MADOTROGUS NIKOLAJEVI NEW SPECIES FROM JORDAN WITH NOTES ON THE GENUS MADOTROGUS REITTER, 1902 AND ITS SUBGENERA
(Coleoptera, Scarabaeidae, Melolonthinae, Rhizotrogini)

Guido SABATINELLI* & Ahmad KATBEH-BADER**

*c/o Dipartimento di Biologia Animale e dell'Uomo (Entomologia), Università degli Studi di Roma «Sapienza», Piazzale Valerio Massimo 6, 00162 Roma, e-mail: g.sabatinelli@hotmail.com

**Department of Protection, Faculty of Agriculture, University of Jordan, Amman 11942, Jordan, e-mail: ahmadk@ju.edu.jo

Abstract : In the period 2006-2009 intensive entomological researches were carried out by the Authors in Jordan, Lebanon, Syria and Palestine. Several species new for the region or for the science were found. *Madotrogus nikolajevi* n. sp. from Jordan is here described, dubitatively attributed to the subgenus *Micramphimallon* Medvedev, 1951. Considerations on the morphology and systematic of the *Madotrogus* subgenera are also provided.

Résumé : Entre 2006-2009, des récoltes entomologiques intensives ont été effectuées par les Auteurs en Jordanie, au Liban, en Syrie et Palestine. Plusieurs espèces nouvelles pour la région ou pour la science ont été trouvées. *Madotrogus nikolajevi* n. sp. de Jordanie est décrit ici, attribuée sans certitude au sous-genre *Micramphimallon* Medvedev, 1951. Des considérations sur la morphologie et la systématique des sous-genres de *Madotrogus* Reitter, 1902 sont également présentées.

Key words : Scarabaeoidea, Scarabaeidae, Melolonthinae, Rhizotrogini, taxonomy, *Madotrogus nikolajevi,* Near East, Jordan.

Introduction

The genus *Madotrogus* Reitter, 1902 has been the object of some recent studies: Keith (2002) while describing two new species of *Madotrogus* from the Middle East proposed to synonymize the genus *Micramphimallon* Medvedev, 1951 with *Madotrogus*. A few years later, Nikolajev (2004) reviewing the entire genus, divided the 27 known species into four subgenera of which two were new and one resulted from the reevaluation of *Micramphimallon: Madotrogus* s.str. (7 species), *Leucotrogus* Nikolajev, 2004 (10 species), *Cyprotrogus* Nikolajev, 2004 (one species) and *Micramphimallon* Medvedev (9 species).

During the extensive entomological research carried out since 2006 in Jordan, we had the opportunity to collect a single male specimen of a *Madotrogus* new for the science and here described.

Madotrogus nikolajevi n. sp. (figs 1, 3, 5, 7, 10, 11, 13)

