

Longitarsus doeberli, a wingless new species from Socotra Island (Coleoptera: Chrysomelidae)

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Abstract. *Longitarsus doeberli* sp. nov. (Coleoptera: Chrysomelidae: Galerucinae: Alticini), from Socotra Island is described. The new species is apparently similar to *Longitarsus lederi* Weise, 1889 from Caucasus with which it shares, in addition to compact body, some adaptive convergences, such as wingless condition and trend of reduction of the metatarsomere I. Based on the structure of the median lobe of aedeagus and the peculiar shape of the spermatheca, the new species shows instead the closest relationships with the species of the *L. anchusae* group, especially *L. anchusae* (Paykull, 1799) and *L. anatolicus* Weise, 1900.

Key words. Coleoptera, Chrysomelidae, Galerucinae, Alticini, *Longitarsus*, new species, Socotra, Yemen

Introduction

Alticini of the Socotra Island were recently studied by DÖBERL (2012), who reported 18 species classified in 10 genera. The flea beetle fauna of Socotra is represented mainly by Afrotropical and, to a lesser extent, Palaearctic elements. In the first group, we find species of the genus *Eriotica* Harold, 1877, *Aphthona pusilla* Laboissière, 1942, *Phyllotreta cheiranthi* Weise, 1903, and *Podagrica puncticollis* Weise, 1902. The Palaearctic component includes mainly *Phyllotreta procera* (Redtenbacher, 1849), *Psylliodes persica* Allard, 1867, and the widespread *Orthocrepis ruficollis* (Lucas, 1847). The endemic taxa known till now, i.e. the genus *Bezdekaltica* Döberl, 2012 with the species *Bezdekaltica socotrana* Döberl, 2012, *Aphthona socotrana* Döberl, 2012, and *Luperomorpha biondii* Döberl, 2012 shows clear Afrotropical affinities.

Longitarsus Latreille, 1829 is a very large flea beetle genus which is widespread throughout all zoogeographical regions and includes about 600 known species, of which about 360 occur

in the Palearctic Region and over 100 in the Afrotropical Region (BIONDI & D'ALESSANDRO 2008, 2012; DÖBERL 2010).

In this contribution, an interesting new species of Palearctic origin closely related to the *Longitarsus anchusae* species-group (sensu BIONDI 1995), *Longitarsus doeberli* sp. nov. from Dixam plateau, is described. In some characteristics, such as wingless condition and trend of reduction of the metatarsomere I, the new species represents a typical example of adaptation to high altitude and/or to small insular environment.

Material and methods

Material examined consisted of dried and pinned specimens preserved in the Department of Entomology, National Museum, Praha, Czech Republic (NMPC). Specimens were examined, measured and dissected using a Leica M205C binocular microscope. The dissections were aimed at the extraction of the median lobe of aedeagus and the spermatheca. Photomicrographs were taken with a Leica DFC500 camera and the Auto-Montage Pro 2006 software. Scanning electron micrographs were taken with a HITACHI TM-1000. The terminology used follows DÖBERL (1986), FURTH & SUZUKI (1994) and SUZUKI (1988) for the spermatheca, and D'ALESSANDRO et al. (2016) for the median lobe of aedeagus.

The following abbreviations are used in the description: LAED – length of aedeagus; LAN – length of antennae; LB – total length of body; LE – length of elytra; LFMT – length of metatarsomere I; LHT – length of metatibiae; LP – length of pronotum; LSP – length of spermatheca including ductus; WE – width of elytra; WP – width of pronotum.

Exact label data are cited for the type material: a double slash (//) divides the data on different labels and a single slash (/) divides the data in different rows.

Taxonomy

Longitarsus doeberli sp. nov.

(Figs 2, 4–7, 9, 12–13)

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

Type material. HOLOTYPE: ♂, 'YEMEN, Socotra Island / Dixam plateau, Tudhen / shrubland with *Commiphora planifrons*, 18.+22.vi.2012 / 12° 32.7'N, 53° 53.9'E, 1135 m // Socotra expedition 2012 / J. Bezděk, J. Hájek, V. Hula, / P. Kment, I. Malenovský, / J. Niedobová & L. Purchart leg. // Holotypus ♂ / *Longitarsus doeberli* n. sp. / M. Biondi & P. D'Alessandro det. 2017' [red label]. PARATYPES: 1 ♂ and 2 ♀♀, same data as the holotype, each with a red label 'Paratypus / *Longitarsus doeberli* n. sp. / M. Biondi & P. D'Alessandro det. 2017'.

