New Tiger Beetle findings from Papua New Guinea (Coleoptera: Cicindelidae)

Fabio CASSOLA & Karl WERNER

Summary: The tiger beetle material is recorded which has been collected by Alexander RIEDEL (München) during his trip to Papua New Guinea (Morobe Province) in spring 1998. Amongst other interesting records, two new species Leptognatha (Leptognatha) riedeliana **n. sp.** and L. (L.) flavoantennalis **n. sp.**, the female of Darlingtonica papua (Darlington, 1947) and the male of Leptognatha (Thylacina) spinilabris Rivalier, 1972, are described. Three species Polyrhanis kampeni (Horn, 1913), L. (L.) latreillei (Guérin-Méneville, 1830) and L. (Th.) spinilabris are recorded as new for Papua New Guinea.

Zusammenfassung: Die von Alexander RIEDEL (München) bei seiner letzten Expedition in Papua Neuguinea (Morobe Provinz) erbeuteten Sandlaufkäfer werden dokumentiert. In der interessanten Ausbeute waren 2 neue Arten Leptognatha (Leptognatha) riedeliana **n. sp.** und L. (L.) flavoantennalis **n. sp.**, das Weibchen von Darlingtonica papua (Darlington, 1947) und das Männchen von Leptognatha (Thylacina) spinilabris Rivalier, 1972, beide bis dahin unbekannt, enthalten. Drei weitere Arten Polyrhanis kampeni (Horn, 1913), L. (L.) latreillei (Guérin-Méneville, 1830) and L. (Th.) spinilabris sind als neu für Papua Neuguinea zu melden.

Introduction

The tiger beetle fauna of New Guinea is still insufficiently known, due to the huge size of this island, to its complex geography, as well as to the lack of intensive appropriate field research. What is presently known, nevertheless, indicates such a fauna as being outstandingly rich and interesting, with an unusually high rate of endemic elements (CASSOLA 1987a, 1989, 1990; CASSOLA & WERNER 1996 a, b). Together with the new species described here below, the number of known New Guinean tiger beetles is raised up to 106 species, 88 of which (83%) are endemic to the island, and the number of species known from the Papua New Guinea alone is presently 77, 44 of which (57%) are endemic to the country (PEARSON & CASSOLA 1992, 1998).

Luckily enough, beginning in 1990, Mr. Alexander RIEDEL is regularly visiting New Guinea each year, exploring different areas of the island and bringing back each time, among other entomological materials, a rich tiger beetle booty. While his previous results came mainly from Irian Jaya, i.e. the Indonesian western half of New Guinea, and have already been studied by us in other recent papers (CASSOLA & WERNER 1996a, b), his 1998 trip has dealt with Papua New Guinea (Morobe Province) only. These new findings are now communicated here below. The specimens are deposited either in first author's (FC) and second author's (KW) collection. The deposit of the type specimens in a museum is provided.

Material

Subfamily Collyrinae Csiki, 1906 / Tribe Collyrini Fleutiaux, 1892 Subtribe Tricondylina Naviaux, 1991

Tricondyla aptera (Olivier, 1790)

Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 150 m, 04.03.98, 13, 19. Mianmin, 700 m, 21.05.98, 299.

A well-known apterous species, widely distributed in New Guinea and surrounding areas (Solomons, Maluku and the mid-peninsular rain forest of Cape York, North Queensland). The insect "is often seen roaming over rubbish where new gardens are being worked, climbing trees and running over the fallen branches" (GRESSITT & HORNABROOK 1977).

Subfamily Cicindelinae Csiki, 1906 / Tribe Cicindelini Sloane, 1906 Subtribe Prothymina Horn, 1910 (sensu RIVALIER 1971)

Darlingtonica papua (Darlington, 1947) (Fig. 1a, b)

Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 150 m, flight interception trap, 02.-05.03.98, 1Q (KW).

