

DATA ON PROTECTED AND INSUFFICIENTLY KNOWN INSECT SPECIES OBTAINED FROM THE INVERTEBRATE MONITORING IN LATVIA (2015 – 2016)

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The current paper presents data on new findings of 66 protected or insufficiently known insect species found in Latvia during invertebrates monitoring activities in years 2015-2016. One species, *Amara nigricornis* Thomson, 1857 (Carabidae), is reported for the first time for the local fauna

Key words: biodiversity monitoring, insects, Latvia, fauna, new records, protected species.

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INTRODUCTION

The studies devoted to the invertebrate diversity research in Latvia predominantly occurred in recent past and were mainly focused on protected nature areas that forms a strong bias for providing a complete view on the protected species occurrence in Latvian fauna. Also, there is a lack of information about temporal changes in abundance and range shifts due to climate change. Such data can be obtained on the basis of the results of species monitoring carried out throughout the country. The monitoring of invertebrates is a part of various national programs that are targeted on enhancement of biodiversity conservation. Various monitoring programmes targeted on research of different groups of invertebrates already been carried out all over the Europe. Dragonflies monitoring is

carried out in Switzerland (Hitterman et al. 2000), United Kingdom (Smallshire & Beynon 2009), The Netherlands (Bouwman et al. 2009) and United States (Panzer et al. 2005). The monitoring of butterflies species is carried in many European countries: The Netherlands, United Kingdom, Switzerland, Sweden, France, Portugal, Germany, Estonia, etc. (Elberg 1999, Van Swaay 2007). The moths monitoring is carried out in Finland since 1993 using light traps method (Söderman, 1994, Söderman et al. 1999). Similar methods are used for the control of separate moth species or groups of species (pests, as well as rare and protected species) (Kruus & Viidalepp 2001). The ground beetles is a broad group of entomophagous insects that have a critical role in various habitats. The beetles of this family belong to various ecological groups and have different requirements in respect of the environmental factors: pollution, amount of

food, quality of soil, type of vegetation and use of various chemicals (Döring et al. 2003). For these reasons the ground beetles were selected for conducting the respective monitoring activity. Invertebrate monitoring potentially can provide a chance to study and to understand which habitats and which species are good representatives for the whole country. During invertebrate monitoring, data on currently protected species and species that potentially might be protected in future needs to be collected, as well as other valuable information that can be used during the elaboration of conservation plans for particular species in future.

MATERIAL AND METHODS

The monitoring was implemented according to the national invertebrate monitoring methodology (Valainis et al. 2009), with several amendments during the approbation. The monitoring sites were located in 15 square shaped study plots all over the country (Fig. 1). The arrangement of sites was selected for the purpose of data extrapolation for whole territory of Latvia afterwards. In each square four transects with the pitfall traps, the

route for butterflies accounting, one light trap station and ten dragonflies accounting polygons were applied (Fig. 2).

Monitoring of ground beetles

The material was collected using a pitfall traps method. Pitfall traps were filled with the 50 % solution of ethylene glycol. Ten pitfall traps with 7 cm hole in diameter and 9 cm high, were placed in each of four linear transects. The traps were placed along the transect with 2 m distance from each other. In each square transects were applied according to one principle (Fig. 2). Pitfall traps were active only during the period of peak activity of carabid beetles, two times per season - two weeks in early summer and at the end of summer season. All material was collected and determined in laboratory. The material was processed focusing mainly on rare and protected species.

Monitoring of butterflies

The monitoring of butterflies was based on surveys with species accounting using route method. In each square one or more pre-marked

