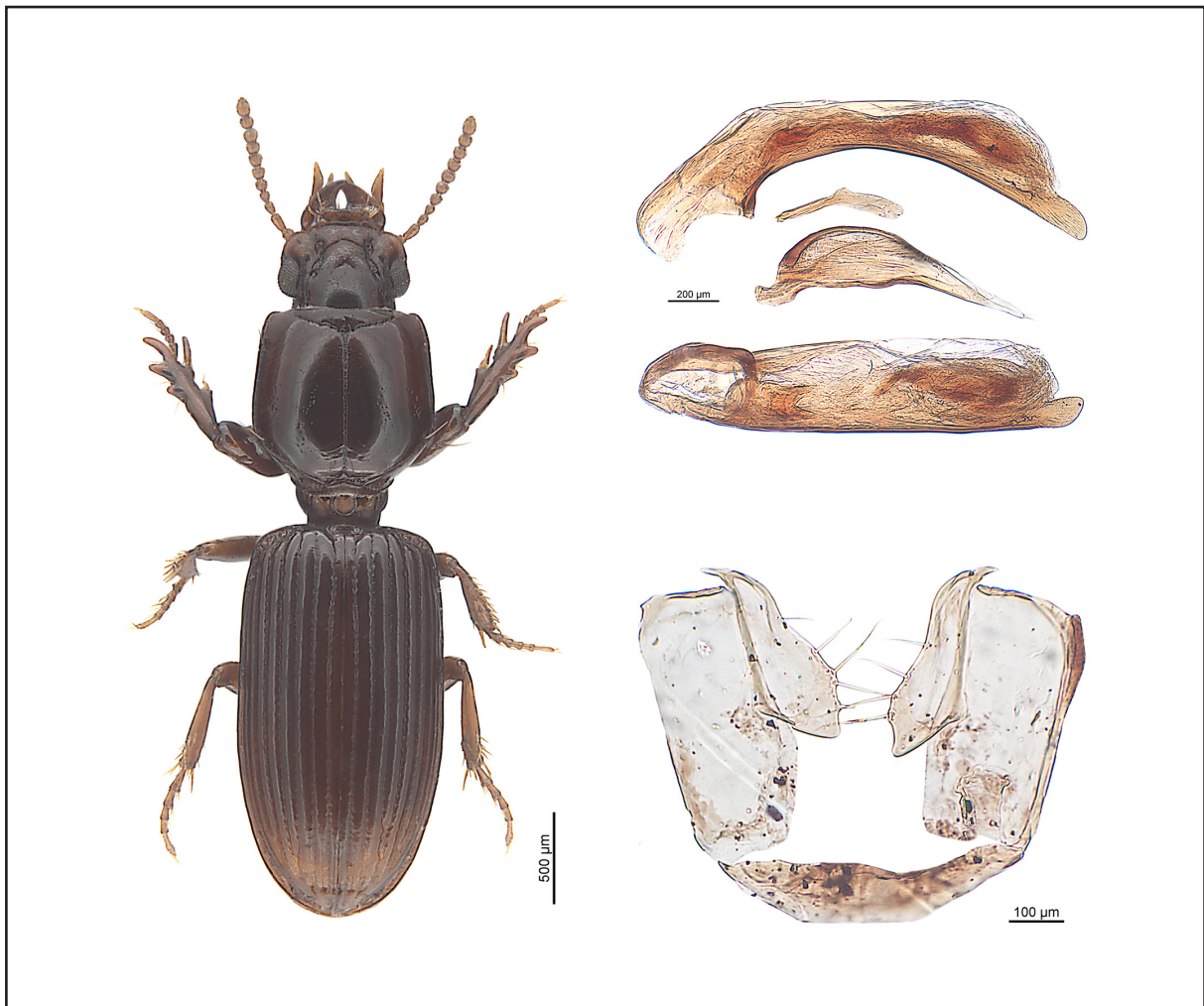


Belgian Journal of Entomology

The genus *Eoclivina* (KULT, 1959) from Africa with the description of two new species (Coleoptera, Carabidae, Clivinini)

Michael BALKENOHL



Volume 138

2023

Citation: BALKENOHL M., 2023. The genus *Eoclivina* (KULT, 1959) from Africa with the description of two new species (Coleoptera, Carabidae, Clivinini). *Belgian Journal of Entomology* 138: 1–17.

urn:lsid:zoobank.org:pub:9E295BCA-47CF-4991-930C-60E295516E51

In compliance with Article 8.6 of the ICZN, printed versions of all papers are deposited in the following libraries:

- Royal Library of Belgium, Boulevard de l'Empereur 4, B-1000 Brussels.
- Library of the Royal Belgian Institute of Natural Sciences, Vautier street 29, B-1000 Brussels.
- American Museum of Natural History Library, Central Park West at 79th street, New York, NY 10024-5192, USA.
- Central library of the Museum national d'Histoire naturelle, rue Geoffroy-Saint-Hilaire 38, F-75005 Paris, France.
- Library of the Muséum d'Histoire naturelle de Genève, route de Malagnou 1, CH-1208 Genève, Suisse.
- Zoological Record, Thomson Reuters, Publication Processing, 1500 spring Garden Street, Fourth Floor, Philadelphia PA 19130, USA.

EDITORIAL BOARD

Editor-in-Chief

Fons Verheyde

Email: fonsverheyde@hotmail.com

Desk editor

Isabelle Coppée

Email: icoppee@naturalsciences.be

ISSN: 1374-5514 (Print Edition)

ISSN: 2295-0214 (Online Edition)

Published: 16 June 2023

The Belgian Journal of Entomology is published by the Royal Belgian Society of Entomology, a non-profit association established on April 9, 1855.

www.srbe-kbve.be

Head office: Vautier street 29, B-1000 Brussels.

N° d'entreprise SRBE : 0408709597

RPM Bruxelles



The publications of the Society are partly sponsored by the University Foundation of Belgium.

Front cover : *Eoclivina basilewskyi* sp. nov. from Nigeria, Ile-Ife. Left side: Habitus, male, holotype, in dorsal view. Right side above: Male genitalia, holotype, dorsal and lateral view of the aedeagus with the parameres in between. Right side below: External female reproductive tract with gonocoxites, epileurites, and mediopleurite, paratype. © M. Balkenohl.

The genus *Eoclivina* (KULT, 1959) from Africa with the description of two new species (Coleoptera, Carabidae, Clivinini)

Michael BALKENOHL

Ligusterweg 9, CH-8906 Bonstetten, Switzerland (e-mail: mike.balkenohl@bluewin.ch)

Abstract

Members of the African genus *Eoclivina* Kult, 1959 are revised for the first time. The two new species *Eoclivina basilewskyi* sp. nov. and *E. schmidli* sp. nov. are described. All species of the genus are characterized and illustrated. A key to the species is proposed. Available recordings are provided.

Keywords: Scaritinae, Thliboclivinina, taxonomy

Zusammenfassung

Die Vertreter der afrikanischen Gattung *Eoclivina* Kult, 1959 werden zum ersten Mal revidiert. Die zwei neuen Arten *Eoclivina basilewskyi* sp. nov. und *E. schmidli* sp. nov. werden beschrieben. Alle Arten der Gattung werden charakterisiert und illustriert. Ein Bestimmungsschlüssel zu den Arten wird zur Verfügung gestellt. Verfügbare Fundorte werden mitgeteilt.