A poorly known species, which was described by DARLINGTON (1947) in the genus *Prothyma* Hope, 1838, based on two male specimens only, from Milne Bay in the south-eastern tip of New Guinea. In his revision of the tiger beetle fauna of New Guinea (CASSOLA 1987a), however, the first author has showed the species to be unrelated to *Prothyma* and,

because of its unusual characters, he placed it in a special separate new genus, *Darlingtonica* Cassola, 1987. The above mentioned specimen from the Morobe Province thus represents the third specimen known so far for the species, and moreover it is a female, for that reason we are able to complete DARLINGTONS description (1947) as follows:

Female of the same length as the male (8.0 mm, without labrum), narrow, elongate, entirely glabrous. Head black, proportionally large, wide between the eyes, fully rugose above, with many waved longitudinal striae on eyes, frons and vertex; cheeks almost smooth. Labrum fourhaired, large, approximately as long as wide, distinctly tridentate in front, rounded at sides, with the same reticulate, isodiametric microsculpture as the male. Mandibles relatively short, strong, fully rufescent; palpi testaceous with the last joints metallic dark.

Antennae short, hardly reaching the half of the elytral length; scape and 2^{nd} joint testaceous, articles 3 and 4 partly metallic dark, glabrous, antennomeres 5-11 black, dull, finely and evenly pubescent. Pronotum slightly longer than wide, coloured and sculptured as the head; coupling sulcus consisting in a small foveate puncture in the upper corner of mesepisternum. Elytra elongate, convex, parallel-sided, black with bluish or roseate reflections; surface with microsculpture like that of labrum, and also rather densely punctate, the punctures being small, round, more numerous and evident in front half, then shallower or even effaced behind. A yellowish, irregular, poorly evident lateral band is noticeable from the shoulder to the subapical arc, slightly protruding on disc with a short humeral lunule and a straight, slightly oblique spur in the middle; this band appears to be briefly interrupted before the subapical arc.

Subtribe Theratina Horn, 1908

Therates b. basalis (Dejean, 1826)

Tekadu, 300-400 m, 28.02.-06.03.98, 2♂♂. Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 150 m, 04.03.98, 2♀♀.

A typical New Guinean species, widely distributed from Misool and Waigeo to the main island and eastwards to the Solomon Islands. All over New Guinea, specimens, including the two ones mentioned above, have a metallic bluish-black metasternum, thus belonging to the nominate subspecies.

Subtribe Cicindelina Horn, 1908 (sensu RIVALIER 1971) Polyrhanis barbata (Horn, 1895)

Tekadu 300-400 m, 28.02.-06.03.98, 1♂, 1♀. Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 180 m, lux, 02.-04.03.98, 1♂; ibid., 150 m, 04.03.98, 3♂♂, 1♀.

E-Pindiu, Kobau 1250-1400 m, 24.04.98, 1♂, 1♀. Mindik 1200-1500 m, 26.04. 98, 1♂, 2♀♀.



Fig. 1. Darlingtonica papua (Darlington, 1947), female specimen from Lakekamu Basin, Ivimka Riv. Stat.: habitus (a), labrum (b). Polyrhanis paulae Cassola, 1987, male specimen from same locality: left elytron (c). Leptognatha (Thylacina) spinilabris Rivalier, 1972, male specimen from same locality: labrum and left mandible (d), aedeagus (e). A common, variable, widely distributed species, known from the Bismarck Archipelago westwards to the "Vogelkop" (CASSOLA 1987a, CASSOLA & WERNER 1996a). One of the males from the Lakekamu Basin is particular in having a slightly longer, distinctly tridentate labrum.

Polyrhanis ancorifera (Horn, 1897)

Aseki, Oiwa, 1600-1700 m, 22.02.98, 13; 1600-1700 m, 11.-12.03.98, 33349, 1700-1800 m, 10.-11.04.98, 13. Range betw. Aseki-Menyamya, 2000-2200 m, 12.04.98, 13. Aseki, 1200-1400 m, 14.04.98, 19. E-Pindiu, Kobau 1250-1400 m, 24.04.98, 13.

Basically a mountain species, commonly found all over New Guinea (CASSOLA 1987a).