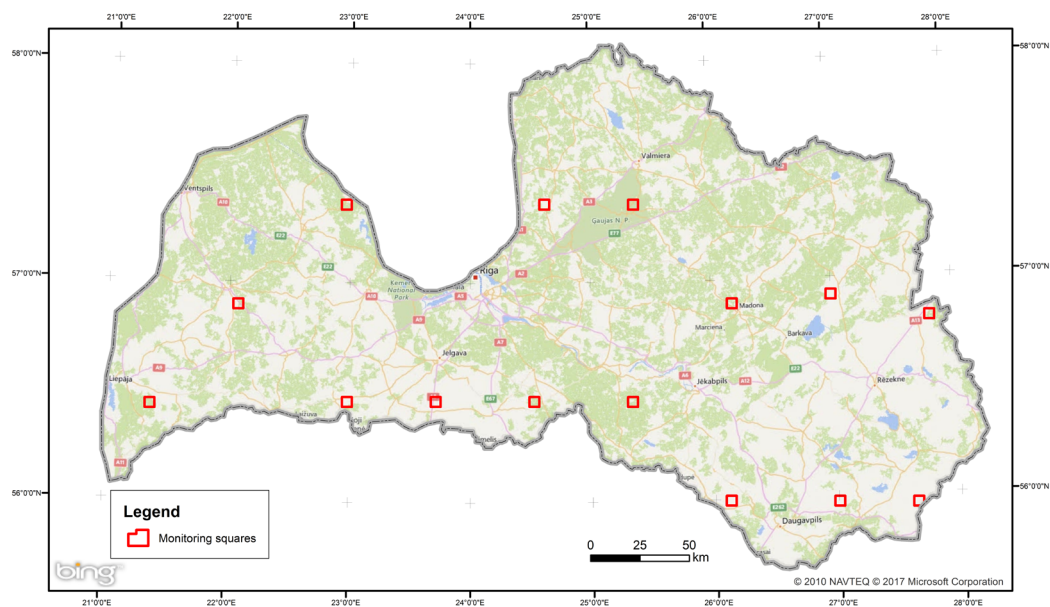


Fig. 1. The layout of invertebrate monitoring sites in Latvia.

routes in a total length of 2 km were surveyed. During the first year of monitoring, routes were revised, where it was necessary. All butterfly species 4-5 m on each side of route central line and 4-5 meters ahead were recorded. The monitoring of species was carried out three times a year during the following periods: from 25 May to 10 June, from 15 June to 30 June, from 15 July to 30 July. Butterflies mainly were determined in flight. Also, collected and determined in laboratory, if it was necessary.

Monitoring of dragonflies

The monitoring was based on dragonfly species accounting in the territory with pre-marked polygons. In each square ten species accounting polygons in suitable habitats for dragonfly species were pre-marked. During the first year of monitoring, polygons were revised, if it was necessary. The size of each polygon was 10x10 meters. All dragonfly species occurred in a polygon were recorded during 5 - 10 minutes time period. The monitoring was carried out three times a year during the following periods:

from 25 May to 10 June, from 15 June to 30 June, from 15 July to 30 July. Dragonfly species mainly were determined in flight. Also, collected and determined in laboratory, if it was necessary.

Moth monitoring

The monitoring was based on data collection using standardised light trap method. In each square a light traps station was mounted, facing the needs for electricity. Samples were collected from 15 June to 15 August. The traps were checked once a week. All material was collected and determined in laboratory.

RESULTS

In years 2015 and 2016 the monitoring of four insect groups (butterflies, moths, dragonflies and ground beetles) in 15 square shaped study plots all over the country was carried out. Leading experts on species groups were involved into current study to assure reliability of collected data. As a result of first two years, several records of new localities on different protected

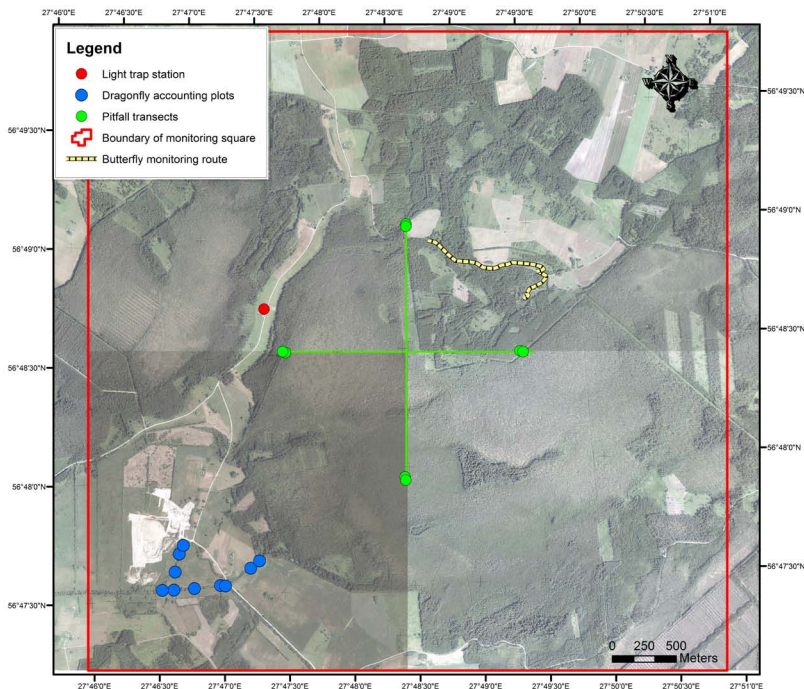


Fig. 2. The spatial arrangement scheme of the monitoring activities in one of the squares.

