

# SCARABAEOIDEA (INSECTA: COLEOPTERA) OF THE KALININGRAD REGION (RUSSIA): THE COMMENTED ACTUAL CHECKLIST, ASSESSMENT OF RARITY AND NOTES TO REGIONAL PROTECTION

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A check-list of scarabaeoid beetles (Lucanidae, Trogidae, Geotrupidae, Bolboceratidae and Scrabaeidae) of Kaliningrad Region (south-eastern Baltic Sea coast) is provided and briefly commented for each species. At present the list includes 98 species, from which 69 species are registered in the Region in last 30 years (Lucanidae – 6 spp., Trogidae – 2 spp., Geotrupidae – 4 spp., and Scrabaeidae – 57 spp.). Ten species (among them one representative of Ochodaeidae) are additionally listed between the potential faunal components. The samplings maps for 36 species are presented. Two species (*Typhaeus typhoeus* and *Aphodius quadrimaculatus*) earlier reported in the northern part of the former Eastern Prussia were excluded from the recent fauna of the Region. *T. typhoeus* should not to be catalogued as a member of Russian fauna, whereas the actually sampled in the Kaliningrad Region *Aphodius porcus* could be added to the fauna of the Central European Russian territories. *Onthophagus taurus* reaches in the Kaliningrad Region its known northern range limit, *Aegialia arenaria* occurs in the Region at the eastern periphery of distrubutional area, and four species (*Lucanus cervus cervus*, *Copris lunaris*, *Gnorimus nobilis nobilis* and *Polyphylla fullo fullo*) are in the Kaliningrad Region at northern or north-eastern periphery of main distributional area. The sampled in the research period species were grouped into eleven clusters according their regional distribution and abundance. Rare and threatened species were detected. The regional priority objects of conservation measurements for two main ecological risk groups (xylophagous and coprophagous) are discussed. Such species as *Lucanus cervus* and *Gnorimus variabilis* were considered “critically endangered”; *Osmoderma barnabita* and *Ceruchus chrysomelinus* belong to “endangered” at the regional level; *Protaetia marmorata* and *Gnorimus nobilis* were assigned to “vulnerable”. The regional priorities in protection of coprophagous biodiversity should be perhaps focused on the charismatic *Copris lunaris* and species of the genus *Onthophagus* (*O. coenobita*, *O. gibbulus*, *O. taurus*) as “flagship species” for the species-rich communities.

Key words: Kaliningrad Region; beetles; fauna; biodiversity, conservation.

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## INTRODUCTION

The recent fauna of the beetles belonging to the Scarabaeoidea superfamily in the Kaliningrad Region is superficially and insufficiently studied. The distribution of individual species has still been also imperfectly documented. The last checklist of Coleoptera for this region was published 39 years ago (Bercio & Folwaczny 1979), where only materials collected before 1945 (i.e. minimum 73 years old now) were summarised. The unique attempt of the recent faunal revision of the Kaliningrad Region for such economically and environmental important superfamily as Scarabaeoidea have been made 18 years ago (Alekseev & Sakhnov 2000) and, unfortunately, contains not only outdated taxonomy, but also several mistakes and misidentifications in Aphodiinae and Hopliini. In addition, several papers on Coleoptera of the Kaliningrad Region including scattered data on Scarabaeidae, Geotrupidae and Trogidae have been published during the last decade (Alekseev & Bukejs 2010, Alekseev 2014 etc.) and this data should be summarized and analyzed too. New actual data obtained during recent surveys in the region in 2018 are added for many species.

The beetles of the superfamily Scarabaeoidea are specific and diverse component of different nature habitats. The representatives of this group are especially interesting and suitable for observations and monitoring programs on the anthropogenic changes in nature. The beetles from this group are often and reasonably represented in regional and national Red Books and Red Lists (e.g. Pawłowski et al. 2002, Rašomavičius 2007, Rössner 2013). The quantity and species composition of Scarabaeoidea can display two important aspects of human economic activity: (1) deforestation and reforestation, (2) peculiarities of farming and plant cultivation. While several species easily become synanthropical (*Oryctes nasicornis*), inhabit suburbs, ruderal places (e.g. *Amphimallon solstitiale*, *Phyllopertha horticola*) or parks landscapes (*Sinodendron cylindricum*), other species inhabit almost

exclusively the rural areas and require deforested land (e.g. *Aphodius prodromus*, *Onthophagus nuchicornis*), and several native species are restricted to various primeval ecosystems (e.g. *Aegialia arenaria*, *Ceruchus chrysomelinus*). The full life cycle of the middle-sized and large scarabaeid beetles often lasts 2-5 years; the population density oscillates between years and decades. The changes of the distributional limits (occupation of new areas and expansion or contraction and local extinction during XX-XXI centuries or earlier) is showed or hypothesized for many species.

The mentioned above makes the current research on the fauna and ecology of scarabaeoids beetles in the Region actual and of particular interest. The presence of unpublished material, including taxa unknown to the Kaliningrad Region fauna, as well as the necessity of critical review of identified materials and published data are the reasons for current study.

## MATERIALS AND METHODS

Field research was carried in the years 1988-2018 with more intensive efforts in 1994, 1997, 2002, 2007 and 2018, mainly within the central and western parts of the Region. Beetles were collected by hand, using entomological net, light and baited pitfall traps. The examined material (vouchers) is deposited in the private collection of the author (Kaliningrad, Russia). The following literature sources were used for the species attribution: Machatschke (1969), Stebnicka (1976), Bunalski (1995), Frolov (1999, 2002), Ljungberg (2002), Kabakov (2006), Byk (2014), Fery & Rössner (2015).

The current catalogue was compiled based on published literature sources and revision of the author's private beetle collection (Kaliningrad, Russia). The catalogues, checklists and other most comprehensive faunal literature on stag and scarab beetles of the neighboring countries (Alexandovitch & Pisanenko 1991, Silfverberg 2010, Tamutis et al. 2011, Telnov 2004 etc.)

have been used to compile the comments to the species of the Kaliningrad Region fauna.

The species recorded in the Region in research period are marked with an index number and bear no special mark. The species name is included in round brackets if the species is known in the region according to the last catalogue of Eastern Prussia (Bercio & Folwaczny 1979).

This old German material is not available and unfortunately could not be examined or verified in questionable cases. The species removed from the current catalogue are marked with a dash in round brackets “(-)”. The species expected for the Kaliningrad Region are placed in square brackets “[ ]”. The state of the species (removed or expected) and reasons for such attribution are discussed in a separate “comments” for each species.

The following information is given for each species: its scientific name and the author’s name, references to bibliographic sources where an appropriate species is indicated for the Kaliningrad Region fauna, voucher specimens data from the author collection, generalized species distribution in this region and comments, including details of distribution and bionomy

for each species. The species synonyms used in old regional literature sources were mentioned after their scientific names.

The distribution of scarabaeid beetles in the Kaliningrad Region is given in accordance with the administrative division of the Region into administrative districts. The districts are listed and abbreviated in the following way: Bagr. – Bagrationovsky, Chern. – Cherniakhovsky, Gur. – Gur’evsky, Gus. – Gusevsky, Gvard. – Gvardeysky, Krasn. – Krasnoznamensky, Nem. – Nemansky, Nest. – Nesterovsky, Oz. – Ozersky, Pol. – Polesky, Pravd. – Pravdinsky, Slav. – Slavsky, Zel. – Zelenogradsky (Fig. 1). If the locality is cited according to old literature, the district name is followed by the German name of this locality in parentheses “()”. Sometimes, there were no specific location given and the distribution in the former Eastern Prussia is described as “everywhere” or in similar verbal way only. Old cited sampling data are separated from the new ones with a semicolon (;). Such data representation makes it possible to separate old and recent data and to make approximate observation about faunal changes during the nineteenth – twenty-first centuries.

The author refrained from listing all the localities examined during field researches and too detailed description of local species distribution in the Region. The short data on voucher specimens from author private collection, 14 samplings maps for 39 species (Fig. 2–15) and generalized distributional data according to subdivision of the Region in districts are given only. Without doubts, the limits of the administrative districts are not natural and important for species distribution, such schema is a substitution of geographical notes like the "northern part", "western part of the region" etc.

The information on species was supplemented by 42 images of 38 Scarabaeoidea beetles species (Fig. 16–57) in nature made by the author in the years 2010–2018 in the Kaliningrad Region.

The comparative estimation scale was used for species distribution (widely/sporadically/locally

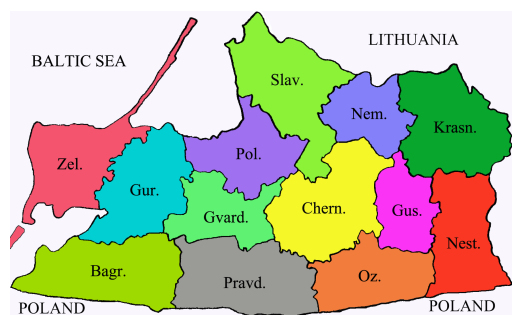


Fig. 1. Schematic map of the administrative division of the Kaliningrad Region into districts: Bagr. – Bagrationovsky, Chern. – Cherniakhovsky, Gur. – Gur’evsky, Gus. – Gusevsky, Gvard. – Gvardeysky, Krasn. – Krasnoznamensky, Nem. – Nemansky, Nest. – Nesterovsky, Oz. – Ozersky, Pol. – Polesky, Pravd. – Pravdinsky, Slav. – Slavsky, Zel. – Zelenogradsky.

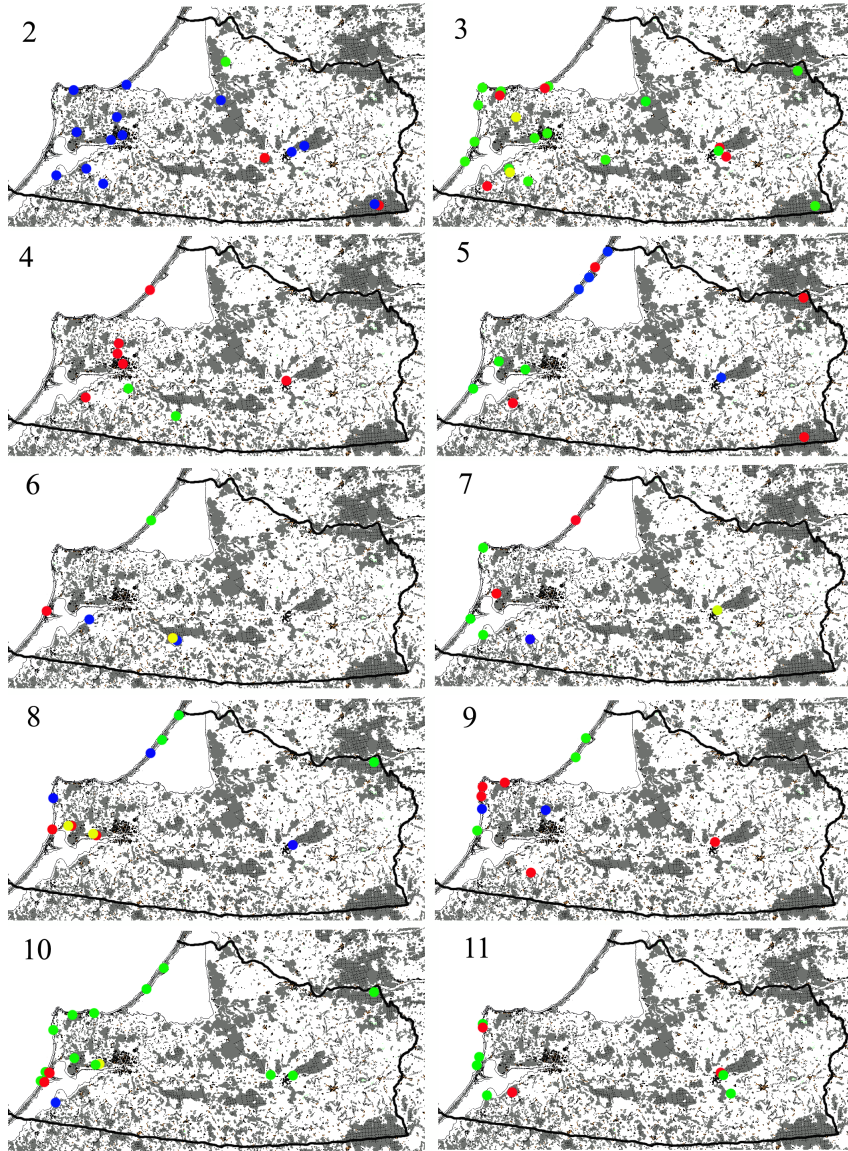


Fig. 2–11. Sampling and observation locations in the Kaliningrad Region: 2 – *Ceruchus chrysomelinus* (red points), *Sinodendron cylindricum* (blue points), and *Lucanus cervus* (green point); 3 – *Dorcus parallelepipedus* (green points), *Platycerus caprea* (red points), and *P. caraboides* (yellow points); 4 – *Trox sabulosus* (green points), and *Trox scaber* (red points); 5 – *Geotrupes spiniger* (green points), *Geotrupes stercorarius* (blue points), and *Trypocopris vernalis* (red points); 6 – *Aphodius brevis* (yellow point), *A. borealis* (green point), *A. coenosus* (red point), and *A. fasciatus* (blue points); 7 – *Aphodius conspurcatus* (red points), *A. melanostictus* (green points), *Aegialia sabuleti* (blue point), and *Copris lunaris* (yellow point); 8 – *Aphodius varians* (blue points), *A. porcus* (yellow points); *A. distinctus* (red points), and *A. subterraneus* (green points); 9 – *Rhyssemus puncticollis* (blue points), *Psammodyus asper* (green points), and *Oxyomus sylvestris* (red points); 10 – *Onthophagus coenobita* (blue point), *O. taurus* (red points), *O. gibbulus* (yellow point), and *O. nuchicornis* (green points); 11 – *Maladera holosericea* (green points), and *Omaloplia nigromarginata* (red points).



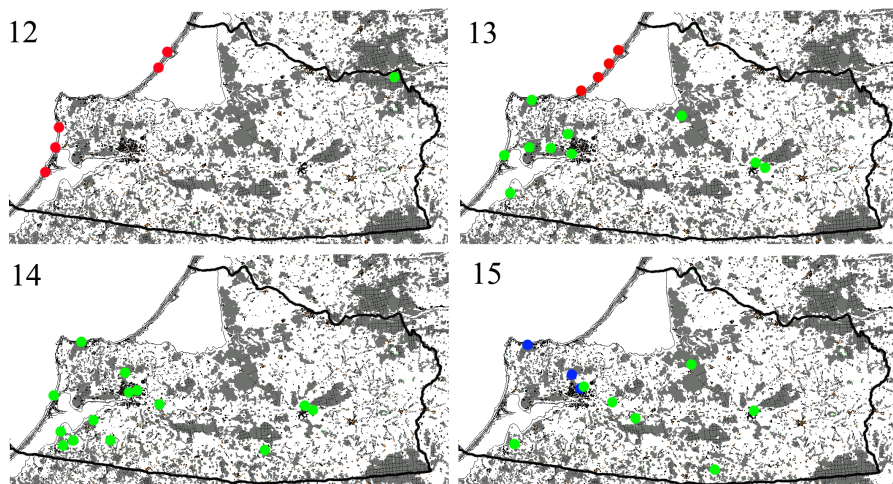


Fig. 12–15. Sampling and observation locations in the Kaliningrad Region: 12 – *Melolontha hippocastani* (green point), and *Polyphylla fullo* (red points); 13 – *Oxythyrea funesta* (green points), and *Hoplia parvula* (red points); 14 – *Protaetia marmorata* (green points); 15 – *Gnorimus nobilis* (blue points), and *Osmoderma barnabita* (green points).

