

Three new species of *Wernoryctes* Dechambre, 1999 from the Eastern Arc Mountains of Tanzania (Scarabaeidae, Dynastinae, Pentodontini)

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Summary. Three new species of *Wernoryctes* Dechambre, 1999, *Wernoryctes smithi* n. sp., *Wernoryctes sarahae* n. sp. and *Wernoryctes barclayi* n. sp., from the highly biodiverse Eastern Arc Mountains of Tanzania are described. The distribution of the genus in Eastern Africa is discussed and a key to the species is provided.

Résumé. Trois nouvelles espèces de *Wernoryctes* Dechambre, 1999, *Wernoryctes smithi* n. sp., *Wernoryctes sarahae* n. sp. et *Wernoryctes barclayi* n. sp., sont décrites des montagnes de l'arc oriental de Tanzanie, à la biodiversité très riche. La distribution du genre en Afrique de l'Est est discutée et une clé des espèces est fournie.

Keywords. Coleoptera, Scarabaeidae, Dynastinae, Pentodontini, *Wernoryctes*, Tanzania, Eastern Arc Mountains, nova species.

Acronyms

ANHRT: African Natural History Research Trust, Leominster, UK

BMNH: The Natural History Museum, London, United Kingdom

IRSNB: Institut royal des Sciences naturelles de Belgique, Brussels, Belgium

TBPC: Thierry Bouyer Private Collection, Chénée, Belgium

ZSM: Zoologische Staatssammlung München, München, Germany

Introduction

The Pentodontine genus *Wernoryctes* was described in 1999 by Dechambre and currently contains two species distributed in the mountainous regions of Tanzania, Malawi and Zambia (SILVESTRE, 2011). *Wernoryctes werneri* Dechambre, 1999 was described from the Poroto Mountains in southwestern Tanzania and appears to be the most widespread species whilst *W. minettii* Silvestre, 2011 is still known only from its type locality, the West Usambara Mountains in north-eastern Tanzania.

Whilst sampling the high-elevation Coleoptera fauna of Tanzania, a number of distinctive *Wernoryctes* specimens were collected in the closed-canopy submontane forests of the Nguru, South Pare and Uluguru Mountains. Further detailed analysis has revealed that each of these mountains harbours a unique species. The three new species are herein described.

Materials and methods

Primary label data has been transcribed verbatim with “/” denoting a different label and “/” denoting a line break followed by a comment for each label in square brackets. If no indication is given, the label is printed on white card. Specimens were photographed using a Canon EOS 5D SR with a Canon Macro 100mm lens. Images were stacked using Helicon Focus 6.0.

Wernoryctes smithi n. sp. (Figs. 5, 10, 15 & 20)

Holotype ♂ (BMNH): “// TANZANIA 1759m / Maskati, Nguru Mountains / S06°03'29" / E37°29'08" / 6-9. xii. 10 Light Trap / leg. Smith, R & Takano, H // BMNH(E) / 2010-91 / 1026947 //” **Paratypes**: 3 ♂♂ (ANHRT, BMNH): *idem*.

Description

Length: 29 mm. **Colour**: elytra testaceous, the rest of the body black including the elytral suture and scutellum. **Head**: clypeus semi-octagonal with rounded angles, weakly emarginate medially; the surface transversely rugose. Ocular canthus rugose and obtusely angled near its apex. Frontoclypeal suture with stout, raised, horn-like carina, bifurcate at apex, arcuate in dorsal view and gently tapering towards the apex in frontal view. The anterior surface of carina glabrous with punctures becoming finer towards the apex. Frons with large, broadly rounded excavation; the surface with intermittent fine punctures becoming larger and more frequent towards the eye. **Pronotum**: glabrous with fine punctures distributed sparsely becoming more frequent towards the margins; anterior declivity with a transversely sub-quadrate depression as wide as the distance between the apices of the ocular canthi; the surface with rugulae becoming more frequent towards the anterior margin. **Elytra**: glabrous with occasional fine punctures. **Pygidium**: surface with long yellowish setae except for anterior half where the setae disappear to leave a largely glabrous region with alutaceous microsculpture and intermittent fine punctures. The anterior margin with long setae medially. **Legs**: protibia tridentate, meso- and meta-tibiae bicarinate externally. **Protarsomere 5** greatly enlarged, subequal in length to protarsomere 1-4. **Interior protibial claw** enlarged, strongly recurved and incised at apex. **Venter**: prosternal process columnar, apex sub-rhomboidal; the posterior margin with long yellow setae. **Metasternum** densely covered in long yellow setae, the ventrites covered in short yellow setae. **Parameres**: median portion constricted, apically dilated; lateral angle acute, apex of each paramere arcuate.

