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Two new species of the leleupidiine genus *Colasidia* BASILEWSKY from New Guinea

(Coleoptera, Carabidae, Zuphiini)

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Abstract

Two new species of the leleupidiine genus *Colasidia* BASILEWSKY are described from New Guinea: *Colasidia avicapitis* from the Bird´s Head Peninsula, West Papua (Indonesia), and *Colasidia microps* from central Papua New Guinea. *Colasidia avicapitis* is the first species of the genus recorded from the western half of New Guinea and thus this record closes a striking gap in the range of this genus. It belongs to a group of species that possess relatively large eyes and a parallel-sided, basally markedly convex head. In view of the unknown male genitalia of most New Guinean species of this group its relationships are obscure. *Colasidia microps* belongs to a group of small eyed species that possess a basad more or less widened head with less convex base. It is probably more related to *Colasidia garainae* BAEHR than to any other species recorded from New Guinea, but due to its unknown male genitalia this remains doubtful. The new species are inserted into the most recent key to the species of the genus *Colasidia* that occur in the Papuan-Australian Region (BAEHR 2004).

Introduction

Through courtesy of Alexander RIEDEL, Karlsruhe, well known collector of many new and interesting species of carabids, but likewise of many other insect groups, in New Guinea, I received two single specimens of the genus *Colasidia* BASILEWSKY from western and eastern New Guinea, respectively, for identification. 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, from the eastern part of New Guinea, and from north-eastern Australia (BAEHR 1988a, b, 1990, 1991, 1993, 1997, 2000, 2004, 2005, 2008). In Nepal, Sikkim, and north-eastern India *Colasidia* is replaced by the closely related genus *Gunvorita* LANDIN (BAEHR 1998, 2001, 2002), and in southern India by the genus *Paraleleupidia* Basilewsky (MATEU 1981, BAEHR 1990) which, however, is more remotely related to both genera mentioned above. Surprisingly, no record of any species of *Colasidia* was yet available from the western half of New Guinea, present Papua Indonesia, although from the eastern part, Papua New Guinea, altogether five species were recorded (BAEHR 2004).

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 male genitalia the specimen was weakened in a wet jar for one night, the genitalia were then cleaned for a short while in hot 4% KOH. For the description normal taxonomic methods were used. The description follows the style of my synoptic paper of the Oriental-Australian *Colasidia* (Baehr 1997).

The habitus photographs were obtained with a digital camera using ProgRes CapturePro 2.6 and AutoMontage and subsequently were worked with Corel Photo Paint 11. Measurements were taken using a stereo microscope with an ocular micrometer. Body length has been measured from apex of labrum to apex of elytra. Length of pronotum was measured along midline, width of base of pronotum at the extreme tips of the basal angles. Length of head was taken from apex of labrum to anterior border of "neck", length of orbit was likewise measured to anterior margin of "neck".

Genus *Colasidia* Basilewsky, 1954

For information about taxonomy and distribution of the genus *Colasidia* see Baehr (1997, 2004, 2005, 2008). Specimens of *Colasidia* are small, more or less pale coloured beetles with rather elongate head and usually fairly small eyes. They are characterized by short antenna, very large labial palpi, cordiform pronotum, and oval-shaped elytra that usually lack distinct and impressed striae, but are, like the whole dorsal surface, covered by very large 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 35 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 Philippines, nor from the Moluccas, nor from the western part of New Guinea. 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.

Because all species of *Colasidia* are unable to fly and seem to live in ground litter or even in the upper ground stratum, specimens are extremely rarely collected and have been sampled almost always by sifting ground litter or by Berlese extraction. 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 avicapitis sp. n.
(Figs 1, 3, 5)

Exemined types. Holotype: ♂, "W-PAPUA, Manokwari, Gn. Meja, 220 m, leg. A. Riedel / 05.XII.2007, sample 1, sifted S00°51.497' E134°04.949' ", Staatliches Museum für Naturkunde Karlsruhe (SMNK).

Etymology: The name is the latin word for the range of this species, the Vogelkop Peninsula.

Diagnosis: Relatively small species, immediately distinguished from most New Guinean species by the comparatively large eye, elongate-convex basal part of the head which is not widened behind the eye, and the rather elongate aedeagus. From the likewise large-eyed *C. kokodae* Baehr distinguished by the barely perceptible, absolutely not raised elytral intervals.

