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A new genus of Cryptocephalinae from Madagascar (Coleoptera: Chrysomelidae)

M. SCHÖLLER

A b s t r a c t : A new genus of Cryptocephalinae, *Madacryptus* gen.nov., is described for 19 species originally described in *Cryptocephalus* and one species originally described in *Coenobius* originating from Madagascar and Mauritius.

K e y w o r d s : Taxonomy, Coleoptera, Chrysomelidae, Cryptocephalini, Cryptocephalina, Afrotropical, Madagascar, *Coenobius*, *Cryptocephalus*, *Madacryptus*.

Introduction

The Afrotropical genera of Cryptocephalinae were never systematically studied since the revision of Eduard SUFFRIAN (1857). Three species from Madagascar were available to SUFFRIAN only. He placed them in the genus *Cryptocephalus*, because of the shape of the prosternum, the moveability of the pronotum and the filiform antennae. However, based on a set of characters, he placed two of the species from Madagascar in one species-group at the base of his systematic list. Later on, the subfamilies Cryptocephalinae and Eumolpinae were found to be most species-rich among the chrysomelid fauna of Madagascar (WEISE 1906). Nearly 30 % of all Afrotropical species of *Cryptocephalus* originate from Madagascar (SCHÖLLER 2002). Up to date, 117 Madagascan *Cryptocephalus*-species were described, 40 of which by Maurice PIC. WEISE (1906) recorded the genus *Melixanthus* from Madagascar, and the two genera remained the only two in Cryptocephalini known from the island. Studies of Madagascan Cryptocephalinae museum specimens revealed that most of the species described in *Cryptocephalus* cannot be placed in this genus. The new genus described below is erected for these species.

Materials and Methods

The dried adults were softened in water, and afterwards disarticulated. The abdomen contents were soaked in cold diluted KOH and then washed in water. The eye length was measured in lateral view, the interocular space in frontal view. MLUH = Martin-Luther-Universität Halle/Saale, Germany, Wissenschaftsbereich Zoologie (K. Schneider); MRAC = Musee Royal de l'Afrique Centrale Tervuren, Dr. Marc De Meyer; ZMHB = Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (J. Frisch and M. Uhlig).

Results

***Madacryptus* gen.nov.**

T y p e s p e c i e s : *Cryptocephalus euchlorus* DOHRN 1884 by present designation.

E t y m o l o g y : The generic name is composed of parts of the words Madagascar and *Cryptocephalus*, and is masculine.

D i a g n o s i s : A genus of Cryptocephalinae, Cryptocephalini, Cryptocephalina. Size 2.2-7.5 mm; eyes convex, curvature even; antennal segments 5-11 usually broadest; anterior and lateral sides of pronotum distinctly bordered, basal margin unbordered, i. e. toothed, base of pronotum extended at middle, overlapping base of scutellum; prosternal process quadrate to elongate, bearing a pair of acute or rounded projections; scutellum gradually elevated, rectangular, truncate at apex; elytral punctation, colour, and surface sculpture variable, dorsally glabrous; tarsi elongate; claws simple.

D e s c r i p t i o n : Habitus (Fig. 1). Size 2.2-7.5 mm; body cylindrical, elytra frequently narrowed apically, pronotum strongly vaulted; colour entirely yellowish, or reddish-brown to red, or black with or without blue, green or purple reflections; dorsum glabrous.

H e a d : (Figs 2-4) Large, hypognathous, sunk into thorax, punctation sparse to coarse, eyes evenly convex, relative large, touching or distance between up to 0.5 times eye length; canthus triangular, moderately deep (Fig. 2), setae on canthus present; antennae inserted near lower third of eyes, at base of canthus, antennae with all segments elongate except for ovoid segment 2, 5-11 longest and 6-11 usually broadest, setae present on all antennomeres, dense on sixth to eleventh (Fig. 3), antennal length 0.6 to 0.75 body length, antennae relatively longer in males, segments without circular sensillate depressions, interantennal space five times diameter of antennal socket; sides of clypeus sinuate (Fig. 2), frontoclypeal suture weak to reduced, with a pair of anterior pits, basally concave, glabrous; labrum quadrate with 4 pairs of dorsal setae, placed in a row from the apical corners to the middle, and more than 4 pairs of short apical setae; maxilla (Fig. 4) with galea broad and almost truncate, bent medially, longer than last two palpomeres combined, bearing apical many setae; lacinia shorter but as wide as galea, narrowing apically, thin, weakly pigmented, bearing an apical comb of setae; labium with three palpomeres, last maxillary and labial palps narrowing apically, usually truncate to concave, apical segment of labial palp shaped as maxillary palp; ligula elongate, proximally straight; mandible robust, with two large teeth and one long external seta (Fig. 5).

