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**First record of the family Cantharidae on Socotra,
with description of a new genus and two new species
of the subfamily Silinae (Coleoptera: Elateroidea)**

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Abstract. The first known representatives of the family Cantharidae are described from Socotra: *Silidius svihlai* sp. nov. and *Socotrasilis enigmatica* gen. et sp. nov. Dorsal habitus, pronotum and aedeagus for each species are illustrated. Both species seem phylogenetically isolated, with no known close relatives.

Key words. Coleoptera, Cantharidae, Silinae, *Silidius*, *Socotrasilis*, new genus, new species, taxonomy, Yemen, Socotra

Introduction

Although Cantharidae, with currently over 6,000 described species, are a rather large family of Coleoptera, they are poorly represented in arid regions of the world. Currently, not a single species of this family is recorded from the Arabian Peninsula (KAZANTSEV & BRANCUCCI 2007). As for the African continent, there is a sharp divide between the Palaearctic fauna found in the Atlas mountains and the Mediterranean parts of Morocco, Algeria and Tunisia (subfamilies Cantharinae and Malthininae), and the Afrotropical fauna of the Sahelian savannahs, populated by a few members of the genus *Silidius* Gorham, 1883 (Silinae). The Sahara itself, including its border regions still containing a relatively rich insect fauna, seems to be completely devoid of any Cantharidae species. So far, Socotra has been thought to be part of this „cantharid-free belt“, separating the Palaearctic and Afrotropical faunas.

It was therefore a rather pleasant surprise to find that entomologists of the National Museum in Prague and Mendel University in Brno have recently discovered two species of the subfamily Silinae during their surveys on Socotra Island. These are of great interest, both taxonomically and biogeographically.

Upon closer examination, it became apparent that these Socotran species are undescribed and they both show a rather unusual combination of characters, making it difficult to link them with any known members of the subfamily. This is further complicated by the fact that the generic taxonomy of Silinae lacks a modern phylogenetic assessment, leaving the monophyly of many genera at least questionable, if not completely unsupported. In the absence of a modern key, the generic placement of any new species has to be based on direct comparison with members of the known genera, using the few character complexes mentioned in the literature (e.g. sexually dimorphic structures on pronotum, antennae and other body parts; claws, and the structure of the highly complex aedeagus). It became evident that the two species collected on Socotra are not only unrelated to any described species, but also unrelated to each other. To avoid creating additional taxonomic instability by introducing an additional genus-group name, one species is here provisionally placed in the Afrotropical genus *Silidius*, based mainly on its claws. The other species, however, shows such an unusual combination of characters that it cannot possibly fit into any described genus. Therefore, it is here described in a new genus.

Material and methods

The material studied here is deposited in the following institutions:

BMNH Natural History Museum, London, United Kingdom;
NMPC Národní muzeum, Prague, Czech Republic.

The specimens were studied under a Zeiss stereoscopic microscope. Measurements were taken using an ocular grid mounted on the microscope at 10× magnification. Total body length is measured from clypeus to tip of elytra. Width measurements should be understood as maximum width of the respective body part; head width is measured including the eyes.

Images are stacked photographs taken with a microscope mounted camera, combined using Helicon Focus 5.3 software. All were processed in Adobe Photoshop.

In the absence of a comparative morphological study of male genitalia of Cantharidae and other Coleoptera, the terminology here adopted follows WITTMER (1969), with the respective terms loosely translated into English (explanations given in the text). Other morphological definitions follow BRANCUCCI (1980).

Verbatim label data are cited in parentheses, with lines separated by a single slash (/) and different labels by a double slash (//). All type specimens were provided with an additional red, printed label, stating the name of the taxon and ‘M. Geiser des. 2017’.

