

## Two new species of the *Gonioctena mauroi* species-group from China (Coleoptera: Chrysomelidae: Chrysomelinae)

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**Abstract.** The *Gonioctena mauroi* species-group of the subgenus *Brachyphytodecta* Bechyně, 1948 is proposed to include four species: *G. (B.) mauroi* Cho & Borowiec, 2016 (Vietnam), *G. (B.) medvedevi* Cho & Borowiec, 2016 (Vietnam), *G. (B.) kuatunensis* sp. nov. (China: Fujian), and *G. (B.) longshengensis* sp. nov. (China: Guangxi). They are characterized by the presence of setae on the aedeagus, which is unique within the subgenus. A key to the species, habitus photographs, illustrations of diagnostic characters and a distribution map are provided. Ovoviviparity is newly recorded in *G. (B.) longshengensis* sp. nov.

**Key words.** Coleoptera, Chrysomelidae, Chrysomelinae, *Gonioctena*, *Brachyphytodecta*, taxonomy, new species, ovoviviparity, China, Vietnam

### Introduction

The genus *Gonioctena* Chevrolat, 1836 is one of the largest genera of the subfamily Chrysomelinae with approximately 110 valid species in nine subgenera distributed in the Holarctic and Oriental Regions (CHO 2016, CHO et al. 2016, SPRECHER-UEBERSAX & DACCARDI 2016). *Brachyphytodecta* Bechyně, 1948 is the third largest subgenus of *Gonioctena* and contains 24 species distributed in the Oriental and Eastern Palaearctic Regions. The subgenus is distinguished from other subgenera by the following combination of characters: body reddish brown to black mostly without distinct spots; labrum with anterior margin weakly concave to almost straight; pronotum without trichobothria on both anterior and posterior angles; elytral disc covered with 11 regular rows of punctures, rarely partially irregular; spermatheca present. Members of *Brachyphytodecta* exhibit high similarity in their coloration and morphology, therefore the structure of male genitalia has been commonly used to differentiate closely related species.

A new character state ‘the presence of setae on the aedeagus’ has been recently observed in *G. (B.) mauroi* Cho & Borowiec, 2016 and *G. (B.) medvedevi* Cho & Borowiec, 2016. It was used as a diagnostic character at the species-group or species level in several members

of the subgenus *Asiphytodecta* Chen, 1935, which is very closely related to the subgenus *Brachyphytodecta* in the absence of pronotal trichobothria and presence of spermatheca (YANG et al. 2014; CHO & BOROWIEC 2016a,b; CHO et al. 2016). Here, I propose the *Gonioctena* (*Brachyphytodecta*) *mauroi* species-group, characterized by the presence of setae on the apicolateral region of aedeagus, body shape, and coloration. Four species are recognized from China and Vietnam, of which two are new to science, *G. (B.) kuatunensis* sp. nov. and *G. (B.) longshengensis* sp. nov. and described in this work.

### Material and methods

The specimens were examined with a Nikon SMZ800 microscope. Male and female genitalia were dissected from adult specimens softened in a closed Petri dish with wet tissue paper for 12–24 hours, cleared in 10% sodium hydroxide solution, and rinsed in distilled water. Photographs were taken by a Nikon D5200 digital camera attached to a Nikon SMZ1500 microscope, and were edited in Helicon Focus 5.3.12 and Adobe Photoshop CS5. Line drawings were made from photographs in Adobe Photoshop CS5 with a Wacom Intuos4 graphics tablet.

The specimens examined in the study are deposited in the following collections:

LMCM	Lev N. Medvedev collection, Moscow, Russia;
NHMB	Naturhistorisches Museum Basel, Basel, Switzerland;
NMPC	Národní Muzeum, Prague, Czech Republic;
TLMF	Horst Kippenberg collection, Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria.