Description: Measurements: Length: 3.9 mm; width: 1.3 mm. Ratios. Length/width of head: 1.63; length orbit/eye: 1.9; length/width of pronotum: 1.22; width widest part/base of pronotum: 1.41; width pronotum/head: 1.10; length/width of elytra: 1.50; width elytra/pronotum: 1.91.

Colour (Figs 3, 5): Head black, pronotum and elytra very dark piceous; neither margins nor suture of elytra perceptibly lighter. Labrum, palpi, most of antennae, and legs pale reddish, only two basal antennomeres slighty darker.

Head (Fig. 5): Moderately elongate, not perceptibly widened behind eyes, widest at position of eyes; orbit comparatively short, very slightly convex, in basal half elongate-convexly narrowed to neck. Eye large in comparison with orbit (in genus), laterally slightly projected, length slightly > 1/2 of orbit length. Surface above and behind eye with a narrow, deep 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, about 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 longer than 1st antennomere, almost twice as long as 2nd antennomere. Surface of head without microreticulation, very glossy. Punctures moderately coarse, sparse, diameter of punctures much smaller than distance between punctures. Pilosity sparse, very 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 (Fig. 5): Rather narrow and elongate, cordiform, anteriad considerably widened, much longer than wide, considerably 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, acute. Lateral margin in anterior third slightly raised, near base perceptibly more raised, with distinct border line and narrow marginal channel. Median line imconspicuous, very faintly impressed. Prebasal grooves barely recognizable. Both anterior marginal setae broken, but situated at apical third of pronotum, slightly in front of widest diameter; posterior marginal seta situated righ on the basal angle, very elongate. Surface without microreticulation, very glossy, with very coarse, rather sparse punctures. Diameter of punctures much wider than distance between them. Pilosity rather sparse, very elongate, rather erect, irregularly inclined posteriad and mediad.

Elytra (Fig. 3): 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, almost transverse, very slightly convex, barely redressed to suture. Striae not perceptible, whole elytra with rather irregularly arranged, very coarse punctures, punctures laterally even more irregular. Diameter of punctures considerably wider than distance between them. 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 not perceptible. 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 sparsely punctate and setose. Mesepisternum, metepisternum, and abdominal sterna sparsely punctate and pilose, both terminal sterna more densely pilose. Metepisternum short, about quadrangular. Terminal sternum in male bisetose.

Legs: In comparison to other species of the genus rather elongate and delicate.

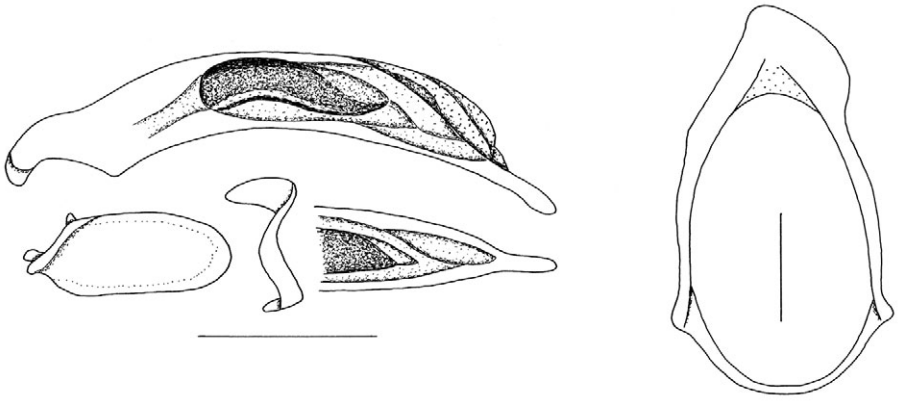


Fig. 1. *Colasidia avicapitis* **sp. n.** Male genitalia: aedeagus (left side), apex of aedeagus (from below), left and right parameres, genital ring. Scale bars: 0.25 mm.

Male genitalia (Fig. 1): Genital ring narrow, laterally slightly convex, slightly asymmetric, basal part elongate, very narrow, apex wide, obliquely convex. Aedeagus moderately elongate, wide, with elongate, narrow, straight, parallel-sided apex. Lower surface regularly concave. Orificium elongate, situated mainly on the upper surface. Internal sac with a distinctly sclerotized fold in middle. Parameres of very different size and shape, the left one large and at apex widely rounded, the right one short.

Female genitalia: Unknown.

Variation: Unknown.

Distribution: Eastern Vogelkop Peninsula, Papua Indonesia, western New Guinea. Known only from type locality.

Collecting circumstances: Sifted from ground litter, probably in rain forest, collected at low altitude at 220 m.

