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On the genus *Rhagiosoma* and the identity of *R. madagascariense* (Coleoptera: Chrysomelidae: Sagrinae: Megamerini)

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Abstract. The genus *Rhagiosoma* Chapuis, 1878, is removed from the synonymy with *Megamerus* MacLeay, 1827. *Mecynodera madagascariensis* Heyden, 1877, is transferred to *Rhagiosoma*, its taxonomic status is revised and species rank restored. *Rhagiosoma chapuisi* nom. nov. is proposed as a substitute name for *R. madagascariense* Chapuis, 1878, nec Heyden, 1877. Lectotypes are designated for both species and their taxonomic status is discussed along with the position of *Prionesthis* Lacordaire, 1845. A list of all *Rhagiosoma* species is presented.

Key words. Coleoptera, Chysomelidae, Sagrinae, *Rhagiosoma*, *Megamerus*, *Mecynodera*, *Prionesthis*, taxonomy, lectotype designation, revised status, new name, Madagascar, Australia

Introduction

Chapuis (1878) proposed the genus *Rhagiosoma* for a unique, cerambycid-like sagrine beetle and described a single species in it, *R. madagascariense* Chapuis, 1878. During subsequent decades four more species were described in this genus, all from Madagascar except *R. obscurithorax* Pic, 1914, from Eastern Africa. However, I have some doubts about the correctness of the locality given by Pic.

Monrós (1956) reviewed the Australian genus *Megamerus* MacLeay, 1827, synonymized *Rhagiosoma* with it, and described *M. alvarengai* from northern Brazil (Rio Grande do Norte). Consequently, eight valid species distributed in Australia, Madagascar, Brazil and Eastern Africa were placed in *Megamerus*. However, Monrós (1956) merely discussed the status of the species without touching upon the structure of male genitalia, although it had been reported as an important diagnostic character (Reineck 1913). This paper is aimed on

resolving the status of *Rhagiosoma* and one neglected species, *Mecynodera madagascariensis* Heyden, 1877.

Material and methods

The following codens of collections are used:

BMNH Natural History Museum, London, United Kingdom (Sharon Shute);
DEI Deutsches Entomologisches Institut, Eberswalde, Germany (Lothar Zerche);
IRSN Institut Royal des Sciences Naturelles, Bruxelles, Belgium (Pol Limbourg);
MRAC Musée Royal d'Afrique Centrale, Tervuren, Belgium (Marc de Meyer);
SMF Senckenberg Museum, Frankfurt am Main, Germany (Damir Kovac);
ZMHB Zoologisches Museum, Humboldt Universität, Berlin, Germany (Johannes Frisch).

Exact label data are cited for all type specimens; a double slash (//) divides data on different labels and a single slash (/) divides data in different rows. Type localities are cited in the original spelling. Other comments and remarks are placed in square brackets: [bb] - black border, [hw] – data are handwritten, [h] – cardboard label, [p] – data are printed, [s] – soft label, and [w] – white label.

The genera *Megamerus* and *Rhagiosoma*

Externally, *Rhagiosoma* and *Megamerus* have a similar shape of body outline and should be distinguished by characters summarized in Table 1.

Megamerus and *Rhagiosoma* also differ in the shape of male genitalia; this character was not studied by Monrós (1956). I have examined male genitalia of type specimens of the following species: *R. chapuisi* nom. nov., *R. fraternum*, *R. grossum*, *R. madagascariensis* and four other unidentified Madagascan species. I have also seen specimens of *Megamerus kingi* MacLeay, 1827 (type species of *Megamerus*), and *M.* cf. *femoralis* Lea, 1917. I found strong differences in the shape of the parameres and aedeagus. In *Megamerus*, the parameres are robust and gradually thickened towards apex, with a shallow apical cleft and apex of each face broadly rounded (Fig. 1c), this structure is rather similar to *Sagra* Fabricius, 1792. *Rhagiosoma* have apices of parameres not thickened but with a very deep apical cleft (often reaching to 2/3 of length) and each apical face angulate to slightly obtuse (Figs. 2c, 3c). The aedeagus in *Megamerus* is very stout, parallel-sided, without a sharp apex and with a shallow apical cleft (Figs. 1a,b). On the other hand, *Rhagiosoma* has the aedeagus parallel-sided in the anterior part and then tapered; the apex is sharp and differently shaped than in *Megamerus* (Figs. 2a, 3a). The findings mentioned above lead me to remove *Rhagiosoma* from the synonymy of *Megamerus*.

Rhagiosoma Chapuis, 1878, stat. restit.

