

A new species of *Brachycerus* from Socotra Island (Coleoptera: Curculionoidea: Brachyceridae)

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Abstract. *Brachycerus socotranus* sp. nov., endemic to Socotra Island, is described from the three specimens collected by the Czech expeditions to Socotra in 2000–2012. The new species is characterized by prominent horn-like tubercles at the base of the rostrum, intact medial groove of pronotum with strongly prominent longitudinal carina and sexual dimorphism in the form of the apical part of the elytra.

Key words. Coleoptera, Curculionoidea, Brachyceridae, *Brachycerus*, taxonomy, new species, morphology, genitalia, Yemen, Socotra

Introduction

The speciose weevil genus *Brachycerus* Olivier, 1789 comprises ca. 400 species, distributed in the Afrotropical Region (ca. 350 species in Africa, the Arabian Peninsula and Madagascar), mainly arid and semiarid zones, and in the southwestern Palaearctic (ca. 50 species in the Mediterranean subregion, Caucasus and Central Asia) (OBERPRIELER 2014). Afrotropical (HAAF 1957a,b, 1958) and Palaearctic (ZUMPT 1937a,b) *Brachycerus* were treated separately and, consequently, possible relationships between groups of species from both regions still remain to be discovered.

The genus *Brachycerus* was recorded for the first time from Socotra Island by COLONNELLI (2014) who quoted the occurrence on the island of two different, but related, undescribed species, each represented by a single specimen collected in 2000 and 2009, respectively. He was the first to note the unique character of two strongly projecting tubercles at the base of the rostrum, and to suggest close affinity of the Socotran *Brachycerus* to some South African species. I studied the two aforementioned specimens (a male and a female), plus an additional male collected in 2012, all of which appear to be conspecific, with the differences that led

COLONNELLI (2014) to recognize two different species probably explained by intraspecific variation, well known in *Brachycerus*, and by sexual dimorphism.

Materials and methods

The studied material is deposited in the National Museum, Prague, Czech Republic (NMPC).

Drawings and measurements were made using a drawing tube and a Leica M125 stereo microscope. Drawings were scanned and processed with Adobe Illustrator 9.0. Images were taken with a Leica DFC295 digital camera mounted on a Leica M205C microscope, image stacks were processed with Leica Application Suite 4.2.0 and Helicon Focus 5.3. Final image editing was done with Adobe Photoshop CS5. Total body length was measured along a straight line extending from the base of the rostrum to the tip of the elytra in dorsal view.

Terminology follows FRIEDMAN & SAGIV (2010). Nomenclature of higher taxa of weevils follows COLONNELLI (2011).

Genitalia were extracted by soaking the dry specimens in hot water, breaking off the posterior sternites of the abdomen and boiling them in KOH (10%). Extracted genitalia were glued on paper cards and pinned together with the specimens.

Labels of specimens are quoted verbatim; a double slash separates between different labels.

Taxonomy

Brachycerus socotranus sp. nov.

(Figs 1–20)