T h o r a x : Prothorax (Figs 6, 10): pronotum evenly curved at sides and contracted at apex, pronotum broadest at base, approximately two times wider than long and anteriorly half as wide as basally, with or without lateral transverse impressions; apical and lateral sides bordered, lateral margins even, carinate or explanate, anterior margin explanate ending in a carina, basal margin unbordered, i.e. toothed (Fig. 10), base of pronotum extended at middle, overlapping base of scutellum; disk strongly and closely punctured to impunctate, without lateral depressions, hind corners with setiferous pore, front edge of pronotum ridged, sides of front margin not projecting beyond prosternum, posterior angles of pronotum right-angled to distinctly produced, male pronotum as wide as or slightly wider than elytral base; intercoxal prosternal process wide (Fig. 6), quadrate to elongate, narrowed in apical third, as wide as coxal cavity, front margin convex with a

narrow carina, hind margin bearing a pair of flat acute or blunt rounded posterolateral projections between coxae, consequently M-shaped in ventral view, prosternal opening relatively narrow, posterior margin of prosternal process does not extend beyond hypomeral projection, coxal cavity closed (Fig. 6), prosternal process usually densely setose, hypomeron impunctate; proendosternites about half the length of prosternal process, their base wide and short; procoxal cavity wider than long; mesothorax: scutellum slightly longer than wide, elongate, rectangular or rarely apically widened, basally emarginate, truncate at apex, impunctate, smooth, gradually elevated; mesoscutum (Fig. 7) twice as long as mesoscutellum, medially with coarse punctation and wrinkles, not keeled on midline, anteriorly convex with narrow, elongate arms (not figured), without lateral patches of microchaetae; mesosternum distinct between coxae, broad, narrower than prosternum, mesosternal intercoxal process as wide as prosternum; elytra 3-4 x length of pronotum, slightly apically expanded for basal ¼ then gradually attenuate, punctation mostly with nine regular striae, plus a short scutellar stria and a row of punctures abutting epipleura, interstriae flat or convex, or punctation substriate or confused, basal margin of elytra simple or bulging, elytra with prominent humeri, elytra with or without lateral transverse impressions, in some species elytra with ridges or tubercles, elytra regularly oblate, reaching base of pygidium, elytral suture bordered, untoothed; epipleuron gradually attenuate to apex, smooth or irregularly punctured or with single stria; metathorax: hind wing apical dark, radial triangle cell closed, radial transverse short, radio-mediane absent, but a chitinised patch present at this location, i.e. medial cell open, 2nd and 3rd anal nerves, and cubital nerves weakly developed, anal cell open, 1st anal nerve and median nerves 1 and 2 strongly developed (Fig. 8); metasternum prominent, convexly swollen ventrally, epimeron densely setose; legs (Fig. 1) long and slender, all femora of similar size, without ventral keel, tibiae almost straight, tibial spurs absent, external edge of tibia excavate, excavation with fringe of strong setae, all tarsal segments elongate, in male first segment of fore- and mid tarsi widened to quadrate in some species, dorsally convex, claws symmetrical, simple to dentate (Fig. 9).

A b d o m e n : Tergites hard, strongly sclerotised, spiracles free in basal tergites; lateral lobe at base of abdomen angular, intercoxal abdominal process of ventrite I broad, slightly concave, sternite III longer than sternites IV to VII along midline; sternite VII not indented in male, apex of male abdomen without hollow; tergites reaching sternites; pygidium densely microsculptured, dull, or smooth and shiny, pygidium regularly convex or with an obtuse keel along midline.

M a l e g e n i t a l i a : (Figs 11-17) Aedeagus straight, but apex recurved in most species, aedeagal lobe with complex apical ridges and lobes (Figs 11-16), venter simple, without longitudinal ventral keel or transparent "windows" in wall of reflexed apex, ventral (Fig. 11) and dorsal (Fig. 12) aedeagal setae present, dorsal setae on lateral, sclerotised or membranous (in *M. euchlorus*) cones, flagellum simple, ejaculatory guide complex, with more than three pairs of clasps and band-shaped sclerites which are connected by muscles and connective tissue; tegmen broad, U- or V-shaped, keeled, with expanded sides and bifid base (Fig. 17), spiculum gastrale fused.

