

CATALOGUE OF LATVIAN SILPHIDAE (INSECTA: COLEOPTERA)

Andris Bukejs, Marina Janovska

Bukejs A., Janovska M. 2019. Catalogue of Latvian Silphidae (Insecta: Coleoptera). *Acta Biol. Univ. Daugavp.*, 19 (1): 17 – 29.

A critical annotated catalogue of Silphidae species recorded in Latvia is presented. In total, 20 species belonging to 8 genera and two subfamilies are confirmed for Latvia. A complete bibliography of Latvian large carrion beetles is reviewed and analysed. The brief research history of Latvian Silphidae is presented. The Latvian silphid fauna is represented by five chorotypes. Species with wide distribution are prevailing: Asiatic-European (8 species or 40.0%), Palearctic (4 species or 20.0%), and Centralasiatic-European (4 species or 20.0%).

Key words: large carrion beetles, Silphidae, Latvia, fauna, catalogue, biogeography, biodiversity..

Andris Bukejs, Marina Janovska. *Daugavpils University, Institute of Life Sciences and Technology, Vienības Str. 13, Daugavpils, LV - 5401, Latvia, E-mail: carabidae@inbox.lv, marina.janovska@biology.lv*

INTRODUCTION

Silphidae is divided into two subfamilies Silphinae and Nicrophorinae, and contains about 200 species in 15 genera worldwide (Bouchard et al. 2011, Ślipiński et al. 2011). The family has a worldwide distribution but is predominant in Holarctic (temperate regions) (Sikes 2005, 2008). The most of silphids are necrophagous and feed on carrion; members of few genera (e.g. *Ablattaria* Reitter, *Dendroxena* Motschulsky and *Phosphuga* Leach) are specialised predators of small invertebrates (snails, slugs and caterpillars) or phytophagous (genus *Aclypea* Reitter) (Nikolajev & Kozminykh 2002, Sikes 2005, 2008, Pushkin 2015). Large carrion beetles perform vital ecosystem function of contributing to the breakdown and recycling of organic matter within the terrestrial ecosystem (Peck 1990, Kalinova et al. 2009, Dekeirsschieter et al. 2011).

The first information on large carrion beetles from the present territory of Latvia was published in the second half of the 18th century by J.B. Fischer (1778, 1784, 1791). In the first edition of his monograph “*Versuch einer Naturgeschichte von Livland*”, which introduced the natural history of Livland (Fischer 1778), three species of *Silpha* were mentioned: *Silpha littoralis* L. [*Necrodes littoralis* (Linnaeus)]; *Silpha seminulum* L. [according to Perreau (2004), it is *Agathidium seminulum* (Linnaeus, 1758) (Leiodidae)]; and *Silpha aquatica* L. [according to Hansen (2004), it is *Helophorus aquaticus* (Linnaeus, 1758) (Helophoridae)]. After some additions (Fischer 1784), in the second edition of his monograph, Fischer (1791) already were mentioned eight *Silpha* species. Of them three species only belong to Silphidae, namely *S. littoralis* L. [*Necrodes littoralis* (Linnaeus)], *Silpha oscura* L., and *S.*

vespillo L. [*Nicrophorus vespillo* (Linnaeus)]. Other five listed *Silpha* species belongs to another Coleoptera families: *Silpha aquatica* L. [according to Hansen (2004), it is *Helophorus aquaticus* (Linnaeus, 1758) (Helophoridae)]; *Silpha ferruginea* L. [according to Kolibáč (2007), it is *Peltis ferruginea* Linnaeus, 1758 (Trogossitidae)]; *Silpha quadripustulata* L. [according to Jelínek & Audisio (2007), *Silpha quadripustulata* Linnaeus, 1761 is synonym of *Silpha quadripunctata* Linnaeus, 1758 and this taxon belong to sap beetle genus *Glischrochilus* Reitter, 1873, *G. quadripunctatus* Linnaeus, 1758 (Nitidulidae)]; *Silpha sabulosa* L. [according to Iwan & Löbl (2008), it is *Opatrum sabulosum* Linnaeus, 1760 (Tenebrionidae)]; and *Silpha seminulum* L. [according to Perreau (2004), it is *Agathidium seminulum* (Linnaeus, 1758) (Leiodidae)].

In “Beschreibungen der Provinz Kurland” (Groschke 1805), the author mentioned *Silpha vespillo* L. [*Nicrophorus vespillo* (Linnaeus)], *Silpha quadripustulata* L. [according to Jelínek & Audisio (2007), belong to genus *Glischrochilus* Reitter, 1873 (Nitidulidae), see comment above], *Silpha littoralis* L. [*Necrodes littoralis* (Linnaeus)], *Silpha atrata* L. [*Phosphuga atrata* (Linnaeus)] and *Silpha rugosa* L. [*Thanatophilu rugosus* (Linnaeus)].

In the monograph devoted to the beetle fauna of “Ostseeprovinzen” (Fleischer 1829), six large carrion beetles were mentioned: *Dendroxena quadrimaculata* (Scopoli) [listed as *Silpha quadripunctata*], *Necrodes littoralis* (Linnaeus) [as *Silpha*], *Silpha tristis* Illiger, *Thanatophilu dispar* (Herbst) [as *Silpha*], *Nicrophorus investigator* Zetterstedt [as *Necrophorus*], and *Nicrophorus vespillo* (Linnaeus) [as *Necrophorus*].

At the end of the 19th century, Seidlitz’s monograph “Fauna Baltica” (Seidlitz 1872-1875, 1887-1891) was published. In this monograph, keys to families, genera and species of the Baltic Coleoptera (including potential ones) were presented. Unfortunately, not all data on localities were provided. In the

second edition of the monograph Seidlitz (1887-1891), 12 species of Silphinae and 7 species of Nicrophorinae were mentioned.

At the beginning of the 20th century, another checklist of Baltic Coleoptera was published (Rathlef 1905). In this list, 19 species of Silphidae were reported for Latvia.

A few other papers containing faunal data on large carrion beetles were published at the beginning of the 20th century (Heyden 1903, Lindberg 1932, Lackschewitz & Mikutowicz 1939).

Four silphid species, namely *Necrodes littoralis* (Linnaeus), *Nicrophorus germanicus* (Linnaeus), *N. vespillo* (Linnaeus), and *N. vespilloides* Herbst, were recorded in Latvian storehouses (Vītols 1941).