invertebrate species were reported, including 14 protected Lepidoptera and Odonata species, of them five species (*Leucorrhinia pectoralis*, *Ophiogomphus cecilia*, *Coenonympha hero*, *Euphydryas aurinia* and *Lycaena dispar*) are protected by the Habitat Directive, and included in Annex II (the Council Directive 92/43/EEC of 21 May 1992), four species (*Leucorrhinia albifrons*, *Leucorrhinia caudalis*, *Parnassius mnemosyne* and *Lopinga achine*) are included in Annex IV of current Directive. Twelve of reported species are protected according to local legislation. During the monitoring activities one species, *Amara nigricornis* Thomson, 1857, (Carabidae) was registered for Latvia for the first time and is reported as new to local invertebrate biota.

List of species

Odonata Fabricius, 1793

Aeshnidae Rambur, 1842

Anax imperator (Leach, 1815) – **Ilūkste munic.**, Cabišku Lake, 26° 5' 30.197" E 56° 0' 30.235" N, 16.06.2016 (1, I. Jakubāne); Talsi munic., Lake Uguņezers, Bergi, 22° 56' 55.090" E 57° 22' 7.058" N, 03.06.2016 (1, A. Lanka), Uguņu Priednieki, 22° 57' 0.995" E 57° 22' 24.343" N, 03.06.2016 (1, A. Lanka).

Gomphidae Rambur, 1842

Ophiogomphus cecilia (Fourcroy, 1785), **Limbaži munic.**, River Aģe, 24° 38' 16.093" E 57° 21' 53.823" N, 19.07.2015 (1, L. Taube), 24° 38' 20.797" E 57° 21' 48.212" N, 19.07.2015 (1, L. Taube), 24° 38' 37.810" E 57° 21' 38.919" N, 19.07.2015 (1, L. Taube), 24° 38' 47.403" E 57° 21' 34.674" N, 19.07.2015 (1, L. Taube), 24° 39' 25.136" E 57° 21' 21.451" N, 12.06.2016 (1, L. Taube), 24° 39' 3.013" E 57° 21' 24.566" N, 27.06.2016 (1, L. Taube), 24° 38' 47.342" E 57° 21' 34.643" N, 27.07.2016 (1, L. Taube), 24° 38' 37.810" E 57° 21' 38.919" N, 27.07.2016 (1, L. Taube), 24° 38' 29.833" E 57° 21' 43.785" N, 27.07.2016 (1, L. Taube).

Lestidae Calvert, 1901

Lestes virens (Charpentier, 1825) – **Vecumnieku munic.**, Lake Zālezers, 24° 34' 4.565" E 56° 28' 18.202" N, 03.07.2015 (1, Z. Striķe), 24° 34' 9.020" E 56° 28' 21.770" N, 27.07.2015 (1, Z. Striķe), 24° 34' 9.862" E 56° 28' 29.741" N, 27.07.2015 (1, Z. Striķe), 24° 33' 42.068" E 56° 28' 40.841" N, 03.07.2015 (1, Z. Striķe).

Libellulidae Rambur, 1842

Leucorrhinia albifrons (Burmeister, 1839) – **Auce munic.**, Mazēnu quarry, 22° 59' 7.765" E 56° 26' 18.751" N, 11.06.2015 (1, U. Valainis), 22° 59' 7.687" E 56° 26' 19.218" N, 03.07.2015 (1, U. Valainis); **Ilūkste munic.**, Lake Cabišku, 26° 5' 26.858" E 56° 0' 24.050" N, 28.06.2015 (1, K. Aksjuta, K. Daudziņa), 26° 5' 14.436" E 56° 0' 26.223" N, 28.06.2015 (1, K. Aksjuta, K. Daudziņa), 26° 5' 26.858" E 56° 0' 24.050" N, 27.07.2016 (1, I. Jakubāne), **Madona munic.**, to the E from Garanči, 26° 9' 59.737" E 56° 54' 26.343" N, 03.06.2015 (1, K. Aksjuta, K. Daudziņa); **Rugāji munic.**, River Itenis oxbow, 26° 58' 8.779" E 56° 54' 11.693" N, 09.06.2016 (1, D. Vasiļevskis).