Introduction

Recently, the subtribe Thliboclivinina was erected on the basis of a bundle of extraordinary characters (BALKENOHL, 2022). These characters are the outstanding morphology of the female reproductive tract not found in any other Clivinini, the elongated and widened form of the supraantennal plates separating the eyes anteriorly or completely into two parts, the small pronotal base, and the mesotibia carrying several setigerous tubercles in rows.

The subtribe comprises four genera: *Thliboclivina* Kult, 1959, *Eoclivina* (Kult, 1959), *Physoclivina* (Kult, 1959), and *Sulciclivina* Balkenohl, 2022.

Thliboclivina and *Physoclivina* have already been treated including genus descriptions and identification keys to the species (BALKENOHL, 2001, 2018, DOSTAL, 2015). For *Sulciclivina* the genus description was provided and a key to the four genera of Thliboclivinina was given in BALKENOHL (2022) followed by an alpha-taxonomic revision of the species of *Sulciclivina* (BALKENOHL, in press). For *Eoclivina* adequate descriptions of the known three species are available (BASILEWSKY, 1955, KULT, 1959).

This contribution has the goal to revise the small genus by providing extended diagnoses to the three known species including figures, to describe two new species, and to provide an identification key to the species.

Material and methods

The material investigated consists of 406 specimens including most of the type material.

Terms, descriptions of characters and methods were based on BALKENOHL (2021, 2022).

Specimens were examined with stereomicroscopes Leica M205-C and Reichert-Jung Polyvar.

Measurements were taken electronically using the integrated and automatically calibrating measurement system of the IMAGIC Client software.

The genitalia dissected were mounted on transparent micro-slides and embedded in polyvinylpyrrolidone. After clearing overnight, these micro-slides were fixed on an object slide and used under the microscope. Descriptions were made from the genitalia with transmitted respectively top light (Reichert-Jung Polyvar microscope; used magnification 80–500 times). Dissected specimens are indicated separately under the material of the new species as males and females, respectively.

Photographs were taken with a 5-megapixel Jenoptic core 5 digital camera either through the stereomicroscope Leica M205–C using diffused light with Leica hood LED5000 HDI, or for the Polyvar microscope using halogen or mercury light. All pictures are composites, processed and optimized by using Imagic Client software and enhanced with CorelDRAW Graphics Suite X5.

The complete information given on labels are displayed in the description chapters of the new species verbatim as they appear on the labels.

ACRONYMS USED:

CMBB	Collection Michael Balkenohl, Bonstetten near Zürich, Switzerland;
DNMP	Ditsong National Museum of Natural History, Pretoria, South Africa;
ETHZ	Entomological Collection of the Eidgenössische Technische Hochschule Zürich, Switzerland;
NHMB	Naturhistorisches Museum Basel, Switzerland;
MNHN	Muséum national d'Histoire naturelle, Paris, France;
MRACT	Musée Royal de l'Afrique Centrale, Tervuren, Belgium;
RBINS	Royal Belgian Institute of Natural Sciences, Brussels, Belgium;
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany;
L/W	ratio length divided by width (used for the pronotum, elytra, and antennomeres)
[sic]	inserted to indicate verbatim quotation
\bar{x}	arithmetic mean (used in the measurements for the descriptive statistics)

Taxonomy

Family **Carabidae** Latreille, 1802
Subfamily **Scaritinae** Bonelli, 1810
Tribe **Clivinini** Rafinesque, 1815
Subtribe **Thliboclivinina** Balkenohl, 2022

Genus ***Eoclivina*** (Kult, 1959)

TYPE SPECIES: *Clivina dumolinii* Putzeys, 1846.

DIAGNOSIS. The genus *Eoclivina* is recognizable by the following characters: Small to medium sized (3.8–9.1 mm), brown or piceous with fuscous intermediate and hind legs, subcylindrical or long-oval shape of the habitus. Head with conspicuously wide supraantennal plates overtopping eyes anteriorly, labrum six-setose, mandibles distinctly widened in the basal part, frons of the head with an inverted V formed by a carina and in some species in addition with a slight sulcus posterior to the carina; pronotum with narrow base, posterior angles rounded-off, pleura just not visible in dorsal view; elytron with row of umbilical setigerous punctures in the lateral channel interrupted by a gap, striae one to three ending free at the base, intervals without setigerous punctures; hind wing fully developed or reduced; last visible sternite of the abdomen with the two marginal setigerous punctures widely separated; mesotibia with rows of tubercles latero-dorsally; gonocoxite monomer, small, leaf-like, hyaline. Occurrence: Tropical rain forest belt of Africa from the west coast to the Tanganyika Lake.

Identification Key to the *Eoclivina* species

- 1 Elytron with all intervals opaque, with all intervals completely and distinctly reticulated. Body length 5.45 mm. Eala, Democratic Republic of the Congo *E. burgeoni* (Kult, 1959)
 - Elytron with the inner intervals smooth (intervals 2-5 at a minimum) 2
- 2 Males: Elytron with interval eight reticulated; abdominal sternite smooth, glossy. Females: Elytron with intervals one and six to eight reticulated: abdominal sternite reticulated, opaque. Body length 5.1-5.5 mm. Angola: Dundo; Democratic Republic of the Congo: Kona *E. machadoi* (Basilewsky, 1955)
 - Elytron with intervals one to seven in both of the sexes smooth, glossy 3
- 3 Elytron with interval 8 reticulated (males and females); disk of pronotum glabrous. Body length 8.3-8.7 mm. Tanzania *E. schmidli* sp. nov.
 - Elytron with all intervals smooth, glossy (males and females). Distinctly smaller species (4.2 mm or less) 4
- 4 Abdominal sternite smooth, glossy; eye distinctly convex. Body length 3.8-4.2 mm. Tropical African rainforest belt from the west coast to the Lake Tanganyika *E. dumolinii* (Putzeys, 1846)
 - All abdominal sternites densely and distinctly reticulated, opaque; eye less distinctly convex. Body length 3.8-4.2 mm). Nigeria: Ile-Ifé *E. basilewskyi* sp. nov.

Species taxonomic account***Eoclivina dumolinii* (PUTZEYS, 1846)**

(Figs 1, 6, 10)

Clivina dumolinii PUTZEYS, 1846: 537;*Clivina dumolini* [sic] PUTZEYS, 1846. PUTZEYS 1863: 55; 1867: 116; CSIKI, 1927: 502;*Clivina pumilia* LUTSHNIK, 1926, CSIKI, 1933: 639; LORENZ 2005: 145; 2023: 5ZCCY;*Clivina (Eoclivina) dumolini* [sic] (PUTZEYS, 1846), KULT, 1959: 215;*Clivina (Eoclivina) dumolinii* (PUTZEYS, 1846), LORENZ 2005: 145; 2023: 5ZCCY;*Eoclivina dumolini* [sic] (PUTZEYS, 1846), BASILEWSKY, 1968: 43;*Eoclivina dumolinii* (PUTZEYS, 1846), BALKENOHL, 2022: 108.**MATERIAL INVESTIGATED.**

SENEGAL. 1♂, 1♀, Velingara (Fig. 1) (CMBB).

GUINEA. 1 spec., Tabéta (MRACT); 1♀, 4 specs, Conakry (CMBB).

COTE D'IVOIRE. 1 spec., Danané (MRACT); 1♀, 1 spec., Adiopodoumé (CMBB/SMNS); 84 specs, Parc Nat. Comoé (CMBB/SMNS); 9 specs, Bingerville (MRACT); 9 specs, Ferkes-sédougou (MRACT); 3 specs, Divo (MRACT).

