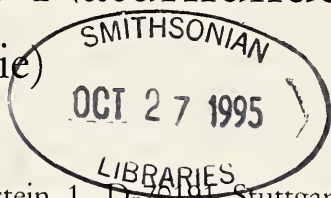


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Three New Species of *Bembidion* (s. l.), Subgenus *Desarmatocillenus* Netolitzky, from the Philippines and Australia (Insecta: Coleoptera: Carabidae: Bembidiinae)

By Martin Baehr, München

With 5 figures

Summary

Three new species of the genus *Bembidion* (s. l.), subgenus *Desarmatocillenus*, from the Philippines and from Australia are described: *B. (Desarmatocillenus) flavescens* n. sp. from Bohol and *B. (D.) leytensis* n. sp. from Leyte, both Philippines, and *B. (D.) angustatum* n. sp. from northern Queensland, Australia.

A new record of *B. (D.) albovirens* Sloane from northern Queensland is also dealt with.

Zusammenfassung

Drei neue *Bembidion*-Arten aus der Untergattung *Desarmatocillenus* von den Philippinen und aus Australien werden beschrieben: *B. (Desarmatocillenus) flavescens* n. sp. von Bohol und *B. (D.) leytensis* n. sp. von Leyte, beides Philippinen, sowie *B. (D.) angustatum* n. sp. aus Nordostqueensland, Australien.

Außerdem wird ein neuer Fund von *B. (D.) albovirens* Sloane aus Nordqueensland mitgeteilt.

1. Introduction

Within a small sample of Philippine carabids received for identification through courtesy of Dr. W. SCHAWALLER (Stuttgart) I discovered two new species of Bembidiinae of the subgenus *Desarmatocillenus* Netolitzky. Both species are represented by small series including at least one ♂, therefore exact identifications and complete descriptions are possible. Actually most species of the former genus (or subgenus) *Cillenus* and especially of the subgenus *Desarmatocillenus* are very closely related and for species distinction consideration of the ♂ genitalia is very useful. Nevertheless I take the opportunity to describe herein also a new species from northeastern Australia that I collected several years ago. Although a single ♀ only is available, shape and structure of this specimen is so distinctive as to justify the description, even when the ♂ genitalia are still unknown.

"*Cillenus*" is a genus or subgenus of characteristically shaped, elongate species with massive head, long and porrect mandibles, and anteriorly wide, usually markedly cordiform pronotum. All species live close to the sea shore or even in the tidal zone, and their diet, as far as it is known, consists of amphipods, in some species also of dipteran larvae. Apparently the long, pointed mandibles are used for piercing through the intersegmental membranes of their prey. Thus far 23 species have been described, though most species are known only from few or even single specimens, and their distribution and their habits are very inadequately known.

LINDROTH (1980) published a revision of the "taxon *Cillenus*" in which he divided the group into two main taxa. A new genus *Zecillenus* including all species from New Zealand was separated by him from the other Indo-Australian and European species that, in his view, are classified as several subgenera of the genus *Bembidion* proper. His taxonomic treatment was mainly based on characters of the ♂ genitalia, especially on the presence of a long central flagellum in the internal sac of all species of *Zecillenus*, while the other species possess the ordinary "brush" sclerite inside the internal sac that is characteristic for most *Bembidion*. LINDROTH's decision implicates that the "cillene" habitus and way of life has been convergently evolved in the species from New Zealand and the other species. Certainly a final decision will be only possible when more information on the actual way of life and the life histories has been accumulated. However, in view of LINDROTH's decision not even the monophyly of the rest of the species is reliable that are currently divided in five subgenera.

2. Abbreviations

<i>ANIC</i>	Australian National Insect Collection, Canberra;
<i>CBM</i>	Collection M. BAEHR, München;
<i>SMNS</i>	Staatliches Museum für Naturkunde, Stuttgart;
<	smaller or shorter than;
>	larger or longer than.