### Taxonomy

#### *Gonioctena* (*Brachyphytodecta*) *mauroi* species-group

**Differential diagnosis.** Body length 5.9–6.9 mm. Body short-oval, strongly convex (Figs 1, 3). Dorsum reddish-brown with basal margin of pronotum black (Figs 2, 4). Venter entirely or largely reddish-brown. Legs black, partially blackish-brown. Aedeagus long and thin, setose apicolaterally, with apical process varying in shape (Figs 7, 9, 11–12). *Gonioctena* (*B.*) *flavipennis* (Jacoby, 1888) is almost identical with members of *Gonioctena mauroi* species-group in body shape and coloration, but differs in its glabrous aedeagus. The most consistent characteristic that differentiates this species-group from other species of the subgenus *Brachyphytodecta* is setose aedeagus.

#### Key to the species of the *Gonioctena* (*Brachyphytodecta*) *mauroi* species-group

- 1 Apex of aedeagus triangular or subtriangular (Figs 9, 11–12). ..... 2
  - Apex of aedeagus semicircular (Fig. 7). ..... *G. (B.) kuatunensis* sp. nov.
- 2 Aedeagus subparallel-sided, with apical process relatively broad (Figs 9, 11). ..... 3
  - Aedeagus moderately narrowed to apical 1/4, with apical process relatively narrow, moderately widened apically, lateral sharp tooth-like projections near apex (Fig. 12). ..... *G. (B.) medvedevi* Cho & Borowiec, 2016

- 3 Apical process of aedeagus widest in apical 1/3 and subequal to median lobe in width in dorsal view; apex pointed in lateral view (Fig. 9). ..... ***G. (B.) longshengensis* sp. nov.**  
 – Apical process of aedeagus widest in middle and slightly narrower than median lobe in dorsal view; apex blunt in lateral view (Fig. 11). .....  
 ..... ***G. (B.) mauroi* Cho & Borowiec, 2016**

***Gonioctena (Brachyphytodecta) kuatunensis* sp. nov.**

(Figs 1–2, 6–7, 13)

**Type locality.** China, Fujian Province, Guadun, 27°40'N 117°40'E, 2300 m a.s.l.

**Type material examined.** HOLOTYPE: ♂, 'Kuatun (2300m) 27,40n. Br. 117,40ö. L. J. Klapperich, 27.4.1938 (Fukien)  
 // HOLOTYPUS *Gonioctena (B.) kuatunensis* sp. n. Cho & Borowiec 2013' (NHMB).

**Description.** Measurements in mm ( $n = 1$ ): length of body: 6.30; width of body: 4.30; height of body: 2.80; width of head: 1.85; interocular distance: 1.20; width of apex of pronotum: 2.15; width of base of pronotum: 3.92; length of pronotum along midline: 1.75; length of elytra along suture: 4.50.

**Body** short-oval and strongly convex (Fig. 1). Head reddish-brown. Mandibles black with reddish-brown band near apex. Maxillary palps blackish-brown. Antennomeres I–V yellowish-brown, V partially darkened, VI–XI black, XI blackish-brown apically. Pronotum reddish-brown with basal margin black (Fig. 2). Scutellum and elytra reddish-brown. Venter reddish-brown, partially black. Legs black, partially blackish-brown.

**Head.** Vertex weakly convex, covered with sparse punctures, becoming coarser and denser towards sides. Frontal suture V-shaped, reaching anterior margin, coronal suture weak. Frons flat, strongly depressed at anterior margin, covered with dense punctures. Clypeus very narrow and trapezoidal. Anterior margin of labrum almost straight. Mandibles with two sharp apical teeth and large excavation for apical maxillary palpomere on outer side. Maxillary palps 4-segmented, with apical palpomere slightly widened, truncate apically. Antennae almost reaching pronotal base; antennomere I robust; II shorter than III; III longer than IV; VII–X distinctly widened, VIII–X each wider than long; XI longest, about 1.40 times as long as wide (Fig. 6).

