

Designations of the lectotypes for Bates' species of the genus *Orthogonius* MACLEAY (Coleoptera: Caraboidea: Orthogoniini), with descriptions of four new species

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Abstract

H. W. Bates described five species and one "variety" of the genus *Orthogonius* in 1891 and 1892 respectively, namely, *O. apiculatus* BATES, *O. dispar* BATES, *O. lucidus* BATES, *O. lucidus nitidulus* BATES, *O. quadricollis* BATES and *O. rufiventris* BATES. Because the type series of Bates' species are mainly deposited in Museo Civico di Genova, Genoa and Muséum National d'Histoire Naturelle, Paris, the lectotypes are designed in order to clarify and fix the taxonomic identify of the species involved. In addition, four new species, viz. *O. feai*, sp. nov., *O. batesianus*, sp. nov., *O. perakicus*, sp. nov. and *O. poggii* sp. nov. are described and illustrated from Bates' collection.

Key words: Coleoptera, Caraboidea, *Orthogonius*, lectotypes, new species

Introduction

In total, H. W. Bates described five species and one "variety" of the genus *Orthogonius* from Myanmar and India (BATES, 1891, 1892). His famous work on Burmese fauna of Carabidae was mainly based on materials collected by L. Fea (BATES, 1892). The majority of the material are well deposited in Museo Civico di Genova (MCG), Genoa, a small part in Museum National d'Histoire Naturelle, Paris (MNHN), and individuals in Institute royal des Sciences naturelles de Belgique, Bruxelles (IRSNB). Bates seldom designed a type when he described a new species, as pointed out by ANDREWES (1923). Considering the type series of his species are deposited in different collections, it is necessary to design the lectotypes in order to clarify and fix the taxonomic identity of species involved, according to International Code of Zoological Nomenclature (ICZN, 1999).

A few specimens of *Orthogonius* belonging to Bates' collection in MNHN and MCG have either been misidentified, or unidentified. From them, four new species are discovered and hereby described.

Lectotype designation

Orthogonius apiculatus BATES

BATES, 1892: 403; ANDREWES, 1923: 34; CSIKI, 1932: 1589

There are two specimens of the type series in MCG, 1♂ and 1♀. The female is designed as the lectotype (**present designation**), labeled "Carin Cheba, 900-1100 m. L. Fea. 88", "*Orthogonius apiculatus* BATES, 1892", "typus", "*apiculatus* BATES", and "*Orthog. apiculatus* (es. tip) BATES". The male is designed as paralectotype, labeled "Carin Cheba, 900-1100 m. L. Fea. 88", and "Syntypus. *Orthogonius apiculatus* BATES, 1892".

In MNHN, 1, labeled "Carin Cheba, 900-1100 m, L. Fea, V.XII-88", "*Orth. apiculatus* n. sp." and "*Orthogonius apiculatus* BATES". One more specimen, a female with same labels as above, is preserved in IRSNB. Therefore, both are designed as paralectotypes.

The designation of the lectotype is necessary to clarify and to fix the taxonomic identify of the species.

Orthogonius dispar BATES

BATES, 1892: 401; CSIKI, 1932: 1588

In MCG, there are four specimens of *O. dispar* BATES in the type series, among them, three from "Carin Cheba", one from "Tenasserim, Thagata". A male is designed as the lectotype (**present designation**), labeled "Carin Cheba, 900-1100 m, L. Fea, V. XII-88", "♂", "*Orthogonius dispar* BATES", and "Syntype. *Orthogonius dispar* BATES" and "Museo Civico di Genova". All others (2 ♂♂ and 1♀) are designed as paralectotypes.

In MNHN, there are two specimens, 1♂ and 1♀, all from Myanmar with labels as lectotype. Both are designed as paralectotypes.

The designation of the lectotype is necessary to clarify and to fix the taxonomic identify of the species.

