

Megarthus Curtis, 1829 of Malawi (Coleoptera, Staphylinidae, Proteininae)

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Abstract. Two new species of *Megarthus* Curtis are described and illustrated from Malawi: *M. kurbatovi* n. sp. and *M. loebli* n. sp. These species represent the first records of the genus in Malawi. They are representatives of the two main lineages of African *Megarthus*, suggesting the ancient presence of the genus in the region. Their discovery extends the limits of the area of endemism of the genus in the Great Lakes of East Africa by more than 6° of latitude (over 650 km) to the South. These finds also reduce by more than one third the distance by which the single South African species of *Megarthus* is separated from its congeners.

Keyword: Taxonomy, new species, East Africa, new country record

Introduction

In Africa south of the Sahara, the genus *Megarthus* Curtis, 1829 is mostly confined to moist habitats of mountainous areas above 1600 m a.s.l. There it is represented by 43 species occurring in Ethiopia (13), Cameroon (2), South Africa (1), and the region of the Great Lakes of East Africa (28), with only one species shared between two of these areas, *M. wittei* Cameron, 1950, known from Kenya and Zaïre, and Cameroon (CUCCODORO & LÖBL 1995, CUCCODORO 1999, 2010).

Phylogenetically the bulk of these species (35, >80%) belong to the *M. depressus*-super-group of species, which also contains most Palearctic and Nearctic species, while the remaining eight species (i.e. *M. africanus* Eichelbaum, 1913, *M. basilewskyi* Fagel, 1957, *M. gigas* Fagel, 1957, *M. major* Cuccodoro & Löbl, 1995, *M. mukankundiyeorum* Cuccodoro & Löbl, 1995, *M. selenitus* Cuccodoro & Löbl, 1995, *M. spinosus* Cuccodoro & Löbl, 1995) seem to be relicts of a more ancient presence of the genus in the area (CUCCODORO 1998, 2011). Thus the extant African *Megarthus* fauna appears to result from an early vicariant speciation in the region of the Great Lakes of East Africa, with subsequent secondary dispersal by members of the *M. depressus* super-group from the Palearctic realm over the entire continent.

Presently in the area of endemism of the Great Lakes of East Africa, the only record of the genus below 5° South is a female *M. mahnerti* Cuccodoro &

Löbl, 1995 collected in 1899 in “Deutsch Ost-Afrika, Langenburg”. Langenburg referred at that time both to a province and the Tanzanian settlement known today as Lumbira, at 9°34' South on the northeast shore of Lake Malawi. In the other hand the northernmost record of the South African *M. zulu* Cuccodoro & Löbl, 1995 is at 24°35' South in the Blyderiver Canyon, thus leaving a gap of nearly 1700 km between the two areas of endemism.

Here I describe two new species from Malawi: *M. kurbatovi* n. sp. and *M. loebli* n. sp. These taxa are representatives of the two main lineages of African *Megarthus* that occur south of the Sahara. They represent the first records of the genus in Malawi, and extend the limits of the area of endemism of the genus within the region of the Great Lakes of East Africa by more than 6° latitude (over 650 km) to the South. These finds also reduce by more than one third the distance by which the single South African species of *Megarthus* is separated from its congeners.

Material and methods

The specimens examined for this study are deposited in the Museum d'histoire naturelle, Geneva, Switzerland (MHNG).

For detailed examination, specimens were dissected, cleared in 0.1N potassium hydroxide and mount-

ed in Canada balsam on acetate slides. Images were taken using a Leica DFC425 camera in conjunction with a Leica M205-C compound microscope. Zerene Stacker (version 1.04) was used for image stacking. All images were modified and grouped using Adobe Photoshop and Illustrator CS6.

Abdominal sternites and tergites are counted from the first morphological segment and quoted in Roman numerals (i.e. last visible tergite = tergite VIII).

Taxonomy

Megarthus kurbatovi n. sp.