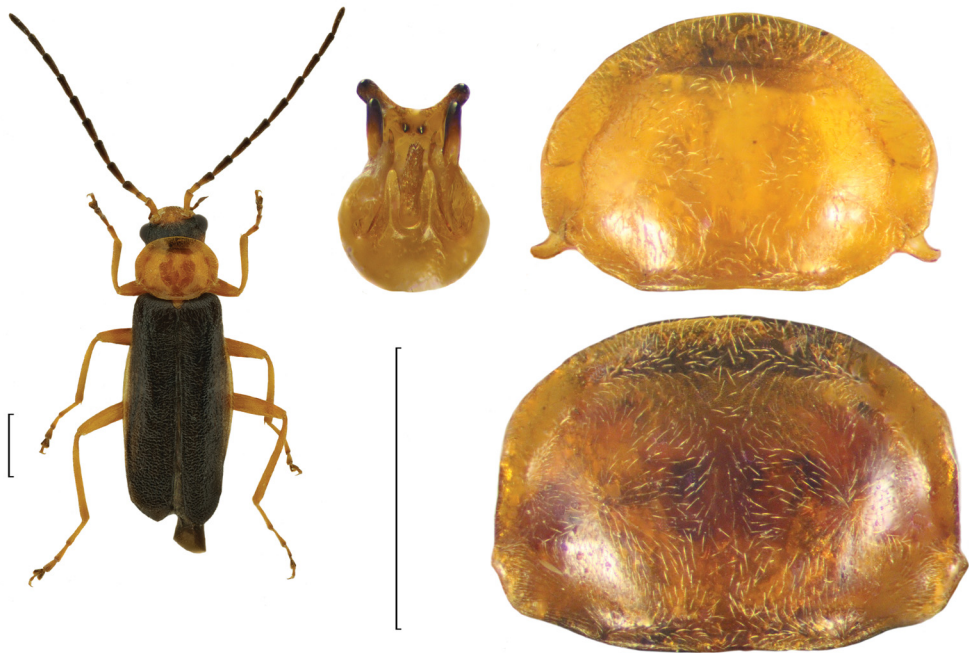
Taxonomy

Silidius svihlai sp. nov.

(Figs 1–4)

Type locality. Yemen, Socotra Island, Hagher Mts., Wadi Madar.

Type material. HOLOTYPE: ♂, ‘YEMEN, SOCOTRA ISLAND, 18.vi. / Hagher Mts., WADI MADAR, 2012 / montane shrubland with / *Cephalocroton socotranus* / 12°33.2’N, 54°00.4’E, 1170 m // SOCOTRA expedition 2012 / J. Bezděk, J. Hájek, V. Hula, / P. Kment, I. Malenovský, / J. Niedobová & L. Purchart leg.’ (NMPC). PARATYPES: 3 ♂♂



Figs 1–4. *Silidius svihlai* sp. nov. 1 – holotype, dorsal habitus; 2 – male genitalia, ventral view; 3 – pronotum of male; 4 – pronotum of female. Scale bars represent 1 mm; longer scale bar refers to Figs 2–4.

with same data as holotype (NMPC, BMNH), one of them also bearing the label ‘? *Silidius* / sp. / V. Švihla det. 2012’; 1 ♀, ‘YEMEN, SOCOTRA ISLAND / Dixam plateau, TUDHEN / shrubland with *Commiphora planifrons*, 18.+22.vi.2012 / 12°32.7’N, 53°59.9’E, 1135 m // SOCOTRA expedition 2012 / J. Bezděk, J. Hájek, V. Hula, / P. Kment, I. Malenovský, / J. Niedobová & L. Purchart leg.’ (NMPC).

Description. Male (Fig. 1): Orange testaceous, head black between and behind eyes, elytra black with narrow yellowish stripe running along extreme margin, starting below humeral callus and disappearing in posterior third, antennae mostly black, with antennomeres I, II (except extreme apex) and sometimes base of antennomere III orange, tarsi dorsally infuscate, scutellum orange.

