

TO THE KNOWLEDGE OF FLEA BEETLES (COLEOPTERA: CHRYSOMELIDAE: ALTICINAE) IN THE FAUNA OF LATVIA. 2. GENUS *PHYLLOTRETA* CHEVROLAT, 1836

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Abstract. New faunal data on 11 species of the genus *Phyllotreta* Chevrolat, 1836 of the Latvian fauna are presented. The first record of flea beetle, *Phyllotreta dilatata* Thomson, 1866, in the Latvian fauna is reported. The summary of bibliographical information and the list of Latvian *Phyllotreta* including 13 species are given. This paper is based on 829 specimens of this genus, which are stored in the collection of Daugavpils University Institute of Systematic Biology.

Key words: Coleoptera, Chrysomelidae, Alticinae, *Phyllotreta*, fauna, Latvia

INTRODUCTION

This publication continues our study on flea beetles of the Latvian fauna (Bukejs 2008).

The genus *Phyllotreta* Chevrolat, 1836 is a cosmopolitan taxon with more than 200 species. There are 135 species and subspecies known (Gruev & Döberl 1997) in the Palearctic region. Fifteen species are reported in northern Europe (Silfverberg 2004). Thirteen *Phyllotreta* species are known in Latvia. In adjacent territories, the number of the documented species slightly differs: in Belarus – 14 species (Lopatin & Nesterova 2005), Estonia – 10 species, Lithuania – 12 species (Pileckis & Monsevičius 1997; Silfverberg 2004), St. Petersburg and the Leningrad province – 12 species (Romantsov 2007).

The first information about the species of the genus *Phyllotreta* in Latvia was published in the beginning of the 19th century (Precht 1818; Fleischer 1829). Subsequently, more than 30 works have been published (Ulanowski 1883; Seidlitz 1887–1891; Heyden 1903; Rathlef 1905; Lindberg 1932; Tomsons 1939–1940, 1940; Smarods & Liepa 1956; Trauberga 1957; Palij 1958; Pūtele 1958a, 1960, 1968, 1970a, c, 1971, 1974, 1975, 1981, 1981a, 1984; Ozols 1963; Spuris 1966, 1974; Danka & Stiprais 1972; Priedītis & Pūtele 1976; Rupais & Kalniņa 1979; Barševskis 1993; Telnov *et al.* 1997; Barševskis *et al.* 2002; Telnov 2004; Petrova *et al.* 2006; Bukejs & Telnov 2007). V. Pūtele (1960, 1970b) provided data on 12 species of *Phyllotreta* in Latvia. Faunal data can also be found in the following articles: Heyden 1903; Lindberg 1932; Pūtele 1974, 1981; Priedītis and Pūtele (1976); Barševskis 1993;

Bukejs and Telnov (2007). The list of Latvian *Phyllotreta* can be found in the published list of Latvian beetles (Telnov *et al.* 1997; Telnov 2004).

Adults *Phyllotreta* feed on leaves, while larvae mostly develop on roots and rhizomes; some larvae mine stems or leaves (Bieńkowski 2004).

Some species of *Phyllotreta* are pests of cultivated plants (Kryzhanovskij 1974). In Latvia, *Ph. vittula* (Redt.) is reported as a pest of cereal crops; *Ph. nemorum* (L.), *Ph. undulata* Kutsch., *Ph. striolata* (F.), *Ph. atra* (F.) – as pests of cultivated Cruciferae and *Ph. armoraciae* (Koch) – as a pest of *Armoracia rusticana* (Smarods & Liepa 1956; Palij 1958; Pūtele 1960, 1970c, 1975; Ozols 1963).

The aim of this work is to summarise information about the genus *Phyllotreta* in Latvia. Faunal data on 11 species are presented. *Phyllotreta dilatata* Thomson, 1866 is reported for the first time in Latvia. Altogether, 13 *Phyllotreta* species are reported in Latvia and their annotated list is presented below.

MATERIAL AND METHODS

This paper is based on 829 specimens of flea beetles from the collection of beetles of Daugavpils University, Institute of Systematic Biology (DUBC). They represent 11 species of the genus *Phyllotreta*.

The following works were used for species identification: Bieńkowski 2004; Lopatin and Nesterova (2005); Mohr (1966); Warchalowski (2003). We follow the nomenclature suggested by Silfverberg (2004).

Host plants are presented following the monograph

(Lopatin & Nesterova 2005). The general distribution of species is in accordance with Gruev and Döberl (1997), Warchalowski (2003), Bienkowski (2004), Lopatin and Nesterova (2005).

Classification of chorotypes is made as suggested by Taglianti *et al.* (1999)*. The transcript of chorotype codes: HOR – Holarctic-Oriental, PAL – Palaearctic, ASE – Asiatic-European, SIE – Sibero-European, CEM – Central Asiatic-European-Mediterranean.

The following information is given for each species: the name, bibliographical sources published in Latvia, new faunal data (locality and the collection date of the species, number of the collected specimens indicated in brackets, habitat and the collector's name), host plants, the code of the chorotype and general distribution.

Abbreviations: d. – district, env. – environs, Isl. – island, vill. – village, NP – Nature Park, NR – Nature Reserve, S – South, N – North, E – East, W – West.

The pictures were made with a stereomicroscope Zeiss Stereo Discovery V12 and an AxioCam digital camera.

* – Except the Holarctic-Oriental chorotype.

RESULTS AND DISCUSSION

The study on 829 specimens of *Phyllotreta* showed that they belong to 11 species. Overall, the list of *Phyllotreta* species of the Latvian fauna includes 13 species.

Analysis of the distribution of the species of the genus *Phyllotreta* in Latvia reveals a rather wide range of chorotypes: Holarctic-Oriental – one species (*Ph. striolata*), Palaearctic – one species (*Ph. atra*), Asiatic-European – four species (*Ph. vittula*, *Ph. nemorum*, *Ph. undulata*, *Ph. ochripes*), Sibero-European – five species (*Ph. armoraciae*, *Ph. tetrastigma*, *Ph. flexuosa*, *Ph. exclamationis*, *Ph. dilatata*), Central Asiatic-European-Mediterranean – 2 species (*Ph. cruciferae*, *Ph. nigripes*).

