

Delopleurus mencli sp. nov. from Socotra Island
(Coleoptera: Scarabaeidae: Scarabaeinae)

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Abstract. *Delopleurus mencli* sp. nov. is described from Socotra Island, Yemen, and its diagnostic characters including external male genitalia are illustrated. The new species can be distinguished from all nine previously known species mainly by the sculpture of the pygidium of both males and females. Discovery of this new species on Socotra Island links disjunctive Afro-Oriental distribution of the genus *Delopleurus* Erichson, 1847, previously reported only from the Sub-Saharan Africa and the Indian subcontinent.

Key words. Coleoptera, Scarabaeoidea, Scarabaeidae, Scarabaeinae, Ateuchini, *Delopleurus*, taxonomy, description, new species, Yemen, Socotra

Introduction

The miniature scarab beetle genus *Delopleurus* Erichson, 1847 was believed to have a remarkably disjunctive Afro-Oriental distribution (cf., e.g., DAVIS et al. 2008, FROLOV 2014). According to the recently published revision of this genus (FROLOV 2014) nine species are known so far; seven of them occur in the Sub-Saharan Africa and two others in the Indian subcontinent. Further species, *Delopleurus janssensii* Frey, 1963, from Somalia has been newly transferred to the genus *Metacatharsius* Montreuil, 1998 (see FROLOV 2014). Classification of the genus on tribal and/or subtribal level in the Scarabaeinae is not yet satisfactorily solved: in recent studies it is considered *incertae sedis* within Ateuchini, not fitting into Ateuchina or Scatimina (cf. VAZ-DE-MELLO 2008), or a group distinct from Ateuchini and closely related to the genera *Coptorhina* Hope, 1830, *Frankenbergerius* Balthasar, 1935, and *Sarophorus* Erichson, 1847 (e.g. MONTREUIL 1998; FROLOV & SCHOLTZ 2003, 2005; FROLOV et al. 2008; FROLOV 2014).

Recently, I had an opportunity to study material of the Scarabaeoidea collected during several Czech biological expeditions to Socotra including a new peculiar *Delopleurus* species described below.

Material and methods

Specimens were examined with an Olympus SZ61 stereomicroscope, measurements were taken with an ocular graticule. The habitus photographs were taken using a Canon MP-E 65/2.8 MACRO lens with 5:1 optical magnification. Partially focused images of specimens were combined using Helicon Focus 3.20.2Pro software.

Specimens of the newly described species are provided with one red printed label: 'Delopleurus mencli sp. nov., HOLOTYPE [or ALLOTYPUS or PARATYPUS No. x, respectively], sex symbol, David Král det. 2013'. Exact label data are cited for the material, individual labels are indicated by a double slash (//), individual lines of every label line by a single slash (/). Author's remarks and additional comments are found in brackets.

For details and comments on individual localities visited, including the prevailing spelling, see BEZDĚK et al. (2012).

All material is deposited in the collection of the National Museum, Prague, Czech Republic (NMPC).

Taxonomy

Delopleurus mencli sp. nov.

(Figs 1–7)