Rhagiosoma Chapuis, 1878: cxliii (type species *R. madagascariense* Chapuis, 1878 nec. Heyden, 1877 (= *Rhagiosoma chapuisi* nom. nov.), by monotypy).
Rhagiosoma: Monrós (1956): 106 (as synonym of *Megamerus* Mac Leay, 1827).

Table 1. Differential characters of genera *Rhagiosoma* Chapuis, 1878, and *Megamerus* MacLeay, 1827.

***Rhagiosoma* Chapuis, 1878**	***Megamerus* MacLeay, 1827**
metepisterna with narrow apical raised area separated from the rest by clearly marked line	metepisterna shallowly transversely impressed close to apex
apical segment of maxillary palpi oval, similar in both sexes, not distinctly broadened	maxillary palpi in males with apical segment securiform and markedly broadened in female
pronotum with rugose and coarse sculpture	pronotum finely sculptured and smooth
elytra with or without pattern	elytra without pattern
females distinctly stouter and larger, occasionally two times as large as males	male and female of nearly similar shape and size
apex of paramere normal, not thickened	parameres robust, gradually thickened apically
apex of median lobe sharp, with very deep apical cleft and each apical face angulate to slightly obtuse	apex of median lobe obtuse, with shallow cleft and each face broadly rounded

***Rhagiosoma chapuisi* nom. nov.**

(Figs. 2 a-c)

Rhagiosoma madagascariense Chapuis, 1878: cxliv (nec *Mecynodera madagascariensis* Heyden, 1877).
Megamerus madagascariensis: Monrós (1956): 107, Monrós (1958): 5.

Type locality. 'Madagascar'.
Type material. Lectotype (designated here): ♂, 'Coll.et.detrm. / Dr.Chapuis [w, p, bb, h] // Coll. Chapuis [w, p, s] // 1590 [w, p, s] // Madagascar [violet, p, s] // Type [w, p, s] // Coll. R. I. Sc. N. B. [blue, p, h; preceding two labels glued on this label] // TYPE [red, p, bb, h]' (IRSN). Paralectotypes: ♂, 'Coll.et.detrm. / Dr.Chapuis [w, p, bb, h] // Coll. Chapuis [w, p, s] // 1592 [w, p, s] // Madagascar [violet, p, s] // M.R.Belg. [w, p, s] // Coll. R. I. Sc. N. B. [blue, p, h; preceding two labels glued on this label] // Para- / type [orange, p, bb, h]' (IRSN); ♂, 'Coll.et.detrm. / Dr.Chapuis [w, p, bb, h] // v. Krogh [w, hw, bb, s] // Coll. Chapuis [w, p, s] // 1590 [w, p, s] // Madagascar [violet, p, s] // M.R.Belg. [w, p, s] // Coll. R. I. Sc. N. B. [blue, p, h; preceding two labels glued on this label] // Para- / type [orange, p, bb, h]' (IRSN); ♀, 'Coll.et.detrm. / Dr.Chapuis [w, p, bb, h] // Coll. Chapuis [w, p, s] // Madagascar [violet, p, s] // Type. [w, p, s] // Coll. R. I. Sc. N. B. [blue, p, h; preceding two labels glued on this label] // Allo- / TYPE [red, p, bb, h, first row hw]' (IRSN); ♂, 'TYPE [red, p, bb, h] // TYPE [r, p, h] // MUSÉE DU CONGO / Madagascar / Coll. Clavareau [w, p, h, middle row hw] // Madagascar / Coll. Chapuis [w, hw, h] // Rhagiosoma / madagascariense / TYPE Chp. [w, hw, h] // R. DÉT. / C / 1795 [w, p, h, middle row hw] // ♂ [w, p, h]' (MRAC). The specimens are provided with the following label: 'LECTOTYPUS [or PARALECTOTYPUS] / Rhagiosoma / madagascariense / Chapuis, 1878 / L. Sekerka des. 2006 [red, p, bb, h]'.

Distribution. Madagascar.

Comments. Based on the examination of the type material, *Mecynodera madagascariensis* fully corresponds with the generic characters of *Rhagiosoma*, and I propose a new combination, *R. madagascariense* (Heyden, 1877), comb. nov. Thus, *R. madagascariense* Chapuis, 1878, nec Heyden, 1877, becomes its junior secondary homonym. *Rhagiosoma chapuisi* nom. nov. is proposed here as a new substitute name for *R. madagascariense* Chapuis, 1878, nec Heyden, 1877.

