

New species and new records of the leleupidiine genus *Colasidia* Basilewsky from the island of Borneo

(Coleoptera, Carabidae, Zuphiini, Leleupidiina)

Martin Baehr

Baehr, M. 2013. New species and new records of the leleupidiine genus *Colasidia* Basilewsky from the island of Borneo (Coleoptera, Carabidae, Zuphiini, Leleupidiina). *Spixiana* 36(2): 211–221.

Four new species of the leleupidiine genus *Colasidia* Basilewsky, 1954 are described from northern and north-western Borneo: *Colasidia multispinosa* and *C. cordicollis* from north-western Kalimantan, *C. longipennis* from Sarawak, and *C. apicalis* from Sabah. *Colasidia brevicornis* Baehr, 1988 which was so far known from Sarawak is now recorded from north-western Kalimantan. These are the first records of any leleupidiine species from Borneo outside of Sarawak and Sabah. A third record of *C. mateui* Baehr, 1997 is noted from Sabah. For the species of *Colasidia* recorded from the island of Borneo a key is provided.

Martin Baehr, Zoologische Staatssammlung, Münchhausenstr. 21, 81247 München, Germany; e-mail: martin.baehr@zsm.mwn.de

Introduction

Through courtesy of Alexander Riedel, Karlsruhe, and Roland Grimm, Tübingen, I received a few specimens of the genus *Colasidia* Basilewsky, 1954 from northern and north-western Borneo for identification. One additional new species from Sabah, Borneo, I also sorted out during a recent visit at the Naturhistorisches Museum Wien.

This genus of small, strangely shaped, flightless, probably more or less subterranean or at least strictly geophilous beetles presently is known from the southern Oriental Region including the southern Malayan Peninsula, Thailand, Vietnam, Sumatra, Borneo, New Guinea, and from north-eastern Australia (Baehr 1988a,b, 1990, 1991, 1993, 1997, 2000, 2004, 2005, 2008, 2011). In Nepal, Sikkim, and north-eastern India *Colasidia* is replaced by the closely related genus *Gunvorita* Landin, 1955 (Baehr 1998, 2001, 2002), and in southern India by the genus *Paraleleupidia* Basilewsky, 1951 (Mateu 1981, Baehr

1990) which, however, is more remotely related to both genera mentioned above. Perhaps due to the secretive mode of life in ground litter of dense forest, or even in the upper soil stratum, of all species of Leleupidiina, the recorded distribution of the subtribe in the Indo-Australian Region is rather dispersed and from many parts of its range no records are available. From Borneo species of the genus *Colasidia* so far were only recorded from Sarawak and Sabah, but not yet from any part of Kalimantan. Therefore, two of the new species described in the present paper and an additional record of *C. brevicornis* Baehr, extend the range of the genus at least into the north-western part of Kalimantan.

The geophilous habits also are responsible for the striking rarity of specimens which can be only collected by elaborated sampling methods, as sifting ground litter or Berlese extraction.

The present paper is a further supplement to my monograph of the Oriental-Australian species of the genus *Colasidia* (Baehr 1997).

Material and methods

For dissection of the genitalia the specimens were relaxed for a night in a jar under moist atmosphere, then the genitalia were removed and subsequently cleaned for a short while in hot KOH. The description follows the style of my synoptic paper of the Oriental-Australian *Colasidia* (Baehr 1997).

Measurements were taken using a stereo microscope with an ocular micrometre. Body length was measured from the apex of the labrum to the apex of the elytra. Length of the elytra was measured from the most advanced part of the humerus to the very apex. Length of pronotum was measured along midline, width of the base of the pronotum at the extreme tips of the basal angles. Length of head was taken from the apex of the labrum to the anterior border of the "neck", length of orbit was likewise measured to the anterior margin of the "neck".

The habitus photographs were obtained with a digital camera using ProgRes CapturePro 2.6 and AutoMontage and subsequently were edited with Corel Photo Paint X4.

Abbreviations

CBM	Working collection M. Baehr in Zoologische Staatssammlung, München (ZSM), Germany
MZB	Museum of Zoology, Buitenzorg, Cibinong, Indonesia
NHMW	Naturhistorisches Museum, Wien, Austria
SMNK	Staatliches Museum für Naturkunde, Karlsruhe, Germany
>	larger or longer than
<	smaller or shorter than

Taxonomy

Genus *Colasidia* Basilewsky, 1954

For information about taxonomy and distribution of the genus *Colasidia* see Baehr (1997, 2004, 2005, 2008, 2011). Generally specimens of *Colasidia* are small, flightless, usually brownish, rarely black beetles with rather elongate head and usually fairly small eyes. They are characterized by short, moniliform antenna, very large labial palpi, cordiform pronotum, glossy, not microreticulate surface, and oval-shaped elytra that usually lack distinct and impressed striae, but are, like the whole dorsal surface, covered by very large, seriate punctures and elongate, hirsute pilosity. The genus belongs to the tribe Zuphiini, but alongside with a few other genera from the Afrotropical and Oriental Regions, it forms the peculiar subtribe Leleupidiina.

So far 37 species of the genus *Colasidia* were described and one additional species presently is being described from Vietnam (Park & Will, pers. com.). Most species were recorded from northern Borneo (Sarawak and Sabah) and Sumatra, fewer from Malaysia, Thailand, Vietnam, and New Guinea, and one from north Queensland, north-eastern Australia. Strangely enough, no one species was ever recorded from Java or any other islands of the Indonesian Insular Belt south and east of Java, nor from the overwhelming part of Borneo, present Indonesian Kalimantan, nor from the Philippines, nor from the Moluccas, nor from the western part of New Guinea except Vogelkop Peninsula. The reasons for this apparent deficiency presently are unknown, but it is demonstrated by the herein described species, that this probably is due to unsatisfactory collecting efforts or methods.

Because all species of *Colasidia* are unable to fly and seem to live in ground litter or even in the upper soil stratum, specimens are extremely rarely collected and have been sampled almost always by sifting ground litter or by Berlese extraction of litter and loose soil. As far as the habitats were recorded, the species apparently live in rain forest, commonly in montane forest. The edaphic habits may add to the apparent rarity of all species.