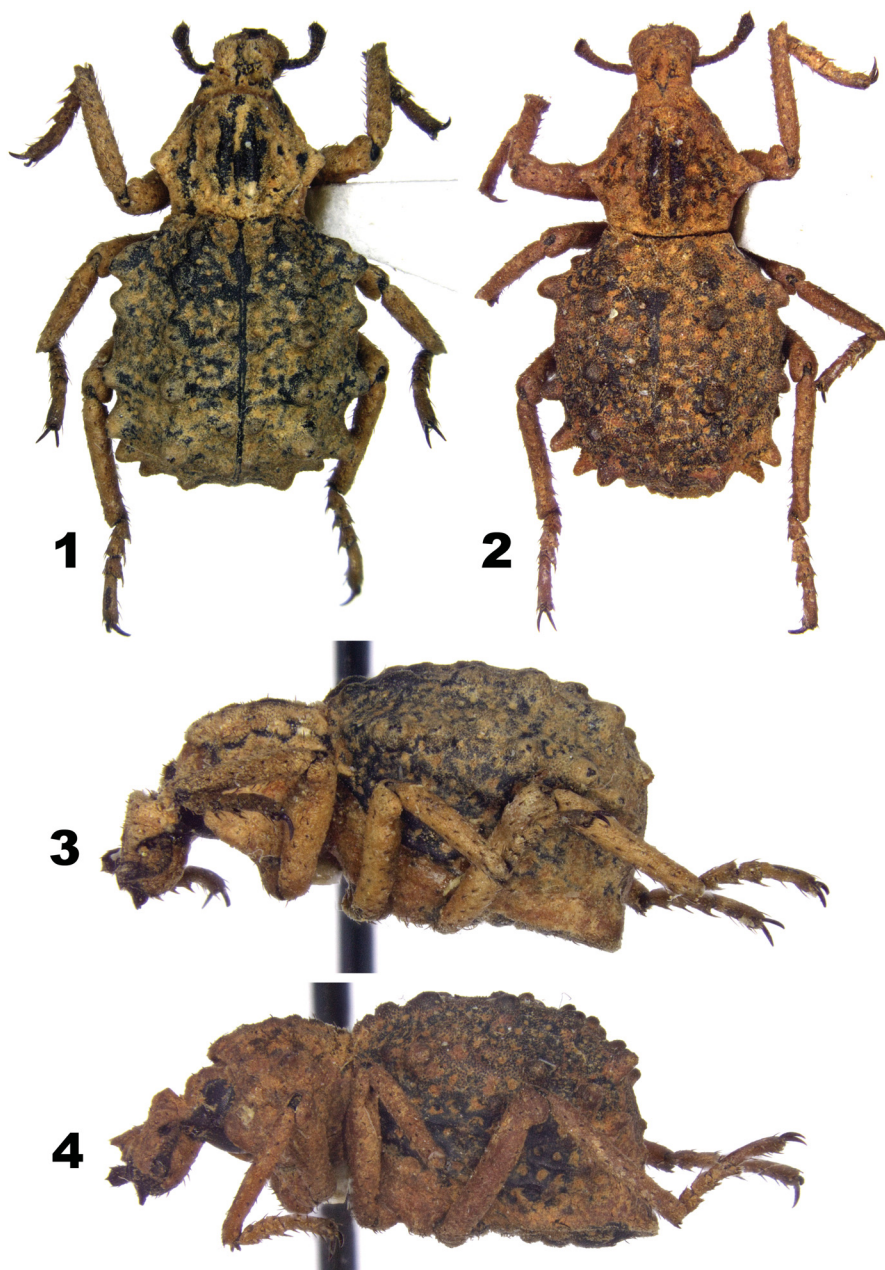
Type locality. Socotra Island, Hamadero hills, ca. 12°37'42"N 54°15'08"E – 12°35'40"N 54°18'20"E, ca. 250–710 m a.s.l. (BEZDĚK et al. 2012).

Type material. HOLOTYPE: ♂ (NMPC), labelled: YEMEN: Socotra Isl.: ‘Hamadero, 20-21.xi.2000, V. Bejček & K. Šťastný leg’. The holotype is glued to a triangular carton plate, dissected; genitalia and ventral sternites are glued to a rectangular carton plate and pinned next to the specimen; in excellent shape; marked with red label. PARATYPES: 1 ♀ (NMPC), ‘YEMEN, SOCOTRA Island: Shibhon, 13.vi.2009, 12°28'15"N 53°68'31"E, 680 m, L. Purchart leg.’; 1 ♂ (NMPC), ‘YEMEN, SOCOTRA Island: Dixam plateau, TUDHEN, shrubland with *Commiphora planifrons*, 18+22.v.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.’.

