

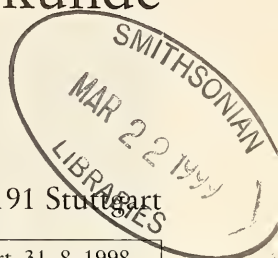
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Borneolaena gen.n. *riedeli* sp.n. from Sarawak, the First Species of Laenini (Coleoptera: Tenebrionidae) from the Sunda Islands

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With 15 figures

Summary

Borneolaena gen.n. *riedeli* sp.n. is described from lowland forests of Sarawak/Borneo. Because of a combination of features including the lack of abdominal defensive glands it belongs to the tenebrionid tribe Laenini. Main diagnostic characters are the deep punctation and dense clavate setation of the surface, the modified antennae with a relatively broad antennomere 7 and a short antennomere 8, as well as the long claw segment of the tarsi. The new taxon shows an extreme external similarity to an as yet undescribed genus of the Adeliini from Australia, being explained by convergence. It seems possible that the present restricted area of *Borneolaena* gen.n. in Sarawak is the place of origin of this interesting genus, indicating the existence of an old fragment of Gondwana within recent Borneo.

Zusammenfassung

Borneolaena gen.n., *riedeli* sp.n. aus Tieflandwäldern von Sarawak/Borneo wird beschrieben. Wegen der Kombination von Merkmalen einschließlich des Fehlens abdominaler Verteidigungsdrüsen gehört sie zum Tribus Laenini der Tenebrionidae. Als diagnostische Merkmale gelten hauptsächlich die tiefe Punktierung und dichte, gekaute Behaarung der Oberseite, die modifizierte Antenne mit einem relativ breiten Glied 7 und einem kurzen Glied 8, und das lange Klauenglied der Tarsen. Das neue Taxon besitzt eine starke äußerliche Ähnlichkeit mit einer noch unbeschriebenen Gattung der Adeliini aus Australien, was durch Konvergenz erklärt wird. Es scheint möglich, daß das rezente begrenzte Areal von *Borneolaena* gen.n. in Sarawak der Entstehungsort dieser interessanten Gattung ist, was auf die Existenz eines alten Gondwana-Fragmentes im heutigen Borneo hinweisen könnte.

*) Contributions to Tenebrionidae, no. 22. - For no. 21 see: Stuttgarter Beitr. Naturk. (A) 574, 1998.

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1. Introduction

In the northern hemisphere the tribe Laenini of the Tenebrionidae contains hitherto morphologically quite homogeneous members. The genus *Laena* Latreille 1829 is widely distributed from eastern Europe through all the Palaearctic to Japan, species-rich in particular in the Himalayas (SCHUSTER, 1916, 1926, 1935; KASZAB, 1977; MASUMOTO, 1990), but also in Thailand (SCHAWALLER, 1998), in Malaysia (SCHAWALLER, 1995) and in China and Vietnam (MASUMOTO, 1996). Additionally the monospecific genera *Psilolaena* Heller 1923 from Sichuan, *Rhacolaena* Kaszab 1979 from southern India and *Prolaena* Kaszab 1980 from Sri Lanka have been described. In the southern hemisphere the Laenini occur on Madagascar and in southern Africa (ENDRÖDY-YOUNGA, pers. comm.).

Recently I received Tenebrionidae from Borneo for study containing also a species of Laenini which has been sifted in lowland forests of Sarawak by ALEXANDER RIEDEL (Munich) in 1990 and by DANIEL BURCKHARDT and IWAN LÖBL (Geneva) in 1994. A detailed study shows that for this species a new genus of Laenini must be created being the first record of this tribe from the Sunda Islands.

Abbreviations

HNHM Hungarian Natural History Museum, Budapest; – *MHNG* Muséum d'Histoire Naturelle, Genève; – *SAMA* South Australian Museum, Adelaide; – *SMNS* Staatliches Museum für Naturkunde, Stuttgart.