LIST OF SPECIES OF THE LATVIAN FAUNA

Family Chrysomelidae

Subfamily Alticinae Newman, 1834

Genus *Phyllotreta* Chevrolat, 1836

1. *Ph. vittula* (Redtenbacher, 1849)

References: Ulanowski 1883; Seidlitz 1887–1891; Rathlef 1905; Tomsons 1939–1940, 1940; Trauberga 1957; Palij 1958; Pūtele 1958a, 1960, 1970a, b, 1974, 1975, 1981, 1981a, 1984; Ozols 1963; Spuris 1966,

1974; Priedītis and Pūtele (1976); Barševskis 1993; Telnov *et al.* 1997; Barševskis *et al.* 2002; Telnov 2004; Bukejs and Telnov (2007).

Examined material: 124 specimens: Bauska d., Bauska NP, 56°24'10"N 24°10'41"E, 3 May 2008 (1, leg. A. Pankjāns, U. Valainis); Daugavpils d., Daugavpils, 17 April 2008 (1, leg. D. Veigule); Daugavpils d., Dviete, 20 August 2006 (4, leg. A. Barševskis); Daugavpils d., Līksna, 28 February 1997 (1, leg. R. Cibulskis), 11 May 1997 (1, leg. R. Cibulskis); Daugavpils d., Līksna parish, 3 km N Daugavpils, 14 April 2008 (16, edge of pine forest, leg. A. Bukejs); Daugavpils d., Šēdere, Straumēni house, 29 July 2007 (10, leg. M. Murd); Daugavpils d., Silene NP, Ilgas, 1991 (1, leg. A. Barševskis); Daugavpils d., Stropi, 20 April 2008 (2, clearing, leg. A. Bukejs), 27 April 2008 (2, bank of Lake Lielais Stropu, leg. A. Bukejs); Liepāja d., Pape, 23–25 June 1994 (1, dunes, beach, leg. N. Savenkovs); Limbaži d., Salacgrīva, 27 July 2007 (1, near the sea, leg. A. Barševskis); Ludza d., 1.5 km SW Gāgari, 56°26'44"N 27°50'02"E, 10 May 2008 (1, old clearing, leg. A. Bukejs); Preiļi d., Jersika, Kurpnieki house, 4 May 2006 (2, leg. K. Barševska), 21 July 2007 (1, leg. A. Barševskis); Saldus d., Saldus, 13 July 2006 (1, bank of the Ciecere River, leg. A. Barševskis, K. Barševska); Talsi d., Mundigciems, Vīceži, 57°12'45"N 22°34'50"E, 11 August 2006 (4, leg. E. Rudāns); Valmiera d., Sprosti, 57°34'58"N 25°20'15"E, 21 August 2006 (1, leg. A. Pankjāns); Ventspils d., Moricsala NR, Moricsala Isl., 14 May 2004 (5, leg. A. Barševskis); Ventspils d., Ziras, 57°11'55"N 21°37'39"E, 28 July 2005 (68, bank of the Venta River, leg. A. Barševskis, A. Bukejs, U. Valainis).

Host plants: various wild and cultivated *Gramineae*, *Cruciferae*. Pest of cereals.

General distribution: ASE – Europe, Caucasus, Asia Minor, Siberia, Kazakhstan, Central Asia, Mongolia, Far East, Korea; introduced also to N America (USA).

Note: Very frequent.

2. *Ph. armoraciae* (Koch, 1803)

References: Seidlitz 1887–1891; Rathlef 1905; Tomsons 1940; Palij 1958; Pūtele 1958a, 1960, 1970a, c, 1971, 1974; Danka and Stiprais (1972); Barševskis 1993; Telnov *et al.* 1997; Telnov 2004.

Examined material: 78 specimens: Daugavpils d., Kalkūni, 30 April 1997 (1, leg. I. Leiskina); Daugavpils d., Šēdere, Straumēni house, 9–10 June 2007 (7, leg. M. Murd), 1–3 May 2008 (1, leg. M. Janovska); Daugavpils d., Stropi, 5 May 2008 (5, agrocenosis, on *Armoracia rusticana*, leg. A. Bukejs); Jēkabpils d., Dunava, 1 June 2002 (1, leg. A. Barševskis); Krāslava d.,

Šķeltova, Barševski house, 25 May 2007 (36, leg. A. Barševskis, K. Barševska), 30 June 2007 (9, leg. A. Barševskis), 22 July 2007 (6, leg. A. Barševskis); Preiļi d., Jersika, 5 May 2005 (1, leg. I. Gurčonoks); Preiļi d., Pelēči, 26 August 1997 (2, leg. I. Jurkjāne); Rīga city, Mārupe, 16 July 2002 (1, leg. V. Surins); Ventspils d., Ziras, 57°11'55"N 21°37'39"E, 28 July 2005 (8, bank of the Venta River, leg. A. Barševskis, A. Bukejs, U. Valainis).

Host plants: *Armoracia rusticana* Gaertn., Mey. et Scherb.

General distribution: SIE – C and N Europe, Siberia, Kazakhstan; introduced also to N America.

3. *Ph. nemorum* (Linnaeus, 1758)

References: Precht 1818 (*Crioceris nemorum*); Ulanowski 1883; Seidlitz 1887–1891; Rathlef 1905; Tomsons 1939–1940, 1940; Smarods and Liepa (1956); Trauberga 1957; Palij 1958; Pūtele 1958a, 1960, 1970a, c, 1974, 1981, 1981a; Ozols 1963; Spuris 1966, 1974; Priedītis and Pūtele (1976); Rupais and Kalniņa (1979); Barševskis 1993; Telnov *et al.* 1997; Barševskis *et al.* 2002; Telnov 2004; Bukejs and Telnov (2007).