3. Measurements

Measurements have been made under a stereo microscope using an ocular micrometer. For better comparison with the measurements recorded by LINDROTH length has been measured from apex of mandibles (in repose) to apex of elytra. Length of pronotum has been measured from the anterior angle to middle of base.

4. Acknowledgements

I am greatly indebted to Dr. W. SCHAWALLER (Stuttgart) for the kind loan of the Philippine specimens.

5. The species

5.1. *Bembidion (Desarmatocillenus) flavescens* n. sp. (Figs 1, 3)

Holotype (♂): Philippines: Bohol, Jao Isl., 6. III. 1991 leg. SCHAWALLER, TRAUTNER & GEIGENMÜLLER (SMNS).

Paratypes: 2 ♀♀, same data (SMNS, CBM).

Diagnosis: Easily identified by the unicolourous yellow surface of pronotum and elytra.

Description: Measurements. Length: 3.95–4.30 mm; width: 1.30–1.37 mm. Ratios. Width/length of prothorax: 1.28–1.33; width widest diameter/base of pronotum: 1.44–1.47; length/width of elytra: 1.67–1.70.

Colour. Pronotum and elytra uniformly light yellow, apex of elytra whitish. Head piceous with faint greenish tinge, though centre of frons and middle of clypeus yellowish. Mandibles light reddish with dark apex. Palpi, antenna, legs, and lower surface light yellowish.

Head. Of ordinary size and shape, large, almost as wide as pronotum. Frontal furrows deep, laterally well delimited. Eyes rather convex. Microreticulation strong, isodiametric, slightly granulate, but weaker and rather superficial in centre of frons and particularly in middle of clypeus.

Prothorax. Large, wide, markedly cordate. Anterior angles slightly protruding, apex straight, lateral margin anteriorly feebly incurved, hence widest diameter close to apex. Margin evenly sinuate to the absolutely rectangular, laterally not projecting posterior angles. Base laterally excised. Prebasal transverse sulcus deep. Microreticulation distinct, isodiametric, though not granulate.

Elytra. Rather elongate, lateral margins slightly convex. Dorsal surface fairly convex. Shoulder moderately angulate. Prebasal sinuosity moderate, lateral angle of excision angulate. All striae distinct and complete. Intervals gently convex. 3rd stria bisetose. Microreticulation distinct, isodiametric, slightly granulate.

Legs. In both sexes metatrochanter elongated and acute, about $\frac{1}{2}$ to $\frac{3}{5}$ of length of femur, apparently without sexual differences.

♂ genitalia (Fig. 1a). Both parameres with two terminal setae, though one very short and situated subapically on right paramere. Aedeagus with almost straight lower surface and with wide, downcurved apex. Orificium asymmetric, oblique and straight above apex. Internal sac with "brush"-shaped sclerite and with a complicatedly coiled sclerite close to base, near apex with an about V-shaped fold.

