

Transfer of three species of *Namakwanus* Scholtz & Howden to *Versicorpus* Deschodt, Davis & Scholtz or to *Namaphilus* gen. nov., with descriptions of two new species (Coleoptera: Scarabaeidae: Scarabaeinae)

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Taxonomic changes are made in the *Byrrhidium* group of Canthonini dung beetles. The genera *Versicorpus* Deschodt, Davis & Scholtz, 2011 and *Namakwanus* Scholtz & Howden, 1987 currently comprise one and four species, respectively. Re-examination of the type material of *Namakwanus irishi* Scholtz & Howden, 1987 indicates that the holotype and paratypes from mountains near Windhoek, Namibia, differ from the paratype from the Kuiseb River near Gobabeb in the Central Namib, warranting description of a new species, *Namakwanus scholtzi* spec. nov. Other species included in the genus, *Namakwanus davisii* Deschodt & Scholtz, 2007 and *Namakwanus endroedyi* Deschodt, Davis & Scholtz, 2011, differ sufficiently to warrant removal to a new genus, *Namaphilus* gen. nov. A further new species, *Namaphilus ameibensis* spec. nov., is added to the new genus. *Namakwanus streyi* Frolov, 2005 is transferred to *Versicorpus*. Lastly a new, updated key and some notes on all the known *Byrrhidium* group species are provided.

Keywords: *Byrrhidium* Group, Taxonomic Changes, Canthonini, Flightless Dung Beetles, Key.

INTRODUCTION

Dung beetles in the *Byrrhidium* group (Deschodt *et al.*, 2016) are currently assigned to the tribe Canthonini (termed Deltochilini by some authors) although tribal placement is under on-going investigation. The group is endemic to the arid southwest of Africa (Deschodt *et al.*, 2007, 2011, 2016) and is believed to be monophyletic (Medina, 2015). Owing to localized occurrence and specialized habits, various new genera and species have been described only recently (Scholtz and Howden, 1987 (two genera and two species), Frolov and Scholtz, 2003 (one genus and one species), Frolov, 2005 (one species), Deschodt *et al.*, 2007 (three new species), 2011 (one new genus and two new species), 2016 (one new genus and one new species), Moretto, 2016 (one new species)), and further taxa may await discovery.

Currently, the *Byrrhidium* group comprises five genera: *Byrrhidium* Harold (two species), *Dicranocara* Frolov & Scholtz (four species), *Namakwanus* Scholtz & Howden (four species), *Drogo* Deschodt, Davis & Scholtz (monotypic) and *Versicorpus* Deschodt, Davis & Scholtz (monotypic). Re-examination of the type material of *Namakwanus* species indicated that some revision of genus and species affiliation is required. The

paratype of *Namakwanus irishi* Scholtz & Howden, 1987 from near Gobabeb belongs to a different species. Thus, the holotype and paratypes from Windhoek become the type series of *Namakwanus irishi* whereas the other paratype is designated as the holotype of a new species, *Namakwanus scholtzi* spec. nov. All other species of *Namakwanus*, described subsequent to 1987, belong to different genera. *Namakwanus davisii* Deschodt & Scholtz, 2007 and *Namakwanus endroedyi* Deschodt, Davis & Scholtz, 2011 share unique characters and are accommodated in a new genus, *Namaphilus* gen. nov., with the addition of a third new species from the Erongo Mountains, *Namaphilus ameibensis* spec. nov. *Namakwanus streyi* Frolov, 2005 shows characteristics that justify its transfer to *Versicorpus*. Thus, the *Byrrhidium* group now comprises six genera with changes in *Namakwanus* (now two species), *Versicorpus* (now two species) and *Namaphilus* (three species).

Although mouthparts could be useful supplements to generic descriptions in this group we feel the genera are defined well enough not to warrant dissections of the holotype specimens. Specimen labels are reported verbatim with authors' comments in square brackets. All the type material is housed in the Ditsong National Museum of Natural History (formerly Transvaal Museum), Pretoria, South Africa (TMSA).