Colasidia brevicornis Baehr, 1988

Baehr, 1988: 118. – Baehr 1997: 619.

New records: 1 ♂, 1 ♀, Borneo, Kalimantan "Gn. Bawang, Bengkayan, N00°53.921' E 109°22.444', 515 m, 11-XII-11 – sample 7" leg. A. Riedel (CBM, SMNK).

This species so far was known only from a single male specimen, collected in western Sarawak (Baehr 1988). The new record extends the range of the species to the west into adjacent north-western Kalimantan. The identity of the newly sampled specimens was verified by the similarly shaped and structured male aedeagus.

Colasidia mateui Baehr, 1997

Baehr 1997: 646.

New record: 1 ♀, "Malaysia, Sabah, Batu, Punggul Resort env., 24.VI.-1.VII.1996, 11c. vegetation debris and forest floor litter accumulated around large trees near river" (NHMW).

This species so far was known from two male specimens, collected on Mt. Kinabalu and in the Crocker Range, both in Sabah (Baehr 1997). The new record

is also from Sabah but from another locality, thus demonstrating the comparatively wide range of this species. The noted collecting circumstances confirm the habits of living in ground litter of rain forest.

Colasidia multispinosa, spec. nov.

Figs 1, 2

Examined types. Holotype: ♂, Borneo, Kalimantan "Gn. Bawang, Bengkayan, N00°53.429' E109°22.230', 246m, 10-XII-11 – sample 1" leg. A. Riedel (MZB). – Paratypes: 1 ♀, same data (CBM); 1 ♀, Borneo, Kalimantan "Gn. Bawang, Bengkayan, N00°54.103' E109°22.515', 652m, 11-XII-11 – sample 5" leg. A. Riedel (SMNK).

Etymology. The name refers to the multitude of spinose sclerites in the internal sac of the aedeagus.

Diagnosis. Comparatively large species, recognized by the basad widened head and rather elongate elytra, but mainly by the unique equipment of the aedeagus of many elongate, heavily sclerotized spines.

Description

Measurements. Length: 4.8–5.1 mm; width: 1.7–1.8 mm. Ratios. Length/width of head: 1.30–1.38; length orbit/eye: 2.0–2.1; length/width of pronotum: 1.02–1.04; width widest/narrowest diameter of pronotum: 1.54–1.62; width pronotum/head: 1.17–1.27; length/width of elytra: 1.52–1.60; width elytra/pronotum: 1.78–1.80.

Colour (Fig. 2). More or less dark piceous, in one paratype head slightly darker than prothorax; suture of elytra in basal half inconspicuously paler. Labrum, palpi, antenna, and legs pale yellow.

Head. Moderately elongate, slightly widened posteriad, widest near the basal angles, base convexly rectangular; orbit rather elongate, slightly oblique, in basal half almost transversally narrowed to neck. Eye rather small in comparison with orbit (in genus), laterally barely projected, length less than half of orbit length. Surface above and behind eye with a narrow, short sulcus. Clypeal suture deep, but in middle interrupted, frons immediately behind clypeal suture in middle slightly raised. Apical margin of clypeus slightly concave, lateral angles (above base of antenna) barely projected. Labrum anteriorly rather excised, lateral angles rounded, 4-setose, inner setae shorter than outer ones, lateral margin densely pilose. Mandibles short. Mentum with triangular, at apex faintly excised tooth. Labium in middle truncate, but paraglossae surpassing glossa, bisetose. Maxillary palpus elongate, apical palpomere cylindrical, apex obtusely rounded. Terminal palpomere of labial palpus very large and elongate, at least twice as long as wide. Antenna short, barely attaining middle of

pronotum. Median antennomeres about as wide as long, or even slightly wider. 3rd antennomere much shorter than 1st antennomere, c. 1.5 × as long as 2nd antennomere. Surface of head without microreticulation, very glossy. Punctures rather coarse, sparse, diameter of punctures much smaller than distance between punctures. Pilosity sparse, elongate, moderately erect, inclined anteriorly. The anterior supraorbital seta located near the anterior border of the eye and slightly mediad, the posterior supraorbital seta located far behind eye on the curvature of the orbit; both setae definitively longer than the erect pilosity.

Pronotum. Moderately elongate, slightly longer than wide, cordiform, anteriorly considerably widened, slightly wider than head, widest at anterior third. Upper surface rather convex, faintly sulcate along median line. Lateral margin in anterior two thirds convex, evenly narrowed to posterior angles, in basal third very sinuate. Apex wide, faintly excised, anterior angles rounded, barely projected. Base narrow, in middle well projected, basal angles much projected laterad, acute. Lateral margin in anterior third slightly raised, near base perceptibly more raised, with distinct border line and narrow marginal channel. Median line inconspicuous, faintly impressed. Prebasal grooves barely recognizable. Anterior marginal setae broken in all specimens, but situated at apical third of pronotum, slightly in front of widest diameter; posterior marginal seta situated right on the basal angle, very elongate. Surface without microreticulation, very glossy, with coarse, rather sparse punctures. Diameter of punctures slightly wider than distance between them. Pilosity rather sparse, elongate, rather erect, irregularly inclined posteriad and mediad.

Elytra. Moderately wide and comparatively elongate, laterally evenly but gently curved, widest slightly behind middle, upper surface comparatively depressed. Humeri rounded, but rather projected. Apex wide, slightly oblique, very slightly concave, slightly redressed to suture. Striae distinctly impressed and with regular rows of coarse punctures. Diameter of punctures slightly wider than distance between them. Intervals convex. Fixed setae in third interval very difficult to recognize within the coarse punctures. Series of marginal pores extremely difficult to detect when setae broken, apparently consisting of 8 basal, 3 postmedian, 6 apical pores, and 1 pore at apex of 3rd stria. Setae elongate if present. Surface without microreticulation, very glossy. Pilosity rather sparse, very elongate, rather irregular, moderately inclined posteriorly, comparatively erect. Flying wings reduced.