Relationships: Due to the unknown male genitalia of the similarly large-eyed species *P. kokodae* BAEHR and *P. papua* DARLINGTON the relationships of the new species to any other New Guinean species at present remain obscure. Because no *Colasidia* species were so far recorded from any islands between Sumatra and Borneo in the north-west, and New Guinea in the south-east, possible relations to extra-New Guinean species likewise are unknown.

Colasidia microps sp. n.
(Figs 2, 4, 6)

Examined types. Holotype: ♀, "Papua New Guinea; Crater Mt. c. a., Haia, S06°41.624' E145°00.728', 960m, sifted, 26-IX-2009, leg. A. Riedel" (SMNK).

Etymology: The name refers to the very small eye of this species.

Diagnosis: Moderately large, reddish-piceous species, characterized by small eyes, basad slightly widened head, and very coarse punctation of the upper surface. Further distinguished from the most similar New Guinean species *C. garainae* BAEHR by wider pronotum with much more projected basal angles, basad less widened head, and coarser and more regular punctation of the elytra.

Description: Measurements: Length:4.45 mm; width: 1.6 mm. Ratios. Length/width of head: 1.53; length orbit/eye: 4.5; length/width of pronotum: 1.10; width widest part/base of pronotum: 1.60; width pronotum/head: 1.22; length/width of elytra: 1.48; width elytra/pronotum: 1.85.

Colour (Figs 4, 6): Head and pronotum dark reddish, elytra piceous, neither margins nor suture of elytra perceptibly lighter. Labrum, palpi, antenna, and legs dirty yellow to pale reddish.

Head (Fig. 6): Rather narrow and elongate, slightly but perceptibly widened behind eyes towards base, widest about at middle of orbit, orbit very elongate, gently convex, and in basal half continuously and convexly narrowed to neck. Eye small in comparison with orbit, laterally barely projected, length only about 1/5 of orbit length. Surface above and behind eye with a narrow, deep sulcus. Clypeus basally in middle with a punctiform groove, frons immediately behind clypeal suture in middle slightly raised, posteriad of the raised area with a very shallow transverse impression. Apical margin of clypeus almost straight, lateral angles (above base of antenna) barely projected. Labrum anteriorly slightly 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, about twice as long as wide. Antenna short, only attaining the anterior third of the pronotum. Median antennomeres about as wide as long, or even slightly wider, 3rd antennomere shorter than 1st, little longer than 2nd antennomere. Surface of head without microreticulation, very glossy. Punctures very coarse, sparse, diameter of punctures larger than distance between punctures. Pilosity sparse, very 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 pilosity.

Pronotum (Fig. 6): Comparably short and wide, cordiform, anteriad considerably widened, slightly longer than wide, considerably 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 oblique, deeply sinuate in front of basal angles. Apex wide, faintly excised, anterior angles convex, barely projected. Base narrow, in middle projected, laterally excised, basal angles acute and well projected. Lateral margin in anterior third slightly raised, near base perceptibly more raised, with distinct border line and narrow marginal channel. Median line inconspicuous, anteriorly faintly impressed, near base slightly deeper. Prebasal grooves barely recognizable. Anterior marginal seta very elongate, situated at apical third of pronotum, slightly in front of widest diameter, position of posterior seta uncertain, because both setae broken, but probably situated at the basal angles. Surface without microreticulation, very glossy, with very coarse,

rather sparse punctures. Diameter of punctures about as wide as distance between them, or slightly smaller. Pilosity rather sparse, elongate, rather erect, irregularly inclined posteriad and mediad.

Elytra (Fig. 4): Moderately wide and elongate, laterally evenly but gently curved, widest slightly behind middle, upper surface slightly depressed. Humeri rounded, but rather projected. Apex wide, oblique-convex, barely redressed to suture. Striae rather regularly marked by rows of very coarse punctures, punctures laterally more irregularly disposed. In middle diameter of punctures considerably wider than distance between them. Intervals absolutely depressed. 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 when still present, very elongate. Surface without microreticulation, very glossy. Pilosity rather sparse, elongate, rather regular, 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 abdominal sterna sparsely punctate and pilose, both terminal sterna more densely pilose. Metepisternum short, about quadrangular. Terminal sternum in female quadrisetose.

Legs: Of average length and size.

Male genitalia: Unknown,

Female gonocoxites (Fig. 2): Gonocoxite 1 elongate, parallel-sided, without any setae at apex. Gonocoxite 2 triangular, with narrow, elongate apex; with two very elongate ventro-lateral ensiform setae, one very elongate dorso-median ensiform seta, and one elongate nematiform seta arising from a large subapical pit at the ventral surface.