Notes

The type series was collected on one night at a light trap set within the pristine submontane forests above Maskati village in the Nguru South Forest Reserve of the Nguru Mountains. Due to the topography of this area, the forests beyond the ridge have naturally been protected from deforestation.

Diagnosis

This species and the subsequent species cannot be confused with any other member of this genus due to their black pronotum. Although their colouration is distinctive, *W. smithi* appears to be allied more closely to *W. werneri* than it is to *W. sarahae*, both sharing a similar stout, horn-like

frontoclypeal carina, the broadly excavated frons and a depressed anterior declivity of the pronotum.

Derivatio nominis

It is with great pleasure that this species is dedicated to Richard SMITH, chairman of the African Natural History Research Trust, Leominster, UK, and collector of the type series; in admiration of his great passion and continued dedication to African entomology and taxonomy, without whom the discovery of a great many new insect species would otherwise not have been possible.

Distribution

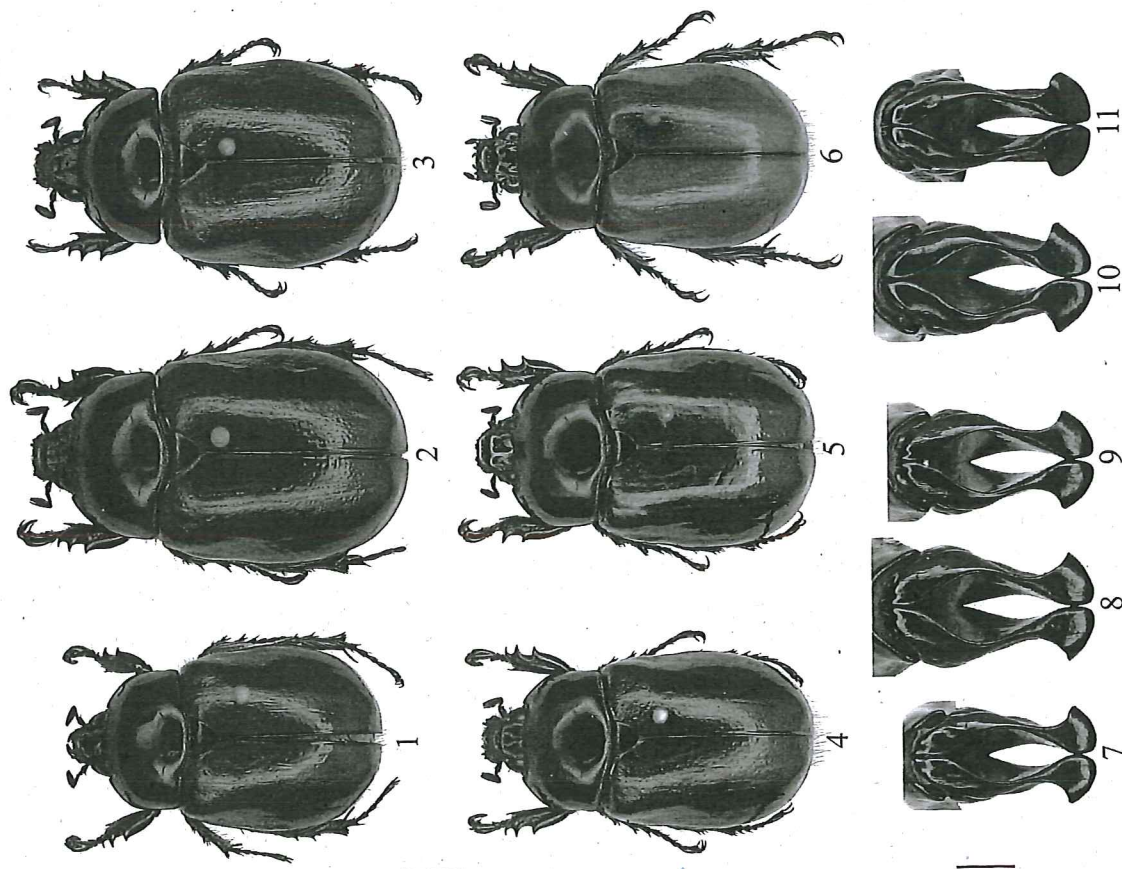
Currently known only from the Nguru Mountains in Tanzania where it is likely to be endemic.