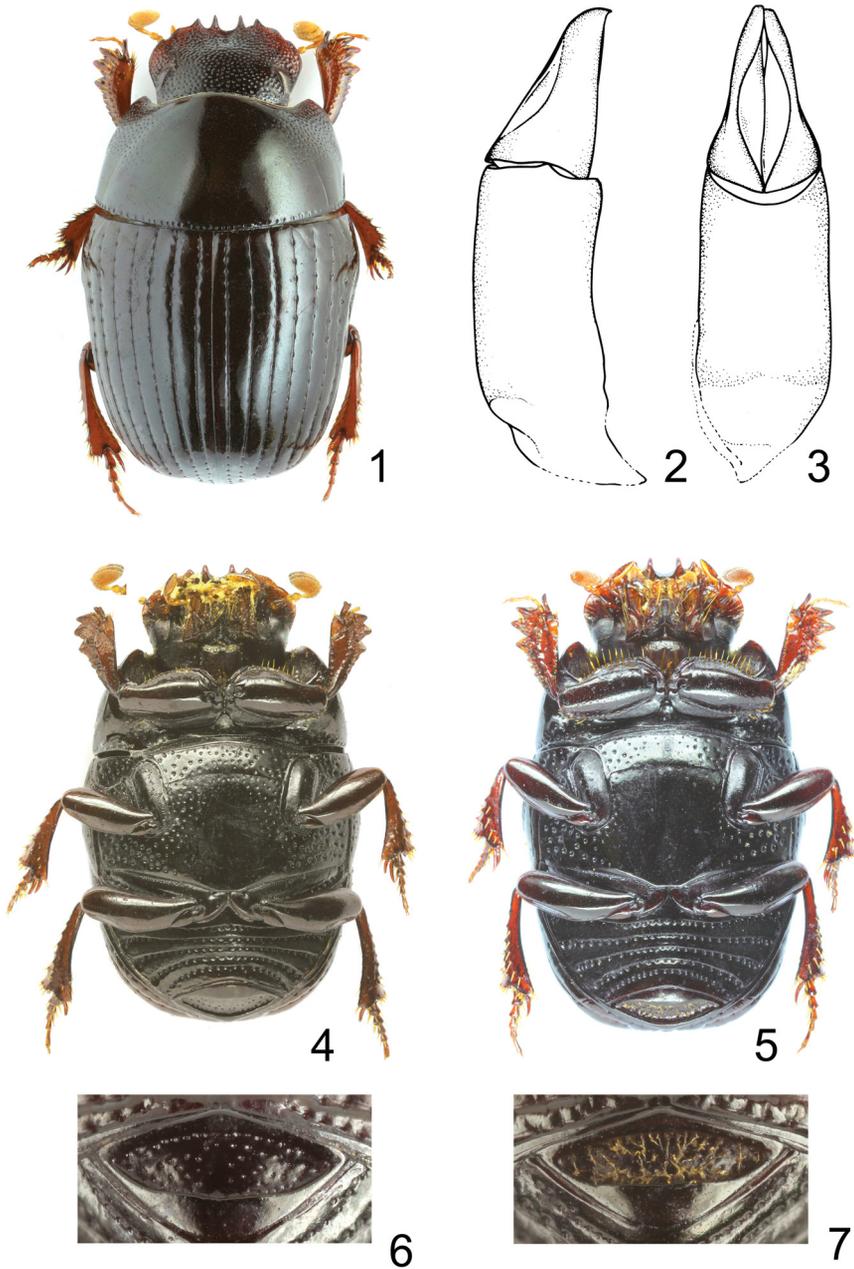
Type locality. Yemen, Socotra Island, Wadi Ayhaft, 12°36'38"N 53°58'49"E, 190 m a.s.l.

Type material (13 specimens). HOLOTYPE: ♂, 'Yemen, Soqotra Is. / 24-26.xi.2003 / WADI AYHAFT, 190m / N12°36'38" E53°58'49" / [GPS], David Král lgt. // YEMEN – SOQOTRA 2003 / Expedition; Jan Farkač, / Petr Kabátek & David Král [printed]' (NMPC). ALLOTYPES: ♀, same label data as holotype (NMPC). PARATYPES: Nos 1 (♂) and 2–3 (♀♀), same label data as holotype; Nos 4–5 (♀♀), 'Yemen, Soqotra Is. WADI / AYHAFT, 24-26.xi.2003, N 12° / 36'38" E 53°58'49", 190m / [GPS], leg. P. Kabátek // YEMEN – SOQOTRA / 2003 / Expedition; Jan Farkač, / Petr Kabátek & David Král [printed]'; No. 6 (♀), 'Yemen, Soqotra Is. 24-26.xi.2003/ WADI AYHAFT / N 12°36'38" E53°58'49" / 190 m / [GPS]; Jan Farkač lgt. // YEMEN – SOQOTRA 2003 / Expedition; Jan Farkač, / Petr Kabátek & David Král [printed]'; Nos 7 (♂) and 8 (♀), 'Yemen, Soqotra Is., 2003 / 9–10.xii., Qalansiyah env. / KHAYRHA mts., N slopes / N12°38'50" E53°27'45" / 85–592 m [GPS]. D. Král lgt. // YEMEN – SOQOTRA 2003 / Expedition; Jan Farkač, / Petr Kabátek & David Král [printed]'; No. 9 (♀), 'YEMEN, SOCOTRA Island / wadi Ayhaft / 12°36.5'N, 53°58.9'E, 200m / Jan Bezděk leg., 7.-8.xi.2010 [printed]'; Nos 10–11 (♀♀), 'YEMEN, SOCOTRA Island / wadi Ayhaft / 12°36.5'N, 53°58.9'E, 200m / Jiří Hájek leg., 7.-8.xi.2010 [printed]' (all in NMPC).