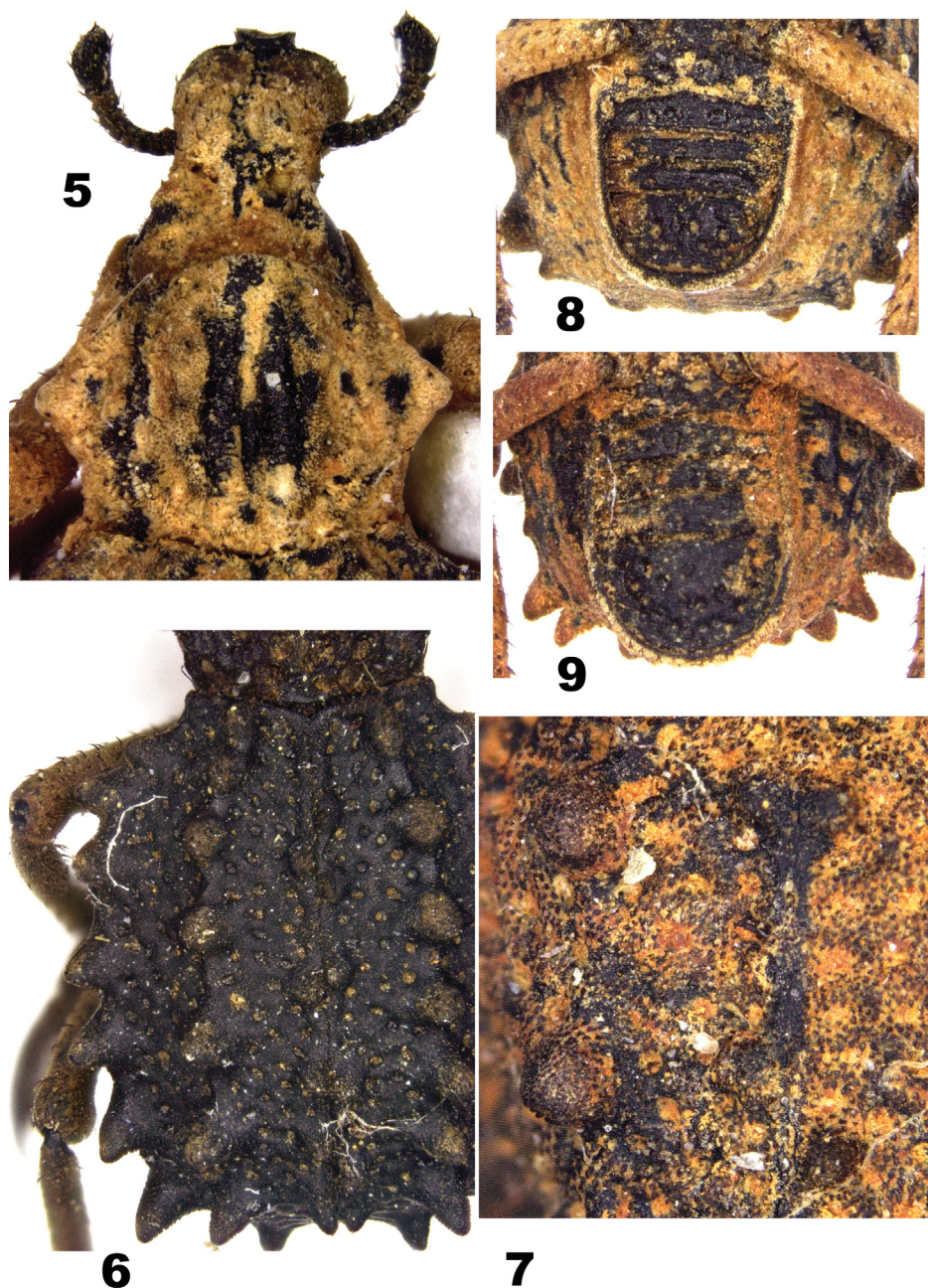
Additional material. Torso without head and legs, Diksam, 21.ii.2000, W. Wranik leg. (NMPC).

Description. Male holotype. Body length 6.3 mm. *Color.* Body, appendages, and elytra black, appearing ochraceous from being covered with strongly attached particles of soil.

