

## Cleridae (Coleoptera) from Socotra Island with description of new species

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**Abstract.** The Cleridae from Socotra Island are reviewed and five species are recorded. In addition to the cosmopolitan *Necrobia rufipes* (De Geer, 1775), *Wittmeridecus insularis* sp. nov. (subfamily Tillinae), *Opilo angustipennis* sp. nov. and *Opilo socotrensis* sp. nov. (subfamily Clerinae) are described and illustrated. *Opilo longipilis* Fairmaire, 1892 is newly recorded from Socotra.

**Key words.** Coleoptera, Cleridae, Clerinae, Tillinae, *Opilo*, *Wittmeridecus*, new species, new records, Socotra, Yemen

### Introduction

Socotra is a continental (not volcanic) island of eastern Gondwanan origin (D'ACREMENT et al. 2010), with a long duration of isolation. It is the largest of four islands constituting the Socotra Archipelago. Though there is still some discussion around interpreting the data on the separation of Socotra from Arabia and Africa (CULEK 2013), Socotra was probably part of southern Arabia prior to the rifting of the Gulf of Aden (BROWN & MIES 2012). Socotra is covered by remarkably diverse vegetation, from mangroves to grasslands, shrublands and woodlands to forests (see BATELKA 2012 for a recent detailed description of the Socotra Archipelago). Its long isolation has resulted in a high degree of endemism, and about 40 genera of insects are known to be endemic to this archipelago (BATELKA 2012), with Curculionidae and Tenebrionidae representing the most diverse and speciose beetle families (SCHAWALLER & PURCHART 2012, COLONNELLI 2014). The cosmopolitan species *Necrobia rufipes* (De Geer, 1775) is the only representative of the checkered beetles (Cleridae) hitherto reported from this archipelago (TASCHENBERG 1883, WRANIK 2000). Recent comprehensive explorations and thorough collecting by Czech entomologists revealed four additional species and therefore the first record of the clerid subfamilies Tillinae and Clerinae. Three of those species are described herein as new to science.

## Material and methods

The descriptions of the new species are based on morphological examination, including preparations of the male genitalia, the pygidium and ventrite VI. For this purpose the specimens were heated in distilled water and the genitalia removed with fine forceps through small incisions made along the sides of the terminal abdominal segments. Aedeagi were cleaned of soft tissue in 10% KOH, cleared in 70% ethanol and submerged in glycerine, and then stored in genital vials pinned below each specimen. Measurements were taken under a stereomicroscope using an ocular micrometer. Total body length is the distance measured from the apical clypeal margin to the elytral apices. Elytral length was measured alongside the elytral suture and pronotal length was taken from the dorsal middle line. Pronotal and elytral width were measured at the broadest extreme. This study is based on 83 specimens. I deposited the material in the following institutional and private collections:

- ABCM Alan Burke collection, Manhattan, Kansas, USA;  
 CULS Faculty of Forestry and Wood Sciences, Czech University of Life Sciences, Prague (Jan Farkač);  
 JRCP Jakub Rolčík collection, Prague, Czech Republic;  
 MMBC Moravian Museum, Brno, Czech Republic (Jiří Kolibáč);  
 NMPC National Museum, Prague, Czech Republic (Jiří Hájek);  
 RGCM Roland Gerstmeier collection, deposited in the collection of the Technical University Munich, Zoology, Munich, Germany.