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NEW GENUS AND SPECIES DESCRIPTIONS

Namaphilus gen. nov., Figs 1–2

TYPE SPECIES. *Namakwanus endroedyi* Deschodt, Davis & Scholtz, 2011, here designated.

Gender of new name: masculine.

DESCRIPTION. Small (7.1–9.7 mm long × 4.5–5.8 mm wide) dark brown, rounded and convex beetles.

Head: with two small and short, slightly upturned clypeal teeth; one much smaller tooth medially on lower margin of clypeus.

Pronotum: dark brown, convex with ovoid to round punctures.

Protibia: tridentate in last one-third of outside margin, more or less smooth in first two-thirds.

Elytra: strongly convex, dark brown.

Sterna: mesometasternal suture straight.

Scutellum not visible.

Pygidium: shagreened with small punctures.

DISCUSSION. Morphologically this new genus can easily be separated from *Versicorpus* by lacking serrations on the outside margins of the front tibiae and by being smaller (7.1–9.7 mm long) and more convex than the larger (10.1 mm) and more elongate *Versicorpus*. The clypeus of *Namakwanus* has much more pronounced clypeal teeth than *Namaphilus*. The known species in the genus thus currently comprise *Namaphilus davis* (Deschodt & Scholtz, 2007) comb. nov., *Namaphilus endroedyi* (Deschodt, Davis & Scholtz, 2011) comb. nov. and *Namaphilus ameibensis* spec. nov.

Namaphilus ameibensis spec. nov., Figs 1–2

TYPE MATERIAL. Holotype ♀: [NAMIBIA]: S. W. Afr[ica], Erongo Mt., Farm Ameib, 21.45S – 15.39E, 23.2.1975; E-Y:687, from under stones, leg. Endrödy & Schulze.– (TMSA).

ETYMOLOGY. This species is named after its collecting locality.

DESCRIPTION. Dark brown, convex.

Head: two short and small slightly upturned clypeal teeth and one much smaller tooth medially on lower margin of clypeus. Clypeal teeth shorter than half the distance between them.

Pronotum: punctate with punctures almost round medially becoming ovoid posteriorly and laterally, surface shagreened. Short, golden brown setae present at outside lateral margin.

Protibia: surface shagreened, outside margin anteriorly tridentate in last one-third and smooth in

first two-thirds. Median dorsal ridge present, almost parallel with outside margin. Golden brown setae present, longer and more numerous terminally. Ventral surface more or less flat, punctate.

Elytra: convex. Surface shagreened, punctures on elytral interval more or less in single line, punctures on other intervals random. Punctures and striae well defined.

Sterna: prosternum with clear, round punctures placed in close proximity. Mesometasternal suture distinct and straight, punctures on mesosternum larger and further apart than on metasternum. Metasternum with faint and shallow anterior pointing curve between coxae.

Pygidium: surface shagreened and punctate, punctures small and further apart than their diameter.

DISCUSSION. This new species can be separated from all other species in the genus by being slightly larger and the edge between the clypeal teeth being curved and not straight as in the other species.

Namakwanus scholtzi spec. nov., Figs 1–2

SPECIMEN EXAMINED. Holotype ♂: [NAMIBIA]: Gobabeb, Kuiseb River, Central Namib, S. W. Afr., 11.v.1959, H. Dick Brown.– (TMSA).

ETYMOLOGY. This species is named in honour of Professor Clarke H. Scholtz, for his extensive and lifelong contribution to entomology.

DESCRIPTION. Dark brown, convex.

Head: two long, distinct, slightly upturned clypeal teeth and one much smaller tooth medially on lower margin of clypeus. Slight red tinge laterally.

Pronotum: punctate with round punctures of variable size, surface shagreened. Laterally clearly flattened with ridge in median one-third just inside of lateral margin. Ridge parallel with outside margin anteriorly and curving inward posteriorly. Lateral sides with slight red tinge.