GHANA. 19 specs, Ashanti, Kumasi (DNMP); 3♀♀, 11 specs, Kumasi (CMBB).

BENIN. 1♂, 2♀♀, Bembereke (CMBB); 2 specs, Wof Ouesse Vossa (CMBB); 1 spec., Save env., Dept. du Zou (SMNS).

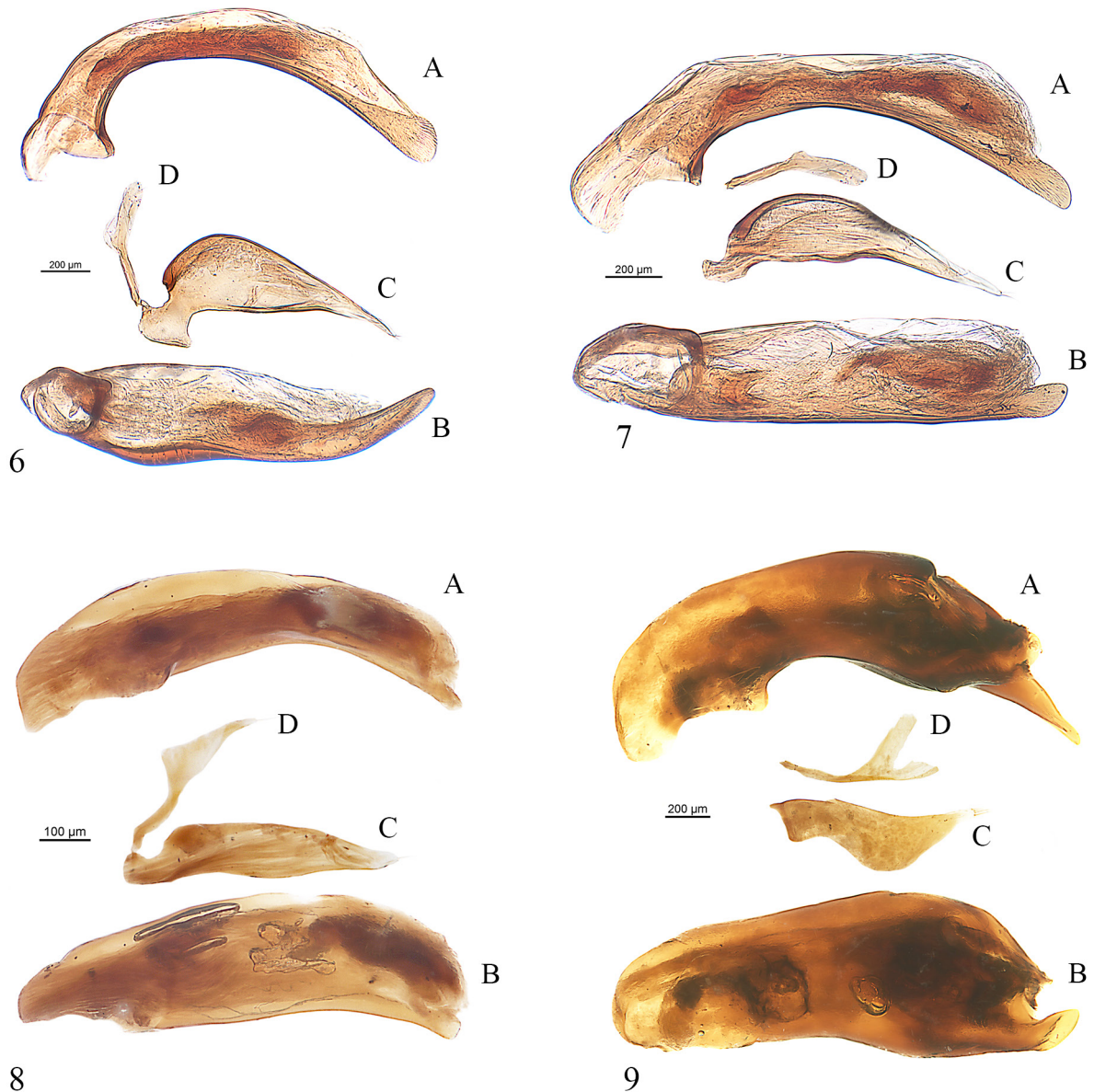
EQUATORIAL GUINEA. 5 specs, Bamanía (MRACT); 1 spec., Flandria (MRACT);



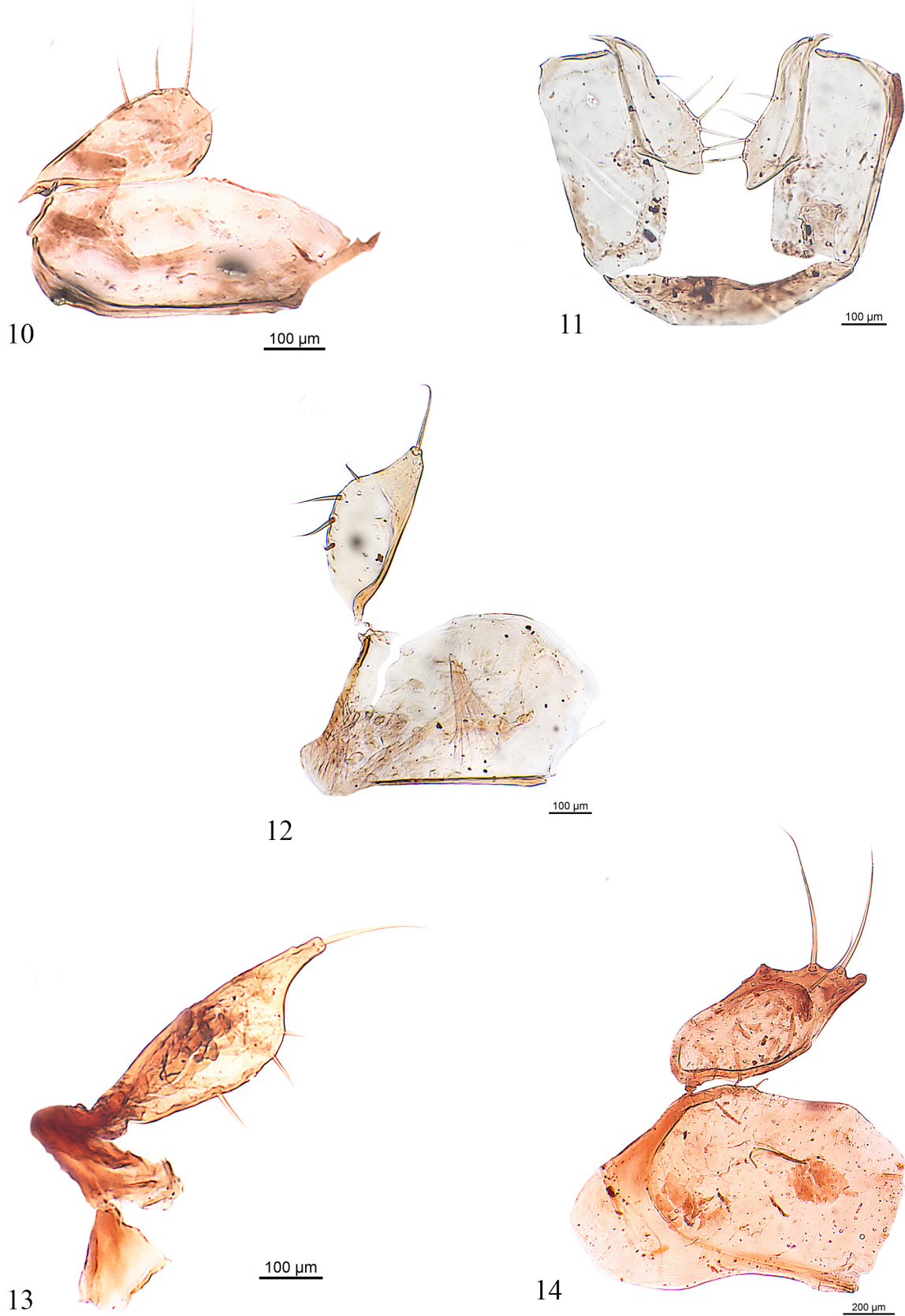
Figs 1-5. *Eoclivina* species, habitus, dorsal view. 1, *E. dumolinii* (Putzeys, 1846), ♂, specimen from Velingara, Guinea. 2, *E. basilewskyi* sp. nov., holotype. 3, *E. machadoi* (Basilewsky, 1955), holotype. 4, *E. burgeoni* (Kult, 1959), holotype. 5, *E. schmidli* sp. nov., holotype.