**Pronotum.** Widest at base, roundly strongly narrowed anteriorly, anterior angles strongly produced. Anterior and lateral margins bordered, lateral margins barely visible in dorsal view. Trichobothria absent on both anterior and posterior angles. Disc covered with very sparse punctures; lateral sides covered with much larger and denser punctures; interspaces covered with fine and sparse punctures. Scutellum slightly wider than long, narrowed posteriorly.

**Elytra.** Lateral sides slightly widened posteriorly, widest before middle, thence roundly narrowed posteriorly. Humeral calli well developed. Disc covered with eleven regular rows of large punctures, including short scutellar row; interspaces covered with fine and sparse punctures. Epipleura visible except near base in lateral view. Hind wings well developed.

**Venter.** Hypomera weakly rugose, with few punctures near anterolateral corners of prosternum. Prosternum covered with coarse and dense punctures bearing long setae; prosternal process enlarged apically, bordered laterally, with sparse punctures. Metasternum covered with small and sparse punctures in median region, large and dense punctures in lateral region. Abdominal ventrites covered with sparse or dense punctures bearing short setae.

**Legs.** Moderately robust. Tibiae widened apically, with tooth-like projection. Fore legs with tarsomere I slightly narrower than III. Tarsal claws appendiculate.

**Genitalia.** Aedeagus long and thin, very slightly narrowed apically, setose apicolaterally, with apical process rather long, apex enlarged and semicircular in dorsal view; weakly curved, apex pointed in lateral view (Fig. 7).

**Differential diagnosis.** *Goniocтена* (*B.*) *kuatunensis* sp. nov. is very similar to *G.* (*B.*) *longshengensis* sp. nov., *G.* (*B.*) *mauroi*, and *G.* (*B.*) *medvedevi* in body shape, coloration and setose aedeagus, but differs in semicircular apex of aedeagus (triangular or subtriangular in other species).

**Etymology.** The species is named after the type locality, Kuatun [= Guadun in modern spelling] in China; adjective

**Distribution.** China: Fujian (Fig. 13).

***Goniocтена* (*Brachyphytodecta*) *longshengensis* sp. nov.**

(Figs 3–5, 8–10, 13)