Protibia: surface shagreened, outside margin anteriorly tridentate in last one-third and slightly sinuous to dentate in first two-thirds. Outside two denticles larger than median denticle. Median dorsal ridge present, angulate at posterior denticle of outside margin. Golden brown setae present, longer terminally. Ventral surface with median ridge.

Elytra: convex. Surface shagreened, punctures on second to fourth intervals more or less in straight double lines, punctures on all other intervals forming more or less straight single lines. Punctures and striae not well defined.

Sterna: prosternum with clear round and adjacent punctures. Mesometasternal suture distinct and very slightly curved, punctures on mesosternum

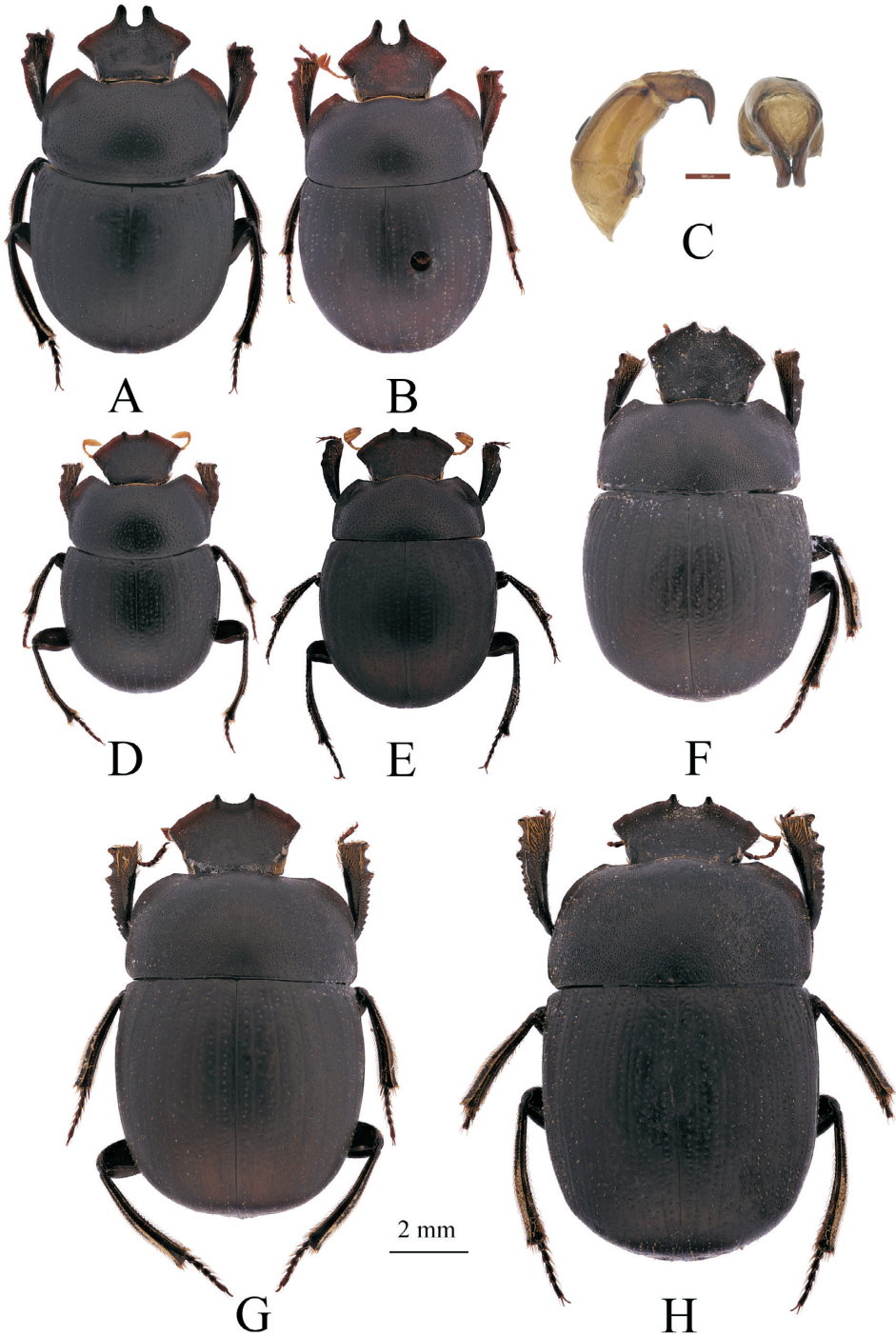


Fig. 1