Figs 1-18

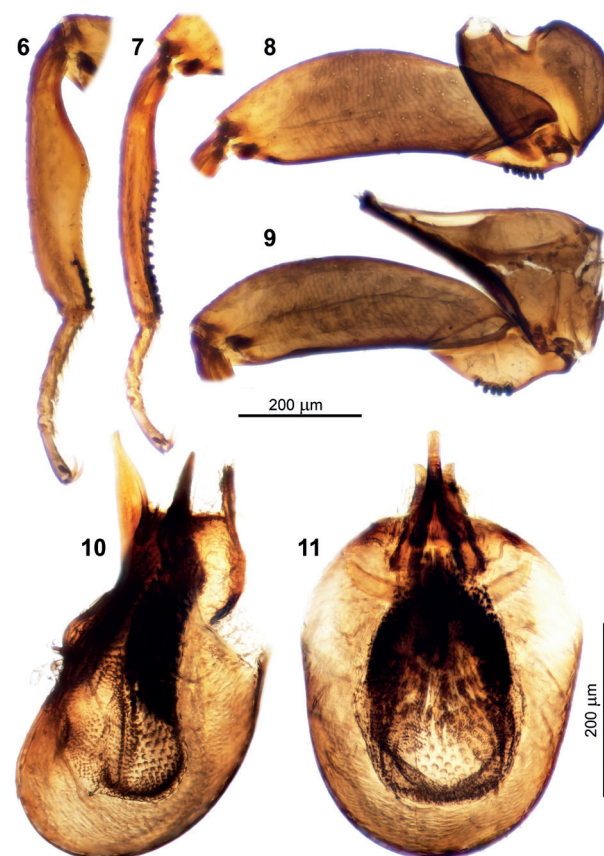
Type material. Holotype, ♂: Malawi, Mulanje district, Mt. Mulanje, Chambe Plateau, near Chambe hut <15°54'28.1"S ; 35°32'34.5"E> 1850 m, 07.iv.2018, G. Cuccodoro, #24, accession number MHNG ENTO 13303; paratypes (6): same data as holotype, 2 ♂♂, 4 ♀♀ females, accession numbers MHNG ENTO 13304-13309.

Description. Habitus as in Figs 1-2. Combined length of head, pronotum and elytra 1.2-1.5 mm;



Figs 1-5. *Megarthus kurbatovi* n. sp. 1, 2 – Habitus of male in dorsal (1) and ventral (2) views. 3 – Antenna. 4, 5 – Apical segments of abdomen in dorsal (4) and lateral (5) views. Scale bars: vertical 1, 2; horizontal 3-5.

maximal pronotal width 0.8-0.9 mm. Body predominantly dark brown, except tibiae and tarsi yellow brown. Dorsal pubescence uniform; frontal pubescence converging, medial setae directed backward; elytral and pronotal setae slightly arcuate, recumbent; metaventral setae absent on disc, becoming longer and denser anteriorly, shorter than prosternal setae; abdominal tergites IV-VI with pubescence parallel,



Figs 6-11. *Megarthus kurbatovi* n. sp., male. 6 – Metatibia and metatarsi. 7 – Mesotibia and mesotarsi. 8 – Mesocoxa, mesotrochanter and mesofemur. 9 – Metacoxa, metatrochanter and metafemur. 10, 11 – Aedeagus in lateral (10) and ventral (11) views. Scale bars: horizontal 6-9; vertical 10, 11.

uniform; sternites IV-VII with pubescence uniform, each with four subapical macrosetae. Surface of frons and vertex oblong-granulate; pronotum and elytra granulo-fossulate; prohypomera almost smooth, except anterior portion shallowly punctate; metaventrite smooth medially, and granulo-fossulate laterally.

Frons above clypeus forming a sharp ridge, the latter not carinate; lateral outlines oblique to apex rounded; entire U-shaped frontal impression obsolete. Eyes strongly convex, with highest point below level of vertex. Temples almost smooth; abruptly narrowed just behind eyes. Occipital ridge indistinct. Antenna (Fig. 3) without patches of sensillae; scape gradually expanded, not flattened and without longitudinal ridges; pedicel subcylindrical, without longitudinal ridge;



Figs 12-18. *Megarthus kurbatovi* n. sp. **12, 14** – Female genitalia in dorsal (12) and lateral (14) views. **13** – Scutellum. **15, 18** – Female apical segments of abdomen in lateral (15) and dorsal (18) views. **16, 17** – Abdominal sternite VIII of female (16) and male (17) in ventral view. Scale bars: white 13; black 12, 14-18.

short and dense pubescence present on antennomeres 5-11. Maxillary palpi with palpomere 4 about 2x as long as palpomere 3, the latter subcylindrical.

Pronotum with lateral outlines slightly angled once in middle, laterobasal notches broad and shallow with anterior angle obtuse; centre weakly convex in frontal view; disc shallowly depressed along lateral edges, the latter not raised anteriorly; medial groove shallow, almost straight in lateral view; hypomera without transverse ridge, nor discal pit. Prosternite without medial ridge. Scutellum as in Fig. 13. Elytral disc almost flat, without notable relief except humeral callus obsolete and moderate depression along lateral edge; elytra slightly narrowed at base; lateral edge nearly straight in dorsal view, slightly carinate and not serrate; sutural margin slightly arcuate on posterior portion in lateral view; posterior margin arcuate toward slightly obtuse inner apical angle. Metaventre without foveiform impressions in front of metacoxae. Mesofemora shorter than metafemora and longer than mesotibiae; metatibiae shorter than metafemora and as long as mesotibiae.

