A new *Yola* from the Western Cape of South Africa (Coleoptera: Dytiscidae: Bidessini)

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Abstract

*Yola matsikammae* sp. nov. is described from the Matsikammaberg, an inselberg–like outlier of the Great Escarpment at the northernmost edge of the winter rainfall zone of the Western Cape, South Africa. A key is provided to separate the new species from other southern African members of the *Yola bicarinata* group. *Y. matsikammae* sp. nov. bears a superficial resemblance to *Sharphydrus* species, particularly *Sharphydrus brincki* Bilton, 2013 with which it was found to co-occur. Comparative notes to separate these taxa are also included.

**Key words**: Coleoptera, Dytiscidae, Bidessini, Yola, new species, South Africa.

Introduction

*Yola* Gozis is one of the largest genera of Bidessini, with 46 described species (Nilsson 2014), 38 of which are known from the Afrotropical region. Of these, 15 have been reported from southern Africa to date, 5 of which are endemic to the region (Stals 2007). Although the detailed biology of most *Yola* species is unknown, the genus is found in both running and standing water habitats (Biström 1983); most of the endemic southern African species apparently being associated with running waters. Here I describe a distinctive new species of *Yola* from permanent stream pools on the Matsikammaberg, an inselberg-like outlier of the Great Escarpment, at the northern edge of the winter rainfall zone of the South African Cape. I provide a key to distinguish the new species from other southern African members of the *Yola bicarinata* species group (sensu Biström 1983), alongside comparative notes to separate *Y. matsikammae* sp. nov. from the superficially similar *Sharphydrus brincki* Bilton, 2013.

Materials and Methods

Specimens were studied using Leica MZ8 and M205C stereomicroscopes, with a Fluopac FP1 fluorescent illuminator. Digital photographs were taken with a Canon EOS 500D camera fitted to a Leica Z6 Apo macroscope, equipped with a 2x objective lens. Specimens were illuminated using a Leica LED5000 HDI dome illuminator to avoid shadow. Genitalia were mounted on glass slides in Kissler’s glycerol gelatine (see Riedel 2005) and imaged using an Olympus CX31 microscope fitted with the same Canon camera. Image stacks were produced by hand, and combined using Zerene Stacker software (www.zerenesystems.com).

Exact label data for specimens are cited in quotation marks. A double slash (/) indicates separate label lines.

Abbreviations
Taxonomy

*Yola matsikammae* sp. nov.
(Figs 1 and 2)

**Type locality.** South Africa. Western Cape, Matsikammaberg, permanent stream ca. 1 km SE of Sewefontein Farm, 31°41’48.08”S 18°49’48.43”E, 617 m. (Fig. 2).

**Type material.** Holotype (male): “22/ix/2014 South Africa WC// Matsikammaberg stream 1 km/ SE of Sewefontein Farm// permanent D T Bilton leg.” (genitalia extracted and mounted in DMHF on same card) with red printed holotype label “Holotype *Yola matsikammae* sp. nov. Bilton” (ISAM).

**Paratypes:** 3m#, 9f# same data as holotype (CDTB, DMSA, ISAM, NMW, SANC, OUMNH). All with red printed paratype labels “Paratype *Yola matsikammae* sp. nov. Bilton”.

**Description.** Size: Holotype: body length (to elytral apices) 2.3 mm; max. width (elytra) 1.25 mm. Elytral length 1.65 mm. Same values for paratypes: 2.3–2.45 mm, 1.3–1.7 mm and 1.6–1.85 mm respectively.

Colour (Fig. 1): Dorsal surface predominantly yellowish brown, straw coloured. Head and pronotum more deeply pigmented than ground colour of elytra. Frons darker than clypeus; infuscated along inner border of eyes. Front and hind margins of pronotum with a black band; anterior band present over central 4/5, between projections of anterior angles. Posterior band more well-developed between lateral plicae; approx. 1/5 of pronotal length. Elytra with diffuse dark markings, boundaries rather ill-defined. Anterior margins with narrow dark band, laterally almost reaching shoulders. Suture dark to apex, with diffuse dark markings expanded laterally from suture; interrupted in centre and reaching lateral keel anteriorly and elytral margin posteriorly (Fig. 1B). Maxillary palpi pale straw yellow, last segment infuscated. Fore and mid legs straw yellow with femoro-tibial junctions and tarsi infuscated. Hind legs same but femoro-tibial and tibio-tarsal junctions infuscated, along with apical 1/3–1/2 of tarsal segments. Antennae with segments 1–5 pale yellow, 6–10 with apices infuscated (more so in later segments) and segment 11 infuscated throughout. Venter reddish brown, abdomen dark pitchy brown, particularly towards lateral margins and apex.