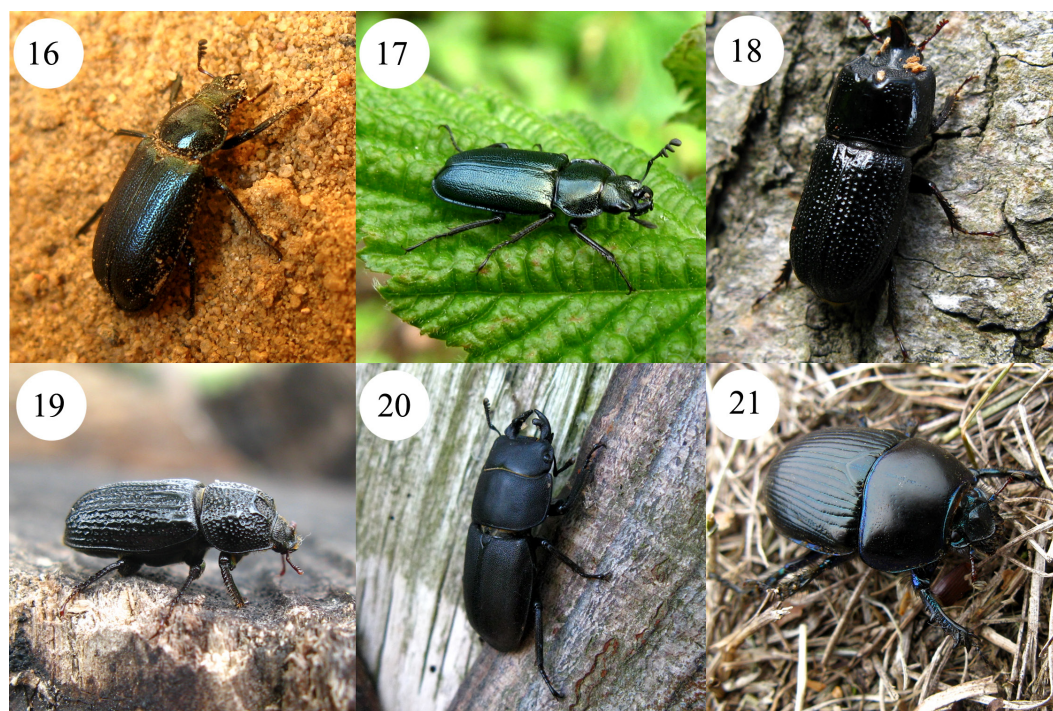


Fig. 16–21. The images of the living regional Scarabaeoidea specimens in nature: 16 – *Platycerus caprea* (30 April 2018); 17 – *P. caraboides* (16 May 2010); 18 – *Sinodendron cylindricum*, male (23 July 2012); 19 – *Sinodendron cylindricum*, female (31 May 2010); 20 – *Dorcus parallelepipedus*, male (16 July 2015); 21 – *Geotrupes spiniger* (11 September 2018).





Fig. 22–27. The images of the living regional Scarabaeoidea specimens in nature: 22 – *Anoplotrupes stercorosus* (15 May 2013); 23 – *Trypocopris vernalis* (19 July 2015); 24 – *Aegialia arenaria* (07 May 2018); 25 – *Oxyomus sylvestris* (10 April 2018); 26 – *Aphodius fimetarius* 16 Oktober 2018); 27 – *A. distinctus* (25 September 2018).

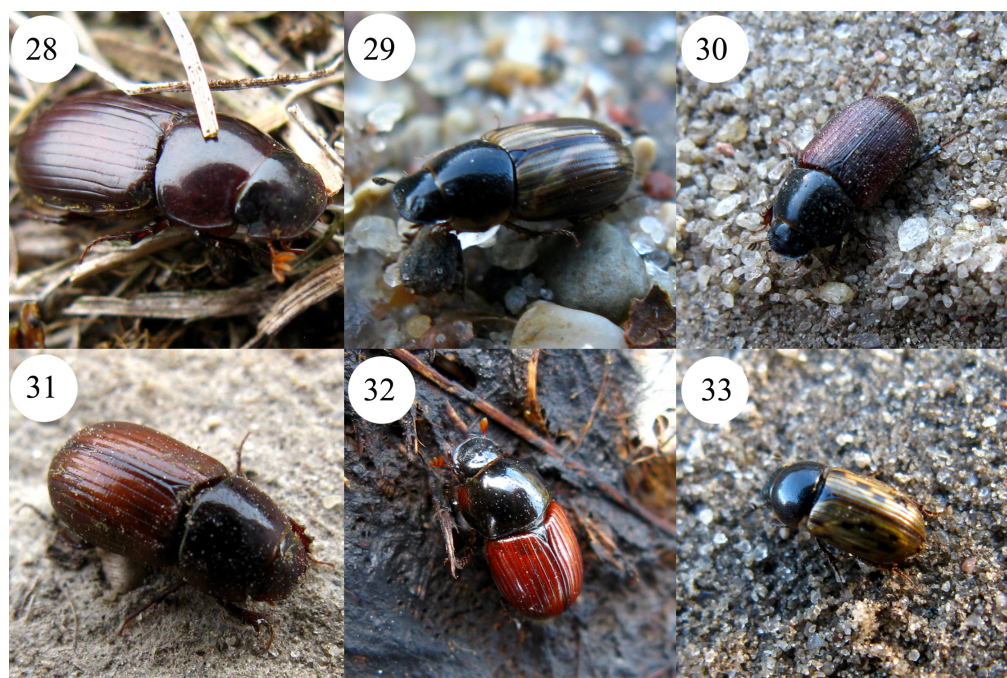


Fig. 28–33. The images of the living regional Scarabaeoidea specimens in nature: 28 – *Aphodius rufipes* (11 September 2018); 29 – *A. prodromus* (01 Oktober 2018); 30 – *A. porcus* (10 September 2018); 31 – *A. sordidus* (17 September 2018); 32 – *A. foetens* (10 September 2018); 33 – *A. conspurcatus* (15 Oktober 2018).





Fig. 34–39. 34 – *A. haemorrhoidalis* (11 September 2018); 35 – *A. sticticus* (10 September 2018); 36 – *Rhyssemus puncticollis* (29 May 2017); 37 – *Onthophagus gibbulus*, male, forma *major* (11 September 2018); 38 – *O. nuchicornis*, male (18 June 2018); 39 – *Serica brunnea* (04 July 2018).



Fig. 40–45. The images of the living regional Scarabaeoidea specimens in nature: 40 – *Melolontha melolontha* (24 May 2010); 41 – *Maladera holosericea* (11 May 2016); 42 – *Omaloplia nigromarginata* (05 July 2010); 43 – *Polyphylla fullo*, male, light colour form (25 June 2018); 44 – *P. fullo*, female, dark colour form (07 July 2018); 45 – *Anomala dubia*, variation with metallic coloured elytra (02 July 2014).



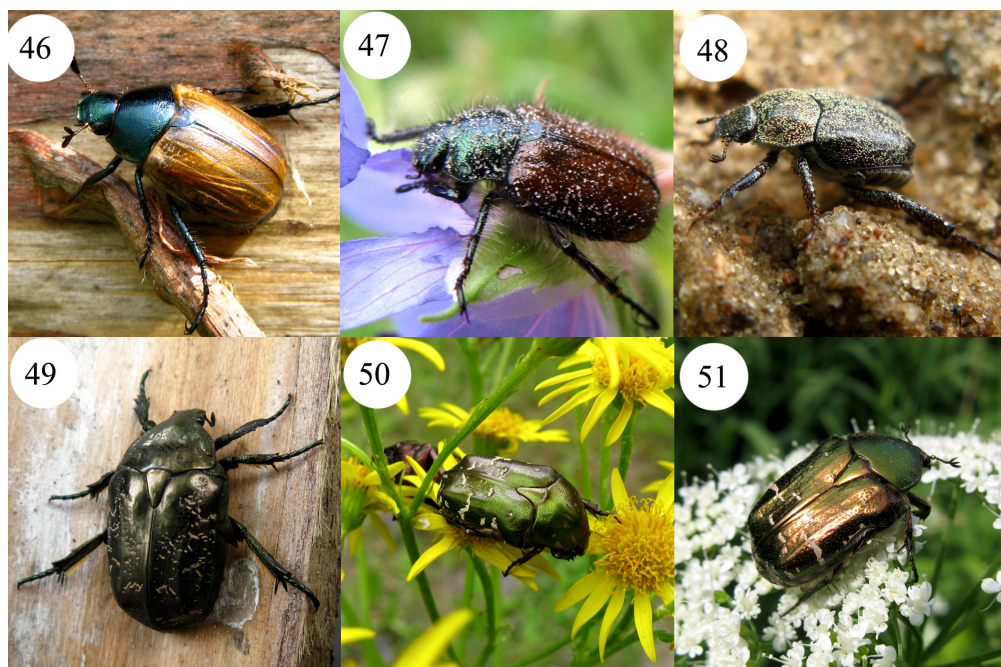


Fig. 46–51. The images of the living regional Scarabaeoidea specimens in nature: 46 – *A. dubia*, habitually coloured form (05 July 2011); 47 – *Phyllopertha horticola* (11 June 2018); 48 – *Hoplia graminicola* (11 June 2018); 49 – *Protaetia marmorata* (28 May 2010); 50 – *P. metallica* (07 July 2011); 51 – *Cetonia aurata* (20 June 2010).

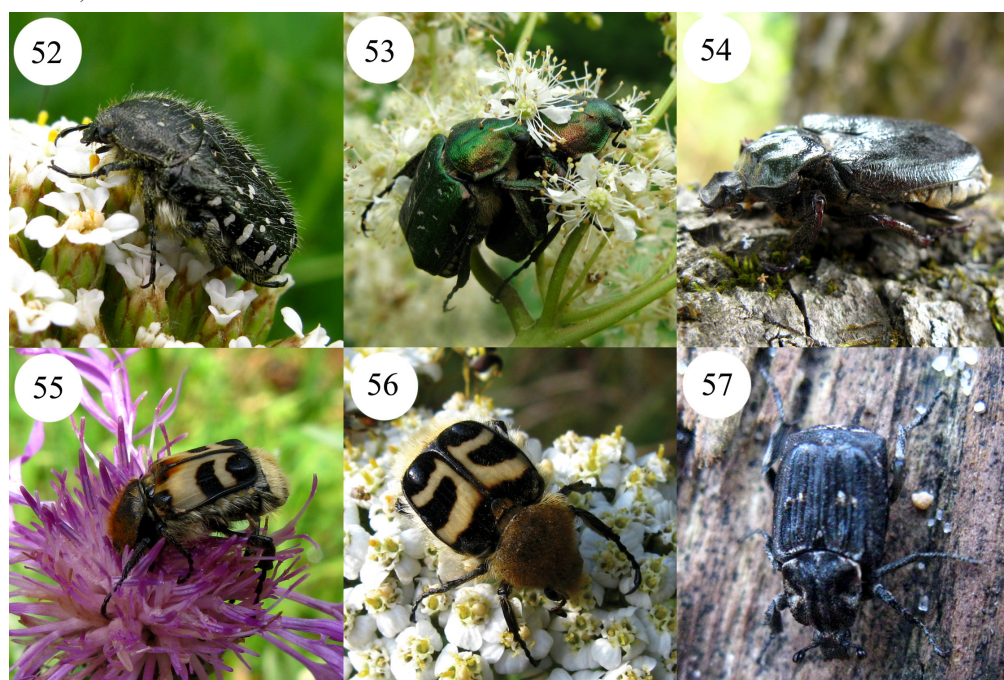


Fig. 52–57. The images of the living regional Scarabaeoidea specimens in nature: 52 – *Oxythyrea funesta* (15 June 2010); 53 – *Gnorimus nobilis* (08 July 2011); 54 – *Osmoderma barnabita*, male (09 July 2018); 55 and 56 – *Trichius fasciatus*, colour variations (14 July 2010); 57 – *Valgus hemipterus*, female (11 May 2018).



distributed) and species abundance (abundant/frequent/ occasional/ rare) in the Kaliningrad Region. The found in 1–2 localities species are considered to be locally distributed, the known from 3–5 localities beetles are considered to be sporadically distributed, the registered in more than 5 localities are considered to be widely distributed. The abundance was subjectively estimated by the number of captured specimens: the “rare” species correspond to 1–2 sampled specimens; the “occasional” ones to 3–5 specimens; the “frequent” beetles can be found regularly in number 5–10 exemplars; the “abundant” species are really numerous and can be sampled in tens or even hundreds exemplars. Such estimation is approximate, but acceptable for the species requiring diverse sampling methods. Theoretically, 12 clusters of the beetles regional distribution and abundance can be obtained by such classification. In reality, the beetles were grouped into 11 clusters (the group “locally abundant” was not registered).

## RESULTS AND DISCUSSION

An annotated catalogue of Lucanidae, Trogidae, Ochodaeidae, Bolboceratidae, Geotrupidae and Scarabaeidae of the Kaliningrad Region (the westernmost Russian exclave) was compiled.

### Superfamily SCARABAEOIDEA Latreille, 1806

#### Family Lucanidae Latreille, 1806

#### Subfamily Syndesinae MacLeay, 1819

#### Genus *Ceruchus* MacLeay, 1819

##### 1. *C. chrysomelinus* (Hochenwarth, 1785)

Lentz 1879 (*tenebrioides* Fabr); Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2010.

**Voucher specimens:** 2 [1 km S Pugachevo, 30 June 1998; 1 km NE Mezhdurech'e, 13 June 2000].

**Kaliningrad Region:** Bagr. (Preußisch Eylau), Nem. (Tilsit); Chern., Nest.

**Comments:** The locally distributed and rare in the Region beetle develops in the laying stumps and logs of old conifers (mostly *Picea*) and

birches with red-rotten heartwood decay. The species is restricted to old-growth forests and listed in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010). The species is considered “near threatened” at the European level (Nieto & Alexander 2010).

### Genus *Sinodendron* Schneider, 1791

##### 2. *S. cylindricum* (Linnaeus, 1758)

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2006, 2007, 2014.

**Voucher specimens:** 5 [Kaliningrad, 05 June 1997; ibidem, 29 July 2008, 2 exx; 1 km S Pugachevo, 30 June 1997; Pavlovo, 24 June – 06 July 2014].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg, Wilkie); Zel. (Rauschen, Palmnicken, Neuhäuser), Nest. (Rominten); Bagr., Chern., Gur., Nest., Pol., Zel.

**Comments:** The species develops in the subcortical rotten wood of different deciduous trees (*Fraxinus*, *Quercus*, *Carpinus*, *Fagus*, *Acer*, *Populus*, *Alnus*, *Tilia*, *Betula*) infested by fungi. The most widespread and comparatively common representative of the family in the Kaliningrad Region, occurring in parks, suburbs, and forests. Widely distributed and occasional in the Region. The species is considered “least concern” at the European level (Nieto & Alexander 2010).

### Subfamily Lucaninae Latreille, 1806

#### Tribe Platycerini Mulsant, 1842

#### Genus *Platycerus* Geoffroy, 1762

##### 3. *P. caprea* (DeGeer, 1774)

**Voucher specimens:** 10 [Cherniakhovsk, 02 May 1988; Svetlogorsk, 11 June 1997; Otradnoe, 30 June 2008, 2 exx; Bogdanovka, 31 May – 16 June 2009, 2 exx; 5 km NE Cherniakhovsk, 17 May 2010; 3 km NE Zelenogradsk, 23 May 2010; 4 km NE Zelenogradsk, 23 May – 13 June 2012; 1 km E Cherniakhovsk, 30 April 2018].

**Kaliningrad Region:** Bagr., Chern., Zel.

**Comments:** The certain findings of the species in Eastern Prussia were unknown, the presence of the species in the regional fauna was expected

only (Bercio & Folwaczny 1979). Widespread in Baltic States and Fennoscandia (Silfverberg 2010). The formally first report of the species in the Kaliningrad Region.

Sporadically distributed, occasional species, known from scattered localities in various parts of the Region. Occurs in the shady and humid mixed forest stands, often on forested slopes of ravines. The species develops (Nikitsky 2016) in the lying on the ground twigs and logs of deciduous trees (*Betula*, *Alnus*, *Salix*, *Fagus*, *Quercus*). The species is considered (Nieto & Alexander 2010) “least concern” at the European level. According to randomly selected regional material of the genus *Platycerus* in the collection, the species is wider distributed and more often encountered than *P. caraboides*.

#### 4. *P. caraboides caraboides* (Linnaeus, 1758)

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2014.

**Voucher specimens:** 4 [Kolosovka, 04 May 2001; railway station “1312 km”, 18 May 2010; ibidem, 02 May 2014 (female, var. *rufipes* (Herbst, 1790)); 2 km S Novomoskovskoe, 12 May 2014].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg), Gvard. (Wehlau), Nem. (Tilsit), Nest. (Rominten), Zel. (Rauschen, Wargen, Warnicken); Bagr., Zel.

**Comments:** The localities listed in Bercio & Folwaczny (1979) and mentioned above could surely concern both species, because these *Platycerus* sibling species were earlier not distinguished.

According to Nikitsky (2016) *P. caraboides* develops in stumps and trunks of deciduous trees (*Quercus*, *Tilia*, *Populus*, *Fagus*, *Carpinus*, *Betula*), adults occur on young leaves and twigs in Mai and June. Locally distributed and occasional species. Occurs in sparse mixed forests and on forest edges. The species is considered “least concern” at the European level (Nieto & Alexander 2010).