Description of holotype. Total body length 4.3 mm. Compact, strongly convex, body outline subquadrate, entire surface except for mouthparts and legs shiny, smooth; colour black, mouthparts, antennae and tarsi brownish to reddish brown (Figs 1, 4).

Head broader than long, flat, with whole dorsal surface densely, coarsely, regularly punctate; punctuation becoming somewhat rugose anteriorly and sparser posteriorly; clypeus armed with four prominent, sharp teeth anteriorly; medial notch deep, rounded basally; lateral notches shallow, broadly rounded; genae angulate anterolaterally; eyes small, narrow, visible in dorsal aspect, not completely divided by eye canthus (Fig. 1). Gula longer than broad, with longitudinal groove. Antennae consisting of nine antennomeres.

Pronotum transversal, strongly convex, anterior outline deeply excised medially; anterior and lateral margins distinctly bordered; basis with row of equidistant, distinct, shallow marginal punctures crenating basal margin; anterior angles rounded, lateral margin gently rounded



Figs 1–7. *Delopleurus mencli* sp. nov. 1 – holotype ♂; 4, 6 – paratype No. 1 ♂; 5, 7 – allotype ♀. 1 – habitus, dorsal aspect; 2 – aedeagus, lateral aspect; 3 – aedeagus dorsal aspect; 4–5 – habitus, ventral aspect; 6, 7 – pygidium, dorsal aspect. Not to scale.

anteriorly and feebly sinuate subbasally; basis broadly rounded; near basis short median, longitudinal line extending to about fifth of length of pronotum; surface smooth except for coarsely and densely punctate anterolateral area (Fig. 1).

Scutellar shield invisible.

Elytra strongly convex with external margin deeply sinuate posteriorly of humerus; pseudopipleura indistinct, impunctate; distinctly striate, striae 1–7 complete, stria 8 interrupted by external sinuation; each stria with row of deeply impressed, regularly spaced punctures crenating distinct intervals; intervals weakly convex, entirely impunctate (Fig 1).

Pygidium about two times wider than long, with strongly raised borders, apical border considerably thick medially (about two times thicker than basal border), basal border slender and almost parallel-sided except for middle; disc flat, glabrous, coarsely and irregularly punctate, punctures separated by 2–3 puncture diameters (Figs 4, 6).

Mesoventrite considerably short and broad, with the anterior and posterior margins almost straight and almost parallel, anterior margin bordered, distance between mesocoxae more than three times length of mesoventrite, surface considerably coarsely, regularly punctate; metaventral disc shallowly concave, coarsely punctate anteriorly and anterolaterally.

Legs. Coxae and femora smooth ventrally, profemora distinctly bordered ventrally (Fig. 4); protibiae considerably broad, with three sharp teeth and row of four small denticles (Figs 1, 4), excavated at basis of protarsus ventrally (allowing protarsus to be folded posteriad) (Fig. 4), terminal spur bifid apically (Fig. 4); meso- and metatibiae long, triangular, regularly expanded distad; protarsomeres long, filiform; meso- and metatarsomeres 1–4 short, approximately as long as broad, slightly diminished distad, meso- and metatarsomere 5 distinctly longer than broad; claws slender, weakly curved (Figs 1, 4).

Abdomen considerably short, abdominal ventrites not fused, remarkably coarsely, regularly punctate (Fig. 4).

Male genitalia. Aedeagus symmetrical; parameres simple, distinctly shorter than phallobasis, straight, convergent distad, with sharply pointed apex in lateral aspect (Figs 2–3).

Female. Differs from male in the following characters: terminal spur of protibia simply pointed apically (Fig. 5), disc of pygidium scabrous, bearing brownish setae (Figs 5, 7), mesoventrite almost impunctate medially, metaventral disc flat, almost impunctate also anteriorly and anterolaterally (Fig. 5).

Variability. Specimens of the type series only slightly vary in body length (4.1–4.4 mm).

