



Longitarsus leonardicarloi (Coleoptera: Chrysomelidae: Galerucinae: Alticini), new species from Turkmenistan

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Abstract - *Longitarsus leonardicarloi* (Coleoptera: Chrysomelidae: Galerucinae: Alticini), new species belonging to *Longitarsus anchusae* species group is described from Turkmenistan. The new species is illustrated with images of male and female genitalia; dorsal, lateral, and frontal habitus; and protarsomeres of both sexes. It is compared with *L. anchusae* (Paykull), *L. anatolicus* Weise and *L. hittita* Biondi, which are illustrated with images of the median lobe of the aedeagi, dorsal and frontal habitus. A key to all species currently included in *L. anchusae* group is provided.

Key words: flea beetles, Palearctic, biodiversity, species groups.

Riassunto - *Longitarsus leonardicarloi* (Coleoptera: Chrysomelidae: Galerucinae: Alticini), nuova specie dal Turkmenistan.

Longitarsus leonardicarloi (Coleoptera: Chrysomelidae: Galerucinae: Alticini), nuova specie appartenente al gruppo di specie *Longitarsus anchusae*, viene descritta dal Turkmenistan. La nuova specie è illustrata con immagini dei genitali maschili e femminili, degli habitus dorsali, laterali e frontali e dei protarsomeri di entrambi i sessi. Viene confrontata con *L. anchusae* (Paykull), *L. anatolicus* Weise e *L. hittita* Biondi, che sono illustrate con immagini del lobo mediano degli eedeagi, degli habitus dorsali e frontali. Viene fornita una chiave di tutte le specie attualmente incluse nel gruppo *L. anchusae*.

Parole chiave: biodiversità, crisomelidi, gruppi di specie, Palearctico.

INTRODUCTION

Longitarsus Latreille 1829 is the most species rich genus among flea beetles with more than 700 species worldwide (Konstantinov unpublished compilation).

To access that diversity a few species groups were provisionally established (Biondi, 1996; Konstantinov, 2005). One of them includes species associated with *L. anchusae* (Paykull 1798) (Biondi, 1996). In addition to *L. anchusae*, it comprises of *L. anatolicus* Weise 1900, *L. hittita* Biondi 1996, *L. iconiensis* Weise 1900, and *L. saulicus* Gruev & Döberl 2005. The last name is a replacement for *L. morio* J. R. Sahlberg 1913, which turned out to be a homonym of *L. morio* Motschulsky 1866. In the same study, Biondi (1996) designated the lectotypes for *L. anatolicus*, *L. iconiensis* and *L. morio* and established the synonymy of *L. angorensis* Gruev & Kasap 1985 with *L. iconiensis* but did not provide characters that circumscribe the group. Our experience in establishing species groups in hyper diverse flea beetle genera (e.g., *Aphthona* Chevrolat, *Longitarsus*) (Konstantinov, 1998; Konstantinov & Lopatin, 2000) suggests that characters of male and female genitalia are more informative than characters of external morphology. Species of *L. anchusae* share the following features of the median lobe of the aedeagus: in lateral view it is nearly straight to slightly curved with apex bent dorsally or ventrally; in ventral view it has a relatively narrow ventral groove that widens apically and gradually narrows basally towards the basal opening, its apex is ogival in shape with apical denticle more or less developed (Figs. 8, 13, 15, 17). With these characters, the shape of the median lobe seems unique for species belonging to *L. anchusae* group. All species of the group are black in color with yellowish-brown appendages, and many are flightless with nearly fused elytra. Their heads are without supra-callinal sulci (which is common for *Longitarsus*), very weak to absent suprafrontal sulci and vertex with very few small punctures and covered with shallow transverse wrinkles (Figs. 3, 18).

Longitarsus anchusae is the most widespread species of the group known from most of Europe, Caucasus and Turkey (Biondi, 1996). It has been mentioned to occur in the vast region of Middle Asia [as defined by Korotyayev *et al.* (2017)], specifically in the southern and southeastern Kazakhstan on *Solenanthus turkestanicus* (Regel & Smirn.) Kusn. (Boraginaceae) (Lopatin, 1977, 2010).

Below we describe a new species from Turkmenistan that obviously belongs to *L. anchusae* species group based on the shape of the median lobe of aedeagus (Fig. 8).