Polyrhanis paulae Cassola, 1987 (Fig. 1c)

Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 150 m, 04.03.98, 333 (KW), 13 (FC).

This species has been described by CASSOLA (1987a), based on a male specimen from Kiunga, Western Province, and a female specimen from Iriri nr. Kerema, Gulf Province. The four specimens mentioned above, therefore, represent the 3^{rd} to 6^{th} specimens known so far, and moreover they extend to the Morobe Province as well the known range of the species. These specimens show the very same characteristic shape of aedeagus as the holotype, however they all slightly differ in elytral markings, by having a longer marginal middle line which projects in front well over the middle discal spot.

Polyrhanis kampeni (Horn, 1913)

Mianmin, 700 m, 21.05.98, 13, 19 (KW).

Description based on a single male specimen from "Hollandia" (HORN 1913), this species was again recorded from the Fakfak (CASSOLA 1987a, one female specimen) and Jayawijaya (CASSOLA & WERNER 1996a, two male specimens) districts, also in Irian Jaya, and it was shown to belong to the *pseudopupillata-klynstrai-olthofi* species group (CASSOLA & WERNER 1996a). The newly collected specimens, therefore, represent respectively the 5th and 6th ones known so far, and moreover they slightly differ from the previously known specimens because of the more setose lateral sides of clypeus and the dull blackish colour (instead of greenish bronze) of head and pronotum. New to Papua New Guinea.

Leptognatha (Leptognatha) latreillei (Guérin-Méneville, 1830)

Tekadu 300-400 m, 28.02.-06.03.98, 299. Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 150 m, 04.03.98, 1♂, 299 (KW), 19 (FC). This is the oldest and the typonominal species of the genus *Lepto-gnatha* Rivalier, 1963, but ironically it is still one of the least known of this genus. The few available specimens seemed to limit the species range to the Irian Jaya only (CASSOLA 1987a), but the ones listed above demonstrate that it occurs in Papua New Guinea as well.

Leptognatha (Leptognatha) orientalis Rivalier, 1972

Tekadu 300-400 m, 28.02.-6.03.98, 1Q.Timini 200 m, 06.04.98, at light, 13.

Unlike the *latreillei*-group of species, *L. orientalis* and its allied species form a different group of species which are immediately recognizable by their bare instead of hairy metepisterna. As far as we know, this species is a common Papua New Guinea endemic (Eastern Highlands, Madang, Morobe and Northern provinces).

Leptognatha (Leptognatha) longidentis Cassola, 1987

Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 150 m, 04.03.98, 233.

A poorly known species, easily recognizable from the closely related *L. orientalis* because of the very long second inner tooth (even exceeding the length of the apical tooth) of male left mandible. The two male specimens mentioned above represent respectively the 7^{th} and 8^{th} ones known so far.

Apparently a Papua New Guinea endemic (Eastern Highlands, Central and Morobe provinces).

Leptognatha (Leptognatha) riedeliana n. sp. (fig. 2 a-e)

Diagnosis: A small black *Leptognatha* species of the *orientalis* group, with proportionally short elytra and long slender legs, having long black antennae in both sexes. Female with a black subtriangular labrum and a distinct curved groove in mesepisterna (coupling sulcus); male with a short, mostly green-metallic labrum and a long 2^{nd} inner tooth of left mandible.

Aedeagus short, bulky, straight, ending in a short blunt apex.

Description: Head glabrous, almost smooth, dull black with some metallic hue on vertex and slight cupric reflections on clypeus; cheeks light metallic golden-green, a small shining metallic golden-green area above the insertion of the antennae. Eyes yellowish, relatively small. Labrum four-haired, wider than long, subtriangular in front and distinctly carinated in the female, shining black with slight metallic green reflections around the setigerous punctures; shorter, smoother, more transverse, slightly unidentate, black with strong metallic green reflections in the male. Mandibles long, slender, slightly curved outwards before the middle, testaceous at base, shining black after the basal molar tooth, rufescent on teeth; 2nd inner tooth of left mandible of male much longer than the other teeth (including the apical one), slightly directed upwards. Labial and maxillary palpi slender, elongate, testaceous with the last joint metallic black (except the extreme tip which is testaceous), the maxillary palpi also more or less darkened above. Antennae slender, very long, obviously surpassing the body length in the male, reaching approximately the third fourth of the elytral length in female; articles 1-4 glabrous, shining metallic black, joints 5-11 finely and evenly pubescent, fully dull black in both sexes.