## Taxonomy

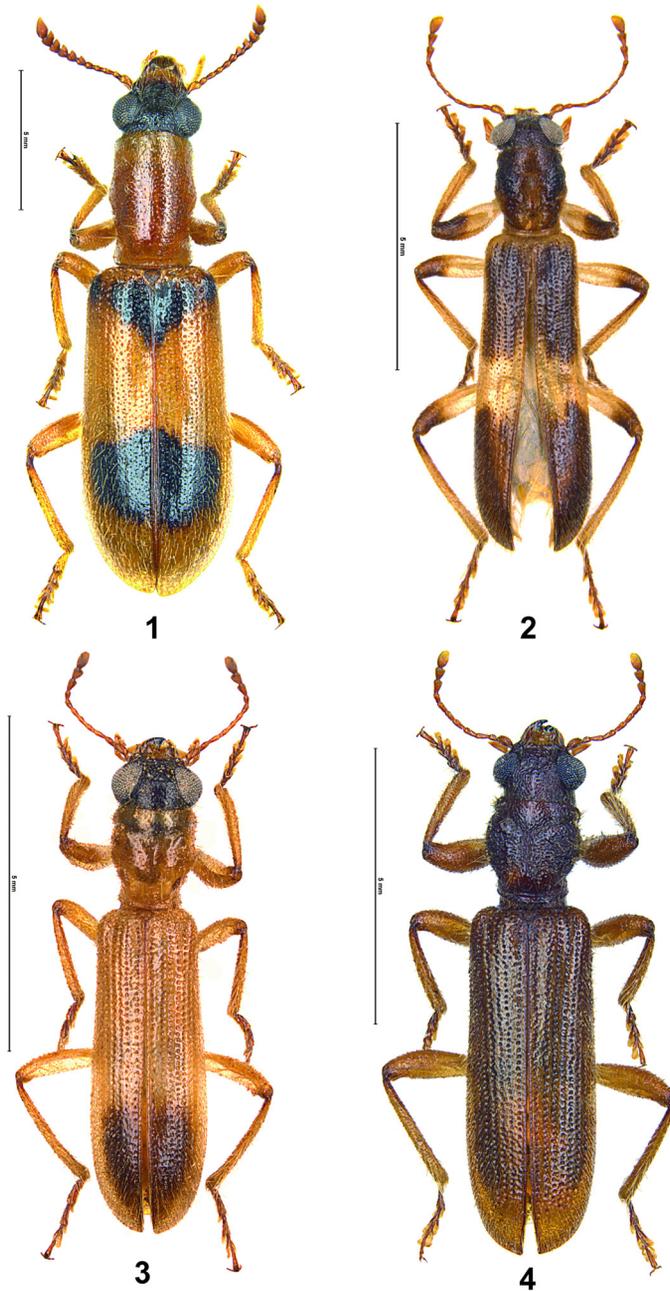
### Subfamily Tillinae

#### *Wittmeridecus insularis* sp. nov.

(Figs 1, 5–14)

**Type locality.** Yemen, Socotra Island, Zemhon area [= Aloove, for details see BEZDĚK et al (2012)].

**Type material.** HOLOTYPE: ♂, YEMEN, SOCOTRA Island, Zemhon area, 270–300 m, N 12°20'58", E 54°06'39", 16.–17.vi.2010, V. Hula leg. (NMPC). PARATYPES: same label data as holotype (14 spec. NMPC; 4 spec. RGCM; 1 spec. ABCM; 1 spec. MMBC); YEMEN, SOCOTRA Island, Qualentiah env., 4.–5.vi.2010, slopes, 5 km SE Quaysoh, 12°39.691'N, 53°26.658'E, V. Hula & J. Niedobová leg. (3 spec. NMPC; 1 spec. RGCM); YEMEN, SOCOTRA Island, Aloove area, Aloove vill. env., *Jatropha uniconostata* shrubland; with *Boswellia elongata* trees, 19.–20.vi.2012, 12°31.2'N, 54°07.4'E, 221 m // SOCOTRA expedition 2012, J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (6 spec. NMPC; 1 spec. RGCM); YEMEN, SOCOTRA Island, Kaza Kazihon vill. env., 12°31'13"N, 53°55'36"E, 900 m, 5.vi.2012, V. Hula & J. Niedobová leg. (1 spec. NMPC; 1 spec. RGCM); YEMEN, SOCOTRA Island, wadi Ayhaft, 12°36.5'N, 53°58.9'E, 200 m, J. Bezděk leg. (1 spec. NMPC); Yemen, Socotra Isl., Homhil, GPS 12.652N, 54.024E, 69 m, 17.–18.xi.2000, V. Bejček & K. Štastný lgt. (2 spec. JRCP, 1 spec. RGCM); Yemen, Socotra Isl., Homhil, GPS 12.318N, 54.302E, 330 m, 20.–21.xi.2000, V. Bejček & K. Štastný lgt. (1 spec. JRCP); Yemen, Soqotra Is., WADI AYHAFI, 24.–26.xi.2003, N12°36'38" E53°58'49", 190 m [GPS], leg. P. Kabátek, YEMEN – SOQOTRA, 2003 Expedition; Jan Farkač, Petr Kabátek & David Král (4 spec. JRCP); dito: ex larve (2 spec. JRCP); Yemen, Soqotra Is., WADI DENEGHEN, 27.xi.2003, N12°36'55" E54°03'49", 85 m [GPS], leg. P. Kabátek, YEMEN – SOQOTRA, 2003 Expedition; Jan Farkač, Petr Kabátek & David Král (1 spec. JRCP); Yemen, Soqotra Is., QAARIAH (waterfall), vill. env., 28.xi.2003, N12°38'05" E54°12'39", 11 m [GPS], leg. P. Kabátek, ex larve, YEMEN – SOQOTRA, 2003 Expedition; Jan Farkač, Petr Kabátek & David Král (3 spec. JRCP, 1 spec. RGCM); Yemen, Soqotra Is., 5.–6.xii.2003, Noked plain: QAAREH (waterfall), 28.xi.2003, N12°38'05" E54°12'39", 57 m [GPS], Jan Farkač lgt. (1 spec. CULS); Yemen, Soqotra Is. 2003, 5–6/xii., Noked plain, QAAREH (waterfall), 57 m, N12°20'10" E53°37'56" [GPS], David Král lgt., YEMEN – SOQOTRA, 2003