Examined material: 106 specimens: Daugavpils d., Butiški, 21 August 2006 (1, valley of the Daugava River, leg. A. Bukejs, M. Balalaikins); Daugavpils d., Daugavpils city, Mežciems, 19 July 1992 (1, leg. A. Barševskis), 19 July 2007 (3, leg. K. Aksjuta, M. Murd), 8 August 2007 (3, leg. K. Aksjuta, M. Murd); Daugavpils d., Līksna, 6 May 1994 (1, leg. R. Cibulskis), 7 May 1994 (2, leg. R. Cibulskis), 3 May 1996 (1, leg. R. Cibulskis); Daugavpils d., Līksna parish, 3 km N Daugavpils, 14 April 2008 (1, edge of pine forest, leg. A. Bukejs); Daugavpils d., Līksna parish, Ļubesti env., 17 May 2007 (1, leg. A. Barševskis, K. Barševska); Daugavpils d., Silene NP, Ilgas, 30 May 1994 (1, leg. A. Barševskis), June 2002 (1, leg. A. Barševskis), 10 May 2006 (1, leg. A. Barševskis); Daugavpils d., Stropi, 4 August 2006 (1, leg. A. Bukejs), 31 May 2008 (9, agrocenosis, on radish and horseradish, leg. A. Bukejs); Daugavpils d., Vabole, 8 March 1997 (1, leg. R. Cibulskis); Daugavpils d., Vasargeliški, 29 April 2008 (5, leg. U. Valainis, A. Pankjāns); Jēkabpils d., Dunava, 23 June 1993 (1, leg. A. Barševskis), 8 May 1994 (1, leg. A. Barševskis), 11 July 1994 (1, near the Daugava River, leg. A. Barševskis), 20–31 July 2006 (3, leg. K. Barševska), 13 May 2007 (7, leg. K. Barševska, A. Barševskis), 16–21 June 2007 (3, leg. K. Barševska); Jēkabpils d., Rubeņi, 1 July 1999 (1, leg. I. Leiskina); Krāslava d., Šķeltova, 9 May 1993 (1, leg. A. Barševskis); Limbaži d., Salacgrīva, 27 July 2007

(1, near the sea, leg. A. Barševskis); Limbaži d., Viķi, 57°51'42"N 24°47'53"E, 22 August 2006 (2, leg. A. Barševskis); Preiļi d., Jersika 5 May 2005 (1, leg. I. Gurčonoks), 15 May 2005 (5, leg. A. Barševskis), 24 June 2005 (1, leg. A. Barševskis), 4 May 2006 (3, leg. K. Barševska), 23–24 June 2006 (22, leg. A. Barševskis, K. Barševska), 15 July 2006 (6, leg. K. Barševska), July 2006 (1, leg. A. Barševskis), 5 June 2007 (5, leg. A. Barševskis); Rēzekne d., Nagļi, 8 September 2007 (1, bank of Lake Lubāns, leg. A. Bukejs & M. Balalaikins); Talsi d., Šlītere, 4 May 1998 (1, Malayse trap, leg. N. Savenkovs); Ventspils d., Moricsala NR, Moricsala Isl., July 2003 (1, leg. U. Valainis), September 2003 (1, leg. U. Valainis), 14 May 2004 (3, leg. A. Barševskis), 9 July 2004 (1, leg. A. Barševskis), U. Valainis), 10 June 2006 (1, leg. A. Barševskis).

Host plants: *Cruciferae*. Pest. Larvae mine leaves.

General distribution: ASE – Europe, Caucasus, Asia Minor, Iran, Siberia, Kazakhstan, Mongolia, Far East, Korea; introduced also to Australia.

4. *Ph. undulata* Kutschera, 1860

References: Seidlitz 1887–1891; Rathlef 1905; Tomsons 1940; Smarods and Liepa 1956; Trauberga 1957; Palij 1958; Pūtele 1958a, 1960, 1970a, c, 1974, 1981, 1981a; Ozols 1963; Spuris 1966, 1974; Priedītis and Pūtele (1976); Rupais and Kalniņa (1979); Barševskis 1993; Telnov *et al.* 1997; Barševskis *et al.* 2002; Telnov 2004; Bukejs and Telnov (2007).

Examined material: 196 specimens: Bauska d., Bauska NP, 56°24'10"N 24°10'41"E, 3 May 2008 (3, leg. A. Pankjāns, U. Valainis); Bauska d., Bauska NP, Mežotne env., 56°44'185"N 24°04'865"E, 3 May 2008 (1, bank of the Lielupe River, leg. U. Valainis, A. Pankjāns); Daugavpils d., Butiški, 12 August 2006 (1, valley of the Daugava River, leg. A. Bukejs & M. Balalaikins), 9 September 2007 (1, leg. A. Bukejs & M. Balalaikins); Daugavpils d., Bebrene, 7 May 2006 (1, leg. E. Rudāns); Daugavpils d., Daugavpils city, 26 April 1993 (1, Mežciems, xeric habitat, leg. A. Barševskis); 28 May 1993 (1, leg. A. Barševskis), 30 April 1994 (1, leg. A. Barševskis), 8 August 2007 (11, bank of the Daugava River, leg. K. Aksjuta, M. Murd), 27 August 2007 (1, center, leg. A. Barševskis); Daugavpils d., Dviete, 22 August 2006 (2, leg. A. Barševskis); Daugavpils d., Kalkūni 30 April 1997 (1, leg. I. Leiskina); Daugavpils d., Līksna, 6 May 1994 (1, leg. R. Cibulskis), 7 May 1994 (2, leg. R. Cibulskis), 20 July 1994 (1, leg. R. Cibulskis), 21 August 1994 (8, leg. R. Cibulskis); Daugavpils d., Līksna parish, 3 km N Daugavpils, 14 April 2008 (2, edge of pine forest, leg. A. Bukejs), 2 km N Daugavpils, 4 May 2008 (1, inland dunes, edge of pine forest, leg. A. Bukejs); Daugavpils d., Līksna

