

New data on little-known flea beetles (Coleoptera: Chrysomelidae: Alticinae) in the fauna of Latvia

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There are faunistical, ecological and bibliographical information on 11 genera (*Hermaeophaga*, *Batophila*, *Lythraria*, *Ochrosis*, *Derocrepis*, *Hippuriphila*, *Epitrix*, *Mantura*, *Dibolia*, *Sphaeroderma* and *Argopus*) of Alticinae is summarized and presented in the article. A total 439 specimens of these genera were processed, representing 12 species. The bibliographical information on Latvian flea beetles are summarized for the first time. General information on the distribution and host plants of species are given. Two species, namely *Batophila fallax* Weise, 1888 and *Dibolia timida* (Illiger, 1807), are herewith excluded from the list of the leaf-beetles of Latvia.

Key words: Coleoptera, Chrysomelidae, Alticinae, fauna, bibliography, Latvia.

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INTRODUCTION

There are 1388 species and subspecies of subfamily Alticinae Newman, 1834 known from the Palaearctic region (Gruev, Döberl 2005). Of them, 262 species and 24 genera are reported for eastern Europe (Bieńkowski 2004). Silfverberg (2004) in his catalogue “Enumeratio nova Coleopterorum Fennoscandiae, Daniae et Baltiae” gives 166 species of 22 genera of flea beetles for Fennoscandian and Baltic fauna.

The Latvian leaf-beetle fauna of the subfamily Alticinae contains 132 species of 19 genera (Telnov 2004; Telnov *et al.* 2006; Bukejs 2008a, 2008b, 2008c, 2008d, 2008e, 2009a, 2009b, 2009c). In adjacent territories, the number of recorded species of flea beetles slightly varies: in Belarus – 126 species of 19 genera (Lopatin, Nesterova 2005), in Estonia – 94 species of 17 genera, in Lithuania – 105 species of 18 genera (Silfverberg

2004), St.-Petersburg and the Leningrad region of western Russian – 77 species of 17 genera (Romantsov 2007).

The first information on species of the subfamily Alticinae Newman, 1834 in Latvia was published at end of the 18th century (Fischer 1784, 1791). Subsequently, more than 30 works have been published in Latvia with information on Alticinae. Some of these publications are specially devoted to study of current group (Palij 1958; Pūtele 1958, 1960, 1965, 1968a, 1970, 1970c, 1971a; Bukejs 2008a, 2008b, 2008c, 2008d, 2009a, 2009b, 2009c; and others). In 1993, Barševskis published his monograph “The Beetles of Eastern Latvia,” contains data on 61 flea-beetles species of 15 genera. Also some faunal information on the flea beetle are to be found in publications of Šmits (1962), Pūtele (1974, 1981, 1981a, 1984), Petrova *et al.* (2000), Telnov (1997, 2002), Petrova *et al.* (2006) and Bukejs & Telnov (2007).

Adults flea beetles feed mostly on leaves of their host plants, they are phytophagous. Imago of *Minota*, *Mniophila* and some other genera occur in moss or litter and possible feed on detritus (e.g. saprophagous species) (Medvedev 1997). These two genera are not yet presented in Latvian fauna. Flea-beetles larvae develop inside leaf mines (*Mantura*, *Phyllotreta nemorum*, *Sphaeroderma*, *Argopus*, *Dibolia*), stems (*Neocrepidodera*, some *Phyllotreta*, *Longitarsus*, some *Chaetocnema* and *Psylliodes*), internodes (*Hippuriphila*) or the leaf axils (some *Aphthona*), on roots and rhizomes in the soil (*Epitrix*, *Hermaphysa*, *Batophila*, *Phyllotreta*, some *Aphthona*, *Longitarsus melanocephalus*, *Chaetocnema*, *Psylliodes*) (Bieńkowski 2004). Most of the species pupate in soil.

Some flea beetles species are among well-known pests of cultivated plants (Kryzhanovskij 1974). In Latvia, *Phyllotreta vittula* (Redtenbacher, 1849) and *Chaetocnema hortensis* (Geoffroy, 1785) are reported as a pest of cereal crops; *Phyllotreta nemorum* (Linnaeus, 1758), *Ph. undulata* Kutschera, 1860, *Ph. striolata* (Fabricius, 1803) and *Ph. atra* (Fabricius, 1775) – as pests of cultivated Cruciferae; *Longitarsus parvulus* (Paykull, 1799) and *Aphthona euphorbiae* (Schrank, 1781) – as pest of flax (*Linum*); *Phyllotreta armoraciae* (Koch, 1803) – as a pest of horseradish (*Armoracia rusticana*); and *Chaetocnema concinna* (Marsham, 1802) – as the pest of beet, buckwheat, sorrel and strawberry (Smarods & Liepa 1956; Palij 1958; Pūtele 1960, 1970a, 1970c, 1975, 1982, 1984; Ozols 1963).

The aim of current work is to summarise information on 11 genera of Alticinae (*Hermaphysa*, *Batophila*, *Lythraria*, *Ochrosis*, *Derocrepis*, *Hippuriphila*, *Epitrix*, *Mantura*, *Dibolia*, *Sphaeroderma* and *Argopus*) in Latvia. Faunal data on 12 species of 10 genera are presented. Two species, *Batophila fallax* Weise, 1888 and *Dibolia timida* (Illiger, 1807) are herewith excluded from a list of Latvian Chrysomelidae.

MATERIAL AND METHODS

A total 439 specimens of flea beetles were processed during the current investigation, representing 12 species of 10 genera. Examined material is stored in the collection of Daugavpils University Institute of Systematic Biology (DUBC, Daugavpils, Latvia), the entomological collection of the Latvian University Institute of Biology (Salaspils, Latvia), and collection of V. Pūtele (Institute of Biology, Salaspils, Latvia).

The following identification keys have been used for determination of specimens: Bieńkowski 2004; Lopatin and Nesterova 2005; Mohr 1966; Warchałowski 2003. We follow the systematics suggested by Silfverberg (2004). The Catalogue of Palaearctic Flea Beetles (Gruev, Döberl 1997) was used for the nomenclature and synonymy.

Host plants are listed citing the monograph of Lopatin & Nesterova (2005) and are not confirmed by local Latvian observations. The general distribution of species is given according to Gruev & Döberl (1997), Warchałowski (2003), Bieńkowski (2004), Lopatin (1977, 1986), Lopatin & Kulenova (1986), Lopatin & Nesterova (2005), Medvedev (1992), Medvedev & Dubeshko (1992).

Classification of chorotypes is made as suggested by Taglianti *et al.* (1999). The transcript of chorotypes codes: HOR – Holarctic-Oriental, PAL – Palaearctic, ASE – Asiatic-European, SIE – Sibero-European, CAE – Centralasiatic-European, TEM – Turano-European-Mediterranean, TUE – Turano-European, EUM – Europeo-Mediterranean, EUR – European, CEU – Centraleuropean.

The following information is given for each species: Latin name, bibliographical source for Latvia, additional faunal data (locality, collecting date, number of collected specimens (in brackets), information on the habitat and collector's name), host plants, general distribution and the code of the chorotype.

Two species are marked with a dash (-) in the list. These species have been recorded for Latvian fauna, but they seem to not appear in the Baltic region, and it is doubtful whether they ever occurred in Latvia. These species are herewith excluded from the list of Latvian Coleoptera.

Explanations of the abbreviations used: d. – administrative district (system of administrative districts used in Latvia from 1991 to 2008), env. – environs, Isl. – Island, vill. – village, PNT – protected nature territory, C – Central, S – South, N – North, E – East, W – West.

The photographs were taken using *Zeiss Stereo Discovery V12* stereomicroscope and *AxioCam* digital camera.