Figs 1–4. Habitus. 1 – *Wittmeridecus insularis* sp. nov.; 2 – *Opilo angustipennis* sp. nov.; 3 – *O. longipilis* Fairmaire, 1892; 4 – *O. socotrensis* sp. nov.

Expedition; Jan Farkač, Petr Kabátek & David Král (1 spec. JRCP); Yemen, Socotra Isl., Ayhaft, 15.iii.2000, V. Bejček & K. Štastný lgt. (1 spec. JRCP).

**Description.** Body length 6.8–12.0 mm. Head black, glossy, with fine and more or less diffuse punctation. Labrum, anterior part of clypeus and palpi yellow, posterior part of clypeus pale red-brown; mandibles red-brown, with black tips. Labrum broadly transverse-ovate; terminal maxillary palpomere long, slender, cylindrical, slightly dilated in middle. Antennae brown, not reaching base of pronotum when laid back; from antennomere VI onwards increasingly triangularly dilated to inner side, antennomeres VI to XI compact, thick, with increasing dense pubescence, antennomere XI apically pointed. Eyes coarsely faceted, margined, separated by more than one eye's width; head including eyes broader than anterior width of pronotum, vested with long, obliquely erect (in all directions), pale setae. Lower surface yellow-brown, smooth, glossy; between eyes conspicuously transversely wrinkled; gula smooth, broadly U-shaped, distally with bulging margin and two large pads, gular sutures slightly diverging apically, genae obliquely wrinkled.

Prothorax long (length = 1.8–3.0 mm, width = 1.2–2.0 mm; mean length to width ratio 1.00 : 1.50), widest in middle, pale brown to red-brown, glossy, with fine and diffuse punctation; vested with more or less long, anteriorly directed, erect, pale setae, sides with isolated stronger setae, vertically erected. Ventral surface basally smooth, somewhat obliquely wrinkled apically; prosternal process strong, diverging, broadly dilated distally. Hypomera broadly rounded, laying down to tips of prosternal process.

Scutellum more or less heart-shaped, apically pointed. Anterior margin of mesoventrite straight, without anterior mesoventral process; mesanepisterna transversely wrinkled, mesepimera coarsely sculptured; mesoventrite coarsely sculptured in middle; posterior mesoventral process solidly connected with anterior metaventral process; metaventrite with fine, diffuse punctation.



Fig. 5. Elytral variability of *Wittmeridecus insularis* sp. nov.

Elytra about twice as long as broad (length = 4.4–7.7 mm, width = 2.2–3.6 mm; mean length to width index 1.00 : 2.10), slightly dilated posteriorly, elytral base margined, apex broadly rounded; elytra yellow-brown, glossy, with broad black macula across shoulders, sometimes reduced to heart-shaped macula and another black, transverse macula behind middle, not reaching lateral margin (for variation, see Fig. 5). Elytral punctation not arranged into striae, ‘outer’ punctation (‘rows VII–XI’) seems to be more regular than ‘inner’ punctation (‘rows I–VI’), not reaching apex, puncture diameter decreasing from base to apex, mostly smaller than interstices, punctures without setae. Surface vested with long, obliquely backwards erected, pale setae.