I found constant differences between *R. madagascariense* and *R. chapuisi* nom. nov. based on the study of the type material. Differential diagnosis and additional comments are given under *R. madagascariense.*

Rhagiosoma madagascariense (Heyden, 1877) comb. nov. & stat. restit.

(Figs. 3 a-c)

Mecynodera madagascariensis Heyden, 1877: 105.
Rhagiosoma madagascariense Chapuis: Reineck (1913): 303 (incl. genitalia), misidentification.

Type locality. 'Nossi-Bé. Madagascar' [= Nossi Bé Island NW of Madagascar].
Type material. Lectotype (designated here): ♂, 'Nossi-Bé. [w, hw, h] / Mecynodera / madagascariensis [w, hw, h]' (ZMHB). Paralectotypes: ♂, 'Fauna / Ins. Nossibé. [w, p, s] // madagascariensis / [w, hw, s] // Coll. / B. Schwarzer [w, p, h] // Senckenberg- / Museum / Frankfurt/Main [w, p, h]' (SMF); ♂, 'Nossibé / 96.70 [w, hw, s] // Mecynodera / madagascariensis / Nossibé [w, hw, s]' (BMNH); ♂, 'Fauna / Ins. Nossibé. [w, p, s] // Mecynodera / madagascariensis / Nossibé [w, hw, s] // Coll. Kraatz [w, p, h] // coll. DEI / Müncheberg [w, p, h]' (DEI). The specimens are provided with the following label: 'LECTOTYPUS [or PARALECTOTYPUS] / Mecynodera / madagascariensis / Heyden, 1877 / L. Sekerka des. 2007 [red, p, bb, h]'.
Additional material examined. MADAGASCAR: Nossi-bé, 2 ♂♂ 1♀, without additional data (ZMHB); Ins. Nossibé, 1♂, without additional data (DEI); Nossibé, 2 ♂♂ 1 ♀, without additional data (BMNH); Nossi-bé, 1885, 5 ♂♂, Stumpff (SMF).

Differential diagnosis. *Rhagiosoma madagascariense* is very similar to *R. chapuisi* nom. nov. and *R. grossum* Reineck, 1913. *Rhagiosoma grossum* distinctly differs from both species in a stouter and larger body (length/width body ratio in *R. grossum*: males below 3.15 and females below 2.50; in *R. madagascariense*: males over 3.20 and females over 2.60); distinctly more convex body, more convergent elytra (converging from 1/3 of the length), well-marked elytral punctuation and striae, and punctures with distinct fovea. On the other hand, *R. madagascariense* and *R. chapuisi* nom. nov. have elytra almost parallel-sided and converging only near apex, only slightly convex on the disc, and smooth surface without distinct foveae at punctures and without impressed striae.

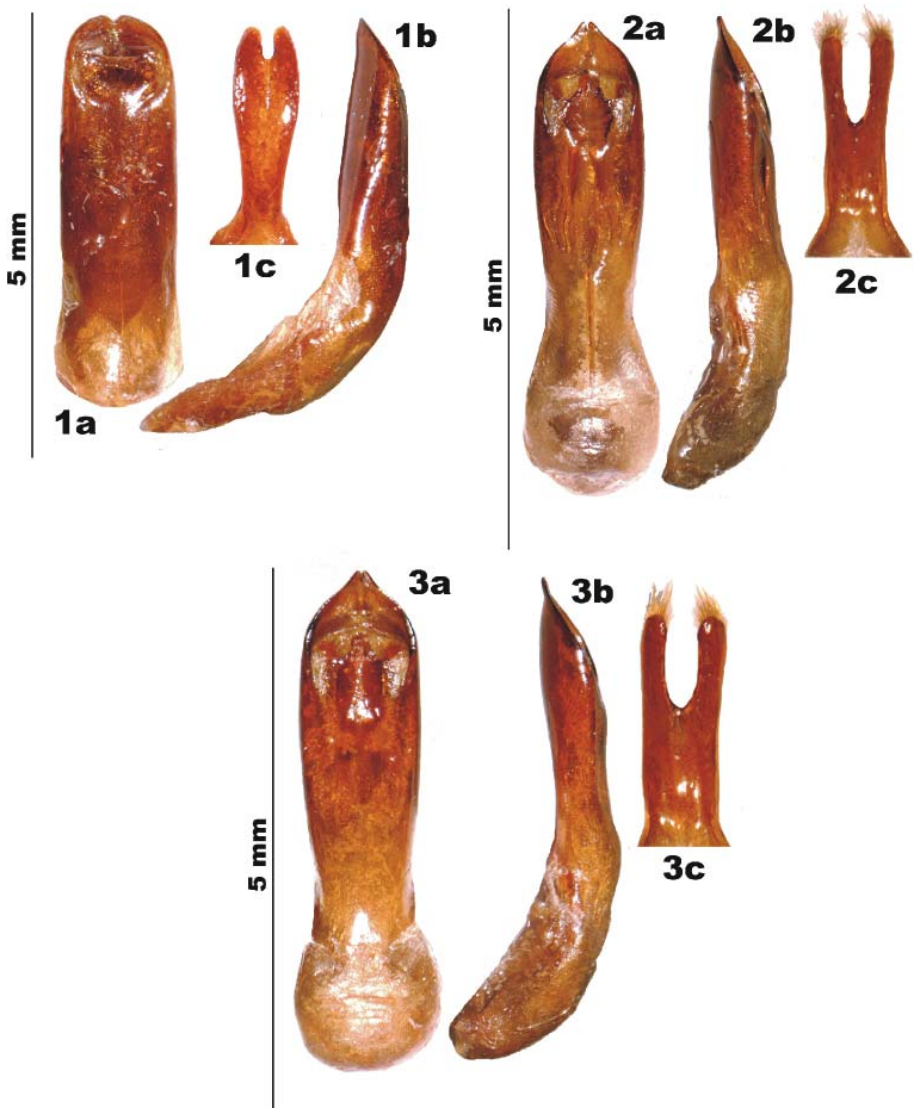
The latter two species are extremely close and can be reliably identified only by the structure of the aedaeagus. The aedaeagus of *R. chapuisi* is distinctly stouter and larger with a more curved lobe and without deep sulci (Figs. 3a,b). The aedaeagus of *R. madagascariense* has a nearly straight lobe and distinct sulci stretching from apex to half length of the tube (Figs. 2a,b); the parameres have a deep basal sulcus (Fig. 2c) and a deeper cleft than in *R. chapuisi* (Fig. 3c).