Head: Broad, with large eyes. Clypeus somewhat thickened and evenly rounded, lacking anterior border, and not separated from rest of head. Head raised in front of eye, above antennal insertion, into a distinct, low tubercle. Frons slightly elevated in centre. Cervical line well marked. Head in front of cervical line with coarse, often confluent punctures, punctures particularly large medioidistally on frons; many punctures bearing small, peg-like setae. Anterior half of frons and clypeus with smaller sparse punctures. Centre of frons and clypeus shining, lacking microreticulation. Areas immediately inside eyes with shallow, isodiometric
microreticulation, particularly anteriorly and around frontal tubercles, giving a duller appearance. Anterior margin of clypeus shining, but with traces of transverse microreticulation. Head behind cervical line duller, with strong transverse microreticulation.

Pronotum: Transverse rectangular. Sides rounded; broadest just before middle. Hind margins distinctly bisinuate around middle. Lateral plicae well developed, relatively deep, and open interiorly. Plicae deepest at posterior ends; sinuate and becoming shallow anteriorly, here extending to approximately 1/3 away from front margin of pronotum. Posterior 1/3 third of disc between plicae depressed, especially in centre, surface here raised abruptly to level of remainder of disc. Pronotal surface shining, lacking microreticulation, but roughened due to dense, coarse punctation. Punctures largest and closest towards centre, smaller towards lateral margins. Punctures bearing flattened, white recumbent setae in centre; peg-like towards posterior and lateral margins.

Elytra: Together forming an elongate oval, with point of maximum width just behind middle. Lateral margin rounded to front angles, parallel over central 1/3, and tapered towards apex in posterior half. Each elytron with 3 keels. Discal keel very strong, gradually elevated both anteriorly and posteriorly and of even height over central 4/5, occupying ca. 2/3 of elytron (Fig. 1B). Median keel lower, running from shoulder to just in front of posterior end of discal keel. Lateral keel slightly lower still, same length as medial keel. Elytra shining, lacking microreticulation. Punctate, punctures close, coarse and shallow anteriorly, becoming finer and sparser posteriorly. Punctures almost confluent in anterior 1/2, between discal and medial keels. Each puncture bearing a flattened decumbent seta.

Venter: Mentum and prementum smooth and shining, lacking microreticulation. Anterior margin of prementum with short, stout bristles. Anterior and lateral margins of mentum thickened and somewhat darkened. Gula and genae shining, lacking microreticulation. Gular sutures weak; gula with scattered shallow medium punctures. Subgenal ridges well-marked, area between ridge and eye with open, isodiametric microreticulation. Pronotal hypomera smooth and shining, with scattered shallow punctures bearing long golden setae, and traces of transverse wrinkles posteriorly. Proepisternum shining, minutely wrinkled, especially posteriorly. Prosternum shining, strongly punctate, especially in centre where punctures are deeper and almost confluent in places. Punctures in centre of prosternum with long, fine golden setae. Prosternal process raised, neck of process making and angle of approx. 70° with prosternum. Process cordiform, elongate, with broad, shallow central groove furnished with dense, coarse, punctures bearing long, decumbent setae. Neck of process with sparse small punctures bearing hair-like, golden setae. Prosternal process meeting anterior projection of metaventrite. Metaventrite and metathoracic anepisternum shining, with sparse, shallow punctures; traces of microreticulation visible towards centre of metaventrite. Punctures somewhat larger on metaventrite and deeper anteriorly, each bearing a short, flattened, decumbent seta. Metacoxa shining, with large, shallow, almost confluent punctures bearing short, flattened, decumbent setae. Elytral pseudepipleura shining, with close, coarse, setose punctures which are almost confluent in posterior 1/2. Elytral epipleura shining, impunctate. Metacoxal lines well marked, subparallel, extending forwards onto metaventrite and converging towards its anterior margin. Metacoxal process with shallow open central channel extending forwards onto metaventrite; foveate at junction of metacoxae and metaventrite. Process punctate, with coarse, shallow punctures, each bearing a short, flat, decumbent seta. Apex of metacoxal process fused to abdomen; sinuate, lobes weakly developed and not covering leg insertions. Abdominal ventrites 2–4 fused, junctions weakly visible. Abdominal ventrites shining, 2–4 densely punctate; punctures smaller and more distinct in centre, larger and more confluent laterally; bearing flattened, decumbent setae. Abdominal ventrites 5–7
with smaller, sparser punctures, each bearing a golden recumbent seta, longer than those on preceding ventrites. Abdominal ventrites 5–6 with central tuft of long, golden, hair-like setae, extending almost to abdominal apex.

Aedeagus: Median lobe characteristically shaped (Fig. 1C); apex flattened and spathulate in ventral view. Parameres (Fig. 1C) two-segmented, with bluntly curved, hooked tips.

Females: As males except head, pronotum and elytra entirely microreticulate between punctures, giving a duller appearance. Venter duller, with fine microreticulation throughout. Venter paler than in male, yellowish brown throughout except for neck of prosternal process and segmental junctions, which are slightly infuscated. Fore and mid tarsi slightly narrower and noticeably shorter than in males, particularly last tarsal segment.