Wernoryctes sarahae n. sp. (Figs. 4, 9, 14 & 19)

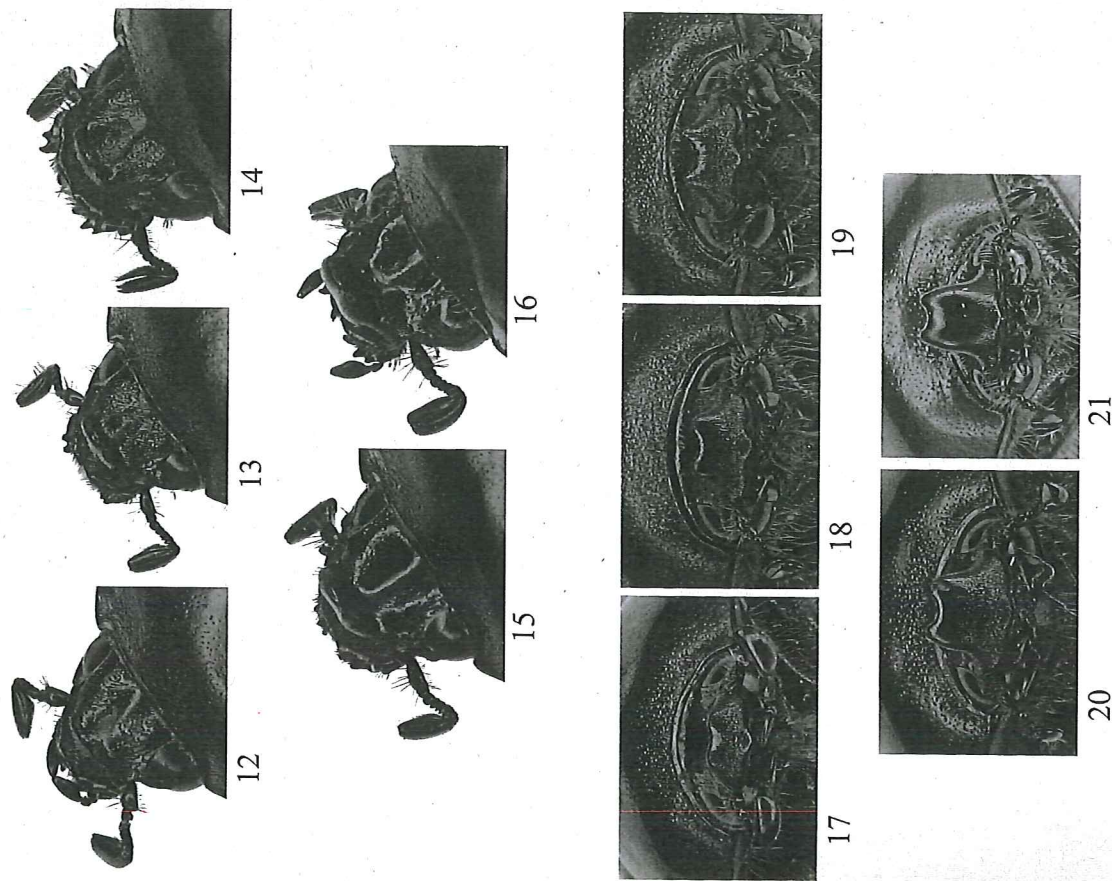
Holotype ♂ (BMNH): “// TANZANIA 1100m / Tegetero, Uluguru Mts. / S06°55'03" / E37°43'16" / 1-4. xii. 10 Light Trap / leg. Smith, R & Takano, H // BMNH(E) / 2010-91 / NHMUK 011523314 [QR code] //”