Acknowledgments

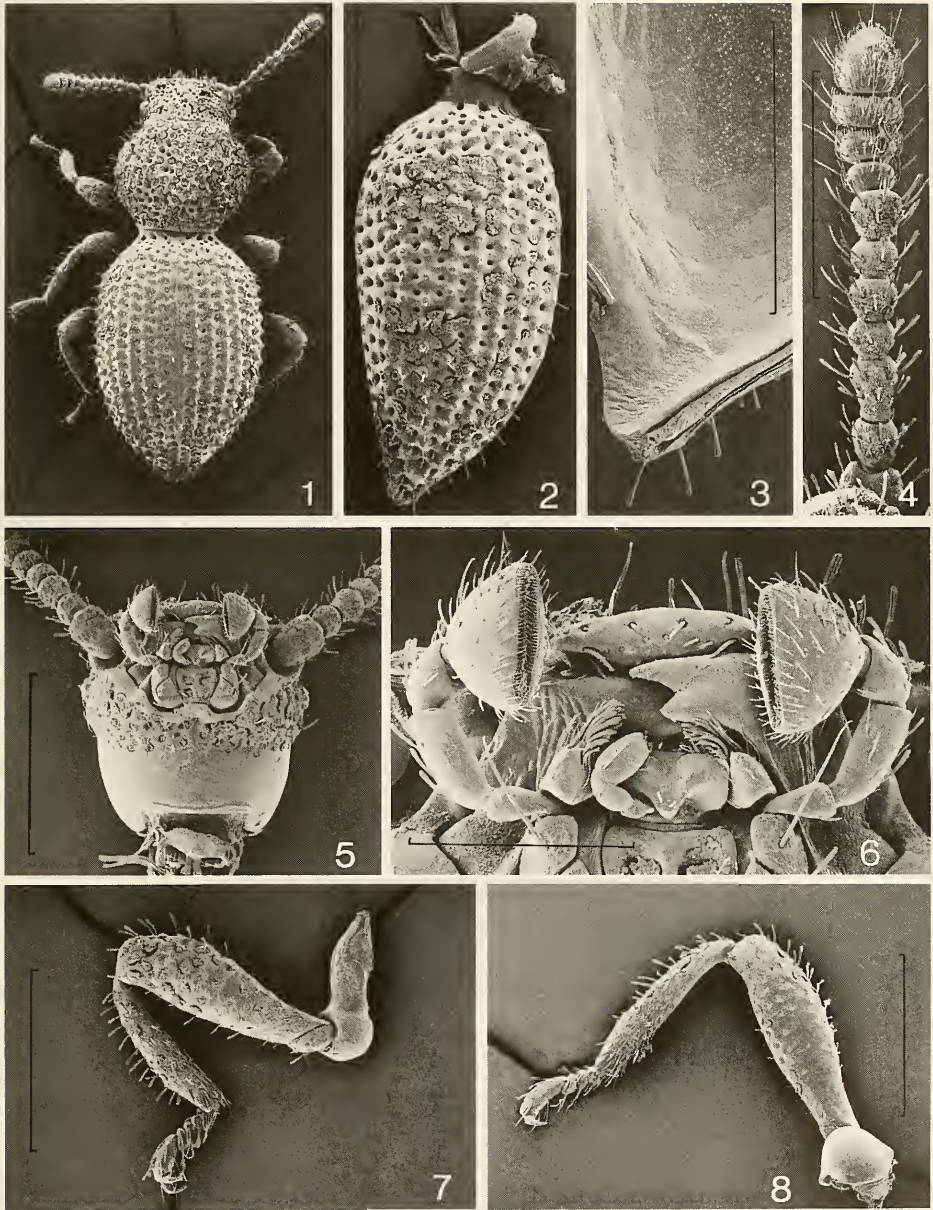
I thank ALEXANDER RIEDEL (Munich) for depositing his Tenebrionidae in the Stuttgart Museum and Dr. IWAN LÖBL (Geneva) for the loan of material under his care. Dr. ERIC MATTHEWS from the South Australian Museum (Adelaide) helped with valuable comments on these specimens and allowed me to publish them. SUSANNE LEIDENROTH (Stuttgart) supported this study with technical assistance at the SEM.