parish, 2.5 km E Lūbaste, 29 April 2008 (1, bank of Lake Židu, leg. A. Bukejs); Daugavpils d., Naujene, 27 April 2007 (2, Juzefov's park, leg. A. Barševskis), 29 April 2008 (1, leg. U. Valainis, A. Pankjāns); Daugavpils d., Nīcgale, 23 September 1997 (1, leg. R. Cibulskis); Daugavpils d., Pilskalnes Siguldiņa NP, Pilskalne, 18 May 1994 (1, leg. A. Barševskis), 9 May 2005 (2, leg. A. Barševskis); Daugavpils d., Šedere, Straumēni house, 1–3 May 2008 (1, leg. M. Janovska); Daugavpils d., Silene NP, Ilgas, June 1994 (1, leg. A. Barševskis), 1994 (1, leg. A. Barševskis), 9 July 2001 (1, leg. G. Lociks), 18 May 2005 (1, leg. A. Barševskis); Daugavpils d., Stropi, 4 August 2006 (6, sandy agroce-nosis, leg. A. Bukejs), 10 August 2006 (1, leg. A. Bukejs), 28 May 2007 (1, meadow near Lake Lielais Stropu, leg. A. Bukejs), 19 July 2007 (1, bank of Lake Lielais Stropu, leg. A. Bukejs), 27 April 2008 (2, bank of Lake Lielais Stropu, leg. A. Bukejs), 5 May 2008 (1, agroce-nosis, leg. A. Bukejs), 8 May 2008 (1, agroce-nosis, on *Armoracia rusticana*, leg. A. Bukejs), 31 May 2008 (7, agroce-nosis, on radish, leg. A. Bukejs); Jēkabpils d., Asare, 6 July 2000 (1, leg. I. Leiskina); Jēkabpils d., Dunava, 17 August 1992 (4, bank of the Daugava River, leg. A. Barševskis), 8 May 1994 (1, leg. A. Barševskis), 11 July 1994 (1, leg. A. Barševskis), 24 June 1995 (6, leg. A. Barševskis), 10–18 June 2006 (2, leg. K. Barševska), 20–31 July 2006 (1, leg. K. Barševska), 29 August 2006 (1, leg. A. Barševskis), 13 May 2007 (9, leg. K. Barševska, A. Barševskis), 10–19 June 2007 (1, leg. K. Barševska); Jēkabpils d., Rubeņi, 13 September 1997 (1, leg. I. Leiskina), 12 August 1999 (1, leg. I. Leiskina); Krāslava d., Arteni, 31 July 1991 (1, leg. A. Barševskis); Krāslava d., Izvalta, 21 August 1992 (5, Adama purvs (bog), leg. A. Barševskis); Krāslava d., Šķeltova, 27 August 1992 (9, leg. A. Barševskis), 9 May 1993 (3, leg. A. Barševskis), 15 May 2005 (1, leg. A. Barševskis), 20 May 2007 (3, leg. A. Barševskis), 25 May 2007 (3, leg. A. Barševskis, K. Barševska), 30 June 2007 (4, leg. A. Barševskis), 22 July 2007 (8, leg. A. Barševskis); Limbaži d., Salacgrīva, 27 July 2007 (1, near the sea, leg. A. Barševskis); Limbaži d., Vīķi, 57°51'42"N 24°47'53"E, 22 August 2006 (4, leg. A. Barševskis); Preiļi d., Jersika, Kurpnieki house, 4 May 2006 (1, leg. K. Barševska), 4 June 2006 (1, leg. K. Barševska), 6–7 June 2006 (1, leg. A. Barševskis, K. Barševska), 15 July 2006 (21, leg. K. Barševska), 7 August 2006 (1, leg. K. Barševska), 18 August 2006 (4, leg. A. Barševskis), 2 September 2006 (1, leg. A. Barševskis); Rēzekne d., Nagļi, 8 September 2007 (2, bank of Lake Lubāns, leg. A. Bukejs & M. Balalaikins); Rīga d., Saulkalne, 20 May 2006 (1, leg. A. Barševskis); Saldus d., Saldus, 13 July 2006 (1, bank of the Ciecere River, leg. A. Barševskis, K. Barševska); Talsi d.,

Sabile, 'Abavas Rumba', 56°55'27"N 22°31'37"E, 19 July 2007 (6, leg. A. Pankjāns, A. Soldāns, U. Valainis, A. Barševskis); Valmiera d., Burtnieki parish, Briede, 57°39'85"N 25°13'54"E, 21 August 2006 (2, leg. A. Barševskis); Ventspils d., Moricsala NR, Moricsala Isl., June 2003 (1, leg. U. Valainis), July 2003 (1, leg. U. Valainis), 14 May 2004 (3, leg. A. Barševskis), 29 May 2006 (1, leg. A. Barševskis), 30 May 2006 (1, leg. E. Rudāns).

Host plants: *Cruciferae*. Known pest of cultivated *Cruciferae*.

General distribution: ASE – Europe, Caucasus, Siberia, Altai, Kazakhstan, Central Asia, Mongolia, Far East; introduced also to N America (Canada, USA), Australian region and New Zealand.

Note: Very frequent.

5. *Ph. tetrastigma* (Comolli, 1837)

References: Seidlitz 1887–1891; Rathlef 1905; Lindberg 1932; Palij 1958; Pūtele 1960, 1970a, c, 1971; Barševskis 1993; Telnov *et al.* 1997; Telnov 2004.

Examined material: 13 specimens: Balvi d., Kuprava, 19 May 1991 (7, leg. A. Barševskis); Daugavpils d., Silene NP, Ilgas, 11 June 1994 (1, leg. A. Barševskis); Daugavpils d., Vasargeliški, 29 April 2008 (3, leg. U. Valainis, A. Pankjāns); Rēzekne d., Puša, 27 May 2002 (2, leg. A. Barševskis).

Host plants: *Cruciferae*.

General distribution: SIE – Europe, W and C Siberia, Yakutia.

6. *Ph. dilatata* Thomson, 1866

Examined material: 16 specimens: Daugavpils d., Daugavpils city, 30 April 1994 (1, leg. A. Barševskis), 8 August 2007 (1, bank of the Daugava River, leg. K. Aksjuta, M. Murd); Daugavpils d., Liksna, 21 August 1994 (5, leg. R. Cibulskis); Jēkabpils d., Dunava,



Figure 1. Habitus: A – *Ph. tetrastigma* (Com.), B – *Ph. dilatata* Thoms.

25 March 1995 (1, valley of the Daugava River, leg. A. Barševskis), 24 June 1995 (6, leg. A. Barševskis); Rēzekne d., Nagļi, 8 September 2007 (2, bank of Lake Lubāns, leg. A. Bukejs & M. Balalajkins).



Figure 2. Left elytron: A, B, C – *Ph. tetrastigma* (Com.), D – *Ph. dilatata* Thoms.