RESULTS AND DISCUSSION

Latvian fauna consists of 132 species and 19 genera of the flea beetles, or approximately 11% of all Palaearctic Alticinae species. In Latvia, the genus *Longitarsus* Latreille, 1827 is most diverse by number of registered species (41 species). Other genera are presented by smaller number of species (Tab. 1): *Phyllotreta* – 13 species, *Aphthona* – 10, *Altica* – 15, *Hermaeophaga* – 1, *Batophila* – 1, *Lythriaria* Bedel, 1897 – 1, *Ochrosis* – 1, *Neocrepidodera* – 5, *Derocrepis* – 1, *Hippuriphila* – 1, *Crepidodera* – 5, *Epitrix* – 1, *Mantura* – 3, *Chaetocnema* – 13, *Dibolia* – 4, *Sphaeroderma* – 2, *Argopus* – 2, *Psylliodes* – 12.

ANNOTATED LIST OF SPECIES

HERMAEOPHAGA FOUDRAS, 1860

Four species of genus *Hermaeophaga* are known in the Palaearctic. Larvae develop on roots of *Mercurialis* (Bieńkowski 2004). In Latvia, single species is recorded.

***H. mercurialis* (Fabricius, 1792)**

References: Bukejs 2008b.

Examined material: 6 specimens: Daugavpils d.: Naujene, 27.IV.2007 (6, Jezufova park, leg. K.Aksjuta, M.Murd).

Host plants: *Mercurialis perennis*. Monophagous species.

General distribution: Europe, Asia Minor, Caucasus. [EUR]

Note: Very rare and insufficiently known species in Latvia, known from single locality in SE Latvia.

BATOPHILA FOUDRAS, 1860

12 species of the genus *Batophila* are known in the Palaearctic. Larvae develop on roots of host plants (Bieńkowski 2004). In Latvia, single sylvicol species is known.

***B. rubi* (Paykull, 1799)**

References: Seidlitz 1872-1875, 1887-1891; Heyden 1903; Rathlef 1905; Trauberga 1957; Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c, 1974, 1980, 1981, 1981a, 1982, 1984; Barševskis et al. 1992; Barševskis 1993, 2002; Telnov et al. 1997; Petrova et al. 2000, 2006; Telnov 2004; Bukejs, Telnov 2007.

Examined material: 162 specimens: Aizkraukle d.: Nereta, 15.IV.2008 (1, leg. A.Barševskis); Balvi d.: Kuprava, 19.V.1992 (1, leg. A.Barševskis); Cēsis d.: Rauguļi, 57°21'79"N 25°22'44"E, 21.VIII.2006 (1, leg. A.Barševskis); Taurkalnes parish, Brežģa kalns (hill), 03.VII.2006 (2, leg. A.Barševskis, U.Valainis, A.Pankjāns); Daugavpils d.: Butišķi, 26.V.2008 (2, valley of the Daugava river, leg. A.Bukejs); Daugavpils, Viduspoguļanka, Lake Plotišķu N side, 55°54'943"N 26°29'789"E, 21.IV.2008 (3, pine forest, leg. U.Valainis); 4 km NE Gveitinišķi, 55°54'51"N 26°53'47"E, 23.V.2008 (2, leg. U.Valainis); Ilgas, Silene Nature Park, 02.IX.1993 (1, leg. A.Barševskis), VI.1994 (1, leg. A.Barševskis), 07.V-06.VI.2001 (1, leg. G.Lociks), VII.2003 (1, clearing, leg. A.Barševskis), 18.V.2005 (3, leg. A.Barševskis); Naujene, 27.IV.2007 (9, Jezufova park, leg. K.Aksjuta, M.Murd), 23.V.2008 (2, leg. A.Pankjāns); Šedere, 11.V.2008 (1, leg. K.Aksjuta); Stropi, 25.V.2007 (10, old clearing, leg. A.Bukejs), 20.IV.2008 (47, edge of mixed forest and old clearing, leg. A.Bukejs); Svente, near Lake Svente, 11.V.2008 (1, roadside, leg. A.Barševskis); Vasarģelšķi, 55°54'55"N 26°48'50"E, 29.IV.2008 (11, Bondaru gļen, leg. A.Pankjāns, U.Valainis); Vecstropi, 25.V.2007 (5, burnt area in coniferous forest, leg. A.Bukejs); Jēkabpils d.: Dunava,

Table 1. The number of known Alticinae species in the Latvian fauna separated by genera

Genus	Number of species	Bibliographical sources
<i>Phyllotreta</i> Chevrolat, 1836	13	Bukejs 2008d
<i>Aphthona</i> Chevrolat, 1836	10	Bukejs 2009b
<i>Longitarsus</i> Latreille, 1827	41	Pūtele 1965; Telnov 2004
<i>Altica</i> Geoffroy, 1762	15	Pūtele 1971b; Telnov 2004; Telnov <i>et al.</i> 2006
<i>Hermaeophaga</i> Foudras, 1860	1	Bukejs 2008b
<i>Batophila</i> Foudras, 1860	1	Telnov 2004; Bukejs 2008e
<i>Lythraria</i> Bedel, 1897	1	Telnov 2004
<i>Ochrosis</i> Foudras, 1859	1	Pūtele 1968a; Telnov 2004
<i>Neocrepidodera</i> Heikertinger, 1911	5	Bukejs 2009a
<i>Derocrepis</i> Weise, 1886	1	Telnov 2004
<i>Hippuriphila</i> Foudras, 1859	1	Telnov 2004
<i>Crepidodera</i> Chevrolat, 1836	5	Bukejs 2009a
<i>Epitrix</i> Foudras, 1860	1	Telnov 2004
<i>Mantura</i> Stephens, 1831	3	Telnov 2004
<i>Chaetocnema</i> Stephens, 1831	13	Bukejs 2008c
<i>Dibolia</i> Latreille, 1829	4	Telnov 2004; Bukejs 2008e
<i>Sphaeroderma</i> Stephens, 1831	2	Telnov 2004
<i>Argopus</i> Fischer, 1824	2	Bukejs 2008a
<i>Psylliodes</i> Latreille, 1827	12	Bukejs 2009c
Total	132	

16.VIII.1997 (1, leg. A.Barševskis), 25.IV.1998 (1, leg. A.Barševskis), IV.2002 (1, leg. A.Barševskis), 18.V.2005 (2, leg. A.Barševskis), VII.2005 (1, clearing, leg. A.Barševskis), 13.V.2007 (1, leg. K.Barševska, A.Barševskis); Mežāre, 04.IX.2009 (14, leg. M.Balalaikins); Krāslava d.: Skerškānu loks (precipice), 55°52'44"N 27°05'35"E, Daugavas Loki Nature Park, 28.IV.2009 (1, leg. M.Nitcis, A.Anishtchenko, U.Valainis); Šķeltova, 28.VIII.1989 (1, leg. A.Barševskis); Madona d.: Aiviekste vill., 56°40'73"N 25°59'04"E, 22.VIII.2006 (5, leg. A.Barševskis); Ogre d.: 4 km NW the Dīrikupīte River connection with the Daugava River, 03.V.2006 (12, leg. A.Barševskis, U.Valainis, E.Rudāns); Preiļi d.: Jersika, 05.V.2005 (1, leg. I.Gurčonoks), 10.V.2009 (2, leg. A.Barševskis, K.Barševska), 22-24.VI.2009 (1, leg. A.Barševskis); Talsi d.: Kaļķi, 57°32'31"N 22°30'45"E, 12.V.2009 (3, leg. A.Barševskis); Puiškalnciems, 02.VI.2009 (4, leg. A.Barševskis), 06.VI.2009 (1, leg. N.Savenkovs); Slītere, 10.VI.1987 (1, leg. V.Pūtele); Valmiera d.: Kauguru parish, 03.VII.2006 (1, forest near the Gauja River, leg. A.Barševskis, U.Valainis, A.Pankjāns);

Ventspils d.: Moricsala Isl., Moricsala Nature Reserve, 05.IV.2002 (1, leg. U.Valainis), 26.VI.2004 (2, leg. A.Barševskis), 15.VII.2008 (1, leg. V.Aleksejev, A.Pavlova).

Host plants: Rosaceae (*Rubus*, *Fragaria*).

General distribution: Europe, Caucasus. [EUR]

(-) *B. fallax* Weise, 1888

References: Barševskis 1993 (misidentification), 2002; Telnov *et al.* 1997; Telnov 2004.