Figs 6–14. Genitalia of *Wittmeridecus insularis* sp. nov. 6 – aedeagus ventral; 7 – aedeagus lateral; 8 – tegmen ventral; 9 – phallus ventral; 10 – spicular fork; 11 – phallus tip ventral; 12 – phallus tip lateral; 13 – pygidium; 14 – ventrite VI.

Legs stout, not very long, yellow-brown, tibial base sometimes darkened; tibiae straight to very slightly curved, without carina, with dense, obliquely directed, pale setae. Tibial spur formula 2-2-2; tarsal sole (pulvillar) formula 4-4-4. Tarsal soles I more or less elongate, minimally emarginate, soles II–IV broad, transverse, slightly emarginate at tip (appearing almost straight). Claws bidentate, with conspicuous denticle.

Abdomen yellow-brown, with short, fine, depressed setae. Male genitalia as in Figs 6–14.

Female without any conspicuous differences from male.

**Differential diagnosis.** Up to now, the genus *Wittmeridecus* Winkler, 1981, contained only *W. mediozonatus* (Fairmaire, 1892), which is probably distributed across the whole Saharan region to Israel and the Arabian peninsula. In *W. mediozonatus* the antennomeres are dilated from antennomere VII onwards, and antennomere XI is elongate, especially in males. The head of *W. mediozonatus* is light reddish brown, and the elytra are brown to black-brown with a yellow to ochreous transverse fascia in the middle. Punctuation of the elytra extends, at most, to the posterior margin of the fascia, see GERSTMEIER (1998).

**Etymology.** Latin adjective *insularis* (-is, -e), meaning ‘belonging to an island’.

**Collection circumstances.** The majority of specimens were collected at light traps in a semi-arid shrubland with dominant *Jatropha uncostata* Balf. f. (Euphorbiaceae) and *Boswellia elongata* Balf. f. (Burseraceae) trees (J. Hájek, pers. comm. 2016).

**Distribution.** So far known only from Socotra Island.

### Subfamily Clerinae

#### *Opilo angustipennis* sp. nov.

(Figs 2, 15–22)

**Type locality.** Yemen, Socotra Island, wadi Ayhaft.

**Type material.** HOLOTYPE ♂, YEMEN, SOCOTRA Island, wadi Ayhaft, 12°36.5'N, 53°58.9'E, 200m, J. Bezděk leg. (NMP). PARATYPES: **YEMEN: SOCOTRA:** Yemen, Soqotra Is., WADI AYHAFT, 24.-26.xi.2003, N12°36'38" E53°58'49", 190 m [GPS], leg. P. Kabátek, YEMEN – SOQOTRA, 2003 Expedition; Jan Farkač, Petr Kabátek & David Král (11 spec. JRCP, 4 spec. RGCM); Yemen, Soqotra Is., WADI AYHAFT, 24.-26.xi.2003, N12°36'38" E53°58'49", 190 m [GPS], David Král lgt., YEMEN – SOQOTRA, 2003 Expedition; Jan Farkač, Petr Kabátek & David Král (8 spec. JRCP; 1 spec. RGCM); Yemen, Soqotra Is., HOMHIL, protected area, 28-29/xi.2003, 364 m, N12°34'27" E54°18'32" [GPS], David Král lgt. (1 spec. JRCP), YEMEN – SOQOTRA, 2003 Expedition; Jan Farkač, Petr Kabátek & David Král; Yemen, Soqotra Is., HOMHIL, protected area, 28-29/xi.2003, 364 m, N12°34'27" E54°18'32" [GPS], leg. P. Kabátek, YEMEN – SOQOTRA, 2003 Expedition; Jan Farkač, Petr Kabátek & David Král (1 spec. JRCP).

**Description.** Body length 7.5–11.2 mm. Head dark brown, glossy, anteriorly smooth with very fine, isolated punctuation, posteriorly wrinkled. Labrum, anterior part of clypeus and palpi yellow-brown, mandibles black brown. Antennae yellow-brown to red-brown (partially with reddish sheen), protruding base of pronotum when laid back, with a more or less loose trimerous club. Head including eyes broader than anterior width of pronotum, vested with long, erect, yellow setae; eyes separated by more or less one eye's width. Lower surface red-brown, glossy, mainly smooth, slightly transversely wrinkled.