Plate showing the habitus and aedeagus of one new species and habitus of all other species treated in this paper: **A:** *Namakwanus irishi* Scholtz & Howden, 1987; **B:** *Namakwanus scholtzi* spec. nov.; **C:** Aedeagus of *Namakwanus scholtzi* spec. nov.; **D:** *Namaphilus davisii* (Deschodt & Scholtz, 2007) comb. nov.; **E:** *Namaphilus endroedyi* (Deschodt, Davis & Scholtz, 2011) comb. nov.; **F:** *Namaphilus ameibensis* spec. nov.; **G:** *Versicorpus streyi* (Frolov, 2005) comb. nov.; **H:** *Versicorpus erongoense* Deschodt, Davis & Scholtz, 2011.

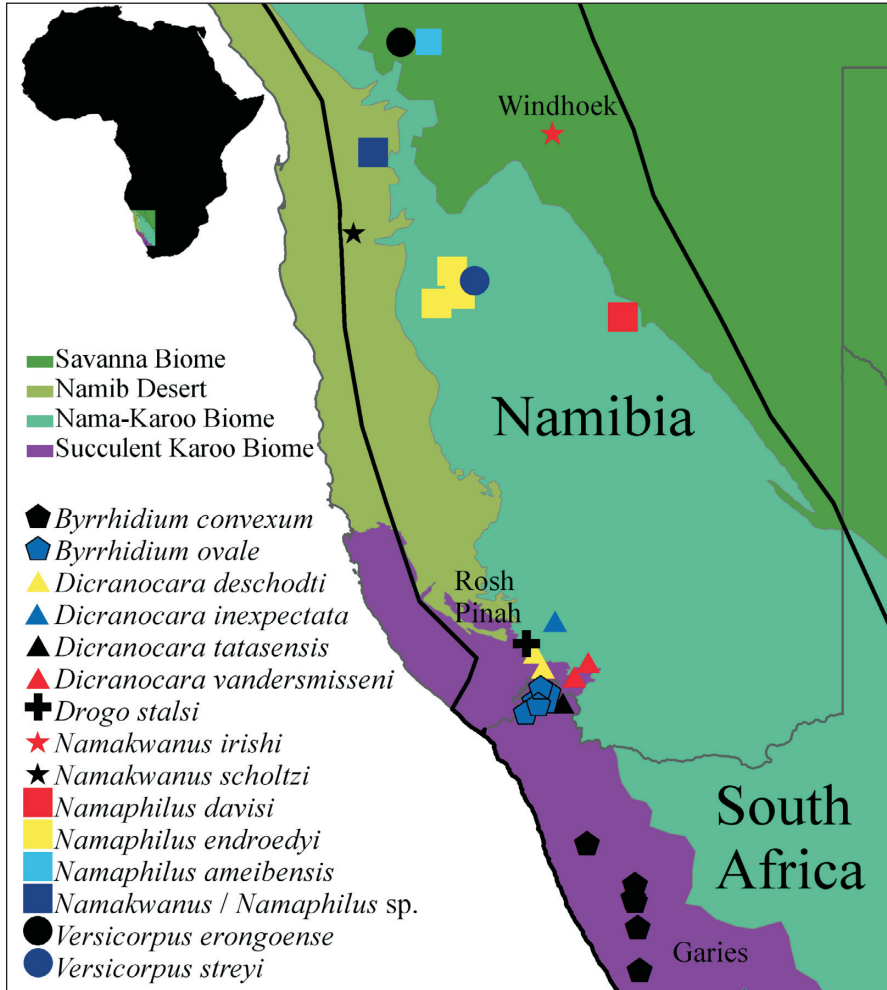


Fig. 2

Map showing the collecting localities of all the known species of the *Byrrhidium* group. The black outline indicates the distribution of rock hyaxes (shapefile supplied by IUCN). See online version for map in colour.

larger and further apart than on metasternum, surface shagreened.