Examined material: Earlier report of this species in Latvia "Daugavpils d., Silene Nature Park, Ilgas, 06.VI.1992 (3 exx)" (Barševskis 1993) was based on misidentification.

Host plants: *Fragaria*, *Rubus*, *Cornus*, *Symphytum*.

General distribution: Europe (S-E Poland, Slovakia, Hungary, Rumania, S Ukraine), Asia Minor, Caucasus (Georgia, Russian Caucasus (Daghestan), Azerbaijan). [TUE]

Note: Faunal data on this species in Latvia is absent. Its occurrence in Latvian fauna is doubtful. The species is herewith deleted from list of Latvian Coleoptera.

LYTHRARIA BEDEL, 1897

Lythrarina is monotypical genus. A single asiatic-european species is known in the Palaearctic region, and also in Latvia.

***L. salicariae* (Paykull, 1800)**

References: Müthel 1886 (*Altica salicaria* Payk.); Seidlitz 1887-1891 (*Ochrosis salicariae* Pk.); Rathlef 1905 (*Ochrosis salicariae* Payk.); Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c, 1974, 1980, 1981, 1981a; Telnov *et al.* 1997; Telnov 2004; Bukejs, Telnov 2007; Spuņģis 2008.

Examined material: 77 specimens: Balvi d.: Šķilbēņu parish, 3.5 km SW Rekova, Plešava vill., 28.VII.1992 (1, leg. A.Barševskis); Daugavpils d.: Butiški, 09.IX.2007 (8, bank of the Daugava River, leg. A.Bukejs, M.Balalaikins), 01.VII.2009 (3, valley of the Daugava River, leg. A.Bukejs, M.Balalaikins); Daugavpils, near Cietoksnis, 25.VI.2009 (1, bank of the Daugava River, leg. A.Bukejs); Ilgas, Silene Nature Park, 18.VI.1997 (1, leg. A.Barševskis), 20.VIII.2002 (1, leg. A.Barševskis), 18.VI.2008 (1, leg. R.Cibuļskis); Kurcums, near Lake Kurcums, 06.VI.2008 (1, leg. A.Barševskis); Krauja, 28.VII.2006 (1, leg. A.Bukejs), 04.VIII.2007 (6, old clearing, leg. A.Bukejs); Stropi, 25.V.2007 (1, old clearing, leg. A.Bukejs), 20.IV.2008 (1, clearing, leg. A.Bukejs); Svente, near Lake Svente, 11.V.2008 (1, roadside, leg. A.Barševskis); Vabole, 12.III.1994 (2, leg. R.Cibuļskis), 14.VII.1996 (1, leg. R.Cibuļskis), 03.VIII.1996 (1, leg. R.Cibuļskis); Jēkabpils d.: Dunava, 20.VIII.2000 (1, leg. I.Leiskina), 18.V.2008 (1, Dvietes forest, leg. A.Barševskis); Krāslava d.: Sauleskalns (hill), 4.5 km NE Kombuļi, 04.V.2008 (1, leg. K.Barševska, A.Barševskis); Šķeltova, 31.VII.1995 (2, leg. A.Barševskis); 2.3 km SW Tartaks, Misjūni, 55°52'813"N 26°56'278"E, 09.V.2008 (1, valley of the Daugava River, meadow, leg. R.Cibuļskis); Ludza d.: Rundēni, 10.V.2008 (1, edge of mixed forest, leg. A.Bukejs); Madona d.: Ošupe env., 2.5 km NE Lake Lubāns, 56°50'03"N 26°56'05"E, 06.VII.2008 (1, wet meadow and bank of the Aiviekste River, leg. M.Balalaikins, A.Bukejs); Preiļi d.: Jersika, Kurpnieki house, 29.V.2007 (1, leg. K.Barševska, A.Barševskis) 23-24.VI.2009 (1, leg. K.Barševska), 30.V.2009 (2, leg. K.Barševska); Talsi d.: Slītere National Park, Zilie Kalni (hills) and Dāvida Pļavas

(meadows), 10.VII.2004 (1, leg. R.Cibuļskis), 02.VII.2009 (1, leg. A.Barševskis); Ventspils d.: Moricsala Isl., Moricsala Nature Reserve, 29.VI.2002 (1, leg. U.Valainis), V.2003 (4, leg. U.Valainis), 25.VI.2004 (1, leg. A.Barševskis, U.Valainis), 26.VI.2004 (1, leg. A.Barševskis), 30.V.2006 (1, leg. E.Rudāns); 15.VII.2008 (2, leg. V.Aleksejev), 15.VII.2008 (2, leg. A.Barševskis), 15.VII.2008 (19, leg. A.Bukejs), 02.VI.2009 (1, leg. N.Savenkovs).

Host plants: *Lythrum*, *Lysimachia*.

General distribution: Europe, Caucasus, Iraq, Siberia, W Kazakhstan, Mongolia, Japan, Korean Peninsula. [ASE]

OCHROSIS FOUDRAS, 1859

One species of this genus is known in the Palaearctic and Latvia.

***O. ventralis* (Illiger, 1807)**

References: Pūtele 1968a, 1970, 1970c, 1971a, 1971c; Telnov *et al.* 1997; Telnov 2004.

Examined material: Not confirmed by the author.

Host plants: *Solanum*, *Anagallis*, *Pistacia*.

General distribution: Europe (northwards to the Netherlands, Poland and S Belarus), Asia Minor, Caucasus, N Africa. [EUM]

Note: In Fennoscandia and Baltic states, this species is only known from Latvia (Silfverberg 2004). First time mentioned by Pūtele (1968a). It is known from single locality in Broceni, Saldus district (SW Latvia). Possibly, this record is based on misidentification. Presence of this species in Latvia is doubtful and needs confirmation.

DEROCREPIS WEISE, 1886

Holarctic genus. Six species are known in the Palaearctic, but only single one - in Latvia. Adults occur on leaves of leguminous plants (Bieńkowski 2004).

***D. rufipes* (Linnaeus, 1758)**

= *ruficornis* Fabricius, 1775

References: Fleischer 1829 (*Altica ruficornis* F.); Seidlitz 1872-1875, 1887-1891; Rathlef 1905; Lindberg 1932; Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c; Barševskis 1993, 2002; Telnov *et al.* 1997; Telnov 2004.

Examined material: 39 specimens: Daugavpils d.: Ilgas, Silene Nature Park, 25.V.1997 (3, leg. A.Barševskis), 14-20.VI.2002 (1, leg. A.Barševskis), 06-15.VI.2004 (1, leg. A.Barševskis), 10.V.2006 (14, leg. A.Barševskis); Kalkūni, 03.VI.1997 (1, leg. I.Leiskina); Naujene, 17.VI.1989 (1, leg. A.Barševskis); Pilskalne, 29.V.1993 (3, leg. A.Barševskis); Tabore, VI.1993 (14, valley of the Daugava River, leg. A.Barševskis); Talsi d.: Slītere, 06.VII.1972 (1, leg. V.Pūtele).

Host plants: Fabaceae (*Vicia cracca*, *Lathyrus vernus*). The species has been collected also from *Melilotus albus* (Pūtele 1971a).

General distribution: Europe, Asia Minor, Caucasus, Siberia. [SIE]

HIPPURIPHILA FODRAS, 1859

This genus is presented by single holarctic species. Larvae develop within internodes of horsetails (Bieńkowski 2004). Monophagous species well connected with wet habitats.

***H. modeeri* (Linnaeus, 1761)**

References: Precht 1818 (*Chrysomela modeeri*); Seidlitz 1872-1875, 1887-1891; Rathlef 1905; Lindberg 1932; Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c, 1974, 1980, 1981, 1981a; Priedītis, Pūtele 1976; Barševskis 1993, 2002; Telnov *et al.* 1997; Telnov 2004.