Description

Length: 28 mm. **Colour**: elytra testaceous, the rest of the body black including the elytral suture and scutellum. **Head**: clypeus semi-octagonal with rounded angles, weakly emarginate medially; the surface transversely rugose. Ocular canthus rugose and externally arcuate following the curvature of the eye. Frontoclypeal suture with stout, raised tuberculate carina, gently arcuate in dorsal view. The anterior surface of carina with punctures towards the apices of each tubercle. Frons with longitudinal depression, anteriorly ovaline and tapering posteriorly; the surface completely rugulopunctate except for the posterior portion of depression which is glabrous. **Pronotum**: surface of disc completely punctate, the larger punctures interspersed with fine punctures. Anterior portion of disc with a short, shallow, longitudinal sulcus medially and some alutaceous microsculpture. Surface of anterior declivity with rugulae becoming more frequent towards the anterior margin. **Elytra**: glabrous with some alutaceous microsculpture; the surface punctate, with punctures of various sizes, heavier and denser basally; some of the finer punctures line up longitudinally, almost forming striae. **Pygidium**: surface with alutaceous microsculpture throughout and completely covered in long yellowish setae which become less frequent towards the apex. The anterior margin with long setae medially. **Legs**: protibia tridentate, meso- and meta-tibiae bicarinate externally. **Protarsomere 5** greatly enlarged, subequal in length to protarsomere 1-4. **Interior protibial claw** enlarged, strongly recurved and incised at apex. **Venter**: prosternal process columnar, apex sub-rhomboidal; the posterior margin with long yellow setae. **Metasternum** densely covered in long yellow setae, the ventrites covered in short yellow setae. **Parameres**: median portion constricted, apically dilated; lateral angle acute, apex of each paramere arcuate. Base of each paramere with sulcus, giving the impression in caudal view of a tubercular projection at the suture of the parameres.



Figs. 1-11: type specimens of *Wernoryctes* spp. Figs. 1-6: dorsal view of *W. minnettii* holotype ♂ (Fig. 1), *W. barclayi* n. sp. holotype ♂ (Fig. 2), *W. barclayi* paratype ♀ (Fig. 3), *W. sarahae* n. sp. holotype ♂ (Fig. 4), *W. smithi* n. sp. holotype ♂ (Fig. 5) and *W. wernerii* holotype ♂ (Fig. 6). Scale is equal to 5 mm. Figs. 7-11: caudal view of parameres of *W. minnettii* (Fig. 7), *W. barclayi* (Fig. 8), *W. sarahae* (Fig. 9), *W. smithi* (Fig. 10) and *W. wernerii* (Fig. 11). Scale is equal to 1 mm.



Figs. 12-21: holotype ♂ specimens of *Wernoryctes* spp. Figs. 12-16: a detailed view of the head of *W. minnettii* (Fig. 12), *W. barclayi* n. sp. (Fig. 13), *W. sarahae* n. sp. (Fig. 14), *W. smithi* n. sp. (Fig. 15) and *W. wernerii* (Fig. 16). Figs. 17-21: frontal view of *W. minnettii* (Fig. 17), *W. barclayi* (Fig. 18), *W. sarahae* (Fig. 19), *W. smithi* (Fig. 20) and *W. wernerii* (Fig. 21).

Notes

The holotype specimen was collected at light in a fragmented area of closed-canopy submontane forest along the shoulder of the Uluguru Mountains above the village of Tegetero.

Diagnosis

This species can only be confused with *W. smithi* but the frontoclypeal carina is bituberculate, the longitudinally depressed frons and its surface rugulopunctate. The base of each paramere has a sulcus, a character which is shared only with *W. minettii* and the subsequent species.

Derivatio nominis

This species is dedicated with great pleasure to Sarah SHARP-SMITH F.R.E.S., who together with her husband Richard has travelled widely through Africa and especially in Tanzania; for her love of natural history and her on-going support of entomological research.