### Tribe Lucanini Latreille, 1804 Genus *Lucanus* Scopoli, 1763

#### 5. *L. cervus cervus* (Linnaeus, 1758)

Lentz 1853; Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 1 [Khrustal’noe, July 2003].

**Kaliningrad Region:** Pravd. (Friedland), Zel. (Galtgarben, Medenau, „Samland 1870“, Rauschen [var. *hircus* Hbst.], Warnicker Forst); Slav.

**Comments:** There are different verbal communication by the non-entomologists about the species in the area of the present-day Kaliningrad Region (1999 - Bagr., 1995 - Nest., 1994 and 1996 - Slav.), but the proofs are absent. The confusion with large *Dorcus* specimens seems to be very probable in most cases. According to the communication of Diana R. Savitskaite six specimens were collected in Slavsk district near Khrustal’noe village in July 2003 (“near old oak stump, in vegetable garden”); one of these specimens is deposited in the private collection of the author. The present-day absence of the old oaks the in the Khrustal’noe environments (the village is surrounded by the very moist alder forest and polder meadows) makes this finding enigmatic. The unique specimens is male of forma *major*: body length 42 mm, mandibular length 13 mm, all mandibular denticles equally long and developed.

The locally distributed and rare in the Region species is associated with oak and other broad-leaved trees (Harvey et al. 2011, Bardiani et al. 2017), duration of larval stage is 5-6 years. Beetles occur on effluent tree sap. The species is included in the Russian Red Data Book (Korotyaev 2001) and is listed in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010). The species is probably extinct in Lithuania (Tamutis et al. 2011), but it is considered “near threaned” only at the European level (Nieto & Alexander 2010). In the XIX century the species considered to be “not rare” in northern and central parts of the Sambian peninsula (Lentz 1853). The actual

presence of the stable population in the Region needs confirmation.

**Subfamily Dorcinae Parry, 1864**  
**Genus *Dorcus* MacLeay, 1819**

**6. *D. parallelepipedus* (Linnaeus, 1758)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 11 [Dolzhanskoe, June 1999, 2 exx; Otradnoe 03 July 2007; railway station “1312 km”, 19 May 2009; Yantarny, 24 May 2010; ibidem 21 May 2014; Mechnikov, 11-25 May 2016; ibidem, 21 June – 06 July 2016; ibidem 04-23 May 2017; ibidem, 02 July – 09 August 2017; railway station “1312 km”, 08 May – 22 July 2018].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg, Wernsdorf), Zel. (Galtgarben, Neuhäuser, Rauschen, Warnicken); Bagr., Chern., Gur., Gvard., Krasn., Nest., Pol., Zel.

**Comments:** This widely distributed and occasional in the Kaliningrad Region species occurs in old parks and forests, especially in western parts of the Region. The species develops in rotten stumps and logs of old deciduous trees (mainly *Quercus* and *Fagus*). Beetles feed on effluent oaken sap. The human settlements and suburbs are not avoided (e.g. the species is encountered regularly in Kaliningrad in 2010-2018) if the sufficient amount of the dead wood is leaved. The species is listed in the supplement to the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010) as the required especially attention beetle. The species is considered “least concern” at the European level (Nieto & Alexander 2010). The populations of the beetle are stable now, the species dont belong to thretheaded at the regional level.

The majority of male specimens from the Region evidently belong to forma *major* (possessing inner denticle on mandibles). The largest measured male specimen is totally 30 mm long including mandibles (body length is 26 mm, open mandibles are 4 mm long); the smallest male specimen is 18.5 mm long (f. *minor*, body length 17 mm, closed mandibles

are 1.5 mm long, with short and rounded inner denticle). The smallest measured female has 16 mm total body length. The statistic analyse like made by Hendriks (2013) was not performed due to small number of collected specimens, but the length variation in randomly sampled beetles and registration of such large specimen in the studied area can characterize environmental conditions for this species in the Kaliningrad Region.

**Family Trogidae MacLeay, 1819**  
**Subfamily Troginae MacLeay, 1819**  
**Genus *Trox* Fabricius, 1775**

**(-) *T. cadaverinus* Illiger, 1802**

Alekseev 2002 (misidentification).

**Comments:** the earlier report of this species from the Kaliningrad Region was based on misidentification. Faunal data on this species in the Region are absent; therefore, it has been removed from the species list. Its occurrence in local fauna is doubtful. The nearest sampling places (Bercio & Folwaczny 1979; Rossa et al. 2017) and the northern distribution range are situated in western and central Poland.

**(1). *T. hispidus* (Pontoppidan, 1763)**

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg „vor dem Sackheimer Thore“).

**Comments:** The beetle is known in Poland (Rossa et al. 2017), Sweden, Denmark (Silfverberg 2010) and Lithuania (Tamutis et al. 2011). The actual presence of the species in the regional fauna needs verification (the single report is from XIX century), but its occurrence is possible.

**2. *T. sabulosus sabulosus* (Linnaeus, 1758)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 2 [Grushevka, 25 April 1998; Otvazhnoe, 01 May 2002].

**Kaliningrad Region:** Bagr. (Ludwigsort), Chern. (Insterburg), Gur. (Königsberg), Oz. (Trempen), Zel. (Loppöhnen); Gur., Pravd.

**Comments:** Rare and locally distributed species restricted to sites with sandy soil and occurred

on dry carrion.

### 3. *T. scaber* (Linnaeus, 1767)

Bercio & Folwaczny 1979; Aleksiev 2007, 2014; Aleksiev & Shapoval 2011b, 2016.

**Voucher specimens:** 12 [Riabinovka, 17 June 2001; Cherniakhovsk, 4 July 2004; Kaliningrad 15 August 2005; Curonian Spit, 18 July 2005; Chkalovsk 04 April 2009, 2 exx; railway station “1312 km”, 19 May – 08 June 2009; ibidem 08 June – 07 July 2009; Curonian Spit, 23 km, 12 May 2010, 2 exx; Kaliningrad 03 June 2011, 2 exx].

**Kaliningrad Region:** Bagr. (Ramsen, Schrombehnen), Chern. (Insterburg), Gur. (Königsberg, Wernsdorf), Zel. (Loppöhnen); Bagr., Chern., Gur., Zel.

**Comments:** Widely distributed, occasional in the Kaliningrad Region species, inhabiting the forests, suburbs and parks. It is associated with nests of birds in the hollows of tree trunks.

### Family Ochodaeidae Mulsant et Rey, 1871

#### Genus *Ochodaeus* Dejean, 1821

#### [*O. chrysomeloides* (Schrank, 1781)]

**Comments:** The species is commonly connected with large river valleys (Bunalski & Sienkiewicz 2012), and it is known in northern Poland (Lentz 1879; Bercio & Folwaczny 1979; Byk et al. 2016) and Belarus (Alexandrovitch et al. 1996). The larvae probably feed on hypogeous fungi (Byk et al. 2016). Its occurrence in local fauna (at the northern border of range) is possible: the nearest finding places are (Bercio & Folwaczny 1979) Lyck [now Elk] and Allenstein [now Olsztyn], both in Warmian-Masurian region, northern Poland.

### Family Bolboceratidae Mulsant, 1842

#### Genus *Odontaeus* Samouelle, 1819

#### [=*Bolboceras* Kirby, 1819]

#### (1). *O. armiger* (Scopoli, 1772)

Lentz 1879 (*Odontaeus mobilicornis* Fabr.); Bercio & Folwaczny 1979 (*Odontaeus*).

**Kaliningrad Region:** Chern. (Insterburg).

**Comments:** The larvae of the species are probably subterranean mycetophage, the

beetle inhabits meadows adjoining the edges of oak forests, brownfields covered with shrubs, scarcely exploited pastures with old single oaks and oak forests characterized by high sunshine intensity (Byk et al. 2012). The larvae probably are hydrophagous (e.g. truffle-eating).

The species is known in southern Fennoscandia (Silfverberg 2010), Poland (Byk et al. 2012; Bunalski et al. 2013), Lithuania (Tamutis et al. 2011) and Belarus (Alexandrovitch et al. 1996).

### Family Geotrupidae Latreille, 1802

#### Subfamily Geotrupinae Latreille, 1802

#### Tribe Chromogeotrupini Zunino, 1984

#### Genus *Typhaeus* Leach, 1815

#### (-) *T. typhoeus* (Linnaeus, 1758)

Lentz 1879; Bercio & Folwaczny 1979 (*Typhaeus*).

**Kaliningrad Region:** Gur. (Königsberg).

**Comments:** The species inhabits pine forests growing on sandy soil, where it feeds on the droppings of rabbits, as well as the faeces of deer, roe deer, sheep, horses and cows (Byk 2011). In Poland (Byk 2011) it has been recorded in dispersed localities, mainly in the western and north-western parts of the country; it is considered quite common in north-eastern Germany (Rössner 2013). The range of its occurrence strongly coincides with the range of a wild rabbit and with the influence of Atlantic climate (Byk 2011). The general distribution range of *T. typhoeus* reaches eastwards the Vistula River line (Bunalski et al. 2014) in central and northern Poland. According to Brussaard and Visser (1987), the species use rabbit droppings as a food source for the larvae. The occasional findings of single allochthonous specimens transported by winds and Baltic Sea currents in south-western part of the Region are possible, but the presence of the beetle population in the Kaliningrad Region seems to be improbable since wild rabbit don't occur in the Region. Old materials from “Königsberg” (Lentz 1879; later only cited by Bercio & Folwaczny (1979) and other authors including Löbl & Löbl 2016) have been perhaps originated from south-western part of the former Eastern Prussia (now Pomerania in



Poland) and erroneously labelled. The species is removed from the regional check-list and from the Russian fauna, where it was included as the inhabiting the Kaliningrad Region only.

**Tribe Geotrupini Latreille, 1802**  
**Genus *Geotrupes* Latreille, 1796**

**(1). *G. mutator* (Marshall, 1802)**

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg), Zel. (Loppöhnen).

**Comments:** The actual occurrence in the Region of this coprophagous species, preferred dry sandy meadows is questionable, but cannot be excluded. The range of this everywhere rare beetle extends to Sweden and eastern Latvia in the north (Telnov 2004; Silfverberg 2010), it is known in Lithuania (Tamutis et al. 2011), Belarus (Alexandovitch & Pisanenko 1991) and northern Poland (Gawroński & Oleksa 2007).

**2. *G. spiniger* (Marshall, 1802)**

Bercio & Folwaczny 1979.

**Voucher specimens:** 3 [Baltic Spit, 26 June 2018; Kostrovo, 10 September 2018; Vzmor'e, 11 September 2018].

**Kaliningrad Region:** Zel. (Loppöhnen, Rauschen); Zel.

**Comments:** Occasional and sporadically distributed species in the Kaliningrad Region. The species prefers open habitats, feeds on horse and cattle excrements and occurs till October.

**3. *G. stercorarius* (Linnaeus, 1758)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev & Shapoval 2011, 2016; Alekseev 2014.

**Voucher specimens:** 3 [Morskoe, 8 May 1997; Rybachii, 17 July 2007; 23 km of the Curonian Spit, 1 July 2009].

**Kaliningrad Region:** Everywhere; Chern., Zel. (Curonian Spit).

**Comments:** Sporadically distributed, occasional species of the forest edges. In the Region is actually reported on horse excrements and in light trap samplings.

**Genus *Anoplotrupes* Jekel, 1866**

**4. *A. stercorosus* (Hartmann in Scriba, 1791)**

Bercio & Folwaczny 1979 (*Geotrupes*); Alekseev & Sakhnov 2000; Alekseev 2014.

**Voucher specimens:** 4 [Cherniakhovsk, April 1993; Svetlogorsk, 4 April 2001; 1312 km, 2 Mai 2009; Mechnikov, Mai 2017].

**Kaliningrad Region:** Common everywhere; Bagr., Chern., Gur., Gus., Gvard., Krasn., Nem., Nest., Oz., Pol., Pravd., Slav., Zel.

**Comments:** The most common and wide distributed species of the family within the whole area of the Region. The occurred in different kinds of excrements and rotten fungi species is abundant in humid forest habitats.

**Genus *Trypocopris* Motschulsky, 1860**

**5. *T. vernalis vernalis* (Linnaeus, 1758)**

Bercio & Folwaczny 1979 (*Geotrupes*); Alekseev & Sakhnov 2000; Alekseev 2003 (*Geotrupes*); Alekseev 2014.

**oucher specimens:** 3 [Dolzanskoe, 27 June 1997; Pugachevo, 26 June 1997; Rybachii, 27 July 2008].

**Kaliningrad Region:** Gur. (Königsberg), Zel. (Rauschen); Bagr., Krasn., Nest., Zel. (Curonian Spit).

**Comments:** The sporadically distributed, occasional in the Kaliningrad Region species inhabited light pine forests and forest edges.

**Family *Scarabaeidae* Latreille, 1802**

**Subfamily *Aegialiinae* Laporte de Castelnau, 1840**

**Genus *Aegialia* Latreille, 1807**

**Subgenus *Aegialia* Latreille, 1807**

**1. *A. arenaria* (Fabricius, 1787)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2003, 2005, 2014.

**Voucher specimens:** 6 [Zelenogradsk, 10 May 1996, 2 exp.; Morskoe, 04 May 2007; Yantarny-Donskoe, 24 May 2010, 3 exp.].

**Kaliningrad Region:** Zel. („Längs des gesamten Strandes von Memel bis Hela“); Bagr., Zel.

**Comments:** Frequent and sporadically distributed psammophilous species on the sandy

beaches and dunes of the Baltic Sea occurred on the *Elymus* roots.

### Subgenus *Psammoporus* Thomson, 1863

#### 2. *A. sabuleti* (Panzer, 1797)

Bercio & Folwaczny 1979.

**Voucher specimens:** 1 [Medovoe, 10 April – 03 July 2018].

**Kaliningrad Region:** Zel. (Pillau, Cranz); Bagr.

**Comments:** The species is locally distributed and rare: it was once sampled in pitfall trap with cow dung on the sandy shore of river Kornevka [Stradick].

### Subgenus *Rhysothorax* Bedel, 1911

#### (3). *A. rufa* (Fabricius, 1792) [= *spissipes* LeConte, 1878]

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg).

**Comments:** The actual presence of the species in the regional fauna needs confirmation, but it is possible. The beetle is known in Lithuania (Tamutis et al. 2011), Latvia (Telnov 2004), Denmark, Norway and Sweden (Silfverberg 2010).

### Subfamily Aphodiinae Leach, 1815

#### Tribe Aphodiini Leach, 1815

#### Genus *Aphodius* Hellwig, 1798

#### Subgenus *Acanthobodilus* Dellacasa, 1983

#### (4). *A. immundus* Creutzer, 1799

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg).

**Comments:** Known in Estonia, Sweden, Denmark (Silfverberg 2010), Latvia (Telnov 2004), Lithuania (Tamutis et al. 2011), and Belarus (Alexandrovitch et al. 1996).

### Subgenus *Acrossus* Mulsant, 1842

#### (5) *A. bimaculatus* (Laxman, 1770)

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg), Gus. (Gumbinnen).

**Comments:** The beetles and larvae feed on

horse dung. The species range formerly included Estonia (Silfverberg 2010), Latvia (Telnov 2004), Belarus (Alexandrovitch & Pisanenko 1991) and southern regions of Central and Eastern Europe. The evident decline of populations and decrease of distributional range in the XX century in the northern parts of areal is recognized (Nikitsky 2016); the species is included in the Russian Red Data Book (Nikitsky 2001a) and is listed in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010) as the regionally extinct during last 50 years species. The beetle has the “possible extinct” status in Poland too (Pawłowski et al. 2002). The actual presence of the species in the regional fauna needs confirmation and the field work in eastern parts of the Kaliningrad Region should definitely clarify the question.

#### 6. *A. depressus* (Kugelann, 1792)

Bercio & Folwaczny 1979

**Voucher specimens:** 4 [Dolzhanskoe, 29 June 1997; Kolosovka, 26 April 2002; Riabinovka, 20 June 2010; Mechnikov, 07 May 2018].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Groß Raum, Königsberg), Zel. (Loppöhen, Neuhäuser, Warnicken); Krasn., Zel.

**Comments:** Sporadically distributed and occasional species associated with forest edges and encountered in cattle and sheep dung.

#### 7. *A. luridus* (Fabricius, 1775)

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 6 [1 km NE Kaliningrad, 28 May 1996, 2 exp.; Zelenogradsk, 27 April 1997; Kolosovka, 2 June 2001, 2 exp.; Kumachevo, 16 June 2001].

**Kaliningrad Region:** Gur. (Königsberg), Oz. (Trempen); Bagr., Gur., Zel.

**Comments:** Sporadically and occasionally encountered species of open mesophilic habitats associated with cattle dung. The color variation with entirely black elytrae is more common in the Kaliningrad Region.