Examined material: 38 specimens: Aizkraukle d.: 6 km N Aizkraukle, Aizkraukles purvs (bog) PNT, 01.VII.2008 (1, edge of moist deciduous forest, leg. A.Bukejs); Daugavpils d.: Daugavpils, Mežciems, 19.VII.2007 (1, bank of the Daugava River, leg. K.Aksjuta, M.Murd.); Ilgas, Silene Nature Park, VI.1994 (1, leg. A.Barševskis), 13.VI.1994 (1, leg. A.Barševskis), 09.V.1996 (1, leg. A.Barševskis), 25-30.VI.1998 (3, meadow near Lake Sitas, leg. A.Barševskis); Jēkabpils d.: Dunava, 23.VI.1993. (1, leg. A.Barševskis), 03.VIII.1997. (1, leg. A.Barševskis); Rubenes parish, Rubēni, 23.IV.1999. (1, leg. I.Leiskina); Krāslava d.: Šķeltova, 22.VIII.1992 (1, leg. A.Barševskis), 28.VIII.1992 (1, leg. A.Barševskis), 02.V.1993 (2, leg. A.Barševskis), 09.V.1993 (3, leg. A.Barševskis), 15.VII.1994 (1, leg. A.Barševskis), 14.VIII.2006 (2, leg. A.Barševskis), 11.VIII.2009 (2, leg. A.Barševskis); Preiļi d.: Jersika, Kurpnieki

house, 04.V.2006 (4, leg. K.Barševska); Talsi d.: Mazirbe, 04.IX.2004 (5, leg. A.Barševskis); Slītere National Park, Zilie Kalni (hills) and Davida Pļavas (meadows) 05.IX.2002 (1, leg. A.Barševskis); Sabīle, 04.VIII.1998 (1, meadow, leg. A.Barševskis); Valka d.: Seda, 03.VII.2006 (1, Seda bog, leg. A.Barševskis, U.Valainis, A.Pankjāns); Ventspils d.: Puze, 13.VI.1974 (2, meadow, leg. V.Melecis); Ziras, 57°11'55"N 21°37'39"E, 28.VII.2005 (2, bank of the River Venta, leg. A.Barševskis, A.Bukejs, U.Valainis).

Host plants: *Equisetum arvense* L. Monophagous species.

General distribution: W, C and N Europe, Asia Minor, Caucasus, Siberia, Mongolia, Russian Far East (Kamchatka), N America (Alaska, Canada); also reported from Spain and Turkey. [OLA]

EPITRIX FODRAS, 1860

This genus is presented approximately by 90 species, which occur mainly on the American continent and are pests of tobacco. In the Palaearctic, 15 species are known, in Latvia - single species. Imago feed on leaves, larvae develop on roots of different Solanaceae (Bieńkowski 2004).

***E. pubescens* (Koch, 1803)**

References: Müthel 1886 (*Altica pubescens* E.H.); Seidlitz 1887-1891; Rathlef 1905; Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c, 1974, 1980, 1981, 1981a; Priedītis, Pūtele 1976; Barševskis 1993, 2002; Telnov *et al.* 1997; Telnov 2004; Bukejs, Telnov 2007.

Examined material: 18 specimens: Daugavpils d.: Kurcums, near Lake Kurcums, 06.VI.2008 (1, leg. A.Barševskis); Stropi, 27.IV.2008 (1, bank of Lake Lielais Stropu, leg. A.Bukejs), 14.V.2009 (2, moist forest, leg. A.Bukejs); Jelgava d.: Vecsvirlauka, 24.V.1972 (1, leg. V.Pūtele); Krāslava d.: Šķeltova, 11.VIII.2009 (6, leg. A.Barševskis); Preiļi d.: Jersika, Kurpnieki house, 23-24.VI.2008 (4, leg. A.Barševskis); Talsi d.: Ances purvi un meži (bog and forest) PNT, 27.VI.2006 (1, U.Valainis leg.); Slītere, 27.VII.1973 (1, leg. V.Pūtele); Ventspils d.: Moricsala Isl., Moricsala Nature Reserve, 29.VI.2002 (1, leg. U.Valainis).

Host plants: Solanaceae (*Solanum*, *Lycium*, *Hyoscyamus*, *Atropa*, *Datura*).

General distribution: Azores, Europe (except the North), Asia Minor, Iran, Caucasus, Kazakhstan, Central Asia (Kyrgyzstan), W Siberia; N America. [OLA]

Note: Insufficiently known species. Probably, should be more widely distributed in suitable habitats (banks of lakes and rivers, wet meadows, forest glens and other) in whole of Latvia.

MANTURA STEPHENS, 1831

17 species of this genus are known in the Palaearctic. In Latvia, 3 species are recorded. Larvae develop inside leaf mines, probably, also on roots in the soil (Bieńkowski 2004).

***M. chrysanthemi* (Koch, 1803)**

References: Fleischer 1829 (*Altica chrysanthemi* Sch.); Lindberg 1932; Palij 1958; Tomsons 1940; Pūtele 1970, 1970c, 1971a, 1971c, 1974, 1980, 1981, 1981a; Barševskis 1993, 2002; Telnov *et al.* 1997; Telnov 2004.

Examined material: 14 specimens: Daugavpils d.: Līksna parish, 4 km N Daugavpils, 29.VI.2009 (13, inland dunes, edge of pine forest, leg. A.Bukejs); Ventspils d.: Blāzma, 57°21'12"N 22°04'47"E, 22.VIII.2008 (1, clearing, leg. A.Barševskis, U.Valainis).

Host plants: *Rumex*, *Leucanthemum vulgare*, *Chrysanthemum*. In Latvia it meets mostly on *Rumex acetosella*, rarely on *R. acetosa* (Pūtele 1971a).

General distribution: Europe, NW Africa, Asia Minor. [EUM]

Note: Rare and insufficiently known species with only few known localities.

***M. obtusata* (Gyllenhal, 1813)**

References: Seidlitz 1872-1875, 1887-1891; Rathlef 1905; Brammanis 1930; Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c, 1974, 1980, 1981a; Telnov *et al.* 1997; Telnov 2004.

Examined material: 1 specimen: Daugavpils d.: Ilgas, Silene Nature Park, 18.V.2005 (1, leg. A.Barševskis).

Host plants: *Rumex*. In Latvia it develop mostly on *Rumex acetosella* and *R. acetosa* (Pūtele 1971a).

General distribution: Europe, Caucasus. [EUR]

Note: Rare and insufficiently known species with only a few known localities.

***M. rustica* (Linnaeus, 1767)**

= *semiaenea* (Fabricius, 1792)

References: Fleischer 1829 (*Altica semiaenea* F.); Seidlitz 1872-1875, 1887-1891; Rathlef 1905; Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c, 1974, 1980, 1981, 1981a; Priedītis, Pūtele 1976; Telnov *et al.* 1997; Telnov 2004.

Examined material: 1 specimen: Daugavpils d.: Vabole, 12.V.1994 (1, leg. R.Cibuļskis).

Host plants: Polygonaceae (*Polygonum*, *Rumex*, *Rheum*).

General distribution: Europe, Asia Minor, Caucasus, Siberia, Kazakhstan, Central Asia (Kyrgyzia, Tadjikistan), Mongolia, Russian Far East, China, Japan. [ASE]

Note: Rare and insufficiently known species with only few known localities.

DIBOLIA LATREILLE, 1829

40 species of this genus are known in the Palaearctic. In Latvia, 4 species are recorded. Larvae mine leaves and pupate in soil (Bieńkowski 2004).

***D. depressiuscula* Letzner, 1846**

References: Palij 1958; Pūtele 1958, 1968a, 1970, 1970c, 1971a, 1971c; Šmits 1962; Telnov *et al.* 1997; Telnov 2004.

Examined material: 2 specimens: Aizkraukle d.: Rīteri, 21.V.1991 (1, leg. A.Barševskis); Jēkabpils d.: Rubenes parish, Rubeņi, 21.IV.2000 (1, leg. I.Leiskina).

Host plants: Labiatae (mostly on *Ballota nigra* L.). This species has also been collected from *Acinos thymoides* and *Galeopsis speciosa* (Pūtele 1971a).

General distribution: Europe, Caucasus, Near East, Asia Minor, south part of W Siberia, Altai, Kazakhstan, Mongolia. [CAE]

Note: Rare and insufficiently known species with only a few known localities.