Lower surface. Proepisternum, apart from apical corner, impunctate and impilose. Prosternum

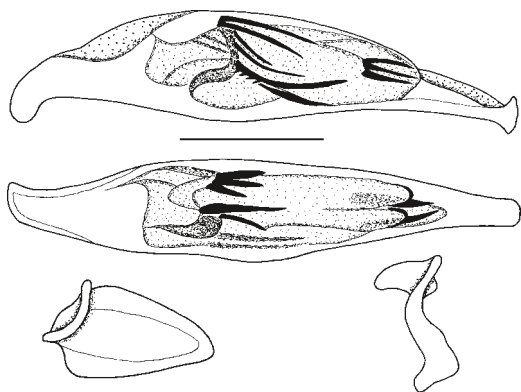


Fig. 1. *Colasidia multispinosa*, spec. nov. Male genitalia: aedeagus, left side; upper surface; left and right parameres. Scale bar: 0.5 mm.

sparsely punctate and setose. Mesepisternum, metepisternum, and abdominal sterna moderately sparsely punctate and pilose, pilosity elongate. Metepisternum very short, rectangular, wider than long. Terminal sternum in both sexes bisetose.

Legs. Comparatively elongate and delicate.

Male genitalia (Fig. 1). Genital ring not preserved. Aedeagus elongate, rather narrow, evenly narrowed to the elongate, straight, at tip rather wide, obtusely rounded apex. Lower surface slightly convex in middle. The very apex slightly denticulate on upper and lower surfaces. Orificium elongate, situated mainly on the upper surface. Internal sac with numerous elongate spines in basal part and with two spines near apex. Parameres of very different size and shape, the left one large and triangular, rounded, the right one small, somewhat axe-shaped.

Female genitalia. As usual in the genus, gonocoxite 1 narrow and elongate, gonocoxite 2 curved, with acute apex, with one elongate dorso-medial ensiform seta, two elongate ventro-lateral ensiform setae, and one elongate nematiform seta situated close to apex and originating from a groove.

Variation. Some variation is noted in body size, shape and width of the pronotum, in particular of the basal angles, and length of elytra.

Distribution. North-western Kalimantan. Only known from the type locality.

Collecting circumstances. Sifted from ground litter, probably in rain forest, collected at low to median altitude.

Relationships. With respect to body size and shape probably nearest related to *C. taylori* Baehr from western Sarawak and *C. cordicollis*, spec. nov. likewise from north-western Kalimantan.

Colasidia cordicollis, spec. nov.

Fig. 3

Examined types. Holotype: ♀, Borneo, Kalimantan "Gn. Bawang, Bengkayan, N00°53.783' E109°22.915', 473 m, 10-XII-11 – sample 4" leg. A. Riedel (MZB). – Paratype: 1 ♀, Borneo, Kalimantan "Gn. Poteng, Singkawan, N00°51.211' E109°03.418', 651 m, 13-XII-11 – sample 3" leg. A. Riedel (CBM).

Etymology. The name refers to the markedly cordate pronotum.

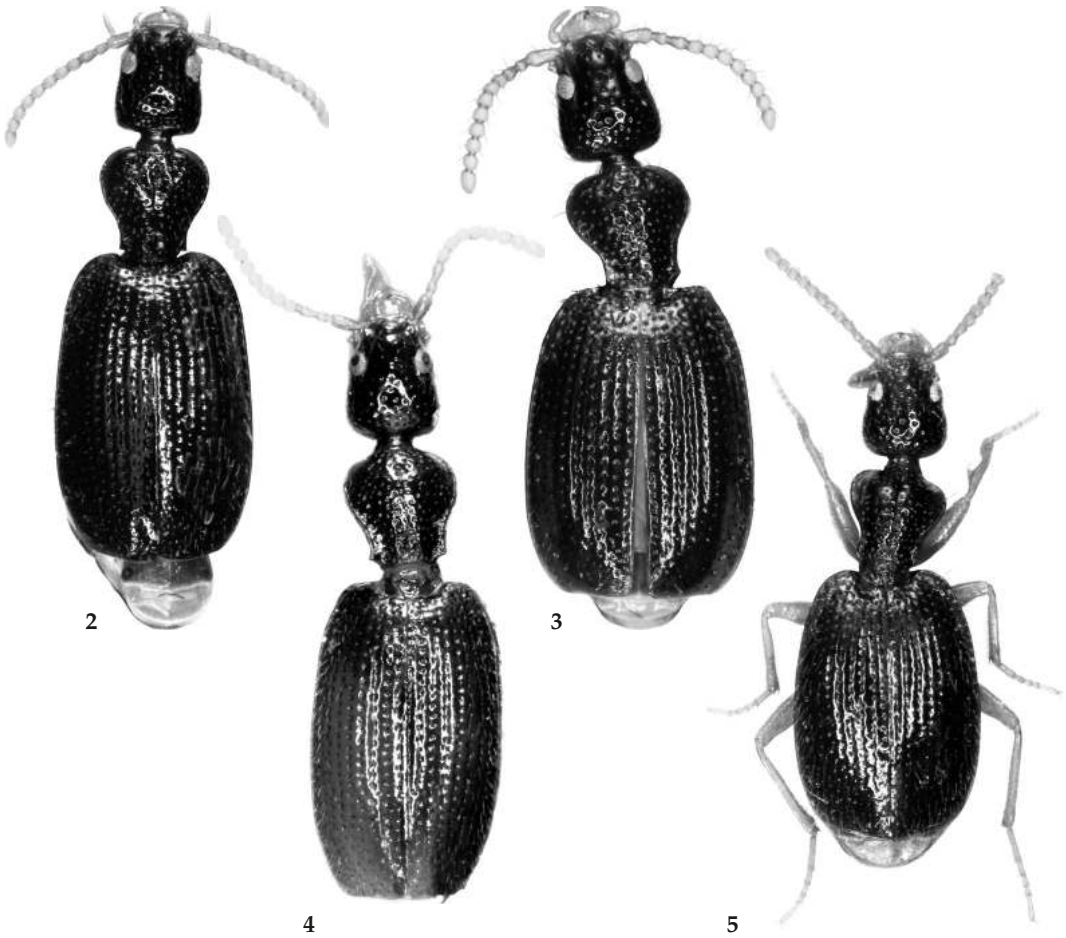
Diagnosis. Medium sized species, recognized by the basad distinctly widened head, very cordiform prothorax, and rather short and wide elytra, which distinguish it from the closely related *C. multispinosa*, spec. nov.