Diagnosis

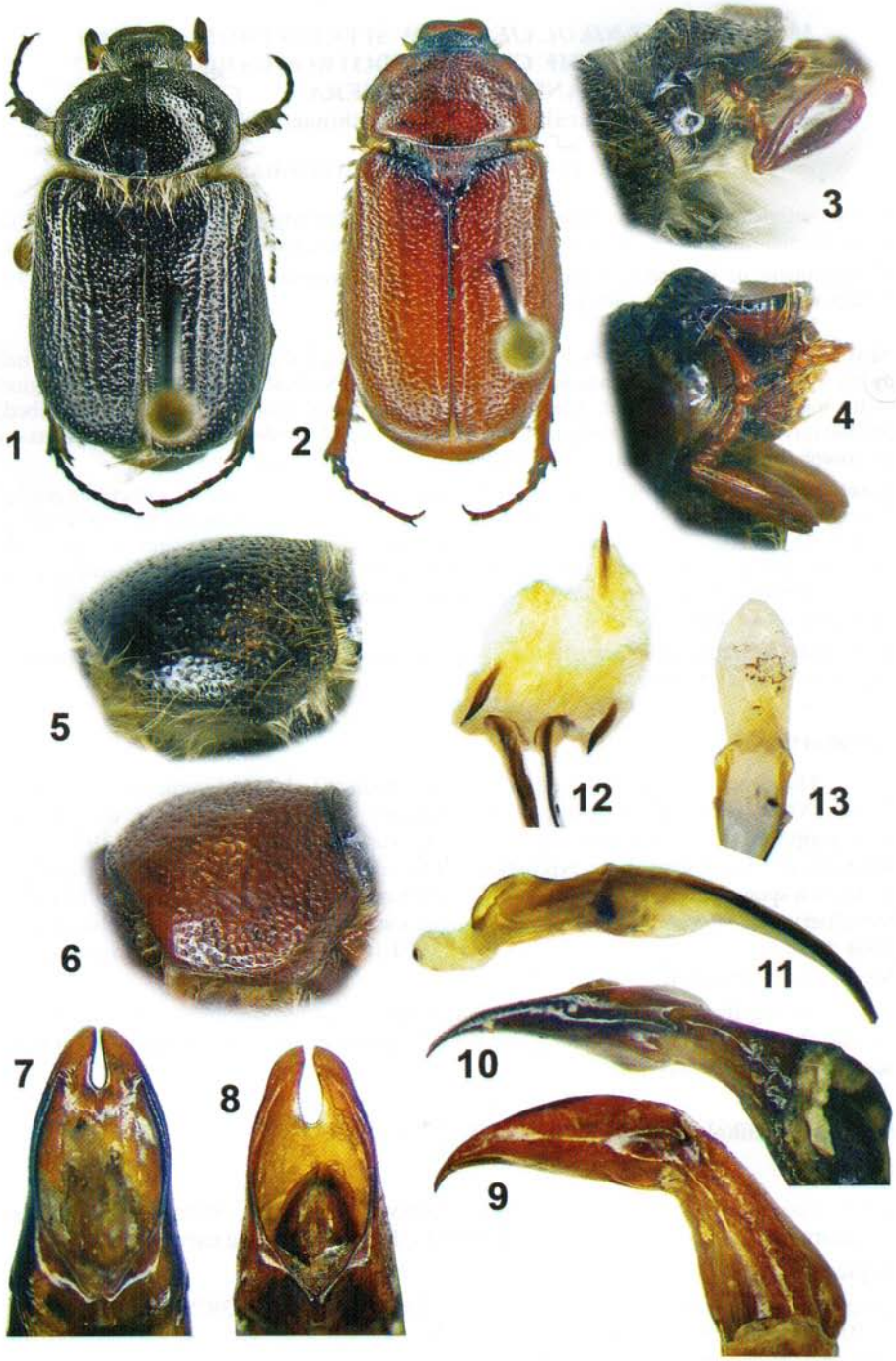
Small size *Madotrogus*, habitus black, glabrous and shiny. Sternum, prothoracic epipleura and episternum with long white hairs; frons with strong carina.

Typical series

Holotypus: male, Jordan, Tafila Governorate, Dana Reserve, 30°39'N 35°36'E, 320 m, 22.III.2008, leg. G. Sabatinelli (collection Musée d'Histoire Naturelle de Genève). No other specimens are presently known.

Description :

Body : length (clypeus-apex elytra) 11.5 mm, width 6 mm; elongated-oval; all integuments black except for antennae and palpi that are brown, dorsal surface shining and almost glabrous. Sternum, prothoracic epipleura and episternum thickly covered by long white hairs visible also dorsally; sparse setae on frons and anterior part of pronotum (fig. 1).