Male: Protarsomeres 1 possessing ventral modified tenent setae. Metatarsomeres 1 shorter than metatarsomeres 2-4 combined. Mesofemora and mesotrochanters as in Fig. 8. Metafemora and metatrochanters as in Fig. 9. Peg-like setae arranged in a single row on mesotrochanters, metatrochanters and metatibiae (Fig. 6); on mesotibiae (Fig. 7) arranged in a single row except subapically where grouped in a field. Abdominal sternites IV-VII unmodified; tergite VIII with apex as in Figs 4-5; sternite VIII as in Fig. 17; aedeagus as in Figs 10-11.

Female: Abdominal tergite VIII as in Figs 15 and 18, with medioapical projection very small (ca. 1/10 of tergal length); sternite VIII as in Fig. 16. Genitalia as in Figs 12 and 14.

Etymology. The species is named in honour of Sergey Kurbatov (Moscow, Russia).

Comparisons and diagnostic notes. In the region of the Great Lakes of East Africa only *M. mahnerti*, *M. merabet* Cuccodoro & Löbl, 1995, *M. monticola* Cameron, 1942 and *M. mwami* Cuccodoro & Löbl, 1995 also have the temples abruptly narrowed just behind the eyes, the combined length of pronotum and elytra shorter than 1.80 mm, in combination with the dorsoapical sclerite of the aedeagal median lobe projecting proximally of level of parameres. Within this species *M. kurbatovi* n. sp. uniquely shares with *M. mahnerti* and *M. monticola* the scutellar tip pointed. The shape of the aedeagus as well as that of the male metatibiae are diagnostic.

Natural history. The type specimens were sifted from moist cut hay along a trail some five meters from a stream, at an elevation of 1850 m a.s.l. in an area devoid of forests for almost 20 years.

Megarthus loebli n. sp.

Figs 19-36

Type material. Holotype, ♂: Malawi, Ntchisi district, Ntchisi forest <13°22'02.0"S; 34°00'41.9"E> 1600 m, 24.iii.2018, G. Cuccodoro, #11, accession number MHNG ENTO 13310; paratypes (6): same data as holotype, 2 ♂♂, accession numbers MHNG ENTO 13311-13312; same data, but #10, 2 ♀♀, accession numbers MHNG ENTO 13313-13314; same data, but #12, 1 ♀, accession number MHNG ENTO 13315; same data, but 22.iii.2018, #3, 1 female, accession number MHNG ENTO 13316.

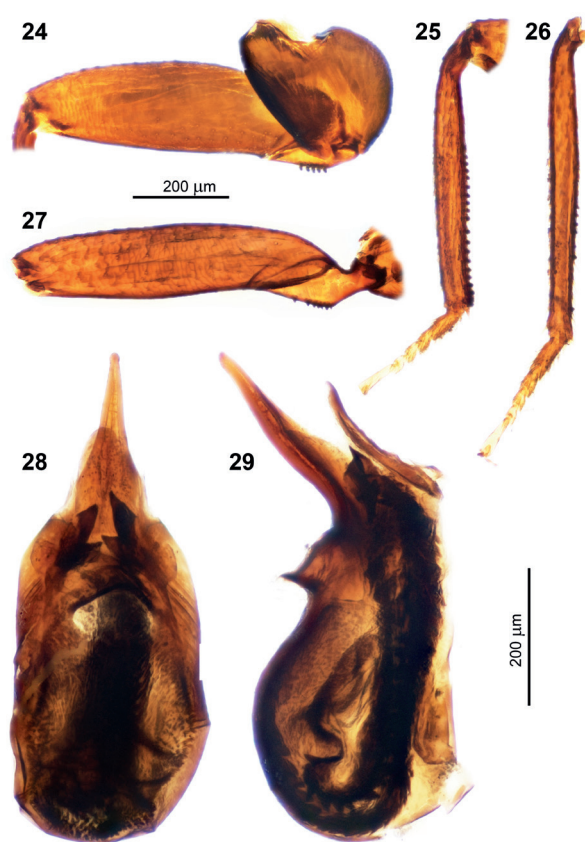
Description. Habitus as in Figs 19-20. Combined length of head, pronotum and elytra 1.5-1.7 mm; maximal pronotal width 1.1-1.2 mm. Body uniformly dark brown, except legs slightly paler, and apical (and occasionally subapical) antennomere(s) yellow. Dorsal pubescence fairly uniform, becoming sparser on posterior portion of elytra; frontal pubescence converging, medial setae directed backward; elytral