Differential diagnosis. The new species is classified in the genus *Delopleurus* mainly by possessing anterior margin of clypeus quadridentate with middle teeth more prominent than lateral ones, eyes not completely divided by eye canthus, gula with longitudinal groove, head and pronotum completely unarmed, elytra with unique external sinuation, pseudopipleura indistinct, protibia with three prominent external teeth and basimetatarsomere not distinctly longer than metatarsomere 2. It is distinguished from other described species mostly by different sculpture of pygidium. In the key to *Delopleurus* species (FROLOV 2014), males of *D. mencli* sp. nov. key to the couplet with *D. darrenmanni* Frolov, 2014 but can be separated from it by flat and longer disc of pygidium (Figs 4, 6) (disc convex and narrower in *D. darrenmanni*, see FROLOV 2014: Fig. 4B); females of *D. mencli* sp. nov. key to the couplet with *D. naviauxi* Frolov & Cambefort, 2014, but the new species possesses flat, scabrous,

macrosetaceous disc of pygidium (Figs 5, 7) in contrast to slit shaped, macrosetaceous disc in *D. naviauxi* (see FROLOV 2014: Fig. 2B); in addition *D. naviauxi* has protibiae with a small acute tooth near terminal spur (see FROLOV 2014: Fig. 1D) while in the new species protibiae are without this small tooth (Figs 1, 4–5).

Etymology. Patronymic; named in honour of my long-time friend Ladislav Mencl (Týnec nad Labem, Czech Republic), an outstanding specialist on dung beetles.

Collecting circumstances. Specimens originating from Wadi Ayhaft (2003, legit DK) and from Khayrha mts. were collected in shaded bushy habitat from human faeces.

Distribution. Endemic species to Socotra Island, so far known only from central (Wadi Ayhaft) and western parts (Khayrha mts.) (see BEZDĚK et al. 2012, for details).

Discussion

We have only scanty information about the biology of *Delopleurus*. According to FROLOV (2014) *Delopleurus* species are specialist feeders on agaric mushrooms (Agaricales) and they have never been found in or under dung pads. Interesting findings of *D. mencli* sp. nov. in human faeces as well as *Delopleurus* specimens collected from traps baited with fish (FROLOV 2014) are probably only chance captures and can be explained, for example, by lack of another moist material in the close proximity of finding. This is also supported by the fact that there have been recently no native ‘large’ mammals, turtles etc. on Socotra whose excrements might *Delopleurus* feed on (see, e.g. WRANIK 2003).

Discovery of the new species represents a link of the disjunctive Afro-Oriental distribution of the genus *Delopleurus* and supports hypothesis that the genus was widely distributed in Africa and Eurasia in the late Miocene (FROLOV 2014).

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References

- BEZDĚK J., PURCHART L., KRÁL K. & HULA V. 2012: List of local Socotran geographical names used in entomological literature. Pp. 27–67. In: HÁJEK J. & BEZDĚK J. (eds): Insect biodiversity of Socotra Archipelago. *Acta Entomologica Musei Nationalis Pragae* **52 (Supplementum 2)**: i–vi + 1–557.
- DAVIS A. V. L., FROLOV A. V. & SCHOLTZ C. H. 2008: *The African Dung Beetle Genera*. Protea Book House, Pretoria, 272 pp.

- FROLOV A. V. 2014: Revision of the genus *Delopleurus* Boheman (Coleoptera: Scarabaeidae: Scarabaeinae) with description of new species from Africa. *Journal of Natural History* **49**(3): 129-154, doi:10.1080/00222933.2014.909072
- FROLOV A. V., AKHMETOVA L. A. & SCHOLTZ C. H. 2008: Revision of the obligate mushroom-feeding African “dung beetle” genus *Coptorhina* Hope (Coleoptera: Scarabaeidae: Scarabaeinae). *Journal of Natural History* **42**: 1477–1508.
- FROLOV A. V. & SCHOLTZ C. H. 2003: Revision of the Afrotropical dung beetle genus *Sarophorus* Erichson (Coleoptera: Scarabaeidae). *African Entomology* **11**: 183–198.
- FROLOV A. V. & SCHOLTZ C. H. 2005: Revision of the southern African genus *Frankenbergerius* Balthasar with description of new taxa (Coleoptera: Scarabaeidae: Scarabaeinae). *Journal of Natural History* **39**: 2355–2377.
- MONTREUIL O. 1998: Analyse phylogénétique et paraphylie des Coprini et Dichotomiini (Coleoptera: Scarabaeidae). Scénario Biogéographique. *Annales de la Société Entomologique de France (Nouvelle Série)* **34**: 135–148.
- VAZ-DE-MELLO F. Z. 2008: Synopsis of the new subtribe Scatimina (Coleoptera: Scarabaeidae: Scarabaeinae: Ateuchini), with descriptions of twelve new genera and review of *Genieridium*, new genus. *Zootaxa* **1955**: 1–75.
- WRANIK W. 2003: *Fauna of the Socotra Archipelago: a field guide*. Universitätsdruckerei, Rostock, 542 pp.