Leucorrhinia caudalis (Charpentier, 1840) – **Krāslava munic.**, E shore of Lake Lielais Gusena, 27° 37' 36.690" E 55° 57' 54.910" N, 10.06.2015 (1, R. Cibuļskis); **Vecumnieku munic.**, Lake Zālezers, 24° 33' 59.990" E 56° 28' 16.974" N, 5.06.2016 (1, Z. Striķe).

Leucorrhinia pectoralis (Charpentier, 1825) – **Auce munic.**, Mazēnu quarry, 22° 59' 7.765" E 56° 26' 18.751" N, 03.07.2015 (1, U. Valainis); **Ilūkste munic.**, Cabišku Lake, 26° 5' 30.197" E 56° 0' 30.235" N, 28.06.2015 (1, K. Aksjuta, K. Daudziņa), 26° 5' 14.436" E 56° 0' 26.223" N, 28.06.2015 (1, K. Aksjuta, K. Daudziņa), 26° 5' 23.476" E 56° 0' 32.209" N, 28.06.2015 (1, K. Aksjuta, K. Daudziņa), 26° 5' 30.197" E 56° 0' 30.235" N, 29.06.2016 (1, I. Jakubāne), 26° 5' 14.436" E 56° 0' 26.223" N, 29.06.2015 (1, I. Jakubāne), 26° 5' 23.476" E 56° 0' 32.209" N, 29.06.2015 (1, I. Jakubāne), **Jaunjelgava munic.**, to the S from Druvinkeļi, 25° 22' 11.913" E 56° 27' 4.261" N, 10.06.2015 (1, K. Aksjuta,

K. Daudziņa), **Krāslava munic.**, SE shore of Lake Lielais Gusena, 27° 37' 41.633" E 55° 57' 41.425" N, 27.06.2016 (1, U. Valainis), 27° 37' 40.159" E 55° 57' 40.167" N 27.06.2016 (1, U. Valainis); **Kuldīga munic.**, Mazventmaļi, 22° 5' 42.667" E 56° 53' 43.607" N, 02.06.2016 (1, A. Lanka), Āžezers Lake 22° 5' 27.443" E 56° 53' 48.397" N, 02.06.2016 (1, A. Lanka); **Madona munic.**, Lake Cepurītes, 26° 10' 4.365" E 56° 53' 9.859" N, 11.06.2015 (1, K. Aksjuta, K. Daudziņa), 01.06.2016 (1, K. Aksjuta, K. Daudziņa), River Kapupīte, to S from Stiebrīni, 26° 10' 39.375" E 56° 54' 26.179" N, 21.06.2016 (1, K. Aksjuta, K. Daudziņa), pond to Z from Garnči, 26° 9' 59.819" E 56° 54' 28.062" N, 21.06.2016 (1, K. Aksjuta, K. Daudziņa), 26° 9' 59.737" E 56° 54' 26.343" N, 21.06.2016 (1, K. Aksjuta, K. Daudziņa); **Pārgauja munic.**, 600 m to N from Jāņmuiža, right bank of the River Gauja, 25° 20' 50.584" E 57° 21' 31.057" N, 03.07.2015 (1, L. Taube); **Vecumnieku munic.**, Lake Zālezers, 24° 33' 57.771" E 56° 28' 16.003" N, 03.07.2015 (1, Z. Striķe), 24° 33' 59.990" E 56° 28' 16.974" N, 03.07.2015 (1, Z. Striķe), 24° 34' 9.020" E 56° 28' 21.770" N, 03.07.2015 (1, Z. Striķe), 24° 34' 9.862" E 56° 28' 29.741" N, 03.07.2015 (1, Z. Striķe), 24° 33' 27.954" E 56° 28' 47.975" N, 03.07.2015 (1, Z. Striķe), 24° 33' 39.119" E 56° 28' 43.029" N, 03.07.2015 (1, Z. Striķe), 24° 33' 57.771" E 56° 28' 16.003" N, 20.06.2016 (1, Z. Striķe), 24° 33' 59.990" E 56° 28' 16.974" N, 20.06.2016 (1, Z. Striķe), 24° 34' 4.565" E 56° 28' 18.202" N, 20.06.2016 (1, Z. Striķe), 24° 34' 9.020" E 56° 28' 21.770" N, 05.06.2015 (1, Z. Striķe), 24° 34' 9.220" E 56° 28' 26.094" N, 20.06.2016 (1, Z. Striķe), 24° 34' 9.862" E 56° 28' 29.741" N, 20.06.2016 (1, Z. Striķe), 24° 33' 27.954" E 56° 28' 47.975" N, 20.06.2016 (1, Z. Striķe), 24° 33' 42.068" E 56° 28' 40.841" N, 20.06.2016 (1, Z. Striķe).