2. Taxonomy

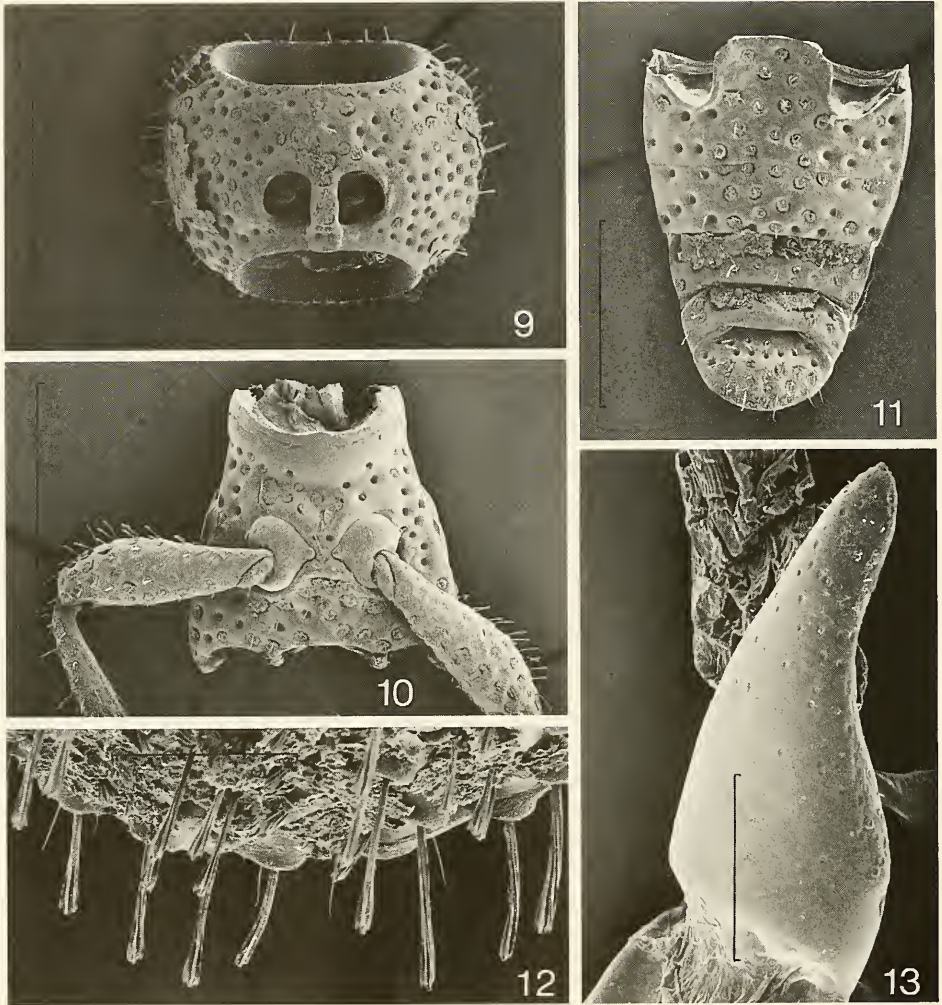
2.1. *Borneolaena* gen.n.

Type species: *B. riedeli* sp.n. by monotypy and present designation.

Diagnosis: With all characters of the Laenini including the lack of defensive glands in abdominal segments 7 and 8. Head, pronotum, elytra, prothoracic and abdominal sternites with deep punctation and with dense stout clavate setation. Modified antennae with antennomere 7 enlarged, antennomere 8 distinctly smaller than



Figs 1–8. *Borneolaena* gen.n. *riedeli* sp.n. – 1. Dorsal view (scale line 1 mm); – 2. elytron in dorsal view (0.5 mm); – 3. tip of elytron internally with microspines (0.5 mm); – 4. antenna (0.5 mm); – 5. head in ventral view (0.5 mm); – 6. maxillary palps (0.2 mm); – 7. anterior leg (0.5 mm); – 8. posterior leg (0.5 mm).



Figs 9–13. *Borneolaena* gen.n. *riedeli* sp.n. – 9. Prosternum (scale line 0.5 mm); – 10. mesosternum (0.5 mm); – 11. abdominal sternites (0.5 mm); – 12. clavate setation (0.1 mm); – 13. parameres with sensillae (0.05 mm).

antennomere 7, antennomeres 1–7 with stout and clavate setation, antennomeres 8–11 with acute setation, apical parts of antennomeres 9–11 additionally with dense sensilla. No lateral pronotal carina and no epipleural carina (except apically). Elytra with clavate setation but without setiferous umbilicate pore(s). Claw segment long, that of metatarsi longer than remaining segments combined. Aedeagus with extremely long basal piece in comparison with the joint parameres.

Etymology: Combination of Borneo and the genus *Laena*, gender feminine.

Distribution: Sarawak/Borneo.

2.2. *Borneolaena riedeli* sp.n. (Figs 1–14)

Holotype (♂): E Malaysia, Sarawak, Kuching, Santubong, 26. III. 1990 leg. A. RIEDEL (SMNS).