Head moderately shining, loosely covered in greyish or golden pubescence arising from fine punctures. Diameter of eyes roughly equivalent to length of antennal scape. Antennae subfiliform, reaching until apical half of elytra, scape not thickened and slightly longer than antennomere III. Antennomere II shortest, about 2/3 of length of III; III shorter than IV; IV–XI subequal in length, slightly shorter than II and III together.

Pronotum as in Fig. 3, transverse, its front part semicircular with angles bluntly rounded, base distinctly narrower than front half and with rounded angles. Front margin explanate, anterior half of lateral margins with raised lobe-like structure with clearly delimited recurrent margin, independent from, but parallel to margin of pronotum (probably homologous

to structure described as 'lappenförmige Platte' or 'Lappen' by WITTMER 1969: 220). Lateral margin produced into rounded, flat lobe dorsally near middle, followed by sharply projecting, slightly excavate appendage underneath.

Scutellum with rounded apex, of similar structure as elytra.

Elytra slightly lustrous, rather glabrous around scutellum and with more leathery texture towards apex, loosely covered in fine, greyish recumbent pubescence, arising from very fine punctures; without any traces of costae.

Outer claw of each tarsus deeply cleft.

Abdomen very weakly sclerotised and with very fine, inconspicuous yellowish pubescence. Apical tergite simple, not emarginate and without modifications. Apical ventrite split into two transverse, rounded lobes.

Aedeagus as in Fig. 2. Two produced lobes of dorsal shield ('Dorsalschild') as well as large laterophyses heavily sclerotised and darkened towards their apex. Inside of dorsal shield with pair of blackish teeth, directed inwards.

Female. Same colour pattern as in male, antennae distinctly shorter, reaching only to basal half of elytra, pronotum as in Fig. 4, without modifications, transversely subrectangular with rounded angles, slightly elevated near posterior angles.

Measurements. Total body length: 6.1–7.6 mm; length of elytra: 4.2–5.5 mm; width of elytra: 2.0–2.5 mm (♂), 2.9 mm (♀); length of pronotum: 1.2–1.5 mm; width of pronotum 1.5–1.9 mm (♂), 2.0 mm (♀); width of head: 1.3–1.5 mm.

Differential diagnosis. Based on the claw morphology (one claw bifid on each tarsus in males, female claws simple), this species is placed here within *Silidius*. However, the structure of the male pronotum and aedeagus, plus the absence of modifications on the last tergite separate this species from any known species of that genus and make it difficult to compare to any of the species from continental Africa. For females, the colour pattern, including the yellow lateral margin of the elytra is also rather characteristic.

Etymology. Named in honour of my late colleague RNDr. Vladimír Švihla (Prague), who had studied this species before, but was not able to describe it before passing away in 2015. During an earlier meeting at NMPC in 2012, it was Vladimír who encouraged me to study the neglected subfamily Silinae.

Distribution. Only known from the mountainous interior of Socotra Island.

Socotrasilis gen. nov.