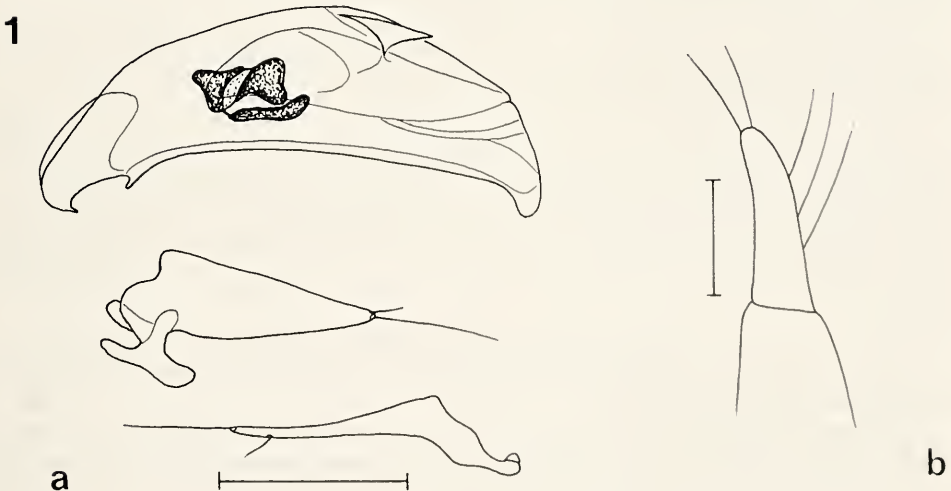


Fig. 1. *Bembidion (Desarmatocillenus) flavescens* n. sp. – 1a. Aedeagus with parameres; – 1b. Stylomere 2. – Scales: 0.25 mm.

♀ genitalia (Fig. 1b). Stylomere 2 very elongate, straight, apex obtuse, with 2 long apical and 3 long lateral subapical setae.

Variation. Very little variation noted.

Distribution: Philippines: Bohol. Known only from type locality.

Habits: Collected at light in mangrove bushes.

Etymology: The name refers to the unicolourous yellow surface.

Note: Although this species is externally well distinguished by its completely yellow colour of pronotum and elytra, it is actually rather closely related to *B. (D.) leytensis* n. sp., especially on behalf of the very similar aedeagus.

Recognition: In the key to the species of subgenus *Desarmatocillenus* (LINDROTH 1980) this species would key out to couplet 9:

- 9 Pronotum and elytra completely yellowish without any dark spots or clouds (Philippines) *flavescens* sp. n.
 – Pronotum and elytra not completely yellowish, at least elytra with a dark spot or cloud (Australia, China, Japan) 9a¹⁾

5.2. *Bembidion (Desarmatocillenus) leytensis* n. sp. (Figs 2, 4)

Holotype (♂): Philippines: Leyte, Visayas State College of Agriculture N Baybay, cultiv. land, 8. III. 1991 leg. SCHAWALLER, TRAUTNER & GEIGENMÜLLER (SMNS).

Paratypes: 1 ♂, 2 ♀♀, same data (SMNS, CBM).

Diagnosis: A dark species with distinct anterior light spot on the elytra. Distinguished from the externally most similar and perhaps closely related species *B. (D.) hoogstraali* (Darlington) by lesser size, shorter metatrochanters, longer, for a short distance parallel basal parts of lateral margin of pronotum, laterally slightly projecting posterior angles of pronotum, and slightly different aedeagus with regard to the presence of a V-shaped fold near apex of internal sac.

Description: Measurements. Length: 3.6–4.4 mm; width: 1.20–1.35 mm. Ratios. Width/length of prothorax: 1.29–1.32; width widest diameter/base of pronotum: 1.44–1.48; length/width of elytra: 1.72–1.74.

Colour. Dark piceous with distinct greenish lustre, head and pronotum in middle sometimes faintly lighter, elytra with yellow epipleurae and marginal interval and with a large, triangular, well delimited yellow spot in anterior half from margin to 2nd interval that is sometimes interrupted on the 4th interval. Sometimes sutural interval slightly lighter. Mandibles reddish with dark apex. Palpi, legs, and base of antenna light yellow, apical part of antenna from 4th segment dark. Lower surface piceous.

Head. Of ordinary size and shape, large, almost as wide as pronotum. Frontal furrows deep, laterally well delimited. Eyes rather convex. Microreticulation strong, isodiametric, slightly granulate.

Prothorax. Large and wide, markedly cordate. Anterior angles slightly protruding, apex straight, lateral margin anteriorly rather incurved, hence widest diameter in

1) 9a = 9 of LINDROTH's key.