Thorax: pronotum obviously longer than wide, parallel-sided, moderately flattened on disc; surface bare and smooth, with some transversal grooves on disc, dull black with a slight metallic hue, entirely glabrous except for a tuft of light curly hairs behind on lateral hind corners, near the elytral base. Episterna light golden metallic green, with cupric reflections, entirely smooth and bare, with a distinct curved groove in mesepisterna of female (coupling sulcus).

Elytra much wider than head with eyes, 5.2-5.4 mm long, slightly rounded at sides, rather convex on disc, obviously depressed on disc before the elytral apex and in front third at sides of suture; colour dull black, with a velvety shot silky appearance, with no elytral markings except for a light yellowish humeral patch below the shoulders of both sexes. Hind margins evenly rounded, apically emarginate, with no sutural tooth. Epipleura more or less testaceous rufous, with some dark metallic hue behind.

Underside glabrous, metallic light golden green with some cupric reflections, with a few fine curly hairs on the front part of pro- and mesocoxae and along the extreme side margins of metacoxae; trochanters testaceous. Femora enlarged, distinctly club-shaped, with fine white curly pubescence on basal half; light metallic green at base, more or less dark brownish bronze apically. Tibiae and tarsi shining metallic black, tarsal claws rufescent.

Aedeagus short, bulky, straight, with a short blunt apex.

Length: 8.5-8.8 mm (without labrum).

Male holotype and one paratype pair from Papua New Guinea (Morobe Province): Mianmin, 700 m, 21.05.98, A. RIEDEL leg.; holotype and female paratype in KW collection, male paratype in FC collection.

Etymology: This small additional new *Leptognatha* species is named in honour of its collector, Mr. A. RIEDEL, who is greatly contributing to the knowledge of the tiger beetle fauna of New Guinea.

Remarks. L. riedeliana **n. sp.** is clearly a near relative of L. orientalis, however obviously differing because of the much smaller size, the much longer antennae, the dark metallic labrum, and the shape of male mandi-

bles (which are somewhat reminiscent of those of *L. longidentis*) and aedeagus. Its discovery, as well as that of the species described below, clearly demonstrates that the genus *Leptognatha* Rivalier, 1963, is still insufficiently known and may well still include many additional, presently undiscovered species. With 32 species known so far, however, it proves itself to be, together with the genus *Polyrhanis* Rivalier, 1963, the most important and distinctive feature of the tiger beetle fauna of New Guinea.



Fig. 2. Leptognatha (Leptognatha) riedeliana n. sp., holotype male from Mianmin: habitus (a), labrum and left mandible (b), left mandible: side view (c), aedeagus (d); female paratype from same locality: labrum (e), mesepisternum (f).

Leptognatha (Leptognatha) flavoantennalis n. sp. (Fig. 3 a-e)

Diagnosis: A small black *Leptognatha* species of the *orientalis* group, very similar to the preceding species, however differing because of the light yellowish colour of the 8th and 9th joints of female antennae, as well as the enlarged, flattened, albard-shaped 2nd inner tooth of male mandibles. Labrum subtriangular, shining black with some green metallic reflections in both sexes.

Female with almost no coupling sulci.

Aedeagus short, bulky, straight, with a short blunt apex.