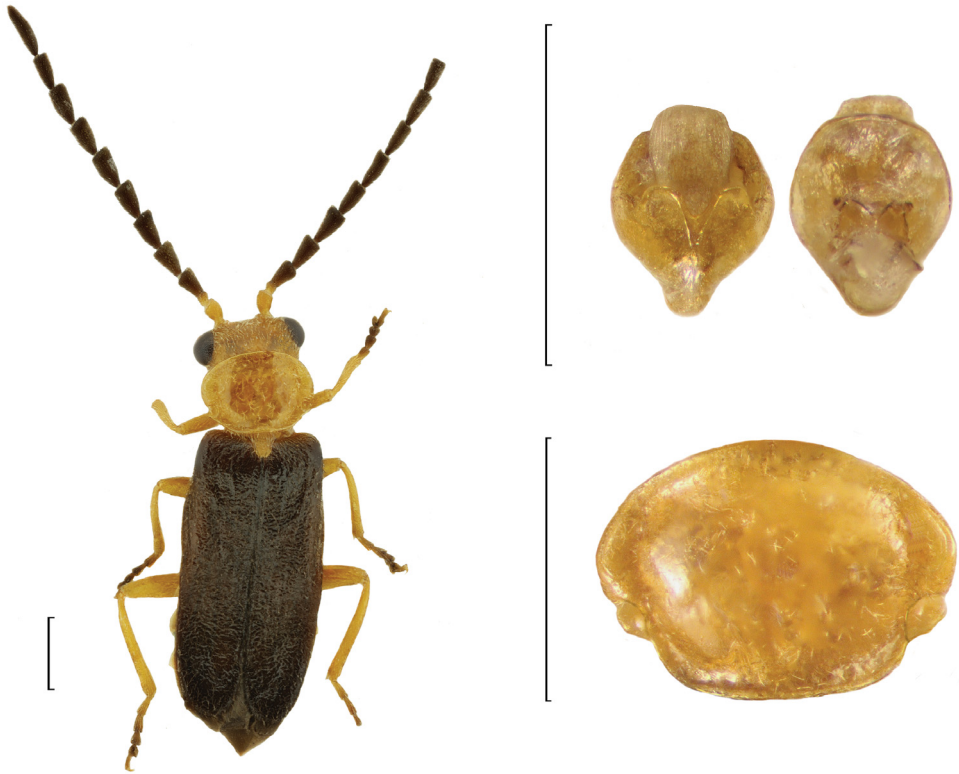
Type species. *Socotrasilis socotrensis* sp. nov.

Description. Head with protruding eyes almost as wide as pronotum. Antennae serrate.

Pronotum transversely oval without distinct anterior or posterior angles, its lateral margin with (presumably sexually dimorphic) modifications, its disc more or less evenly convex, without any visible pores, lobes, concavities or tubercles (as found in other Silinae genera).

Claws of each tarsus simple, none cleft, and without basal teeth or lobes.

Elytra very thin and weakly sclerotised, with somewhat leathery texture, their apices individually rounded, leaving a small gap in between, exposing middle part of second-last tergite. Fully winged and with distinct humeral callus.



Figs 5–8. *Socotrasilis enigmatica* gen. et sp. nov. 5 – holotype, dorsal habitus; 6 – male genitalia, ventral view; 7 – male genitalia, dorsal view; 8 – pronotum of male. Scale bars represent 1 mm.

Last tergite relatively large and protruding. Last ventrite deeply split into two rounded lobes.

Aedeagus relatively simple, its outer capsule (composed of what Wittmer refers to as ‘Dorsalschild’ and ‘Ventrales Basalstück’) opened ventrally, not completely covering internal structures in ventral view; with very large, broad and weakly sclerotised median lobe (‘Mittelstück’ in Wittmer’s terminology), and pair of laterophyses behind, other sclerotised structures often found inside aedeagus capsule of other Silinae genera absent. Dorsal shield unusually broad, almost disc-like, subcircular in dorsal view, non-emarginated (Fig. 7).

Differential diagnosis. Distinguished from other genera of the subfamily Silinae by the combination of the following characters: All claws simple and none cleft in male, lacking a basal tooth. Pronotum modified in male, with an emargination and an ear-like lobe in basal half of the lateral margin, but without the additional modifications found in many other Silinae genera. Furthermore, the dorsal shield of the aedeagus is very unusual within the subfamily.