**Type locality.** China, Guangxi Province, Longsheng, Longsheng Hot Spring, 25°53.6'N, 110°12.4'E, 360 m a.s.l.

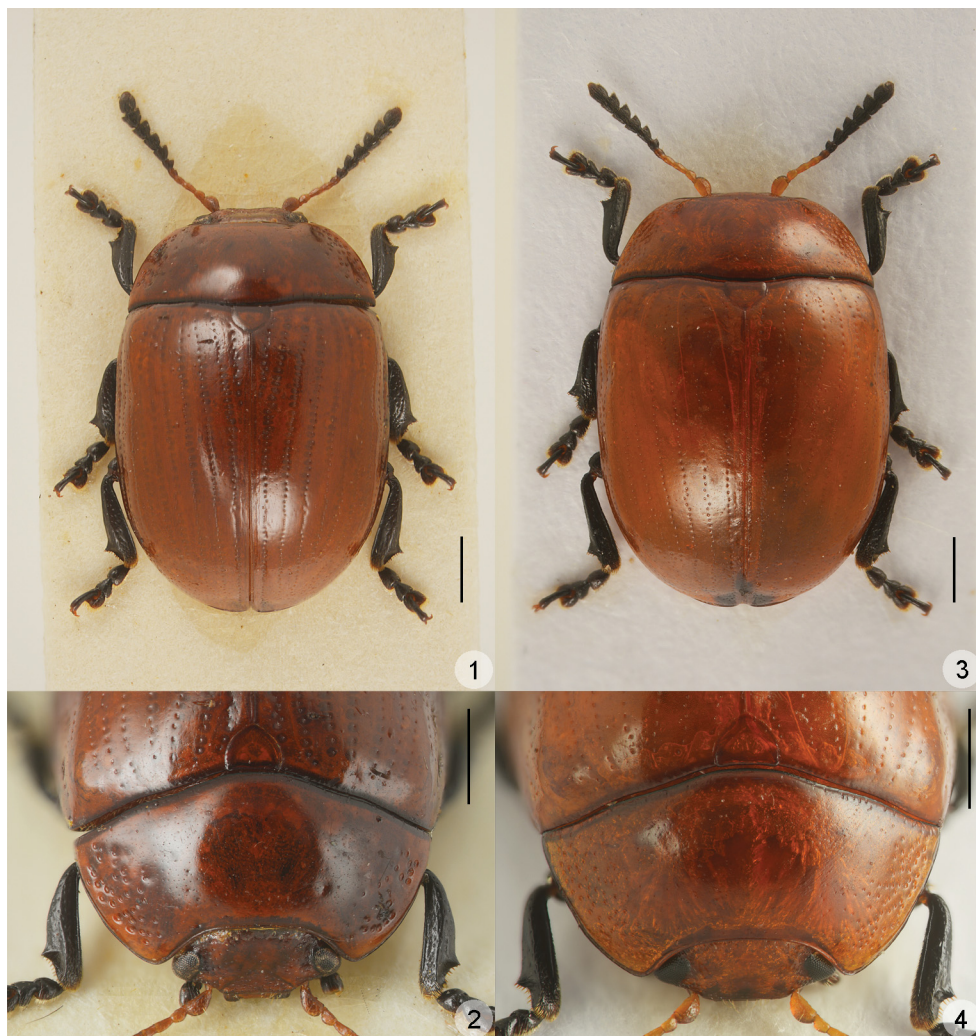
**Type material examined.** HOLOTYPE: ♂, 'China, Guangxi A.R., 11.–14.IV.2013, Longsheng Hot Spring (forested river valley, wet rocks), 25°53.6'N, 110°12.4'E, 360 m, M. Fikáček, J. Hájek, J. Růžička leg. // HOLOTYPE *Goniocтена* (*B.*) *longshengensis* sp. n. Cho & Borowiec 2014' (NMPC). PARATYPES: 2 ♀♀, same data as holotype plus 'PARATYPE *Goniocтена* (*B.*) *longshengensis* sp. n. Cho & Borowiec 2014' (NMPC).

**Description.** Measurements in mm ( $n = 3$ ): length of body: 6.40–6.90 (mean 6.63); width of body: 4.55–4.90 (mean 4.72); height of body: 3.10–3.30 (mean 3.17); width of head: 1.85–1.92 (mean 1.89); interocular distance: 1.15–1.25 (mean 1.20); width of apex of pronotum: 2.15–2.20 (mean 2.17); width of base of pronotum: 4.05–4.27 (mean 4.16); length of pronotum along midline: 1.80–1.87 (mean 1.84); length of elytra along suture: 4.90–5.30 (mean 5.07).

Body short-oval and strongly convex (Fig. 3). Head reddish-brown with apex of mandibles black, maxillary palpomeres III–IV dark brown. Antennomeres I–V yellowish-brown, V partially darkened, VI–XI black, XI blackish-brown apically. Pronotum reddish-brown with basal margin black (Fig. 4). Scutellum reddish-brown. Elytra reddish-brown with tip darkened. Venter reddish-brown. Legs black, partially blackish-brown.

**Head.** Vertex weakly convex, covered with sparse punctures, becoming coarser and denser towards sides. Frontal suture V-shaped, reaching anterior margin, coronal suture weak. Frons flat, strongly depressed at anterior margin, covered with dense punctures. Clypeus very narrow and trapezoidal. Anterior margin of labrum almost straight. Mandibles with two sharp apical teeth and large excavation for apical maxillary palpomere on outer side. Maxillary palps 4-segmented, with apical palpomere slightly widened, truncate apically. Antennae reaching pronotal base; antennomere I robust; II as long as III; III longer than IV; VII–X distinctly widened, VIII–X each wider than long; XI longest, about 1.47 times as long as wide (Fig. 8).