Description

Measurements. Length: 4.4–4.55 mm; width: 1.65 mm. Ratios. Length/width of head: 1.28–1.32; length orbit/eye: 2.2; length/width of pronotum: 0.97–1.0; width widest/narrowest diameter of pronotum: 1.70–1.74; width pronotum/head: 1.20–1.22; length/width of elytra: 1.41–1.43; width elytra/pronotum: 1.78–1.80.

Colour (Fig. 3). Reddish-piceous to piceous, in the paratype head slightly darker than prothorax; suture of elytra in basal half inconspicuously paler. Labrum, palpi, antenna, and legs pale yellow.

Head. Moderately elongate, considerably widened posteriad, widest near the basal angles, base rather rectangular; orbit rather elongate, slightly oblique, in basal half almost transversally narrowed to neck. Eye rather small in comparison with orbit (in genus), laterally barely projected, length considerably less than half of orbit length. Surface above and behind eye with a narrow, short sulcus. Clypeal suture deep, but in middle interrupted, frons immediately behind clypeal suture in middle slightly raised. Apical margin of clypeus slightly concave, lateral angles (above base of antenna) barely projected. Labrum anteriorly rather excised, lateral angles rounded, 4-setose, inner setae shorter than outer ones, lateral margin densely pilose. Mandibles short. Mentum with triangular, at apex faintly excised tooth. Labium in middle truncate, but paraglossae surpassing glossa, bisetose. Maxillary palpus elongate, apical palpomere cylindrical, apex obtusely rounded. Terminal palpomere of labial palpus very large and elongate, distinctly more than twice as long as wide. Antenna short, barely attaining middle of pronotum. Median antennomeres slightly wider than long. 3rd antennomere much shorter than 1st antennomere, c. 1.5× as long as 2nd antennomere. Surface of head without microreticula-



Figs 2-5. Habitus. Body lengths in brackets. 2. *Colasidia multispinosa*, spec. nov. (4.8 mm). 3. *C. cordicollis*, spec. nov. (4.4 mm). 4. *C. longipennis*, spec. nov. (5.05 mm). 5. *C. apicalis*, spec. nov. (4.3 mm).

tion, very glossy. Punctures coarse, sparse, diameter of punctures about as large as, or slightly smaller than distance between punctures. Pilosity sparse, elongate, moderately erect, inclined anteriorly. The anterior supraorbital seta located near the anterior border of the eye and slightly mediad, the posterior supraorbital seta located far behind eye on the curvature of the orbit; both setae definitively longer than the erect pilosity.

Pronotum. Moderately short, slightly shorter than wide, markedly cordiform, anteriorly considerably widened, slightly wider than head, widest at anterior third. Upper surface rather convex, faintly sulcate along median line. Lateral margin in anterior two thirds very convex, in basal third almost straight to slightly concave. Apex wide, faintly excised, anterior angles rounded, barely projected. Base narrow, in middle well projected, basal angles much projected

laterad, very acute. Lateral margin in anterior third slightly raised, near base perceptibly more raised, with distinct border line and narrow marginal channel. Median line inconspicuous, faintly impressed. Prebasal grooves rather deep. Anterior marginal seta situated at apical third of pronotum, slightly in front of widest diameter; posterior marginal seta situated right on the basal angle, both setae very elongate. Surface without microreticulation, very glossy, with coarse, sparse punctures. Diameter of punctures slightly wider than distance between them. Pilosity rather sparse, elongate, rather erect, irregularly inclined posteriorly and mediad.

Elytra. Moderately wide, comparatively short, laterally evenly but gently curved, widest slightly behind middle, upper surface comparatively depressed. Humeri rounded, but rather projected. Apex wide, very slightly oblique, barely concave, slightly

redressed to suture. Striae distinctly impressed and with regular rows of coarse punctures. Diameter of punctures slightly wider than distance between them. Intervals in basal half convex. Fixed setae in third interval very difficult to recognize within the coarse punctures. Series of marginal pores extremely difficult to detect because all setae broken, apparently consisting of 8 basal, 3 postmedian, 6 apical pores, and 1 pore at apex of 3rd stria. Surface without microreticulation, very glossy. Pilosity rather sparse, elongate, rather irregular, moderately inclined posteriorly, comparatively erect. Flying wings reduced.

Lower surface. Proepisternum, apart from apical corner, impunctate and impilose. Prosternum sparsely punctate and setose. Mesepisternum and metepisternum moderately sparsely punctate and pilose, abdominal sterna rather densely punctate and pilose, pilosity elongate, on abdomen declined. Metepisternum very short, rectangular, wider than long. Terminal sternum in female bisetose.

Legs. Comparatively elongate and delicate.

Male genitalia. Unknown.

Female genitalia. As in *C. multispinosa*, spec. nov.

Variation. Very little variation noted.

Distribution. North-western Kalimantan.

Collecting circumstances. Sifted from ground litter, probably in rain forest, collected at median altitude.

Relationships. Due to the unknown male genitalia the relationships of this species are obscure, but, with respect to body shape and surface structure, it is rather similar to *C. multispinosa*, spec. nov.

Colasidia longipennis, spec. nov.

Fig. 4

Examined types. Holotype: ♀, "Borneo, Sarawak Santubong Pen., Permai Rainfor. Res. 10–200 m 11.–14.9. 2008, R. Grimm (CBM).

Etymology. The name refers to the remarkably elongate elytra.

Diagnosis. Comparatively large species, recognized by the basad widened head, narrow prothorax with little produced basal angles, and remarkably narrow and elongate elytra.

Description

Measurements: Length: 5.05 mm; width: 1.65 mm. Ratios. Length/width of head: 1.36; length orbit/eye: 2.1; length/width of pronotum: 1.09; width widest diameter/base of pronotum: 1.47; width pronotum/

head: 1.19; length/width of elytra: 1.62; width elytra/pronotum: 1.74.