Few species were mentioned as pest of agriculture (Tomsons 1939-1940, 1940, Danka 1950, Smarods & Liepa 1956).

Fragmentary information on Latvian Silphidae can also be found in Trauberga (1957), Brammanis (1930), Stiprais & Varzinska (1985), Barševskis (1988a, 1988b, 1997), Barševskis & Savenkovs (1991), Cibulskis (1995, 1997), Telnov (1996), and Cinītis (1997).

In monograph “The Beetles of Eastern Latvia” (Barševskis 1993), faunal data on fifteen silphid species are presented.

As for specially protected nature territories, 16 species of Silphidae are known from Silene Nature Park (Barševskis 2002), and 17 species – from Gauja National Park (Kalniņš et al. 2007).

During the last decades, Gailis & Vilks (2001), Spunģis (2002), Barševskis et al. (2004, 2008, 2009), Telnov et al. (2005, 2010), Bukejs (2006), Telnov & Salmane (2015), and Roze & Barševskis (2018) have also provided fragmentary faunal data on Latvian large carrion beetles.

The catalogues of Latvian Coleoptera (Telnov et al. 1997, Telnov 2004) list 19 species of Silphidae.

Two papers especially devoted to Latvian Silphidae: Šmits (1975) present faunal data on 19 species, but Murd & Barševskis (2007) given faunal data on 16 silphid species.

The aim of the current work is to critically summarize previous bibliographical data, to compile the annotated catalogue of Latvian Silphidae according to modern systematics, and to provide biogeographical analysis of the Latvian fauna of large carrion beetles.

MATERIAL AND METHODS

Taxa listed in the current catalogue are arranged in tribes and subfamilies. The order of higher taxa follows the Catalogue of Palaearctic Coleoptera, volume 2, chapter Silphidae (Růžička & Schneider 2004; Růžička 2015) and Bouchard et al. (2011), synonymy and nomenclature for the species-rank taxa were used in accordance with Sikes et al. (2002), Růžička & Schneider (2004), Růžička (2015). Species and genera are listed alphabetically.

The species certainly recorded from Latvia are marked with index number. Synonyms and references follow species names. For some species a Note is presented.

The general distribution of the species was analysed according to Lafer (1989), Peck & Miller (1993), Peck (2001), Nikolajev & Kozminykh (2002), Sikes et al. (2002), Růžička & Schneider (2004), Pushkin (2015), Růžička (2015), Ghahari & Háva (2015), and Çiftçi et al. 2018. The classification of chorotypes follows the one suggested by Taglianti *et al.* (1999). Abbreviations of chorotypes: OLA – Holarctic, PAL – Palaearctic, ASE – Asiatic-European, CAE – Centralasiatic-European, and WPA – West Palaearctic.

ANNOTATED CATALOGUE OF LATVIAN SILPHIDAE

Family Silphidae Latreille, 1806 Subfamily Silphinae Latreille, 1806

Genus *Aclypea* Reitter, 1885 = *Blitophaga* Reitter, 1885

1. *Aclypea opaca* (Linnaeus, 1758)

- = *hirta* Herbst, 1783
- = *tomentifera* Reitter, 1907
- = *tomentosa* Villers, 1789
- = *villosa* Naezén, 1792
- = *villosa* Reitter, 1887

Precht 1818 (*Silpha*); Seidlitz 1872-1875 (*Silpha*), 1887-1891 (*Silpha*); Rathlef 1905 (*Blitophaga*); Tomsons 1939-1940, 1940; Ozols 1948; Danka 1950; Eglītis 1954; Smarods & Liepa 1956; Trauberga 1957; Ozols 1963, 1973; Šmits & Spuris 1966; Šmits 1975; Barševskis 1988a, 1988b, 1993 (*Blitophaga*), 2002; Telnov et al. 1997; Silfverberg 2004, 2010; Růžička & Schneider 2004; Telnov 2004; Murd & Barševskis 2007; Kalniņš et al. 2007; Růžička 2015.

2. *Aclypea undata* (O.F. Müller, 1776)

- = *cancellata* Gmelin, 1790
- = *kindermanni* Faust, 1877
- = *reticulata* Fabricius, 1787
- = *verrucosa* Faldermann, 1835

Precht 1818 (*Silpha reticulata*); Seidlitz 1872-1875 (*Silpha*), 1887-1891 (*Silpha*); Rathlef 1905 (*Blitophaga*); Tomsons 1940; Trauberga 1957; Ozols 1963, 1973; Šmits 1975; Barševskis 1993, 2002; Telnov et al. 1997; Silfverberg 2004, 2010; Růžička & Schneider 2004; Telnov 2004; Murd & Barševskis 2007; Růžička 2015.

Note: Insufficiently known species, known from few localities.

Genus *Dendroxena* Motschulsky, 1858

- = *Xylodrepa* Thomson, 1859

3. *Dendroxena quadrimaculata* (Scopoli, 1771)

- = *flavicans* Goeze, 1777 (*Silpha*)

= *hexapunctata* Gerhard, 1897 (*Silpha*)
 = *maculata* Geoffroy, 1785 (*Peltis*)
 = *quadripunctata* (Schreber, 1759) nec
 (Linnaeus, 1758)
 Fleischer 1829 (*Silpha quadripunctata*);
 Seidlitz 1872-1875 (*Silpha*), 1887-1891
 (*Silpha quadripunctata* L.); Rathlef 1905
 (*Xylodrepa quadripunctata* L.); Lindberg 1932
 (*Xylodrepa quadripunctata*); Lackschewitz &
 Mikutowicz 1939 (*Xylodrepa quadripunctata*
 L.); Šmits 1975 (*Xylodrepa quadripunctata* L.);
 Telnov 1996, 2004; Cinišis 1997 (*Xylodrepa*
quadripunctata L.); Telnov et al. 1997, 2005;
 Gailis & Vilks 2001; Silfverberg 2004, 2010;
 Rūžička & Schneider 2004; Murd & Barševskis
 2007; Kalniņš et al. 2007; Barševskis et al.
 2012; Rūžička 2015.

Note: Officially protected species in Latvia.