***Orthogonius lucidus* BATES**

BATES, 1891: 337; CSIKI, 1932: 1589

There are four specimens in the MNHN, but only one with the identification label. It is a female and designed as lectotype (**present designation**), labeled "*Orthogonius lucidus* BATES", "*Orthogonius lucidus* BATES, Tian & Deuve des.", "Kanbir, Chora Nagpore" and "Lectotype". The other three specimens, 1♂ and 2♀♀, are paralectotypes, labeled "*Orthogonius lucidus* BATES, Tian & Deuve des." and "Chora Nagpore", respectively.

The designation of the lectotype is necessary to clarify and to fix the taxonomic identify of the species.

***Othogonius lucidus nitidulus* BATES**

BATES, 1891: 337; CSIKI, 1932: 1589

There are four female specimens in the type series in MNHN. It was originally described by the author as a "variety" of *O. lucidus*, and treated here as a subspecies. One of the specimens is designed as lectotype (**present designation**), labeled "*Othogonius lucidus* var. *nitidulus* BATES", "*Othogonius lucidus nitidulus* BATES, Tian & Deuve des.", and "Kanbir". Other three are designed as paralectotypes, each with labels as the lectotype, but from "Chota Nagpore", rather than "Kanbir".

The designation of the lectotype is necessary to clarify and to fix the taxonomic identify of this subspecies.

***Orthogonius quadricollis* BATES**

BATES, 1892: 400; ANDREWES, 1923: 31; CSIKI, 1932: 1588

There are four specimens in the type series in MCG, 2♂♂ and 2♀♀. A male is designed as the lectotype (**present designation**), labeled "Carin Cheba, 900-1100 m, L. Fea, 89", "*Orthogonius quadricollis* BATES", "*quadricollis* BATES", "Typus", and "*Orthogonius quadricollis* (es. tip) BATES", "Syntype, *Orthogonius quadricollis* BATES, 1892" and "Museo Civico di Genova". Other three are designed as paralectotypes, 1♂ with same labels as lectotype. 1♂ and 1♀, labeled "Palon (Pegu). L. Fea. VIII. IX. 87", "Syntype, *Orthogonius quadricollis* BATES, 1892" and "Museo

Civico di Genova".

There are two specimens (1♂ and 1♀) in MNHN, both were mentioned by the author and are designed as paralectotypes. The male is labeled "Palon (Pegu), L. Fea, VIII. IX. 87", and "*Orthogonius quadricollis* BATES". The female is labeled "Carin Cheba, 900-1100 m, L. Fea, V. XII-88" and "*Orthogonius quadricollis* BATES".

The designation of the lectotype is necessary to clarify and to fix the taxonomic identify of the species.

***Orthogonius rufiventris* BATES**

BATES, 1892: 402; ANDREWES, 1923: 34; CSIKI, 1932: 1590

In MCG, the type series is composed of four female specimens. One is designed as lectotype (**present designation**), and others as paralectotypes, each labeled "Carin Cheba, 900-1100 m, L. Fea, V. XII-88", "Typus", "*rufiventris* BATES", "*Orthogonius rufiventris* BATES", "*Orthog. rufiventris* BATES, 1892" and "Mu. C. di Genova".

In MNHN, there are three specimens, all are females too. All are designed as paralectotypes, labeled "Carin Cheba, 900-1100 m, L. Fea, V. XII-88" and "*Orthogonius rufiventris* BATES".

The designation of the lectotype is necessary to clarify and to fix the taxonomic identify of the species.