Description of male holotype. Dorsal integument black, more reddish on pronotum, with evident metallic reflection. Body (Fig. 2) compact, sub-oval (LB = 1.74 mm), rather convex. Maximum pronotal width in middle: 0.72 mm; maximum elytral width in basal third: 0.95 mm.

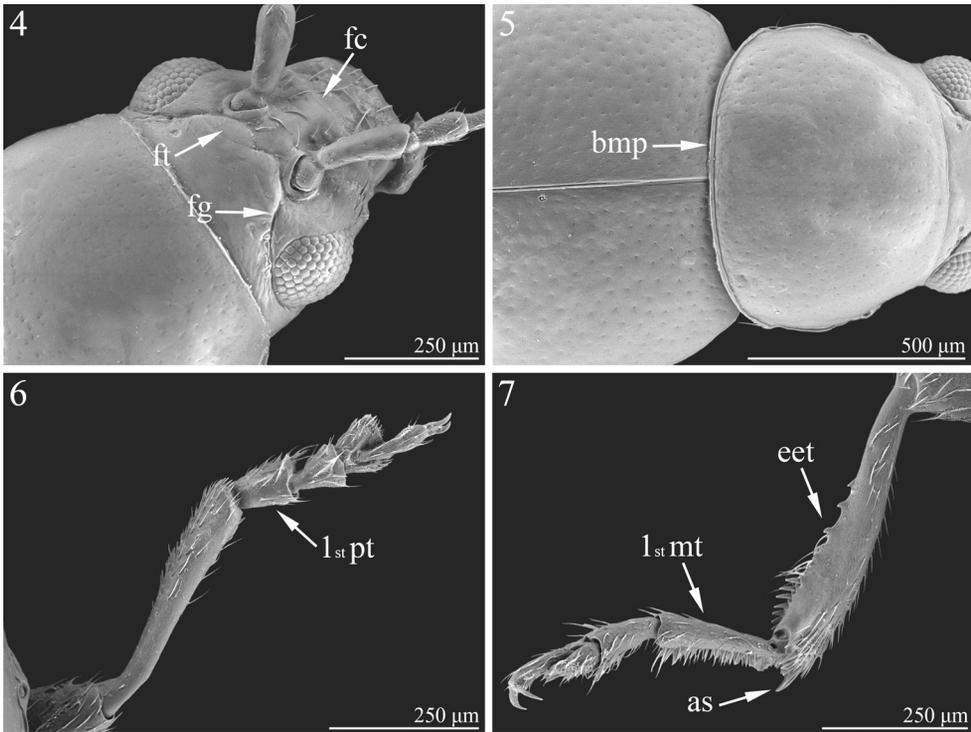
Head (Fig. 4) with impunctate vertex and frons but with some weakly impressed and large punctures near frontal grooves; surface wrinkled and sparsely punctuated between eyes. Frontal tubercles finely delimited, elongate, sub-horizontal, with smooth surface; frontal grooves finely impressed, distally convergent to ocular margin; frontal carina wide, not raised; labrum elongate, sub-trapezoidal, blackened; palpi distinctly darkened; eyes sub-elliptical, not reduced; antennae elongate (LAN = 1.42 mm; LAN/(LE+LP) = 0.84) with yellowish



Figs 1–3. Habitus. 1 – *Longitarsus anchusae* species group (*L. anchusae* (Paykull, 1799)); 2 – *L. doeberli* sp. nov., holotype; 3 – *L. lederi* Weise, 1889.

antennomeres I–V and gradually darkened antennomeres VI–XI; length of each antennomere of right antenna proportional to numerical sequence 18 : 8 : 8 : 10 : 14 : 12 : 18 : 13 : 14 : 14 : 18 (1 = 0.01 mm).

Pronotum (Figs 2, 5) scarcely transverse (LP = 0.56 mm; WP/LP = 1.29), laterally distinctly rounded, basally slightly narrower; lateral and basal margin very finely bordered; punctuation