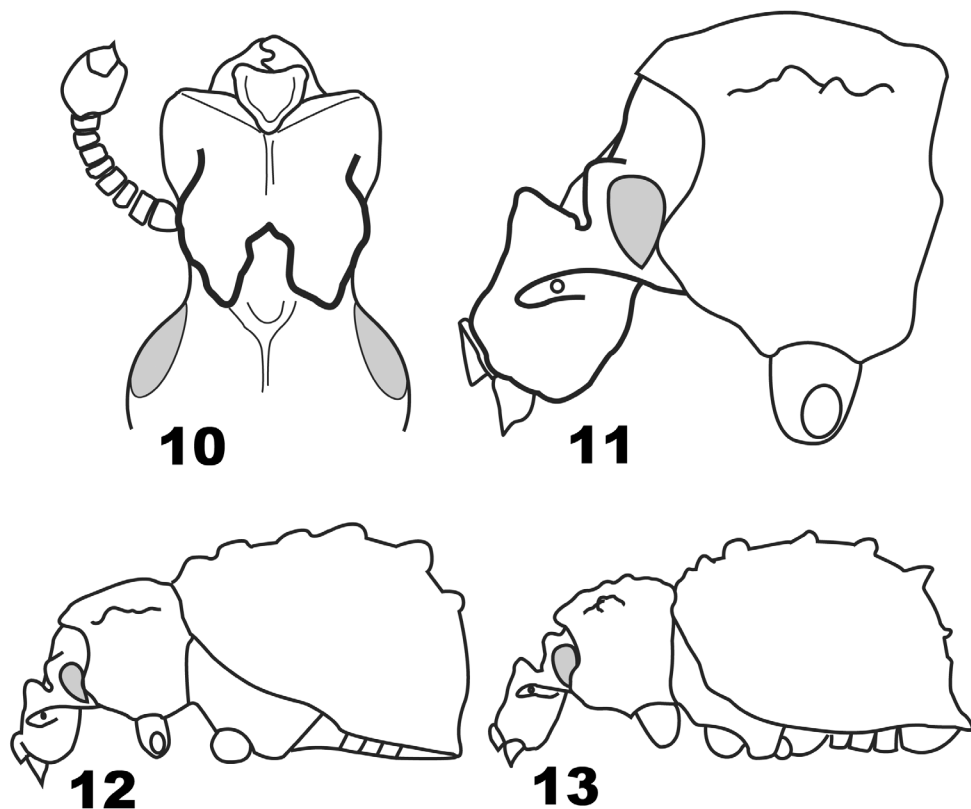
Vestiture comprises scales of various shapes and sizes on different body parts: head and pronotum covered densely with erect oblong pale flat or peg-shaped scales and dark three-bladed scales (Y-shaped in section) and thick black setae on prominent places, such as ridges and lateral lobes of pronotum, longer and denser on underside of rostrum; elytra covered with flat or short appressed pale scales, and small nearly obsolete black scales, apices of tubercles more densely covered with scales and bearing 1–3 thick short black setae; legs covered with erect oblong black setae. Surface of body and elytra shagreened or finely granulated.



Figs 1–4. Habitus of *Brachycerus socotranus* sp. nov. 1 – male holotype, dorsal view; 2 – female, dorsal view; 3 – male holotype, lateral view; 4 – female, lateral view.



Figs 5–9. Details of *Brachycerus socotranus* sp. nov. 5 – head and pronotum, dorsal view; 6 – elytra, dorsal view, male paratype; 7 – elytral scales, female; 8 – abdominal ventrites, male; 9 – abdominal ventrites, female.



Figs 10–13. Details of *Brachycerus socotranus* sp. nov. 10 – head, dorsal view; 11 – head and pronotum, lateral view; 12 – male, lateral view; 13 – female, lateral view.

Rostrum dorso-laterally distinctly separated from head by deep transverse groove, medially interrupted by dorsal longitudinal ridge, bent at base at obtuse angle to head, stout, as long as wide, apically dilated, medially expanded into obtuse projection over antennal pit, dorsally flattened, with medial longitudinal ridge in anterior 3/4. Base of rostrum bifurcate and bearing pair of strongly projecting horn-shaped tubercles, protruding posteriad; posteromedially concave, extended posteriorly into two narrow ridges fusing in anterior part of forehead into longitudinal ridge. Epistome large, cordate, medially concave. Antennal scrobe lateroventral, deep. Mandibles flat to slightly convex, with 2–3 rounded denticles at anterior margin, subapically with small concavity, probably scar of deciduous mandibular cusp.

Antenna short and stout, not geniculated, comprising nine antennomeres, covered with sparse pale setae; scape at most twice as long as wide, antennomeres II–VIII 0.5× as wide as long, club obovate, its apical part asymmetrical, apicolaterally slightly flattened, microsetose, apically prominent, with fine pointed spine.

Head. Forehead deeply concave, medially with strongly projected longitudinal ridge, gradually descending towards vertex. Vertex coarsely punctured with sparse round punctures. Eye orbit strongly projected above forehead, dorsally slightly incrassate, rounded, in lateral view completely separated from head anterodorsally, posteriorly so at most on dorsal fourth. Eye flat, obovate.