Descriptions of new species

***Orthogonius feai*, sp. nov.**

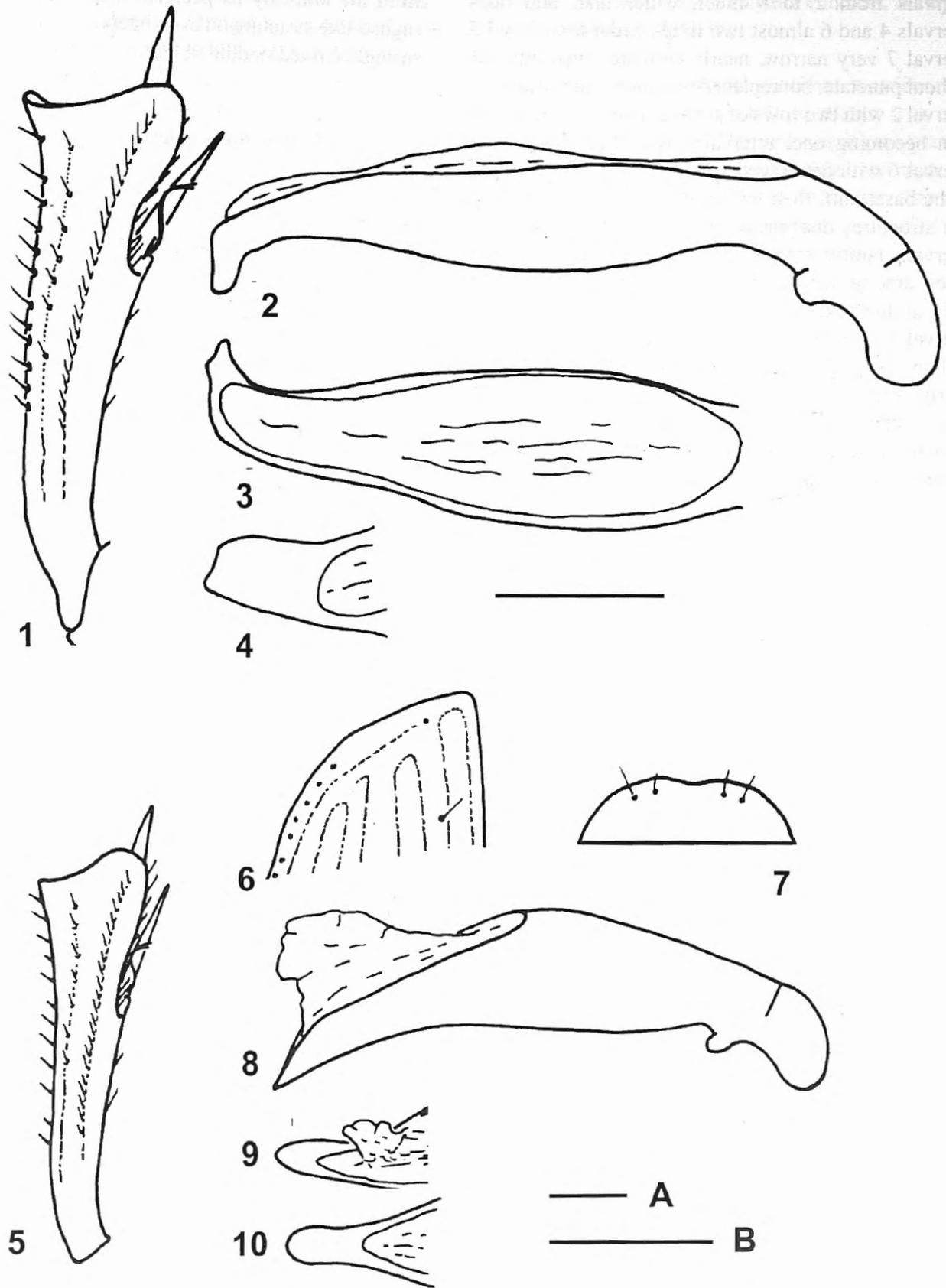
(Figs 1-4)

HOLOTYPE: male; length: 18.0 mm; width: 6.0 mm.

Dark brown species, head black, pronotum darker on disc. Head large, vertex coarsely rugose, frontal impressions faint. Labrum slightly emarginated in frontal margin, ligula small, bisetose at apex, paraglossa membranaceous, prominent, mouthparts palpi subcylindrical, labial palpomere 2 bisetose on inner margin, and two additional shorter setae on the outer margin, apex of palpomere 2 and palpomere 3 with several tiny setae.