**Pronotum.** Widest at base, roundly strongly narrowed anteriorly, anterior angles strongly produced. Anterior and lateral margins bordered, lateral margins barely visible in dorsal view. Trichobothria absent on both anterior and posterior angles. Disc covered with very sparse punctures; lateral sides covered with much larger and denser punctures; interspaces covered with fine and sparse punctures. Scutellum distinctly wider than long, narrowed posteriorly.



Figs 1–4. 1–2 – *Gonioctena* (*B.*) *kuatunensis* sp. nov., holotype: 1 – dorsal habitus; 2 – head and pronotum. 3–4 – *G.* (*B.*) *longshengensis* sp. nov., holotype: 3 – dorsal habitus; 4 – head and pronotum. Scale bars = 1.0 mm.

*Elytra*. Lateral sides slightly widened posteriorly, widest before middle, thence roundly narrowed posteriorly. Humeral calli well developed. Disc covered with eleven regular rows of large punctures, including short scutellar row, sometimes with additional punctures between striae; interspaces covered with fine and sparse punctures. Epipleura visible except near base in lateral view. Hind wings well developed.

*Venter*. Hypomera weakly rugose, with few punctures near anterolateral corners of prosternum. Prosternum covered with coarse and moderately dense punctures bearing long setae;





Fig. 5. Larvae dissected from the female of *Gonioctena (B.) longshengensis* sp. nov.

prosternal process enlarged apically, bordered laterally, with sparse punctures. Metasternum covered with minute and sparse punctures in median region, large and dense punctures in lateral region. Abdominal ventrites covered with sparse or dense punctures bearing short setae.

**Legs.** Moderately robust. Tibiae widened apically, with tooth-like projection. Fore legs with tarsomere I distinctly narrower than III in both sexes. Tarsal claws appendiculate.

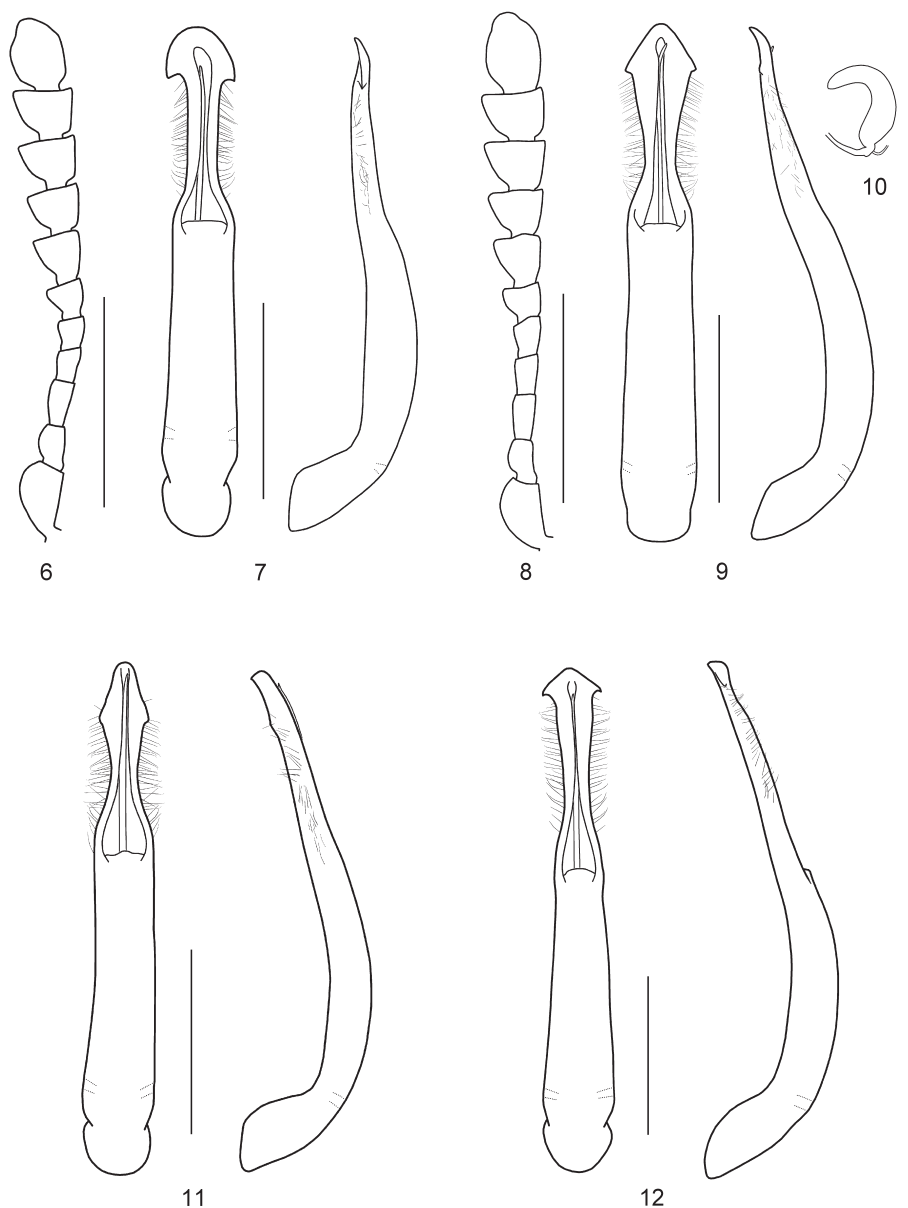
**Genitalia.** Aedeagus long and thin, subparallel-sided, setose apicolaterally, with apical process rather broad, distinctly widened to lateral tooth-like projections, apex triangular in dorsal view; moderately curved, apex pointed in lateral view (Fig. 9). Spermatheca C-shaped, swollen basally and apex rounded (Fig. 10).

