

**New species of *Oryzaeophilus* and *Silvanolomus*
from Socotra Island
(Coleoptera: Silvanidae: Silvaninae)**

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Abstract. *Oryzaeophilus socotraensis* sp. nov. and *Silvanolomus depressus* sp. nov. from Socotra Island, Yemen are described, illustrated (habitus and male genitalia), and compared with similar known species. *Oryzaeophilus gibbosus* Aitken, 1965 is also recorded from Socotra. Brief introductory notes on the two genera are given.

Key words. Coleoptera, Silvanidae, Silvaninae, *Oryzaeophilus*, *Silvanolomus*, new species, Yemen, Socotra

Introduction

A small number of silvanid beetles sent to the author for identification by Jiří Hájek (NMPC) included nine silvanines collected in Socotra Island in 2010. Six of these were found to represent a new species of *Oryzaeophilus* Ganglbauer, 1899, one a species of this genus not previously recorded from Socotra, *Oryzaeophilus gibbosus* Aitken, 1965, and the other two a new species of *Silvanolomus* Reitter, 1912. These beetles are described/recorded below, with two additional specimens, one of each of the *Oryzaeophilus* species, which were first examined by the author a decade ago in HLMD.

Material and methods

Genitalia were dissected and mounted beneath a cover slip in Berlese Fluid, as described in HALSTEAD (1980). Illustrations were made from slide preparations using a monocular microscope with a squared graticule in the eye-piece and graph paper. The genitalia and associated parts were replaced on the card mounts in a drop of the water/alcohol soluble resin, dimethyl hydantoin formaldehyde. Line habitus illustrations were made by drawing a sketch of the specimen, recording measurements on it and re-drawing the image on graph paper. Colour

photographs were kindly prepared for the author by Jiří Hájek. A Canon EOS 550D digital camera with a Canon MP-E 65mm objective was used and images of the same specimen at different focal planes were combined using Helicon Focus 5.1.19 software.

Data for types and other specimens have been cited verbatim. A single forward slash (/) indicates different lines on a label and a double slash (//) separates different labels. Type specimens have been labelled with the author's determination labels on which their status has been indicated and in addition a small circular label with a red border and 'HOLOTYPE' or a yellow border and 'PARATYPE' has been added.

The following acronyms have been used for depositories:

- BMNH Natural History Museum [formerly British Museum (Natural History)], London, United Kingdom (Maxwell V. L. Barclay);
 NMPC Národní muzeum, Praha, Czech Republic (Jiří Hájek);
 HLMD Hessisches Landesmuseum, Darmstadt, Germany (Sabine Wamser).

Taxonomy

Oryzaephilus Ganglbauer, 1899

Oryzaephilus is a relatively small genus containing 16 species including the new one described below. It is indigenous to the Old World and is well represented in Africa. All species have six lateral teeth on each side of the pronotum that are moderately to strongly developed. In males the tooth at the anterior angle is sometimes conspicuously more strongly developed than the others. In addition, the sides of the pronotal disc are raised to form lateral ridges (one at each side) and usually a median longitudinal ridge is also present. They have 5 tarsomeres, the 4th (penultimate) very small, and the 3rd apically slightly broader than previous tarsomeres and concave to receive the 4th. Two pest species, *Oryzaephilus surinamensis* (Linnaeus, 1758) (the Saw-toothed Grain Beetle) and *Oryzaephilus mercator* (Fauvel, 1889) (the Merchant Grain Beetle), are virtually cosmopolitan having been introduced to many parts of the world in association with grain and various other stored food products. Consequently, *Oryzaephilus* is a well-known genus throughout the greater part of the world. Although the two pest species have occasionally been collected under bark, trapping records for other field species suggest that humus, fallen seeds and dead plant material in general may be more important as natural habitats for the genus. The most recent revision of *Oryzaephilus* is that of the author (HALSTEAD 1980). Since then two additional species have been described (HALSTEAD 1997).

Oryzaephilus socotraensis sp. nov.