#### 8. *A. rufipes* (Linnaeus, 1758)

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev & Shapoval 2011a,

b, 2013, 2016; Alekseev 2014.

**Voucher specimens:** 9 [Dolzhanskoe, 29 June 1997, 2 exp.; Zelenogradsk, 10 June 2000; 23 km of the Curonian Spit, 14 August 2008, 2 exp.; ibidem 11 September 2015, 2 exp.; Kostrovo, 10 September 2018, 2 exp.].

**Kaliningrad Region:** Bagr. (Ludwigsort), Chern. (Insterburg), Gur. (Juditten, Königsberg, Wernsdorf, Wilkie), Zel. (Kurische Nehrung, Rauschen, Warnicken); Bagr., Chern., Krasn., Nem., Nest., Zel.

**Comments:** This quite eurytopic species favors different forest habitats (including forest edges and large parks) and is widely distributed and frequent in the Kaliningrad Region.

### Subgenus *Agoliinus* A. Schmidt, 1913

#### (9). *A. nemoralis* Erichson, 1848

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Chern. (Insterburg), Pravd. (Zehlau).

**Comments:** Umbrophilous forest species, a coprophage encountered mainly in the feces of forest cervids. Widely distributed in Baltic region, Fennoscandia (Silfverberg 2010), Lithuania (Tamutis et al. 2011), Belarus (Alexandovitch et al. 1996), and north-western Poland (Byk & Rutkiewicz 2017).

#### [*A. piceus* Gyllenhal, 1808]

**Comments:** Known in Baltic region, Fennoscandia (Silfverberg 2010), Lithuania (Tamutis et al. 2011). The certain data from Eastern Prussia are absent (Bercio & Folwaczny 1979), but the occurrence of the species in the Region is possible.

### Subgenus *Agrilinus* Mulsant et Rey, 1870

#### 10. *A. ater* (De Geer, 1774)

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2014.

**Voucher specimens:** 19 [Mel'nikovo, 30 April 1997; Chekhovo, 17 May 1998; 3 km NE Zelenogradsk, 18 June 1998; Cherniakhovsk, 06 May 1999; Mezhdurech'e, 13 June 2000; Zelenogradsk, 13 May 2001; Kolosovka, 02 June 2001, 2 exp.; ibidem, 11 June 2003;

Nizinnoe, 12 June 2007, 2 exp.; Krasnoles'e, 08 June 2008; Primorsk, 27 May 2015; Medovoe, 10 April 2018, 2 exp.; Timofeevka, 30 April 2018, 2 exp.; Mechnikov, 07 May 2018, 2 exp.].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Juditten); Zel. (Rauschen); Bagr., Chern., Gur., Krasn., Nem., Nest., Pravd., Zel.

**Comments:** Widely distributed and frequent heliophilous species, associated with dung of domestic herbivores.

#### (11). *A. rufus* (Moll, 1782) [= *scybalarius* (Fabricius, 1781)]

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Juditten, Königsberg), Zel. (Kurische Nehrung, Neuhäuser, Rauschen, Warnicken).

**Comments:** Widely distributed in Baltic region, Fennoscandia (Silfverberg 2010), Lithuania (Tamutis et al. 2011), and Belarus (Alexandovitch et al. 1996).

#### 12. *A. sordidus sordidus* (Fabricius, 1775)

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Shapoval 2016.

**Voucher specimens:** 14 [Rybachii, 10 August 1997; Sovetsk, 09 July 2000; Kumachevo, 16 June 2001; Kosa, 06 July 2005; Chkalovsk, 24 June 2007; Timiryazevo, 12 June 2007, 2 exp.; 23 km of the Curonian Spit, 13 August 2012; ibidem, 05 September 2015; Divnoe, 17 September 2018, 5 exp.].

**Kaliningrad Region:** Common everywhere; Chern., Gur., Nem., Zel.

**Comments:** Widely distributed and frequent in the Kaliningrad Region species. In the cattle dung on meadows, pastures, forest edges.

### Subgenus *Ammoecius* Mulsant, 1842

#### 13. *A. brevis* Erichson, 1848

Alekseev & Sakhnov 2000 (misidentification).

**Voucher specimens:** 2 [Zehlau, 21 May 2007, 2 exp.].

**Kaliningrad Region:** Gvard.

**Comments:** The species was known according to Bercio & Folwaczny (1979) in the northern Poland only, later report (Alekseev & Sakhnov 2000) from the Region was based on

inaccurately identified specimens. The species is considered to be locally distributed and rare: it was once sampled in dry elk dung in the raised bog Zehlau.

### Subgenus *Aphodius* Hellwig, 1798

#### 14. *A. fimetarius* (Linnaeus, 1758) [= *pedellus* (De Geer, 1774) sensu Wilson (2001)]

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2005, 2007, 2014; Alekseev & Shapoval 2016.

**Voucher specimens:** 33 [Zelenogradsk, 27 April 1997; Svetlogorsk, 14 May 1997; Dolzhanskoe, 29 June 1997; Rybachii, 10 August 1997, 3 exp.; 1 km E Cherniakhovsk, 06 May 1999, 2 exp.; ibidem, 29 May 2007; Kashirskoe, 22 May 1999; 1 km S Zelenogradsk, 10 June 2000, male edeagus extracted; Sovetsk, 09 July 2000, 2 exp., male edeagus extracted; Kumachevo, 16 June 2001; Kolosovka, 02 June 2001; ibidem, 11 June 2003; 5 km NE Cherniakhovsk, 31 March 2002, 2 exp.; Timiryazovo, 12 June 2007; Kaliningrad, May 2003; ibidem, 19 August 2007, *A. fimetarius* ab. *autumnalis* (Naezen, 1792); Krasnoles'e, 07 June 2008; Cherniakhovsk, 1 May 2016; Mechnikov, 09 April 2018; ibidem, 07 May 2018; Medovoe, 10 April 2018, 2 exp.; Baltic Spit, 26 June 2018, 2 exp.; Vzmor'e, 11 September 2018; Sosnovka, 16 October 2018, 3 exp.].

**Kaliningrad Region:** Common everywhere; Bagr., Chern., Gur., Gus., Gvard., Krasn., Nem., Nest., Oz., Pol., Pravd., Slav., Zel.

**Comments:** Eutytopic, widely distributed and abundant species occupies a variety of open habitats. It is encountered in different kinds of excrements on pastures, forest edges and in towns; the species is one of the most frequently observed representatives of the subfamily Aphodiinae. The aberration *autumnalis* (Naezen) is rare and was sampled only once in Kaliningrad. The sibling species *A. cardinalis* Reitter, 1892 [= *fimetarius* (Linnaeus, 1758) sensu Wilson (2001)], recently discovered on the base of distinctly different karyotype (Wilson 2001) and sympatric with *A. fimetarius* within Central and Southern Europe (Miraldo

et al. 2014; Fery & Rössner 2015; Rössner & Fery 2015) was not found. Several externally questionable specimens were dissected, but the genitalia extracted showed the presence of *A. fimetarius* [*pedellus* sensu Wilson] in the Region only.

#### 15. *A. foetens* (Fabricius, 1787) [= *aestivalis* Stephens, 1839]

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000 (*aestivalis*).

**Voucher specimens:** 47 [Dolzhanskoe, 29 June 1996; Mezhdurech'e, 13 June 2000; Timiryazovo, 12 June 2007; Chenyakhovsk, 18 August 2007; Kostrovo, 10 September 2018, 3 exp.].

**Kaliningrad Region:** Bagr. (Ludwigsort), Chern. (Insterburg), Gur. (Kleinheide, Königsberg), Zel. (Loppöhnen, Medenau); Chern., Krasn., Zel.

**Comments:** Widely distributed and frequent coprophagous species on river valleys and meadows.

#### (16) *A. foetidus* (Herbst, 1783) [= *scybalarius* auct. nec (Fabricius, 1781)]

Bercio & Folwaczny 1979 (*scybalarius* F. (*foetidus* Hbst.));

**Kaliningrad Region:** Zel. (Cranz).

**Comments:** The species is known in Sweden, Denmark, Estonia (Silfverberg 2010), Latvia (Telnov 2004), and Lithuania (Tamutis et al. 2011). The actual occurrence of the species in the Kaliningrad Region is possible, but not confirmed by our material.

### Subgenus *Bodilus* Mulsant et Rey, 1870

#### 17. *A. ictericus ictericus* (Laicharting, 1781) [= *nitidulus* (Fabricius, 1792)]

Lentz 1879; Bercio & Folwaczny 1979 (*nitidulus*); Alekseev & Sakhnov 2000 (*nitidulus*).

**Voucher specimens:** 3 [Sovetsk, 09 July 2000; the Baltic Spit, 19 July 2005, 2 exp.].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg), Zel. (Loppöhnen, Rauschen, Warnicken); Barg., Chern., Nem., Zel.

**Comments:** Sporadically distributed, frequent



species of open habitats, in cattle and horse dung.

**(18). *A. lugens* Creutzer, 1799**

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Zel. (Großheydekrug, Pillau).

**Comments:** The species is known in Estonia (Silfverberg 2010), Latvia (Telnov 2004), and Belarus (Alexandovitch et al. 1996).

**Subgenus *Calamosternus* Motschulsky, 1859**

**19. *A. granarius* (Linnaeus, 1767)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2005; Akhmetova & Frolov 2014.

**Voucher specimens:** 32 [Veseloje, 08 May 1996; Mel'nikovo, 30 April 1997, 3 exp.; Sovetsk, 10 May 1997, 2 exp.; Svetlogosk, 14 May 1997, 2 exp.; ibidem, 02 June 2003, 3 exp.; 3 km N Zelenogradsk, 18 June 1998; Zelenogradsk, 13 May 2001; Kaliningrad, 17 April 2002; 2 km N Ladushkin, 07 May 2007, 2 exp.; Nagornoe, 12 June 2007, 3 exp.; Ushakovo, 07 May 2007, 2 exp.; Nizinnoe, 12 June 2007, 4 exp.; Russkoe, 11 May 2010; Kaliningrad, 21 April 2014; Mechnikov, 06 May 2014; 3 km W Baltiysk, 30 May 2012; 3 km N Yantarny, 12 June 2012; Mechnikov, 07 May 2018, 2 exp.].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg), Zel. (Rossitten, Loppöhhnen); Bagr., Chern., Gur., Gvard., Krasn., Nem., Nest., Pravd., Zel.

**Comments:** Widely distributed and frequent in the Kaliningrad Region heliophilous species associated with different open habitats.

**Subgenus *Chilothorax* Motschulsky, 1859**

**20. *A. conspurcatus* (Linnaeus, 1758)**

Alekseev & Shapoval 2016.

**Voucher specimens:** 9 [23 km of the Curonian Spit, 17 October 2015; Kostrovo, 15 October 2018, 8 exp.].

**Comments:** According to Bercio & Folwaczny (1979) the findings of this rarely encountered species were earlier known in present-day territory of Poland only. Generally, the beetle is

widely distributed: it is known in Fennoscandia, Baltic Region (Silfverberg 2010), and Belarus (Alexandovitch & Pisanenko 1991). Locally frequent species, registered in mid-October in light trap and in horse excrements only.

**21. *A. distinctus distinctus* (Müller, 1776)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000 (misidentification).

**Voucher specimens:** 12 [3 km W Primorsk, 16 April 2018; Vzmor'e, 11 September 2018; ibidem 25 September 2018, 5 exp.; Kostrovo, 15 October 2018, 5 exp.].

**Kaliningrad Region:** Common everywhere; Zel.

**Comments:** Heliophilous, collected in autumn and spring, sporadically frequent in the Region species.

**22. *A. melanostictus* W. Schmidt, 1840**

Lentz 1879; Bercio & Folwaczny 1979.

**Voucher specimens:** 3 [Veseloje, 08 May 1996; Donskoe, 04 May 2016; Baltic Spit, 23 April 2018].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg); Bagr., Zel.

**Comments:** Heliophilous, sporadically distributed and rare species. In the Kaliningrad Region is collected on the sandy coasts of Baltic Sea and Kaliningrad Gulf in spring.

**23. *A. paykulli* Bedel, 1907 [=*tessulatus* (Paykull, 1798)]**

Bercio & Folwaczny 1979 (*tessulatus* Payk.); Akhmetova & Frolov 2014.

**Kaliningrad Region:** The species is reported in Eastern Prussia with no locality specified (Bercio & Folwaczny 1979), and is known in the Kaliningrad Region according to Akhmetova & Frolov (2014). It reported in Fennoscandia and Baltic region (Silfverberg 2010), Belarus (Alexandovitch & Pisanenko 1991), and north-western Poland (Byk & Rutkiewicz 2017). Adults occur in autumn and early spring. The species is considered to be local and rare, not sampled in research time by author, but included in the list of recent regional fauna according to Akhmetova & Frolov (2014).

**Subgenus *Colobopterus* Mulsant, 1842****24. *A. erraticus* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 6 [Ozersk, 17 May 1997; 1 km E Cherniakhovsk, 06 May 1999, 2 exp.; Mezhdurech'e, 13 June 2000, 2 exp.; Chkalovsk, 24 June 2007].

**Kaliningrad Region:** Bagr. (Kämmershöfen), Gur. (Groß Raum, Königsberg, Wilkie), Zel. (Rauschen, Warnicken); Bagr., Chern., Gur., Oz.

**Comments:** Heliophilous species, widely distributed and frequent in cattle excrements of the open habitats.

**Subgenus *Esymus* Mulsant et Rey, 1870****(25). *A. merdarius* (Fabricius, 1775)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Shapoval 2013 (misidentification); Alekseev 2014.

**Kaliningrad Region:** Bagr. (Ludwigsort), Gur. (Königsberg), Zel. (Loppönnen, Rauschen).

**Comments:** Widespread in Baltic States and Fennoscandia (Silfverberg 2010), known in Belarus (Alexandovitch & Pisanenko 1991) and north-western Poland (Byk & Rutkiewicz 2017).

**26. *A. pusillus pusillus* (Herbst, 1789)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000 (*pusilus*); Alekseev & Shapoval 2011a, b, 2013, 2016; Alekseev 2014.

**Voucher specimens:** 10 [Cherniakhovsk, 17 June 1997; Chekhovo, 17 May 1998; Zelenogradsk, 10 June 2000, 3 exp.; 5 km NE Cherniakhovsk, 23 May 2001; Kolosovka, 02 June 2001, 3 exp.; Kostrovo, 30 May 2016].

**Kaliningrad Region:** Gur. (Königsberg), Oz. (Trempen), Nest. (Rominten), Zel. (Kurische Nehrung, Loppönnen); Bagr., Chern., Gur., Zel.

**Comments:** Widely distributed and abundant species of open habitats feeding in sheep and cattle excrements.

**Subgenus *Eudolus* Mulsant et Rey, 1870****(27). *A. quadriguttatus* (Herbst, 1783)**

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg), Zel. (Neuhäuser, Pillau, Rauschen).

**Comments:** Formerly widespread in western part of the Region. The species with evident decrease of distributional range in the northern parts of areal (Rössner 2013), but the actual occurrence of the species in the Region is possible. The species is known in Sweden, Denmark (Silfverberg 2010), Latvia (Telnov 2004), Lithuania (Tamutis et al. 2011), and Belarus (Alexandovitch & Pisanenko 1991).

**Subgenus *Euorodalus* Dellacasa, 1983****28. *A. coenosus* (Panzer, 1798) [= *tristis* (Zenker, 1801)]**

Bercio & Folwaczny 1979 (*tristis* Zenker); Alekseev & Sakhnov 2000 (*tristis* Zenk.).

**Voucher specimens:** 1 [Baltiysk, 25 May 2008].

**Kaliningrad Region:** Bagr. (Kämmershöfen), Zel. (Loppönnen); Zel.

**Comments:** Rare and locally distributed species in the Kaliningrad Region, but widely distributed in the whole Baltic Region (Silfverberg 2010; Tamutis et al. 2011; Byk & Rutkiewicz 2017).

**[*A. paracoenosus* Balthasar et Hrubant, 1960]**

**Comments:** The species is known in Belarus (Alexandovitch et al. 1996) and Poland (Stebnicka 1976). The occurrence of the species in the Kaliningrad Region is quite possible.

**Subgenus *Eupleurus* Mulsant, 1842****29. *A. subterraneus subterraneus* (Linnaeus, 1758)**

Bercio & Folwaczny 1979; Alekseev 2005, 2014.