Prothorax longer than wide (length = 1.3–2.2 mm, width = 1.1–1.3 mm; mean length to width ratio 1.00 : 1.23), widest more or less in middle, more constricted towards base than

anteriorly, appearing relatively regular. Pronotum brown, glossy, darker brown towards sides, sides more yellowish, in middle and posteriorly smooth, only with isolated small punctation, sides coarsely wrinkled; vested with long, erect, pale (at sides darker) setae. Ventral surface pale yellow-brown, glossy, with fine, transverse wrinkles; prosternal process narrow, dilated distally; hypomera short, rounded, procoxal cavities broadly open posteriorly.

Scutellum rounded, yellow-brown, glossy. Anterior mesoventral process with two bulging, protruding lumps; mesanepisterna smooth; metathorax very elongate.

Elytra dark brown, glossy, subparallel, very long (length = 5.2–7.9 mm, width = 1.7–2.7 mm, mean length to width ratio 1.00 : 3.10); apices sometimes slightly dehiscent. Pale



Figs 15–22. Genitalia of *Opilo angustipennis* sp. nov. 15 – aedeagus ventral; 16 – aedeagus lateral; 17 – tegmen ventral; 18 – phallus ventral; 19 – spicular fork; 20 – phallus tip ventral; 21 – pygidium; 22 – ventrite VI.

yellowish ground color is reduced to transverse fascia behind middle. Punctuation arranged in ten rows of fine punctures, row II perceptible only basally as isolated (1–4) punctures, rows VIII–X hardly visible; puncture diameter conspicuously decreasing from base towards apex, generally conspicuously smaller than interstices. Surface vested with long, erect, pale setae, mostly directed posteriorly.

Legs very long, pale yellowish, tips of femora, base of tibiae and tarsi dark brown; metatibiae almost straight, reaching apex of elytra, only base with darkened carina, which is line-like afterwards. Legs with long, erect, pale setae.

Abdomen yellow to red-brown, glossy; whole ventral surface with long, erect, pale setae. Male genitalia as in Figs 15–22.

Female without any conspicuous differences from male.

**Differential diagnosis.** Regarding the distribution of the relevant Cleridae of north-eastern Africa and the Arabian Peninsula, the new species is the most similar to *Opilo barbarus* Abeille, 1893 (Morocco, Algeria, Egypt) and *O. longipilis* Fairmaire, 1892 (Libya, Egypt, Saudi Arabia, Iran, Israel, Oman, Yemen). However, in *O. longipilis* (the most similar species to *O. angustipennis* sp. nov.), the punctuation of the elytra is dense, with conspicuous striae remaining distinct towards the apex; the eyes are separated by less than one eye width. In *O. barbarus* the diameter of punctures is larger than interstices, but decreases posteriorly to midlength; the elytral apices each have a pale yellow macula. From both mentioned species, *Opilo angustipennis* sp. nov. can be easily distinguished by its long pronotum and elytra.

**Etymology.** Composed Latin adjective *angustipennis* (*-is, -e*), meaning ‘with narrow elytra’.

**Collection circumstances.** Unknown.

**Distribution.** So far known only from Socotra Island.

### *Opilo longipilis* Fairmaire, 1892

(Fig. 3)

**Material examined.** YEMEN: SOCOTRA: YEMEN, SOCOTRA Island, Kaza Kazihon vill. env., 12°31'13"N, 53°55'36"E, 900m, 5.vi.2012, V. Hula & J. Niedobová leg. (1 ♀, NMPC); Yemen, Soqotra Is., 2003, 2-3/xii., Dixam plateau, WADI ESGEGO, 300 m, N12°28'09" E54°00'36" [GPS], David Král lgt., YEMEN-SOCOTRA 2003 Expedition; Jan Farkač, Petr Kabátek & David Král (1 spec. JRCP); YEMEN, Socotra Isl., Shuab, 10.iii.2000, V. Bejček & K. Štastný lgt. (1 spec. JRCP).

**Redescription.** Body length 6.0–12.8 mm. Head glossy black to brown-black, with isolated punctuation and wrinkles or almost smooth. Labrum, anterior part of clypeus and palpi yellow-brown to brown, mandibles red-brown to black, with black tips; posterior part of clypeus glossy red-brown. Antennae brown, extend beyond pronotum midlength, with loose trimerous club. Head including eyes slightly broader than anterior width of pronotum, vested with long, erect, pale setae; eyes large, protruding, separated by less than one eye's width. Ventral surface glossy dark brown.