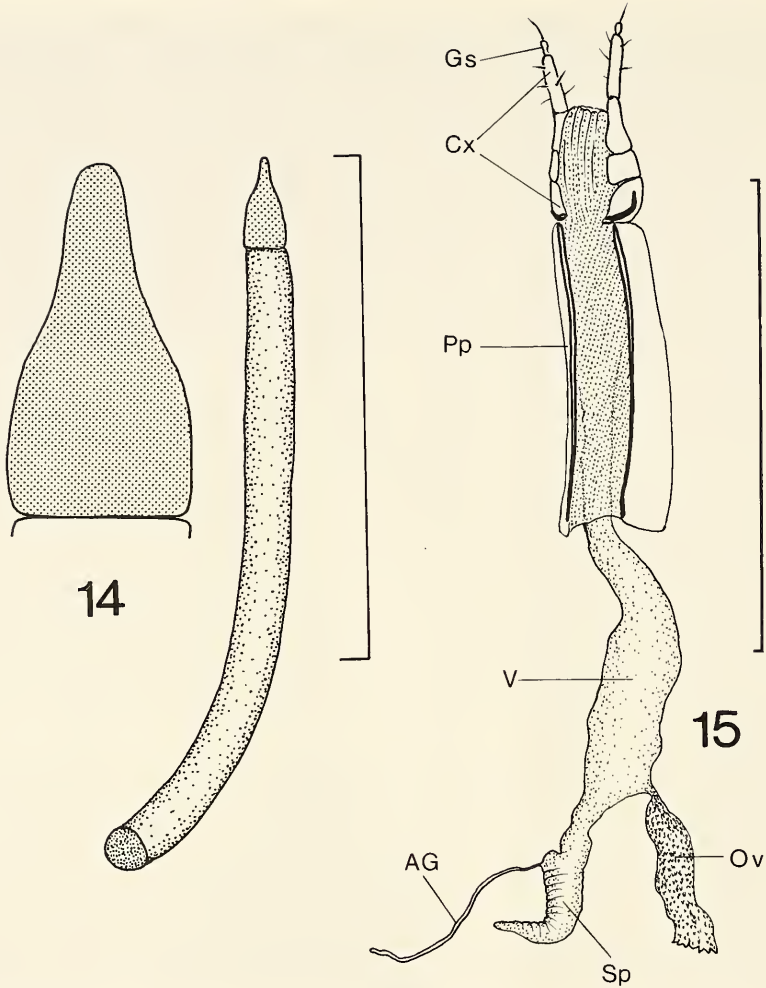
Paratypes: Same data as holotype, 1 ex. SMNS. – E Malaysia, Sarawak, Santubong, 32 km N Kuching, 0–100 m, 11.–16. V. 1994 leg. I. LÖBL & D. BURCKHARDT, 2 ex. MHNG. – E Malaysia, Sarawak, confluence of Suan Oyan and Mujong rivers, E Kapit, 150 m, 19. V. 1994 leg. I. LÖBL & D. BURCKHARDT, 37 ex. MHNG, 4 ex. HNHM, 4 ex. SAMA, 5 ex. SMNS.

Etymology: Named after ALEXANDER RIEDEL (München), who discovered this interesting species.

Description: Surface of body (Fig. 1) mostly covered with dense layer of soil detritus between setation. Head (Fig. 1) uneven, with rough and deep punctation, distance between punctures equal to 1–4 diameters, surface with dense stout clavate setation (Fig. 12); ventral side of head (Fig. 5) basally without punctation, mentum with 2 basal setae and 4 impressions, last segment of maxillary palps broad and with a distal groove with dense sensilla (Fig. 6); small round prominent eyes; for proportions of antennomeres see Fig. 4, in both sexes antennomere 7 enlarged, antennomere 8 distinctly smaller than antennomere 7, last antennomere not prolonged, antennomeres 1–7 with stout clavate setation, antennomeres 8–11 with acute setation, antennomeres 9–11 additionally with dense sensilla. For proportions of pronotum see Fig. 1, surface with rough and deep punctation, distance between punctures at most equal to 1 diameter, surface with dense stout clavate setation; no distinct lateral margin; propleures and prosternum (Fig. 9) deeply punctured like pronotum, but punctures on prosternum sparser than on pronotum; prosternal process not surpassing basal margin of prosternum. Mesosternum (Fig. 10) punctured as prosternum. Wings lacking. Elytra (Fig. 2) with 11 rows of deep punctures, intervals convex and laterally with tubercles; setation dense, stout and clavate as on pronotum; no epipleural carina except apically; internal side of elytra with microspines (Fig. 3). Abdominal sternites (Fig. 11) deeply punctured, punctures on sternite 1 and 2 larger and sparser than on last (visible) segment 5; segment 1 and 2 combined as long as segments 3–5 combined; intercoxal process of segment 1 broad. Femora and tibiae of legs with clavate setae, claw segment of protarsi (Fig. 7) as long as remaining segments combined, claw segment of metatarsi (Fig. 8) longer than remaining segments combined. Aedeagus (Figs 13–14) with extremely long basal piece and triangular joint parameres, joint parameres distally with scattered impressed sensilla (Fig. 13). Ovipositor (Fig. 15) of typical lagriine form, with coxite lobe 4 long and digitate, gonostyles attached apically. Gonostyles small, coxites shorter than paraprocts (approximate ratio 3/8 to 5/8). Female tract without vaginal sclerites, without bursa copulatrix, at anterior end with single large tapering spermatheca and filiform accessory gland. No distinct external sexual dimorphism. Body length 1.8–2.6 mm.