Colour (Fig. 4). Reddish-piceous. Labrum, palpi, antenna, and legs pale yellow.

Head. Rather elongate, considerably widened posteriorly, widest near the basal angles, base convexly rectangular; orbit rather elongate, slightly oblique, in basal half almost transversally narrowed to neck. Eye rather small in comparison with orbit (in genus), laterally barely projected, length c. half of orbit length. Surface above and behind eye with a narrow, short sulcus. Clypeal suture deep, but in middle interrupted, frons immediately behind clypeal suture in middle slightly raised. Apical margin of clypeus slightly concave, lateral angles (above base of antenna) barely projected. Labrum anteriorly rather excised, lateral angles rounded, 4-setose, inner setae shorter than outer ones, lateral margin densely pilose. Mandibles short. Mentum with triangular, at apex faintly excised tooth. Labium in middle truncate, but paraglossae surpassing glossa, bisetose. Maxillary palpus elongate, apical palpomere cylindrical, apex obtusely rounded. Terminal palpomere of labial palpus very large and elongate, c. twice as long as wide. Antenna short, barely attaining middle of pronotum. Median antennomeres slightly wider than long. 3rd antennomere much shorter than 1st antennomere, c. 1.5× as long as 2nd antennomere. Surface of head without microreticulation, very glossy. Punctures coarse, sparse, diameter of punctures about as large as, or slightly smaller than distance between punctures. Pilosity sparse, elongate, moderately erect, inclined anteriorly. The anterior supraorbital seta located near the anterior border of the eye and slightly mediad, the posterior supraorbital seta located far behind eye on the curvature of the orbit; both setae definitively longer than the erect pilosity.

Pronotum. Comparatively elongate, considerably longer than wide, moderately cordiform, anteriorly widened, slightly wider than head, widest at anterior third. Upper surface rather convex, faintly sulcate along median line. Lateral margin in anterior two thirds convex, in basal third very gently concave. Apex wide, faintly excised, anterior angles rounded, barely projected. Base narrow, in middle well projected, basal angles slightly projected laterad, about rectangular. Lateral margin in anterior third slightly raised, near base perceptibly more raised, with distinct border line and narrow marginal channel that distinctly widens basad. Median line inconspicuous, faintly impressed. Prebasal grooves rather deep. Anterior marginal seta situated at apical third of pronotum, slightly in front of widest diameter; posterior marginal seta situated right on the basal angle, both setae very elongate. Surface

without microreticulation, very glossy, with coarse, sparse punctures. Diameter of punctures slightly wider than distance between them. Pilosity rather sparse, elongate, rather erect, irregularly inclined posteriad and mediad.

Elytra. Rather narrow, elongate, laterally evenly but gently curved, widest about at middle, not perceptibly widened apicad, upper surface comparatively convex. Humeri rounded, but rather projected. Apex wide, almost transversal, barely concave, slightly redressed to suture. Striae slightly impressed and with regular rows of coarse punctures. Diameter of punctures slightly wider than distance between them. Intervals slightly convex. Fixed setae in third interval very difficult to recognize within the coarse punctures. Series of marginal pores extremely difficult to detect because all setae broken, apparently consisting of 8 basal, 3 postmedian, 6 apical pores, and 1 pore at apex of 3rd stria. Surface without microreticulation, very glossy. Pilosity rather sparse, elongate, rather irregular, moderately inclined posteriorly, comparatively erect. Flying wings reduced.

Lower surface. Proepisternum, apart from apical corner, impunctate and impilose. Prosternum sparsely punctate and setose. Mesepisternum, metepisternum, and abdomen moderately sparsely punctate and pilose, pilosity elongate, on abdomen declined. Metepisternum very short, rectangular, wider than long. Terminal sternum in female bisetose.

Legs. Comparatively elongate and delicate.

Male genitalia. Unknown.

Female genitalia. As in *C. multispinosa*, spec. nov.

Variation. Unknown.

Distribution. Western Sarawak. Known only from type locality.

Collecting circumstances. Probably sifted from ground litter, in rain forest, collected at low altitude.

Relationships. Due to the unknown male genitalia the relationships of this species are unknown. It is unique in its narrow pronotum and elongate elytra.

Colasidia apicalis, spec. nov.

Fig. 5

Examined types. Holotype: ♀, Malaysia, Sabah, Batu, Punggul Resort env., 24.VI.-1.VII.1996, 11c. vegetation debris and forest floor litter accumulated around large trees near river (NHMW).

Etymology. The name refers to the oblique apex of the elytra.

Diagnosis. Relatively small species, distinguished from similarly sized species by the distinctly triangular head, rather narrow prothorax, and the remarkably oblique apex of the elytra.

Description

Measurements: Length: 4.3 mm; width: 1.6 mm. Ratios. Length/width of head: 1.25; length orbit/eye: 2.25; length/width of pronotum: 1.08; width widest/narrowest diameter of pronotum: 1.69; width pronotum/head: 1.15; length/width of elytra: 1.46; width elytra/pronotum: 1.90.

Colour (Fig. 5). Piceous, elytra very slightly paler than head and pronotum, margins of pronotum and base of elytra inconspicuously paler. Labrum, palpi, antenna, and legs pale yellow.

Head. Rather short, considerably widened posteriad, widest near the basal angles, base rather rectangular; orbit rather elongate, slightly oblique, in basal half almost transversally narrowed to neck. Eye rather small in comparison with orbit (in genus), laterally barely projected, length considerably less than half of orbit length. Surface above and behind eye with a narrow, short sulcus. Clypeal suture deep, but in middle interrupted, frons immediately behind clypeal suture in middle slightly raised. Apical margin of clypeus slightly concave, lateral angles (above base of antenna) barely projected. Labrum anteriorly rather excised, lateral angles rounded, 4-setose, inner setae shorter than outer ones, lateral margin densely pilose. Mandibles short. Mentum with triangular, at apex faintly excised tooth. Labium in middle truncate, but paraglossae surpassing glossa, bisetose. Maxillary palpus elongate, apical palpomere cylindrical, apex obtusely rounded. Terminal palpomere of labial palpus very large and elongate, c. twice as long as wide. Antenna very short, barely attaining apical third of pronotum. Median antennomeres considerably wider than long. 3rd antennomere much shorter than 1st antennomere, c. 1.3 × as long as 2nd antennomere. Surface of head without microreticulation, very glossy. Punctures coarse, sparse, somewhat irregularly spaced, diameter of punctures about as large as distance between punctures. Pilosity sparse, elongate, moderately erect, inclined anteriorly. The anterior supraorbital seta located near the anterior border of the eye and slightly mediad, the posterior supraorbital seta located far behind eye on the curvature of the orbit; both setae definitively longer than the erect pilosity.