Variation: Unknown.

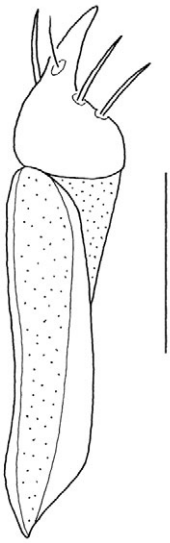


Fig. 2. *Colasidia microps* **sp. n.** Female gonocoxites (ventral side). Scale bar: 0.1 mm.

Distribution: Central Papua New Guinea. Known only from type locality.

Collecting circumstances: Sifted from ground litter, probably in rain forest, collected at median altitude at 960 m.

Relationships: In shape and external structure rather similar to *C. garainae* BAEHR, but due to the unknown male genitalia of *C. microps*, this suggested relationship remains obscure.

Recognition

To facilitate identification of the new species, the most recent key to those species of the genus which occur in the Papuan-Australian Region (BAEHR 2004) is revised here. For the benefit of the user some figures from previous papers on the subject are mentioned in this key: **B88**: BAEHR 1988a; **B91**: BAEHR 1991; **B00**: BAEHR 2000; **B04**: BAEHR 2004.

1. Head about parallel-sided, or wider across eyes than across orbits; base of head usually markedly rounded (Fig 3) (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 (Fig. 6) . . . . . 5.

2. Eye very large, ratio of distance from orbit to neck/eye length < 2 (Fig. 5; **B91** fig. 6); aedeagus when known, elongate with rather elongate apex (Fig. 1) . . . . . 3.

– Eye smaller, ratio of distance from orbit to neck/eye length > 3 (**B04** fig. 2); aedeagus when known short and compact, with shorter apex (**B04** fig. 1) . . . . . 4.

3. Eye larger, ratio of distance from orbit to neck/eye length < 1.5 (**B91** fig. 6); punctation of elytra irregular, rather confused; odd intervals raised in anterior half; aedeagus unknown. Kokoda, central Papua Peninsula, eastern Papua New Guinea . . . . . *C. kokodae* BAEHR, 1991

– Eye smaller, ratio of distance from orbit to neck/eye length c. 2 (Fig. 5); punctation of elytra less irregular; intervals barely perceptible, absolutely not raised; aedeagus elongate, with rather elongate apex (Fig. 1). Vogelkop Peninsula, western Papua Indonesia . . . . . *C. avicapitis* **sp. n.**

4. Eye larger, ratio of distance from orbit to neck/eye length c. 3; prothorax shorter, ratio length/with c. 1.10; prothorax less wide in comparison to head, ratio width of prothorax/width of head c. 1.16; elytra shorter and wider, ratio length/width c. 1.50; aedeagus unknown. Dobodura, central Papua Peninsula, eastern Papua New Guinea . . . . . *C. papua* DARLINGTON, 1971

– Eye smaller, ratio of distance from orbit to neck/eye length c. 4; prothorax longer, ratio length/width >1.16; prothorax wider in comparison to head, ratio width of prothorax/width of head >1.20; elytra longer and narrower, ratio length/width >1.54; aedeagus short, rather compact, with moderately elongate, faintly upturned apex (**B04** fig. 1). Vicinity of Wau, eastern central Papua New Guinea . . . . . *C. wau* BAEHR, 2004

5. Head very elongate, markedly triangular (**B88** fig. 1). Northeastern Queensland, Australia . . . . . *C. monteithi* BAEHR, 1988

– Head shorter, usually less markedly triangular (Fig. 6; **B00** fig. 2; **B04** fig. 2). New Guinea . . . . . 6.

6. Pronotum shorter and wider, ratio length/width c. 1.05; elytra shorter and wider, less depressed, ratio width of elytra/width of prothorax >2.05, ratio length/width of elytra c. 1.40; aedeagus unknown. Damanti, Huon Peninsula, northern Papua New Guinea . . . . . *C. madang* DARLINGTON, 1971

– Pronotum longer and narrower, ratio length/width >1.10; elytra longer and narrower, more depressed, ratio width of elytra/width of prothorax <1.90, ratio length/width of elytra >1.48; aedeagus either elongate, with elongate, slightly upturned apex (**B00** fig. 1), or short and compact, with short, likewise slightly upturned apex (**B04** fig. 1). Distribution different . . . . . 7.