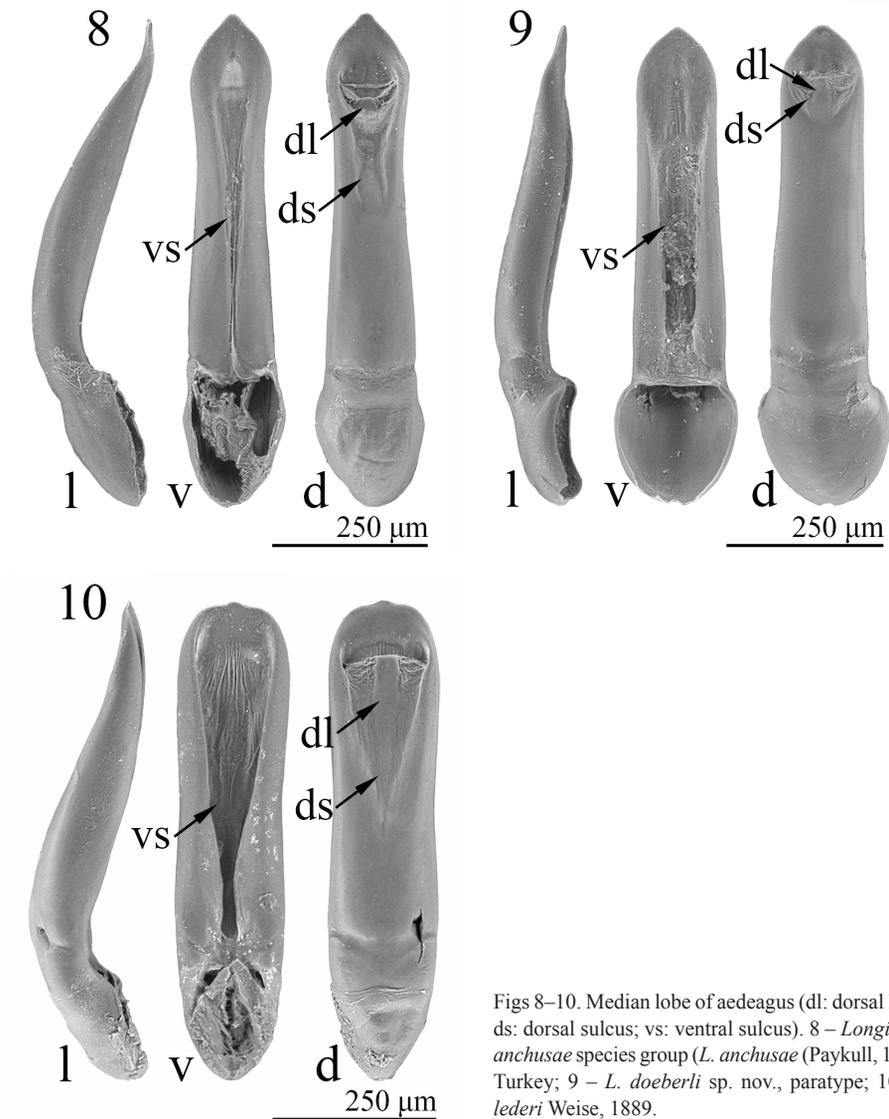


Figs 4–7. Morphological traits of *Longitarsus doeberli* sp. nov. 4 – head (fc: frontal carina; fg: frontal groove; ft: frontal tubercle); 5 – pronotum and basal part of elytra (bmp: basal margin of pronotum); 6 – protibia and tarsus (1st pt: protarsomere I); 7 – metatibia and tarsus (1st mt: metatarsomere I; as: apical spur of metatibia; eet: external edge of tibia).

evenly distributed with moderately densely impressed punctures on smooth surface. Scutellum wide, semi-circular, with smooth surface.

Elytra elongate (Fig. 2) (LE = 1.12 mm; LE/LP = 2.00) but not covering pygidium completely, laterally distinctly rounded, apically widely arcuate, apparently sub-truncate in dorsal view; punctation (Fig. 5) similar to that on pronotum but more strongly impressed, very homogenous, with large punctures impressed on smooth surface; humeral calli and metathoracic wings absent.

Fore and middle legs entirely yellowish; hind legs with femora darkened; distal two thirds of metatibiae distinctly dentate on external edge (Fig. 7); apical spur of metatibiae about as long as tibial apex width; protarsomere I (Fig. 6) and mesotarsomere I slightly but distinctly enlarged; metatarsomere I (Fig. 7) shorter than half metatibial length (LFMT/LHT = 0.44). Ventral parts dark brown, with paler abdomen; apical ventrite without preapical dimples or impressions.



Figs 8–10. Median lobe of aedeagus (dl: dorsal ligula; ds: dorsal sulcus; vs: ventral sulcus). 8 – *Longitarsus anchusae* species group (*L. anchusae* (Paykull, 1799)), Turkey; 9 – *L. doeberli* sp. nov., paratype; 10 – *L. lederi* Weise, 1889.