Genus *Necrodes* Leach, 1815

= *Asbolus* (Bergroth, 1884)

4. *Necrodes littoralis* (Linnaeus, 1758)

= *clavipes* Sulzer, 1776
 = *contusus* Bergsträsser, 1778
 = *curtis* Leach, 1815
 = *femoratus* O.F. Müller, 1776
 = *gibbosus* Geoffroy, 1785
 = *lividus* Herbst, 1783
 = *rufoclavatus* DeGeer, 1774

Fischer 1778 (*Silpha*), 1791 (*Silpha*); Groschke
 1805 (*Silpha*); Precht 1818 (*Silpha*); Fleischer
 1829 (*Silpha*); Seidlitz 1872-1875 (*Silpha*),
 1887-1891 (*Silpha*); Rathlef 1905; Vītols 1941;
 Trauberga 1957; Danka & Stiprais 1972; Šmits
 1975; Stiprais & Varzinska 1985; Barševskis
 1988a, 1988b, 1993, 2002; Telnov et al. 1997;
 Silfverberg 2004, 2010; Rūžička & Schneider
 2004; Murd & Barševskis 2007; Telnov 2004;
 Kalniņš et al. 2007; Rūžička 2015.

Genus *Oiceoptoma* Leach, 1815

5. *Oiceoptoma thoracicum* (Linnaeus, 1758)

= *golowatschowii* Lindermann, 1865

Precht 1818 (*Silpha thoratica*); Kawall 1865

(*Silpha*); Seidlitz 1872-1875 (*Silpha*), 1887-
 1891 (*Silpha*); Heyden 1903 (*Oiceoptoma*);
 Rathlef 1905 (*Oiceoptoma*); Danka 1950
 (*Silpha*); Trauberga 1957 (*Oiceoptoma*
thoracicum L. and *Silpha thoracica* L.); Spuris
 1974; Šmits 1975; Stiprais & Varzinska 1985;
 Barševskis 1988a, 1988b, 1993, 2002; Telnov
 et al. 1997; Silfverberg 2004, 2010; Rūžička
 & Schneider 2004; Telnov 2004; Bukejs
 2006; Murd & Barševskis 2007; Kalniņš et al.
 2007; Spuņģis 2008; Rūžička 2015; Roze &
 Barševskis 2018.

Genus *Phosphuga* Leach, 1817

6. *Phosphuga atrata atrata* (Linnaeus, 1758)

= *brunnea* Herbst, 1793
 = *cassidea* Kraatz, 1876
 = *fusca* Herbst, 1793
 = *nitida* Faldermann, 1835
 = *paedemontana* Fabricius, 1775
 = *punctata* DeGeer, 1774
 = *punctata* Herbst, 1786
 = *rostrata* Reitter, 1885
 = *subparallela* Reitter, 1885

Groschke 1805 (*Silpha*); Precht 1818 (*Silpha*);
 Kawall 1866 (*Silpha*); Seidlitz 1872-1875
 (*Silpha*), 1887-1891 (*Silpha*); Heyden 1903
 (*Silpha*); Rathlef 1905; Trauberga 1957; Spuris
 1974; Šmits 1975; Rūtenberga 1992; Barševskis
 1988a, 1988b, 1993, 2002; Telnov et al. 1997;
 Silfverberg 2004, 2010; Rūžička & Schneider
 2004; Telnov 2004; Bukejs 2006; Murd &
 Barševskis 2007; Kalniņš et al. 2007; Rūžička
 2015; Roze & Barševskis 2018.

Genus *Silpha* Linnaeus, 1758

7. *Silpha carinata* Herbst, 1783

= *bilineata* Reitter, 1901
 = *recta* Marsham, 1802
 = *rufocincta* Reitter, 1901
 = *trilineata* Gmelin, 1790

Seidlitz 1872-1875, 1887-1891; Rathlef 1905;
 Šmits 1975; Telnov et al. 1997; Silfverberg
 2004, 2010; Spuņģis 2002; Rūžička & Schneider
 2004; Telnov 2004; Kalniņš et al. 2007; Rūžička
 2015.

Note: Insufficiently known species, probably rare; recorded from only a few localities.

8. *Silpha obscura obscura* Linnaeus, 1758

Fischer 1791; Precht 1818; Seidlitz 1872-1875, 1887-1891; Rathlef 1905; Lackschewitz & Mikutowicz 1939; Danka 1950; Priedītis 1958; Trauberga 1957; Šmits 1975; Barševskis 1988b, 1993, 1997, 2002; Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004; Kalniņš et al. 2007; Barševskis et al. 2004, 2008, 2009; Murd & Barševskis 2007; Spuņģis 2008; Rūžička 2015.

9. *Silpha tristis* Illiger, 1798

= *dalmatina* Küster, 1851
= *granulata* Thunberg, 1794

Fleischer 1829; Seidlitz 1872-1875, 1887-1891; Rathlef 1905; Lackschewitz & Mikutowicz 1939; Šmits 1975; Stiprais & Varzinska 1985; Barševskis 1988a, 1988b, 1993, 2002; Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004; Petrova et al. 2006; Murd & Barševskis 2007; Kalniņš et al. 2007; Barševskis et al. 2004, 2008, 2009, 2012; Rūžička 2015; Roze & Barševskis 2018.

Genus *Thanatophilus* Leach, 1815

10. *Thanatophilus dispar* (Herbst, 1793)

= *abscissus* Laicharting, 1781
= *frigidus* J. Sahlberg, 1889

Fleischer 1829 (*Silpha*); Seidlitz 1872-1875 (*Silpha*), 1887-1891 (*Silpha*); Rathlef 1905; Šmits 1975; Barševskis 1993, 2002; Cibulskis 1995, 1997; Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004; Bukejs 2006; Murd & Barševskis 2007; Kalniņš et al. 2007; Rūžička 2015.

11. *Thanatophilus rugosus* (Linnaeus, 1758)

= *complicatus* Geoffroy, 1785
= *grossulus* Bergsträsser, 1778
= *parimaribous* Herbst, 1793
= *scaber* Scopoli, 1763

Groschke 1805 (*Silpha rugosa*); Precht 1818 (*Silpha*); Kawall 1865 (*Silpha*); Seidlitz 1872-1875 (*Silpha*), 1887-1891 (*Silpha*); Rathlef 1905; Trauberga 1957; Danka & Stiprais 1972

(sic! *Tanathophilus*); Šmits 1975; Stiprais & Varzinska 1985; Barševskis 1988a, 1988b, 1993, 2002; Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004; Bukejs 2006; Murd & Barševskis 2007; Kalniņš et al. 2007; Spuņģis 2008; Rūžička 2015; Roze & Barševskis 2018.