Prothorax slightly longer than wide (length = 1.2–2.3 mm, width = 1.0–2.1 mm; mean length to width ratio 1.00 : 1.15), anterior part subparallel, widest in middle, constricted towards base. Pronotum yellow-brown to black brown, glossy, almost smooth, with very isolated, fine punctuation; anterior transverse depression slightly bulging, vested with long, erect, pale setae. Ventral surface yellow-brown to dark brown, glossy, prosternal process narrow, dilated distally; hypomera short, broadly rounded; procoxal cavities broadly open posteriorly.

Scutellum transverse-ovate, yellow-brown to dark brown. Anterior mesoventral process strongly protruding.

Elytra yellow-brown to dark brown, long (length = 3.8–8.8 mm, width = 1.3–3.1 mm; mean length to width ratio 1.00 : 2.72), subparallel to very slightly dilated behind middle, apices slightly bevelled to straight. Basal third of each elytron with longitudinal oblong, dark brown macula (mostly not reaching suture or side margin); apical macula dark brown, reaching suture, but not side margin, apically V-shaped emarginate with yellow. Sometimes yellow ground color reduced to transverse macula across both elytra, expanding anteriorly and posteriorly. Punctuation consists of ten rows of fine punctures, almost reaching apex; larger interval present between rows I and II; puncture diameter conspicuously smaller than interstices. Surface vested with long, erect, pale setae.

Legs long, pale yellow-brown to dark brown, tips of femora, base of tibiae and tarsi dark brown. Metatibiae slightly curved, not reaching apex of elytra; carina continuous; with long, erect, pale setae.

Abdomen yellowish-brown, whole ventral surface with long, erect, pale setae.

**Distribution.** So far recorded from northern Africa (Libya, Egypt), the Arabian Peninsula (Saudi Arabia, Yemen, Oman), Israel and Iran (GERSTMEIER 2010). **First record from Socotra Island.**

### *Opilo socotrensis* sp. nov.

(Figs 4, 23–31)

**Type locality.** Yemen, Socotra Island, Dixam plateau.

**Type material.** HOLOTYPE: ♂, YEMEN, SOCOTRA Island, Dixam plateau, 14.–15.vi.2012, Firmihin, Dracaena woodland, 12°28.6'N, 54°01.1'E, 490m // SOCOTRA expedition 2012, J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart leg. (NMPC). PARATYPE: same label data as holotype (RGCM); SOCOTRA Isl., Zerik, 25.–27.iii.2001 (JRCP); Yemen, Socotra Isl., Noged, Mokhar, 31.iii.2001, V. Bejček & K. Štátný lgt. (RGCM).

**Description.** Body length 5.3–9.2 mm. Head red-brown, glossy, conspicuously wrinkled. Labrum, anterior part of clypeus and palpi yellow, mandibles red-brown, with black tips. Antennae yellow, not reaching base of pronotum when laid back, in female even shorter; with more or less loose trimerous club. Head including eyes broader than anterior width of pronotum, vested with long, erect, pale setae; eyes separated by at least 1.5 eye width. Ventral surface smooth in middle, with oblique rugosity; gula almost circular, slightly depressed, with small knob-like process and large pads.