***D. occultans* (Koch, 1803)**

References: Seidlitz 1872-1875, 1887-1891; Rathlef 1905; Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c; Telnov *et al.* 1997; Telnov 2004.

Examined material: Not confirmed by the author.

Host plants: *Mentha*.

General distribution: Europe (except the British Isles; in the North reaching S Sweden and Estonia), N Africa (Canary Islands, Morocco, Algeria), Caucasus, Asia Minor, Iran. [TEM]

Note: In Latvia this species was not recorded more than 120 years. Record needs confirmation.

(-) *D. timida* (Illiger, 1807)

References: Barševskis 1993 (misidentifications), 2002; Telnov *et al.* 1997; Telnov 2004.

Examined material: Earlier record of this species, “Aizkraukle d., Rīteri, 21.V.1991 (1 ex., xeric meadow)” (Barševskis 1993), was based on misidentification.

Host plants: *Eryngium*.

General distribution: C and S Europe (in the North reaching the Netherlands, Germany and Poland), N Africa (Morocco, Algeria, Tunisia), Caucasus. [EUM]

Note: Faunal data on this species in Latvia is absent. Its occurrence in Latvian fauna is doubtful. The species is herewith deleted from list of Latvian Coleoptera. This species is herewith deleted from the list of Latvian Coleoptera.

***D. cryptocephala* (Koch, 1803)**

References: Barševskis 1993, 2002; Telnov *et al.* 1997; Telnov 2004.

Examined material: Not confirmed by the author.

Host plants: *Eryngium*, *Salvia*, *Mentha*.

General distribution: S and C Europe, Caucasus, south part of W Siberia, Kazakhstan. [TUE]

Note: rare species in Latvia, registered from two localities in SE part of the country (Daugavpils district). Record needs confirmation.

***D. cynoglossi* (Koch, 1803)**

References: Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c; Telnov *et al.* 1997; Telnov 2004.

Examined material: Not confirmed by the author.

Host plants: *Galeopsis*, *Stachys*, *Marrubium*, *Ballota*, *Cynoglossum*.

General distribution: Europe (excepting N). [CEU]

Note: Very rare species, known from a single locality in SW Latvia (Palij 1958). Record needs confirmation.

***SPHAERODERMA* STEPHENS, 1831**

34 species of this genus are known in the Palaearctic. In Latvia, 2 species are recorded. Larvae develop inside leaf mines, pupate in soil (Bieńkowski 2004).

***S. testaceum* (Fabricius, 1775)**

References: Seidlitz 1872-1875, 1887-1891; Rathlef 1905; Palij 1958; Pūtele 1970, 1970c, 1971a, 1971c; Telnov *et al.* 1997; Telnov 2004.

Examined material: 80 specimens: Aizkraukle d.: 6 km N Aizkraukle, Aizkraukles purvs (bog) PNT, 06.VIII.2008 (18, edge of moist deciduous forest, on *Cirsium oleraceum*, leg. A.Bukejs, M.Balalaikins); Ērberģe, 06.VIII.2009 (2, leg. A.Barševskis); Balvi d.: Kuprava, 19.V.1991 (1, leg. A.Barševskis); Šķilbēņu parish, 4 km SE Rekova, Upīte vill., 28.VII.1992 (1, leg. A.Barševskis); Daugavpils d.: Daugavpils, 19.VII.2007 (1, Mežciems, leg. K.Aksjuta, M.Murd), 08.VIII.2007 (1, bank of the Daugava River, leg. K.Aksjuta, M.Murd); Krauja, 04.VIII.2007 (2, old clearing, leg. A.Bukejs); Lociki, 20.VIII.2001 (1, leg. G.Lociks); Šēdere, Straumēni house, 22.VII.2007 (2, leg. M.Murd); Viški, 11.VI.1991 (1, leg. A.Barševskis); Dobele d.: Jaunbērze, Mežnieki house, 12.VIII.2008 (1, leg. A.Barševskis); Jēkabpils d.: Dignāja, 12.VII.2009 (1, leg. M.Balalaikins); Dunava, 11-17.VII.2007 (1, leg. K.Barševska), 25-30.VI.2008 (2, K.Barševska leg.); Rubenes parish, Rubeņi, 31.VII.1998 (1, leg. I.Leiskina), 04.VII.1999 (1, leg. I.Leiskina), 16.VII.2000 (1, leg. I.Leiskina); Vandāni, 16.VIII.2008 (2, bank of the Daugava River, M.Balalaikins leg.); Jelgava d.: Jelgava, 05.VIII.1977 (1, aerodrome, leg. V.Pūtele); Jūrmala: Kūdra, 30.VI.2008 (1, leg. A.Titovs); Krāslava d.: Izvalta, 02.VIII.1993 (1, bank of river, leg. A.Barševskis); 3.6 km NE Skaista, Grundāni houses, Lake Dridzis Nature Park, 15.VIII.2008 (1, leg. R.Cibuļskis); Ūdrīši, Zapoļniki house, 30.VIII.-01.IX.2007 (1, leg. M.Murd); bank of Lake Velnezers, Velnezers Nature Reserve, 11.VII.2008 (1, leg. A.Barševskis, V.Aleksejev); Liepāja d.: Pāvilsta, 13.VIII.2008 (1, seashore, dunes,

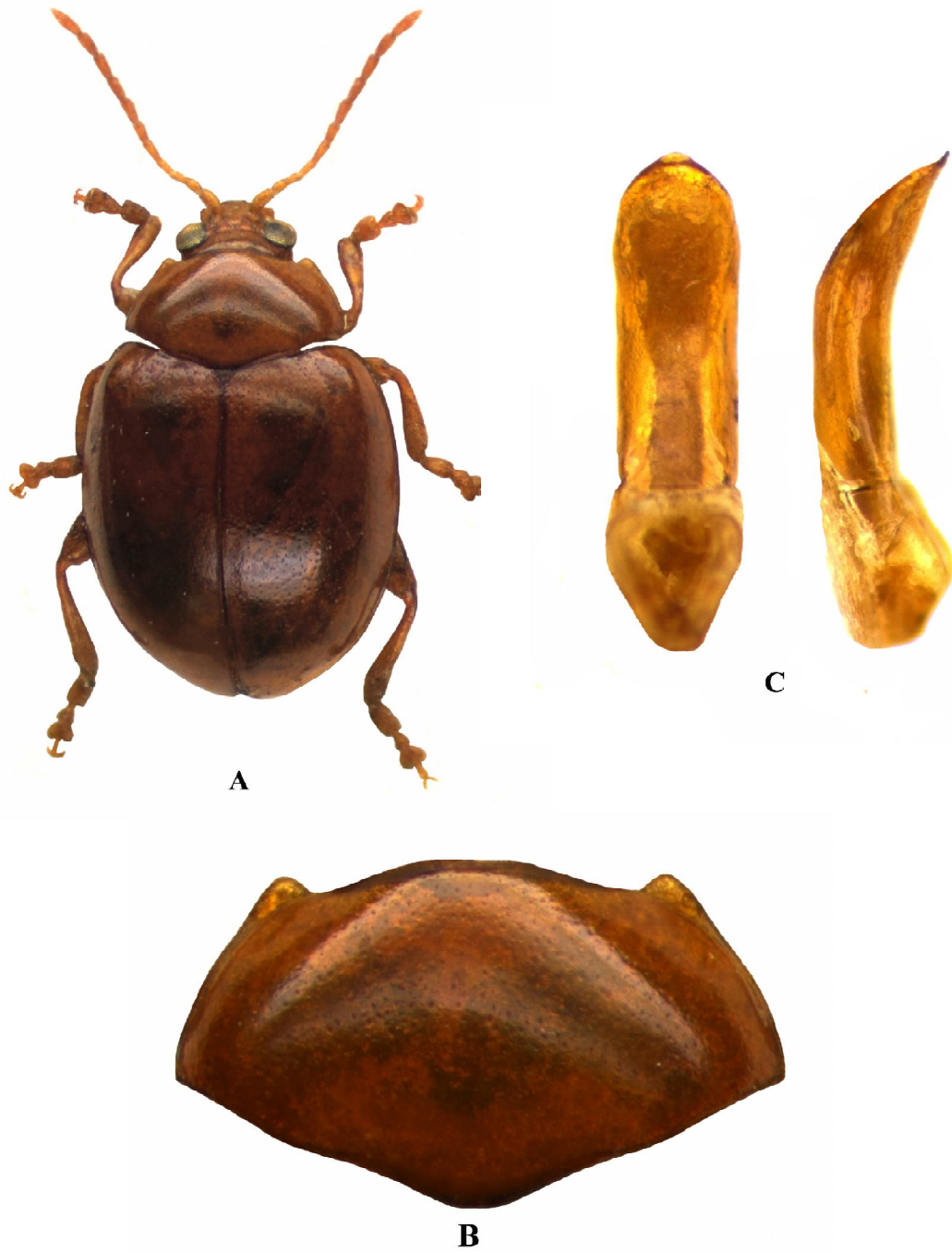


Fig. 1. *Sphaeroderma rubidum* (Graëlls): A – habitus, B – pronotum, C – aedeagus (dorsal, ventral and lateral aspects).