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Received for publication: 26 May 2023

Accepted for publication: 8 September 2023

Online publication: 13 December 2023

MATERIAL AND METHODS

The source of the flea beetle diversity numbers is an unpublished World flea beetle genus and species compilation, which is a FileMakerPro database maintained by ASK since 2006. It is cited as follows: (Konstantinov unpublished compilation). Digital images of beetles were taken with Macropod Pro photomacrography system (Macroscopic Solutions, LLC, Tolland, CT, USA) and processed with Zerene Stacker, version 1.04 and edited with Adobe Photoshop Elements 2020. Dissecting techniques and morphological terminology follow Konstantinov (1998).

Specimens studied in this paper are deposited in the following collections:

BCET - Biodiversity Application and Research Center, Atatürk University (Erzurum, Turkey).

USNM - United States National Museum of Natural History, Washington DC, USA.

RESULTS

Longitarsus leonardicarloi, new species
(Figs. 1-11)

Diagnosis

Longitarsus leonardicarloi may be separated from all other members of *L. anchusae* group by the following three features: (1) elytral apex more or less truncate (Figs. 1, 5); (2) relatively short spermathecal duct with numerous

small coils (Fig. 9); (3) ventral groove of the median lobe, which is nearly as wide apically and basally in ventral view (Fig. 8).

Description

Body length 1.55-2.02 mm, width 0.80-1.00 mm. Color black without metallic reflection. Base of first antennomere and antennomeres 5-11 slightly darker. Metafemur black. Pro- and mesofemora dark brown, except lighter apex. Tibiae dark yellow, slightly darker in middle.

Head with vertex shagreened with few small widely spaced punctures. Antennal callus slightly convex. Surface of antennal callus moderately shiny, lacks any sculpture. Midfrontal and suprafrontal sulci absent. Frontal ridge high and convex in lateral view, moderately narrow, slightly wider in middle (Fig. 3). Second antennomere slightly longer than third, as long as fourth.

Pronotum nearly parallel sided, about as wide basally as apically. Lateral side nearly straight. Anterolateral callosity well developed, slightly lower anteriorly, forming acute angle (Fig. 2). Posterolateral callosity low and wide. Punctures poorly defined, shallow, small. Interspaces smooth, not shagreened. Scutellum widely rounded on top. Elytron without humeral callus, maximum width nearly in middle. Apex almost flat with denticle (Figs. 1, 4). Punctures larger than punctures on pronotum. Interspaces shallowly shagreened.

Male first protarsomere 2.5 times longer than wide, as wide as second and narrower than third protarsomere. Second protarsomere about 2.5 times shorter than



Figs. 1-4 – *Longitarsus leonardicarloi* new species, holotype. 1) dorsal habitus, 2) pronotum, 3) head, frontal view, 4) three quarter view with first pro- and mesotarsomeres visible. / *Longitarsus leonardicarloi* nuova specie, olotipo. 1) habitus dorsale, 2) pronoto, 3) capo, vista frontale, 4) vista di tre quarti con primi pro- e mesotarsomeri visibili.



Figs. 5-7 – *Longitarsus leonardicarloi* new species, paratypes. 5) lateral habitus, 6) lateral habitus with first protarsomere visible, 7) pronotum. / *Longitarsus leonardicarloi* nuova specie, paratipi. 5) habitus laterale, 6) habitus laterale con primo protarsomero visibile, 7) pronoto.

first (Fig. 4). Female second protarsomere about as long as first protarsomere (Fig. 6). Pro- and mesotibiae with apical spurs. Metatibia with seven denticles on lateral side.

Median lobe of aedeagus in middle narrower than apically and basally. Ventral groove narrower medially, basally as wide as apically in ventral view. In lateral view – slightly bent above basal opening, straight and curved apically toward apex. Apex curved dorsally and ventrally. Dorsal opening relatively short (Fig. 8).