Description: Head glabrous, almost smooth, dull black with some metallic hue on vertex, light metallic golden-green on clypeus and cheeks; a bluish-green metallic area above the insertion of the antennae. Eyes vellowish, relatively small. Labrum four-haired, wider than long, subtriangular in front, more or less distinctly carinated in the middle, shining black with slight green metallic reflections at sides and in setigerous punctures; slightly shorter and smoother in the male. Mandibles long, slender, slightly bent outwards before the middle, testaceous at base, shining black after the basal molar tooth, rufescent on teeth; 2nd inner tooth of male larger and longer than the other inner teeth, flattened, albard-shaped. Labial and maxillary palpi slender, elongate, testaceous with the last joint metallic black (its extreme tip excepted), the maxillary palpi also more or less darkened above. Antennae slender, very long, obviously surpassing the body length in male, nearly reaching the elytral tip in female; articles 1-4 glabrous, shining metallic black, joints 5-11 finely and evenly pubescent, fully dull black in both sexes, except the 8^{th} , the 9^{th} and sometimes the basal half of 10^{th} antennomeres which are light yellow in female.

Thorax: pronotum obviously longer than wide, parallel-sided, moderately flattened on disc; surface bare and smooth, dull black with some slight metallic hue, entirely glabrous except for a tuft of light curly hairs behind on lateral hind corners, near the elytral base. Episterna light golden metallic green, entirely smooth and bare, without any evident mesepisternal coupling sulci in female.

Elytra much wider than head with eyes, relatively short (4.8-5.3 mm), slightly rounded at sides, rather convex on disc, obviously depressed on disc before the apex and in front third at sides of suture; colour dull black, with a velvety shot silky appearance; no elytral markings, except for a light yellowish humeral patch below the shoulders of both sexes. Apical margins evenly rounded, apically emarginate, without any evident sutural tooth. Epipleura yellowish-testaceous in front, more or less darkened behind.

Underside and abdominal sternites light metallic golden-green with some cupreous reflections at sides. Coxae also light metallic goldengreen, with some white hairs in the front part of pro- and mesocoxae and along the extreme side margins of metacoxae; trochanters testaceous. Femora enlarged, distinctly club-shaped, with fine white curly pubescence on basal half; light metallic green at base, more or less dark bronze apically. Tibiae and tarsi shining metallic black, tarsal claws rufescent.

Aedeagus short, bulky, straight, with a short blunt apex.

Length: 8-8.5 mm (without labrum).

Female holotype and four female paratypes from Papua New Guinea (Morobe Province): Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 150 m, 04.03.1998, A. RIEDEL leg.; five additional paratypes (one male, four females) from Tekadu, 300-400 m, 28.02.-6.03.98, A. RIEDEL leg.; holotype and 6 paratypes in KW collection, two female paratypes in FC collection.

Etymology: This small remarkable new *Leptognatha* species is so named because of the unusual colour pattern of female antennae, whose 8^{th} and 9^{th} joints are pale yellow instead of black.

Remarks: L. flavoantennalis **n**. sp. is clearly a close relative of the preceding species and it could even be regarded as conspecific, unless for the obviously different shape of male mandibles, the almost lacking coupling sulci of female and the very characteristic colour pattern of female antennae (8^{th} and 9^{th} joints light yellow instead of black). Further material from many additional localities will probably help in the future to get a better definite assessment of the geographical range and the respective taxonomic relationships of these newly described interesting taxa.

Leptognatha (Leptognatha) viridimicans (Brouerius van Nidek, 1959) Tekadu 300-400 m, 28.02.-6.03.98, 1 (KW).

The immaculate light green elytra, with the brown ground colour more or less shining through, as well as the peculiar pointed shape of male aedeagus, make this species easily recognizable. Described from the Snow Mountains in eastern Irian Jaya (BROUERIUS VAN NIDEK 1959), it had already been recorded from Papua New Guinea (Western Province) by the first author (CASSOLA 1987a). This new record represents a nice eastern range extension.

Leptognatha (Thylacina) spinilabris Rivalier, 1972 (Figs. 1 d, e)

Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 180 m, lux, 02.-04.03.98, 13.

A small, bronze, long-legged species, which was known so far by just seven female paratype specimens, from the region of Hollandia, Irian Jaya. The above mentioned specimen now extends the known species's range to Papua New Guinea as well, and moreover it allows us to complete RIVALIERS description (1972) by describing the male too. The study of the aedeagus has showed that this species well belongs to the subgenus *Thylacina* Rivalier, 1963, as the first author (CASSOLA 1987a) had rightly supposed.