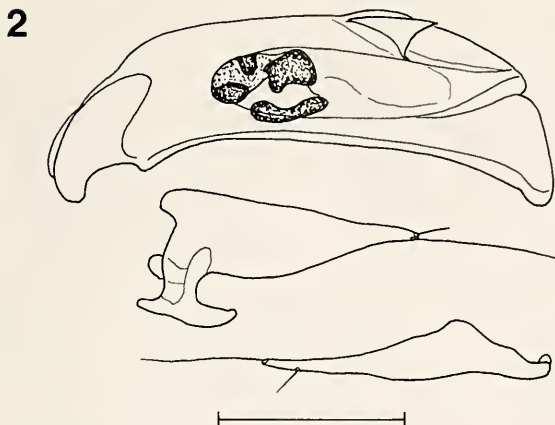


Fig. 2. *Bembidion (Desarmatocillen) leytensis* n. sp.; aedeagus with parameres. — Scale: 0.25 mm.

anterior fourth. Margin strongly sinuate in front of the about rectangular, though laterally slightly projecting posterior angles. Basal part of lateral margin in front of posterior angles parallel for a short distance. Base laterally excised. Prebasal transverse sulcus deep. Microreticulation distinct, isodiametric, more or less granulate, surface laterally even slightly rugose.

Elytra. Elongate, lateral margins almost straight. Dorsal surface fairly convex. Shoulder distinctly angulate. Prebasal sinuosity moderate, lateral angle of excision angulate. All striae distinct and complete. Intervals gently convex. 3rd stria bisetose. Microreticulation very distinct, isodiametric, slightly granulate.

Legs. In both sexes metatrochanter elongated and acute, in ♂♂ about $\frac{2}{3}$, in ♀♀ about $\frac{3}{5}$ of length of femur.

♂ genitalia (Fig. 2). Both parameres with two terminal setae, though one very short and situated subapically on right paramere. Aedeagus with almost straight lower surface and with wide, rather suddenly downcurved apex. Orificium asymmetric, oblique and straight above apex. Internal sac with "brush"-shaped sclerite and with a complicately coiled sclerite close to base, near apex with an about V-shaped fold.

♀ genitalia. Stylomere 2 very elongate, straight, apex obtuse, with 2 long apical and 3 long lateral subapical setae, similar to that of *B. (D.) flavescens*.

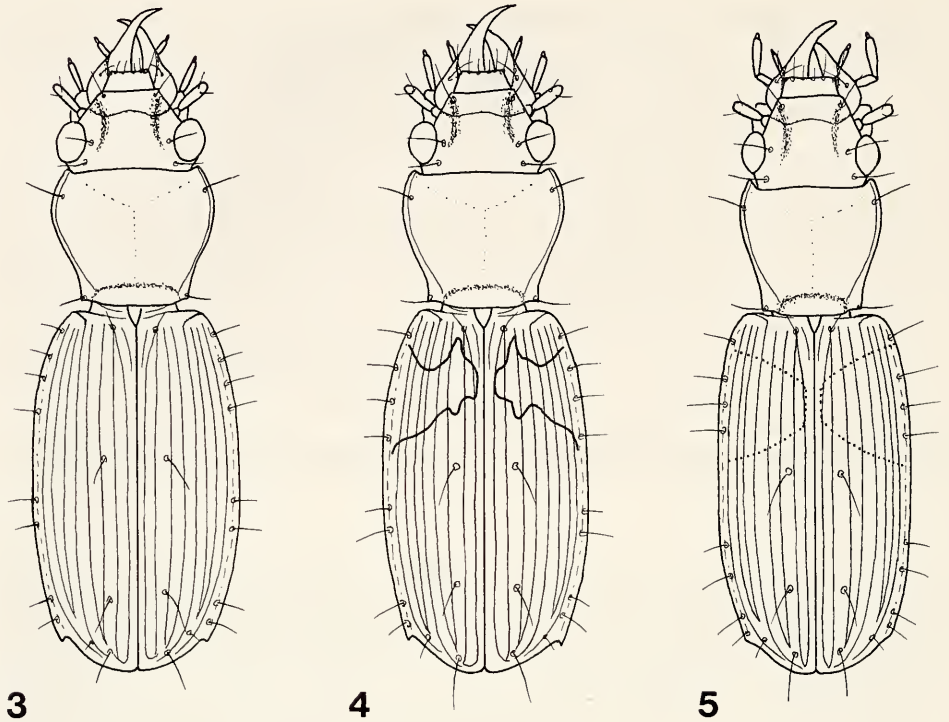
Variation. Apart from some differences in size and shape of elytral spot little variation noted.