Pronotum transverse, lateral expanded margins rather wide and reflexed, disc convex, median line distinct, basal foveae small, connected with basal impression. Disc with dense and transverse faint striate.

Elytra completely bordered at base, elongate ovate, striae moderately deep, intervals rather convex, even



Figs 1-10 — *Orthogonius* ssp. nov. Figs 1-4: *Orthogonius feai*, sp. nov.: 1. left fore tibia; 2-4. aedeagus (lateral view, dorsal views of apex and tip) (scale: 1 mm). Figs 5-10: *Orthogonius batesianus*, sp. nov.: 5. left fore tibia; 6. apex of right elytron; 7. abdominal ventrite VII of male; 8-9. aedeagus (lateral and dorsal views); 10. aedeagus of *O. disper* (apex) (scale: 1 mm, A for 6-7; B for 5, 8-10).

intervals from 2 to 8 much wider than odd ones, intervals 4 and 6 almost two times wider than 3 and 5, interval 7 very narrow, nearly carinate; even intervals without punctate, but replaced by rugose-like structures, interval 2 with two rows of such structures in basal half, then becoming one; interval 4 with two rows, while interval 6 with disarrayed, dense rugose-like structures in the basal half, then becoming two rows, all rugose-like structures disappeared near apex of interval; odd intervals faintly striate; interval 3 with 7 setiferous pores, among them 5 in the basal portion, 1 in middle and 1 at subapex; interval 5 with several setae near base, interval 7 with a row of setae throughout.

Fore tibia stout, outer margin curved, outer angle nearly rectangular (Fig. 1); middle tibia strongly curved, apical spurs of hind tibia short and broad, hind leg with tarsomere 3 slightly longer than 4, tarsomere 4 deeply emarginated, as deep as half of length; claws pectinate, fore and middle coxae setose in middle portion. Prosternal process bordered at apex. Abdominal ventrites VII of male complete at apical margin.

Male genitalia (Fig. 2-4): The median lobe of the aedeagus long and rather slender, apex bent in profile, right towards in dorsal view, and nearly spade-like in laterodorsal aspect.

ETYMOLOGY: Patronym, in honor of Leonardo Fea, an excellent insect collector in the late of XIX century in Myanmar.

DISTRIBUTION: India and Bhutan. Known only from the type localities. There is an antinomy concerning the locality of the holotype because there are two different labels under the specimen, "Carin Cheba" and "Sadiya, Assam", either one is correct, of course. Since the paratype was from Assam, we presume that the holotype was from Bhutan, rather than Myanmar.

HOLOTYPE: "Carin Cheba, 900-1100 m, L. Fea, V. XII-88" and "Sadiya, Assam", from Myarmar or East India, deposited in MNHN. Paratype 1 ♀, "Bootan, Soc. Ent. Belg., Coll. Putzeys", from Bhutan, deposited in IRSNB.

REMARKS: This specimen was gathered with other two specimens of *Orthogonius* by Bates under a label "sp. nov. near *duplicatus*". Actually, no of them is identical to *O. duplicatus* WIEDEMANN, 1819. One is *O. alternans* WIEDEMANN, 1823 (from Sumatra, Indonesia). Another should be *O. haunanus* TIAN & DEUVE, 2000 (from Hongkong). This new species is similar to *O. sinuatiphallus* TIAN & DEUVE, but differs

from the latter by its peculiar shape of aedeagus, the rugose-like structure on even intervals of elytra, and the strongly curved middle tibiae.

Orthogonius batesianus, sp. nov.

(Figs 5-10)

HOLOTYPE: male; length: 13.0 mm; width: 5.0 mm.