Libellula fulva (Müller, 1764) – **Auce munic.**, Mazēnu quarry, 22° 59' 7.765" E 56° 26' 18.751" N, 11.06.2015 (1, K. Aksjuta), 22° 59' 7.687" E 56° 26' 19.218" N, 31.07.2016 (1, K. Aksjuta); **Krāslava munic.**, E shore of Lake Lielais Gusena, 27° 37' 41.700" E, 55° 57' 51.010" N, 10.06.2015 (1, R. Cibulskis); 27° 37' 36.690" E 55° 57' 54.910" N 10.06.2015 (1, R. Cibulskis),

27° 37' 32.790" E 55° 57' 57.280" N, 10.06.2015 (1, R. Cibulskis), 27° 37' 27.930" E 55° 58' 2.980" N, 10.06.2015 (1, R. Cibulskis), SE shore of Lake Lielais Gusena, 27° 37' 38.340" E 55° 57' 43.640" N, 10.06.2015 (1, R. Cibulskis), Robežnieki, N shore of Lake Lielais Gusena, 27° 37' 6.418" E 55° 58' 32.851" N, 3.06.2016. (1, U. Valainis), 27° 37' 14.465" E 55° 58' 30.518" N 3.06.2016. (1, U. Valainis), 27° 37' 16.391" E 55° 58' 33.587" N, 27.06.2016 (1, U. Valainis); **Limbaži munic.**, River Aģe, 24° 38' 37.810" E 57° 21' 38.919" N, 12.06.2016 (1, L. Taube); **Lubāna munic.**, right bank of the river Aiviekste, to S from River Pīsteņas embouchure to River Aiviekstē, 26° 57' 58.774" E 56° 54' 46.587" N, 03.07.2015 (1, D. Vasiļevskis), 26° 58' 0.550" E 56° 54' 42.888" N, 03.07.2015 (1, D. Vasiļevskis), 26° 57' 59.045" E 56° 54' 29.884" N, 03.07.2015 (1, D. Vasiļevskis), 26° 57' 59.857" E 56° 54' 22.972" N, 03.07.2015 (1, D. Vasiļevskis), 26° 57' 59.045" E 56° 54' 29.884" N, 27.07.2015 (1, D. Vasiļevskis); **Pārgauja munic.**, 600 m to the N from Jāņmuiža, right bank of the river Gauja, 25° 20' 39.176" E 57° 21' 32.111" N, 31.05.2015 (1, L. Taube), 25° 20' 17.714" E 57° 21' 35.817" N, 27.07.2016 (1, L. Taube), 25° 20' 39.176" E 57° 21' 32.111" N, 30.06.2016 (1, L. Taube), 25° 20' 50.584" E 57° 21' 31.057" N, 30.06.2016 (1, L. Taube), **Rugāji munic.**, river Itenis oxbow, 26° 58' 9.024" E 56° 54' 15.920" N, 03.07.2016 (1, D. Vasiļevskis), 26° 58' 8.779" E 56° 54' 11.693" N, 03.07.2016 (1, D. Vasiļevskis).

Lepidoptera Linnaeus, 1758

Cossidae Leach, 1815

Lamellocossus terebra (Denis & Schiffermüller, 1775) – **Krāslava munic.**, Robežnieki parish, "Dravieši", 27° 37' 47.021" E 55° 58' 31.871" N, 18.08.2015 (1, M. Balalaikins).