Male 7,6 mm long (without the labrum), dark metallic bronze with some roseate reflections on elytra, dull greenish-black on head and pronotum; labrum subtriangular, testaceous, shortly darkened in front tip; mandibles and palpi long, slender, testaceous, partly darkened above. Antennae black, much longer than those of female, even surpassing the specimen's body length. Pronotum longer than wide, slightly restricted in front, finely setose at sides (pubescence probably rubbed-off on disc). Elytral markings consisting in a roundish humeral spot on shoulders and a large sinuated apical lunule behind.

Underside dark greenish to golden-green, coxae, trochanters and the two last abdominal sternites testaceous; episterna, epimera and first abdominal sternites with some white erect pubescence. Aedeagus narrow, elongate, arcuated, with a long ventrally bent apical beak, somewhat intermediate in shape between those of L. (Th.) rudolfbennigseni (W. Horn, 1912) and L. (Th.) sumliniana Cassola, 1987 (CASSOLA 1987a).

Guineica tetrachoides (Gestro, 1876)

Tekadu-Kakaro, Lakekamu Basin, Ivimka Riv. Stat., 150 m, 04.03.98, 13.

A widely distributed species, commonly found in both the Irian Jaya and Papua New Guinea (CASSOLA 1987a) and also known from the Solomons as well (CASSOLA 1987b).

Myriochile (Myriochile) semicincta (Brullé, 1834)

Garaina, 700 m, 21.03.98, at light, 2 ♂♂. Timini 200m, 06.04.98, at light, 5♂♂, 7♀♀.

A well-known Australian species, widely distributed in the whole of New Guinea, a large part of northern and eastern Australian continent, and some eastern archipelagos such as the Solomon and Loyalty Is., the Vanuatu (New Hebrides) and New Caledonia (CASSOLA 1987a,b). As most *Myriochile* species do, it apparently comes readily to lights at night.



Fig. 3. Leptognatha (Leptognatha) flavoantennalis n. sp., holotype female from Lakekamu Basin, Ivimka Riv. Station: habitus (a), labrum (b), mesepisternum (c); paratype male from Tekadu: labrum (d), aedeagus (e).

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Authors: Fabio CASSOLA, Via F. Tomassucci 12/20, I-00144 Roma. Karl WERNER, Dr. Kisselmann-Straße 19, D-86971 Peiting.

Kollegenkontakte

Projekt

Laufkäfer des Bodenseeufers

Laufkäfer sind eine der wichtigsten Indikatorgruppen für Uferzonen an Fließ- und größeren Stillgewässern. Gefördert von der BRISTOL-STIFTUNG wurde 1998 mit einem Projekt begonnen, das zum Ziel hat, den aktuellen Kenntnisstand zu Laufkäfern an den Ufern des Bodensees – länderübergreifend für Deutschland, Österreich und die Schweiz – zu verbessern. Anhand dieser Artengruppe sollen Entwicklungsziele, räumliche Schwerpunkte und mögliche Maßnahmen zur Aufwertung der Ufer aufgezeigt werden.

Im Rahmen des Projektes werden sowohl Bestandsaufnahmen im Gelände durchgeführt als auch vorhandene Daten (ältere und neue) ausgewertet. In diesem Zusammenhang möchten wir alle Kolleginnen und Kollegen, die am Bodensee gesammelt haben, darum bitten, uns ihre Funddaten von Laufkäferarten zur Verfügung zu stellen. Dabei sind vor allem Daten vom Seeufer, aber auch von zufließenden Bächen und aus dem seenahen Hinterland von Interesse. Herzlichen Dank im voraus!

Michael BRÄUNICKE und Jürgen TRAUTNER, Johann-Strauß-Straße 22 D-70794 Filderstadt. Tel.: 07158/21 64; Fax: 07158/6 53 13; e-mail: gb atp@t-online.de

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