12. *Thanatophilus sinuatus* (Fabricius, 1775)

= *appendiculatus* Fuessli, 1775
= *pellaecephalus* Bergsträsser, 1778
= *unicostatus* Laporte, 1832

Precht 1818 (*Silpha*); Seidlitz 1872-1875 (*Silpha*), 1887-1891 (*Silpha*); Rathlef 1905; Brammanis 1930; Trauberga 1957; Danka & Stiprais 1972 (sic! *Tanathophilus*); Šmits 1975; Barševskis 1988a, 1988b, 1993, 2002; Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004; Bukejs 2006; Murd & Barševskis 2007; Kalniņš et al. 2007; Spuņģis 2008; Rūžička 2015; Roze & Barševskis 2018.

Subfamily *Nicrophorinae* Kirby, 1837

genus *Nicrophorus* Fabricius, 1775

= *Cyrtoscelis* Hope, 1840

13. *Nicrophorus germanicus* (Linnaeus, 1758)

= *apicalis* Kraatz, 1880
= *bimaculatus* Haworth, 1807
= *bipunctatus* Kraatz, 1880
= *cadaverinus* Gistel, 1857
= *frontalis* Fischer von Waldheim, 1844
= *listerianus* Geoffroy, 1785
= *speciosus* Schulze, 1775

Precht 1818 (*Necrophorus*); Seidlitz 1872-1875 (*Necrophorus*), 1887-1891 (*Necrophorus*); Rathlef 1905 (*Necrophorus*); Vītols 1941 (*Necrophorus*); Trauberga 1957 (*Necrophorus*); Šmits 1975 (*Necrophorus*); Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004; Rūžička 2015.

Note: This very rare species is only known from a few localities in western Latvia. North border of main distribution area.

14. *Nicrophorus humator* (Gleditsch, 1767)= *nigerrimus* Kraatz, 1884= *sulcatus* Fischer von Waldheim, 1844

Precht 1818 (*Necrophorus*); Seidlitz 1872-1875 (*Necrophorus*), 1887-1891 (*Necrophorus*); Rathlef 1905 (*Necrophorus*); Lackschewitz & Mikutowicz 1939 (*Necrophorus*); Danka 1950 (*Necrophorus*); Trauberga 1957 (*Necrophorus*); Šmits 1975 (*Necrophorus*); Stiprais & Varzinska 1985 (*Necrophorus*); Barševskis 1988a, 1988b, 1993, 2002; Barševskis & Savenkons 1991; Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004; Murd & Barševskis 2007; Kalniņš et al. 2007; Rūžička 2015; Roze & Barševskis 2018.

15. *Nicrophorus interruptus* Stephens, 1830= *basalis* Gistel, 1848= *brunnipes* Gradl, 1882= *fossor* Erichson, 1837

Seidlitz 1872-1875 (*Necrophorus*), 1887-1891 (*Necrophorus*); Rathlef 1905 (*Necrophorus*); Šmits 1975 (*Necrophorus*); Barševskis 1988a (*fossor* Erichson), 1988b (*fossor* Erichson), 1993 (*fossor* Erichson), 2002 (*fossor* Erichson); Cibulskis 1997 (*fossor* Erichson); Telnov et al. 1997 (*fossor* Erichson); Silfverberg 2004 (*fossor* Erichson), 2010 (*fossor* Erichson); Rūžička & Schneider 2004; Telnov 2004; Bukejs 2006 (*fossor* Erichson); Murd & Barševskis 2007 (*fossor* Erichson); Kalniņš et al. 2007 (*fossor* Erichson); Rūžička 2015..

16. *Nicrophorus investigator* Zetterstedt, 1824= *confossor* J.L. LeConte, 1854= *funeror* Reitter, 1885= *intermedius* Reitter, 1895= *maritimus* Mannerheim, 1843= *microcephalus* Thomson, 1862= *melsheimeri* Kirby, 1837= *particeps* Fischer von Waldheim, 1844= *ruspator* Erichson, 1837

Fleischer 1829 (*Necrophorus*); Seidlitz 1872-1875 (*Necrophorus*), 1887-1891 (*Necrophorus*); Rathlef 1905 (*Necrophorus*); Brammanis 1930 (*Necrophorus*); Šmits 1975 (*Necrophorus*); Barševskis 1988a, 1988b, 1993, 2002; Cibulskis 1997; Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004;

Bukejs 2006; Murd & Barševskis 2007; Kalniņš et al. 2007; Spuņģis 2001, 2008; Rūžička 2015.

17. *Nicrophorus sepultor* Charpentier, 1825= *obrutor* Erichson, 1837

Telnov 1996, 2004; Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Barševskis et al. 2004; Telnov et al. 2010; Kalniņš et al. 2007; Rūžička 2015.

Localities: Sveta, Gulbitis (Barševskis et al. 2004); Sigulda, Kolka (Telnov 1996); Sigulda (Telnov et al. 2010);

Note: Insufficiently known species, known from few localities.

18. *Nicrophorus vespillo* (Linnaeus, 1758)= *bifasciatus* Hausmann, 1799= *cadaverinus* Gravenhorst, 1807= *curvipes* Duftschmid, 1825= *hadenius* Gistel, 1857= *spinipes* Leach, 1815= *vulgaris* Fabricius, 1775

Fischer 1784 (*Silpha*); Groschke 1805 (*Silpha vespillo*); Precht 1818 (*Necrophorus*); Fleischer 1829 (*Necrophorus*); Seidlitz 1872-1875 (*Necrophorus*), 1887-1891 (*Necrophorus*); Heyden 1903 (*Necrophorus*); Rathlef 1905 (*Necrophorus*); Brammanis 1930 (*Necrophorus*); Vītols 1941; Danka 1950 (*Necrophorus*); Trauberga 1957 (*Necrophorus*); Danka & Stiprais 1972; Spuris 1974; Šmits 1975 (*Necrophorus*); Barševskis 1988a, 1988b, 1993, 2002; Telnov et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004; Bukejs 2006; Murd & Barševskis 2007; Kalniņš et al. 2007; Spuņģis 2001, 2008; Rūžička 2015; Roze & Barševskis 2018.