The sole known species of this genus resembles some small Indo-Malayan species of *Podosilis* Wittmer, 1978 and ‘*Silis*’ Charpentier, 1825 *sensu lato* (i.e. species currently placed in *Silis*, which do not fit the restricted definition of this genus given by KAZANTSEV (2011)

and will have to be transferred to other genera in the future). Both genera have more complex pronotal modifications in males, including multiple lobes, incisions or appendages and pores on the disc (*Silis*); also, they are readily distinguished by their claws. *Eusilis* Reitter, 1887, with one known species from Central Asia, also has simple claws, but a very different pronotum (twice as wide as long, widest in basal half, strongly sculptured, and with a pair of deep impressions on the disc and a thin appendage on its lateral margin); also, its aedeagus is of a very different build. The large Afrotropical genus *Silidius* has one claw of each tarsus cleft in males. Although habitus and pronotum shape show a great deal of variation within *Silidius*, none of the described species shows much similarity to *Socotrasilis*. The Palearctic genera *Autosilis* Kazantsev, 2011 and *Silis* (sensu KAZANTSEV 2011) are distinguished by their claws (see WITTMER 1977: figs 1–2 for *A. nitidula* (Fabricius, 1792)), pronotal modifications and a different structure of the aedeagus.

Etymology. A combination of the locality ‘Socotra’ and the related genus *Silis*. Gender feminine (as in *Silis*).

Socotrasilis enigmatica sp. nov.

(Figs 5–8)

Type locality. Yemen, Socotra, near Hadiboh.

Type material. HOLOTYPE: ♂, ‘Yemen, Soqotra Is. / 21.xi.-12.xii.2003 / HADIBOH env., ca10-100m / 12°65′02″N, 54°02′04″E / [GPS], David Král lgt. // YEMEN – SOQOTRA 2003 / Expedition; Jan Farkač, / Petr Kabátek & David Král // ? *Silidius* / sp. / V. Švihla det., 2012’ (NMPC). PARATYPE: 1 ♂, ‘Socotra I., 17.-18.ix.2000 / Lahas / V. Bejček, K. Šťastný lgt.’ (NMPC).

Description. Male (Fig. 5): Pale yellow to orange testaceous, with pitchy black elytra and antennomeres III–XI; tarsi more or less infusate; scutellum yellow.

Head large and strongly transverse, sparsely covered in very fine, greyish recumbent pubescence, arising from very fine punctures; with large, laterally protruding eyes. Frons between antennal insertions only about half as wide as space between eyes. Antennomeres III–X serrate in males. Scape short and thick, not much longer than wide; antennomere II very small, less than half size of scape; III about as long as I and II together; IV–X slightly longer than III; XI longest and thinnest.

Pronotum as in Fig. 8, shining and with sparse, inconspicuous pubescence, its lateral margin in anterior half with bulge, followed by sharp emargination after middle; underneath emargination with ear-like lobe; emargination and ear-like lobe together form opening to short, deep groove, continued underneath antero-lateral bulge and open towards side.

Scutellum flat, longer than wide, with broadly rounded apex, with pubescence similar to elytra.

Elytra rather matt, with moderately dense, long greyish pubescence, arising from very fine punctures; without any traces of costae; leaving small gap between individually rounded apices and not entirely covering apical two tergites.

Abdomen weakly sclerotised and with fine, yellowish recumbent pubescence.

Apical tergite subtriangular, rather pointed, without emargination or other modifications. Apical ventrite split into two lobes, each about as long as wide.

Aedeagus as in Fig. 6. Ventral basal piece (‘Ventrales Basalstück’ according to WITTMER

1969) produced into two rounded lobes, median lobe posteriorly very broad, rather flat, weakly sclerotised and covering two small, stick-like laterophyses behind, which are only visible when median lobe is lifted up; dorsal shield ('Dorsalschild') short, broad, with bulging margins in fronto-ventral view, dorsally rather flat, subcircular, without any trace of apical emargination (Fig. 7).

Female. Unknown.

Measurements. Total body length: 6.2–6.8 mm; length of elytra: 4.3–4.4 mm; width of elytra: 2.0–2.1 mm; length of pronotum: 1.1–1.2 mm; width of pronotum 1.6 mm; width of head: 1.6 mm.

Etymology. Named by Latin adjective '*enigmatica*' in reference to its 'enigmatic' phylogenetic position.

Distribution. Only known from the lowland parts of Socotra Island.

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