Head dark brown, pronotum and elytra brownish. Glabrous, shiny; without punctures, but moderately wrinkled on head and pronotum; elytra with odd intervals tiny punctured. Labrum straight at frontal margin, clypeus bisetose, mouthparts palpi cylindrical, mentum without seta. Antennae rather long, reaching about 1/3 of elytra from base, antennomere 4 laterally explanated.

Pronotum transverse, lateral margin broad, both fore and hind angles rounded, basal foveae small, transverse impressions rather faint.

Elytra elongate ovate, rather flat, sides nearly paralleled, subapex roundly truncate (Fig. 6), inner angle broadly rounded; striae fine and deep, intervals slightly convex, subequal in width; interval 3 with three setiferous pores. Legs slender; fore tibiae moderate, apex obliquely truncated, outer angle nearly rectangular (Fig. 5); middle tibia slightly curved; hind leg with apical spurs short and blunt, tarsomere 3 one and half times longer than tarsomere 4, apex of tarsomere 4 deeply emarginated, forming lobe about 1/3 as long as the joint; claws pectinate, teeth rather strong. Prosternal process well bordered at apex; abdominal ventrite VII of male emarginated at apical margin (Fig. 7).

Male genitalia (Figs 8-9): The median lobe of aedeagus slender, dorsal opening as long as half of length, apex pointed in profile; in dorsal aspect, subapex curved on the right margin, the apical lamella short and rather narrow.

ETYMOLOGY: Patronym, in honour of H. W. Bates, a well-known English entomologist in XIX century.

DISTRIBUTION: Myanmar (Tenasserim). Known only from the type locality.

HOLOTYPE: "Tenasserim, Thagata. Fea, Apr. 1887", in Bates' Collection, MNHN.

REMARKS: This new species was placed together with the type series of *O. dispar* BATES, 1892. Actually, both species are closed to each other, but the new species is distinguishable from *O. dispar* by the structure of

aedeagus. On dorsal view, the aedeagus with apical lamella asymmetrical, nearly straight on the left margin, but distinctly curved rightwards in *O. batesianus*, sp. nov., while the apical lamella symmetrical, slightly constricted on both sides in *O. dispar* (Fig. 10).

***Orthogonius perakicus*, sp. nov.**

(Figs 11-15)

HOLOTYPE: male; length: 14.0 mm; width: 5.5 mm.

Yellow, but head and pronotum brown or light dark brown, antennae, legs, palpi of mouthparts, labrum, clypeus and underside yellowish brown.

Head rather convex, without punctures and wrinkles, but with distinct striae; eyes moderate, front margin of labrum slightly emarginated, six setose, clypeus bisetose, frontal impressions small; ligula narrow, slightly dilated at apex, bisetose; palpi subcylindrical, labial palpomere 2 with an additional seta in inner margin, apex of palpomere 2 and palpomere 3 with sparse shorter setae; maxillary palpomeres 3 and 4 glabrous. Antennae extending to 1/4 of elytra from base, pubescent from antennomere 4.

Pronotum somewhat convex on disc, lateral marginal bead narrow, indistinctly reflexed; basal foveae shallow, flat, median line clear.

Elytra bordered at base, but interrupted against interval 3; elongate ovate, sides nearly paralleled each other, apex broadly truncate (Fig. 12); striae fine and shallow; intervals flat, odd and even intervals subequal in width; interval 3 with three setiferous pores, located at about 1/4, middle, and 3/4 of elytra from base, respectively. Legs moderate, fore tibia stout, outer margin somewhat serrate, apex obliquely truncate, outer angle rather pointed (Fig. 11); hind apical spurs short and long, hind tarsomere 3 longer than tarsomere 4; tarsomere 4 emarginated as deep as 1/3 of the joint; claws pectinate. Prosternal process well-bordered at apex; underside smooth and glabrous; abdominal ventrite VII of male slightly emarginated at apical margin (Fig. 13).

Male genitalia: Median lobe of aedeagus stout, more or less bent near apex, apex pointed in profile, but obtused in dorsal aspect (Figs 14-15).