**Differential diagnosis.** *Gonioctena (B.) longshengensis* sp. nov. is almost identical with *G. (B.) mauroi* and *G. (B.) medvedevi* in body shape, coloration and setose aedeagus. From these two species, *G. (B.) longshengensis* sp. nov. can be distinguished only by aedeagus subparallel-sided with apical process broad, widest in apical 1/3 and subequal to median lobe in width (subparallel-sided with apical process widest in middle and slightly narrower than median lobe in *G. (B.) mauroi* and moderately narrowed with apical process moderately widened to lateral tooth-like projections near apex in *G. (B.) medvedevi*). *Gonioctena (B.) kuatunensis* sp. nov. differs in semicircular apex of aedeagus (triangular or subtriangular in other species).

**Etymology.** The species is named after the type locality, Longsheng in China; adjective.

**Distribution.** China: Guangxi (Fig. 13).

**Remarks.** Several larvae were dissected from the female specimen, therefore this species is ovoviviparous (Fig. 5).



Figs 6–12. 6–7 – *Gonioctena* (*B.*) *kuatunensis* sp. nov.: 6 – antenna; 7 – aedeagus, holotype (dorsal and lateral views). 8–10 – *G. (B.) longshengensis* sp. nov.: 8 – antenna; 9 – aedeagus, holotype (dorsal and lateral views); 10 – spermatheca. 11 – *Gonioctena* (*B.*) *mauroi* Cho & Borowiec, 2016 (after CHO & BOROWIEC 2016a), aedeagus, holotype (dorsal and lateral views). 12 – *G. (B.) medvedevi* Cho & Borowiec, 2016 (after CHO & BOROWIEC 2016a), aedeagus, holotype (dorsal and lateral views). Scale bars = 1.0 mm (except Fig. 10 = 0.5 mm).

