosperms and that therefore they appeared with the arrival of the Angiosperms, an opinion that contrasts with its worldwide diffusion and suggest that it would find explanations in its most ancient origins, at the time of the separation of the continents. A specimen of *Agrilus* perfectly preserved in amber dating back to the Middle Miocene shows characters practically



Figures 31–33. *Agrilus bocaki dimidius* n. ssp., holotype. Fig. 31: dorsal view; Fig. 32: ventral view; Fig. 33: aedeagus dorsal view, 1.1 mm.

the same as the current species (Curletti & Gigli, 2022) and does not allow us to give exhaustive answers on the subject.

The presence of the post humeral elytral carinae in the *Agrilus* seems to be limited to a small number of Oriental and E-Palearctic species, absent in the rest of the Palearctic, Nearctic, Australian, Ethiopian faunas. Within the Agrilini tribe, the character reappears in an accentuated and constant form in the genus *Neotropicius* Curletti et Brûlé, 2014 characterized by particularly metallic, bright and mostly elongated species, present exclusively in the tropical areas of South America and marginally in Central America.

The presence of this character in the Agrilini tribe is difficult to interpret from an evolutionary and biogeographical point of view. If on the one hand it can be understood as a character that appeared relatively recently in the Afrotropical and Australian species, fauna considered among the most ancient, the elytral carinae could have evolved after the division of the Antarctic continent, but this would not explain the presence of this character, both in the E-Palearctic and tropical S-Neotropical fauna, geographically and geologically well separated. A second hypothesis relating to the presence of elytral carinae in these faunas could suggest a residual character that diversified over time, conditioned by the different environmental pressures.

Beyond these suppositions, the elytral carinae are, in our opinion, an important character that deserves further investigation, evaluating the hypothesis that the Oriental and E-Palearctic species with this character may be attributable to archaic forms of the genus *Neotropicius* or to a form of evolutionary convergence.

## DISCUSSION

The authors deem it premature to discuss the results obtained, since the genus *Agrilus* in its context, as previously mentioned, does not currently offer a sufficient framework for a correct interpretation, in particular for the fauna of Taiwan in relation to the faunas of the contiguous geographical areas (China, Japan, and the Philippines). At least a dozen other entities, probably new to science, are under study, and the faunal picture is still incomplete, so offering

partially incorrect evaluations even including the results of previous contributions would be wildcat. Further, more in-depth research is planned in the future through the use of innovative systems, increasing the search for larvae to better clarify the biology and relationships with host plants.

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