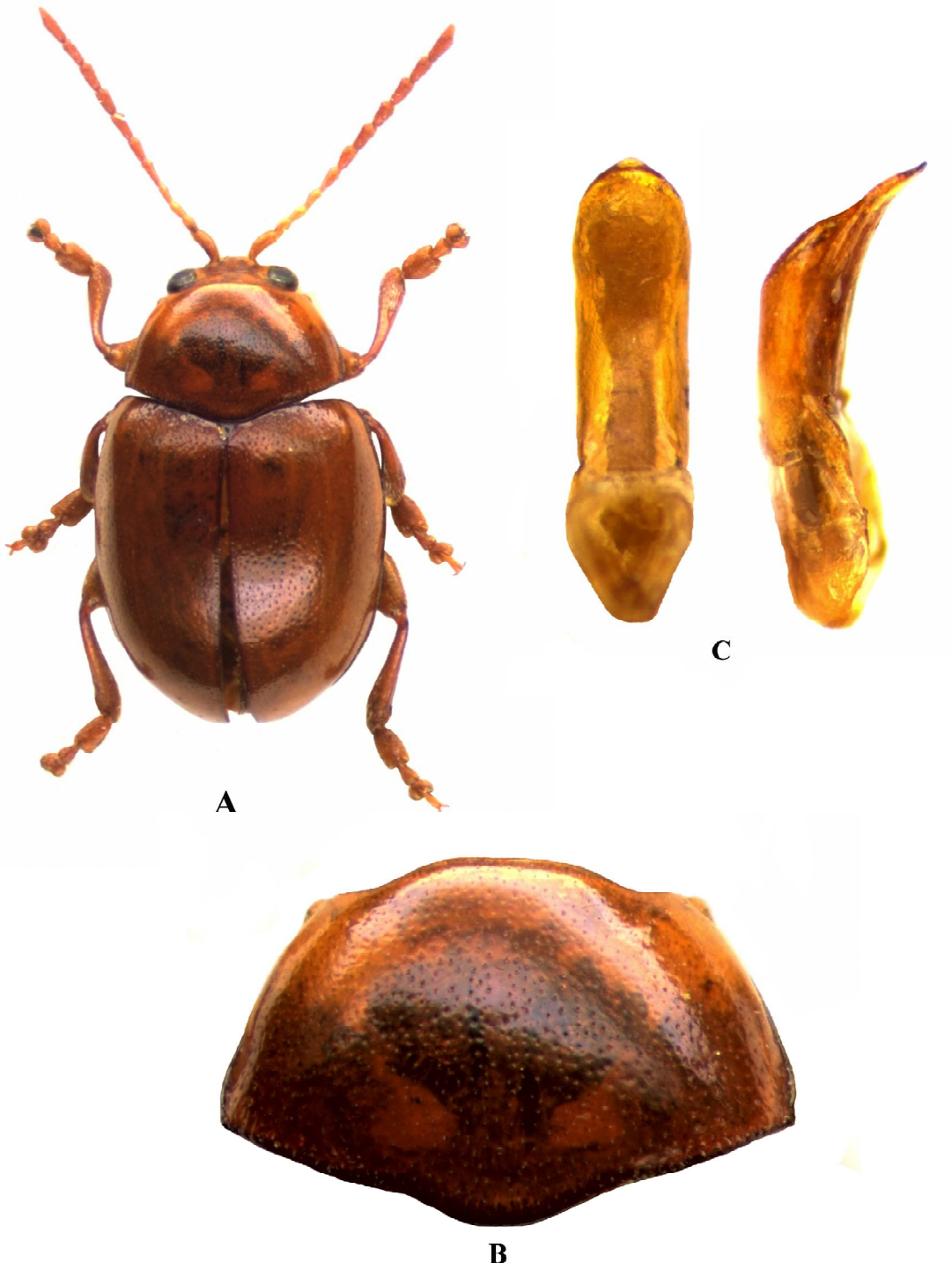


Fig. 2. *Sphaeroderma testaceum* (F.): A – habitus, B – pronotum, C – aedeagus (dorsal, ventral and lateral aspects)

A.Barševskis leg.); Ogre d.: Ķegums, 13.VII.2006 (1, left bank of the Daugava River, leg. A.Barševskis, K.Barševska); Preiļi d.: Jersika, Kurpnieki house, 06.VIII.2008 (1, leg. A.Barševskis), 25.VII.2009 (1, leg. A.Barševskis); Sutri, 14.VIII.2008 (2, leg. A.Barševskis); Rēzekne d.: Tiltiņi, 08.VIII.2008 (3, leg. M.Balalaikins); Rīga d.: Lake Lielais Baltezers, 25.VI.1993 (1, leg. anonymous); Saulkrasti, 16.VIII.2008 (2, leg. A.Barševskis); Sigulda, Gauja National Park, 16.VIII.2008 (1, bank of the Gauja River, leg. A.Barševskis); Tālsī d.: Slītere National Park, Zilie Kalni (hills) and Dāvida Pļavas (meadows), 10.VII.2004 (1, leg. R.Cibuškis), 29.VII.2005 (1, leg. A.Barševskis, A.Bukejs, U.Valainis), 01.IX.2006 (2, leg. A.Pankjāns, E.Rudāns, U.Valainis), 13.VII.2009 (1, leg. R.Cibuškis); Valka d.: Trikāta, Rūtiņi house, 29.VII.1993 (1, leg. anonymous); Valmiera d.: Mazsalaca, 57°52'22"N 25°00'53"E, 27.VIII.2006 (1, leg. A.Barševskis); Talava, 57°43'04"N 25°09'75"E, 21.VIII.2006 (1, leg. A.Barševskis); Ventspils d.: Ziru vill., 57°11'55"N 21°37'39"E, 28.VII.2005 (2, bank of the Venta River, leg. A.Barševskis, A.Bukejs, U.Valainis).

Host plants: Compositae (*Cirsium*, *Carduus*). In Latvia it feeds mostly on *Cirsium oleraceum*.

General distribution: Europe, Asia Minor, Caucasus. [EUR]

***S. rubidum* (Graells, 1858)**

References: Pūtele 1980, 1981, 1981a; Barševskis 1993 (misidentifications), 2002 (misidentifications); Telnov *et al.* 1997; Leiskina 1999 (misidentifications); Telnov 2004; Bukejs, Telnov 2007 (misidentifications).

Examined material: Not confirmed by the author. Earlier reports of this species (Barševskis 1993, 2002; Leiskina 1999; Bukejs, Telnov 2007) were based on misidentifications. Pūtele (1981) reported this species from Slītere National Park (NW Latvia). The author has reviewed 4 specimens of *S. rubidum* (without labels) from V. Pūtele collection, but all these specimens are belong to *S. testaceum*.

Host plants: Compositae (*Centaurea*, *Carduus*, *Onopordium*).