Drepanidae Meyrick, 1895

Sabra harpagula (Esper, 1786) – **Grobiņa munic.**, Gavieze parish, "Brieži", 21° 23' 15.811" E, 56° 26' 40.897" N, 07.07.2016 (1, K. Aksjuta, A. Pankjāns); **Jaunjelgava munic.**, Sece parish, "Druvenieki", 25° 21' 50.208" E 56° 27' 20.557" N,

N, 22.06.2015 (1, J. Dreimanis), 11.08.2016 (1, J. Dreimanis); **Ilūkste munic.**, Bebrene parish, "Draudziņi", 26° 7' 36.276" E 55° 59' 47.806" N, 18.08.2016 (1, I. Jakubāne); **Rugāji munic.**, Lazdukalna parish, Slavīti, 27° 3' 7.402" E 56° 54' 5.288" N, 07.07.2016 (1, D. Vasiļevskis).

Erebidae Leach, 1815

Eublema minutata (Fabricius, 1794) – **Kārsava munic.**, Malnava parish, "Reiziņmājas", 27° 47' 26.795" E 56° 48' 41.899" N, 31.07.2016 (1, M. Balalaikins, I. Jakubāne).

Laelia coenosa (Hübner, 1808) – **Jaunjelgava munic.**, Sece parish, "Druvenieki", 25° 21' 50.208" E 56° 27' 20.557" N, 14.07.2016 (1, J. Dreimanis), 13.07.2016 (1, J. Dreimanis); **Ilūkste munic.**, Bebrene parish, "Draudziņi", 26° 7' 36.276" E 55° 59' 47.806" N, 29.06.2015 (1, I. Jakubāne); **Rugāji munic.**, Lazdukalna parish, Slavīti, 27° 3' 7.402" E 56° 54' 5.288" N, 04.08.2015 (1, D. Vasiļevskis); **Krāslava munic.**, Izvalta parish, "Kļavinieši", 27° 0' 13.771" E 55° 58' 27.621" N, 18.08.2015 (1, K. Aksjuta); **Kārsava munic.**, Malnava parish, "Reiziņmājas", 27° 47' 26.795" E 56° 48' 41.899" N, 20.06.2016 (1, M. Balalaikins); **Krāslava munic.**, Robežnieki parish, "Dravieši", 27° 37' 47.021" E 55° 58' 31.871" N, 31.07.2016 (1, M. Balalaikins).

Geometridae Leach, 1815

Asthena anseraria (Herrich-Schäffer, 1855) – **Priekuļi munic.**, Priekuļi parish, "Lejas Podiņi", 25° 21' 54.764" E 57° 20' 55.159" N, 29.06.2016 (1, L. Taube).

Charissa ambigua (Duponchel, 1830) – **Vecumnieki munic.**, Bārbele parish, "Gērķi", 24° 32' 25.085" E, 56° 27' 40.494" N, 04.08.2016 (1, J. Dreimanis).

Chlorissa cloraria (Hübner, 1813) – **Krāslava munic.**, Izvalta parish, "Kļavinieši", 27° 0' 13.771" E 55° 58' 27.621" N, 21.07.2015 (1, K. Aksjuta), 13.07.2016 (1, M. Balalaikins, I. Jakubāne); **Kārsava munic.**, Malnava parish,

"Reiziņmājas", 27° 47' 26.795" E 56° 48' 41.899" N, 13.07.2016 (1, M. Balalaikins, I. Jakubāne).

Chloroclysta infuscata (Tengström, 1869) – **Vecumnieki munic.**, Bārbele parish, "Gērķi", 24° 32' 25.085" E, 56° 27' 40.494" N, 25.07.2015 (1, J. Dreimanis); 13.07.2016 (1, J. Dreimanis); **Jaunjelgava munic.**, Sece parish, "Druvenieki", 25° 21' 50.208" E 56° 27' 20.557" N, 18.08.2016 (1, J. Dreimanis).

Cidaria fulvata (Forster, 1771) – **Limbaži munic.**, Gravas parish, "Strautiņi 2", 13.07.2016 (1, L. Taube).

Cyclophora quercimontaria (Bastelberger, 1897) – **Kuldīga munic.**, Pelēči parish, "Bišavas", 22° 4' 7.229" E 56° 53' 35.157" N, 18.08.2015 (1, K. Aksjuta), 01.07.2016 (1, K. Aksjuta, M. Nitcis); **Vecumnieki munic.**, Bārbele parish, "Gērķi", 24° 32' 25.085" E, 56° 27' 40.494" N, 04.08.2015 (1, J. Dreimanis), 21.07.2016 (1, J. Dreimanis); **Priekuļi munic.**, Priekuļi parish, "Lejas Podiņi", 25° 21' 54.764" E 57° 20' 55.159" N, 14.07.2015 (1, K. Aksjuta).