Pronotum. Fairly elongate, considerably longer than wide, markedly cordiform, anteriorly considerably widened, slightly wider than head, widest at anterior third. Upper surface rather convex, faintly sulcate along median line. Lateral margin in ante-

rior two thirds very convex, in basal third regularly concave. Apex wide, faintly excised, anterior angles rounded, barely projected. Base narrow, in middle well projected, basal angles much projected laterad, about rectangular but at tip acute. Lateral margin in anterior third slightly raised, near base perceptibly more raised, with distinct border line and narrow marginal channel throughout. Median line inconspicuous, faintly impressed. Prebasal grooves inconspicuous. Anterior marginal seta situated at apical third of pronotum, slightly in front of widest diameter; posterior marginal seta situated right on the basal angle, both setae very elongate. Surface without microreticulation, very glossy, with coarse, sparse punctures. Diameter of punctures about as wide as, or slightly narrower than distance between them. Pilosity rather sparse, elongate, rather erect, irregularly inclined posteriad and mediad.

Elytra. Wide, comparatively short, laterally evenly but gently curved, widest slightly behind middle, upper surface comparatively depressed. Humeri rounded, but rather projected. Apex wide, conspicuously oblique, barely concave, slightly redressed to suture. Striae distinctly impressed and with regular rows of coarse punctures. Diameter of punctures slightly wider than distance between them. Intervals convex. Fixed setae in third interval very difficult to recognize within the coarse punctures. Series of marginal pores extremely difficult to detect because all setae broken, apparently consisting of 8 basal, 3 postmedian, 6 apical pores, and 1 pore at apex of 3rd stria. Surface without microreticulation, very glossy. Pilosity rather sparse, elongate, rather irregular, moderately inclined posteriorly, comparatively erect. Flying wings reduced.

Lower surface. Proepisternum, apart from apical corner, impunctate and impilose. Prosternum sparsely punctate and setose. Mesepisternum, metepisternum, and abdomen moderately sparsely punctate and pilose, pilosity elongate, on abdomen declined. Metepisternum very short, rectangular, wider than long. Terminal sternum in female bisetose.

Legs. Comparatively elongate and delicate.

Male genitalia. Unknown.

Female genitalia. As in *C. multispinosa*, spec. nov.

Variation. Unknown.

Distribution. Sabah. Known only from type locality.

Collecting circumstances. Sifted from ground litter in rain forest, at the base of trees near to a river.

Relationships. Due to the unknown male genitalia the relationships of this species are unsettled.

However, it differs from all similarly sized Bornean species by the unique shape of the elytral apex.

**Key to the species
of the genus *Colasidia* Basilewsky
recorded from Borneo**

For the benefit of the user some figures from previous papers on the subject are mentioned in this key: **B88**: Baehr 1988b; **B90**: Baehr 1990; **B97**: Baehr 1997.

1. Head about parallel-sided, or wider across eyes than across orbits; base of head usually considerably rounded (doubtful specimens under both couplets). 2.
 - Head decidedly wider at posterior angles or across orbits than across eyes; base of head less rounded, more square. 6.
2. Pronotum narrower, $<0.85 \times$ as wide as long, prebasal sinuosity longer, basal angles less prominent (**B88** fig. 1; **B97** fig. 66); aedeagus with slightly upturned apex (**B88** fig. 10; **B97** fig. 13). 3.
 - Pronotum wider, $>0.9 \times$ as wide as long, prebasal sinuosity shorter, basal angles more prominent (**B90** figs 2, 3; **B97** fig. 67); aedeagus different (**B90** fig. 2; **B97** fig. 14), or unknown. 4.
3. Head longer and more parallel, not at all widened towards base; eyes slightly smaller, orbits to neck $>2 \times$ as long as eyes; pronotum narrower, $c. 0.8 \times$ as wide as long, anteriorly less widened (**B88** fig. 1); aedeagus elongate, internal sac without any sclerites, apex slightly upturned (**B88** fig. 10). Sarawak. *angusticollis* Baehr, 1988
 - Head shorter and less parallel, faintly widened towards base; eyes slightly larger, orbits to neck $c. 2 \times$ as long as eyes (**B97** fig. 50); pronotum wider, $c. 0.85 \times$ as wide as long, anteriorly more widened (**B97** fig. 66); aedeagus elongate, apex thin, slightly asymmetric, markedly upturned, internal sac with a small sclerotized plate (**B97** fig. 13). Sabah. *burckhardtii* Baehr, 1997
4. Colour deep black, legs black; head slightly widened behind eyes, orbits to neck $>2 \times$ as long as eyes (**B97** fig. 51); aedeagus with knob-like, faintly upturned apex (**B97** fig. 14). Sabah.
 - Colour piceous, legs reddish; head not at all widened behind eyes, orbits to neck distinctly $<2 \times$ as long as eyes (**B90** figs 2, 3); aedeagus with apex slightly turned down (**B90** fig. 10) or unknown. Sarawak. 5.