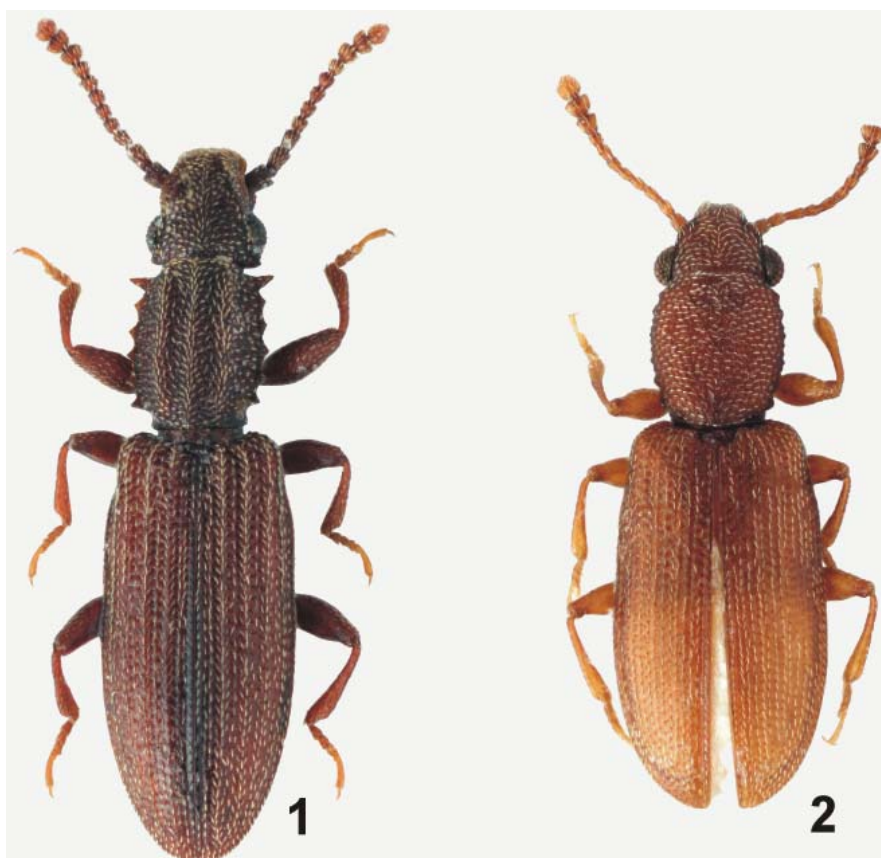
(Figs. 1, 3–6)

Oryzaephilus canus non Halstead, 1980: HALSTEAD (2011): 234 (misidentification).

Type locality. Yemen, Socotra Island, Noked plain, Sharet Halma vill. env., 12°21.9'N, 54°05.3'E, 20 m.

Type material. HOLOTYPE: dissected ♂, (NMPC): 'YEMEN, SOCOTRA Island/ Noked plain (sand dunes) / SHARET HALMA vill. env. / 12°21.9'N, 54°05.3'E, 20m / J. Bezděk leg., 10-11.xi.2010'. PARATYPES: 4 ♂♂ 1 ♀, same data as holotype but ♂♂ collected by Jiří Hájek and ♀ by Luboš Puchart (NMPC, 1 ♂ BMNH).

Additional material examined. 1 dissected ♂: 'YEMEN, SOQOTRA-ARCHIPEL, SOQOTRA/ Noked. Farmihin, Nähe Strand, Om./ 12° 24' 41" N, 54° 13' 35" E, 24.-25.10.2000/ leg.: H. Pohl, SOQ 2000/04 // HLMD-CoI-934'. Although this specimen has all the characters of the species and falls within the measurements given, it has not been included in the type series because it is badly damaged, particularly its pronotum, which is split down the middle.



Figs. 1–2. Habitus, dorsal view. 1 – *Oryzaeophilus socotraensis* sp. nov. (paratype, male); 2 – *Silvanolomus depressus* sp. nov. (holotype, male).

Description. Dark brown to blackish-brown, moderately depressed and elongate (as usual for the genus). Length 2.4–2.8 mm (holotype: 2.4 mm); length : maximum elytral breadth ratio, 32.4–38.3 : 10. Pubescence golden or greyish. Head and pronotum appearing dull, elytra more shining.

Head. As long or slightly longer than breadth across temples; genae (sides of head in front of eyes) obviously raised forming conspicuous rim (as in many other *Oryzaeophilus*), not sharply angled and without horns; small depressions above antennal insertions; eyes large, separated medially across head by about $\times 5$ – $\times 7$ breadth, separated from front of head by about $\times 1.5$ length; temple length: eye length ratio, 10 : 50–60; antennal length: body length ratio, males 10 : 31.5–33.2, female 10 : 35; head of usual size compared with pronotum (breadth across temples: pronotal maximum breadth, excluding anterior angles and other teeth, males 10 : 11.3–11.5, female 10 : 12.3); puncturation strongly reticulate on vertex.