F e m a l e g e n i t a l i a a n d K o t p r e s s e : (Figs 18-22) Vaginal palp with all borders wholly sclerotised, apical border narrow, rounded (Fig. 18); spermatheca with long collum, sinuate and falciform, receptaculum V-shaped (Fig. 19), accessory gland simply emerging from vascular bulb, or from a little stick; rectum with dorsal fold of

intestine and lateral folds, kotpresse with two dorsal (Fig. 20) and two ventral (Fig. 21) sclerites, apodemes wider than rectum (Fig. 22); females with apex of egg-hollow not indented, with large deep egg-hollow.

Immature stages unknown.

D i f f e r e n t i a l d i a g n o s i s : *Madacryptus* gen.nov. may be distinguished from *Cryptocephalus* GEOFFROY and *Melixanthus* SUFFRIAN by the following combination of character states: truncate median posterior lobe of pronotum raised, with three teeth at apex, scutellum rectangular and antennae filiform, kotpresse with two ventral sclerites, and dorsal aedeagal setae on lateral cones.

D i s t r i b u t i o n : The genus is endemic to Madagascar, Mauritius and Aldabra.

C h e c k l i s t o f i n c l u d e d s p e c i e s : Format used is as follows: species name with author, date and page in brackets, because they are all new combinations, originally all species were placed in *Cryptocephalus* if not otherwise indicated; additional references if present; # = type specimens examined in MLUH, MRAC or ZMHB; all species from Madagascar if not otherwise mentioned.

anthrax (FAIRMAIRE 1904: 266)

argyropleurus (FAIRMAIRE 1901: 237) #

coeruleipennis (JACOBY 1901: 288) #

costipennis (DUVIVIER 1891: 364)

ebenus (FAIRMAIRE 1897: 200) #

euchlorus (DOHRN 1884: 182) #

flavomelas (FAIRMAIRE 1902: 260) ♂

imitans (JACOBY 1901: 289) #

impressidorsis (FAIRMAIRE 1904: 265)

mauritiensis (PIC 1936: 11) #; Mauritius

mutilatus (SUFFRIAN 1857: 71) #

nodulosus (WEISE 1910: 454) #

oberthuri (DUVIVIER 1891: 240) #

perrieri (FAIRMAIRE 1899: 555)

pulchripennis (FAIRMAIRE 1899: 505) #

scutellatus (JACOBY 1892: 566)

sulcicollis (JACOBY 1902: 203) #; as *Coenobius*, Mauritius

= *jacobyi* CLAVAREAU 1913: 123 (replacement name, nec *Coenobius sulcicollis* BALY, 1873: 86); = *Cryptocephalus jacobyi*: SCHÖLLER 1999.

tenuepunctatus (FAIRMAIRE 1902: 260) #

tridentatus (KLUG 1833: 123) #

tripartitus (FAIRMAIRE 1899: 505)

Discussion

The Cryptocephalinae of Madagascar are still insufficiently studied. Five genera are currently recognized, *Clytra* LAICHARTING in the tribe Clytrini (one species), *Chlamisus* RAFINESQUE in Chlamisini (two species), and *Cryptocephalus* GEOFFROY (97 species), *Melixanthus* SUFFRIAN (one species) and *Madacryptus* gen.nov. (20 species) in Cryptocephalini. Future studies of type specimens are needed to verify the generic placement of the majority of species. A screening of undetermined specimens showed the presence of at least two more species of *Melixanthus*, and suggested *Madacryptus* to be more species-rich than *Cryptocephalus* in Madagascar. Most Madagascan species of *Cryptocephalus* seen are similar to those in the *decemnotatus*-group sensu REINECK (1915), both in habitus and aedeagus morphology. The systematic placement of *Madacryptus* within the Cryptocephalina remains to be determined, too. Many of the characters used in this study were provided by more recent studies of Australasian (REID 1998) or Neotropical (LOURDES CHAMORRO-LACAYO & KONSTANTINOV 2004) Cryptocephalini, and the respective character states of Old-world Cryptocephalini remain to be studied for comparison.

Zusammenfassung

Eine neue Gattung aus der Unterfamilie Cryptocephalinae, *Madacryptus* gen.nov., wird beschrieben. Sie umfasst 19 ursprünglich in *Cryptocephalus* und eine ursprünglich in *Coenobius* beschriebene Arten aus Madagaskar und Mauritius.