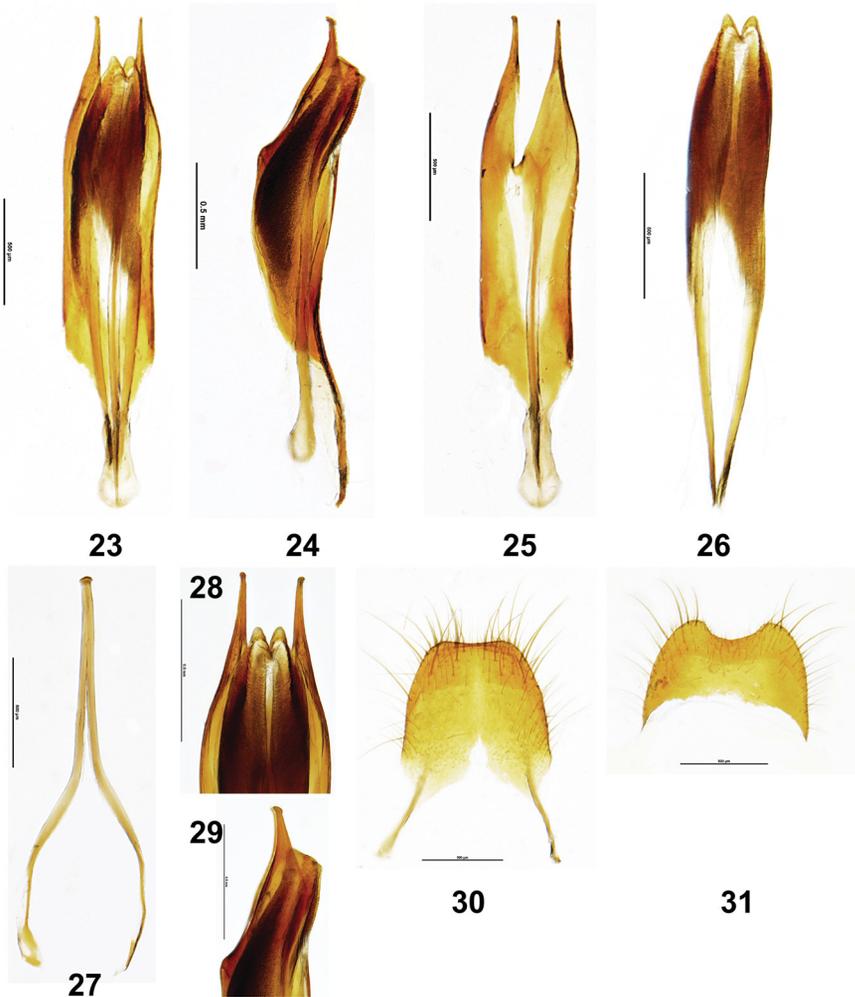
Prothorax only slightly longer than wide (length = 1.00–1.83 mm, width = 0.90–1.73 mm; mean length to width ratio 1.00 : 1.09), widest more or less in middle, more constricted towards base than anteriorly; pale red-brown, glossy; anteriorly and posteriorly in middle smooth, sides with isolated punctuation, disc conspicuously wrinkled, in middle and towards sides deeply and coarsely wrinkled; vested with long, erect, pale setae. Ventral surface with transverse wrinkles; prosternal process narrow, dilated distally; hypomera short, slightly rounded, procoxal cavities broadly open posteriorly.

Scutellum brown, circular to transverse-ovate. Anterior mesoventral process conspicuously broad, protruding; whole anterior margin of mesoventrite bulging; with deep, irregular wrinkles.

Elytra brown, glossy, subparallel, slightly dilated towards apex (length = 3.47–6.18 mm, width = 1.20–2.43 mm; mean length to width ratio 1.00 : 2.64); apices subangular to slightly rounded, minimally dehiscent. Punctuation consists of ten conspicuous rows of punctures, slightly irregular in middle, not reaching apex; puncture diameter smaller than interstices. Surface vested with long, erect, pale setae, mostly slightly directed posteriorly.

Legs long, yellow, knees and tarsi slightly darkened; metatibiae straight, only base with short, darkened carina, which is line-like afterwards; with very long, erect, pale setae.

Abdomen yellowish to red-brown, whole lower surface with long, erect, pale setae. Male genitalia as in Figs 23–31.



Figs 23–31. Genitalia of *Opilo socotrensis* sp. nov. 23 – aedeagus ventral; 24 – aedeagus lateral; 25 – tegmen ventral; 26 – phallus ventral; 27 – spicular fork; 28 – phallus tip ventral; 29 – phallus tip lateral; 30 – pygidium; 31 – ventrite VI.

Female without any conspicuous differences from male.

**Differential diagnosis.** In habitus, *Opilo socotrensis* sp. nov. is similar to the more or less unicolored brown *O. zavattari* (Pic, 1938) from Ethiopia. However, in the latter species, the elytral punctation is distinct, with nodules, and reaches apex, the puncture diameter is approximately double the interstices, and eye separation is less than one half of an eye width.

**Etymology.** Latin adjective *socotrensis* (-is, -e) given according to its distribution.

**Collection circumstances.** Both type specimens were collected at light trap in a *Dracaena cinnabari* Balf. f. (Asparagaceae) woodland (J. Hájek, pers. comm. 2016).

**Distribution.** So far known only from Socotra Island.

## Acknowledgements

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