Pronotum. Moderately elongate, length: maximum breadth (excluding anterior angles and other teeth) ratio, males 13.2–14.0 : 10, female 13.0 : 10 (probably tending to be less elongate in all females); lateral ridges well developed, somewhat curved in female, more or less parallel for greater length in males, median ridge higher than lateral ridges; anterior angles strongly produced forming very prominent laterally directed teeth (slightly more so in males than in female seen), see Figs. 3–4, other teeth moderately developed; puncturation coarse, reticulate as on head, a few punctures reniform.

Elytra. Length : maximum breadth ratio, 18.7–22.6 : 10; sides gradually curved to apex (apices curved to suture, not produced before it); third and alternate interstriae with setae arranged in three rows (usual herring-bone arrangement).

Metathoracic legs. Male, metatrochanter with spine, metatibia with minute spine near apex (metafemur without spine); female, without secondary sexual characters (as in other *Oryzaephilus* spp.).

Male genitalia. (Figs. 5–6). Internal sac with armature (Fig. 5, somewhat fragmented in specimen drawn); 11–13 rods on each side towards ostium; median strut strongly narrowed to basal half; median lobe with a few short setae on basal third, sinuate before broad, rounded apex; parameres elongate, more or less parallel sided, slightly curved to base from apical half, apices truncate to slightly rounded to outer margin, bearing four long apically forked setae plus two or three thinner, shorter simple setae towards outer margin, outer and inner margins below the apices with several short inconspicuous setae (Fig. 6); sternites VIII–IX (not illustrated), sternite VIII with three longer setae present on outer half of margin of each side, finer very short setae medially.

Differential diagnosis. The following combination of characters distinguishes this from other known species: Eyes large and prominent; temples short, about a fifth or less as long as eye; anterior angles of pronotum strongly produced laterally to form a prominent, narrow tooth, obviously more strongly developed than all other teeth; pronotum not gibbous; male genitalia: internal sac with armature; median lobe without a ventral tooth, sides sinuate before broad apex; parameres elongate more or less parallel-sided, only a few short setae along outer margin (no long setae there).

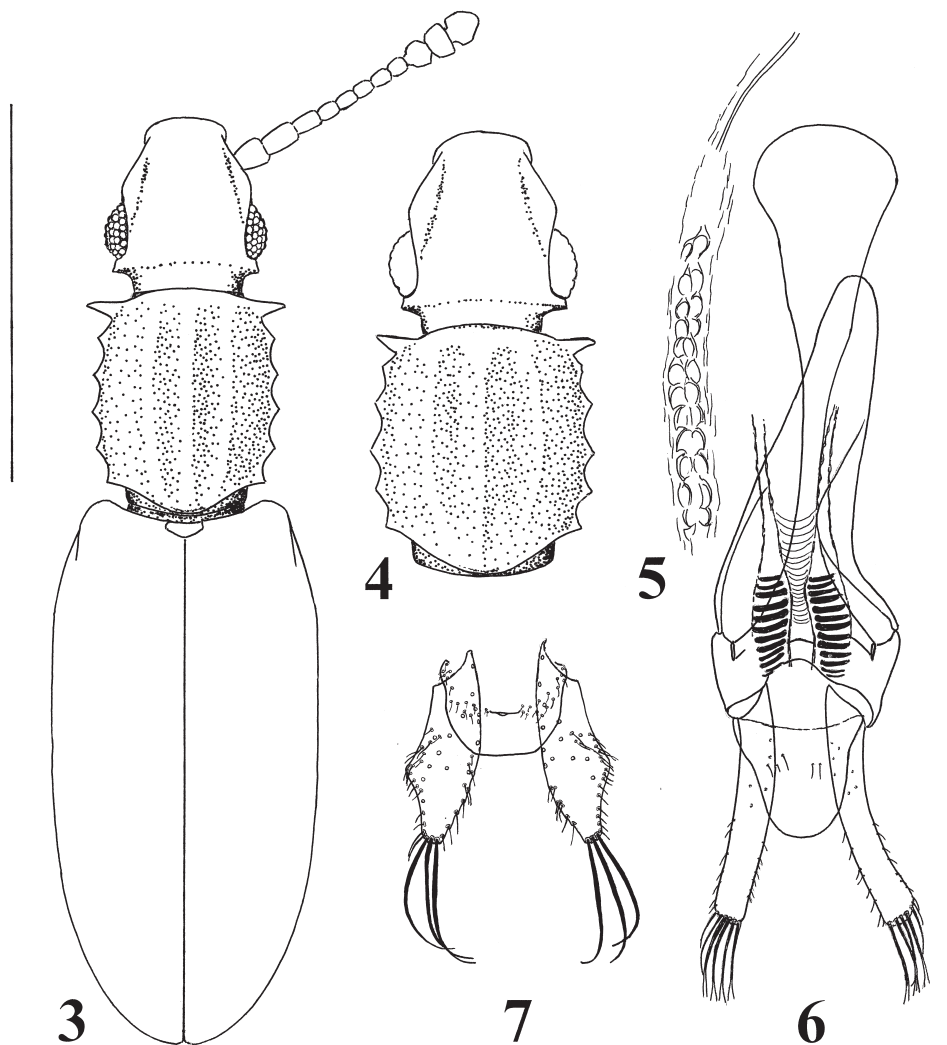
A strongly developed tooth at the anterior pronotal angle, more prominent than the other teeth especially in larger males, is also present in *O. gibbosus*, an African species that has been found in Socotra (see below), and *O. acuminatus* Halstead, 1980, an Oriental species. However, apart from having obviously different male genitalia (parameres and median lobe are quite different) the elytra of these two species appear more elongate, more parallel sided and at their apices usually have the margin slightly produced before meeting the suture, also the pronota of these species are to some extent gibbous, inconspicuously to (in large males) obviously so.