ETYMOLOGY: Toponym, derived from Perak, Malaysia, the type locality.

DISTRIBUTION: Malaysia. Known only from the type locality.

HOLOTYPE: "Perak", from Malayan Peninsula, Malaysia, in Bates' collection, MNHN.

REMARKS: Although the single specimen was identified as *O. parallelus* CHAUDOIR, 1871 by Bates, it is quite different from the species. This new species is a peculiar member in *Orthogonius* concerning its aedeagal structure, together with shapes of pronotum, fore tibia and abdominal ventrite VII.

***Orthogonius poggii* sp. nov.**

(Figs 16-19)

HOLOTYPE: male; length: 10.0 mm; width: 4.0 mm.

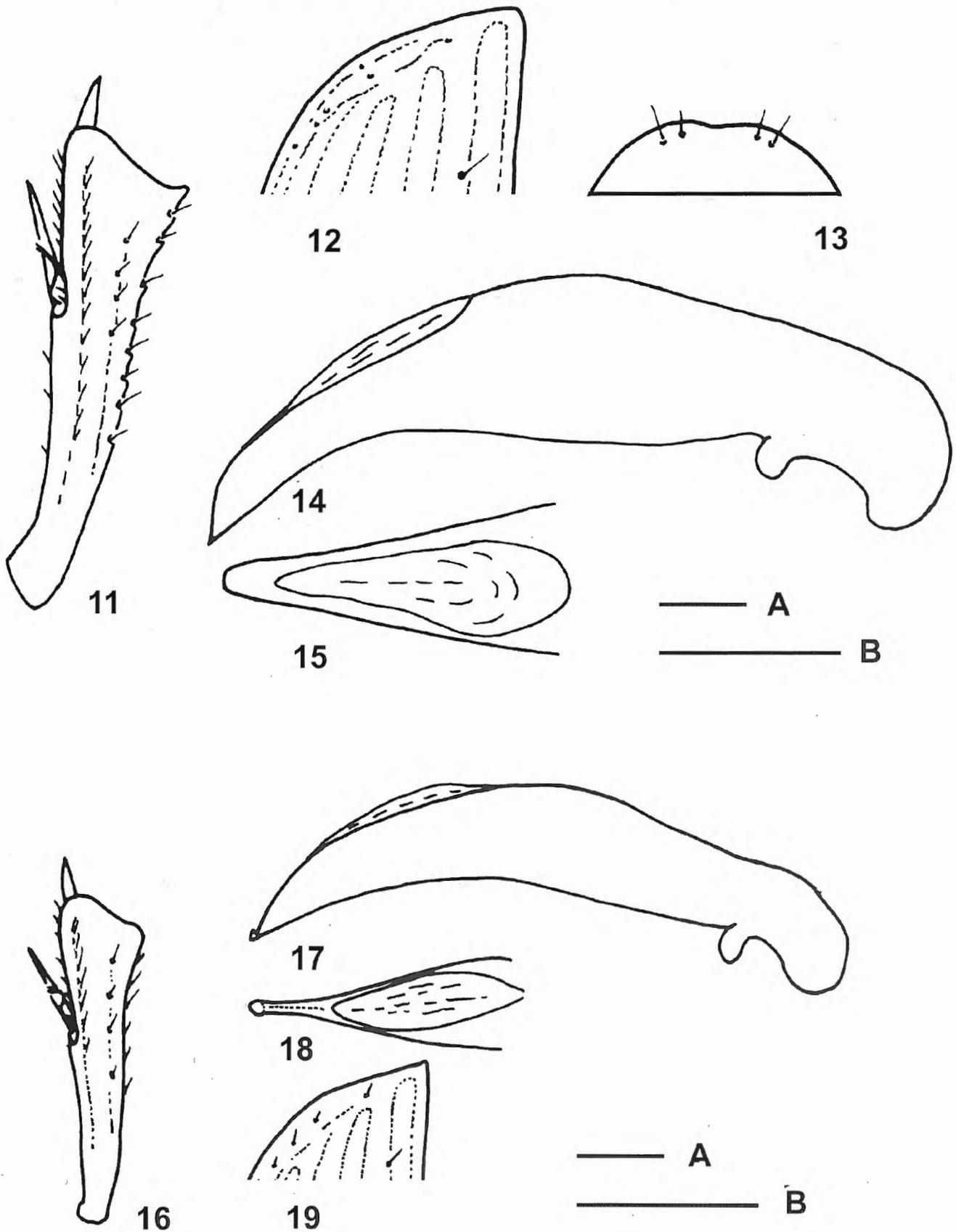
Yellowish brown, except mandibles with apical parts black. Head finely and clearly wrinkled, pronotum almost smooth. Surface glabrous, impunctate. Microsculpture patterns isodiametric.