Distribution: Philippines: Leyte. Known only from type locality.

Habits: Collected at light in cultivated land near sea shore.

Etymology: The name refers to the provenance of this species.

Note: This species is certainly very closely related to *B. (D.) hogstraali* (Darlington) from Palawan (Philippines) with which it shares shape and pattern. The aedeagus, however, is more similar to that of *B. (D.) alatum* (Darlington) from the Moluccas and Mindanao, because it has a similar V-shaped fold near the apex of the internal sac, and, of course, it is also similar to that of *B. (D.) flavescens* n. sp. (see 5.1.). It differs from *B. (D.) alatum* in that the parameres bear 2 setae in *B. (D.)*



Figs 3–5. Habitus. – 3. *Bembidion (Desarmatocillenus) flavescens* n. sp.; – 4. *B. (D.) leytensis* n. sp.; – *B. (D.) angustatum* n. sp. – Lengths: 4.2 mm; 4.0 mm; 3.5 mm.

leytensis n. sp. instead of a single seta in *B. (D.) alatum*. Hence, *B. (D.) leytensis* takes an intermediate systematic position between *B. (D.) hogstraali* and *B. (D.) alatum* that exactly corresponds to the intermediate geographic range of *B. (D.) leytensis*.

Recognition: For recognition see under following species.

5.3. *Bembidion (Desarmatocillenus) angustatum* n. sp. (Fig. 5)

Holotype (♀): Clevedon 30 km E Townsville, N Qld. Australien, 23. 12. 1981, M. BAEHR (ANIC).

Diagnosis: Easily identified by very narrow shape, depressed eyes, depressed surface and absolutely parallel sides of the elytra, and inconspicuous and ill-defined elytral spots.

Description: Measurements. Length: 3.5 mm; width: 1.1 mm. Ratios. Width/length of prothorax: 1.18; width widest diameter/base of pronotum: 1.37; length/width of elytra: 1.80.

Colour. Dark piceous with distinct greenish lustre especially on head and pronotum. Elytra with yellowish epipleurae, ill defined reddish marginal interval, and with a large, about triangular, inconspicuous and very ill defined yellowish spot in anterior half from margin to about 2nd interval. Lateral margin near prebasal sinuosity also indistinctly lighter. Also sutural interval slightly lighter. Mandibles reddish

with dark apex. Palpi, legs, and base of antenna light yellow, apical part of antenna from 4th segment gradually but very slightly darkened. Lower surface reddish-piceous to piceous.

Head. Of ordinary shape, though comparatively narrow, almost as wide as pronotum. Eyes rather depressed. Frontal furrows rather deep, laterally quite well delimited. Mandibles less curved than in other species and their apices rather obtuse, though mandibles perhaps rather worn out. Microreticulation strong, isodiametric, though markedly superficial in middle of clypeus and frons, not granulate.

Prothorax. Remarkably narrow, cordate. Anterior angles distinctly and angulately protruding, apex almost straight, lateral margin anteriorly little incurved, widest diameter in anterior fourth. Margin gently sinuate in front of the not fully rectangular, laterally not projecting posterior angles. Prebasal sinuosity elongate. Base comparatively wide, laterally excised. Prebasal transverse sulcus deep. Microreticulation rather distinct, isodiametric, not granulate, on disk highly superficial, hence surface on disk rather glossy. Laterally and near median line surface with some weak transverse striae.

Elytra. Narrow and elongate, lateral margins absolutely straight. Dorsal surface depressed. Shoulder barely angulate. Prebasal sinuosity shallow, lateral angle of excision feeble, not angulate. All striae distinct and complete. Intervals rather convex. 3rd striae bisetose. Microreticulation distinct, isodiametric, barely granulate, slightly superficial.