**Voucher specimens:** 7 [Morskoe, 08 May 1997, 3 exp.; Dolzhanskoe, 29 June 1997; Rybachii, 10 August 1997, 3 exp.].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg), Nem. (Tilsit), Zel. (Cranz, Rauschen); Zel. (Curonian Spit); Krasn., Zel.

**Comments:** Sporadically distributed, frequent heliophilous species of the cattle excrements preferred well drained and sandy soils.

### Subgenus *Labarrus* Mulsant et Rey, 1870

[*A. lividus* (A. G. Olivier, 1789)]

**Kaliningrad Region:** The species is known in Finland, Karelia, Sweden, Estonia (Silfverberg 2010), Lithuania (Tamutis et al. 2011), and Belarus (Alexandrovitch et al. 1996). The certain data from Eastern Prussia are absent (Bercio & Folwaczny 1979), but the occurrence of the species in the Kaliningrad Region is quite possible.

### Subgenus *Liothorax* Motschulsky, 1859

(30). *A. plagiatus* (Linnaeus, 1767)

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg), Nest. (Eydtkuhnen), Zel. (Fischhausen, Loppöhnen, Neuhäuser, Rossitten).

**Comments:** Widely distributed in Baltic region, Fennoscandia (Silfverberg 2010), Lithuania (Tamutis et al. 2011), and Belarus (Alexandrovitch et al. 1996).

### Subgenus *Melinopterus* Mulsant, 1842

31. *A. prodromus* (Brahm, 1790)

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Akhmetova & Frolov 2014.

**Voucher specimens:** 23 [Ladushkin, 28 April 1997, 2 exp.; Cherniakhovsk, 01 May 1997, 2 exp.; ibidem, 06 May 1999; ibidem, 01 October 2018, 4 exp.; 5 km NE Cherniakhovsk, 23 May 2001, 2 exp.; ibidem, 31 March 2002, 2 exp.; Grushevka, 09 May 2008; Medovoe, 10 April 2018, 2 exp.; Baltic Spit, 23 April 2018; Timofeevka, 30 April 2018, 2 exp.; Kostrovo, 15 October 2018, 4 exp.].

**Kaliningrad Region:** Common everywhere; Bagr., Chern., Gur., Pravd.

**Comments:** Widely distributed and abundant species on pastures and meadows in dung of domestic herbivores throughout the Kaliningrad Region. One of commonest species of the

*Aphodius* genus in the Kaliningrad Region.

(-) *A. pubescens* Sturm, 1800

Alekseev & Sakhnov 2000 (misidentification).

[*A. punctatosulcatus hirtipes* Fischer von Waldheim, 1844 [= *sabulicola* Thomson, 1868]]

Bercio & Folwaczny 1979 (*sabulicola* Thoms.).

**Kaliningrad Region:** The species is reported in Eastern Prussia without specified localities (Bercio & Folwaczny 1979), but known in Fennoscandia, Estonia (Silfverberg 2010), Latvia (Telnov 2004), and Belarus (Alexandrovitch & Pisanenko 1991).

(32). *A. sphacelatus* (Panzer, 1798)

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg), Zel. (Rossitten).

**Comments:** Widely distributed species, known in Fennoscandia, Baltic States (Silfverberg 2010), and Belarus (Alexandrovitch & Pisanenko 1991).

### Subgenus *Nialus* Mulsant et Rey, 1870

33. *A. varians* Duftschmid, 1805 [= *niger* (Panzer, 1797)]

Bercio & Folwaczny 1979 (*varians* Dft. and *niger* Panz.).

**Voucher specimens:** 4 [23 km of the Curonian Spit, 30 May 2009; ibidem, 20 May 2012; Yantarny, 02 June 2014; Cherniakhovsk, 25 May 2018].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Metgethen, Dammhof, Forst Fritzen), Gur. (Königsberg for „*varians* Dft.“), Zel. (Loppöhnen, Neuhäuser, Pillau, Rauschen, Rossitten).

**Comments:** The species names *A. niger* (Panzer, 1797) and *A. niger* Illiger, 1798 are considered homonyms and the specific name *A. niger* Illiger, 1798 for a widely distributed and endangered species of European dung beetle is conserved by suppression of other name (Krell et al. 2003). Panzer's actual species is considered to be conspecific with *A. varians* Duftschmid, 1805 (Tamutis et al. 2011). All data

from catalogue of Bercio & Folwaczny (1979) is united under name *A. varians*. The species is considered to be sporadically occasional in the Region.

### Subgenus *Nimbus* Mulsant et Rey, 1870

#### (34). *A. contaminatus* (Herbst, 1783)

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg).

**Comments:** The species was included in the list of Bercio and Folwaczny (1979) as taxon “under question”. It is known in Fennoscandia (Silfverberg 2010), Lithuania (Tamutis et al. 2011) and north-western Poland (Byk & Rutkiewicz 2017) and its findings in the Region are expected.

### Subgenus *Otophorus* Mulsant, 1842

#### 35. *A. haemorrhoidalis* (Linnaeus, 1758)

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2014.

**Voucher specimens:** 13 [Rybachii, 11 August 1997; Pionerskiy, June 2000; Cherniakhovsk, 29 May 2007, 2 exp.; Nagornoe, 12 June 2007; Timiryazovo, 12 June 2007, 2 exp.; Kaliningrad, 17 June 2007, 2 exp.; Vzmor’e, 07 July 2011; Grushevka, 10 June 2015; Vzmor’e, 11 September 2018, 2 exp.].

**Kaliningrad Region:** Bagr. (Kämmershöfen), Chern. (Insterburg), Gur. (Condehnen, Königsberg), Zel. (Loppönnen, Neukuhren, Rauschen, Warnicken); Bagr., Chern., Gur., Gus., Pravd., Zel.

**Comments:** Widely distributed and frequent heliophilous species of cattle excrements on the pastures.

### Subgenus *Phalacrothous* Motschulsky, 1859

#### (-) *A. (Emadus) quadrimaculatus* (Linnaeus, 1761)

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Zel. (Caporner Heide, Galtgarben 1848, Frische Nehrung).

**Comments:** Formerly registered in western part of the region (reports of XIX century). The species is known in Karelia (Silfverberg 2010),

Estonia (Süda 2009), and Lithuania (Tamutis et al. 2011). The majority of reports are historical and recent limits of the distribution area of the species should be situated further south than the Baltic region. It is presumed the species is extinct in the Kaliningrad Region, therefore it is deleted from the list.

### Subgenus *Plagiogonus* Mulsant, 1842

#### (36). *A. arenarius* Olivier, 1789 [= *A. putridus* (Geoffroy, 1785)]

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg), Zel. (Loppönnen).

**Comments:** The species prefer to feed on dry dung of different animals (Verdú and Galante 2000), it is widespread in the Baltic region and Fennoscandia (Silfverberg 2010), known in Lithuania (Tamutis et al. 2011), Belarus (Alexandovitch & Pisanenko 1991) and northern Poland (Bunalski & Szwałko 1990).

### Subgenus *Planolinus* Mulsant et Rey, 1870

#### 37. *A. borealis* Gyllenhal, 1827

Bercio & Folwaczny 1979.

**Voucher specimens:** 6 [23 km of the Curonian Spit, 27 June 2009; 30 May 2010; 28 June 2010; 3 July 2010; 2 August 2010; 30 June 2015].

**Kaliningrad Region:** Gvard. (Wehlau), Slav. (Tawellningken), Zel. (Cranz, Rauschen); Zel.

**Comments:** Widely distributed in forest habitats of Baltic region, Fennoscandia (Silfverberg 2010), Lithuania (Tamutis et al. 2011), and Belarus (Alexandovitch et al. 1996). Locally distributed and occasional in the Kaliningrad Region: repeatedly sampled in light trap at the Curonian Spit only.

#### 38. *A. fasciatus* (Olivier, 1789) [= *uliginosus* Hardy, 1847 = *putridus* (Herbst, 1789)]

Bercio & Folwaczny 1979 (*putridus* Hbst.); Alekseev & Sakhnov 2000 (*putridus*).

**Voucher specimens:** 4 [Zehlau, deer excrements with larvae collected 21 May 2007, the beetles obtained 27 July 2007, 4 exp.].

**Kaliningrad Region:** Gur. (Groß Raum, Juditten, Königsberg), Zel. (Galtgarben); Bagr.



[observed 07 March 1999, roe excrements in pine forest], Oz., Pravd.

**Comments:** Locally distributed, occasional in the Kaliningrad Region species associated with forest habitats and excrements of wild ungulates.

#### **Subgenus *Pubinus* Mulsant et Rey, 1870**

##### **(39). *A. tomentosus* (Müller, 1776)**

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Bagr. (Bladiau bei Heiligenbeil), Zel. (Bludauer Forst bei Fischhausen, Loppöhnen).

**Comments:** Widely distributed species, known in Fennoscandia, Baltic States (Silfverberg 2010), Belarus (Alexandovitch & Pisanenko 1991) and Lithuania (Tamutis et al. 2011).

#### **Subgenus *Sigorus* Mulsant et Rey, 1870#**

##### **40. *A. porcus* (Fabricius, 1792)**

Bercio & Folwaczny 1979.

**Voucher specimens:** 8 [Kostrovo, 10

September 2018, 6 exp.; Vzmor'e, 11

September 2018, 2 exp.].

**Kaliningrad Region:** Zel. (Elendskrug bei Fischhausen); Zel.

**Comments:** Locally frequent species, sampled together with *Geotrupes spiniger* under cow and horse excrements in September-October. According to Akhmetova & Frolov (2014), the species is known in Russia from Rostov Region only and such southern distribution is catalogued by Löbl & Löbl (2016) too. The actual report of the species is the addition to the fauna of Russian Central European Territory.

#### **Subgenus *Teuchestes* Mulsant, 1842**

##### **41. *A. fossor* (Linnaeus, 1758)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2005.

**Voucher specimens:** 4 [2 km NE Cherniakhovsk, 15 July 1988; Ozersk, 17 May 1997; Dolzhanskoe, 29 June 1997; 1 km E Cherniakhovsk, 29 May 2007].

**Kaliningrad Region:** Bagr. (Kämmershöfen, Ludwigsort), Chern. (Insterburg), Gur. (Königsberg, Metgethen), Gvard. (Wehlau),

Zel. (Cranz, Kurische Nehrung, Loppöhnen, Rauschen); Bagr., Chern., Krasn., Nem., Nest., Oz., Zel.

**Comments:** Widely distributed and frequent throughout the Region in cattle excrements on the mesophilous meadows and pastures.

#### **Subgenus *Trichonotulus* Bedel, 1911**

##### **(42). *A. scrofa* (Fabricius, 1787)**

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg), Zel. (Rauschen).

**Comments:** The species is known in Karelia, Sweden, Denmark, Estonia (Silfverberg 2010), Latvia (Telnov 2004), Lithuania (Tamutis et al. 2011), and Belarus (Alexandovitch et al. 1996).

#### **Subgenus *Volinus* Mulsant et Rey, 1870**

##### **43. *A. sticticus* (Panzer, 1798) [=equestris (Panzer, 1798)]**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 10 [Cherniakhovsk, 29 April 1996; Veseloe, 12 June 1999; Kaliningrad, 26 April 2008; ibidem, 11 September 2010, 4 exp.; 3 km W Svetlogorsk, 04 May 2009; Kostrovo, 10 September 2018, 2 exp.].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg, Metgethen), Zel. (Neuhäuser); Bagr., Chern., Gur., Zel.

**Comments:** Umbrophilous species encountered on horse and cattle excrements in parks and suburbs. Sporadically distributed and frequent in the Kaliningrad Region.

#### **Genus *Euheptaulacus* Dellacasa, 1983**

##### **(44). *E. sus* (Herbst, 1783)**

Lentz 1879; Bercio & Folwaczny 1979 (*Heptaulacus*).

**Kaliningrad Region:** Gur. (Königsberg), Zel. (Galtgarben, Rauschen).

**Comments:** The species is known in Karelia, Sweden, Denmark, Estonia (Silfverberg 2010), Latvia (Telnov 2004), Lithuania (Tamutis et al. 2011), and Belarus (Alexandovitch et al. 1996).

**[*E. villosus* (Gyllenhal, 1806)]**

**Kaliningrad Region:** The species is known in Finland, Sweden, Norway, Denmark, Estonia (Silfverberg 2010) and northern Poland (Lentz 1879). The species is considered extinct (Rössner 2013) in Mecklenburg-Vorpommern (north-eastern Germany) and noted as “Very rare and insufficiently known species with only few records in the last 50 years” in the Latvian check-list (Telnov 2004). The occurrence of the species in the Region could be expected.

**Genus *Heptaulacus* Mulsant, 1842****(45). *H. testudinarius* (Fabricius, 1775)**

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg, Margen, Spittelhof).

**Comments:** The species occurs in dry excrements on sandy soils and is known in Sweden, Denmark, Estonia (Silfverberg 2010), Latvia (Telnov 2004), Lithuania (Tamutis et al. 2011), Belarus (Alexandovitch et al. 1996), and north-western Poland (Byk 2012).

**Genus *Oxyomus* Stephens, 1839****46. *O. sylvestris* (Scopoli, 1763)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 10 [Cherniakhovsk, 27 April 1992, 2 exp.; Svetlogorsk, 06 June 2004; Yantarny, 05 May 2008; Yantarny-Donskoe, 24 May 2010; Medovoe, 10 April 2018, 5 exp.].

**Kaliningrad Region:** Common everywhere; Bagr., Chern., Zel.

**Comments:** Saprophagous species, mostly associated with dry old cow excrements, sporadically distributed and occasional in the Region.

**Tribe Psammodiini Mulsant, 1842****Genus *Diastictus* Mulsant, 1842****(47). *D. vulneratus* (Sturm, 1805)**

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Bagr. (Heiligenbeil, Ludwigsort), Gur. (Königsberg), Zel. (Loppöhnen).

**Comments:** Psammophilous and detritivorous species, known in Baltic States, Sweden, and Denmark (Silfverberg 2010). The species is considered extinct (Rössner 2013) in Mecklenburg-Vorpommern (north-eastern Germany). The actual presence of the species in the regional fauna needs confirmation.

**Genus *Psammodius* Fallen, 1807****48. *P. asper* (Fabricius, 1775) [= *sulcicollis* (Illiger, 1802)]**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000 (*sulcicollis*); Alekseev 2003, 2005, 2008 (*sulcicollis*); Alekseev & Shapoval 2011b (*sulcicollis*); Alekseev 2014.

**Voucher specimens:** 6 [23 km of the Curonian Spit, 19 June 1997; ibidem, 15 June 2009; ibidem, 28 June 2009; ibidem, 17 July 2010; 3 km W Rybachii, 08 August 1998; 3 km W Primorsk, 27 May 2015].

**Kaliningrad Region:** Bagr. (Heiligenbeil), Gur. (Königsberg), Zel. (Frische Nehrung, Loppöhnen, Neukuhren, Rossitten); Zel.

**Comments:** Stenotopic, rare psammophilous and saprophagous (feeding on detritus in the soil) species restricted in the Region to sandy dunes and cliffs of the Baltic seaside, where occurs sporadically.

**Genus *Rhyssemus* Mulsant, 1842****49. *R. puncticollis* Brown, 1929**

Lentz 1879; Bercio & Folwaczny 1979 (*R. germanus* (L.) [= *asper* (F.)])

**Voucher specimens:** 2 [2 km W Riabinovka, 17 June 2001; 4 km W Povarovka, 29 May 2017].

**Kaliningrad Region:** Gur. (Juditten, Königsberg), Gvard. (Kapkeim), Zel. (Loppöhnen, Neuhäuser); Zel.

**Comments:** The independent status of the species *Rh. germanus* (Linnaeus, 1767) and *R. puncticollis* Brown was recently validated by Rössner (2012). The species is known (Byk 2014) in Austria, Bulgaria, Canada, the Czech Republic, Germany, Latvia and Poland at present. All collected in the Kaliningrad Region specimens of the genus belongs to this species. It is very probable, all old reports of

*Rh. germanus* (L.) from Eastern Prussia (based on the not available for the author materials) concern *R. puncticollis* Brown too. Therefore, the species *Rh. germanus* (L.) has been removed from the species list and the data concerning its distribution was used for *R. puncticollis* Brown. Locally distributed and rare species in the Region.

**Subfamily Scarabaeinae Latreille, 1802**

**Tribe Coprini Leach, 1815**

**Genus *Copris* Geoffroy, 1762**

**50. *C. (s. str.) lunaris* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 1 [1 km E Cherniakhovsk, 29 May 2007].

**Kaliningrad Region:** Bagr. (Heiligenbeil, Ludwigsort), Gur. (Königsberg), Nest. (Rominten), Slav. (Linkuhnen/Elchniederung), Zel. (Galtgarben, Rauschen); Chern., Oz.