Variability. Paratypes vary slightly in size (see above) and the development of the elytral pattern, some specimens being darker than the holotype.

Differential diagnosis and key to southern African members of the Yola bicarinata group. The new species is apparently a member of the bicarinata species group, sensu Biström (1983), having three distinct elytral keels with discal keels that descend gradually to the elytral surface (Fig. 1B). Within this group Y. matsikammae sp. nov. would key to the Palaeartic Y. bicarinata (Latreille, 1804) using Biström (1983), which at 1.8–2.1 mm is smaller than the new species, as well as being more strongly rounded, and differing in genital anatomy (median lobe pointed and needle-like in ventral view in Y. bicarinata – see Biström, 1983). The new species can be distinguished from other southern African members of the bicarinata group as follows (for detailed descriptions and illustrations of previously described species see Biström 1983):

1 Median keel of elytra relatively low, equal in height to lateral keel; both keels indistinct. Median lobe with elongate, parallel-sided, needle-like apical projection in ventral view. Total length 1.8–2.0 mm. ... Yola subopaca Régimbart, 1895

- Median elytral keel more strongly elevated than lateral keel. Both keels distinct. ... 2

2 Median lobe in lateral view with apex distinctly curved in a ventral direction. All three elytral keels distinct; discal keel higher than median keel, lateral keel lower than median. Total length 1.8–2.0 mm. ... Yola dilatata Régimbart, 1906

- Median lobe straight, or curved dorsally in lateral view. ... 3

3 Median elytral keel only slightly more strongly elevated than lateral keel. Pronotum broadest at posterior corners, or just anterior to them. Pronotal disc flat between plicae. Median lobe in lateral view relatively broad almost until apex; apex at most slightly expanded and triangular in ventral view. Size smaller, total length 1.9–2.3 mm; max. width 1.1–1.4 mm. ... Yola frontalis Régimbart, 1906

- Median elytral keel distinctly more strongly elevated than lateral keel. Pronotum broadest just before middle. Posterior 1/3 third of pronotal disc depressed between plicae, especially in centre, where the surface is raised abruptly to level of remainder of disc (Fig. 1A). Median lobe (Fig. 1C) in lateral view narrowing approx. 1/6 before apex, then parallel-sided to apex; apex strongly expanded, spathulate, in ventral view. Size larger, total length 2.3–2.45 mm; max. width 1.25–1.7 mm. ... Yola matsikammae sp. nov.
Superficially, in both shape and dorsal colouration, the new taxon resembles *Sharphydrus* species, especially *S. brincki*, with which it was microsympatric (i.e. co-occurred in the same microhabitat). It can readily be distinguished from *S. brincki* by the presence of three elytral keels rather than just the discal one. The discal keel of *Y. matsikammae* sp. nov. is also much stronger, the dorsal surface shinier, and the dorsal and ventral punctures larger than in *S. brincki*. In addition, the median lobe of the aedeagus lacks the tripartite apical structure characteristic of known *Sharphydrus* species (see Bilton 2013). As discussed by Biström (1988) and Bilton (2013), the distinction between *Yola* and *Sharphydrus* is not well-defined. Bilton (2013) suggested that the tripartite structure of the median lobe represented a unique synapomorphy of this group, although the inter-relationships between *Sharphydrus* and *Yola*, including the new species, require further exploration.

**Distribution.** To date known from the type locality (Fig. 2), a permanent stream surrounded by Bokkeveld Sandstone Fynbos (sensu Mucina & Rutherford 2006) on the Matsikammaberg in the northern part of the Western Cape province of South Africa. The Matsikammaberg forms a striking inselberg, reaching just over 1,000 m in altitude, with 700 m high sandstone cliffs towering over the dry Knersvlakte plains of Namaqualand. The mountain forms a mesic island in an otherwise semi-arid landscape, annual rainfall reaching 550 mm in the east contrasting with as little as 50 mm per year on the plains below. The Matsikammaberg is consequently home to a diverse flora, 10% of which is regionally, and 4% locally endemic (Helme 2004).

**Etymology.** Named after the Matsikammaberg, on which the type locality is situated. Matsikamma is a Khoi-San word which translates as “full of pools”, in apparent reference to the abundance of seasonal rock pools on the mountain plateau. The specific epithet is a noun in the genitive case.


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**References**


Figure legends

Fig. 1. *Yola matsikammae* sp. nov. A) holotype habitus, dorsal view; B) holotype habitus, lateral view; C) holotype median lobe, lateral and ventral views, right paramere. Scale bar A–B = 1 mm; C = 0.5 mm.

Fig. 2. Type locality of *Yola matsikammae* sp. nov., South Africa, Western Cape, Matsikammaberg, permanent stream ca. 1 km SE of Sewefontein Farm. Photo D. T. Bilton.