Figure 3. Aedeagus in lateral and dorsal aspects: A – *Ph. tetrastigma* (Com.), B – *Ph. dilatata* Thoms.

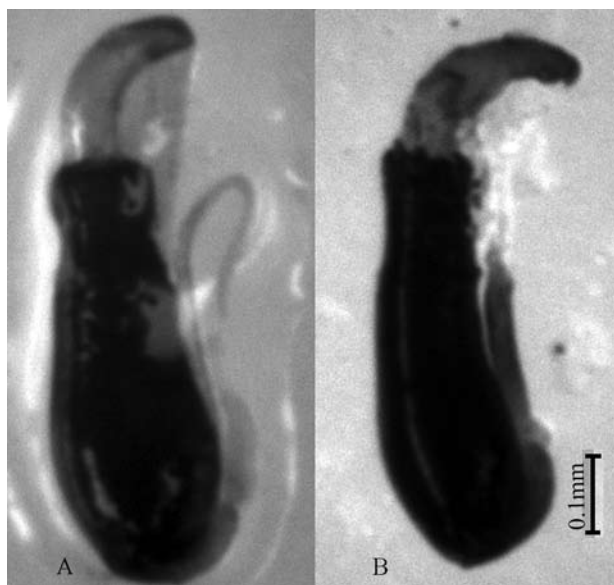


Figure 4. Spermatheca: A – *Ph. tetrastigma* (Com.), B – *Ph. dilatata* Thoms.

Host plants: *Cruciferae*.

General distribution: SIE – W and C Europe, C Siberia (Krasnoyarsk district).

Note: New species in the Latvian fauna. In N Europe, known also from Denmark and Sweden (Silverberg 2004). This species externally is similar to *Ph. tetrastigma* (Com.). In *Ph. tetrastigma* (Com.), yellow stripe on each elytron usually divided into two spots (typical form = ab. *fenestrata* Bedel, 1900) (Figs 1A, 2C), rarely narrowly connected (ab. *vittipennis* Heikertinger, 1941) (Figs 2A, B); humeral callus not surrounded by yellow stripe; antennomeres 1st–3rd usually pale. In *Ph. dilatata* Thoms., yellow stripe on each elytron always entire (Figs 1B, 2D); humeral callus surrounded posteriorly by yellow stripe; basal antennomere usually darkened. The genitalia of these species are also similar: aedeagus (Fig. 3) and spermatheca (Fig. 4).

7. *Ph. flexuosa* (Illiger, 1794)

References: Fleischer 1829; Seidlitz 1887–1891; Rathlef 1905; Palij 1958; Pūtele 1960, 1970a, c, 1971, 1974; Barševskis 1993; Telnov *et al.* 1997; Telnov 2004; Petrova *et al.* 2006.

Examined material: 3 specimens: Krāslava d., Izvalta, 21 August 1992 (3, Adama bog, leg. A. Barševskis).

Host plants: *Cruciferae*.

General distribution: SIE – Europe, Siberia, Far East, Sakhalin.

Note: Rare species.

8. *Ph. striolata* (Fabricius, 1803)

syn.: *vittata* auct. nec Fabricius, 1775

References: Seidlitz 1887–1891; Heyden 1903; Rathlef 1905; Tomsons 1940; Palij 1958; Pūtele 1958a, 1960, 1970a, c, 1974, 1981, 1981a, 1984; Ozols 1963; Spurris 1974; Priedītis and Pūtele (1976); Barševskis 1993; Telnov *et al.* 1997; Telnov 2004; Bukejs and Telnov (2007).

Examined material: 56 specimens: Aizkraukle d., Aizkraukle, 21 June 1995 (1, cutting area, leg. A. Barševskis); Daugavpils d., Butiški, 12 August 2006 (1, valley of the Daugava River, leg. A. Bukejs & M. Balalajkins), 21 August 2006 (1, valley of the Daugava River, dry meadow, leg. A. Bukejs & M. Balalajkins); Daugavpils d., Līksna, 21 August 1994 (1, leg. R. Cibulskis), 9 May 1997 (1, leg. R. Cibulskis); Daugavpils d., Līksna parish, 3 km N Daugavpils, 14 April 2008 (2, edge of pine forest, leg. A. Bukejs); Daugavpils d., Šēdere, Straumēni house, 29 July 2007 (1, leg. M. Murd); Daugavpils d., Silene NP, Ilgas, 30 May 1994 (1, leg. A. Barševskis), 18 May 2005 (1, leg. A. Barševskis), 29 June – 4 July 2007 (1, Malayse

trap, leg. A. Barševskis); Daugavpils d., Stropi, 10 August 2006 (1, leg. A. Bukejs), 27 April 2008 (1, bank of Lake Lielais Stropu, leg. A. Bukejs), 24 July 2008 (1, agrocenosis, on cabbage, leg. A. Bukejs); Daugavpils d., Vasargeliški, 29 April 2008 (1, leg. U. Valainis, A. Pankjāns); Jēkabpils d., Dunava, 13 May 2006 (1, leg. K. Barševska, A. Barševskis), 6–9 June 2006 (1, leg. K. Barševska), 20–31 July 2007 (1, leg. K. Barševska), 18 May 2008 (1, Dvietes forest, leg. A. Barševskis); Jēkabpils d., Rubepi, 30 June 1999 (1, leg. I. Leiskina); Krāslava d., Izvalta, 21 August 1992 (4, Adama bog, leg. A. Barševskis); Krāslava d., Šķeltova, 27 August 1992 (3, leg. A. Barševskis); Limbaži d., Vīķi, 57°51'42"N 24°47'53"E, 22 August 2006 (2, leg. A. Barševskis); Madona d., Aiviekste vill., 56°40'73"N 25°59'04"E, 22 August 2006 (2, leg. A. Barševskis); Preiļi d., Jersika, Kurpnieki house, 15 May 2005 (2, leg. A. Barševskis), 23–24 June 2006 (1, leg. A. Barševskis, K. Barševska), 13 July 2006 (1, leg. K. Barševska), 15 July 2006 (10, leg. K. Barševska), 18 August 2006 (1, leg. A. Barševskis); Talsi d., Sabile, 'Abavas Rumba', 56°55'27"N 22°31'37"E, 19 July 2007 (3, leg. A. Pankjāns, A. Soldāns, U. Valainis, A. Barševskis); Ventspils d., Moricsala NR, Moricsala Isl., July 2003 (1, leg. U. Valainis), September 2003 (2, leg. U. Valainis), 14 May 2004 (2, leg. A. Barševskis), 29 May 2006 (2, leg. A. Barševskis).