Figs 19-23. *Megarthus loebli* n. sp., male **19, 20** – Habitus in dorsal (**19**) and ventral (**20**) views. **21** – Antenna. **22, 23** – Apical segments of abdomen in dorsal (**22**) and lateral (**23**) views. Scale bars: vertical **19, 20**; horizontal **21-23**.

and pronotal setae slightly arcuate, recumbent to semi-erect; metaventral setae becoming denser medially, shorter than prosternal setae; abdominal tergites IV-VII with pubescence parallel, uniform; sternites IV-VII with pubescence uniform, lacking subapical macrosetae. Surface of frons and vertex densely and coarsely granulate; pronotum and elytra granulo-fossulate; prohypomera with anterior portion coarsely granulo-fossulate; metaventrite coarsely punctate. Frons above clypeus forming a sharp ridge, the latter finely carinate, evenly; outline rounded; U-shaped frontal impression well-marked, narrow. Eyes strongly convex, with highest point reaching level of vertex. Temples almost smooth; gradually narrowed behind eyes. Occipital ridge well-marked in middle, obsolete laterally. Antenna (Fig. 21) without patches of sensillae; scape gradually expanded, not flattened and without longitudinal ridges; pedicel subcylindrical, without longitudinal ridge; short and dense pubescence present on antennomeres 5-11. Maxillary palpi with palpomere 4 about twice as long as palpomere 3, the latter subcylindrical.

Pronotum with lateral outlines forming four distinct angles, laterobasal notches narrow and deep



Figs 24-29. *Megarthus loebli* n. sp., male. **24** – Mesocoxa, mesotrochanter and mesofemur. **25** – Mesotibia and mesotarsi. **26** – Metatibia and metatarsi. **27** – Metatrochanter and metafemur. **28, 29** – Aedeagus in ventral (**28**) and lateral (**29**) views. Scale bars: horizontal **24-27**; vertical **28, 29**.

with anterior angle sharp; centre moderately convex in frontal view; disc moderately depressed along lateral edges, the latter slightly raised on entire length; medial groove shallow, moderately convex in lateral view; hypomera without transverse ridge, nor discal pit. Prosternite without medial ridge. Scutellum as in Fig. 32. Elytral disc almost flat, without notable relief except moderate humeral callus and depression along lateral edge; elytra slightly narrowed at base; lateral edge slightly arcuate in dorsal view, slightly carinate and distinctly serrate; sutural margin slightly arcuate on posterior portion in lateral view; posterior margin straight toward slightly obtuse inner apical angle. Metaventrite without foveiform impressions in front of metacoxae. Mesofemora shorter than metafemora and longer than mesotibiae; metatibiae as long as metafemora, and longer than mesotibiae.

Male: Protarsomeres 1 lacking ventral modified tenent setae. Metatarsomeres 1 shorter than metatarsomeres 2-4 combined. Mesofemora and mesotrochanters as in Fig. 24. Metafemora and metatrochanters as in Fig. 27. Peg-like setae arranged in a single row on mesotrochanters and metatibiae (Fig. 26); on metatrochanters arranged in two overlapping rows; on



Figs 30-36. *Megarthus loebli* n. sp. **30, 31** – Female genitalia in lateral (30) and dorsal (31) views. **32** – Scutellum. **33, 36** – Female apical segments of abdomen in lateral (33) and dorsal (36) views. **34, 35** – Abdominal sternite VIII of female (34) and male (35) in ventral view. Scale bars: white 32; black 30, 31, 33-36.

mesotibiae (Fig. 25) arranged in a single row except subapically where grouped in a field. Abdominal sternites IV-VII unmodified; tergite VIII with apex as in Figs 22-23; sternite VIII as in Fig. 35; aedeagus as in Figs 28-29.

Female: Abdominal tergite VIII as in Figs 33 and 36, lacking medioapical projection; sternite VIII as in Fig. 34. Genitalia as in Figs 30-31.

Etymology. The species is named in honour of Ivan Löbl (Geneva, Switzerland).

Comparisons and diagnostic notes. In Africa South of the Sahara *M. loebli* n. sp. uniquely shares with *M. africanus*, *M. basilewskyi*, *M. gigas*, *M. major*, *M. mukankundiyeorum*, *M. selenitus*, and *M. spinosus* the shape of the eleventh antennomere piriform, as well as the absence of modified protarsal tenent setae in the males. Within these species only *M. africanus* also has a symmetrical aedeagus, however the ventral outline of the apical portion of the median lobe sinuate as well as the presence of peg-like setae on the male metatrochanters and metatibiae are diagnostic for *M. loebli* n. sp.

Natural history. The type specimens were sifted from leaf litter, fungi and woody debris under vegetation near a stream forming a small clearing in a remnant of montane forest, at an elevation on 1600 m a.s.l.

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