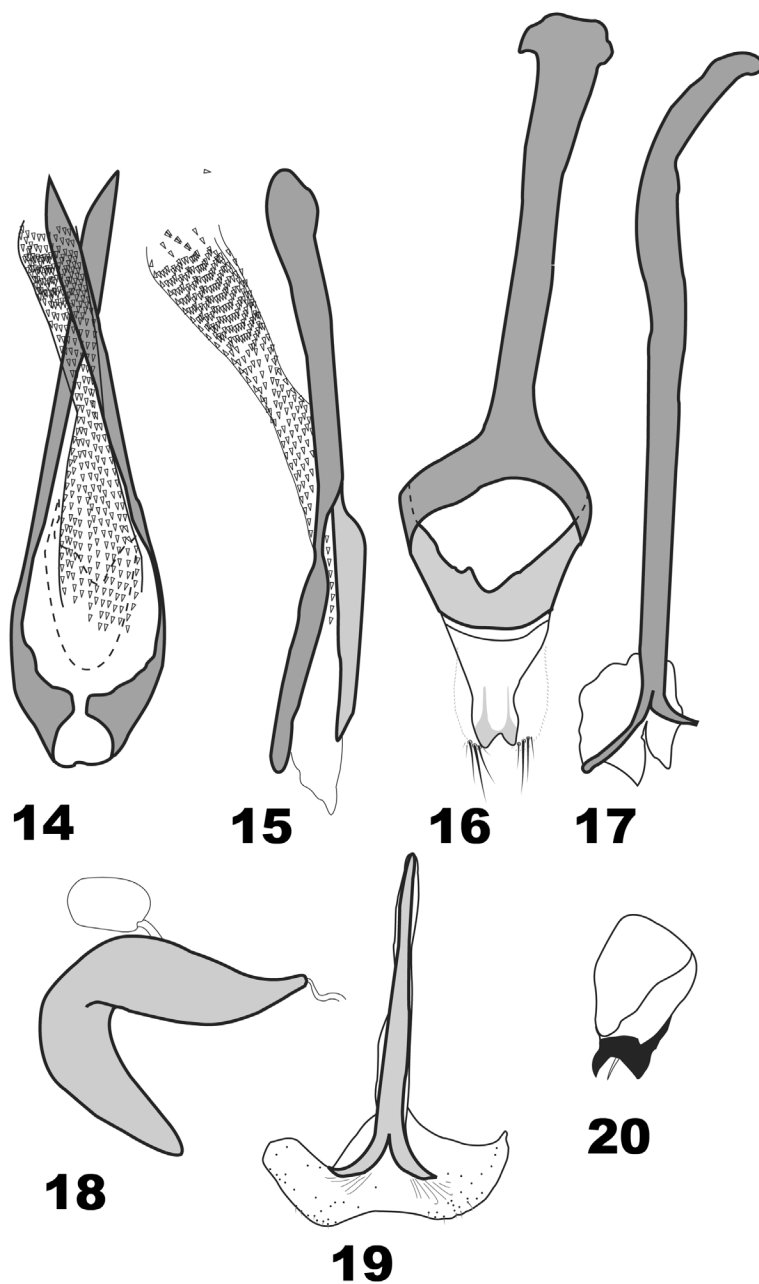
Pronotum as long as wide or slightly transverse, laterally extended into massive lateral lobe, apically acute-angled. Anterior margin of pronotum prominent, rounded, extending over vertex. Pronotal disc with pair of distinct well-projecting median ridges and pair of indistinct lateromedian ridges, partly confluent with coarse sculpture of pronotum. Median ridges stretch throughout entire length of pronotum, slightly blurred anteriorly and posteriorly, not connected medially in any part; median groove divided medially by strongly prominent longitudinal carina, nearly as developed as median ridges, into two deep hollow grooves, transversely wrinkled, not punctured, not bearing scales. Pronotum anteromedially with strongly projecting rounded postocular lobe.