Host plants: *Cruciferae*. Pests. Sometimes on *Salix* un *Quercus* (Pūtele 1960, 1984).

General distribution: HOR – In the Palaearctic region, distributed in Europe, Caucasus, Siberia, Far East, Sakhalin, Kazakhstan, Mongolia, China, Nepal, Tibet, Korea and Japan; known also from N America (Canada, USA) and the Oriental region (India, SE China, Taiwan, Bhutan, Burma, Vietnam, Thailand, Sumatra, Java, Malaysia, Singapore); introduced also to S Africa.

9. *Ph. ochripes* (Curtis, 1837)

References: Seidlitz 1887–1891; Rathlef 1905; Palij 1958; Pūtele 1960, 1970a, c, 1971, 1974; Telnov *et al.* 1997; Telnov 2004; Bukejs and Telnov (2007).

Examined material: 8 specimens: Daugavpils d., Daugavpils, 2 May 1993 (4, leg. A. Barševskis); Daugavpils d., Silene NP, Ilgas, June 1994 (1, leg. A. Barševskis); Jēkabpils d., Dunava, 25 July 1994 (1, leg. A. Barševskis), 23 March 1995 (1, valley of the Daugava River, leg. A. Barševskis), 1 June 2002 (1, leg. A. Barševskis).

Host plants: *Cruciferae* (mostly on *Alliaria petiolata*).

General distribution: ASE – Europe, Caucasus, Asia Minor, Iran, Siberia, Far East, Korea, Japan.

10. *Ph. exclamationis* (Thunberg, 1784)

syn.: brassicae (Olivier, 1789)

References: Fleischer 1829 (*Altica barssicae* Ill.); Pūtele 1960, 1968, 1970a, b, 1971, 1974, 1981, 1981a; Barševskis 1993; Telnov *et al.* 1997; Telnov 2004.

Examined material: 14 specimens: Daugavpils d., Daugavpils, 9 May 1998 (1, meadow, leg. A. Barševskis); Daugavpils d., Stropi, 30 April 2008 (3, swampy bank of Lake Lielais Stropu, leg. A. Bukejs); Jēkabpils d., Dunava, April 2002 (8, leg. A. Barševskis); Krāslava d., Izvalta, 21 August 1992 (1, Adama bog, leg. A. Barševskis); Krāslava d., Šķeltova, 9 May 1993 (1, leg. A. Barševskis).

Host plants: *Cruciferae* (mostly on *Cardamine pratensis*).

General distribution: SIE – Europe, Caucasus, Siberia, Far East.

11. *Ph. atra* (Fabricius, 1775) s. str.

References: Fleischer 1829; Ulanowski 1883; Tomsons 1940; Palij 1958; Pūtele 1958a, 1960, 1970a, c, 1974, 1981a; Ozols 1963; Spuris 1966, 1974; Priedītis and Pūtele (1976); Rupais and Kalniņa (1979); Barševskis 1993; Telnov *et al.* 1997; Telnov 2004.

Examined material: 218 specimens: Cēsis d., Katrīnkalns, 26 July 2007 (1, leg. A. Barševskis); Daugavpils d., Daugavpils city, 19 July 2007 (2, Mežciems, leg. K. Aksjuta, M. Murd), 8 August 2007 (1, leg. K. Aksjuta, M. Murd); Daugavpils d., Dviete, 52°02'84"N 26°20'73"E, 22 August 2006 (59, leg. A. Barševskis); Daugavpils d., Šēdere, Straumēni house, 26 August 2007 (2, leg. M. Murd); Daugavpils d., Stropi, 5 May 2008 (4, agrocenosis, on *Armoracia rusticana*, leg. A. Bukejs), 31 May 2008 (14, agrocenosis, on ra-dish, leg. A. Bukejs); Jēkabpils d., Dunava, 17 July 1993 (3, leg. A. Barševskis), 11 July 1994 (3, leg. A. Barševskis), 12 July 1994 (2, leg. A. Barševskis), 10–18 June 2006 (1, leg. K. Barševska), 14 September 2006 (4, leg. A. Barševskis); Krāslava d., Auleja, 7 August 2007 (1, bank of Lake Auleja, leg. M. Murd); Krāslava d., Šķeltova, Barševski house, 22 July 2007 (1, leg. A. Barševskis); Limbaži d., Salacgrīva, 27 July 2007 (6, near the sea, leg. A. Barševskis); Limbaži d., Vīķi, 57°51'42"N 24°47'53"E, 22 August 2006 (1, leg. A. Barševskis); Preiļi d., Aglona, 27 April 2007 (1, leg. M. Murd, A. Barševskis); Preiļi d., Jersika, 18 August 2006 (107, leg. A. Barševskis), 5 June 2007 (2, leg. A. Barševskis); Ventspils d., Ziras, 57°11'55"N 21°37'39"E, 28 July 2005 (2, bank of the Venta River, leg. A. Barševskis, A. Bukejs, U. Valainis).

Host plants: *Cruciferae*. Pest of cultivated *Cruciferae*.

General distribution: PAL – Europe, N Africa (Morocco), Siberia, Kazakhstan, Mongolia, Far East.

Note: Very frequent.

12. *Ph. cruciferae* (Goeze, 1777)

References: Seidlitz 1887–1891; Rathlef 1905; Palij 1958; Pūtele 1960; Ozols 1963; Telnov *et al.* 1997; Telnov 2004.

Examined material: Not confirmed by the author.

Host plants: various *Cruciferae*.

General distribution: CEM – Europe, N Africa, Asia Minor, Caucasus, Iran, Iraq, Afghanistan, W Siberia, Kazakhstan, Central Asia, Mongolia; reported also from Sudan and India; introduced to N America.

Note: Insufficiently known species.

13. *Ph. nigripes* (Fabricius, 1775) s. str.