Distribution

Currently known only from the Uluguru Mountains in Tanzania where it is likely to be endemic.

Wernoryctes barclayi n. sp. (Figs. 2-3, 8, 13 & 18)

Holotype ♂ (BMNH): “// TANZANIA 2039m / Igoma, Chome NR / South Pare Mountains / S04°17'42"; E3°56'17" / 5-7. xii. 11 Light Trap / leg. Smith, R & Takano, H // BMNH[E] / 2012-92 / 1195889 /". **Paratype**: 1 ♀ (BMNH): *idem*.

Description

Length: 34 mm. Colour: testaceous, the elytra a little lighter. The head, tarsi, elytral suture and ventrites are black. Head: clypeus semi-octagonal with rounded angles, weakly emarginate medially; the surface transversely rugose. Ocular canthus rugose and externally arcuate following the curvature of the eye. Frontoclypeal suture with stout, raised bituberculate carina, gently arcuate in dorsal view. The anterior surface of carina with punctures towards the apices of each tubercle. Frons with longitudinal depression, anteriorly ovaline and slightly tapering posteriorly; the surface completely rugulopunctate. Pronotum: surface of disc completely punctate, the larger punctures interspersed with fine punctures becoming less frequent towards the posterior margin. Anterior portion of disc with a slight depression medially and some alutaceous microsculpture. Surface of anterior declivity with rugulae becoming more dense towards the anterior margin. Elytra: glabrous with some alutaceous microsculpture; the surface punctate, with punctures of various sizes, heavier and denser basally; some of the finer punctures line up longitudinally, almost forming striae. Pygidium: surface with long yellowish setae except for anterior half where the setae disappear to leave a largely glabrous region with alutaceous microsculpture and intermittent fine punctures. The anterior margin with long setae medially. Legs: protibia tridentate, meso- and meta-tibiae bicarinate externally. Protarsomere 5 greatly enlarged, subequal in length to protarsomere 1-4. Interior protibial claw enlarged, strongly recurved

and incised at apex. Venter: prosternal process columnar, apex sub-rhomboidal; the posterior margin with long yellow setae. Metasternum densely covered in long yellow setae, the ventrites covered in short yellow setae. Parameres: median portion constricted, apically dilated; lateral angle acute, apex of each paramere arcuate. Base of each paramere with sulcus, giving the impression in caudal view of a tubercular projection at the suture of the parameres.

Paratype female. Length: 31 mm. Similar in appearance to male but tubercles on the frontoclypeal suture greatly reduced, the frons not depressed and the surface with a longitudinal glabrous region medially. Protarsomere 5 not enlarged, subequal in length to protarsomeres 2-4. Interior protibial claw simple.

Notes

The two known specimens were collected at a light trap set near a montane stream within the closed-canopy forests of Chome Nature Reserve in the South Pare Mountains.

Diagnosis

This species is similar to *W. minettii* but is larger, the surface of the frons is completely rugulopunctate, the margin of the parameres from the apex to the external angle is gently arcuate and the distance between the apical external angles shorter than the widest section of the basal portion of the parameres.

Derivatio nominis

This species is named after Max BARCLAY of the Natural History Museum, London in acknowledgement of his assistance in the preparation of this manuscript and for taking an interest in these Dynastines at the time of their capture.

Distribution

Currently known only from the South Pare Mountains in Tanzania. It is possible that this species may also be found in the North Pare Mountains.