Elytra moderately convex, laterally nearly parallel-sided, not angled at humeri, bearing three ridges of tubercles. Sutural ridge comprising four small spherical to conical tubercles, completely separated. Median and lateral ridges comprising 6–7 and 5–6 (respectively) erect conical tubercles, rounded at apex, gradually increasing in size towards apex, largest subapical tubercles slightly bent apicad, apices microsetose, bearing 1–3 black setae or devoid of them; tubercles separated or connected by slight elevation of integument. Sublateral ridge represented by single low tubercle in subapical part of elytra. Spaces between ridges coarsely sculptured by scattered deep uneven round pits, 0.5–3.0× as distant as their diameter, surface rough, microgranulated. Epipleuron sculptured evenly by small round tubercles and round pits or comprising two ridges of small tubercles connected by slight elevation and three rows of pits. Base of elytra upraised as to form entire marginal carina fused to basal tubercles. Elytra steep subapically, apically tapering and slightly produced into short truncated ‘tail’ not visible from above (Figs 1, 3, 8, 12).

Legs long, slender, covered with isolated long erect black setae and with dense erect pale to brownish scales; femora not dentate, profemur slightly incrassate medially, meso- and metafemur slightly bent medially, with anterior side concave; tibiae cylindrical, without longitudinal keels, pro- and mesotibiae distally with wide rounded mucro and narrower uncus, and tuft of brown setae near uncus, as long as uncus, metatibiae with mucro nearly indistinct, without corbel; tarsomeres subcylindrical to conically tapered, ventrally with pair of tufts of setae and occasionally with few single setae; onychium as long as or slightly longer than tarsomeres I–III together; claws widely separated at base, not toothed, without basal seta.

Venter coarsely punctured with round pits; mesoventral process rounded, as wide as width of coxa; abdominal ventrites II–IV subequal in length and width, ventrite V flat and apically truncate.

Male genitalia. Aedeagus (Figs 14–15) flat, strongly sclerotized laterally and apically, laterally rounded, apex slightly tapering, truncated; temones sclerotized, slightly longer than tube; endophallus with densely denticulate collar comprising rows of triangular denticles, densest posteriorly. Tegmen (Fig. 16) with tegminal plate triangular, slightly enveloping, apically notched and strongly sclerotized, parameres separated, microtrichose, bearing long macrosetae apically



Figs 14–20. Genitalia of *Brachycerus socotranus* sp. nov. 14 – aedeagus, dorsal view; 15 – aedeagus, lateral view; 16 – tegmen, dorsal view; 17 – spiculum gastrale; 18 – spermatheca; 19 – spiculum ventrale; 20 – distal gonocoxite.

and subapically, prostegium fused to form strongly sclerotized ring; manubrium straight, slightly longer than tegminal plate, dilated apically. Spiculum gastrale (Fig. 17) sclerotized, Y-shaped, with long apodeme and short arms with expanded membranous lobes.

Variability. Body length: male paratype 7.5 mm, female paratype 6.3 mm. The female paratype has slightly more slender rostrum and longitudinal ridge (Figs 2, 4, 13). The male paratype possesses larger count of elytral tubercles (5–6 of sutural ridge, 8–9 of median ridge and 7 of lateral ridge) and has no tubercles of sublateral ridge. Elytra of the female paratype sparsely covered with dark flat short appressed scales (Fig. 7), elytra of the male paratype bare, with traces of scales on tubercles and in pits (Fig. 6). Female elytra less steep subapically, apically tapering and strongly produced into oblong truncated ‘tail’ visible from above (Figs 2, 4, 9, 13). Abdominal ventrite V convex and apically rounded (Figs 9, 13).

Female genitalia. Spermatheca (Fig. 18) strongly sclerotized, duct-lobe (collum, nodulus) tapering, gland-lobe (ramus) not pronounced, tail (cornu) elongated, apically pointed, spermathecal gland globular, not sclerotized. Spiculum ventrale (Fig. 19) sclerotized, Y-shaped, with long manubrium and wide apical plate. Distal gonocoxite apically bidentate, without stylus, apicomediaally with narrow tuft of setae (Fig. 20).

Differential diagnosis. *Brachycerus socotranus* sp. nov. is unique mainly in the sculpture of its pronotum: deep median groove between the median pronotal ridges, stretching from the anterior to posterior margin without any transverse interruptions, divided into two parallel grooves by longitudinal carina nearly as wide and prominent as the median ridges. Two other rare characters are known from a few South African *Brachycerus*: bifurcate base of rostrum (*B. boei* Gyllenhal, 1840; *B. coronirostris* Gyllenhal, 1840 and *B. duplicatus* Gyllenhal, 1840) and apex of elytra extended and truncated (*B. vestitus obtusus* Pascoe, 1887), but *B. socotranus* sp. nov. is the only species to possess this combination of characters and the only species in which sexual dimorphism in the structure of elytra is recorded. Prominent tip of antennal club, lack of metatibial corbels and prominent conical tubercles with pointed tip, giving its body the ‘star’ shape, distinctly delimit *B. socotranus* sp. nov. from any species of the Palaearctic *Brachycerus*.