However, it is also possible to distinguish the two species by some external morphological characters. *Rhagiosoma madagascariense* is somewhat less arched with elytral plate rather depressed, and has a dull pronotum with irregular punctuation, several wrinkles, and a smooth and impunctate medial area extended from the base to the anterior margin. The pronotum of

R. chapuisi is stouter with somewhat elevated anterior margin, shiny and nearly regularly punctate without wrinkles.

Distribution. Madagascar, Antsiranana province, Nossi-bé Island.

Comments. *Mecynodera madagascariensis* was described from Nossi-bé Island (Heyden 1877) and was omitted in all catalogues and papers until Monrós (1958) cited it, without any comments, as a synonym of *R. madagascariense*. Even in his revision of the genus *Megamerus*,



Figs. 1-3. 1 – *Megamerus kingi* MacLeay, 1827; 2 – *Rhagiosoma madagascariense* (Heyden, 1877); 3 – *R. chapuisi* nom. nov.; a – aedeagus, dorsal view; b – aedeagus, lateral view; c – parameres, dorsal view.

Monrós (1956) pointed out only the occurrence of *Mecynodera* Hope, 1840, in Madagascar without any additional data.

Both species are very close, and *R. madagascariense* may represent only an insular form of *R. chapuisi*. Besides types, I have seen only limited material of *R. madagascariense*. All examined specimens show constant morphology in both species, thus both are treated as valid. It is necessary to examine more material from various Madagascan localities to verify their status.

The number of available specimens and deposition of type(s) was not mentioned in the original description of *M. madagascariensis* by Heyden (1877). Heyden's collection is spread among several museums and institutions. According to L. Zerche (2006, pers. comm.), DEI houses mainly the Palaearctic part of Heyden's collection and exotic specimens are deposited in SMF. I found a total of four specimens bearing the identification label '*Mecynodera madagascariensis*'. Their labels are handwritten by Heyden and they are deposited in museums which contain parts of his collection. These facts lead me to suppose that with great probability they belong to syntypes, and I designate them as lectotype and paralectotypes.