Pygidium: surface shagreened and punctate, punctures small and further apart than their diameter.

DISCUSSION. This new species can be separated from *N. irishi* by the tips of the clypeal horns being slightly further apart, more upturned and slightly pointing inward at the apex.

NEW KEY TO THE GENERA AND SPECIES IN THE BYRRHIDIUM GROUP
(adapted from Deschodt *et al.*, 2016)

- | | |
|---|---|
| <p>1 Fore tibia with three external denticles. 2</p> <p>— Fore tibia with two external denticles. 8</p> | <p>2 Habitus relatively large, longer than 10 mm and elongate <i>Versicorpus</i> Deschodt, Davis and Scholtz 3</p> <p>— Habitus smaller than 10 mm long and convex 4</p> <p>3 Mesometasternal suture curving forward; punctures on prosternum large; Erongo Mountain <i>V. erongoense</i> Deschodt, Davis & Scholtz</p> <p>— Mesometasternal suture straight; punctures on prosternum small; Tsondab Mountain <i>V. streyi</i> (Frolov)</p> <p>4 Clypeal horns as long as, or longer than, distance between them <i>Namakwanus</i> Scholtz & Howden . . . 5</p> |
|---|---|

- Clypeal horns shorter than distance between them
 . . . *Namaphilus* gen. nov. Deschodt & Davis ... 6
- 5 Space between clypeal horns about one and a half times more at base than the width of a single horn at apex; clypeal horns not upturned and slightly pointing inward at the apex; Windhoek area
 *N. irishi* Scholtz & Howden
- Space between clypeal horns about two times greater at base than the width of a single horn at apex; clypeal horns more upturned and slightly pointing inward at the apex; Gobabeb area *N. scholtzi* spec. nov.
- 6 Area between clypeal teeth somewhat arcuate *N. ameibensis* spec. nov.
- Area between clypeal teeth straight 7
- 7 Tips of parameres with two notches in frontal view; Naukluft Mountains to the south of the Tsonabab River canyon
 *N. endroedyi* (Deschodt, Davis & Scholtz)
- Tips of parameres without notches in frontal view; Hardap Dam *N. davisii* (Deschodt & Scholtz)
- 8 Clypeus clearly bidentate with clypeal horns long *Dicranocara* Frolov & Scholtz ... 9
- Clypeus quadridentate, with short medial clypeal horns 12
- 9 Aedeagus without lateral horns on parameres 10
- Aedeagus with lateral horns on parameres 11
- 10 Apex of parameres bulky; northern Richtersveld. *D. inexpectata* Deschodt & Scholtz
- Apex of parameres slender; southern Richtersveld, Boom River
 *D. deschodti* Frolov & Scholtz
- 11 Side horns on aedeagus extending somewhat sideways, tip curved downwards; Richtersveld National Park in South Africa
 *D. tatasensis* Deschodt & Scholtz
- Side horns on aedeagus slightly forward, tip not curved downwards; Fish River Canyon. *D. vandersmisseni* Moretto
- 12 Clypeal horns short, mesometasternal suture not well defined; south of Orange River *Byrrhidium* Harold ... 13
- Clypeal horns of medium length, mesometasternal suture well defined; north of Orange River
 *Drogo stalsi* Deschodt, Davis & Scholtz
- 13 Aedeagus with side protrusions, fore tibia

- with outer teeth parallel; Richtersveld in South Africa
 *B. convexum* Scholtz & Howden
- Aedeagus plain with no side protrusions, fore tibia with outer teeth diverging; Namaqualand. *B. ovale* Harold

NOTES ON THE CURRENTLY KNOWN SPECIES IN THE *BYRRHIDIUM* GROUP

The *Byrrhidium* group is confined to the arid west of Namibia and South Africa (Fig. 2). It currently consists of six genera and 14 described species. These species (Deschodt *et al.*, 2007, 2011, 2016) may mostly be associated with dung middens of rock hyraxes (*Procavia capensis* (Pallas, 1766)). As there are gaps in the known range of this group relative to that of rock hyraxes (Fig. 2), new related dung beetle species and genera may await discovery.