19. *Nicrophorus vespilloides* Herbst, 1783= *hebes* Kirby, 1837= *mortuorum* Fabricius, 1792= *pygmaeus* Kirby, 1837= *sylvaticus* Reitter, 1895

Seidlitz 1872-1875 (*Necrophorus*), 1887-1891 (*Necrophorus*); Rathlef 1905 (*Necrophorus*); Vītols 1941 (*Necrophorus*); Trauberga 1957 (*Necrophorus*); Šmits 1975 (*Necrophorus*); Stiprais & Varzinska 1985 (*Necrophorus*); Barševskis 1988a, 1988b, 1993, 2002; Telnov

et al. 1997; Silfverberg 2004, 2010; Rūžička & Schneider 2004; Telnov 2004; Petrova et al. 2006; Bukejs 2006; Murd & Barševskis 2007; Kalniņš et al. 2007; Spuņģis 2001, 2008; Rūžička 2015; Roze & Barševskis 2018.

20. *Nicrophorus vestigator* Herschel, 1807

= *anglicus* Stephens, 1830

= *brullei* Jakobson, 1910

= *interruptus* Brulle, 1832

= *interruptus* Gistel, 1857

= *olfactor* Gistel, 1848

= *sepultor* Gyllenhal, 1827

Seidlitz 1872-1875 (*Nicrophorus*), 1887-1891 (*Nicrophorus*); Rathlef 1905 (*Nicrophorus*); Danka 1950 (*Nicrophorus*); Šmits 1975 (*Nicrophorus*); Barševskis 2002; Silfverberg 2004, 2010.

Table 1. Comparison of the Silphidae fauna in Latvia (LV), Lithuania (LT), Estonia (EE), and Belarus (BY)

Taxa		Number of species			
		LV	LT	EE	BY
Silphinae					
	<i>Ablattaria</i>	-	-	1	1
	<i>Aclypea</i>	2	2	2	2
	<i>Dendroxena</i>	1	1	1	1
	<i>Nicrodes</i>	1	1	1	1
	<i>Oiceoptoma</i>	1	1	1	1
	<i>Phosphuga</i>	1	1	1	1
	<i>Silpha</i>	3	3	3	3
	<i>Thanatophilus</i>	3	3	4	3
Nicrophorinae					
	<i>Nicrophorus</i>	8	7	7	9
	Total	20	19	21	22

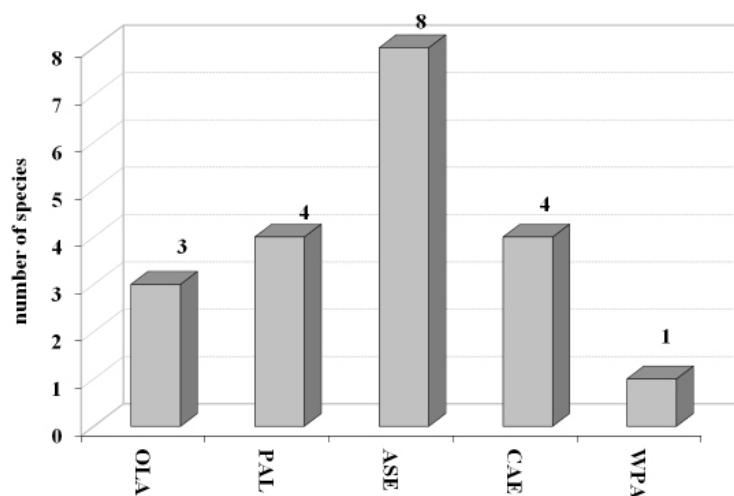


Fig. 1. Biogeographical structure of the Latvian Silphidae fauna: OLA – Holarctic, PAL – Palearctic, ASE – Asiatic-European, CAE – Centralasiatic-European, and WPA – West Palearctic.

Note: Insufficiently known species, known from few localities.

TAXONOMICAL STRUCTURE OF THE LATVIAN SILPHIDAE FAUNA

In Latvian fauna, 20 species belonging to 8 genera and 2 subfamilies of Silphidae are known. The number of known species in adjacent territories varies slightly (Table 1): 21 species in Estonia (Silfverberg 2010), 19 species in Lithuania (Tamutis et al. 2011), 22 species in Belarus (Alexandrovitch et al. 1996; Rūžička & Schneider 2004; Rūžička 2015).

BIOGEOGRAPHY OF LATVIAN SILPHIDAE

Ten chorotypes represent the Latvian fauna of large carrion beetles:

Holarctic – 3 species (15.0%): *Aclypea opaca*, *Nicrophorus investigator*, *N. vespilloides*;

Palaeartic – 4 species (20.0%): *Dendroxena quadrimaculata*, *Thanatophilu sinuatus*, *Nicrophorus humator*, *N. interruptus*;

Asiatic-European – 8 species (40.0%): *Necrodes littoralis*, *Oiceoptoma thoracicum*, *Phosphuga atrata*, *Silpha carinata*, *S. obscura*, *Thanatophilu dispar*, *Th. rugosus*, *Nicrophorus vespillo*;

Centralasiatic-European – 4 species (20.0%): *Aclypea undata*, *Nicrophorus germanicus*, *N. sepultor*, *N. vestigator*;

West Palaeartic – 1 species (5.0%): *Silpha tristis*.

The analysis of the distribution of Latvian Silphidae species shows that the range of chorotypes is rather limited. Species with wide distribution are prevailing. Asiatic-European (8 species or 40.0%), Palaeartic (4 or 20.0%), and Centralasiatic-European (4 or 20.0%) species are considered to be predominant (Fig. 1).