7. Larger species, length >4.75 mm; head longer and narrower, ratio length/width >1.64; elytra longer and narrower, ratio length/width >1.54; aedeagus short, compact, with rather short apex (**B04** fig. 1). Vicinity of Wau, eastern central Papua New Guinea . . . . . *C. wau* BAEHR, 2004

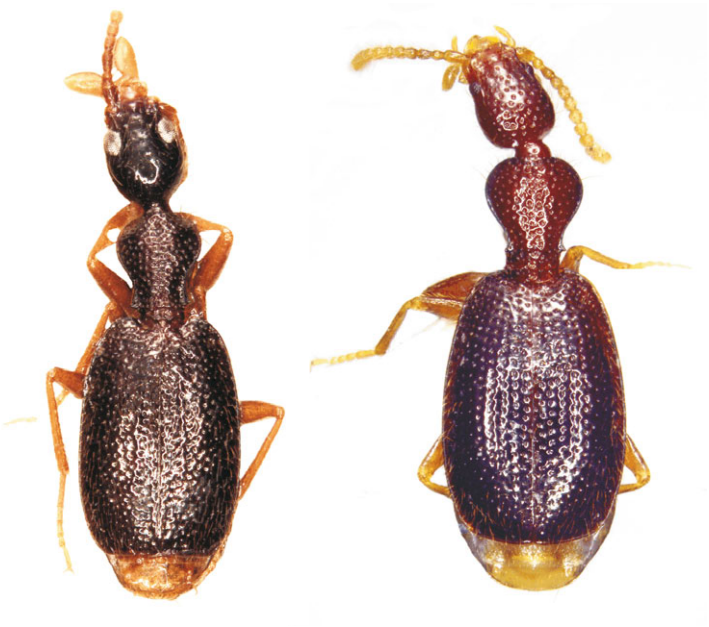
– Smaller species, length <4.45 mm; head shorter and wider, ratio length/width <1.55; elytra shorter and wider, ratio length/width <1.51; aedeagus elongate, with elongate, at tip slightly upturned apex (**B00** fig. 1), or unknown. Distribution different . . . . . 8.

8. Colour dark piceous to almost black; punctures on head and elytra much finer, distance between punctures considerably larger than their diameter; aedeagus elongate, with elongate, at tip slightly upturned apex (**B00** fig. 1). Garaina, northwestern Papua Peninsula, eastern Papua New Guinea . . . . . *C. garainae* BAEHR, 2000

– Colour lighter, head and pronotum dark reddish (Figs 4, 6); punctures on head and elytra much coarser, distance between punctures smaller than their diameter; aedeagus unknown. Crater Mt., central Papua New Guinea . . . . . *C. microps* **sp. n.**

Remarks

The two herein described New Guinean species rather differ *inter se* and belong to two different species groups within the genus. 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



Figs 3, 4. Habitus. Body lengths in brackets.
3. *Colasidia avicapitis* **sp. n.** (3.9 mm). **4.** *Colasidia microps* **sp. n.** (4.45 mm).

Figs 5, 6. Head and prothorax. **5.** *Colasidia avicapitis* **sp. n. 6**. *Colasidia microps* **sp. n.**

one hand lead to small species having short and wide, posteriorly rather triangular heads and comparatively short and convex elytra; and on the other hand to narrow and elongate species with fairly elongate heads and small eyes. *C. avicapitis*, alongside with the New Guinean species *C. kokodae* BAEHR, belongs to the probably most plesiotypic group of species within the genus (if plesiotypic means a short distance of a taxon from the base of the group-specific cladogram expressed in the number of dichotomies from the base of the cladogram), whereas *C. microps* belongs to the second group of small-eyed and long-headed species. It seems, thus, that the species occurring in New Guinea are not derived from a single ancestor, but that at least two colonization events must be postulated.

Unfortunately, very little is known about habits and ecology of any species of *Colasidia*, but 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, but for many 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 conspicuously in their body shape and structure.

What can be said is, that the complete range of the genus certainly is not yet fully recorded and that additional species could not only be detected within the range, i.e. in areas so far devoid of any records, e.g. on the Lesser Sunda Islands, Sulawesi, and the Moluccas, but probably also at the northern and north-eastern margin of the range, in Indochina and perhaps also in south-western China, as well as at the south-eastern border, e.g. in the Bismarck Archipelago and perhaps even on Solomon Islands. This will be only possible, however, if adequate sampling methods are employed and if sampling is done more systematically than it has been done so far in most areas.

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