Median lobe of aedeagus (Fig. 9) (LAED = 0.79 mm; LE/LAED = 1.41) moderately elongate; in ventral view laterally slightly tapered from base to apical fifth; distal part sub-lanceolate without any median small tooth apically; ventral sulcus elongate, deeply impressed, gradually narrowing from apex towards basal part, basally not interrupted; dorsal sulcus U-shaped, apical fourth visible; dorsal ligula apically sub-rectangular; in lateral view basal half of median lobe slightly curved and distal half widely and slightly sinuous.



Figs 11–14. Spermatheca. 11 – *Longitarsus anchusae* species group (*L. anatolicus* Weise, 1900); 12–13 – *L. doeberli* sp. nov., paratypes; 14 – *L. lederi* Weise, 1889.

Variation. Paratypes very similar in shape, sculpture and colour to the holotype but sometimes with more darkened metafemora. Females with slightly shorter antennae and not enlarged first protarsomere and mesotarsomere. Spermatheca (Figs 12–13) with sub-reniform basal part; distal part developed, not well distinct from collum; ductus very elongate, simple or with a strict semi-coil, basally and medially inserted.

Measurements. ♂ (n = 1): LE = 1.16 mm; LP = 0.56 mm; WE = 1.00 mm; WP = 0.74 mm; LAN = 1.48 mm; LAED = 0.82 mm; LB = 1.90 mm; LE/LP = 2.07; LE/WE = 1.16; WP/LP = 1.32; LE/LAED = 1.41; LAN/(LE+LP) = 0.86. ♀ (n = 2): LE = 1.26, 1.26 mm; WE = 1.00, 1.06 mm; LP = 0.51, 0.52 mm; WP = 0.68, 0.70 mm; LAN = 1.28, 1.34 mm; LSP = 0.45, 0.38 mm; LB = 1.88, 1.94 mm; LE/LP = 2.47, 2.42; LE/WE = 1.26, 1.19; WP/LP = 1.33, 1.35; LE/LSP = 2.80, 3.32; LAN/(LE+LP) = 0.72, 0.75.

Differential diagnosis. Based on the body colour, wing reduction, the shape of the median lobe of aedeagus and the spermatheca, *Longitarsus doeberli* sp. nov. could be attributed to the subgenus *Testergus* Weise, 1893. However, in our opinion the real affiliation of this taxon still needs further investigation, considering also the different meanings given to it by recent authors (KONSTANTINOV 2005, DÖBERL 2010). Based on the external habitus, the new species seems very similar to *Longitarsus lederi* Weise, 1889 (Figs 2–3), but this similarity is only superficial and due to adaptive convergence to isolated environments with trend of loss of flying ability and, to a lesser extent, jumping abilities. In fact, considering the morphology of the median lobe of aedeagus (Figs 9–10), and the spermatheca (Figs 12–14), these two species are clearly different. Based on the shape of the aedeagus and mostly the peculiar spermatheca with long and widely arcuate ductus (Figs 12–13), *Longitarsus doeberli* sp. nov. indeed

shows closer affinity to the species of the *L. anchusae* group (sensu BIONDI 1995), especially *L. anchusae* (Paykull, 1799) and *L. anaticus* Weise, 1900, widespread mainly in Southern Europe and Western Asia (Figs 1, 8, 11). However, the new species can be easily separated from them by the following characters: body clearly thicker; pronotum wider; metatarsomere I shorter; median lobe of aedeagus less slender and distally not lanceolate, with wider ventral sulcus; spermatheca smaller, with distal part shorter not well distinct from collum.

Etymology. The name of the new species is dedicated to our friend Manfred Döberl, an excellent specialist in flea beetles who recently passed away.

Habitat. All specimens were collected on the type locality Tudhen with vegetation dominated by *Juncus socotranus* (Juncaceae), *Cyperus* sp. (Cyperaceae), *Bacopa monieri* (Plantaginaceae) and *Exacum caeruleum* (Gentianaceae). The area was grazed by cattle and situated within an extensive sparse montane shrubland dominated by *Commiphora planifrons*, *Cephalocroton socotranus*, *Croton sulcifructus*, and *Croton socotranus*.

Comments. *Longitarsus doeberli* sp. nov. shows a complete reduction of the metathoracic wings, so it is not able to fly, which limits its accidental removal from its insular habitat. Moreover, considering that *Longitarsus* species perform in jumping better than *Aphthona* species (cf. SCHMITT 2004, NADEIN & BETZ 2016), reduction in length of the first metatarsomere in the new species is likely to result in a lower jumping ability, thus further limiting the movement. Considering the clear relationships of *L. doeberli* sp. nov. with the species of the *Longitarsus anchusae* group, we presume that it is very probably associated with the plant family Boraginaceae.

Distribution. Species endemic to Socotra Island.

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