REFERENCES

Part A. Bibliography on Latvian Silphidae

- Barševskis A. 1988a. Materials about the beetle fauna in the old valley of the river Daugava between the towns Krāslava and Daugavpils. *Latvijas Entomologs*, 31: 35 – 38.
- Barševskis A. 1988b. Фаунистические исследования жуков юго-восточной части Латвии в различных биотопах. [Faunal investigations on beetles in various habitats of the south-eastern part of Latvia]. In: *Экологическое воспитание в средней и высшей школе [Ekologischesкое vospitanie v srednej i vysshej shkole]*. Даугавпилс, ДПИ: 63 – 75. [in Russian]
- Barševskis A. 1993. *The Beetles of Eastern Latvia*. Saule, Daugavpils: 221 pp. [in Latvian, English summary]
- Barševskis A. 1997. Materials about Latvian beetles (Coleoptera). *Acta coleopterologica latvica*, 1 (2): 63 – 71.
- Barševskis A. 2002. Vaboļu kārta (Coleoptera). In: Barševskis A., Savenkovs N., Evarts-Bunders P., Daniele I., Pētersons G, Pilāts V., Zviedre E., Pilāte D., Kalniņš M., Vilks K., Poppels A. (Eds.) *Silenes dabas parka fauna, flora un veģetācija [Fauna, flora and vegetation of Silene Nature Park]*. Baltijas Koleopteroloģijas institūts, Daugavpils: 37 – 60.
- Barševskis A., Bukejs A., Anichtchenko A. 2008. Faunistic records of the beetles (Hexapoda: Coleoptera) in Latvia. 2. *Acta Biologica Universitatis Daugavpiliensis*, 8 (2): 227 – 258.
- Barševskis A., Cibulskis R., Shavrin A., Anichtchenko A., Valainis U., Balalaikins M., Vorobjova I., Litvinceva J. 2012. Faunistic records of the beetles (Hexapoda: Coleoptera) in Latvia. 4. *Acta Biologica*

- Univervsitatis Daugavpiliensis*, 12 (4): 85 – 117.
- Barševskis A., Janovska M., Aksjuta K., Cibulskis R. 2009. Faunistic records of the beetles (Hexapoda: Coleoptera) in Latvia. 3. *Acta Biologica Universitatis Daugavpiliensis*, 9 (2): 139 – 159.
- Barševskis A., Savenkovs N. 1991. Piedrujas sauso pļavu vaboļu īpatnības [Peculiarities of the beetles fauna on dry meadows in Piedruja]. In: *Kultūrvides veidošanas problēmas Daugavas ielejā*. Daugavpils: 5 – 7. [in Latvian]
- Barševskis A., Valainis U., Bičevskis M., Savienkovs N., Cibulskis R., Kalniņš M., Strode N. 2004. Faunistic records of the beetles (Hexapoda: Coleoptera) in Latvia. 1. *Acta Biologica Universitatis Daugavpiliensis*, 4 (2): 93 – 106.
- Brammanis L. 1930. Zur Kenntnis der Coleopterenfauna des Saatkampesschutzgrabens in der Oberforstei Intschukalms (Hinzenberg). [Pētījumi Inčukalna virsmežniecības stādu audzētavas aizsarggrāvja Coleoptera faunas pazīšanai.] *Folia zoologica et hydrobiologica*, 2 (1): 129 – 135. [in Latvian, German summary]
- Bukejs A. 2006. Materials about the fauna of beetles (Insecta: Coleoptera) of Naujene rural municipality (Daugavpils district, Latvia). Part 1. *Acta Biologica Universitatis Daugavpiliensis*, 6 (1-2): 65 – 75.
- Cibulskis R. 1995. Retas vaboļu (Coleoptera) sugas no Liksnas un Vaboles pagastiem [Rare species of beetles (Coleoptera) from Likсна and Vabole municipalities territory]. DPU DIVIC Informatīvais biļetens IB, 9: 9 – 10 [in Latvian, English summary].
- Cibulskis R. 1997. Materials about new and rare species of beetles in fauna of Latvia [Materiāli par Latvijas faunai jaunām un retām vaboļu (Coleoptera) sugām]. *Acta coleopterologica latvica*, 1 (2): 72 – 76 [in Latvian, English summary].
- Cinītis M. 1997. New and rare species of beetle (Coleoptera) in fauna of Latvia [Latvijas faunai jaunas un retas vaboļu (Coleoptera) sugas]. *Acta coleopterologica latvica*, 1 (2): 77 – 80 [in Latvian, English summary].
- Danka L. 1950. *Derīgas un kaitīgas vaboles*. Rīga, Latvijas Valsts Izdevniecība: 117 pp. [in Latvian]
- Danka L., Stiprais M. 1972. [Einige Angaben über Insektenfauna der Gartenkolonie „Dārziņi” bei Rīga] Dažas ziņas par Pierīgas dārzu kolonijas „Dārziņi” kukaiņu faunu. *Zooloģijas muzeja raksti*, 8: 45 – 64. (in Latvian, German summary).
- Eglītis V. [Эглитис В. К.] 1954. Фауна почв Латвийской ССР. Рига, изд-во АН ЛатвССР: 263 pp. [in Russian]
- Fischer J.B. 1778. *Versuch einer Naturgeschichte von Livland. 1 Auflage*. Leipzig: 16 + 8 + 390 pp.
- Fischer J.B. 1784. Zusätze zu seinem „Versuch einer Naturgeschichte von Livland“. In: Febers J.J. (Ed.) *Anmerkungen zur physischen Erdbeschreibung von Kurland, nebst J.B. Fischers Zusätzen zu einem Versuch einer Naturgeschichte von Livland*. Riga: XVI + 305 pp.
- Fischer J.B. 1791. *Versuch einer Naturgeschichte von Livland. 2. Auflage*. Königsberg: XXIV + 826 pp.
- 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; Kurländische Gesellschaft für Literatur und Kunst*, 1 (2): 9 – 19.