**Comments:** Heliophilous, locally distributed and rare species associated with cattle dung on well drained soils. The species is listed in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010).

**Tribe Oniticellini Kolbe, 1905**

**Genus *Euoniticellus* Janssens, 1953**

**(51). *O. fulvus* (Goeze, 1777)**

Bercio & Folwaczny 1979 (*Oniticellus*).

**Kaliningrad Region:** Gur. (Königsberg).

**Comments:** The probable occurrence in the Kaliningrad Region and in Lithuania (Tamutis et al. 2011) belongs to the northernmost localities of the species in Baltic region. The beetle is known in south-eastern Belarus (Alexandovitch & Pisanenko 1991) and Poland (e.g. Lentz 1879). The range of this coprophagous beetle reaches its northern limits around 53° north latitude (Kabakov 2006), but it is recently reported from Moscow Region (Nikitsky 2009). The actual presence of the species in the regional fauna is questionable and needs verification. The species is termophilous in Central Russia (Nikitsky 2016).

**Tribe Onthophagini Burmeister, 1846**

**Genus *Caccobius* Thomson, 1863**

**(52). *C. (s. str.) schreberi* (Linnaeus, 1767)**

Lentz 1879 (*Onthophagus*); Bercio & Folwaczny 1979.

**Kaliningrad Region:** Bagr. (Heiligenbeil, Ludwigsort), Chern. (Insterburg), Gur. (Königsberg, Wilkie), Nest. (Rominten), Zel. (Rauschen).

**Comments:** Psammophilous species. Formerly widespread and abundant beetle [according to Bercio & Folwaczny (1979): „Insterburg, in jedem Jahr unter jedem Kuhfladen“, that is “Insterburg, every year under every cow pat”] with evident decline of populations and probably decrease of distributional range. The actual presence in the Region needs confirmation. The species is known in Belarus (Alexandovitch & Pisanenko 1991), all three Baltic States and eastern Fennoscandia (Silfverberg 2010). The range of this beetle reaches its northern limits around 56° north latitude (Kabakov 2006).

**Genus *Onthophagus* Latreille, 1802**

**Subgenus *Onthophagus* Latreille, 1802**

**53. *O. taurus* (Schreber, 1759)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Nikitsky 2008.

**Voucher specimens:** 3 [the Baltic Spit, 19 July 2005, 2 exp.; Baltiysk, 25 May 2008].

**Kaliningrad Region:** Gur. (Königsberg, Wilkie), Nest. (Rominten), Zel. (Frische Nehrung, Neuhäuser, Pillau); Zel.

**Comments:** Heliophilous occasional species, currently localized in south-western part of the Region on sandy coasts of Baltic Sea in cattle dung. The occurrence in the Kalinigrad Region and in Lithuania is the northernmost localities of the species in the eastern Baltic region. According to Kabakov (2006), the northern limit of distribution range is the line between Kaliningrad and Smolensk, i.e. reaching to 54°40' north latitude. This European species is considered regionally extinct in England and in Mecklenburg-Vorpommern, north-eastern Germany (Rössner 2013), but is successfully introduced in North America in the 1970s and

now occurs in Florida and Michigan, United States of America (Floate et al. 2015).

The beetles are collected in cattle excrements on the Baltic seaside. All male specimens found in the Region during research belong to forma *media* (with the short and weakly arcuate horns). Horn development is facultative, and depends on the the attainment of a certain body size (Arrow 1951), which, in turn, depends on the nutrient conditions encountered by males during development and may be regulated hormonally (Emlen & Nijhout 1999). Males reared on reduced food amounts do not develop horns, irrespective of the morphology of their fathers (Emlen 1994; Emlen & Nijhout 1999). The exclusively observed forma *media* should be a characteristic of the insufficient development conditions for the beetles in the area.

#### Subgenus *Palaeonthophagus* Zunino, 1979

##### 54. *O. coenobita* (Herbst, 1787)

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 1 [Veseloe, 20 June 1999].

**Kaliningrad Region:** Gur. (Glacis, Kleinheide, Königsberg), Zel. (Neuhäuser); Bagr.

**Comments:** Locally distributed and rare in the Kaliningrad Region species, encountered once in baited with carrion pitfall trap.

##### (55). *O. fracticornis* (Preysler, 1790)

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Juditten, Königsberg, Metgethen, Wilkie), Zel. (Georgenshöhe, Rauschen, Warnicken).

**Comments:** Formerly widespread at least in western parts of the Region. Widespread in the Baltic States and Fennoscandia (Silfverberg 2010), known in Lithuania (Bercio & Folwaczny 1979; Tamutis et al. 2011), Belarus (Alexandovitch & Pisanenko 1991) and north-western Poland (Byk 2012). The presence of the species in the regional fauna needs actual confirmation.

##### 56. *O. gibbulus gibbulus* (Pallas, 1781)

##### [=*austriacus* (Panzer, 1793)]

Bercio & Folwaczny 1979.

**Voucher specimens:** 5 [Vzmor'e, 11 September 2018, 5 exp.]

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg), Nem. (Tilsit), Zel. (Frische Nehrung); Zel.

**Comments:** The range of this beetle reaches its northern limits around 60° north latitude (Kabakov 2006). Locally frequent species, found in the cattle excrements.

##### [*O. joannae* Goljan, 1953]

**Comments:** The described from the north-western Poland species is known in all adjacent countries: Sweden, Norway, Denmark (Silfverberg 2010), and Lithuania (Tamutis et al. 2011). The heliophilous in north-western Poland (Byk 2012) and coprophagous species, whose findings in the Kaliningrad Region are very possible. The beetle generally prefers more humid climate than *O. ovatus*, but both close related species can co-occur in one biotope (Rössner 1992).

##### (59). *O. medius* (Kugelann, 1792)

Lentz 1853; Lentz 1879 (*vacca* L. *medius* Pz.); Bercio & Folwaczny 1979 (*vacca*).

**Kaliningrad Region:** Gur. (Königsberg, Metgethen, Spittelhof, Wilkie), Nest. (Rominten), Zel. (Cranz, Rauschen).

**Comments:** The species "*O. vacca* L. *medius* Pz." or "*O. vacca* L." is reported from the Region according to Lentz (1879) and Bercio & Folwaczny (1979). In the recent research of Rössner et al. (2010) the former species *O. vacca* (L.) is considered to consist of two sibling species: *O. medius* (Kugelann, 1792) occurring further north and reaching at least 54° of northern latitude and *O. vacca* (Linnaeus, 1767), seemingly to be absent north of 50° latitude. The locality of the *O. medius* neotype is "Lyck, Ostpreussen" [now Elk, Warmian-Masurian region, northeastern Poland]. In accordance with mentioned above, in the Kaliningrad Region should be expected only one species – *O. medius* (Kug.). Therefore, the species *O. vacca* (L.) has been removed from the species list and the old data concerning its distribution



was used for *O. medius* (Kug.).

Formerly widespread in the Region species [“often” (Lentz 1853) or “everywhere common” (Lentz 1879)]. The species “*vacca* (L.)” is reported in Belarus (Alexandrovitch & Pisanenko 1991), Lithuania (Tamutis et al. 2011), Sweden, Denmark (Silfverberg 2010), Latvia (Telnov 2004), the Moscow Region (Nikitsky 2009), but it is very possible, part of these reports really concern *O. medius* (Kug.).

**57. *O. nuchicornis* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 16 [Rybachii, 10 August 1997, 3 exp.; ibidem, 26 July 2008, 2 exp.; Mezhdurech’e, 13 June 2000, 2 exp.; Pionerskiy, June 2000, 2 exp.; 1 km E Cherniakhovsk, 07 June 1997; ibidem, 29 May 2007; Yantarny 09 May 2008; ibidem, 21 May 2018; Baltiysk, 25 May 2008, 2 exp.; Vzmor’e, 11 September 2018].

**Kaliningrad Region:** Gur. (Königsberg, Wilkie), Zel. (Neuhäuser, Rauschen, Rossitten, Tenkitten); Chern., Gvard., Krasn., Zel.

**Comments:** The most common species of the genus, widely distributed and occasional in the Kaliningrad Region, in cattle excrements on the pastures and forest edges.

**(58) *O. ovatus* (Linnaeus, 1767)**

Lentz 1879; Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg, Wilkie).

**Comments:** Widely but sporadically distributed in the Baltic region coprophagous species, the actual findings in the Kaliningrad Region are expected. Above mentioned old reports of the species could concern specimens of *O. joannae* Goljan. The species is more xerophilous than *O. joannae* according to Rössner (1992) and is known in Sweden, Norway, Denmark, Estonia (Silfverberg 2010), Latvia (Telnov 2004), north-western Poland (Byk 2012) and Lithuania (Tamutis et al. 2011).

**[*O. similis* (Scriba, 1790)]**

**Comments:** The species is known in Sweden,

Denmark (Silfverberg 2010), Lithuania (Kabakov 2006; Tamutis et al. 2011), Belarus (Alexandrovitch & Pisanenko 1991; Kabakov 2006) and north-western Poland (Byk 2012). The data from Kaliningrad Region are absent, but the old data on distribution of *O. fracticornis* (Preys.) could include this species too. In any case, the occurrence of the species in the Kaliningrad Region is possible.

**Subfamily Sericinae Hope, 1837**

**Tribe Sericini Kirby, 1837**

**Genus *Serica* MacLeay, 1819**

**60. *S. brunnea* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2005, 2007, 2014; Alekseev & Shapoval 2011a, b, 2013, 2016.

**Voucher specimens:** 4 [Kaliningrad, 13 July 1997; Rybachii, 27 July 2008; 23 km of the Curonian Spit, 13 September 2015, 2 exp.].

**Kaliningrad Region:** Everywhere; Bagr., Chern., Gur., Gus., Gvard., Krasn., Nem., Nest., Oz., Pol., Pravd., Zel.

**Comments:** Widely distributed and abundant in the Region species, occurring in mostly in forests and parks. Larvae feed in soil on roots, imago is aphagous and nocturnal.

**Genus *Maladera* Mulsant, 1871**

**61. *M. holosericea* (Scopoli, 1772)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 7 [Veseloje, 08 May 1996; Krasnoyarskoe, 20 June 2003; Yantarny, 05 May 2008; ibidem, 02 June 2014; 3 km E Primorsk, 27 May 2015; Mechnikov, 11 May 2016; 1 km E Cherniakhovsk, 30 April 2018].

**Kaliningrad Region:** Gur. (Königsberg), Zel. (Loppöhnen, Fischhausen, Pillau, Rauschen); Bagr., Chern., Zel.

**Comments:** Wide distributed but occasionally on the edges of the pine stands. Larvae in the sandy soils.

**Genus *Omalopecta* Schonherr, 1817****62. *O. nigromarginata* (Herbst, 1785)**

Lentz 1879 (*Homaloptia ruricola*); Bercio & Folwaczny 1979 (*Homaloptia ruricola*); Alekseev & Sakhnov 2000 (*Homaloptia ruricola*).

**Voucher specimens:** 7 [1 km E Cherniakhovsk, 28 June 1999, 3 exp.; ibidem, 21 May 2005; ibidem, 06 July 2010; 2 km E Ladushkin, 27 June 2010; Yantarny, 12 July 2015].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Arnau, Königsberg, Neuhausen), Zel. (Loppöhnen, Palmnicken, Rauschen, Warnicken); Bagr., Chern., Zel.

**Comments:** According to morphological characters and distributional maps of *O. ruricola* and *O. nigromarginata* in Rössner (1995), the specimens from the Kaliningrad Region belong to *O. nigromarginata* and all abovementioned reports from the northern Eastern Prussia and the Kaliningrad Region should concern the distributed in northern and eastern Europe *O. nigromarginata* only. The beetle occasionally and sporadically occurs in the Kaliningrad Region on the sun exposed meadows.

**Subfamily Melolonthinae Samouelle, 1819****Tribe Rhizotrogini Reitter, 1901****Genus *Amphimallon* Berthold, 1827****63. *A. solstitialis solstitialis* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979 (*solstitialis*); Alekseev & Sakhnov 2000 (*solstitialis*); Alekseev 2007; Alekseev & Shapoval 2011b; Alekseev 2014.

**Voucher specimens:** 4 [Cherniakhovsk, 10 June 1987; Dolzhanskoe, 29 June 1997; Kaliningrad, 15 July 2010; ibidem, 18 June 2018].

**Kaliningrad Region:** “Common everywhere”, Bagr. (Heiligenbeil), Gur. (Königsberg); Bagr., Chern., Gur., Gus., Gvard., Krasn., Nem., Nest., Oz., Pol., Pravd., Slav., Zel.

**Comments:** Widely distributed and frequent in the Kaliningrad Region species of human influenced landscapes: parks, suburbs and villages.

**(64). *A. ruficornis* (Fabricius, 1775)**

Ziani et al. 2015.

**Kaliningrad Region:** The species is known from Königsberg [Kaliningrad] according to Ziani et al. (2015) only. The actual presence of the species in the regional fauna needs verification: the range constriction in XX century or erroneous labeling of old material as “Königsberg” is possible. The species known in western Belarus from single locality (Alexandrovitch & Pisanenko 1991) and in northern Poland according old data (Lentz 1879; Stebnicka 1978; Bercio & Folwaczny 1979). It is confirmed regionally extinct in Mecklenburg-Vorpommern at present (Rössner 2013).

**Tribe Melolonthini Reitter, 1901****Genus *Melolontha* Fabricius, 1775****65. *M. hippocastani* Fabricius, 1801**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev & Shapoval 2014.

**Voucher specimens:** 1 [Dolzhanskoe, 28 June 1997].

**Kaliningrad Region:** “Common, especially in forests”; Krasn.

**Comments:** Formerly widespread in the region forest species, found in research period in north-eastern part of the Region only, where is locally distributed and occasional. The regional population decline in XX century is evident.

**66. *M. melolontha* (Linnaeus, 1758)**

Lentz 1879 (*vulgaris* Fabr.); Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev & Shapoval 2011a, b, 2013, 2014, 2016; Alekseev 2014; Drotikova et al. 2015.

**Voucher specimens:** 2 [Cherniakhovsk, 08 May 1987; 23 km of the Curonian Spit, 20 May 2012].

**Kaliningrad Region:** Common everywhere, Zel. (Palmnicken); Bagr., Chern., Gur., Gus., Gvard., Nest., Oz., Pol., Pravd., Slav., Zel.

**Comments:** Widely distributed and locally very abundant species associated with forest edges, deciduous parks, shrubs and groves throughout the Region. There was observed a large number of individuals in aggregations along the Baltic seaside in several years (Bercio & Folwaczny 1979; Alekseev & Shapoval 2014).

**Genus *Polyphylla* Harris, 1842**

**67. *P. fullo fullo* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2003, 2010, 2014; Alekseev & Shapoval 2011a, b, 2013, 2016.

**Voucher specimens:** 5 [23 km of the Curonian Spit, 18 July 1996; ibidem, 12 July 2011; Rybachii, 12 August 2002; the Baltic Spit, 08 July 2007; 3 km W Povarovka, 07 July 2018].

**Kaliningrad Region:** Zel. (“im Strandgebiet”, Pillau, Cranz); Zel.

**Comments:** The thermophilous species is usually an inhabitant of coastal pine plantations, where larvae feed in soil at the roots of plants. In the Region occurs on the Curonian Spit (locally numerous in edges of pine forests in vicinity of white dunes complexes near the Curonian Gulf), in coastal sandy areas of the western Sambian seacoast and on the Baltic Spit. In general, the species can be considered “sporadically distributed and abundant” in the Region. The species is listed in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010) as stenotopic beetle at the northern periphery of main distributional range. The real damage for sparse appropriate habitats is evident by increase of recreation too. Two colour forms of adults are encountered in the Region (with dark/ light brown cuticular pigmentation). The ratio of these forms by light trapping and the possible reasons of the sampled numbers are discussed in Alekseev & Shapoval (2012).

**Tribe Hopliini Latreille, 1829**

**Genus *Hoplia* Illiger, 1803**

**Subgenus *Decamera* Mulsant, 1842**

**(68). *H. (Decamera) pulverulenta* (Fabricius, 1775) [= *philanthus* (Fuessly, 1775)]**

Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg).

**Comments:** The species is known in Sweden, Denmark (Silfverberg 2010), Lithuania (Tamutis et al. 2011), Poland (Bunalski 1995) and Belarus (Alexandrovitch & Pisanenko 1991). Possible faunal element of the Kaliningrad Region, but

the actual findings of the species are unknown.