GABON. 1♀, Lac Zonanghe (ETHZ).

DEMOCRATIC REPUBLIC OF THE CONGO. 1 spec., Kwango (MRACT); 1 spec., Kaswabilenga (MRACT); 8 specs., Kivu, Kavimvira; 1 spec., Kivu, Sanghe Pl. de Ruzizi (MRACT); 1 spec., Coquilhatville (MRACT); 1 spec., Stanleyville a Coquilhatville (MRACT); 2 spec., Stanleyville (MRACT); 1 spec., Bamania (près Coq.) (MRACT); 2 specs, Eala (MRACT); 6 specs, Tshuapa, Mabali (MRACT); 7 specs, Tshela (MRACT); 3 specs, Kisanfu (MRACT); 2 specs, Sankuru, Kondue (MRACT); 9 specs, Haut-Ulele, Mauda (MRACT); 1 spec., Ulele, Dingila (MRACT); 2 specs, Ulelé, Kumu (MRACT); 1 spec., Lulua, Samdos (MRACT); 1 spec., Rutshuru (MRACT); 1 spec., Kivango, Terr. Feshi, Kiauza (MRACT); 1 spec., Gandajika (MRACT); 1 spec. Elisabethville (MRACT); 1 spec., Kuimba-Diambo (MRACT); 6 specs, Katanga, Kanzenze (MRACT); 8 specs, Thysville, Grotte (MRACT);



Figs 6-9. *Eoclivina* species, male genitalia. A-B, aedeagus. A, dorsal view. B, lateral view. C-D, parameres, dorsal view. 6, *E. dumolinii* (Putzeys, 1846), specimen from Velingara, Guinea. 7, *E. basilewskyi* sp. nov., holotype. 8, *E. machadoi* (Basilewsky, 1955), paratype from Riv. Chiumbe, Angola. 9, *E. schmidli* sp. nov., holotype.



Figs 10-14. *Eoclivina* species, females, gonocoxite and epipleurite, ventro-lateral view. 10, *E. dumolinii* (Putzeys, 1846), specimen from Velingara, Guinea. 11, *E. basilewskyi* sp. nov., paratype. 12, *E. machadoi* (Basilewsky, 1955), paratype. 13, *E. burgeoni* (Kult, 1959), holotype. 14, *E. schmidli* sp. nov., paratype.

6 specs, Kasongo (MRACT); 4 specs, Uele, Bambesa (MRACT); 1 spec., Kungu-Mabangi (MRACT); 7 specs, Zarfre, Kasai, Mbuji (MRACT); 3 specs, Riv. Semliki, rive g. (MRACT); 2 specs, Banga (MRACT); 1 spec., Kimuela (MRACT).

TANGANYIKA. 1 spec., Tanganijika, Moero, Niunzu (MRACT); 5 specs, pr. Kiaoma, 45 km N of Uvinza, 4°56.5'N, 30°16.6'E, 1150m (SMNS); 2 specs, Ost-Afrika, Peramiho-Songea (SMNS).

BURUNDI. 1 spec., Mugeru (MRACT).

ANGOLA. 21 specs, Dundo; 1♀, 2 specs, Dundo, Luna de Varvallo (MRACT); 8 specs, Nzargi-Andrada (MRACT); 1 spec., Youte Dundo-Sombo (MRACT); 8 specs, Lac Calundo E. Vila Loso (MRACT); 2 specs, Damba (MRACT); 6 specs, Angola 2-1791-4 and 13566.14 (MRACT); 3 specs, Angola 16411-7 7.22 S, 21.30 E; alt. 750 m (MRACT); 2 specs, Angola 16474-6 8.56 S, 20.38 E, alt. 1050 m (MRACT).

ZAMBIA. 1♀, 40 specs, Kapiri Mposhi; 4 specs, Mwinilunga (CMBB); 1 spec., 42 km N of Lusaka (CMBB); 1 spec., 50 km W Chingola (CMBB); 4 specs, 130 km W Solwezi (CMBB).

ZIMBABWE. 1 spec., Vungu (MRACT).

REMARKS. The type material of *C. dumolinii* consists of one specimen from Senegal, which should be deposited in the Collection Dupont (MNHN) (PUTZEYS, 1846). A careful search during a personal visit at the MNHN in November 2021 revealed there is no specimen from Senegal. BURGEON (1935) reports on page 150 “Le type unique est perdu.” It is also not deposited in the collection of Puzeys curated in RBINS and personally checked in November 2021. However, designation of a lectotype should be performed when all the sub-collections in the large treasure of the MNHN have been checked. The type of *C. pumilia* should be deposited in the museum of Saint Petersburg. It is not available for study at this time.

In total, 355 specimens were investigated including specimens from Senegal. Around 10% of these specimens were already determined by Basilewsky and Kult. The specimens correspond exactly to the descriptions of PUTZEYS (1846), BURGEON (1935), and KULT (1959). Although the type of *C. pumilia* is not available, I completely share the interpretation of KULT (1959, p. 215) regarding the synonymy. In addition, the material reported by LUTSHNIK (1926) was collected in Sierra Leone which is located in the tropical rain forest belt of Africa surrounded by other finds.

The specimen from Eala reported and roughly characterised as “*C. dumoloni*” by BURGEON (1937, p. 393) is obviously *C. burgeoni* Kult, 1959.

EXTENDED DIAGNOSIS. A small sized fuscous species with the following measurements: Body length 3.77–4.14 mm (\bar{x} = 3.92 mm*), width 1.07–1.18 mm (\bar{x} = 1.12 mm*), ratio L/W of pronotum 0.94–0.98 (\bar{x} = 0.95*), ratio L/W of elytra 1.86–1.97 (\bar{x} = 1.89*); (*n = 10). The apex of the elytron is more or less pale fulvous coloured. Wing of the clypeus small. Eye distinctly convex in dorsal view. Pronotum with lateral margin indistinctly convex and slightly attenuating anteriorly, on the disk baso-laterally with small but distinct group of punctures, medially with group of punctures, proepisternum tumid laterally but just not visible in dorsal view. Elytra with the shape long-oval with straight and diverging part of the lateral margins, with maximum width slightly behind middle, intervals smooth and glossy in both sexes, row of umbilical setigerous punctures of the lateral channel interrupted posterior humerus and at middle. Abdominal sternite in males and females smooth and glossy at middle, laterally with some punctures. Mesotibia with row of eight setigerous tubercles latero-dorsally, with row of setigerous tubercles laterally.