Figures of genitalia given in Reineck (1913) correspond with *R. madagascariense* and not with *R. chapuisi*. I have examined several specimens with locality 'Nossi-bé' dissected by Reineck (deposited at ZMHB) and confirm that they belong to *R. chapuisi.*

Position of the genus *Prionesthis* Lacordaire, 1845

Lacordaire (1845) proposed the genus for a single species, *Prionesthis funerarius* Lacordaire, 1845, and cited 'Australie' as the type locality. Until Monrós (1956), all authors only cited original description (Chapuis 1874; Clavareau 1900, 1913; Jacoby 1903; Crowson 1946). Monrós (1956) reported that he found one specimen identified as *P. funerarius* in the Paris museum, and transferred the species to *Megamerus*. He suggested that the specimen in front of him is the lost type but noted that it was marked by a small rounded blue label which indicates Afrotropical and not Australian origin. Monrós assumed that it comes from Madagascar, and because it was uniformly brown, he synonymized *R. fraternum* and *R. transactor* (two uniformly brown Madagascan species) with it. However, this was done without examination of types and genitalia, in spite of Reineck (1913) reported importance of male genitalia in *Rhagiosoma*. Unfortunately, I could not examine the type specimen. According to Monrós (1956) it is a female, and thus its status is nearly unsolvable. I have examined the type of *R. fraternum* and two other more uniformly brown species (both identified as *R. transactor*), and found that all three taxa differ in the male genitalia. I therefore do not include the synonymy proposed by Monrós (1956) in the catalogue provided below.

Lacordaire (1845) separated *Prionesthis* and *Megamerus* based on the shape of maxillary palpi (oval in *Prionesthis* and securiform or broadened in *Megamerus*) but unfortunately did not discuss the structure of the metepisterna, which might provide important distinguishing characters. He also mentioned that *P. funerarius* has somewhat bulgy and rugose pronotum. If these characters are correct, *Rhagiosoma* is possibly synonymous with *Prionesthis*. However, this conclusion needs a re-examination of the type specimen of *P. funerarius*, which is presently unavailable.

Catalogue of *Rhagiosoma* species

Rhagiosoma Chapuis, 1878: cxliii; Donckier de Donceel (1885): 5; Clavareau (1900): 270; Clavareau (1913): 4; Jacoby (1903): 2; Weise (1910): 484; Reineck (1913): 300; Crowson (1946): 101; Monrós (1955): 2 (as possible syn. of *Megamerus*); Monrós (1956): 106 (as syn. of *Megamerus*).

Rhagiosoma chapuisi nom. nov.

Rhagiosoma madagascariense Chapuis, 1878: cxliv (nec Heyden, 1877); De Borre (1880): clii (incl. fig.); Donckier de Donceel (1885): 5; Clavareau (1900): 270; Clavareau (1913): 4; Jacoby (1903): 2; Weise (1910): 484; Reineck (1913): 303 (incl. genitalia).
Megamerus madagascariensis: Monrós (1956): 107; Monrós (1958): 5; Monrós (1959): 73.

Distribution. Madagascar.
Comments. According to Reineck (1913), figures given in De Borre (1880) and Jacoby (1903) are conspecific with *R. grossum*.

Rhagiosoma fraternum Duvivier, 1891

Rhagiosoma fraternum Duvivier, 1891: ccxxxviii; Clavareau (1900): 270; Clavareau (1913): 4; Weise (1910): 484; Monrós (1956): 107 (as syn. of *Megamerus funerarius* Lacordaire, 1845).
Rhagiosoma fraternus: Jacoby (1903): 3.

Distribution. Madagascar, Antsiranana province, Fenérive.

Rhagiosoma grossum Reineck, 1913

Rhagiosoma grossum Reineck, 1913: 300.
Rhagiosoma grossum var. *tristiculum* Reineck, 1913: 300.
Megamerus grossus: Monrós (1956): 107; Monrós (1958): 5; Monrós (1959): 73.

Distribution. Madagascar, Antsiranana province, Vohémar.

Rhagiosoma madagascariense (Heyden, 1877) comb. nov.

Mecynodera madagascariensis Heyden, 1877: 105.

Distribution. Madagascar, Antsiranana province, Nossi-bé Island.

Rhagiosoma obscurithorax Pic, 1914

Rhagiosoma obscurithorax Pic, 1914: 21; Crowson (1946): 101; Monrós (1956): 107 (as possible syn. of *Megamerus funerarius* Lacordaire, 1845); Monrós (1959): 73 (as ? syn. of *M. funerarius)*.

Distribution. East Africa.
Comments. Distribution of this species is doubtful; the species was based on a single specimen labeled 'E. Africa' (Pic 1914). Monrós never examined the type. Nevertheless, he suggested its synonymy with *Megamerus funerarius.*

Rhagiosoma transactor Fairmaire, 1903

Rhagiosoma transactor Fairmaire, 1903: 376; Weise (1910): 484; Clavareau (1913): 4; Reineck (1913): 303; Monrós (1956): 107 (as syn. of *Megamerus funerarius* Lacordaire, 1845).

Distribution. Madagascar, Antsiranana province, Antsiranana (= Diégo-Suaréz).

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