Eupithecia analoga Djakonov, 1926 – **Vecumnieki munic.**, Bārbele parish, "Gērķi", 24° 32' 25.085" E, 56° 27' 40.494" N, 13.07.2016 (1, J. Dreimanis).

Eupithecia millefoliata Rössler, 1866 – **Auce munic.**, Auce parish, "Slavietīņas", 22° 59' 59.805" E 56° 28' 6.195" N, 21.07.2016 (1, K. Aksjuta, M. Nitcis).

Gagitodes sagittata (Fabricius, 1787) – **Kuldīga munic.**, Pelēči parish, "Bišavas", 22° 4' 7.229" E 56° 53' 35.157" N, 07.07.2015 (1, K. Aksjuta), 11.08.2016 (1, K. Aksjuta, M. Nitcis); **Talsi munic.**, Vandzene parish, "Dreimaņi", 22° 57' 35.279" E 57° 21' 30.925" N, 31.07.2015 (1, K. Aksjuta).

Idaea humiliata (Hufnagel, 1767) – **Kuldīga munic.**, Pelēči parish, "Bišavas", 22° 4' 7.229" E 56° 53' 35.157" N, 14.07.2015 (1, K. Aksjuta), 11.08.2016 (1, K. Aksjuta, M. Nitcis).

Pareulype berberata (Denis & Schiffermüller, 1775) – **Auce munic.**, Auce parish, “Slavietīņas”, 22° 59' 59.805" E 56° 28' 6.195" N, 29.06.2016 (1, K. Aksjuta, M. Nitcis).

Peribatodes secundaria (Denis & Schiffermüller, 1775) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23' 15.811" E, 56° 26' 40.897" N, 13.08.2015 (1, K. Aksjuta); **Kuldīga munic.**, Pelēči parish, “Bišavas”, 22° 4' 7.229" E 56° 53' 35.157" N, 31.07.2016 (1, E. Dreijers); **Auce munic.**, Auce parish, “Slavietīņas”, 22° 59' 59.805" E 56° 28' 6.195" N, 11.08.2016 (1, K. Aksjuta, M. Nitcis).

Perizoma lugdunaria (Herrich-Schäffer, 1855) – **Kuldīga munic.**, Pelēči parish, “Bišavas”, 22° 4' 7.229" E 56° 53' 35.157" N, 13.07.2016 (1, A. Pankjāns).

Scopula corrivalaria (Kretschmar 1862) – **Vecumnieki munic.**, Bārbele parish, Gerķi, 24° 32' 25.085" E, 56° 27' 40.494" N, 20.06.2016 (1, J. Dreimanis); **Krāslava munic.**, Izvalta parish, “Kļavinieši”, 27° 0' 13.771" E 55° 58' 27.621" N, 21.07.2015 (1, K. Aksjuta), 11.08.2016 (1, M. Balalaikins); **Krāslava munic.**, Robežnieki parish, “Dravieši”, 27° 37' 47.021" E 55° 58' 31.871" N, 21.07.2015 (1, M. Balalaikins), 20.06.2016 (1, M. Balalaikins).

Lampropteryx otregiata (Metcalf, 1917) – **Vecumnieki munic.**, Bārbele parish, Gerķi, 24° 32' 25.085" E, 56° 27' 40.494" N, 20.06.2016 (1, J. Dreimanis); **Priekuļi munic.**, Priekuļi parish, “Lejas Podiņi”, 25° 21' 54.764" E 57° 20' 55.159" N, 14.07.2015 (1, K. Aksjuta); **Jaunjelgava munic.**, Sece parish, “Druvenieki”, 25° 21' 50.208" E 56° 27' 20.557" N, 04.08.2015 (1, J. Dreimanis); **Rugāji munic.**, Lazdukalna parish, Slavīti, 27° 3' 7.402" E 56° 54' 5.288" N, 22.06.2015 (1, D. Vasiļevskis), 18.08.2016 (1, D. Vasiļevskis); **Krāslava munic.**, Izvalta parish, “Kļavinieši”, 27° 0' 13.771" E 55° 58' 27.621" N, 29.06.2015 (1, K. Aksjuta); **Kārsava munic.**, Malnava parish, “Reiziņmājas”, 27° 47' 26.795" E 56° 48' 41.899" N, 21.07.2015 (1, M. Balalaikins), 11.08.2016 (1, M. Balalaikins);

Krāslava munic., Robežnieki parish, “Dravieši”, 27° 37' 47.021" E 55° 58' 31.871" N, 18.08.2015 (1, M. Balalaikins), 11.08.2016 (1, M. Balalaikins, I. Jakubāne).