Males of *Oryzaephilus canus* Halstead, 1980 and the new species have the same secondary sexual characters of the hind legs; in both the metafemora are without a spine. Also their genitalia are similar although in *O. socotraensis* sp. nov. the parameres, apart from having long setae limited to the apices, are more elongate. In *O. canus* long setae are also present along the apical half of the outer margin of the parameres (see HALSTEAD 1980 for figures). The damaged ♂ specimen of *O. socotraensis* sp. nov. from Farmihin was first seen in 2002, when it was mistakenly thought to be a form of *O. canus* with more prominent anterior pronotal angles, etc. Its true status became apparent when the author received additional specimens

last year. [Unfortunately, the record of *O. canus* from Socotra that was included in HALSTEAD (2011) was based on the Farmihin specimen and consequently is wrong. However, *O. canus* occurs in Somalia, as well as other parts of East Africa, and in the United Arab Emirates, so perhaps it will be found in Socotra in the future.]

Etymology. The geographic species name has been used because Socotra is where it was first discovered.

Distribution. So far known only from two localities in Noged plain, Socotra Island.



Figs. 3–7. *Oryzaephilus* spp. 3–6 – *O. socotraensis* sp. nov.: 3 – head, pronotum and elytra of male; 4 – head and pronotum of female; 5–6 – male genitalia, 5 – internal sac, 6 – genitalia without sac. 7 – *O. gibbosus* Aitken, 1965, median lobe and parameres of male genitalia (after HALSTEAD 1980). Scale bars = 1 mm (Figs. 3–4), 0.1 mm (Figs. 5–7).

***Oryzaephilus gibbosus* Aitken, 1965**

(Fig. 7)

Material examined. 1 dissected ♂, 'YEMEN, SOCOTRA Isl. / GPS 12.652N, 54.024E; 10m / Hadibu, 11.-23.xi.2000 / V. Bejček & K. Štátný leg' (NMPC); 1 ♀, 'YEMEN, SOQOTRA-ARCHIPEL. SOQOTRA / Wadi Danegan, Barbelfallen, 90m / 12°36'59"N 54°03'48"E, / 28.-30.x.2000 / leg: T. van. Harten & H. Pohl SOQ 2000/02a // HLMD-Col-933' (HLMD).

Notes. *Oryzaephilus gibbosus* is widespread in Africa but has not previously been recorded from Socotra. In the past it was found on East African coconuts and coconut shell (AITKEN 1965) imported to the United Kingdom. It has also been found on other oilseeds, sifted from compost, and caught in a soil trap (HALSTEAD 1980). Some notes on characters for distinguishing *O. gibbosus* and *O. socotraensis* sp. nov. are included in the differential diagnosis for the latter species. In addition, *O. gibbosus* males have a spine on the metafemora, as well as the other secondary sexual characters of the hind legs. The typical form of the parameres and median lobe of this species is illustrated in Fig. 7. For additional line illustrations of *O. gibbosus* and its genitalia, see HALSTEAD (1980, 1993).