5. Head slightly shorter, more rounded behind eyes; eyes slightly larger, orbits to neck $< 1.75 \times$ as long as eyes; elytra decidedly widened behind middle (**B90** fig. 3); aedeagus unknown. *macrops* Baehr, 1990
 - Head slightly longer, more parallel behind eyes; eyes slightly smaller, orbits to neck $> 1.8 \times$ as long as eyes; elytra widest about at middle (**B90** fig. 2); aedeagus with several sclerites within internal sac and with apex slightly turned down (**B90** fig. 10). *riedeli* Baehr, 1990
6. Larger species, body length > 4.8 mm. 7.
 - Smaller species, body length < 4.6 mm. 10.
7. Colour at most dark piceous, legs reddish or yellow; aedeagus elongate, distinctly bisinuate on lower surface, apex markedly hooked (Fig. 1; **B88** fig. 11), or unknown. 8.
 - Colour deep black, legs black; aedeagus compact, evenly concave on lower surface, apex barely hooked (**B95** fig. 14). *atra* Baehr, 1997
8. Pronotum longer and narrower, $1.09 \times$ as long as wide; elytra elongate, $> 1.65 \times$ as long as wide (Fig. 4); aedeagus unknown. Sarawak. *longipennis*, spec. nov.
 - Pronotum shorter and wider, $< 1.04 \times$ as long as wide; elytra shorter, $< 1.6 \times$ as long as wide; aedeagus see Fig. 1 and **B88** fig. 11. 9.
9. Elytra slightly shorter, $< 1.5 \times$ as long as wide; aedeagus with massive apical hook which is barely angulate on lower side; internal sac with two denticulate folds and with a single stronger tooth (**B88** fig. 11). Western Sarawak. *taylori* Baehr, 1988
 - Elytra slightly longer, $> 1.5 \times$ as long as wide; aedeagus with more delicate apical hook which is also angulate on the lower side; internal sac with several elongate spines (Fig. 1). North-western Kalimantan. *multispinosa*, spec. nov.
10. Head barely widened behind eyes (**B97** fig. 50) and apex of elytra almost straight (**B97** fig. 34) and apex of aedeagus markedly upturned (**B97** fig. 13); head and pronotum usually distinctly paler than elytra. Sabah. *burckhardti* Baehr, 1997
 - Head distinctly widened behind eyes (Figs 3, 5); apex of elytra more or less distinctly convex or oblique, rarely almost straight; apex of aedeagus when known at most slightly upturned (**B88** fig. 12; **B97** figs 11, 12); surface usually unicolourous. 11.
11. Larger species, length > 4.1 mm; aedeagus with short, stout, not upturned apex (see Perrault 1982, fig. 2), or unknown (doubtful species under both couplets). 12.
 - Smaller species, length < 4.1 mm; aedeagus either with narrower, slightly upturned apex (**B88** fig. 12; **B97** figs 11, 12), or very short, with extremely short apex (**B90** fig. 12), or unknown. 15.
12. Apex of elytra remarkably oblique; head considerably widened basad, basal angles less rounded; basal angles of pronotum distinctly produced laterad (Fig. 5); aedeagus unknown. Sabah. *apicalis*, spec. nov.
 - Apex of elytra straight or very slightly convex; head less widened basad, basal angles more rounded (Fig. 3, **B97** figs 30, 31, 46, 47); basal angles of pronotum various (Fig. 3, **B97** figs 62, 63); aedeagus short, with short, stout, straight apex (see Perrault 1982, fig. 2), or unknown. ... 13.
13. Slightly larger species, length > 4.4 mm; head larger, posteriorly much wider (Fig. 3, **B97** fig. 47); pronotum anteriorly distinctly wider, lateral margins more deeply sinuate (Fig. 3, **B97** fig. 63); aedeagus short, with short, stout, straight apex (see Perrault 1982, fig. 2), or unknown. 14.
 - Slightly smaller species, length < 4.3 mm; head narrower, posteriorly less widened (**B97** fig. 46); pronotum anteriorly rather narrow, lateral margins far less deeply sinuate (**B97** fig. 62); aedeagus unknown. Sabah. *borneensis* Baehr, 1997
14. Pronotum as wide as long, or wider; basal angles distinctly produced laterad; basal angles of head much more rectangular (Fig. 3); aedeagus unknown. North-western Kalimantan. *cordicollis*, spec. nov.
 - Pronotum longer than wide; basal angles barely produced laterad; basal angles of head much more rounded (**B97** figs 31, 47, 63); aedeagus short, with short, stout, straight apex (see Perrault 1982, fig. 2). Sabah. *gerardi* Perrault, 1982
15. Small species, length c. 3.7 mm; pronotum distinctly wider than long, basal angles markedly projected laterad (**B90** fig. 4); aedeagus short, with very short apex (**B90** fig. 12). Sarawak. *pumila* Baehr, 1990
 - Larger species, length > 3.9 mm; pronotum not wider than long, basal angles less projected laterad (**B88** fig. 3; **B97** figs 62, 64, 65); aedeagus with longer, slightly upturned apex (**B88** fig. 12; **B97** figs 11, 12) or unknown. 16.

16. Apex of elytra almost straight (B88 fig. 3); aedeagus with longer, more upturned apex, internal sac at base with tridentate sclerite (B88 fig. 12). Sarawak, north-western Kalimantan. ...
 *brevicornis* Baehr, 1988
- Apex of elytra remarkably convex (B97 figs 30, 32, 33); aedeagus with shorter, less upturned apex (B97 figs 11, 12), or unknown. 17.
17. Head heavy and wide, markedly triangular (B97 figs 48, 49); pronotum rather wide, almost as wide as long (B97 figs 64, 65); aedeagus with slightly upturned apex (B97 figs 11, 12). 18.
- Head rather small and narrow, feebly triangular (B97 fig. 46); pronotum rather narrow, distinctly longer than wide (B97 fig. 62); aedeagus unknown. Sabah.
 *borneensis* Baehr, 1997
18. Head remarkably heavy and wide, distinctly wider than pronotum (B97 fig. 49); aedeagus slightly longer, with longer apex (B97 fig. 12). Sabah.
 *laticeps* Baehr, 1997
- Head slightly less heavy and wide, not distinctly wider than pronotum (B97 fig. 48); aedeagus slightly shorter, with shorter apex (B97 fig. 11). Sabah, western Sarawak.
 *mateui* Baehr, 1997

Remarks

The four new species described in this paper again demonstrate the high grade of species diversity in Borneo of this genus of rarely collected species. However, all species known so far from this large island are recorded from the northern fringe only, i. e. from Sarawak, Sabah, and the north-westernmost part of Kalimantan, close to the western border of Sarawak. This means that no one species has been found so far in the remaining four fifth of the island. Moreover, the two species herein recorded from north-western Kalimantan denote the first records of the genus from the Indonesian part of the island. The recorded distribution pattern again illustrates our very incomplete knowledge of the distribution of the genus and of its species. Given the high number of species already known and their fragmentary distribution (Baehr 1997), a much greater number of species can be expected in future, not only in Borneo but throughout the range of the genus, when sampling efforts are intensified and collecting will be done more systematically and with adequate techniques. More systematical sampling in this connection means as well collecting in areas where no collecting activities have been conducted so far, as sampling by use of adequate methods, e. g. sifting

of ground litter and Berlese extraction of leaf litter and the upper soil stratum in rain forest.