- Gailis J., Vilks K. 2001. New data on rare beetles (Insecta, Coleoptera) in Latvia. *Latvijas Entomologs*, 38: 52 – 55.
- Groschke J. 1805. Merkwürdigkeiten aus dem Tierreich. In: Derschau E., Keyserlingk P. (Eds.) *Beschreibungen der Provinz Kurland*. Mitau: 119 – 176.
- Heyden L. 1903. Beiträge zur Coleopteren-Fauna der nordwestlichen Teile Russlands. *Korrespondenzblatt des Naturforscher-Vereins zu Riga*, 46: 18 – 35.
- Kalniņš, M., Juceviča, E., Karpa, A., Salmane, I., Poppels, A. and Teļnovs, D. 2007. Invertebrates. In: Pilāts V. (Ed.). *Biodiversity in Gauja National Park*. Sigulda, Gauja National Park Administration: 106 – 149.
- Kawall J.H. 1865. Chronik phänologischer Beobachtungen in Kurland. *Korrespondenzblatt des Naturforscher-Vereins zu Riga*, 15 (4/5): 47 – 67.
- Kawall J.H. 1866. Phänologische Beobachtungen. *Korrespondenzblatt des Naturforscher-Vereins zu Riga*, 15 (10/11): 146 – 165.
- Lackschewitz T., Mikutowicz J. 1939. Zur Koleopterenfauna des ostbaltischen Gebietes, II. *Korrespondenzblatt des Naturforscher-Vereins zu Riga*, 63: 48 – 76.
- Lindberg H. 1932. Käfer, gesammelt in Lettland 1931. *Folia zoologica et hydrobiologica*, 4 (2): 163 – 166.
- Murd M., Barševskis A. 2007. Materials about Latvian fauna of carrion beetles (Coleoptera: Silphidae). *Acta Biologica Univiversitatis Daugavpiliensis*, 7 (1): 63 – 71.
- Ozols E. 1963. *Lauksaimniecības entomoloģija*. 2. izd. [Agricultural entomology. 2 ed. Latvian State Publishing House, Rīga]. Rīga, Latvijas Valsts izdevniecība: 512 pp. [in Latvian]
- Ozols E. 1973. *Lauksaimniecības entomoloģija*. 3. izd. Rīga, Zvaigzne: 496 lpp. [in Latvian]
- Petrova V., Čudare Z., Cibulskis R. 2006. Predators and herbivores beetles (Coleoptera) naturally occurring on strawberry (Latvia). *Acta Biologica Univiversitatis 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: 39 pp.
- Priedītis A. [Приедитис А. П.] 1958. Материалы о составе корма некоторых видов синантропных птиц. В кн.: *Привлечение полезных птиц-дуплогнёздников в лесах Латвийской ССР*. Рига, изд-во АН ЛатвССР: 221 – 248. [in Russian]
- Rathlef H. 1905. *Coleoptera Baltica. Käfer-Verzeichnis der Ostseeprovinzen nach den Arbeiten von Ganglbauer und Reitter*. Dorpat, C. Mattiesen: 16 + 199.
- Roze L., Barševskis A. 2018. To the knowledge of Coleopteroфаuna of Zalve rural municipality, Nereta District, Latvia. *Acta Biologica Univiversitatis Daugavpiliensis*, 18 (2): 273 – 279.
- Rūtenberga D. 1992. Materiāli par Slīteres rezervāta vaboļu faunu [Materials on beetles fauna of Slītere Reserve]. *Daba un muzejs*, 4 – Rīga, Gandrs: 20 – 23. [in Latvian, English and Russian summary]
- Rūžička J. 2015. Family Silphidae. In: Löbl I., Löbl D. (Eds.), *Catalogue of Palaearctic Coleoptera. Volume 2/1. Hydrophiloidea - Staphyloidea. Revised and Updated Edition*. Brill, Leiden & Boston: pp. 291 – 304.