***Silvanolomus* Reitter, 1912**

Silvanolomus is a genus of small beetles found in tropical and subtropical regions of the Old World. The following seven species have been described: three from Australia, including *Silvanolomus armatulus* (Blackburn, 1891), *Silvanolomus crenicollis* (Grouvelle, 1911) and *Silvanolomus goughi* Halstead, 1993; 1 from Sri Lanka, *Silvanolomus denticollis* (Reitter, 1876); one from India, *Silvanolomus halsteadii* Sengupta & Pal, 1996; one from Japan, *Silvanolomus inermis* (Reitter, 1876) and one from Africa, *Silvanolomus pullus* (Reitter, 1898), the new one described below making a total of eight. The author has also seen a few additional new species from the Orient and Australia. These beetles have been collected on flower heads of various plants including cereals and wild grasses, they have been found quite commonly on heads of sorghum in Queensland, Australia, occasionally in association with stored products and often collected in light traps. *Silvanolomus* spp. usually have six obvious lateral teeth on each side of the pronotum but these may be very much reduced or virtually absent. Their eyes are large and prominent. The pronotum and elytra are usually transversely, moderately convex. The tarsi have 5 tarsomeres, the 3rd produced in front to form a conspicuous lobe, the 4th is very small. In general, because there are few useful external characters species identification is very difficult, however male genitalia are often valuable for species recognition. Secondary sexual characters have not been discovered and size rarely seems to be linked to sex. Further notes on the genus with descriptions and illustrations for some of the species are given in HALSTEAD (1993) and SENGUPTA & PAL (1996).

***Silvanolomus depressus* sp. nov.**

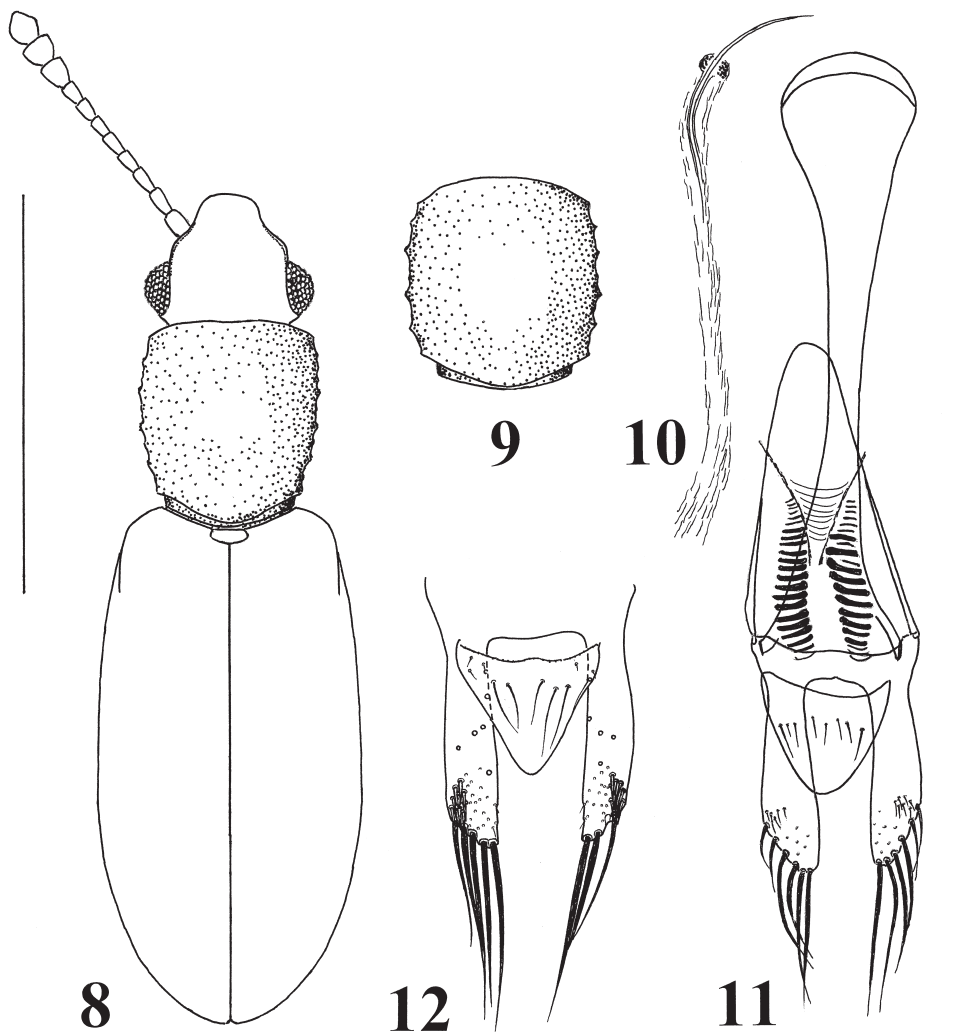
(Figs. 2, 8–11)

Type locality. Yemen, Socotra Island, Dixam plateau, Firmihin (*Dracaena* forest), 12°28.6'N, 54°01.1'E, 490 m.