3. Phylogeny

The characters given in the generic diagnosis do not allow us to include this interesting species in the genus *Laena* Latreille 1829. For example, the deep punctation and dense clavate setation of the surface, the modified antennae, and the long claw segments of the tarsi cannot be found in all more than 200 hitherto described species of *Laena*. Thus a new genus for the Sarawak species must be created, even if a de-



Figs 14–15. *Borneolaena* gen.n. *riedeli* sp.n. – 14. Aedeagus in dorsal view (scale line 1 mm); – 15. ovipositor and female reproductive tract in ventral view, proctiger omitted (1 mm) (by E. G. MATTHEWS) (abbreviations: AG = accessory gland; CX = coxite lobes; Gs = gonostyles; Ov = common oviduct; Pp = paraproct; Sp = spermatheca; V = vagina).

tailed phylogenetic analysis of all Laenini is not possible at the moment. Such a study must firstly determine whether *Laena* with its numerous species is really a monophyletic group or not. It seems possible that at least a few species (for example those from the Malayan peninsula) belong to a different evolutionary line and must be excluded from *Laena*. Secondly, such an analysis must include also the African representatives of the Laenini. Thus, the phylogenetic position of *Borneolaena* gen.n. within the Laenini still remains unclear.

MATTHEWS (in press) considered the Laenini and the Adeliini to be separate tribes, being sister groups and extremely similar externally. The main difference is the lack

(Laenini) or existence (Adeliini) of the abdominal defensive glands. *Borneolaena* gen.n. *riedeli* sp.n. has to be placed in the Laenini because of the lack of those glands, but is extremely similar externally to an as yet undescribed genus of Adeliini from Australia (MATTHEWS in press). Thus we face a remarkable case of convergence, difficult to explain. Perhaps the Adeliini and the Laenini retained most of the genes of their common ancestor and therefore tend to produce similar forms independently in response to the same environments in tropical lowland forests.

The ovipositor (Fig. 15) is of the primitive type seen in most Lagriinae, with digitate or styliform fourth coxite lobe and terminal gonostyles. The female tract, on the other hand, while being basically similar to that of other Laenini and of Adeliini, is unique in having only a single large spermatheca shaped like a tapering sac. In all other Laenini and Adeliini examined (MATTHEWS, pers. comm.) the spermatheca is divided into a number of filiform tubules each attached separately to the anterior end of the vagina. The spermatheca of *Borneolaena* gen.n. *riedeli* sp.n. conforms to the hypothetical primitive state of this structure, which is believed to be derived from the original bursa copulatrix. The most primitive known form of the female tract is that of Lagriini, which has a primary bursa but no spermatheca.

4. Zoogeography

The Laenini have a Gondwanian distribution, but most of the species apparently occurred in a more northern area of Gondwana than the Adeliini. Fragments of Gondwana are believed to have drifted into Malaysia. In spite of intensive siftings by the same collectors (and by the author) in other parts of Borneo, in particular in Sabah, *Borneolaena* gen.n. *riedeli* sp.n. has been collected only in a small lowland area of Sarawak and is probably restricted to this area because of its limited dispersal abilities (being wingless). It seems possible that the present restricted area of *Borneolaena* gen.n. in Sarawak is the original distribution area of this interesting genus, indicating the existence of an old fragment of Gondwana within recent Borneo.

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