References: Ulanowski 1883; Seidlitz 1887–1891; Rathlef 1905; Smarods and Liepa (1956); Trauberga 1957; Palij 1958; Pūtele 1958, 1960, 1970a, b, 1971; Ozols 1963; Rupais and Kalniņa (1979); Telnov *et al.* 1997; Telnov 2004.

Examined material: Not confirmed by the author.

Host plants: various *Cruciferae*.

General distribution: CEM – Europe, N Africa, Asia Minor, Israel, Caucasus, Iran, Afghanistan, southern part of W Siberia, Kazakhstan, Central Asia.

Note: Insufficiently known species.

ACKNOWLEDGMENTS

The author is grateful to the colleagues Kristīna Akšjūta, Arvīds Barševskis, Raimonds Cibulskis, Marina Murd, Ainārs Pankjāns, Uldis Valainis (DUBC, Daugavpils, LV), Maksims Balalaikins (Rēzekne, LV), Katrīna Barševska, Iveta Leiskina (Daugavpils, LV), Nikolajs Savenkovs (Rīga, LV) and the students of Daugavpils University for presented material.

Special thanks are given to Andrzej Warchalowski (Wrocław, Poland) for helpful comments.

The study was supported by VPD1/ESS/PIAA/04/NP/3.2.3.1/0003/0065 project.

REFERENCES

Barševskis, A. 1993. *The Beetles of Eastern Latvia*. Daugavpils: Saule (in Latvian, English summary).
 Barševskis, A., Savenkovs, N., Evarts-Bunders, P., Dāniele, I., Pētersons, G., Pilāts, V., Zviedre, E., Pilāte, D., Kalniņš, M., Vilks, K. and Poppels, A. 2002. *Silenes dabas parka fauna, flora un veģetācija*.

Daugavpils: Baltijas Koleopteroloģijas institūts (in Latvian).
 Bienkowski, A. O. 2004. *Leaf-beetles (Coleoptera: Chrysomelidae) of Eastern Europe. New key to subfamilies, genera and species*. Moscow: Mikron-print.
 Bukejs, A. 2008. To the knowledge of flea beetles (Coleoptera: Chrysomelidae: Alticinae) in the fauna of Latvia. 1. Genus *Chaetocnema* Stephens, 1831. *Acta Zoologica Lituonica* 18 (3): 191–198.
 Bukejs, A. and 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.
 Danka, L. and Stiprais, M. 1972. Einige Angaben über Insektenfauna der Gartenkolonie 'Dārziņi' bei Rīga. *Zooloģijas muzeja raksti* 8: 45–64 (in Latvian, German summary).
 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. and Döberl, M. 1997. General Distribution of the Flea Beetles in the Palaearctic Subregion (Coleoptera, Chrysomelidae: Alticinae). *Scopolia* 37: 1–496.
 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 (in Russian).
 Lindberg, H. 1932. Käfer, gesammelt in Lettland 1931. *Folia zoologica et hydrobiologica* 4 (2): 163–166.
 Lopatin, I. K. and Nesterova, O. L. 2005. *Insecta of Belarus: Leaf-Beetles (Coleoptera, Chrysomelidae)*. Minsk: Tehnoprint (in Russian, English abstract).
 Mohr, K. H. 1966. Chrysomelidae. In: H. Freude, K. Harde and G. Lohse (eds) *Die Käfer Mitteleuropas. Cerambycidae: Chrysomelidae* 9: 95–280. Frefeld: Goecke & Evers.
 Ozols, E. 1963. *Agricultural entomology, 2nd ed.* Rīga: Latvijas Valsts izdevniecība (in Latvian).
 Palij, V. F. 1958. On the fauna and biocenology of Latvian flea beetles. *Proceedings of the Institute of Biology of the Latvian SSR Academy of Sciences* 5: 69–89. [Палий, В. Ф. 1958. О фауне и биоценологии земляных блошек Латвии (Coleoptera, Chrysomelidae, Halticinae). *Труды Института биологии Академии наук Латвийской ССР* 5: 69–89.]
 Petrova, V., Čudare, Z. and Cibulskis, R. 2006. Predators and herbivores beetles (Coleoptera) naturally occurring on strawberry (Latvia). *Acta Biologica Universitatis Daugavpiliensis* 6 (1–2): 155–159.