- Rūžička J., Schneider J. 2004. Family Silphidae. In: Löbl I., Smetana A. (Eds.) *Catalogue of Palaearctic Coleoptera, Volume 2*. Stenstrup, Apollo Books: pp. 229 – 237.
- Seidlitz G. 1872-1875. *Fauna Baltica. Die Käfer (Coleoptera) der Ostseeprovinzen Russlands*. Dorpat, H. Laakmann: 4 + XLII + 142 + 560 pp.
- Seidlitz G. 1887-1891. *Fauna Baltica. Die Käfer (Coleoptera) der Ostseeprovinzen Russlands. Zweite neu bearbeitete Auflage mit 1 Tafel*. Königsberg, Hartungsche Verlagsdruckerei: 12 + LVI + 192 + 818 pp.
- Smarods J., Liepa I. 1956. *Dārzeņu kaitēkļi un slimības*. Rīga, Latvijas Valsts izdevniecība: 407 pp. [in Latvian]
- Šmits V. 1975. Materiāli par Latvijas kapračvaboļu (Coleoptera, Silphidae) faunu. *Zooloģijas muzeja raksti*, 13: 23 – 26. [in Latvian]
- Šmits V., Spuris Z. 1966. Vaboles – Coleoptera. In: Spuris Z. (Ed.) *Latvijas dzīvnieki*. Rīga, Zvaigzne: 177 – 187.
- Spuņģis V. 2001. Changes in arthropod species composition and density in the burned area of Suda bog in Latvia. *Acta Biologica Universitatis Daugavpiliensis*, 1 (1): 11 – 15.
- Spuņģis V. 2002. Invertebrates of the sandy coastal habitats in Latvia. *Latvijas Entomologs*, 39: 10 – 19.
- Spuņģis V. 2008. *Fauna and ecology of terrestrial invertebrates in raised bogs in Latvia*. Rīga, Pertovskis & Co: 80 pp.
- Spuris Z. 1974. Cietspārni jeb vaboles – Coleoptera. In: Spuris Z. (Ed.) *Latvijas dzīvnieku pasaule*. Rīga, Liesma: 139 – 151.
- Stiprais M., Varzinska R. 1985. Vaboles cūkkopības kompleksā Jumpravā [The beetles in the pig-breeding farm at Jumprava]. *Latvijas Entomologs*, 28: 18 – 31. [in Latvian, English summary]
- Telnov D. 1996. Sixty three new and rare species of Coleoptera in the fauna of Latvia. *Latvijas Entomologs*, 35: 36 – 43.
- Telnov D. 2004. Check-List of Latvian Beetles (Insecta: Coleoptera). Second Edition. 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., Bukejs A., Gailis J., Kalniņš M., Napolov A., Piterāns U., Vilks K. 2010. Contributions to the knowledge of Latvian Coleoptera. 8. *Latvija Entomologs*, 48: 80 – 91.
- Telnov D., Gailis J., Kalniņš M., Napolov A., Piterāns U., Vilks K., Whitehead P.F., 2005. Contributions to the Knowledge of Latvian Coleoptera. 4. *Latvijas Entomologs*, 42: 18 – 47.
- Telnov D., Salmane I. 2015. Ecology and diversity of urban pine forest soil invertebrates in Rīga, Latvia. *Proceedings of the Latvian Academy of Sciences. Section B*, 69 (3): 120 – 131.
- Tomsons A. 1939-1940. Aizrādījumi cukurbiešu slimību un kaitēkļu apkarošanā. *Cukurbiešu kultūra un cukurrūpniecība*, 3: 131 – 144. [in Latvian]
- 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]
- Vītols, O. 1941. Latvijas PSR noliktavās sastaptie posmkāji (Arthropoda) [Arthropoda Found in Latvian (RLSS) Storehouses]. *Jelgavas Lauksaimniecības akadēmijas raksti* 1(3): 421 – 476. [in Latvian, English summary]
- Part B. Other literature**
- Alexandrovitch O.R., Lopatin I.K., Pisanenko A.D., Tsinkevitch V.A., Snitko S.M. 1996. *A catalogue of Coleoptera (Insecta) of Belarus*. Minsk, Fund Fundamental Research of Republic of Belarus: 103 pp.
- Bouchard P., Bousquet Y., Davies A.E., Alonso-Zarazaga M.A., Lawrence J.F., Lyal C.H.C., Newton A.F., Reid C.A.M., Schmitt M., Šlipiński S.A., Smith A.B.T. 2011. Family-group names in Coleoptera (Insecta). *ZooKeys* 88: 1 – 972.
- Çiftçi D., Růžička J., Hasbenli A., Şahin Ü. 2018. The large carrion beetles (Coleoptera: Silphidae) of Turkey: a review with a new species record. *Zootaxa*, 4441 (3): 555 – 591.
- Dekeirsschieter J., Verheggen F., Loganay G., Haubruge E. 2011. Large carrion beetles (Coleoptera, Silphidae) in Western Europe: a review. *Biotechnologie, Agronomie, Société et Environnement*, 17 (4): 435 – 447.
- Hansen M. 2004. Family Helophoridae. In: Löbl I., Smetana A. (Eds.) *Catalogue of Palaearctic Coleoptera*, Vol. 2. Stenstrup, Apollo Books: pp. 36 – 41.
- Ghahari H., Háva J. 2015. An annotated checklist of the Iranian carrion beetles (Coleoptera: Staphylinoidea: Silphidae). *Linzer biologische Beiträge*, 47 (2): 1501 – 1511.
- Iwan D., Löbl I. 2008. Tribe Opatrini. In: Löbl I., Smetana A. (Eds.) *Catalogue of Palaearctic Coleoptera*, Vol. 2. Stenstrup, Apollo Books: pp. 258 – 277.
- Jelínek J., Audisio P. 2007. Family Nitidulidae. In: Löbl I., Smetana A. (Eds.) *Catalogue of Palaearctic Coleoptera. Volume 4*. Apollo Books, Stenstrup: pp. 459 – 491.
- Kalinova B., Podskalska H., Růžička J., Hoskovec M. 2009. Irresistible bouquet of death. How are burying beetles (Coleoptera: Silphidae: *Nicrophorus*) attracted by carcasses. *Naturwissenschaften*, 96: 889 – 899.
- Kolibáč J. 2007. Family Trogossitidae. In: Löbl I., Smetana A. (Eds.) *Catalogue of Palaearctic Coleoptera*, Volume 4. Apollo Books, Stenstrup: pp. 364 – 366.
- Lafer G.Sh. 1989. Family Silphidae. In: Ler P.A. (Ed.) [*Определитель насекомых Дальнего Востока СССР. Том III. Жесткокрылые, или жуки. Часть 1.*] Leningrad, Nauka: pp. 329 – 344. [in Russian]
- Nikolajev G.V., Kozminykh V.O. 2002. *The carrion beetles (Coleoptera: Agyrtidae, Silphidae) of Kazakhstan, Russia and adjacent countries: guides*. Almati, Kazak universiteti: 159 pp. [in Russian, English summary]
- Peck S.B. 1990. Insecta: Coleoptera Silphidae and the associated families Agyrtidae and Leiodidae. In: Dindal D.L. (Ed.), *Soil biology guide*. New York, USA, John Wiley & Sons: pp. 1113 – 1136.
- Peck S.B. 2001. Family 21. Silphidae. In: Arnett R.H. Jr., Thomas M.C. (Eds.), *American*

- Beetles, Volume 1. CRC Press, Boca Raton, FL: pp. 268 – 271.
- Peck S.B., Miller S.E. 1993. *A catalog of the Coleoptera of America north of Mexico. Family: Silphidae*. USDA Agriculture Handbook No. 529-28: 24 pp.
- Perreau M. 2004. Family Leiodidae. In: Löbl I., Smetana A. (Eds.) *Catalogue of Palaearctic Coleoptera*, Vol. 2. Stenstrup, Apollo Books: pp. 133 – 203.
- Pushkin S.V. 2015. *Zhuki-mertvoedy (Coleoptera, Silphidae) Rosii: atlas-opredelitel [Carrion beetles (Coleoptera, Silphidae) of Russia: atlas and identification key]*. Direkt-Media, Moskva & Berlin: 169 pp. [in Russian]
- Sikes D.S. 2005. Silphidae Latreille, 1807. In: Kristensen N.P., Beutel R.G. (Eds.), *Handbook of Zoology. Volume 4: Arthropoda: Insecta*. Berlin, Germany, Waler de Gruyter: pp. 288 – 296.
- Sikes D.S. 2008. Carrion beetles (Coleoptera: Silphidae). In: Capinera, J.L. (Ed.), *Encyclopedia of Entomology. 2nd Edition*. Springer, Dordrecht: pp. 749 – 757.
- Sikes D.S., Madge R.M., Newton A.F. 2002. A catalog of the Nicrophorinae (Coleoptera: Silphidae) of the world. *Zootaxa*, 65: 1 – 304.
- Silfverberg, H. 2004. Enumeratio nova Coleopterorum Fennoscandiae, Daniae et Baltiae. *Sahlbergia*, 9 (1): 1 – 111.
- Silfverberg H. 2010. Enumeratio renovata Coleopterorum Fennoscandiae, Daniae et Baltiae. *Sahlbergia*, 16: 1 – 144.
- Ślipiński S.A., Leschen R.A.B., Lawrence J.F. 2011. Order Coleoptera Linnaeus, 1758. In: Zhang, Z.-Q. (Ed.) *Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness*. *Zootaxa*, 3148: pp. 203 – 208.
- 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 a chorotype classification of the Near East fauna, in the framework of the Western Palearctic region. *Biogeographia*, 20: 31 – 59.
- Tamutis V., Tamutė B., Ferenca R. 2011. A Catalogue of Lithuanian Beetles (Insecta, Coleoptera). *ZooKeys*, 121: 1 – 494.

Received: 12.05.2019.

Accepted: 10.08.2019.