Literature

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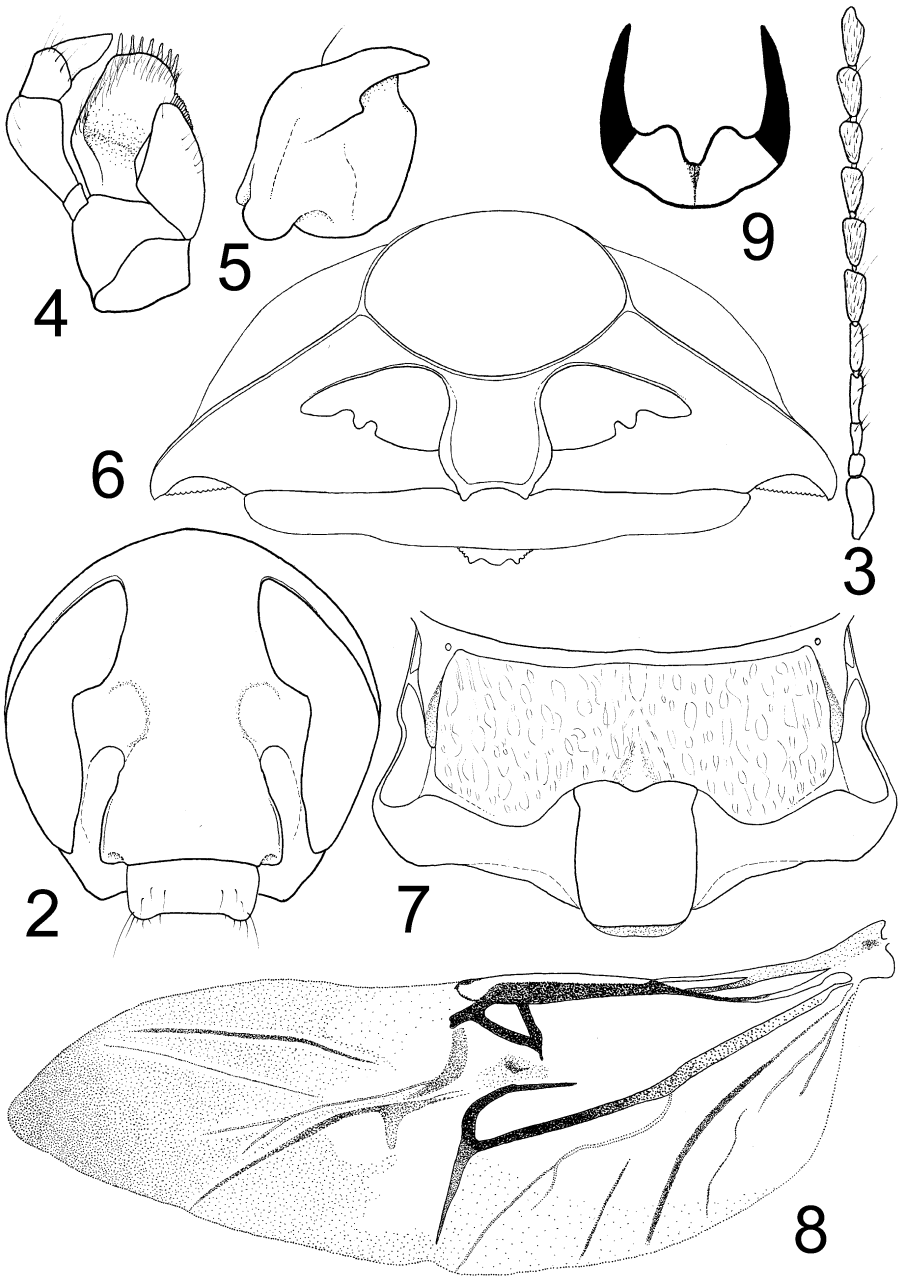
Anschrift des Verfassers: Dr. Matthias SCHÖLLER
Grünberger Straße 33, D-10245 Berlin, Germany
E-Mail: schoeller@tricho.b.shuttle.de

Fig. 1: *Madacryptus euchlorus* (DOHRN), Habitus.



Figs 2-9: *Madacryptus euchlorus* (DOHRN), (**2**) head, frontal (**3**) antenna (**4**) maxilla (**5**) rigth mandible, ventral (**6**) prothorax, antero-ventral (**7**) mesoscutum (**8**) hind wing (**9**) claw.