Key

- 1- Body colour uniform or slightly bicoloured, pronotum reddish-brown.... 2
- Body distinctly bicoloured, pronotum black 4
- 2- Frontoclypeal carina stout, horn-like and recurved; clypeus with fine punctures, frons broadly excavated with fine punctures; anterior declivity of pronotum with transversely sub-quadrate depression *W. werneri*
- Frontoclypeal carina reduced and bituberculate; clypeus rugose, frons depressed with rugulae; anterior declivity of pronotum without depression 3

- 3- Frons depressed posteriorly, the surface rugose but glabrous medially; margin of parameres from apex to external angle arcuate; the distance between the apical external angles wider than the widest section of the basal portion of the parameres *W. minettii*
- Frons with circular depression anteriorly, the surface completely rugulopunctate; margin of parameres from apex to external angle gently arcuate; the distance between the apical external angles shorter than the widest section of the basal portion of the parameres *W. barclayi* n. sp.
- 4- Frontoclypeal carina stout, horn-like and recurved; frons broadly excavated; anterior declivity of pronotum with transversely sub-quadrate depression *W. smithi* n. sp.
- Frontoclypeal carina reduced and bituberculate; frons with circular depression anteriorly, tapering posteriorly; surface rugulopunctate *W. sarahae* n. sp.

Discussion

The discovery of further new species of *Wernoryctes* from the Eastern Arc Mountains highlights once more, the exceptional biodiversity of these mountains. The high levels of endemism observed in species which occupy the closed-canopy submontane forests is well-established in many groups of organisms (BURGESS *et al.*, 2007).

Close analysis of the external and internal morphology of *Wernoryctes* suggests that the genus divides into two groups: 1) the species with a stout, recurved, horn-like frontoclypeal carina, broadly excavate frons, the anterior declivity with a sub-quadrate depression and glabrous elytra with occasional fine punctures (*W. smithi* and *W. werneri*) and 2) the species with a reduced, bituberculate frontoclypeal carina, rugose or rugulopunctate frons and the presence of a sulcus at the base of each paramere (*W. barclayi*, *W. minettii* and *W. sarahae*).

It is interesting to note that two species of *Wernoryctes* appear to be found in the Nguru and Uluguru Mountains. Although the records of *W. werneri* from Uluguru have not been corroborated (SILVESTRE, 2011), photographs of a pair of *W. werneri* from Nguru (with no specific locality data) in TBPC have been studied. As there are three isolated forest reserves within the Nguru Mountains (Kanga, Nguru South and Mkindo) it is not inconceivable that *W. werneri* is found in a different forest fragment to that of *W. smithi*. Similar distributional patterns have been observed in other orophilic organisms within these forest reserves in the Nguru Mountains

(LOADER *et al.*, 2010). The scenario may be similar in the case of *W. sarahae* and *W. werneri* in the Uluguru Mountains.

The sampling of beetles, especially using light traps, in the high-elevation forests of the Eastern Arc Mountains has been limited. Further sampling in mountains such as Udzungwa will likely yield records of *W. werneri*, thus linking the southern populations around the type locality to those records from Uluguru and Nguru, and furthermore, may also yield hitherto undescribed species of *Wernoryctes*.

Comparative material examined (all BMNH unless otherwise stated):

Wernoryctes werneri Dechambre, 1999 (3 ♂♂)

Holotype ♂ (ZSM) – “// HOLOTYPE [red card] // TANZANIA 8/9. XII. 1998 / Porote [sic] Mts, Mbeya Prov. / WERNER & LIZLER leg. // Wernoryctes ♂ / werneri n. gen. n. sp. mihi / HOLOTYPE / R. -P. Dechambre det. 1999 [partially handwritten] //” (Figs. 6, 11, 16, 21); 2♂♂ – “// TANZANIA 2000m / Mt Rungwe, Mbeya Prov. / S09°04'; E33°38' / xii. 12 Local Collector / leg. Smith, R. & Takano, H // BMNH(E) / 2012-92 //”.

Length: males: 27–28 mm.

Wernoryctes minettii Silvestre, 2011 (1 ♂)

Holotype ♂ (IRSNB) – “// Holotype [red card] // TANZANIA: Tanga. Lushoto Dist. Mazumbai / For. Res. 04°49'S, 38°29'E. 1650-1730m / 20-XI-1995. UV 21-E4 / ZMUC, DENMARK. // U. Copenhagen/UDSM Canopy Light-trapping Project. S. McKarney *et al.* // Wernoryctes minettii / n. sp. mihi ♂ / HOLOTYPE / det. G. Silvestre. 2011 //” (Figs. 1, 7, 12, 17).

Length: male: 27 mm.

Acknowledgements

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