Type material. HOLOTYPE: dissected ♂ (NMPC): 'YEMEN, SOCOTRA Island / Dixam plateau Firmihin (*Dracaena* forest) / 12°28.6'N, 54°01.1'E, 490m. / J. Bezděk leg., 15-16.xi.2010'. PARATYPE: 1 dissected ♀, with the same data as holotype (NMPC).

Description (measurements/ratios given for holotype first): Body. Brown, vertex of head and disc of pronotum appearing flat. Length 2.0 mm, 2.2 mm; length: maximum elytral breadth ratios, 30.74 : 10, 29.7 : 10. Pubescence golden.

Head. Length: breadth across eyes ratios, 10 : 13.75, 10 : 14.37; eyes very large and protuberant (as usual in the genus), separated across mid-line by $\times 4.8$, $\times 5.0$ breadth, length : breadth ratio 23.1 : 10, 24.62 : 10; antennal length about 1/3 body length; vertex almost flat, with puncturation coarsely reticulate.



Figs. 8–12. *Silvanolomus* spp. 8–11 – *S. depressus* sp. nov.: 8 – head, pronotum and elytra of male; 9 – pronotum of female; 10–11 – male genitalia, 10 – internal sac, 11 – genitalia without sac. 12 – *S. inermis* (Reitter, 1876), median lobe and parameres of male genitalia. Scale bars = 1 mm (Figs. 8–9), 0.1 mm (Figs. 10–12).

Pronotum. Length: maximum breadth ratio, 11.81 : 10, 11.02 : 10 i.e., slightly more elongate in male than in female seen (although possibly significant, similar sexual difference has not been observed in other *Silvanolomus* – more material is required for confirmation); puncturation as on vertex of head, coarsely reticulate; disc overall shallowly depressed (appearing almost flat at low magnification), depression deepest toward base; lateral margins with teeth obsolete, represented by six very small prominences (anterior and posterior angles included), most obvious in larger (female) specimen, coarse punctures at pronotal edge producing an uneven margin between prominences.

Elytra. Slightly less than $\times 2$ as long as broad, length: maximum breadth ratios, 18.4 : 10, 18.1 : 10; interstriae with setae arranged in alternate single and double rows, one row on 1st (sutural) interstriae, two on 2nd etc.

Male genitalia (Figs. 10–11). Internal sac as in Fig. 10, usual form in *Silvanolomus*, rows of 11–13 obvious rods on each side towards ostium; median lobe somewhat triangular, apex rounded, row of setae across basal half; parameres, at about apical third tapered from distal margin to apex, bearing 5–6 long setae along apical margin, longest more than half as long as parameres, few short setae on distal half at beginning of taper.

Differential diagnosis. This species differs from other described and new ones known to the author in having the pronotal disc shallowly depressed and appearing rather flat, and the head with the vertex comparatively flat. Other species have the pronotum and head obviously, transversely, moderately convex.

Poorly developed pronotal teeth, although somewhat variable, are also a characteristic of *S. inermis* (Japan, China and Korea). In addition, this species has similar genitalia but they differ from those of the new species as follows: the median lobe appears more triangular (sides straighter) and the parameres more widely separated, more parallel sided and with the point of taper a little closer to the apex (cf. Figs. 11–12). Relatively poorly developed teeth are also present on the pronotum of *S. pullus* (distribution Africa and South Yemen) but teeth in this species are generally more easily distinguished from the smaller prominences between them. The male genitalia of *S. depressus* sp. nov. and *S. pullus* do not appear to differ in any significant way, suggesting that they are very closely related. However, separate species status has been given to the taxon based principally on the rather unique character provided by the shallowly depressed pronotal disc.

Etymology. The name refers to the pronotal disc.

Distribution. So far known only from the type locality in Socotra Island.

Acknowledgements

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