Byrrhidium convexum Scholtz & Howden, 1987. Widespread in Namaqualand from the environs of Nuwerus [31.149°S 18.358°E] in the south to Steinkopf [29.266°S 17.734°E] in the north. More or less confined to the Namaqualand Klipkoppe Shrubland vegetation unit as defined by Mucina and Rutherford (2006). Collected some distance from rock hyrax middens among Namaqualand heuweltjies (Mima-like earth mounds, Lovegrove and Siegfried, 1986), but probably also associated with rock hyraxes.

Byrrhidium ovale Harold, 1869. Collected in the Richtersveld National Park [28.113°S 16.934°E] in association with rock hyraxes.

Dicranocara deschodti Frolov & Scholtz, 2003. Confined to the lower Boom River [28.013°S 17.063°E] in southern Namibia in close association with rock hyrax dung middens.

Dicranocara inexpectata Deschodt & Scholtz, 2007. Confined to the Witputs area [27.573°S 17.147°E] in southern Namibia in close association with rock hyrax dung middens.

Dicranocara tatasensis Deschodt & Scholtz, 2007. Only recorded from the Tatasberg Mountains [28.323°S 17.241°E], Richtersveld National Park, South Africa, in close association with rock hyrax dung middens. A single female was collected live in the shade of boulders six months after the previous rains (C.M.D. pers. obs.).

Dicranocara vandersmisseni Moretto, 2016. Only recorded near Ai-Ais [27.920°S 17.489°E] in the Fish River Canyon, Namibia.

Drogo stalsi Deschodt, Davis & Scholtz, 2016. Known from a single male specimen collected at Zebrafontein [27.750°S 16.883°E], about 30 km NNE of Rosh Pinah.

Namakwanus irishi Scholtz & Howden, 1987. Known only from the four specimens in the type series. Not collected since its description in 1987. Most probably occurs in the mountains around Windhoek [c. 22.571°S 17.086°E].

Namakwanus scholtzi spec. nov. Known only from a single specimen collected in 1959, most probably from the Kuiseb River Canyon near Barrowberg Mountain [23.658°S 15.477°E] close to Gobabeb in the central Namib Desert.

Namaphilus davis (Deschodt & Scholtz, 2007). Collected after rain in the rocky areas around Hardap Dam in Namibia.

Namaphilus endroedyi (Deschodt, Davis & Scholtz, 2011). Collected live in the Naukluft Mountains, Namibia, at least six months after the previous rain (C.M.D. pers. obs.). The holotype is currently curated by the South African National Collection of Insects [SANC] in Pretoria.

Namaphilus ameibensis spec. nov. Known only from a single female specimen collected under a rock in the Erongo Mountains, Namibia.

Versicorpus erongoense Deschodt, Davis & Scholtz, 2011. Known only from a single female specimen collected in 1975 from under a rock in the Erongo Mountains, Namibia.

Versicorpus streyi (Frolov, 2005). Known from a single male specimen collected from Bullsport Farm [24.133°S 16.366°E] in the Remhoogte Mountains to the northeast of the Tsondab River Canyon, Namibia.

Namakwanus / *Namaphilus* species, undescribed. Some disarticulated beetle fragments collected from Bloedkoppe [22.8445°S 15.3763°E] in the Namib Desert undoubtedly represent an undescribed species of the *Byrrhidium* group. However no head was collected and the species cannot be reliably placed in either *Namakwanus* or *Namaphilus*. Further material is required for its description.

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