General distribution: Europe (northwards to S Sweden, Lithuania and Belarus), N Africa, Caucasus, Near East (Israel), Asia Minor. [EUM]
Note: The occurrence of this species in Latvian fauna is doubtful and needs further confirmation. Externally *S. rubidum* (Graells) is very similar to *S. testaceum* (F.). In *S. rubidum* (Graells), the body is sub-circular; pronotum uniformly very finely punctate, lateral margins are not swollen and visible from above (Fig. 1A, 1B); aedeagus as in Fig. 1C. In *S. testaceum* (F.) has body broadly-oval; pronotum with coarse punctures near the base and fine punctures on anterior part, lateral margins swollen and not visible from above (Fig. 2A, 2B); aedeagus as in Fig. 2C.

***ARGOPUS* FISCHER, 1824**

18 species of this genus are known in the Palaearctic. In Latvian fauna, 2 species are known. Larvae develop inside leaf mines, pupate in soil (Bieńkowski 2004).

***A. ahrensii* (Germar, 1817)**

References: Palij 1958; Pūtele 1958, 1968a, 1970, 1970c, 1971a, 1971c, 1980, 1981a; Telnov *et al.* 1997; Telnov 2004.

Examined material: Not confirmed by the author. The author has reviewed 16 specimens of *A. ahrensii* from V. Pūtele collection [Jelgava, 05.VIII.1977 (1 ex., aerodrome, leg. V. Pūtele) and 15 exx without labels], but all these specimens are belong to *Sphaeroderma testaceum*.

Host plants: Ranunculaceae (*Clematis*).

General distribution: SE and E Europe (from Italy and Austria to Greece, Rumania, SE Poland, Ukraine, Belarus and central Russia), N Caucasus. [CEU]

Note: The occurrence of this species in Latvian fauna is doubtful and needs further confirmation. In Fennoscandia and Baltic states, recorded only from Latvia (Silfverberg 2004).

***A. nigratarsis* (Gebler, 1823)**

References: Bukejs 2008a.

Examined material: 1 specimen: Rēzekne d.: Puša, 25.V.2002 (1, leg. A.Barševskis).

Host plants: Ranunculaceae (*Adonis*, *Clematis*, *Pulsatilla*).

General distribution: E Europe (Belarus, Hungary, NE Poland, Russia (Leningrad region, Luzhskij district), Ukraine), Siberia, Kazakhstan, Mongolia, Russian Far East, Japan, NE China, Korean Peninsula. [ASE]

Note: Very rare species, known from single locality in E Latvia. In Fennoscandia and Baltic states is recorded only from Latvia.

veģetācija. Baltijas Koleopteroloģijas institūts, Daugavpils: 1-107. [in Latvian]

Bieńkowski A.O. 2004. Leaf-beetles (Coleoptera: Chrysomelidae) of the Eastern Europe. New key to subfamilies, genera and species. Moscow, Mikron-print: 1-278.

Brammanis L. 1930. Zur Kenntnis der Coleopterenfauna des Saatkampeschutzgrabens in der Oberforstei Intschukalms (Hinzenberg). *Folia zoologica et hydrobiologica*, 2 (1): 129-135.

Bukejs A. 2008a. The first record of flea beetle *Argopus nigratarsis* (Gebler, 1823) (Coleoptera: Chrysomelidae) in Baltic and Fennoscandian fauna of Latvia. *Acta Zoologica Lituonica*, 18 (1): 71-73.

Bukejs A. 2008b. *Hermaeophaga mercurialis* (Fabricius, 1792) – a new genus and species of flea beetle (Coleoptera: Chrysomelidae) in Latvian fauna. *Baltic Journal of Coleopterology*, 8 (1): 69-73.

Bukejs A. 2008c. To the knowledge of flea beetles (Coleoptera: Chrysomelidae: Alticinae) in the fauna of Latvia. 1. Genus *Chaetocnema* Stephens, 1831. *Acta Zoologica Lituonica*, 18 (3): 191-197.

Bukejs A. 2008d. To the knowledge of flea beetles (Coleoptera: Chrysomelidae: Alticinae) of Latvian fauna. 2. Genus *Phyllotreta* Chevrolat, 1836. *Acta Zoologica Lituonica*, 18 (3): 198-206.

Bukejs A. 2008e. Some little-known flea-beetles (Coleoptera: Chrysomelidae: Alticinae) in the Latvian fauna. Programme & Abstracts. VII Symposium of Baltic Coleopterologists. Hyttälä, Finland, 3rd-6th September 2008: 12.

Bukejs A., Telnov D. 2007. Materials about the fauna of beetles (Insecta: Coleoptera) of Naujene rural municipality (Daugavpils district, Latvia). Part 2. *Acta Biologica Universitatis Daugavpiliensis*, 7 (2): 191-208.

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REFERENCES

Barševskis A., Spuriņš G., Oga A. 1992. Riču ezera salu vaboļu fauna. LDPAB DPU org. IB, 2: 11. [in Latvian]

Barševskis A. 1993. The Beetles of Eastern Latvia. Saule, Daugavpils: 1-221. [in Latvian, English abstract]

Barševskis A., Savenkovs N., Evarts-Bunders P., Daniele I., Pētersons G., Pilāts V., Zviedre E., Pilāte D., Kalniņš M., Vilks K., Poppels A. 2002. *Silenes dabas parka fauna, flora un*

- Fischer J.B. 1784. Zusätze zu seinem „Versuch einer Naturgeschichte von Livland“. In: J.J.Febers Anmerkungen zur physischen Erdbeschreibung von Kurland, nebst J.B.Fischers Zusätzen zu einem Versuch einer Naturgeschichte von Livland. Riga: XVI + 305.
- Fischer J.B. 1791. Versuch einer Naturgeschichte von Livland. 2. Auflage. Königsberg: XXIV + 826.
- Fleischer J. 1829. Beitrag zur Fauna der Ostseeprovinzen. Verzeichnis derjenigen Käfer, die soweit mir bekannt ist, als einheimische bis hierzu noch nicht aufgeführt sind. *Die Quatember, Kurlandische Gesellschaft für Literatur und Kunst*, 1 (2): 9-19.
- Gruev B., Döberl M. 1997. General Distribution of the Flea Beetles in the Palaearctic Subregion (Coleoptera, Chrysomelidae: Alticinae). *Scoplia*, 37: 1-496.
- Gruev, B., Doeberl, M., 2005. General distribution of the flea beetles in the Palaearctic subregion (Coleoptera, Chrysomelidae: Alticinae). Supplement Pensoft Series Faunistica, 42. Pensoft Publishers, Sofia-Moscow: 1-240.
- Heyden L. 1903. Beiträge zur Coleopteren-Fauna der nordwestlichen Teile Russlands. *Korrespondenzblatt des Naturforschervereins zu Riga*, 46: 18-35.
- Kryzhanovskij O. L. (ed.) 1974. Insects and ticks – the pests of agricultural cultures. II. Coleoptera. Leningrad, Nauka: 1-336. [in Russian]
- Lindberg H. 1932. Käfer, gesammelt in Lettland 1931. *Folia zoologica et hydrobiologica*, 4 (2): 163-166.
- Lopatin I.K., Nesterova O.L. 2005. Insecta of Byelarus: Leaf-Beetles (Coleoptera, Chrysomelidae). Minsk, Tehnoprint: 1-293. [in Russian, English abstract]
- Medvedev L.N. 1997. New aberrant genus of Alticinae (Coleoptera, Chrysomelidae) - the representative of ecological group of detritobionts. *Zoological Journal*, 76 (10): 1218-1220. [in Russian]
- Müthel C. 1889. Neue Käfer aus Südlivland. *Korrespondenzblatt des Naturforschervereins zu Riga*, 32: 6-8.
- Ozols E. 1963. Agricultural entomology. 2 ed. Rīga, Latvian State Publishing House: 1-512. [in Latvian]
- Palij V.F. 1958. On the fauna and biocenology of flea beetles of Latvia (Coleoptera, Chrysomelidae, Halticinae). *Proceed. of the Institute of Biology of the Latvian SSR Academy of Sciences*, 5: 69-89 [in Russian]
- Petrova V., Čudare Z., Šteinīte I. 2000. Invertebrates fauna on strawberry in Latvia. *Proc. Latvian Acad. Sci. Sect. B*, 54, 3 (608): 79-84.
- Petrova V., Čudare Z., Cibulskis R. 2006. Predators and herbivores beetles (Coleoptera) naturally occurring on strawberry (Latvia). *Acta Biologica Universitatis Daugavpiliensis*, 6 (1-2): 155-159.
- Precht K. 1818. Verzeichnis der bis jetzt, vornehmlich in der Umgegend von Riga und im Rigischen Kreise bekannt gewordenen und systematisch bestimmten käferartigen Insecten (Coleoptera Linnaei, Eleutherata Fabricii). Riga, D. Müller: 1-39.
- Priedītis A., Pūtele V. 1976. Leaf-beetles (Coleoptera, Chrysomelidae) in agrocenoses of apple in Zemgale plain of Latvia. *Abstr. of rep. of the scient. conf. 'Ways of implementation of progressive methods for the protection of agricultural plants, 28-30 June 1976'*. Riga, RPI Press: 96-98.
- Pūtele V. 1958. Daži novērojumi par spradžu sugām Latvijas PSR. *LLA Raksti*, 7: 83-92. [in Latvian, Russian summary]