Legs. Metatrochanter (in ♀) elongated and very acute, almost $\frac{3}{4}$ of length of femur.

♂ genitalia. Unknown.

♀ genitalia. Stylomere 2 very elongate, straight, apex obtuse, with 2 long apical and 3-4 long lateral subapical setae, very similar to that of *B. (D.) flavescens*.

Variation. Unknown.

Distribution: Northeastern Queensland, Australia. Known only from type locality.

Habits: The holotype was captured while digging for *Megacephala* (Cicindelidae) on a salt flat near the coast.

Etymology: The name refers to the narrow body shape.

Note: This species has been discovered exactly in the same area, where *B. (D.) albovirens* (Sloane) occurs. Hence both species may even live sympatrically. They are not very closely related, but the exact relationships of *B. (D.) angustatum* n. sp. are still obscure, because the ♂ genitalia are thus far unknown. Probably it is most closely related to the species group that includes *B. (D.) adelaideae* Lindroth, *B. (D.) albertisi* (Putzeys), *B. (D.) hogstraali* (Darlington), *B. (D.) alatum* (Darlington), and *B. (D.) leytensis* n. sp.

Recognition: In the key to the species of subgenus *Desarmatocillenus* (LINDROTH 1980) this species and *B. (D.) leytensis* n. sp. would key out to couplet 8:

- 8 Metatrochanters $>\frac{3}{5}$ length of femur, pointed. Front angles of pronotum protruding. Parameres (when known) with 2 apical setae. 8a
- Metatrochanters about half length of femur, only slightly pointed. Front angles of pronotum not protruding. Parameres with 1 apical seta (Moluccas) *alatum* Darl.
- 8a Narrow species with absolutely parallel and depressed elytra. Pronotum narrow, basal angles not fully rectangular. Eyes depressed. Pale elytral spot inconspicuous, very ill delimited (Australia) *angustatum* n. sp.

- Wider species with slightly convex lateral margins and fairly convex surface of elytra. Pronotum wide, basal angles rectangular or even laterally projecting. Eyes convex. Pale elytral spot conspicuous, well delimited (Philippines) **8b**
- 8b** Larger species, >4.4 mm long. Metatrochanters longer, about $\frac{4}{5}$ length of femur. Basal angles of pronotum rectangular, laterally not protruding, basal part of lateral margin evenly sinuate. Aedeagus without V-shaped fold in the internal sac (Palawan) *hogstraali* Darl.
- Smaller species, <4.4 mm long. Metatrochanters shorter, $<\frac{2}{3}$ length of femur. Basal angles of pronotum laterally slightly protruding, basal part of lateral margin parallel for some distance. Aedeagus with V-shaped fold in the internal sac (Leyte) *leytensis* n. sp.

5.4. *Bembidion (Desarmatocillenus) albovirens* (Sloane)

Cillenum albovirens Sloane, 1903: 575.

Bembidion (Cillenus) albovirens, DARLINGTON 1962: 9.

Bembidion (Desarmatocillenus) albovirens, LINDROTH 1980: 196.

New record: 1 ♂, North Hull River, 20 km E Tully, N Qld. Australien, 16. 1. 1982, M. BAEHR (CBM). This locality is about 150 km north of Townsville and corroborates the wide distribution of this species.

Habits: The single specimen was captured at light in lowland rain forest near a tidal river about 5 km from the coast.

Note: This species was described from Townsville, where it was recollected by DARLINGTON (DARLINGTON 1962). According to MOORE et alii (1987) it is only known from the type locality. LINDROTH (1980), however, gives an additional record from "Stewart R., Queensl." that is probably the similar Stewart River in the lower Cape York Peninsula. If this is correct, then *B. albovirens* has a wide distribution along the east coast of North Queensland.

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