As can be expected from the insufficient knowledge of species inventory and distribution, likewise very little is known about habits and ecology of any species of *Colasidia*. As mentioned above, the few specimens of which we have any information about sampling circumstances, usually were collected by either sifting of ground litter or by Berlese extraction of the upper soil substrate, probably including leaf litter. Those specimens of which any information is available, were collected in rain forest, preferably in montane areas, but for most species virtually nothing is known about collecting circumstances. Therefore, at present it is impossible to speculate about putative differences of habits and habitats in species that deviate in their body shape and structure.

The four herein described species are closely or fairly closely related, as far as it can be judged from their external morphology, and without knowledge of the structure of the male genitalia. As Baehr (1997) suggested, the most plesiotypic species of the genus *Colasidia* probably occur in southern Malaysia, and these are fairly large, rather depressed species with moderately large, posteriorly rounded head and comparatively large eyes. Within the genus, morphological clines at the one hand lead to small species having short and wide, posteriorly rather triangular head and comparatively short and convex elytra; and on the other hand to narrow and elongate species with fairly elongate head and small eyes. According to their external morphology, all four mentioned species exhibit rather apomorphic character states, but do not belong to the group of most apotypic species (if apotypic means a long distance of a taxon from the base of the group-specific cladogram expressed in the number of dichotomies from the base of the cladogram). These so far have been found at the eastern and southern margins of the genus range, in Vietnam (Baehr 2008) and north-eastern Australia (Baehr 1988a).

Acknowledgements

My sincere thanks are due to Alexander Riedel, Karlsruhe, Roland Grimm, Tübingen, and Manfred Jäch, Wien for the kind loan or gift of the specimens.

References

- Baehr, M. 1988a. Revision of the Australian Zuphiinae 2. *Colasidia monteithi* sp. nov. from North Queensland, first record of the tribe Leleupidiini in Australia (Insecta: Coleoptera: Carabidae). *Memoirs of the Queensland Museum* 25: 135-140 (1987).

- 1988b. Three new Leleupidiini from Sarawak (Coleoptera, Carabidae, Zuphiinae). *Mitteilungen der Münchner Entomologischen Gesellschaft* 78: 115-123.
 - 1990. Four new species of Leleupidiini from the Oriental Region (Coleoptera, Carabidae, Zuphiinae). *Mitteilungen der Münchner Entomologischen Gesellschaft* 80: 9-19.
 - 1991. On new and rare Leleupidiini from the Oriental and Australian Regions (Coleoptera, Carabidae, Zuphiinae). *Mitteilungen der Münchner Entomologischen Gesellschaft* 81: 193-202.
 - 1993. *Colasidia convexior*, sp. n., a further new leleupidiine beetle from Sumatra (Coleoptera, Carabidae, Zuphiini). *Mitteilungen der Münchner Entomologischen Gesellschaft* 83: 39-42.
 - 1997. Leleupidiini from the Oriental Region. 1. New species of the genus *Colasidia* Basilewsky (Insecta, Coleoptera, Carabidae, Zuphiinae). *Revue Suisse de Zoologie* 104: 611-659.
 - 1998. Leleupidiini from the Oriental Region. 2. The leleupidiine genus *Gunvorita* Landin (Insecta, Coleoptera, Carabidae, Zuphiinae). *Revue Suisse de Zoologie* 105: 261-318.
 - 2000. A new species of the leleupidiine genus *Colasidia* Basilewsky from New Guinea (Coleoptera, Carabidae, Zuphiinae). *Spixana* 23: 41-45.
 - 2001. Four new species of the leleupidiine genus *Gunvorita* Landin from Nepal (Insecta: Coleoptera: Carabidae: Zuphiinae). *Stuttgarter Beiträge zur Naturkunde, Serie A* 627: 1-18.
 - 2002. A further new species of the leleupidiine genus *Gunvorita* Landin from Nepal (Insecta, Coleoptera, Carabidae, Zuphiinae). *Spixiana* 25: 239-243.
 - 2004. *Colasidia wau*, a new leleupidiine species from Papua New Guinea (Insecta, Coleoptera, Carabidae, Zuphiinae). *Revue Suisse de Zoologie* 111: 175-181.
 - 2005. New Species of the Leleupidiine Genus *Colasidia* Basilewsky from Mainland Asia (Insecta: Coleoptera: Carabidae: Zuphiinae). *Stuttgarter Beiträge zur Naturkunde, Serie A* 675: 1-13.
 - 2008. A peculiar new leleupidiine species from Vietnam (Coleoptera, Carabidae, Zuphiinae). *Zoosystematica Rossica* 17: 85-88.
 - 2011. Two new species of the leleupidiine genus *Colasidia* Basilewsky from New Guinea (Coleoptera, Carabidae, Zuphiini). *Mitteilungen der Münchner Entomologischen Gesellschaft* 101: 59-67.
- Basilewsky, P. 1954. Un genre nouveau de Leleupidiini de la presqu'île de Malacca (Col. Carabidae, Zuphiinae). *Revue française d'Entomologie* 21: 213-216.
- Mateu, J. 1981. A propos des Leleupidiini Basilewsky (sic!) en Asie (Col. Carabidae). *Revue Suisse de Zoologie* 88: 715-722.
- Perrault, G.-G. 1982. Une espèce nouvelle de Leleupidiini d'Asie: *Colasidia gerardi* n. sp. de Borneo (Coleoptera - Carabidae). *Bulletin de la Société Linnéenne de Lyon* 51: 76-78.