Head wide, eyes large, remarkably prominent, frontal impressions faint; neck moderate; labrum straight on frontal margin, six setose, clypeus bisetose, base slightly convex, but without wrinkles; palpi subcylindrical; maxillary palpomere 4 glabrous, longer than palpomere 3; labial palpomere 3 glabrous, subequal to palpomere 2; palpomere 2 bisetose in inner margin, 2 setae apex; ligula small, bisetose at apex; mentum with a distinct median tooth, asetose, submentum with one setae on either side. Antennae long, almost reaching mid of elytra, antennomere 3 shorter than antennomere 4, pubescent from two third of antennomere 4.

Pronotum transverse, widest at about middle, lateral marginal bead well bordered, slightly reflexed, disc convex; basal foveae small, adjoined hind transversal impressions; base sinuated, median line clear.

Elytra elongate ovate, slightly convex, paralleled at sides in middle, basal border complete, apex roundly truncate, inner angle sharp (Fig. 19); striae deep, intervals convex, subequal in width, glabrous on most intervals, but faintly punctured on intervals 3 and 5; interval 3 with three setiferous pores. Legs slender; fore tibia with apical margin obliquely truncate, outer angle broadly obtuse (Fig. 16); hind tibia with apical spurs long and sharp, hind 3 much longer than tarsomere 4; tarsomere 4 shallowly emarginated at apex; claws pectinate. Prosternal process well bordered at apex, abdominal ventrite VII of male slightly emarginated at apical margin.

Male genitalia (Figs 17-18): The median lobe of aedeagus slender, ventral margin arcuate, apex beaded in profile; in dorsal view the apical lamella very long and narrow, nearly paralleled at sides (Fig. 18).



Figs 11-19 — *Orthogonius* spp. nov. Figs 11-15: *Orthogonius perakicus*, sp. nov.: 11. right fore tibia; 12. apex of right elytron; 13. abdominal ventrite VII of male; 14-15. aedeagus (lateral and dorsal views) (scale: 1 mm, A for 12-13; B for 11, 14-15). Figs 16-19: *Orthogonius poggii*, sp. nov.: 16. right fore tibia; 17-18. aedeagus (lateral and dorsal views); 19. apex of right elytron (scale: 1 mm, A for 16, B for 17-19).

ETYMOLOGY: Patronym, in honour of Dr. R. Poggi (MCG), who kindly provided the type specimens of Bates' species and other orthogonines materials for our study.

DISTRIBUTION: Tenasserim, Myanmar, bordered to Thailand. Known only from the type locality.

HOLOTYPE ♂: "Tenasserim, Thagata. Fea, Apr. 1887", "*Orthogonius dispar* BATES", "typus", "♂", "dispar BATES", "Syntypus. *Orthogonius dispar* BATES, 1892", "Museo Civico di Cinova", is deposited in MCG.

REMARKS: As the holotype of this new species is a paralectotype of *O. dispar* BATES, 1892, *O. poggii* sp. nov. is similar to *O. dispar* in appearance, indeed, but is quite different from the latter by its small size, the toothed mentum and especially the structure of aedeagus.

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