**Subgenus *Hoplia* Illiger, 1803**

**(-) *H. (s. str.) dilutipes* Reitter, 1890**

Alekseev & Sakhnov 2000 (missidentification); Alekseev 2003 (missidentification).

**Comments:** This is the southern species (f. exp. known in south-western Ukraine), impossible in the Region.

**(-) *H. (s. str.) hungarica* Burmeister, 1844**

Alekseev & Sakhnov 2000 (as *H. subnuda* Rtt., missidentification); Alekseev 2003 (missidentification).

**Comments:** This is the southern species, whose range extends to southern Poland in the north (Bunalski 1995).

**69. *H. (s. str.) graminicola* (Fabricius, 1792)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000.

**Voucher specimens:** 10 [Dolzhanskoe, 29 June 1997; Cherniakhovsk, 11 June 1999, 2 exp.; ibidem, 29 May 2018; Svetlogorsk, 10 June 2003, 3 exp.; 3 km S Novomoskovskoe, 04 June 2014, 2 exp.; Donskoe, 31 June 2016].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg, Quednau), Nest. (Rominten), Zel. (Bludau, Kurische Nehrung, Loppönnen, Neuhäuser, Pillau, Rauschen); Bagr., Chern., Krasn., Nest., Zel.

**Comments:** Widely distributed, occasional species in the Kaliningrad Region, associated with xeric meadows and edges of pine forests species.

**70. *H. (s. str.) parvula* Krynicki, 1832**

Lentz 1879 (*pollinosa* Er. *minuta* Illig.); Bercio & Folwaczny 1979; Alekseev 2005, 2014.

**Voucher specimens:** 5 [Zelenogradsk, 10 June 2010, 2 exp.; ibidem, 06 June 2002; 23 km of the Curonian Spit, 19 June 2007; 13 km of the Curonian Spit, 08 June 2011].

**Kaliningrad Region:** Zel. („am ganzen Strand am Wurzeln des *Elymus*,” Neuhäuser, Pillau); Zel.

**Comments:** The psammophilous and thermophilous species sporadically and occasionally occurs along the Baltic seacoast

and coastal dunes of the Region, mostly at the Curonian Spit.

**Subfamily Rutelinae MacLeay, 1819**

**Tribe Anomalini Mulsant, 1842**

**Genus *Anomala* Leach, 1819 [=*Euchlora* Macleay, 1819]**

**71. *A. dubia* (Scopoli, 1763)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2003, 2005, 2014.

**Voucher specimens:** 5 [Yantarny, 10 July 1985; Baltiysk, 21 June 2008, 2 exp.; 2 km E Ladushkin, 27 June 2010; 1312 km, 02 July 2014].

**Kaliningrad Region:** Common everywhere; Bagr., Gvard., Oz., Zel.

**Comments:** Psammophilous species of open habitats, sometimes numerous in coastal dunes of Baltic Sea and in the inland places with sandy soils. Sporadically distributed and frequent in the Kaliningrad Region. The variation with metallic coloured elytra is quite seldom encountered in the Region.

**Genus *Chaetopteroptia* Medvedev, 1949**

**[*Ch. segetum* (Herbst, 1783)]**

**Kaliningrad Region:** no locality specified.

**Comments:** The species is known in Lithuania (Tamutis et al. 2011), western Poland (Bunalski et al. 2015b) and Belarus (Alexandovitch & Pisanenko 1991). The findings in the Region cannot be excluded. At the moment, there are no data on certain occurrence in the Region.

**Genus *Phyllopertha* Stephens, 1830**

**72. *P. horticola* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2003, 2005, 2007, 2014.

**Voucher specimens:** 3 [Cherniakhovsk, 14 June 1997; 4 km of the Curonian Spit, 04 June 2007; Mechnikov, 06 June 2018].

**Kaliningrad Region:** Common everywhere; Bagr., Chern., Gur., Gus., Gvard., Krasn., Nem., Nest., Oz., Pol., Pravd., Slav., Zel.

**Comments:** Eurytopic species of meadows,

forest edges and grass areas in the cities, abundant and widespread throughout the Region.

**Subfamily Dynastinae MacLeay, 1819**

**Tribe Oryctini Mulsant, 1842**

**Genus *Oryctes* Hellwig, 1798**

**73. *O. nasicornis* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2007.

**Voucher specimens:** 2 [Cherniakhovsk, 1990; Cherniakhovsk, 1997].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg), Gus. (Gumbinnen), Nest. (Groß Trakehnen), Pravd. (Friedland), Slav. (Linkuhnen), Zel. (Kurische Nehrung); Chern., Gur., Krasn., Oz., Zel.

**Comments:** The almost exclusively synanthropic in the Region species is associated with the heaps of the horse manure near stables and greenhouses. The quite numerous larvae of the species was only once observed in more or less natural ecosystem [Krasn.: Dolzhanskoe environs, July 1997, clearing in mixed forest, the heaps of sawdust]. Sporadically distributed and occasional species in the Kaliningrad Region.

**Subfamily Cetoniinae Leach, 1815**

**Tribe Cetoniini Leach, 1815**

**Genus *Cetonia* Fabricius, 1775**

**74. *C. aurata aurata* (Linnaeus, 1758)**

Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2006, 2007, 2014; Alekseev & Shapoval 2011b.

**Voucher specimens:** 3 [2 km W Cherniakhovsk, 11 June 1994, 2 exp.; Medovoe, 10 April – 03 July 2018].

**Kaliningrad Region:** Everywhere; Bagr., Chern., Gur., Gus., Gvard., Krasn., Nem., Nest., Oz., Pol., Pravd., Slav., Zel.

**Comments:** Widely distributed and frequent throughout the Region species. Larvae develop in logs and stumps of deciduous trees, in mounds of compost, rotten sawdust and dung; beetles occur on flowers in forest adges, clearings, and suburbs.



### Genus *Oxythyrea* Mulsant, 1842

#### 75. *O. funesta* (Poda von Neuhaus, 1761)

Alekseev & Sakhnov 2000; Alekseev 2002; Alekseev & Bukejs 2010.

**Voucher specimens:** 6 [3 km E Cherniakhovsk, 10 May 2009; Cherniakhovsk, 21 June 2009; Sosnovka, 22 June 2010, 2 exp.; Divnoe, 08 July 2010; Yantarny, 12 June 2012].

**Kaliningrad Region:** Chern., Gur., Bagr., Pol., Zel.

**Comments:** Lentz (1879) and later Bercio and Folwaczny (1979) reported this beetle from northern Poland only. The species is considered to be “the southern element periodically appearing in Polish fauna” (Szwajko 1989) and the most rare flower chafers in western Poland (Bunalski et al. 2015a). However, during the last twenty years the areal of the given species has essentially spread to the north and extended Latvia, Estonia and the St. Petersburg suburbs (Roosileht 2003; Bukejs et al. 2006). The beetle is widespread in Lithuania (Tamutis & Dapkus 2013), Western Europe (Thomaes et al. 2016), and in Central Russia up to the Altai region (Nikitsky 2016; Vondráček et al. 2018). Summarizing all these sources, the assumed centre of the pulsating species range should be situated in Eastern Europe and the migratory vector [=origin of invasion] in the Baltic region should be determined as southern and south-eastern (for Latvia) and south-eastern and eastern (for Lithuania, Poland and Kaliningrad Region). The different possible factors, induced grow of the species population are discussed in Tamutis & Dapkus (2013) and Thomaes et al. (2016). The last publication assumed the possibility of recolonization a large part of Northern Europe starting from the Czech Republic. Different authors (Horák et al. 2013; Vondráček et al. 2018) supposed different factors for such spreading, between them a hypothetical shift in ecological preferences of the species. The change of land use after 1991 appears to be more significant factor in the Kaliningrad Region, however other factors cannot be excluded.

First specimen of this species in the Kaliningrad Region (Alekseev & Sakhnov 2000) was

registered near Cherniakhovsk in 15 June 1996. After that the species is repeatedly registered in ten different localities in 2009-2018 and can be recognized as widely distributed and frequent species in the Kaliningrad Region now. Adult beetles occur on different flowers and feed on pollen in May-September. It seems, the beetles from the Kaliningrad Region belong to *O. funesta* var. *consobrina* (Villa, 1833) because possess well-developed white pattern in young specimens.

### Genus *Protaetia* Burmeister, 1842

#### Subgenus *Cetonischema* Reitter, 1899

#### [*P. speciosissima* (Scopoli, 1786) [= *aeruginosa* (Drury, 1770)]]

Korotyaev & Nikitsky 2001 (*Netocia aeruginosa*).

**Comments:** The species is still unknown, but quite possible occurs in the southern or south-western parts of the Kaliningrad Region at the northernmost limit of the distributional range. Larvae develop in hollows of old broad-leaved trees (mostly *Quercus*, but also *Populus*, *Tilia*, *Fagus*, *Ulmus*), beetles feed on enfluent tree sap and live mainly in crowns of trees (Byk & Cieślak 2011; Bunalski et al. 2015a). The species is known in northern, western and central Poland (Bercio & Folwaczny 1979; Byk & Cieślak 2011; Bunalski et al. 2015a), Lithuania (Tamutis et al. 2011), and Belarus (Alexandrovitch & Pisanenko 1991). It is listed in the Russian Red Data Book (Korotyaev & Nikitsky 2001) as the inhabited Kaliningrad Region species and is included in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010) as the required especially attention species. The species is considered “near threatened” at the European level (Nieto & Alexander 2010). The nearest to the Kaliningrad Region known locality of the species is situated near Olsztyn in Warmian-Masurian region, northern Poland (Byk & Cieślak 2011).

### Subgenus *Liocola* Thomson, 1859

#### 76. *P. marmorata marmorata* (Fabricius, 1792) [= *lugubris* (Herbst, 1786)]

Lentz 1879 (*Cetonia marmorata*); Bercio & Folwaczny 1979 (*Liocola lugubris*); Alekseev & Sakhnov 2000 (*Potosia lugubridis*); Alekseev 2007 (*Liocola*); Alekseev 2010.

**Voucher specimens:** 7 [Cherniakhovsk, 1990; Kaliningrad, 05 September 2008; Mamonovo, 14 September 2008; Bogdanovka, July 2010; Mechnikov, May 2016; ibidem, June 2016; Medovoe, 10 April – 03 July 2018].

**Kaliningrad Region:** Bagr. (Heiligenbeil), Chern. (Insterburg), Gur. (Friedrichstein, Königsberg), Zel. (Palmnicken); Bagr., Chern., Gur., Krasn., Oz., Pravd.

**Comments:** The beetle occurs in tree-lined country roads, forest edges, old parks and abandoned gardens. Larvae develop inside tree hollows and are associated with different deciduous trees (*Quercus*, *Fagus*, *Tilia*, *Carpinus*, *Acer*, *Fraxinus*, *Alnus*, *Malus*), adults feed mainly in crowns of trees. The species is listed in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010) as comparatively stenotopic species. The species is considered “least concern” at the European level (Nieto & Alexander 2010). Widely distributed and occasional in the Kaliningrad Region.

### Subgenus *Potosia* Mulsant et Rey, 1870

#### 77. *P. metallica metallica* (Herbst, 1782)

Bercio & Folwaczny 1979 (*Potosia cuprea* F. ssp. *metallica* Hbst.); Alekseev & Sakhnov 2000 (*Potosia*); Alekseev 2006 (*Potosia*); Alekseev 2014 (*Potosia cuprea metallica*).

**Voucher specimens:** 4 [Svetlogorsk, 20 June 1990, 2 exp.; Krasnoles'ce, 08 June 2008; Medovoe, 10 April – 03 July 2018].

**Kaliningrad Region:** Numerous reports; Bagr., Chern., Gur., Nest., Pol., Zel.

**Comments:** The larvae develop in the nest mounds of the ant genus *Formica*, adult beetles occur on flowers in June-July. The species is widely distributed and occasional throughout the Kaliningrad Region: it occurs mostly in pine forest edges and along roads in forested areas.

### Genus *Tropinota* Mulsant, 1842

#### Subgenus *Epicometis* Burmeister, 1842

(78). *T. hirta hirta* (Poda von Neuhaus, 1761) Bercio & Folwaczny 1979.

**Kaliningrad Region:** Gur. (Königsberg).

**Comments:** The species is known in Latvia as “Very rare species with no records in the last 50 years. North border of main distribution area” (Telnov 2004), Lithuania (Tamutis et al. 2011), Poland (Bunalski et al. 2015a) and also reported in Belarus (Alexandrovitch & Pisanenko 1991). The actual presence of the species in the regional fauna very possible but needs confirmation.

### Tribe Trichiini Fleming, 1821

#### Genus *Gnorimus* Le Peletier et Audinet-Serville, 1828

#### 79. *G. nobilis nobilis* (Linnaeus, 1758)

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev & Nikitsky 2008; Alekseev & Bukejs 2011; Alekseev et al. 2012.

**Voucher specimens:** 3 [Kaliningrad, 08 June 1998; Otradnoe, 30 June 2006; Riabinovka, 08 July 2010].

**Kaliningrad Region:** Gur. (Juditten, Kleinheide, Neuhausen), Gvard. (Löwenhagen), Zel. (Georgenswalde, Rauschen, Warnicken); Gur., Zel.

**Comments:** The species is connected with broad-leaved parks and forests (oak-lime-hornbeam). Beetles occur on flowers of Apiacea and Rosacea in June-July. The species is listed in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010) and is considered “least concern” at the European level (Nieto & Alexander 2010). Sporadically distributed (known in the Sambian peninsula only) and occasional species.

#### 80. *G. variabilis* (Linnaeus, 1758)

[=*octopunctatus* (Fabricius, 1775)]

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000 (*octopunctatus*).

**Voucher specimens:** 1 [Pravdinsk, before 1995].

**Kaliningrad Region:** Gur. (Karmitten, Königsberg, Neuhausen, Wilkie); Zel. (Frische Nehrung); Gur. (?), Pol. (?), Pravd.

**Comments:** The locally distributed and rare species associated with hollows of ancient

oaks and listed in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010) and is considered “near threatened” at the European level (Nieto & Alexander 2010). The unique specimen in the author collection is without precise label and probable was collected before 1995 in Pravdinsk district. Additionally, there are verbal communication concerning the species in the area of the present-day Kaliningrad Region (e.g. vicinity of Bogdanovka in Pollesk district, Gur’evsk vicinity, both before 1995), but the proofs are absent.

**Genus *Osmoderma* LePeletier et Audinet-Serville, 1828**

**81. *O. barnabita* Motschulsky, 1845 [= *eremita* auct., nec (Scopoli, 1763)]**

Bercio & Folwaczny 1979 (*Osmoderma eremita* Scop.); Alekseev & Sakhnov 2000 (*eremita*); Ranius et al. 2005 (*eremita*); Alekseev 2010.

**Voucher specimens:** 4 [Podlipovo, August 1994; Cherniakhovsk, 18 July 1997; Kaliningrad, 03 August 2008; Tumanovka, 09 July 2018].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Königsberg, Neuhausen), Pravd. (Friedland); Bagr., Chern., Gvard., Gur., Pol., Pravd.

**Comments:** The Latin name of hermit beetles is selected according to the published results (Audisio et al. 2007, 2009) of a molecular analysis on the European hermit beetles. The single possible species in Eastern Europe and in the Region should be named *O. barnabita* Motsch. Larvae develop in the hollows of the broad-leaved (*Quercus*, *Tilia*, *Alnus*, *Fagus*) and fruit (*Prunus*, *Pyrus*, *Malus*) trees. The beetle preferred trees about 450 cm in circumference at 1.3 m height (Oleksa et al. 2007). Beetles usually occur on the effluent tree sap in July-August. The adults of *Osmoderma* were reported to feed on flowers and fruits too (Ranius et al. 2005; Maurizi et al. 2017). The species is mostly associated with avenues and old parks in the Region. The species is included in the Russian Red Data Book (Nikitsky 2001b); it is considered “near threatened” at the European level (Nieto & Alexander 2010) and it is listed in the Red Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010). Widely distributed,

but rare species, restricted to the isolated known localities (hollow oaks and limes).

**Genus *Trichius* Fabricius, 1787**

**82. *T. fasciatus* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2003, 2006, 2014.

**Voucher specimens:** 4 [Dolzhanskoe, 28 June 1997; Sukhodol’e, 11 July 2001; Bogatovo, 22 June 2010; Gribki, 09 July 2018].

**Kaliningrad Region:** Chern. (Insterburg), Gur. (Forst Fritzen, Wilkie), Zel. (Hirschau, Rauschen, Warnicker Forst); Bagr., Chern., Gur., Gvard., Krasn., Nem., Oz., Pravd., Zel.