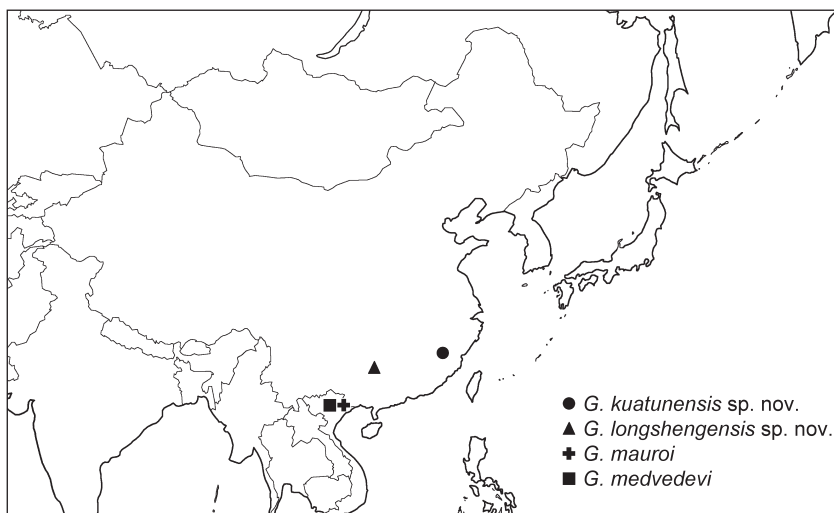


Fig. 13. Distribution of *Gonioctena* (*B.*) *mauroi* species-group.

### *Gonioctena* (*Brachyphytodecta*) *mauroi* Cho & Borowiec, 2016

(Figs 11, 13)

*Gonioctena* (*Brachyphytodecta*) *mauroi* Cho & Borowiec, 2016a: 176 (original description).

**Type locality.** ‘Vietnam, Lang Son Province, Loc Binh, Mt. Mau Son’.

**Type material examined.** HOLOTYPE: ♂, ‘Tonkin, Montes Mauson, April, Mai 2-3000’, H. Fruhstorfer // HOLOTYPE *Gonioctena* (*Brachy.*) *mauroi* sp. n. Cho & Borowiec 2015’ (LMCM).

**Description.** See CHO & BOROWIEC (2016a).

**Differential diagnosis.** *Gonioctena* (*B.*) *mauroi* is very similar to *G. (B.) longshengensis* sp. nov. and *G. (B.) medvedevi* in body shape, coloration and setose aedeagus. From these two species, *G. (B.) mauroi* can be distinguished only by aedeagus subparallel-sided with apical process widest in middle and slightly narrower than median lobe (subparallel-sided with apical process broad, widest in apical 1/3 and subequal to median lobe in width in *G. (B.) longshengensis* sp. nov. and moderately narrowed with apical process moderately widened to lateral tooth-like projections near apex in *G. (B.) medvedevi*). *Gonioctena* (*B.*) *kuatunensis* sp. nov. differs in semicircular apex of aedeagus (triangular or subtriangular in other species).

**Distribution.** Vietnam: Lang Son Province (Fig. 13).

### *Gonioctena* (*Brachyphytodecta*) *medvedevi* Cho & Borowiec, 2016

(Figs 12–13)

*Gonioctena* (*Brachyphytodecta*) *flavipennis* (partim): YANG et al. (2014): 374 (taxonomy, misidentification).

*Gonioctena* (*Brachyphytodecta*) *medvedevi* Cho & Borowiec, 2016a: 177 (original description).

**Type locality.** Vietnam, Vinh Phuc Province, Tam Dao.

**Type material examined.** HOLOTYPE: ♂, ‘Vietnam, Prov. Vinh-phu (divided into Vinh Phuc and Phu Tho), Tam-dao, L. Medvedev @ Dang Dap // on *Ormosia* (Fab.) // HOLOTYPE *Gonioctena* (*Brachy.*) *medvedevi* sp. n. Cho & Borowiec 2014’ (LMCM). PARATYPES: 1 ♂ 1 ♀, same data as holotype plus ‘PARATYPE *Gonioctena* (*Brachy.*)



*medvedevi* sp. n. Cho & Borowiec 2014' (LMCM); 1 ♂, same data as preceding paratype (TLMF); 1 ♂, 'Vietnam, Tam Dao, 900 m, 4.VI.1987, L. Medvedev et al. // PARATYPUS *Gonioctena* (*Brachy*) *medvedevi* sp. n. Cho & Borowiec 2014' (LMCM).