Figs. 1-13 - *Madotrogus nikolajevi* n.sp.: habitus fig. 1; head lateral view fig. 3; pronotum later view fig. 5; paramera dorsal view fig. 7; lateral view fig. 10; medial lobe lateral view fig 11; evaginated endophallus dorsal view fig. 13. *Madotrogus sinaicus* Baraud: habitus fig. 2; head lateral view fig 4; pronotum later view fig. 6; paramera dorsal view fig. 8; lateral view fig. 5; evaginated endophallus dorsal view fig. 12.
The relative dimensions of anatomical parts are indicated in the text.

Clypeus transverse, ratio length/width 0.81; anterior margin largely rounded, sinuate medially, narrowly and slightly reflected; epistoma flat, with distinct punctures, coarse and irregular; surface not microscultured, sparse erect setae at the base; frontoclypeal suture distinctly incised only laterally; ocular canthus thick, as long as the eye radius, with relatively long erect yellowish setae; frons strongly elevated, transversally ridged on vertex (fig. 3), coarsely and deeply punctured, punctures nearly connivent, vertex coarsely and densely sculptured anteriad, less posterad, with erect setae longer than those on frons and clypeus; eyes small with ratio diameter/interocular-width: 0.17.

Antennae brown with nine antennomeres, five and six much wider than long, club of three antennomeres, straight, 1.2 times longer than scape+funicle. Last palpus joint enlarged in the middle, depressed externally.

Pronotum transverse, ratio length/width: 0.62, widest after the middle, lateral margins strongly curved, angulose, converging much more anteriad than posterad (fig. 5), gently crenulated, anterior angles obtuse, posterior angles largely rounded almost absent, anterior and lateral border margined, basal border not margined but with a parallel row of dense punctures, anterior border with large marginal line strongly thickened and flattened especially medially; surface not microscultured, shining, unevenly punctate especially laterally, sparsely punctate on discus and posterad, densely anteriad, most punctures with a white microseta, sparse long erect white setae near the anterior border of pronotum.

Scutellum subtriangular, large, microscultured, sparsely and finely punctate, glabrous but covered by hairs rising from the mesothoracic episternum.

Elytrae oblong, length 7.5 mm, widest posterad the middle, striae indistinct, interstriae densely and rugosely punctured, only the sutural interval and two other interstriae between suture and humeral callus convex; surface microscultured, most punctures with short erect seta; epipleuron fine, ending at curved external apical edge, with dense setae shorter towards apex.

Sternum, prothoracic epipleura and episternum covered by long, woolly, white hairs, abdominal sternites with a transverse row of punctures each bearing a short adpressed seta. Pygidium weakly convex, distinctly microscultured, rather sparsely punctured, each puncture bearing an adpressed seta longer than the diameter of the puncture; lateral margin ridged, and flattened, with a row of setate punctures.

Protibiae 3-dentate, teeth strong and equidistant, inner apical spur accidentally absent on both tibiae (point of insertion clearly visible), apical spurs of metatibiae short, nearly straight.

Edeagus with phallobase much longer (2.9 mm) than paramera (1.6 mm) (fig. 7). Median lobe of tubular shape with sclerotized temones for the anchorage to the tegmen and apex slightly sclerotized laterally; the evaginated endophallus shows only ventromedially an area with raspulae (without isolated sclerites) (figs. 11, 13).

Bionomics

A unique male specimen was found in the morning dying on the soil near a camp probably attracted by lights in the Dana Reserve situated in the Tafila Governorate of Jordan. The colleting site is situated in the Irano-Turanian ecological zone: a narrow strip of variable width that surrounds all the Mediterranean ecozone except in the North of Jordan. Soils are mostly calcareous or transported by winds. Rainfall ranges from 150-300 mm; mean annual minimum temperatures range from 5-2° C, and mean annual maxima range from 15-25° C. The vegetation is treeless dominated by chamaeophytes composed mainly by small shrubs and bushes such as *Artemisia herbaalba* Asso (Asteracee) and *Anabasis syriaca* Iljin (Chenopodiaceae).