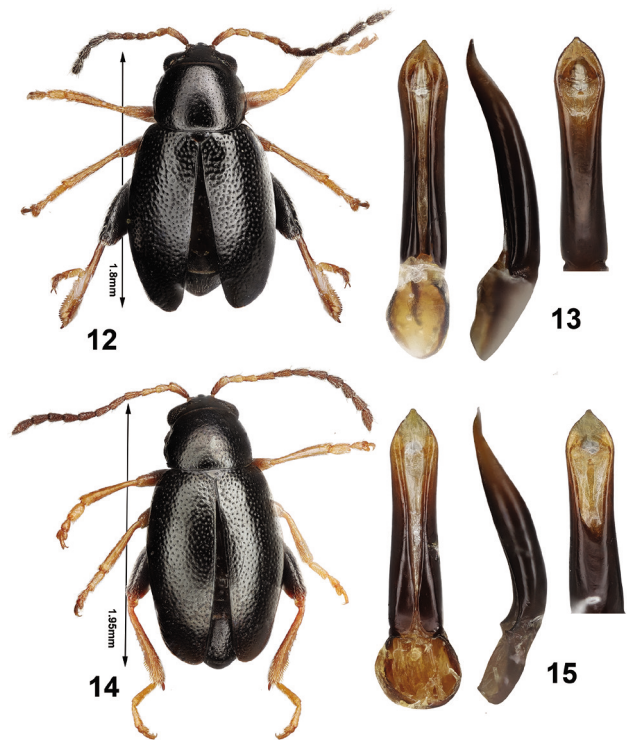
Spermatheca with receptacle nearly as long and wide as pump. Receptacle moderately convex on the outer side and strongly curved on the inner side. Pump wide basally, narrow and curved apically. Duct relatively short, with numerous small coils (Fig. 9). Vaginal palpi slender, slightly curved outward, apical sclerotization short, obtuse at apex (Fig. 10). Tignum slender, arrow-shaped posteriorly (Fig. 11).

Etymology

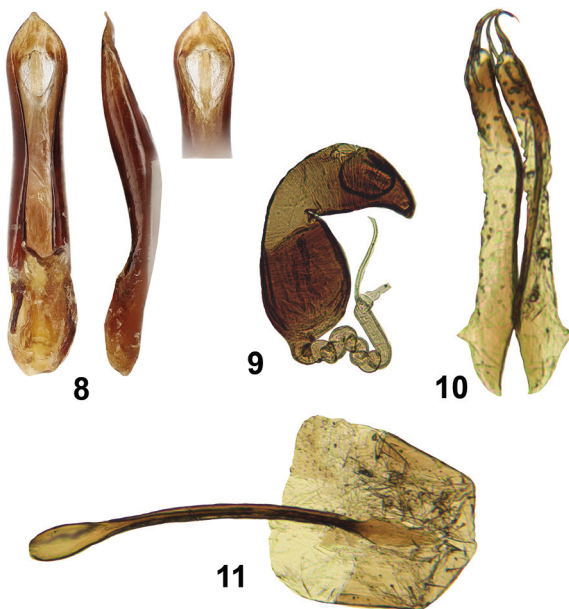
This species is named after Carlo Leonardi (Milano, Italy) on the occasion of his 80th birthday. Carlo's half a century contribution to leaf beetle systematics, taxonomy and biology generated meticulous research papers that established research and publication standards for scores of leaf beetle systematists worldwide.

Type material examined

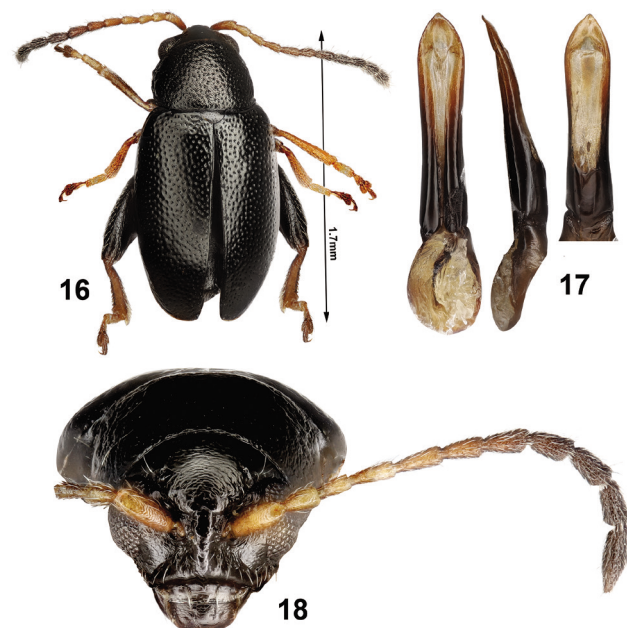
Holotype, male. 1) Turkmenistan: Kugitang range, nr. Karlyuk caves, 20.IV.1969, leg. I.K. Lopatin; 2) Holotype *Longitarsus leonardicarloi* sp. nov. des. A. Konstantinov & M. Dorr (USNM). Paratypes, with the same labels as the holotype (3 females USNM).