- Pileckis, S. and Monsevičius, V. 1997. *Fauna of Lithuania: Beetles, 2*. Vilnius: Publishing House of Encyclopaedias and Scientific Literature. [Pileckis, S., Monsevičius, V. 1997. *Lietuvos Fauna. Vabalai, 2*. Vilnius: Mokslo ir enciklopedijų leidybos institutas.]
- 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.
- Priedītis, A. and Pūtele, V. 1976. Leaf-beetles (Coleoptera, Chrysomelidae) in agrocenoses of apple in Zemgale plain of Latvia. *Abstracts of reports of the scientific-practical conference 'Ways of implementation of progressive methods for the protection of agricultural plants, 28–30 June 1976'*: 96–98. Riga: Riga Polytechnical Institute Press. [Приедитис, А., Путеле, В. 1976. Листоеды (Chrysomelidae, Coleoptera) в агроценозе яблони Земгальской низменности Латвии. *Тезисы докладов научно-практической конференции „Пути внедрения прогрессивных методов защиты растений в с. х. производстве 28–30 июня 1976 г.“*: 96–98. Рига: Типогр. РПИ.]
- Pūtele, V. 1958a. Daži novērojumi par spradzū sugām Latvijas PSR. *Latvijas Lauksaimniecības akadēmijas raksti* 7: 83–92 (in Latvian, Russian summary).
- Pūtele, V. 1960. *Phyllotreta* Foudras ģints spradzī Latvijas PSR. *Latvijas entomologs* 1: 34–42 (in Latvian).
- Pūtele, V. 1968. New species of flea beetles in Latvia. *Abstracts of reports of the 6th Conference on Baltic Plant Protection*: 114–115. Tartu: *Estonian Academy of Agriculture*. [Путеле, В. О. 1968. Новые виды земляных блошек в Латвии. *Тезисы докладов VI научной конференции Прибалтийских республик по защите растений*: 114–115. Тарту: Эстонская сельско-хозяйственная академия.]
- Pūtele, V. 1970a. Species composition of flea beetles of the Latvian SSR. *Proceedings of the 7th Conference on Baltic Plant Protection* 1: 17–20. Jelgava. [Путеле, В. О. 1970. Видовой состав земляных блошек в Латвийской ССР. *Материалы 7-го Прибалтийского совещания по защите растений* 1: 17–20. Елгава.]
- 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. [Путеле, В. О. 1970. *Исследования по фауне и экологии земляных блошек (Coleoptera, Chrysomelidae, Halticinae) Латвийской ССР*. Автореферат диссертации, представленной на соискание учёной степени кандидата биологических наук. Елгава: Сельско-хозяйственная министерия Латвийской ССР.]
- Pūtele, V. 1971. Flea beetle fauna in Latvian SSR. *Proceedings of the XIII International Congress of Entomology* 1: 35–38.
- Pūtele, V. 1974. Leaf-beetles (Coleoptera, Chrysomelidae) discovered in the surroundings of Jelgava city. *Brief reports of a scientific conference on the protection of plants. Saku, 2–4 1974* (2): 55–58. Tallinn. [Путеле, В. О. 1974. Листоеды (Coleoptera, Chrysoelidae), выявленные в окрестностях города Елгава. *Краткие доклады научной конференции по защите растений, Саку, 2–4 1974 г.*, 2: 55–58. Таллин.]
- 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 the leaf-beetle fauna of the Slītere state nature reserve: reports. *Latvijas Lauksaimniecības akadēmijas raksti* 188: 12–19 (in Russian).
- Pūtele, V. 1981a. Studies on the leaf-beetle fauna of the Slītere state nature reserve: reports. *Mežsaimniecība un mežrūpniecība* 3: 42–44 (in Latvian).
- Pūtele, V. 1984. Leaf-beetles – pests of tree cultures in the Slītere state nature reserve. *Latvijas Lauksaimniecības akadēmijas raksti* 213: 9–15. [Путеле, В.О. 1984. Листоеды – вредители древесных культур в Государственном заповеднике «Слитере». *Latvijas Lauksaimniecības akadēmijas raksti* 213: 9–15.]
- Rathlef, H. 1905. *Coleoptera Baltica. Käfer-Verzeichnis der Ostseeprovinzen nach den Arbeiten von Ganglbauer und Reitter*. Dorpat: C. Mattiesen.
- Romantsov, P. V. 2007. A review of leaf beetles (Coleoptera, Chrysomelidae) of St. Petersburg and Leningrad province. *Entomological Reviews* 86 (2): 306–336. [Романцов, П. В. 2007. Обзор жуков-листоедов (Coleoptera, Chrysomelidae) Санкт-Петербурга и Ленинградской области. *Энтомологическое Обозрение* 86 (2): 306–336.]
- Rupais, A. and Kalniņa, V. 1979. *Krāšņumaugu aizsardzības rokasgrāmata*. Rīga: Liesma.
- Seidlitz, G. 1887–1891. *Fauna Baltica. Die Käfer (Coleoptera) der deutschen Ostseeprovinzen Russlands. 2 Auflage*. Königsberg.
- Silfverberg, H. 2004. Enumeratio nova Coleopterorum Fennoscandiae, Daniae et Baltiae. *Sahlbergia* 9: 1–111.
- Smarods, J. and Liepa, I. 1956. *Dārzeņu kaitēkļi un slimības*. Rīga: Latvijas Valsts izdevniecība.
- Spuris, Z. 1966. Vaboles – Coleoptera. *Latvijas dzīvnieki*: 177–187. Rīga: Zvaigzne.
- Spuris, Z. 1974. Cietspārni jeb vaboles – Coleoptera. *Latvijas dzīvnieku pasaule*: 139–151. Rīga: Liesma.
- Telnov, D. 2004. Check-List of Latvian Beetles (Insecta: Coleoptera). In: D. Telnov (ed.) *Compedium of Latvian Coleoptera* 1: 1–114. Rīga: Pertovskis & Co.
- Telnov, D., Barševskis, A., Savich, F., Kovalevsky, F.,

- Berdnikov, S., Doronin, M., Cibulskis, R. and Ratniece, D. 1997. Check-List of Latvian Beetles (Insecta: Coleoptera). *Mitteilungen des Internationalen Entomologischen Vereins*, Supplement V: 1–140.
- Tomsons, A. 1939–1940. Aizrādījumi cukurbiešu slimību un kaitēkļu apkarošanā. *Cukurbiešu kultūra un cukurrūpniecība* 3: 131–144.
- 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.
- Trauberga, O. 1957. Coleoptera – vaboles. *Latvijas PSR dzīvnieku noteicējs* 1: 455–592. Rīga: Latvijas Valsts izdevniecība.
- Ulanowski, A. 1883. Z fauny coleopterologiczney inflant polskich. *Sprawozdanie Komisji Fizyjograficznej* 18: 1–60.
- Vigna Taglianti, A., Audisio, P. A., Biondi, M., Bologna, M. A., Carpaneto, G. M., De Biase, A., Fattorini, S., Piattella, E., Sindaco, R., Venchi, A. and 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.
- Warchalowski, A. 2003. *The leaf-beetles (Chrysomelidae of Europe and the Mediterranean region*. Warszawa: Natura optima dux Foundation.
- KRYŽMAŽIEDĒS SPRAGĒS (COLEOPTERA: CHRYSOMELIDAE: ALTICINAE) LATVIJOS FAUNOJE. 2. GENTIS *PHYLLOTRETA* CHEVROLAT, 1836**
- A. Bukejs*
- SANTRAUKA**
- Publikuojami nauji duomenys apie 11 Latvijoje aptinkamų *Phyllotreta* genties (Chevrolat, 1836) rūšių. Kryžmažiedė spragė *Phyllotreta dilatata* Thomson, 1866 Latvijoje užregistruota pirmą kartą. Apibendrinta bibliografinė medžiaga ir pateikiamas 13 Latvijos *Phyllotreta* rūšių sąrašas. Duomenys surinkti ištyrus 829 *Phyllotreta* genties individus iš Daugpilio universiteto Sistematinės biologijos instituto kolekcijos.
- Received: 25 June 2008*
Accepted: 13 August 2008