Derivatio nominis

The species is dedicated to our colleague and friend Georgy Nikolajev who recently reviewed the genus *Madotrogus* and who provided us assistance in studying this species.

Comparative diagnosis

This new species shows as unique feature its black color of integuments differing in that from all other known *Madotrogus*. It differs moreover obviously from the geographically close *Madotrogus sinaicus* (Baraud 1975) a part for the dark color of integuments (figs. 1 vs. 2, 5 vs. 6), for its less elevated frons (figs. 3 vs. 4) and for the more elongated paramera (figs 7 vs. 8, 9 vs. 10).

Discussion

In his recent revision Nikolajev (2004) provided a quite comprehensive picture of the morphological characteristics and systematics of the genus *Madotrogus* composed of 27 species. As this study was published is in Russian, I took this opportunity to summarize the key-characters of the subgenera as indicated by Nikolajev.

Table 1 : Key-characters of the *Madotrogus* subgenera (from Nikolajev, 2004)

Subgenera	*Leucotrogus*	*Madotrogus*	*Micramphimallon*	*Cyprotrogus*
Body shape	oval or short-oval	oval	elongate-oval	oval
Antennal club	shorter than scape+funicle	generally longer than scape+funicle	generally longer than scape+funicle	shorter than scape+funicle
Last palpus joint	big and wide with a groove on external face	narrow with a groove on external face	narrow with or without a groove on external face	narrow with a groove on external face
Frons	without a strong carina	without a strong carina	generally with a strong carina	without a strong carina
Pronotum	glabrous	hairy in some species	hairy in some species	glabrous
External border of anterior tibia	with tendency to reduction of basal tooth	always with 3 teeth	always with 3 teeth	with 3 teeth
Paramera in lateral view	with (or without) a step	with a step (fig. 28a Nikolajev, 2004)	in regular curve	with a step and 2 dorsal apophyses (fig 42a Nikolajev, 2004)
Endophallus	without chitinous sclerites	with 2-3 chitinous sclerites	with chitinous sclerites (? see below)	not know
Species distribution	10 species; eastern sector of the distribution of the genus: Himalayas, Afghanistan mountains (many species), eastern Central Asia; in the North up to southern extremity Zailiyskiy Alatau, on the West up to eastern Kopet Dagh	7 species; central sector of the distribution of the genus: Turkmenistan, Kazakhstan, Kirghizstan, Uzbekistan, Afghanistan (most of species)	7 species + 2 dubitatively; western-south sector of the distribution of the genus in a strongly elongated area: Baluchistan, Afghanistan, Iraq, Kuwait, Armenia, Caucasus, Turkey, Jordan and Sinai	Monotypic; Cyprus

From the table 1, appears clearly that the differences between the four subgenera are not sharp and the characteristics of one subgenus are overlapping with the others. Nikolajev also attributed to the subg. *Micramphimallon* the two easternmost species *(M. laghmanicus* Nikolajev & Kabakov, 1977 and *M. beludschistanus* (Brenske, 1896)) dubitatively, because some of their external morphological characters are more close to species of the subg. *Madotrogus*. Problematic is also the attribution of *Madotrogus nikolajevi* n. sp. to one of the subgenera because the external key-characters are those of the subgenus *Micramphimallon* but the endophallus is unarmed and presents only one area with raspulae ventromedially as in the species of the subg. *Leucotrogus*. Therefore we describe *Madotrogus nicolajevi* attributing it dubitatively to the subg. *Micramphimallon*.

During the present work, two male specimens of *Madotrogus sinaicus* Baraud (Israel, Arava valley, Timna, 3.IV.1997, leg. A.Chikatunov, coll. Tel Aviv University; Israel, Nahal Shaharut, 1.IV.2003 coll. G.Sabatinelli) were studied and the presence on the endophallus of three sclerites, one ventral and two lateral (fig. 12), is confirmed, characteristic indicated by Nikolajev for the species of the subg. *Micramphimallon*.

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