Brachycerus socotranus sp. nov. belongs to the ‘Merkmalgruppe C’ [species group C] of HAAF (1957b), characterized by: a) antennal club apically rounded with fine pointed spine at apex, b) abdominal ventrite II as long or almost as long as ventrite IV. The subdivision of African *Brachycerus* by HAAF (1957b) into species groups sharing the same characters is technical rather than phylogenetic, therefore the groups are artificial and probably include several not closely related lineages; a discussion of this important issue is however beyond the scope of the current research. The ‘Merkmalgruppe C’ comprises 126 species, of which 81 occur only in South Africa and seven are known from Ethiopia and Somalia (the area closest geographically to Socotra). Socotra Island is strongly isolated, lying 240 km east of the African (Somalian) coast and 380 km south of the Arabian Peninsula (Yemeni coast). Whereas one might expect that the *Brachycerus* from Socotra would demonstrate relationship affinities to the Yemeni or Somalian *Brachycerus* species, in fact there are no close affinities between the only Yemeni species, *B. gibbosus* Haaf, 1957 (which also occurs in Egypt and Ethiopia), and its East-African relative *B. tropicalis* Haaf, 1957 (which belongs to the ‘Merkmalgruppe D’, characterized by the second abdominal ventrite distinctly longer than the fourth). Within the

‘Merkmalgruppe C’ *B. socotranus* sp. nov. can be compared with the South African *B. wahlbergi* Fähræus, 1871, having intact pronotal groove, but completely different characters of head and elytra, as well as with *B. annulatus* Gerstaecker, 1855, widely distributed in southern, central and east Africa, with similar morphology of pronotum and elytra, but pronotal groove with median interruption and differing in sculpture of head. *Brachycerus socotranus* sp. nov. strongly resembles three South African species, *B. boei*, *B. coronirostris* and *B. duplicatus*, in its bifurcate ‘horned’ base of rostrum; in Haaf’s identification key (HAAF 1957b) it keys to these species; however, the morphology of pronotum and elytra is completely different.

Etymology. The species name is the Latin adjective *socotranus* (-a, -um) which refers to its distribution, restricted to Socotra Island.

Immature stages. Egg elliptical, 2.5×1.5 mm, whitish, surface densely granulate. Eggs of *Brachycerus* are not known (or at least not described) for most species apart from *B. ornatus* Drury, 1773 (LOUW 1990), in spite of their unusual size – about a third of female body length (A.L.L. Friedman, unpublished observations). An egg of *B. socotranus* sp. nov. is $0.4\times$ as long as the female body. Larva and pupa not known.

Phenology. The only three known specimens were collected in late November, May and June, which fits the general phenological pattern of members of the genus which are active in the wet season. Occurrence of an egg in the female collected in mid-June probably indicates the oviposition season.

Host plants. Nothing is known about the host preferences of *B. socotranus* sp. nov. *Brachycerus* spp. feed and develop on geophyte plants, particularly those with bulbs, from the monocotyledon families Amaryllidaceae, Araceae, Asparagaceae (Asparagoideae, Scilloideae), Iridaceae, Liliaceae and Orchidaceae (ARZANOV 2005; OBERPRIELER 2014; A.L.L. Friedman, unpublished observations). The flora of Socotra Island includes numerous geophytes, some of them quite common throughout the island (BROWN & MIES 2012). It can be assumed that *B. socotranus* sp. nov. may be oligophagous on several monocotyledon geophytes, particularly on *Drimia* Jacq. (formerly known as *Urginea* Steinh.) (Asparagaceae: Scilloideae), which is a host for many species of *Brachycerus* in the East Mediterranean (FRIEDMAN & SAGIV 2010).

Distribution. Endemic to Socotra Island. The specimens were collected in the central and northeastern parts of the island, predominantly at high altitudes (680–1135 m) (BEZDĚK et al. 2012).

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