- Pūtele V. 1960. *Phyllotreta* Foudras ģints spradži Latvijas PSR. *Latvijas entomologs*, 1: 34–42. [in Latvian]
- Pūtele V. 1965. Die Erdflöhe der Gattung *Longitarsus* Latr. in der Lettischen SSR. *Latvijas Entomologs*, 10: 3-15. [in Latvian]
- Pūtele V. 1968. Die Erdflöhe der Gattung *Psylliodes* Latr. in der Lettischen SSR. *Latvijas Entomologs*, 12: 35-38. [in Latvian]
- Pūtele V. 1968a. New species of flea beetles in Latvia. *The theses of the reports of VI scientific conference of Pribaltic republics on protection of plants 25-27.III.1968*. Estonian agricultural academy, Tartu: 114-115. [in Russian]
- Pūtele V.O. 1968b. Flea-beetle fauna of Latvian SSR. *XIII International Congress of Entomology*. Abstracts of papers. Moscow: 208
- Pūtele V. 1970. Species composition of flea beetles of the Latvian SSR. *The materials of the 7th Baltic Plant Protection Conference, Jelgava*, 1: 17-20. [in Russian]
- Pūtele V. 1970a. The flea beetles *Chaetocnema* Steph. in Latvian SSR. *The materials of the 7th Baltic Plant Protection Conference, Jelgava*, 1: 20-25. [in Russian]
- Pūtele V. 1970b. Distribution of flea beetles *Aphthona* Chevr. in Latvian SSR. *The materials of the 7th Baltic Plant Protection Conference, Jelgava*, 1: 25-27. [in Russian]
- Pūtele V. 1970c. Research on the fauna and ecology of the flea beetles (Coleoptera, Chrysomelidae, Halticinae) of the Latvian SSR. Abstract of the doctoral thesis in Biological Sciences. Jelgava: Latvian Ministry of Agriculture. 1-36. [in Russian]
- Pūtele V. 1971a. Little-known flea beetles in Latvia. *Latvijas Lauksaimniecības akadēmijas Raksti*, 42: 76-86. [in Latvian, Russian summary]
- Pūtele V. 1971b. The flea beetles *Haltica* Fabr. and *Chalcoides* Foudr. in Latvian SSR. *Latvijas Lauksaimniecības akadēmija Raksti*, 42: 87-94. [in Latvian, Russian summary]
- Pūtele V. 1974. Leaf-beetles (Coleoptera, Chrysomelidae) discovered in surrounding of Jelgava city. In: *Brief reports of a scientific conference on the protection of plants. Saku, 2–4 1974*, (2). Tallinn: 55-58. [in Russian]
- Pūtele V. 1975. Flea Beetles as pests to Poaceae in the Latvian SSR. *Latvijas Lauksaimniecības akadēmijas raksti*, 84: 42-48. [in Latvian]
- Pūtele V. 1981. Studies on leaf-beetles (Coleoptera, Chrysomelidae) fauna of the Slītere State Nature Reserve. *Latvijas Lauksaimniecības akadēmijas raksti*, 188: 12-19. [in Russian]
- Pūtele V. 1981a. Studies on leaf-beetles fauna of the Slītere State Nature Reserve: reports. *Mežsaimniecība un mežrūpniecība*, 3: 42-44. [in Latvian]
- Pūtele V.O. 1982. Pested leaf-beetles (Coleoptera, Chrysomelidae) of the Latvian SSR. *Մշտաւ Էգոմաճենչիէ նաւնչիժիէ ւնդաճկիէ գչգաճճճճ, 200 (Իսւյլ գ ն աճաճնաէճճ ճ յեճէկճճ ճգճնիժաէճ, յեաւիլկիւժ ճ յեաւիւժ ճունոճ)*: 28-33. [in Russian]
- Pūtele V.O. 1984. Leaf-beetles – pests of tree cultures in the Slītere State Nature Reserve. *Latvijas Lauksaimniecības akadēmijas raksti*, 213: 9-15. [in Russian]
- Rathlef H. 1905. Coleoptera Baltica. Käfer-Verzeichnis der Ostseeprovinzen nach den Arbeiten von Ganglbauer und Reitter. Dorpat, C. Mattiesen: 16 + 199.
- Romantsov P.V. 2007. A review of leaf beetles (Coleoptera, Chrysomelidae) of St.Petersburg and Leningrad province.

- Entomological Review*, LXXXVI (2): 306-336. [in Russian, English summary]
- Seidlitz G. 1887-1891. Fauna Baltica. Die Käfer (Coleoptera) der deutschen Ostseeprovinzen Russlands. 2. Auflage. Königsberg: 12 + LVI + 192 + 818.
- Silfverberg H. 2004. Enumeratio nova Coleopterorum Fennoscandiae, Daniae et Baltiae. *Sahlbergia*, 9: 1 - 111.
- Smarods J., Liepa I. 1956. Dārzeņu kaitēkļi un slimības. Rīga, Latvijas Valsts izdevniecība: 1-407. [in Latvian]
- Šmits V. 1962. Jaunas sugas Latvijas vaboļu faunai. *Latvijas Entomologs*, 5: 51-52. [in Latvian]
- Taglianti V. A., Audisio P. A., Biondi M., Bologna M. A., Carpaneto G. M., De Biase A., Fattorini S., Piattella E., Sindaco R., Venchi A., Zapparoli M. 1999. A proposal for the chorotype classification of the Near East fauna, in the framework of the Western Palearctic region. *Biogeographia* XX: 31–59.
- Telnov D. 2004. Check-List of Latvian Beetles (Insecta: Coleoptera). In: Telnov D. (ed.) *Compendium of Latvian Coleoptera, vol. 1*. Rīga, Pertovskis & Co: 1-114.
- Telnov D., Barševskis A., Savich F., Kovalevsky F., Berdnikov S., Doronin M., Cibulskis R., Ratniece D. 1997. Check-List of Latvian Beetles (Insecta: Coleoptera). *Mitteilungen des Internationalen Entomologischen Vereins*, Supplement V: 1-140.
- Telnov D., Fägerström Ch., Gailis J., Kalniņš M., Piterāns U., Vilks K. 2006. Contributions to the Knowledge of Latvian Coleoptera. 5. *Latvijas Entomologs*, 43: 78-125.
- Tomsons A. 1940. Cukurbiešu kaitēkļi Zemgales līdzenumā, Rīgas apkārtnē un Daugavas labajā krastā starp Pļaviņām un Lielvārdi.
- Cukurbiešu kultūra un cukurrūpniecība, 10 (4/6): 164-199. [in Latvian]
- Trauberga O. 1957. Coleoptera – vaboles. In: *Latvijas PSR dzīvnieku noteicējs*, 1. Rīga, Latvijas Valsts izdevniecība: 455-592. [in Latvian]
- Warchałowski A. 2003. The leaf-beetles (Chrysomelidae) of Europe and the Mediterranean region. Warszawa, Natura optima dux Foundation: 1-600.

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