**Description.** See CHO & BOROWIEC (2016a).

**Differential diagnosis.** *Gonioctena* (*B.*) *medvedevi* is very similar to *G. (B.) longshengensis* sp. nov. and *G. (B.) mauroi* in body shape, coloration and setose aedeagus. From these two species, *G. (B.) medvedevi* can be distinguished only by aedeagus moderately narrowed with apical process moderately widened to lateral tooth-like projections near apex (subparallel-sided with apical process broad, widest in apical 1/3 and subequal to median lobe in width in *G. (B.) longshengensis* sp. nov. and subparallel-sided with apical process widest in middle and slightly narrower than median lobe in *G. (B.) mauroi*). *Gonioctena* (*B.*) *kuatunensis* sp. nov. differs in semicircular apex of aedeagus (triangular or subtriangular in other species).

**Distribution.** Vietnam: Vinh Phuc Province (Fig. 13).

**Remarks.** The male genitalia of *Gonioctena* (*B.*) *flavipennis* (Jacoby, 1888) illustrated by YANG et al. (2014) without any doubts refer to *G. (B.) medvedevi*. The correct drawings of male genitalia of *G. (B.) flavipennis* were provided by CHO & BOROWIEC (2016a).

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## References

- BECHYNĚ J. 1948: Příspěvek k poznání rodu *Phytodecta* Kirby. Additamenta ad cognitionem specierum generis *Phytodecta* Kirby (Col. Phytoph. Chrysomelidae). *Sborník Národního musea v Praze* **3B(3)** [1947]: 89–158 + 5 pls.
- CHEN S. H. 1935: Classification of Asiatic *Phytodecta* (Col. Chrysomelinae). *Chinese Journal of Zoology* **1**: 125–133.
- CHEVROLAT L. A. A. 1836: Chrysomelidae. Pp. 361–443. In: DEJEAN P. F. M. A. (ed.): *Catalogue des coléoptères de la collection de le M. le Comte Dejean. Deuxième édition, revue, corrigée et augmentée. [Livraison 5].* Méquignon-Marvis Père et Fils, Paris, 443 pp.
- CHO H. W. 2016: *Revision and classification of the genus Gonioctena Chevrolat, 1836 (Coleoptera: Chrysomelidae: Chrysomelinae)*. Ph.D. thesis, University of Wrocław, Wrocław, 403 pp.
- CHO H. W. & BOROWIEC L. 2016a: On the genus *Gonioctena* Chevrolat (Coleoptera: Chrysomelidae: Chrysomelinae), with descriptions of seven new species from the Oriental region and Palaearctic China. *Zootaxa* **4067**: 168–184.
- CHO H. W. & BOROWIEC L. 2016b: Revision of the *Gonioctena flavoplagiata* species-group (Coleoptera: Chrysomelidae: Chrysomelinae), with descriptions of two new species from China and Laos. *Acta Entomologica Musei Nationalis Pragae* **56**: 755–768.
- CHO H. W., TAKIZAWA H. & BOROWIEC L. 2016: Notes on *Gonioctena tredecimmaculata* (Jacoby, 1888), with descriptions of two new species from Taiwan (Coleoptera: Chrysomelidae: Chrysomelinae). *Annales Zoologici (Warszawa)* **66**: 357–369.
- SPRECHER-UEBERSAX E. & DACCORDI M. 2016: Leaf-beetles of the subfamily Chrysomelinae of Laos (Coleoptera: Chrysomelidae). *Entomologica Basiliensia et Collectionis Frey* **35**: 455–485.
- YANG X. K., GE S. Q., WANG S. Y., LI W. Z. & CUI J. Z. 2014: *Fauna Sinica, Insecta Vol. 61. Coleoptera Chrysomelidae Chrysomelinae*. Science Press, Beijing, 641 pp. (in Chinese, English abstract and keys).