Hind wing: Fully developed.

Male genitalia (Fig. 6): Median lobe slender, distinctly and at middle regularly arcuate, with

wide and rounded spatula. Endophallus with larger group of bristles basally.

Female gonocoxite and epipleurite (Fig. 10): Gonocoxite foliform with clubbed shape, completely flattened, with three robust nematiform setae positioned at the median side, subapically with one small seta. Epipleurite long quadrangular, asetose.

Sexual dimorphism at the integument: Not observed.

VARIATION. The clypeal wings are more or less convex. On the disk of the pronotum, the median group of punctures is developed with variable number and distinctness and more or less extended anteriorly. The smaller punctures scattered on the disk are more or less dense. On the abdominal sternite, the laterally situated punctures vary in number. The pale coloration at the apex of the elytron varies from just traceable at the tip of the apex to one fifth of the posterior elytron.

Most distinguishing characters from the similar species *E. basilewskyi* sp. nov. are the smooth and glossy surface of the abdominal sternite (in both sexes), the more convex eye, the different shape of the male aedeagus and of the female gonocoxites.

DISTRIBUTION. The species is widely distributed along the tropical rain forest belt of Africa from Senegal to Zimbabwe. The summarized data confirm the faunistic records from different regions along the rain forest belt (BASILEWSKY, 1948, 1952, 1953, 1955, 1963, 1967, 1968, 1969).

***Eoclivina basilewskyi* sp. nov.**

(Figs 2, 7, 11)

urn:lsid:zoobank.org:act:5D13B28C-52D3-4338-87FE-B68FCEBCA35C

ETYMOLOGY. The name is a patronym in honour of the Belgian entomologist Pierre Basilewsky, curator of the Musée Royal de l’Afrique Centrale, Tervuren, Belgium, specialist in Carabidae and especially in Scaritinae, who published his results in 404 contributions during 1929 and 1992 (REIGNIEZ & ANDRÉ, 1994).

TYPE MATERIAL. Holotype: ♂, with white black printed label and data: “Coll. Mus. Tervuren Nigeria : Ile-Ife J.T. Medler” (Fig. 2) (MRACT).

Paratypes: 1 ♂, 6 ♀♀, 1 spec., with blue black printed label and data: “NIGERIA: Ile-Ife 7.VIII.1986 leg.: F.-T. KRELL” / white, black printed “Clivina SG. Eoclivina dumolinii PUTZ. det. Balkenohl 94” (CMBB); 6 specs, same data as before (SMNS); 1 ♂, 4 ♀♀, 4 specs, “Coll. Mus. Tervuren Nigeria: Ile-Ife J.T. Medler” (MRACT).

REMARK. The majority of the paratypes from MRACT are more or less rotten inside.

DIAGNOSIS. A small sized fuscous species with long-oval elytra with straight and slightly diverging part of the lateral margins, all intervals of the elytron smooth, and with the apex of the elytron more or less pale fulvous coloured. Distinguished from the most similar species *E. dumolinii* by the completely reticulated abdominal sternite (in both of the sexes), the less convex eye, the different shape of the male aedeagus and the different shape of the female gonocoxite.

DESCRIPTION. *Measurements*. Holotype: Body length 4.15 mm, width 1.21 mm; ratio L/W of pronotum 0.96; ratio L/W of elytra 1.86. Paratypes: Body length 3.84–4.18 mm (\bar{x} = 4.04 mm*), width 1.12–1.21 mm (\bar{x} = 1.16 mm*), ratio L/W of pronotum 0.95–1.01 (\bar{x} = 0.97*), ratio L/W of elytra 1.85–1.9 (\bar{x} = 1.88*); (*n = 10).

Colour: Glossy. Dark fuscous. Mouthparts, antenna, intermediate and hind leg fuscous. Supraantennal plate translucent-fuscous. Elytron with the tip of apex pale fuscous.

Head: About a quarter narrower than pronotum. Clypeus with central part bilobed anteriorly;

lateral lobe slightly projecting, wing small, separated from clypeus by obtuse notch, separated from supraantennal plate by sharp notch. Supraantennal plate wide, laterally regularly convex and somewhat less projecting as eye; clypeus, wing, and supraantennal plate reflexed margined. Supraantennal plate overlapping eye latero-anteriorly less than a fifth (dorsal view), extended posteriorly into a keel, separated from wing by a slight furrow. Clypeus transverse, convex in frontal view, concave in lateral view, separated from frons by distinct sharp carina in form of a flat inverted V. Frons convex, with a triangle-like impressions at middle, with supraorbital carina extending from anterior to posterior eye-level. Clypeus and frons smooth, separated from supraantennal plate and supraorbital carina by deep moderately wide furrow, with clypeal seta in front; with two supraorbital setigerous punctures at middle and posterior end of the eye. Neck constriction missing. Eye moderately convex in dorsal view. Main part of eye situated ventrally where it is globose. Due to the overlapping supraantennal plate and the gena, the eye resembles in lateral view contracted at middle. Gena distinct, moderately convex, covering a quarter of posterior eye in ventral view. Antenna moderately short, reaching middle of pronotum. Labrum nearly straight anteriorly, slightly trilobed, with transverse to irregular reticulation, six setose. Mentum with base isodiametrically reticulated, with lateral lobe moderately hollowed out, shape of lobe asymmetric, regularly convex laterally, with irregular surface. Median tooth shorter than lateral lobe, wide and hollowed out at apex, with short carina at base.

Pronotum: Disk moderately convex in lateral view, distinctly convex in frontal view with increasing convexity laterally. Indistinctly wider than long, peltate. Reflexed lateral margin smooth, attenuating in anterior half with nearly straight part, widest behind middle; anterior angle distinct, slightly projecting, rounded off, posterior angle missing; lateral channel moderately narrow, completely and regularly rounded off at posterior setigerous puncture and continuing up to base. Median line distinctly engraved, somewhat punctured, complete. Anterior transverse line consisting of longitudinal connected punctures, joining median line, not joining anterior margin. Surface almost smooth, with few micro punctures, with circular group of medium sized punctures baso-laterally, with paramedian longitudinal group of punctures in basal half, with a few transverse wrinkles. Base narrow but distinct, three times as wide as lateral channel. Proepisternum not visible in dorsal view.

Elytron: Disk slightly to moderately convex in lateral view, distinctly and regularly convex in frontal view. Shape long-oval with nearly straight and diverging part in anterior half, with maximum width slightly behind middle. Humerus distinct. Reflexed lateral margin smooth. The row of setigerous punctures in the lateral channel is interrupted posterior of the humerus by a small gap and at middle by a wider gap. Scutellar striole missing; setigerous tubercle at base of first stria, with small tubercle at base of third interval, basal declivity with isodiametric reticulation. Humeral tooth small, situated at base of fourth interval. Striae moderately deep, distinctly and regularly punctuate-striate, one to three free at base, four to six reaching humerus, one and two indistinctly joining at apex, three and four, and five and six distinctly joining apically. Intervals convex, more convex laterally, interval eight narrow, carinate at apex. Surface of intervals glossy, interval eight smooth, intervals smooth at apex.

Hind wing: Fully developed.

Lower surface: Proepisternum with lateral two-thirds distinctly isodiametrically reticulated, with dense transverse wrinkles. Sternites of abdomen in both sexes completely covered with isodiametric reticulation, opaque. The two marginal setigerous punctures are widely separated.