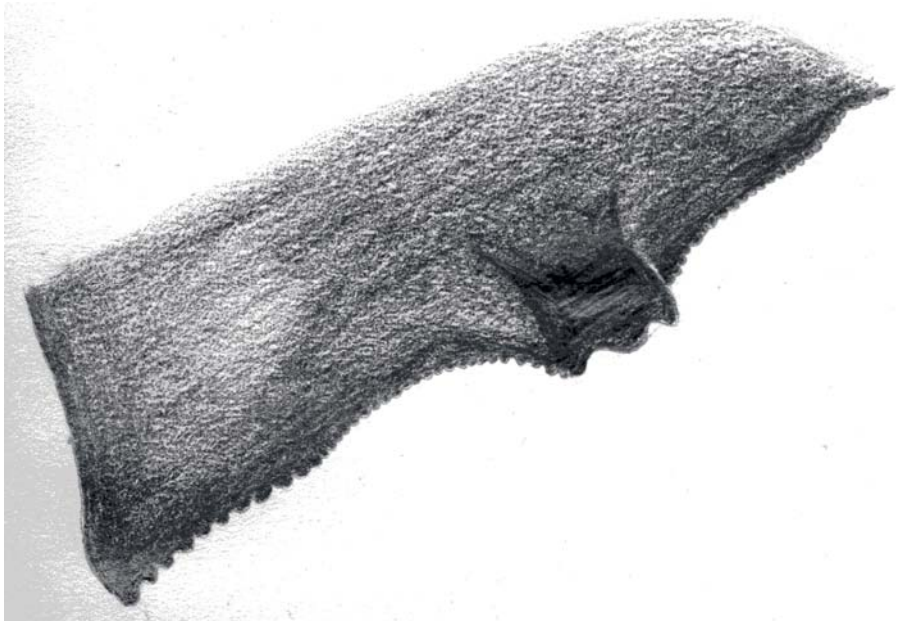
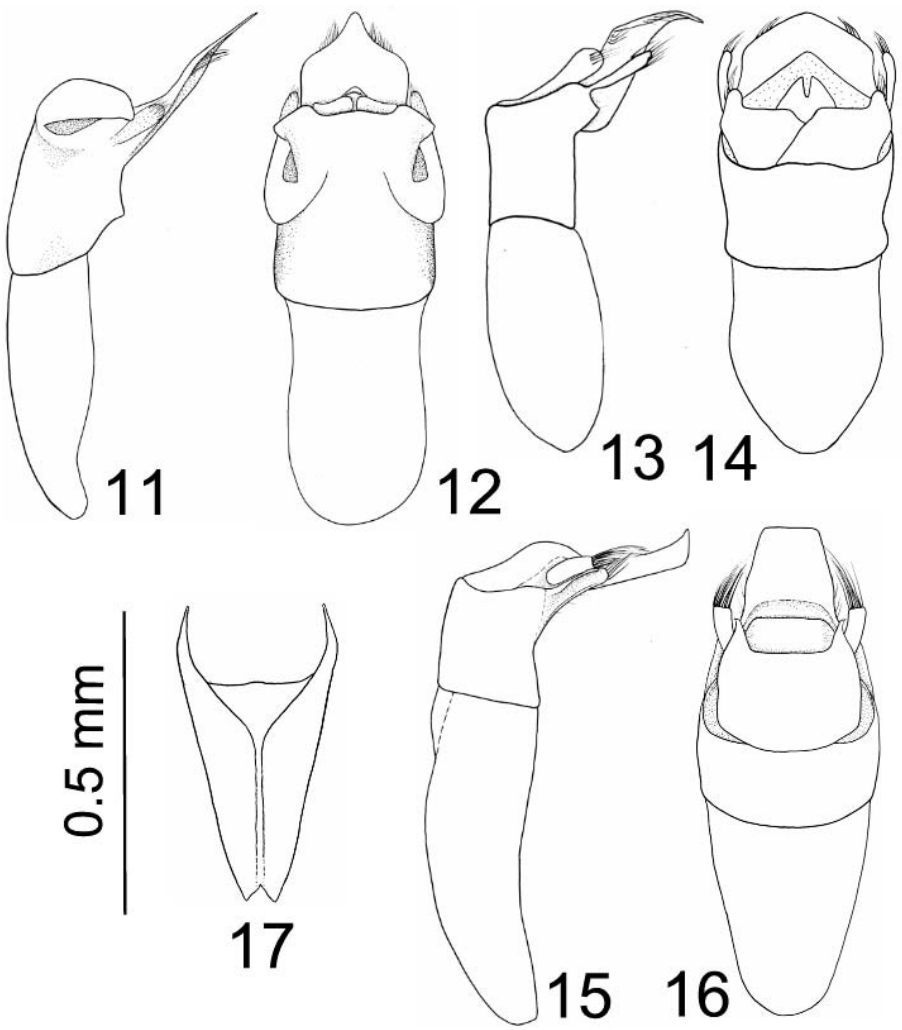
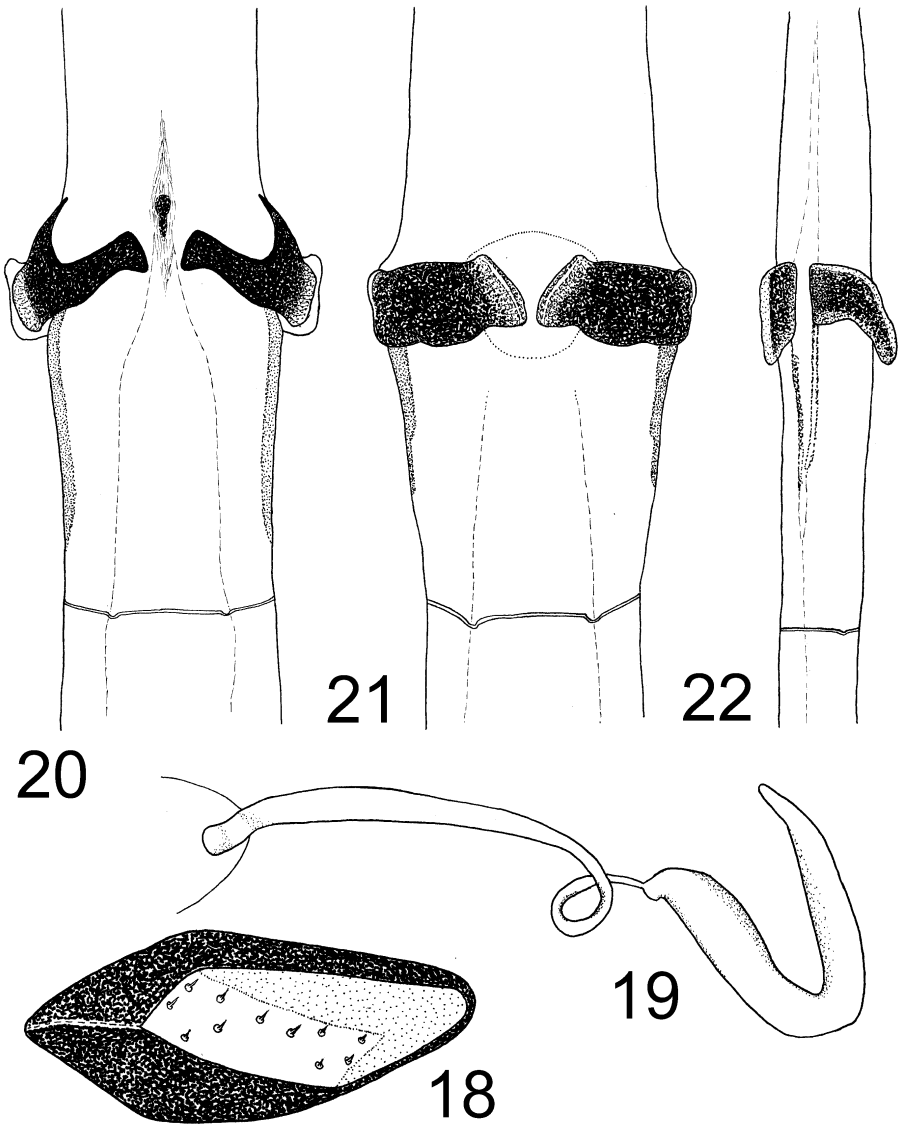


Fig. 10: *Madacryptus euchlorus* (DOHRN), basal margin of pronotum.



Figs 11-17: *Madacryptus euchlorus* (DOHRN), (**11**) aedeagus, lateral (**12**) aedeagus, dorsal; *Madacryptus tenuepunctatus* (FAIRMAIRE), (**13**) aedeagus, lateral (**14**) aedeagus, dorsal; *Madacryptus imitans* (JACOBY), (**15**) aedeagus, lateral (**16**) aedeagus, dorsal; *Madacryptus euchlorus* (DOHRN), (**17**) tegmen.



Figs 18-22: *Madacryptus euchlorus* (DOHRN), (**18**) vaginal palp (**19**) spermatheca (**20**) rectum, dorsal (**21**) rectum, ventral (**22**) rectum, lateral.