**Comments:** Larvae develop in the white rotten stumps and logs of birch, beetles occur on flowers (Apiacea, Compositae, Rosacea) in June-August. The species is considered “least concern” at the European level (Nieto & Alexander 2010). Occasional species, widely distributed throughout the Region.

**Tribe Valgini Mulsant, 1842**

**Genus *Valgus* Scriba, 1790**

**83. *V. hemipterus* (Linnaeus, 1758)**

Lentz 1879; Bercio & Folwaczny 1979; Alekseev & Sakhnov 2000; Alekseev 2006, 2014.

**Voucher specimens:** 8 [Yantarny, 05 May 2008, 3 exp.; ibidem, 24 May 2010; Otradnoe, 01 July 2010; 1312 km, 21 May 2013; 23 km of the Curonian Spit, 15 June 2015].

**Kaliningrad Region:** Zel. (Pillau); Bagr., Chern., Gur., Zel.

**Comments:** Larvae develop in the white rotten stumps of deciduous trees, beetles feed on flowers (mostly Apiacea) in May-June. The species is considered “least concern” at the European level (Nieto & Alexander 2010). Widely distributed throughout the Region and occasional species, can be found in suburbs, parks (4-5 specimens yearly in 2015-2017 in Kaliningrad) and mixed forests.

So far, 98 species of five families (Trogidae, Lucanidae, Geotrupidae, Bolboceratidae and



Table 1. Fauna of the Scarabaeoidea of the Kaliningrad Region.

Category of species	Number of families	Number of species
(1) Recently (1989-2018) confirmed	4	65
(2) Historical, not recently confirmed	5	29
(3) Recently registered and added	2	4
Not reported but probable	2	10
Historical data, excluded from the list	2	2
Misidentified species, removed from the list	2	4
Regional fauna (1 + 2 + 3)	5	98

Scarabaeidae) are known from the Kaliningrad Region. The occurrence of 29 species is not certain and needs confirmation by current data. Stenotopic character of some species, resulting their insular and strictly seasonal occurrence and difficulties in observation, make the possibility of finding these “secretive” species quite probable.

Four species were incorrectly determined and later erroneously cited for the Kaliningrad Region (Alekseev & Sakhnov 2000; Alekseev 2002, 2003): *Trox cadaverinus*; *Aphodius pubescens*; *Hoplia dilutipes*; *H. hungarica*. These beetles should be removed from the list of the regional fauna. Two species known in the northern part of the former Eastern Prussia (Lentz 1879) were excluded from the recent regional fauna too. There are *Typhaeus typhoeus* and *Aphodius quadrimaculatus*. Both these species were reported in XIX century only, first of them is possible erroneously labeled, and second species seems to be regionally extinct similarly as in Poland (Pawłowski et al. 2002).

The actual presence in the regional fauna of nine other species (*Trox hispidus*, *Aphodius bimaculatus*, *A. quadriguttatus*, *Euheptaulacus sus*, *Euoniticellus fulvus*, *Caccobius schreberi*, *Onthophagus medius*, *Amphimallon ruficorne*, *Hoplia pulverulenta*) is especially under question and in need of confirmation. These species probably do not occur now in the Kaliningrad Region as the result of oscillations in their overall ranges. Additional field surveys (especially across southern parts of the Region) are needed to verify if these species still inhabit the Kaliningrad Region.

Five species names of the listed Kaliningrad Region fauna are replaced by the new systematically correct for the regional fauna species names: *Rhyssesus puncticollis*, *Onthophagus medius*, *Omaloplia nigromarginata*, *Potosia metallica*, and *Osmoderma barnabita*. Such a decision was made on the base of the species distribution in the adjacent territories and the collected specimens from the Kaliningrad Region. In this way, the species *Rhyssesus germanus*, *Onthophagus vacca*, *Omaloplia ruricola*, *Protaetia cuprea*, and *Osmoderma eremita* are removed from the Kaliningrad Region fauna. The authorship of the genera *Aphodius* and *Oryctes* was changed according to Alonso-Zarazaga & Krell (2011).

Ten species (*Ochodaeus chrysomeloides*, *Aphodius piceus*, *A. paracoenosus*, *A. lividus*, *A. punctatosulcatus hirtipes*, *Euheptaulacus villosus*, *Onthophagus joannae*, *O. similis*, *Chaetopteroptia segetum*, *Protaetia speciosissima*) are listed between the potential faunal components. The findings of these beetles are quite probable in the Kaliningrad Region and, may be, more probable, than rediscovery of several historical species.

One species, not reported in the Kaliningrad Region earlier, is added to the regional checklist in this paper. There is *Platycerus caprea* (Lucanidae). The regional occurrence of two inaccurately identified (Alekseev & Sakhnov 2000) species of *Aphodius* [*brevis* and *coenosus*] is confirmed in present study by reliable material.

The above discussed categories and listed species can be tabularly presented (Table 1).

According to the comparative estimation scale of distribution and abundance in the Kaliningrad Region, the sampled in the research period 69 species were grouped into eleven clusters:

**1. Locally distributed and rare [11 species]:**

*Ceruchus chrysomelinus* (Hochenwarth, 1785); *Lucanus cervus cervus* (Linnaeus, 1758); *Trox sabulosus sabulosus* (Linnaeus, 1758); *Aegialia sabuleti* (Panzer, 1797); *Aphodius brevis* Erichson, 1848; *A. coenosus* (Panzer, 1798); *A. paykulli* Bedel, 1907; *Rhyssemus puncticollis* Brown, 1929; *Copris lunaris* (Linnaeus, 1758); *Onthophagus coenobita* (Herbst, 1787); *Gnorimus variabilis* (Linnaeus, 1758).

**2. Locally distributed and occasional [5 species]:**

*P. caraboides caraboides* (Linnaeus, 1758); *A. borealis* Gyllenhal, 1827; *A. fasciatus* (Olivier, 1789); *Onthophagus taurus* (Schreber, 1759); *Melolontha hippocastani* Fabricius, 1801.

**3. Locally distributed and frequent [3 species]:**

*Aphodius porcus* (Fabricius, 1792); *A. conspurcatus* (Linnaeus, 1758); *Onthophagus gibbulus* (Pallas, 1781).

**4. Sporadically distributed and rare [2 species]:**

*Psammodyus asper* (Fabricius, 1775); *A. melanostictus* Schmidt, 1840.

**5. Sporadically distributed and occasional [12 species]:**

*Platycerus caprea* (DeGeer, 1774); *Geotrupes spiniger* (Marsham, 1802); *G. stercorarius* (Linnaeus, 1758); *Trypocopris vernalis vernalis* (Linnaeus, 1758); *Oxyomus sylvestris* (Scopoli, 1763); *Aphodius depressus* (Kugelann, 1792); *A. varians* Duftschmid, 1805; *A. luridus* (Fabricius, 1775); *Omaloplia nigromarginata* (Herbst, 1785); *Hoplia parvula* Krynicki, 1832; *Oryctes nasicornis* (Linnaeus, 1758); *Gnorimus nobilis nobilis* (Linnaeus, 1758).

**6. Sporadically distributed and frequent [6 species]:**

*Aegialia arenaria* (Fabricius, 1787); *Aphodius ictericus ictericus* (Laicharting, 1781); *A. subterraneus subterraneus* (Linnaeus,

1758); *A. sticticus* (Panzer, 1798); *A. distinctus* (Müller, 1776); *Anomala dubia* (Scopoli, 1763).

**7. Sporadically distributed and abundant [1 species]:**

*Polyphylla fullo fullo* (Linnaeus, 1758).

**8. Widely distributed and rare [1 species]:**

*Osmoderma barnabita* Motschulsky, 1845.

**9. Widely distributed and occasional [10 species]:**

*Sinodendron cylindricum* (Linnaeus, 1758); *Dorcus parallelepipedus* (Linnaeus, 1758); *Trox scaber* (Linnaeus, 1767); *Onthophagus nuchicornis* (Linnaeus, 1758); *Hoplia graminicola* (Fabricius, 1792); *Maladera holosericea* (Scopoli, 1772); *Protaetia marmorata marmorata* (Fabricius, 1792); *Protaetia metallica metallica* (Herbst, 1782); *Trichius fasciatus* (Linnaeus, 1758); *Valgus hemipterus* (Linnaeus, 1758).

**10. Widely distributed and frequent [11 species]:**

*Aphodius rufipes* (Linnaeus, 1758); *A. ater* (DeGeer, 1774); *A. foetens* (Fabricius, 1787); *A. sordidus sordidus* (Fabricius, 1775); *A. granarius* (Linnaeus, 1767); *A. erraticus* (Linnaeus, 1758); *A. haemorrhoidalis* (Linnaeus, 1758); *A. fossor* (Linnaeus, 1758); *Amphimallon solstitiale* (Linnaeus, 1758); *Cetonia aurata aurata* (Linnaeus, 1758); *Oxythyrea funesta* (Poda, 1761).

**11. Widely distributed and abundant [7 species]:**

*Anoplotrupes stercorosus* (Scriba, 1791); *Aphodius fimetarius* (Linnaeus, 1758); *A. pusillus pusillus* (Herbst, 1789); *A. prodromus* (Brahm, 1790); *Serica brunnea* (Linnaeus, 1758); *Melolontha melolontha* (Linnaeus, 1758); *Phyllopertha horticola* (Linnaeus, 1758).

Such classification provides up-to-date assessments of “rarity status” for each species of the Kaliningrad Region. It stands to reason, not all scarce and rare in our samples species from clusters 1–4 (21 spp., about 30% of all actually reported species) are really threatened and merit any conservation actions. It is also noteworthy, that the included in the actual Red

Data Book of the Kaliningrad Region (Dedkov & Grishanov 2010) species belong in fact to first cluster of "rarity" [*Ceruchus chrysomelinus*, *Lucanus cervus cervus*, *Copris lunaris*, *Gnorimus variabilis*], to fifth [*Gnorimus nobilis nobilis*], to seventh [*Polyphylla fullo fullo*], to eighth [*Osmoderma barnabita*], and even to ninth cluster [*Dorcus parallelepipedus*, *Protaetia marmorata marmorata*]. The statuses of these species in the Red Data Book don't correspond to our clusters of distribution and abundance. The situation is, possible, justified, but it re-indicates the difference between species rarity, knowledge's on fauna and need of conservation measurements. Four species of the above mentioned general list (*Lucanus cervus*, *Aphodius bimaculatus*, *Protaetia speciosissima*, *Osmoderma barnabita*) are protected by the Russian Federal law. The occurrence of two of them (*Aphodius bimaculatus*, *Protaetia speciosissima*) is not confirmed in the research time.

Twelve species of the Kaliningrad Region fauna are listed in the European Red Lists of saproxylic beetles (Nieto & Alexander 2010). Four of them (*Ceruchus chrysomelinus*, *Lucanus cervus*, *Gnorimus variabilis*, *Osmoderma barnabita*) are considered "near threatened" (NT) and eight of them (*Platycerus caprea*, *P. caraboides*, *Sinodendron cylindricum*, *Dorcus parallelepipedus*, *Protaetia marmorata*, *Gnorimus nobilis*, *Trichius fasciatus*, and *Valgus hemipterus*) are considered "least concern" (LC) at the European regional level. The threatened status of Scarabaeoidea in the Kaliningrad Region for these species was approximately assessed by the author as following: *Lucanus cervus* and *Gnorimus variabilis* can be considered "critically endangered"; *Osmoderma barnabita* and *Ceruchus chrysomelinus* belong to "endangered" at the regional level; *Protaetia marmorata* and *Gnorimus nobilis* can be assigned to "vulnerable" and the status of other species can be estimated as NT (*Platycerus*, *Valgus*) or even LC (*Sinodendron*, *Dorcus*, *Trichius*). Major threats to saproxylic beetles in the Region are following: (1) illegal and uncontrolled selective oak wood harvesting in forests by population;

(2) widening of roads and remove of old alleys; (3) intensive and uncivilized sanitation of old parks and compacting building in urban areas. All above listed processes are especially intensive at present time and the regional loss of the veteran broad-leaved trees of value is no less as tens of thousands units in last fifteen years. According to official statistic, the Kalininrad city only losed approximately twenty thousands trees in five years (2011-2016). The more or less drastic population decreasing for majority of saproxylic beetles depending on old and veteran trees in the Kaliningrad Region is unique possible population trend and forecast in such conditions for the nearest decade.

Only one species (*Onthophagus taurus*) reaches in the Kaliningrad Region its known northern range limit. The population of this species presents itself as not numerous and geographically restricted. The distribution at the northernmost periphery of its range in the Kaliningrad Region should be dependent on local climate. The climatic characteristics of Baltiysk and the Baltic Spit area (where the species was sampled) are following: mean annual temperature +7.5 °C; annual precipitation around 700 mm; average January temperature -2.5 °C; average July temperature +17.5 °C. These conditions are the most Atlantic influenced and belong to the mildest ones in winter time throughout the Kaliningrad Region. The temperature differences between different sites within small area of the whole Region consist no more than 2 °C, but could be of possible value for the species.

Such species, as *Lucanus cervus cervus*, *Copris lunaris*, *Gnorimus nobilis nobilis* and *Polyphylla fullo fullo* are in the Kaliningrad Region at northern or north-eastern periphery of main distributional area, but can be isolately encountered northwards also in Lithuania and/ or in Latvia. These species evidently are not so climatically restricted. *G. nobilis* and *P. fullo* are strongly connected with the coastal climate and the area influenced by the Baltic Sea in the Kaliningrad Region. Noble chafer (*G. nobilis*) prefers the edges of humid shady mixed forests



and the parks with oak and hornbeam, whereas Pine chafer (*P. fullo*) inhabits sun exposed, sandy coasts and dune areas (usually but not obligatorily on the pine forest edges).

According to Catalogue of Palaearctic Coleoptera (Löbl & Löbl 2016), two species (*Typhaeus typhoeus* and *Aegialia arenaria*) occur in Russia only in the Kaliningrad Region. Thereby these species could be regarded as occurring at eastern periphery of main distribution area. *T. typhoeus* as the more south-western beetle was excluded from the recent regional fauna (perhaps only occasional introduction is possible). Thus only *A. arenaria* can be considered to be single “western” species in our fauna. No species at southern or western periphery of main distributional area were detected in the Kaliningrad Region.

The species from clusters 10 and 11 (altogether 18 spp.) can be regarded as being of the greatest economic importance in the Kaliningrad Region. The phyllophagous representatives of these groups cannot be considered economically significant pests of forestry or agriculture at present, but their possible role in the local ecosystems (especially during the population peak) is surely the highest and should be specially and separately measured.

A fairly few coprophagous scarab beetles inhabit the mature, dense and shady forests. The original occurrence of many coprophagous species of open habitats in the Eastern Baltic region was earlier insular and surely very limited. Various natural meadows, shores and seaside were the most important habitats prior to intensive human activity in the region in XV century. The native character of many occurred in the region in XIX century species associated with dung of domestic herbivore animals in open ecosystems (several *Aphodius* and *Ontophagini*, such as: *Aphodius bimaculatus*, *A. quadriguttatus*, *Euoniticellus fulvus*, *Caccobius schreberi*, *Onthophagus medius*) can be called in question. The deforestation, agriculture and farming with long grazing continuity during XVI–XX centuries favored these initially forst-steppe

species of grazing ecosystems. These alien in the Region forms colonise the area naturally once appropriate environments had appeared. The land abandonment, loss of agriculture habitats (like extensive pastures incorporating various microhabitats) and availability of dung resources have resulted in a decline of their populations and in a general decrease of biodiversity in agro-ecosystems of the Region at the second half of the XX century. The actual decline of dung beetle populations could be related to the harmful effects of chemical contamination in the dung by ivermectin (e.g. Verdú et al. 2018), also widely used by the cattle farming in the Kaliningrad Region. Given the reduced distribution of several coprophagous scarabaeids and eventual threats under current human activity, conservation measurements and legislation should include the representatives of this group too. The regional priorities should be perhaps focused on the charismatic *Copris lunaris* and species of the genus *Onthophagus* (except for *O. nuchicornis*) as “flagship species”.

The species-rich community of coprophagous beetles (Aphodiinae and Scarabaeinae) mostly requires deforested grassy areas used as pastures, the species-rich community of xylophagous beetles (like Cetoniinae or Lucanidae) requires somewhat opposite situation with obligatory presence of mature and veteran trees (forest edges, old parks and avenues). The sufficient part of Sericinae and Melolonthinae (and also, possible, the actually increasing *Oxythyrea funesta*) are associated with intermediate successional stage of an ecotone [young growth, unmanaged grasslands, shrubs, abandoned arable land etc.]. The balance should be taken in account by the scientifically informed habitat management strategies and by planning of the targeted at the biodiversity conservation measurements.

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