Legs: Protibia covered with distinct longitudinal reticulation, with three spines of moderate length, not sulcate dorsally, movable spur as long as apical spine, slightly arcuate in apical third. Intermediate tibia with five tubercles at the inner side and seven at the lateral side, tubercles furnished with strong setae.

Male genitalia (Fig. 7): Median lobe relatively long, slender, moderately arcuate, flattened laterally, with asymmetric spatula. Endophallus with two groups of bristles.

Female gonocoxite and epipleurite (Fig. 11): Gonocoxite foliform, elongated, completely

flattened, with five robust nematiform setae positioned at the median side, apex asetose. Epipleurite long quadrangular, asetose.

Sexual dimorphism at the integument: Not observed.

VARIATION. In the eighteen specimens investigated, the clypeal wing varies in size. On the elytron, stria one and two are joining at apex in some specimens, in others they are ending free. The pale coloration at the apex of the elytron varies considerably in colour and extend.

DISTRIBUTION. Known from Ile-Ifé in Nigeria.

***Eoclivina machadoi* (BASILEWSKY, 1955)**

(Figs 3, 8, 12)

Clivina machadoi BASILEWSKY, 1955: 101;

Clivina (Eoclivina) machadoi (BASILEWSKY, 1955), KULT, 1959: 215; LORENZ 2005: 145; 2023: 5ZCCZ;

Eoclivina machadoi (BASILEWSKY, 1955), BALKENOHL, 2022: 108.

TYPE MATERIAL. Holotype: ♀, with white black printed and handwritten in black ink label and data: “Angola : Dundo Forêt (Luachimo) IX. 1948 A.deBarrosMachado” / handwritten in black ink: “11 30.4” / red, black framed and printed: “HOLOTYPUS” / white, handwritten in black ink and printed: “Clivina machadoi, n.sp. P. Basilewsky det., 1953” / white, black printed: “RMCA ENT 000019856” and a bar code (Fig. 3) (MRACT).

Paratypes: 1 ♂, same data as holotype (MRACT); 1 ♂, 1 ♀, with white black printed label and data: “Angola: Riv. Chiumbe, 40 km E. de Dundo V-1949 A.deBarrosMachado” / handwritten in black ink: “1493.18” / red, black framed and printed: “PARATYPUS” / white, handwritten in black ink and printed: “Clivina machadoi, n.sp. P. Basilewsky det., 1954” (MRACT).

ADDITIONAL MATERIAL. ANGOLA. 1 ♂, 1 ♀, Angola: 15908.6 7.20 S, 20.52 E; alt. 720 m R. Cambuacala, env. Dundo A. de Barros Machado (MRAC); 2 ♂♂, ANG. 14614.14 (MRAC). DEMOCRATIC REPUBLIC OF THE CONGO. 1 ♀, Coll. I.R.Sc.N.B. Congo D.R. Kona 2°02'32.97"N, 22°47'26.09"E 11.v.2010, swamp forest Light trap, leg. P. Grootaert I.G.: 33.593 (RBINS).

EXTENDED DIAGNOSIS. A medium sized piceous species with the following measurements: Body length 5.1–5.53 mm (\bar{x} = 5.39 mm*), width 1.51–1.61 mm (\bar{x} = 1.58 mm*), ratio L/W of pronotum 0.95–0.99 (\bar{x} = 0.97*), ratio L/W of elytra 1.82–1.87 (\bar{x} = 1.84*); (*n = 9). The elytron is unicolor. Wing of the clypeus relatively wide but nearly fused with lateral lobe of the clypeus. Eye convex and projecting laterally. Pronotum with lateral margin slightly attenuating anteriorly with straight parts anterior middle, on the disk with scattered small to moderate sized punctures, punctures larger towards base, proepisternum just not visible in dorsal view. Elytra with the shape long-oval with straight and diverging part of the lateral margins, with maximum width slightly behind middle, intervals with different pattern of reticulation among the sexes: In males, interval eight reticulated, all the others are smooth and glossy. In females, the reticulation covers intervals one, and six to eight. In addition, the base is reticulated as well as around a fifth of the apex. Intervals two to five smooth on the disk. Row of umbilical setigerous punctures of the lateral channel interrupted posterior humerus and at middle by one puncture. Abdominal sternite in males with minute punctures, smooth and glossy at middle, laterally with some smaller punctures, sternite of females distinctly and completely covered with transverse reticulation. Intermediate tibia with six tubercles at the inner side and eight at the lateral side, tubercles furnished with strong setae.

Hind wing: Fully developed.

Male genitalia (Fig. 8): Median lobe wide in lateral view, slightly arcuate, with small and rounded spatula. Endophallus with longitudinal group of bristles apically.

Female gonocoxite and epipleurite (Fig. 12): Gonocoxite foliform, widened, with four robust nematiform setae positioned at the median side, apically with one long seta. Epipleurite quadrangular, aetose, with widened angulated rod.

Sexual dimorphism at the integument: Males and females differ considerably in the reticulation on the intervals of the elytron and the abdominal sternites (see diagnosis above).

VARIATION. On the disk of the pronotum, the punctures are more or less dense and vary in its distinctness. In some of the females, the reticulation on the intervals of the elytron is not strongly expressed on interval six. In others, it extends slightly to interval two and five.

The distinguishing character from the similar species *E. burgeoni* KULT is the reticulation on the intervals of the elytron. In the female holotype of *E. burgeoni*, all intervals are completely reticulated.

DISTRIBUTION. The species is found in the North and West of Angola, and in the Democratic Republic of the Congo.

***Eoclivina burgeoni* (KULT, 1959)**

(Figs 4, 13)

Clivina (*Eoclivina*) *burgeoni* KULT, 1959: 215; LORENZ 2005: 145; 2023: 5ZB8F;

Eoclivina burgeoni (KULT, 1959), BALKENOHL, 2022: 108.

TYPE MATERIAL. Holotype: ♀, with white black printed and handwritten in black ink label and data: “MUSÉE DU CONGO Eala XI-1934 J. Ghesquière” / white with handwritten black ink and data: “Clivina dumolini Putz?” / white with handwritten black ink and data: “Clivina Burgeoni 47 Kult det. K. Kult” / red, black framed, printed: “HOLOTYPUS” (Fig. 4) (MRACT).

EXTENDED DIAGNOSIS. A medium sized piceous species with the following measurements: Body length 5.45 mm, width 1.6 mm, ration L/W of pronotum 0.95, ratio L/W of elytra 1.86. The elytron is unicolor. In nearly all characters, the species resembles exactly *E. machadoi*. It is different from *E. machadoi* mainly by the reticulation on the intervals of the elytron. In *E. burgeoni*, all intervals are completely covered with reticulation and the elytron appears opaque. In addition, the gonocoxite show a slight difference. In *E. burgeoni*, the apical tubercle is slightly more prolonged and shows apically an additional small seta.

The variation of the reticulation of the elytron is distinct in the nine specimens of *E. machadoi*. If the reticulation seen in *E. burgeoni* is the maximum end in the spectrum of this character or if it constitutes a stable character cannot be decided on the basis of one female specimen. A similar argumentation is true for the gonocoxite.

Therefore, taxonomic action is not performed at present because more material is needed for a solid decision. The specimen is also mentioned in BASILEWSKY (1955, p. 102).

REMARK. A similar wide pattern of the reticulation on the elytron up to a complete cover including its sexual dimorphism has been observed recently in *Sulciclivina sulcigera* (PUTZEYS, 1867) from the Oriental region, where numerous specimens were available for study (BALKENOHL, in press).