Figs. 12-15 – *Longitarsus* species. 12-13) *L. anatolicus* Weise (Turkey, USNM, BCET). 12) dorsal habitus, 13) median lobe of aedeagus, ventral, lateral and dorsal views. 14-15) *L. anchusae* Paykull (Germany, USNM). 14) dorsal habitus, 15) median lobe of aedeagus, ventral, lateral and dorsal views. / Specie di *Longitarsus*. 12-13) *L. anatolicus* Weise (Turchia, USNM, BCET). 12) habitus dorsale, 13) lobo mediano dell'edeago, viste ventrali, laterali e dorsali. 14-15) *L. anchusae* Paykull (Germania, USNM). 14) habitus dorsale, 15) lobo mediano dell'edeago, viste ventrali, laterali e dorsali.



Figs. 8-11 – *Longitarsus leonardicarloi* new species. 8) median lobe of aedeagus, ventral, lateral and dorsal views, 9) spermatheca, 10) vaginal palpi, 11) tignum and apical abdominal sternites. / *Longitarsus leonardicarloi* nuova specie. 8) lobo mediano dell'edeago, viste ventrali, laterali e dorsali, 9) spermatheca, 10) palpi vaginali, 11) tignum e sterniti addominali apicali.



Figs. 16-18 – *Longitarsus hittita* Biondi (Turkey, USNM, BCET). 16) dorsal habitus, 17) median lobe of aedeagus, ventral, lateral and dorsal views, 18) head, frontal view. / *Longitarsus hittita* Biondi (Turchia, USNM, BCET). 16) habitus dorsale, 17) lobo mediano dell'edeago, viste ventrali, laterali e dorsali, 18) capo, vista frontale.

Key to species of *L. anchusae* group

- 1 Median lobe of aedeagus and its ventral groove parallel sided in ventral view, apex strongly bent ventrally in lateral view *L. iconiensis* Weise
- Median lobe of aedeagus in middle narrower than basally in ventral view, apex straight, bent dorsally or slightly ventrally in lateral view (Figs. 8, 17) 2
- 2 Median lobe of aedeagus with straight sides narrowing from base to apex in ventral view, apex without denticle, slightly and evenly bent dorsally in lateral view *L. saulicus* Gruev & Döberl
- Median lobe of aedeagus with curved sides generally narrower in middle than apically and basally in ventral view, apex with denticle (Figs. 8, 13, 15, 17) 3
- 3 Pronotal punctures about as coarse as elytral punctures (Fig. 16). Median lobe of aedeagus nearly straight in lateral view (Fig. 17) *L. hittita* Biondi
- Pronotal punctures finer than elytral punctures (Figs. 1, 12, 14). Median lobe of aedeagus slightly curved in lateral view (Figs. 8, 13, 15) 4
- 4 Male first protarsomere wider than second and third protarsomeres separately (Fig. 14). Median lobe of aedeagus in lateral view bent basally above basal opening, straight apically, ventral groove with straight sides gradually merging towards base (Fig. 15) *L. anchusae* Paykull
- Male first protarsomere about as wide as second and narrower than third (Fig. 4). Median lobe of aedeagus bent basally above basal opening, curved or concave apically, ventral groove wider at apex, narrowing near middle and widening again before merging near base (Figs. 8, 13) 5
- 5 Elytral apex more or less truncate (Figs. 1, 4, 5). Median lobe of aedeagus with ventral groove nearly as wide apically and basally in ventral view, apex bent ventrally in lateral view (Fig. 8). Spermathecal duct with numerous small twists (Fig. 9) *L. leonardicarloi* new species
- Elytral apex more or less evenly curved (Fig. 12). Median lobe of aedeagus with ventral groove nearly wider apically than basally in ventral view, apex bent dorsally in lateral view (Fig. 13). Spermathecal duct straight *L. anatolicus* Weise

Acknowledgements

We thank Levent and Neslihan Gültekin (BCET) for access to collections in their care.

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