DISTRIBUTION. The specimen was found in Eala, Democratic Republic of the Congo.

***Eoclivina schmidli* sp. nov.**

(Figs 5, 9, 14)

urn:lsid:zoobank.org:act:56BA6969-1ADF-49E4-9281-16DCFEBB20DB

ETYMOLOGY The name is a patronym of the German entomologist Dr. Jürgen Schmidl to recognize his support and technical advice of my work over the last 30 years as well as supporting me with numerous material from his excursions.

TYPE MATERIAL. Holotype: ♂, with white black framed and printed and handwritten label and data: “Tanganika D.O.AFRIKA Böttcher” / “Sammlung H. HESSE SMNS 1995” / “Clivina dumolinii-group spec. det. Balkenohl, 2001” (Fig. 5) (SMNS).

Paratypes: 2 ♀♀, same data as holotype but “Iringa” (SMNS, CMBB).

REMARK. In the paratypes, some tarsalia are missing at the right intermediate and hind leg.

DIAGNOSIS. A large sized piceous species with unicolor elytron and interval eight of the elytron reticulated. It is distinctly the largest sized species of the genus and is distinguished besides the size from the most similar species *E. machadoi* and *E. burgeoni* by the different reticulation pattern on the elytron, the glabrous disk of the pronotum, and the different male aedeagus and the female gonocoxite.

DESCRIPTION. Measurements. Holotype: Body length 8.43 mm, width 2.46 mm; ratio L/W of pronotum 1.0; ratio L/W of elytra 1.85. Paratypes: Body length 8.32 mm, 8.69 mm; width 2.56 mm, 2.44 mm; ratio L/W of pronotum 1.0, 1.0; ratio L/W of elytra 1.87, 1.78.

Colour: Glossy. Piceous, antenna, mouthparts, intermediate and hind leg fuscous. Supraantennal plate translucent-fuscous.

Head: A third narrower than pronotum. Clypeus with central part bilobed anteriorly; lateral lobe distinctly projecting, wing indistinct, almost fused with central part; separated from supraantennal plate by right-angulated notch, supraantennal plate laterally regularly convex, laterally less projecting than eye; clypeus, wing, and supraantennal plate reflexed margined. Supraantennal plate overlapping eye latero-anteriorly by a quarter (dorsal view), extended posteriorly into a keel, separated from wing by a flat furrow. Clypeus transverse, convex, separated from frons by indistinct flat carina in form of an inverted V, followed posteriorly by a furrow. Frons convex, with a triangle-like impressions at middle, supraantennal plate continuing uninterrupted as widened supraorbital carina up to posterior eye-level. Clypeus smooth, frons with few micro-punctures, separated from supraantennal plate and supraorbital carina by deep and wide furrow, with clypeal seta in front; with two supraorbital setigerous punctures at middle and posterior end of the eye. Neck constriction missing. Eye distinctly convex in dorsal view. Main part of eye situated ventrally where it is globose. Due to the overlapping supraantennal plate, the eye resembles in lateral view anteriorly contracted. Gena distinct, convex, covering a quarter of posterior eye in ventral view. Antenna short, not reaching middle of pronotum. Labrum nearly straight but slightly advanced at middle, with transverse to irregular reticulation, six setose. Mentum with lateral lobe asymmetric, base isodiametrically reticulated, at middle with transverse reticulation, lateral lobe flattened, with longitudinal to irregular reticulation. Median tooth shorter than lateral lobe, wide and hollowed out at apex, with long carina at base.

Pronotum: Disk convex in lateral view, distinctly convex in frontal view with slightly increasing convexity laterally. As long as wide, peltate. Reflexed lateral margin smooth, somewhat attenuating in anterior half with slight convexity, widest behind middle; anterior angle distinct, rounded and slightly projecting, posterior angle missing; lateral channel narrow, completely and regularly rounded off at posterior setigerous puncture and continuing up to base. Median line narrow, sharp, complete. Anterior transverse line consisting of longitudinal connected punctures, joining median line, not joining anterior margin. Surface smooth, with few micro

punctures, without punctures in basal half, with a few transverse wrinkles. Base narrow but distinct, three times as wide as lateral channel. Proepisternum just not traceable in dorsal view.

Elytron: Disk in lateral view flattened in anterior half and regularly convex in posterior half, distinctly and regularly convex in frontal view. Shape long-oval with indistinctly convex and diverging part in anterior half, with maximum width slightly behind middle. Humerus rounded, distinct. Reflexed lateral margin smooth. The row of setigerous punctures in the lateral channel is interrupted at middle by one puncture. Scutellar striole just traceable at declivity; setigerous tubercle at base of first stria distinct, with just traceable tubercle at base of third interval, basal declivity with isodiametric reticulation. Humeral tooth small, situated at base of fourth interval. Striae moderately deep, narrow, distinctly and regularly punctuate-striate, one to three free at base, four to six reaching humerus, one and two indistinctly joining at apex, three and four, and five and six distinctly joining apically. Intervals convex, the two lateral ones more convex, interval eight narrowed apically. Surface of intervals glossy, interval eight with isodiametric reticulation in males and females.

Hind wing: In one of the two females, the hind wing is reduced to half of the length and width of the elytron. In the other female and the male the hind wing is not traceable.

Lower surface: Proepisternum in lateral half distinctly isodiametrically reticulated, with few transverse wrinkles. Sternite of abdomen in both sexes smooth and glossy at middle, with moderately sized punctures laterally, in females in addition with traces of isodiametric reticulation baso-laterally. The two marginal setigerous punctures are widely separated.

Legs: Protibia covered with distinct longitudinal reticulation, with the three spines of moderate length, not sulcate dorsally, movable spur nearly as long as apical spine, slightly arcuate in apical third. Intermediate tibia with six tubercles at the inner side and eight at the lateral side, tubercles furnished with strong setae.

Male genitalia (Fig. 9): Median lobe massive, moderately short in comparison to body size, distinctly arcuate at middle, apex straight, with flattened, asymmetric acuminate and slightly contorted, with dorsal bulge in apical half. Endophallus densely folded, with group of bristles. Ventral paramere with apophysis, somewhat distorted, apex unknown. Dorsal paramere sinus-like arcuate, with widened apophysis, apex with four long setae

Female gonocoxite and epipleurite (Fig. 14): Gonocoxite foliform, widened, flattened dorsally and ventrally, with three long nematiform setae positioned at the median side and arising from obtuse tubercles, with one long apical nematiform seta arising from the top of a short protuberance. Epipleurite semi-rectangular, with conspicuously widened angulated rod.

Sexual dimorphism at the integument: Not observed.

VARIATION. In the three available specimens, the triangle-like impressions at the middle of the frons varies in size. On the elytron, stria one and two are joining at apex at one side in two specimens.

DISTRIBUTION. Known from Tanganyika, (continental part of Tanzania).

REMARK. It should be mentioned that *E. schmidli* sp. nov. is similar to *Sulciclivina attenuata* (Herbst, 1806) from the Oriental region. By contrast, it differs by the less swollen proepisternum, the missing punctures on the disk of the pronotum, the presence of an interruption of the umbilical setigerous punctures in the lateral channel of the elytron, the female gonocoxites which are stouter, have only three setae at the median side, a short tubercle at the apex, and an additional seta at the inner side on the surface of the gonocoxites. The male aedeagus is not bisinuate curved at the apex and the apical lamella is more acuminate and hollowed out. The character differences between *Eoclivina* and *Sulciclivina* have been keyed out in BALKENOHL (2022).

Remark on the biology

The most similar genus to *Eoclivina* is *Sulciclivina*, which seems to replace the genus *Eoclivina* in the Oriental region.

For both of the genera, ecological information is extremely poor, i.e., nothing is reported in the literature. The few data given on labels indicate that specimens were found in the soil, usually in single specimens. If small series were found, there are occasionally remarks on the labels, e.g. ‘sous des pierres’, ‘in moist ground’, or in ‘swampy forest’.

The form with fully developed wings often carry the information ‘at light’.

Acknowledgements

I am grateful to Stéphane Hanot (MRACT) who gave me the opportunity to examine the type material of *Eoclivina machadoi*, *E. burgeoni*, and lots of *E. dumolinii* material. I am also thankful Alain Drumont (RBINS), Dr. Arnaud Faille (SMNS), Ruth Müller (DNMP), and Dr. Michael Greeff (ETHZ) for making additional material available. Dr. Christoph Germann (NHMB) and an anonymous reviewer improved the manuscript by their constructive reviews.

References

- BALKENOHL M., 2018. - The first species of the subgenus *Physoclivina* KULT, 1959 outside equatorial Africa (Coleoptera, Carabidae, Clivinini). *Linzer biologische Beiträge*, 50: 189-195.
- BALKENOHL M., 2001. - *Key and Catalogue of the tribe Clivinini from the Oriental realm, with revisions of the genera Thliboclivina KULT, and Trilophidius JEANNEL (Insecta, Coleoptera, Carabidae, Scarititae, Clivinini)*. Pensoft Series Faunistica 21. Pensoft Publ., Sofia-Moscow. 83pp.
- BALKENOHL M., 2021. - Revision of the *Clivina castanea*-species group from Asia (Coleoptera: Carabidae: Clivinini). *Belgian Journal of Entomology*, 68, 1-83.
- BALKENOHL M., 2022. - On the female gonocoxites of Asian, Arabian, and African Clivinini with realignment of the *Thliboclivina*-, *Physoclivina*-, and *Eoclivina*-species groups, and notes on the higher systematics of the tribe Clivinini Rafinesque, 1815 (Coleoptera, Carabidae, Clivinini). *Zootaxa*, 5190 (1): 99-126. <https://doi.org/10.11646/zootaxa.5190.1.4>
- BALKENOHL M., (in press). - Revision of the genus *Sulciclivina* Balkenohl, 2022 from Asia (Coleoptera, Carabidae, Clivinini). *European Journal of Taxonomy*.
- BASILEWSKY P., 1948. - Contributions à l'étude des Coléoptères Carabidae du Congo Belge. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, 24: 1-48.
- BASILEWSKY P., 1952. - Contributions à l'étude des Coléoptères Carabidae du Congo Belge. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, 28: 1-27.
- BASILEWSKY P., 1953. - *Exploration de Park National de l'Upemba. Carabidae (Coleoptera Adephaga)*. Institut des Parcs Nationaux de Congo Belge. Bruxelles. 252pp (10 plates).
- BASILEWSKY P., 1955. - Carabidae (Coleoptera) de l'Angola. *Publicações culturais Companhia de Diamantes de Angola*, Lisboa, 27: 93-137.
- BASILEWSKY P., 1963. - La réserve naturelle intégrale du Mont Nimba, Coleoptera Carabidae. *Mémoires de l'Institut fondamental d'Afrique noire*, 66: 367-391.
- BASILEWSKY P., 1967. - Contributions à la faune du Congo (Brazzaville). Mission A. Villiers et A. Descarpentries. Coleoptera Carabidae. *Bulletin de l'Institut fondamental d'Afrique noire*, 29: 1732-1762.
- BASILEWSKY P., 1968. - Contributions à la connaissance de la faune entomologique de la Côte-d'Ivoire (J. Decelle, 1961-1964). 4. Coleoptera Carabidae. *Annales du Musée Royal de l'Afrique Centrale*, 165: 29-124.
- BASILEWSKY P., 1969. - Coleoptera Carabidae. Le Park national du Niokolo-Koba. *Mémoires de l'Institut fondamental d'Afrique noire*, 84: 321-353.
- BURGEON L., 1935. - Catalogues raisonnés de la faune entomologique du Congo Belge. *Annales du Musée du Congo Belge*, Tome II, Fasc. 3: 134-257.
- BURGEON L., 1937. - Catalogues raisonnés de la faune entomologique du Congo Belge. *Annales du Musée du Congo Belge*, Tome II, Fasc. 5: 318-405.
- CSIKI E., 1927. - *Coleopterorum Catalogus auspiciis et auxilio. W. Junk editus a S. Schenkling. 91: Carabidae: Carabinae I.* W. Junk, Berlin: 1-553.

- CSIKI E., 1933. - *Coleopterorum Catalogus auspiciis et auxilio. W. Junk editus a S. Schenkling. 127: Carabidae: Carabinae III, Corrigenda et Addenda.* W. Junk, Berlin: 623-641.
- DOSTAL A., 2015. - Two new species of *Clivina* LATREILLE, 1802 (Coleoptera: Carabidae: Scaritinae) from Africa. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen*, 67: 27-37.
- HERBST J.F.W., 1806. - *Natursystem aller bekannten in- und ausländischen Insekten, als eine Fortsetzung der von Buffonschen Naturgeschichte. Der Käfer. Zehnter Theil.* Mit 18 illuminierten Tafeln. Berlin, Joachim Pauli, viii + 285pp, pls. 159-177.
- KULT K., 1959. - Revision of the African Species of the old Genus *Clivina* LATR. (Col. Carabidae). *Revue de Zoologie et de Botanique Africaines*, 60: 172-225.
- LORENZ W., 2005. - *Systematic list of extant Ground Beetles of the World (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodidae)*, Second Edition 2005. Tutzing, printed by the author. 530pp.
- LORENZ W., 2023. - *CarabCat: Global database of ground beetles* (version February 2023). In: Species 2000 & ITIS catalogue of life, 2021 Annual Checklist (Roskov Y., Ower G., Orrell T., Nicolson D., Bailly N., Kirk P.M., Bourgoin T., DeWalt R.E., Decock W., Nieukerken E. van, Zarucchi J., Penev L., eds). Species 2000. Naturalis, Leiden, The Netherlands. www.catalogueoflife.org/annual-checklist/2023. (date accessed March 2023).
- LUTSHNIK V.N., 1926. - Two new species of the genus *Clivina* Latr. (Col.) *Acta Societatis Entomologicae Stauropolitanae*, 2: 31-32.
- PUTZEYS J.A.A.H., 1846. - Monographie des *Clivina* et genres voisins, précédée d'un tableau synoptique des genres de la tribu des Scaritides. *Mémoires de la Société Royale des Sciences de Liège*, 2: 521-663. <https://doi.org/10.5962/bhl.title.5635>
- PUTZEYS J.A.A.H., 1863. - Postscriptum ad Clivinidarum Monographiam atque de quibusdam aliis. *Mémoires de la Société Royale des Sciences de Liège*, 18: 1-78.
- PUTZEYS J.A.A.H., 1867. - Révision générale des clivinides. *Annales de la Société Entomologique de Belgique*, 10: 1-242.
- REIGNIEZ C. & ANDRÉ H.M., 1994. - Liste chronologique des publications de Pierre Basilewsky. *Journal of African Zoology*, 108: 7-20.