Spargania luctuata (Denis & Schiffermüller, 1775) – **Priekuļi munic.**, Priekuļi parish, “Lejas Podiņi”, 25° 21' 54.764" E 57° 20' 55.159" N, 10.08.2015 (1, K. Aksjuta); **Krāslava munic.**, Izvalta parish, “Kļavinieši”, 27° 0' 13.771" E 55° 58' 27.621" N, 21.07.2016 (1, M. Balalaikins, I. Jakubāne).

Lasiocampidae Harris, 1841

Gastropacha populifolia (Esper, 1784) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23' 15.811" E, 56° 26' 40.897" N, 20.06.2016 (1, E. Dreijers); **Talsi munic.**, Vandzene parish, “Dreimaņi”, 22° 57' 35.279" E 57° 21' 30.925" N, 21.07.2015 (1, K. Aksjuta); **Auce munic.**, Auce parish, “Slavietīņas”, 22° 59' 59.805" E 56° 28' 6.195" N, 13.07.2016 (1, A. Pankjāns); **Madona munic.**, Sarkaņi parish, “Kalna Lindes”, 26° 10' 51.900" E 56° 53' 12.375" N, 04.08.2016 (1, G. Akmentins).

Lycaenidae Leach, 1815

Lycaena dispar (Haworth, 1802) – **Grobiņa munic.**, Strēļi, 21° 23' 53.069" E 56° 26' 23.136" N, 01.07.2015 (1, U. Valainis); **Krāslava munic.**, 150 metri to the N from Lake Mazais Gusena, near the road Robežnieki – Joņini, 27° 38' 0.456" E 55° 57' 28.475" N, 03.07.2015 (1, R. Cibuļskis); **Limbaži munic.**, Saulgrieži, 24° 37' 13.258" E 57° 21' 44.136" N, 19.07.2016 (1, U. Piterāns); **Madona munic.**, Lazdukalns, 26° 9' 14.571" E 56° 53' 54.248" N, 10.06.2016 (1, G. Akmentiņš); **Rugāji munic.**, River Pīsteņa, to the N from Bierzpiļs pūrs, 26° 59' 42.435" E 56° 54' 46.999" N, 19.06.2016 (1, G. Akmentiņš), 27° 0' 10.408" E 56° 54' 47.985" N, 10.06.2016 (1, G. Akmentiņš), 26° 59' 37.477" E 56° 54' 46.200" N, 30.06.2016 (1, G. Akmentiņš); **Vecumnieku munic.**, Kociņi, 24° 34' 9.624" E 56° 27' 30.305" N, 28.07.2016 (1, E. Ēmanis), 24° 34' 16.530" E 56° 27' 29.599" N, 27.07.2015 (1, E. Ēmanis).

Noctuidae Latreille, 1809

Acronicta tridens (Denis & Schiffermüller, 1775) – **Talsi munic.**, Vandzene parish, “Dreimaņi”, 22° 57' 35.279" E, 57° 21' 30.925" N, 20.06.2016 (1, R. Abaja).

Amphipoea crinanensis (Burrows, 1908) – **Priekuļi munic.**, Priekuļi parish, “Lejas Podiņi”, 25° 21' 54.764" E, 57° 20' 55.159" N, 07.07.2016 (1, L. Taube).

Amphipyra berbera (Rungs, 1949) – **Kuldīga munic.**, Pelēči parish, “Bišavas”, 22° 4' 7.229" E, 56° 53' 35.157" N, 11.08.2016 (1, K. Aksjuta, M. Nitcis).

Apamea anceps (Denis & Schiffermüller, 1775) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23' 15.811" E, 56° 26' 40.897" N, 10.07.2015 (1, K. Aksjuta), 11.08.2016 (1, K. Aksjuta, M. Nitcis); **Auce munic.**, Auce parish, “Slavietīņas”, 22° 59' 59.805" E, 56° 28' 6.195" N, 31.07.2016 (1, K. Aksjuta); **Jelgava munic.**, Eleja parish, “Kapteines”, 23° 43' 14.101" E, 56° 27' 44.829" N, 22.06.2016 (1, M. Balalaikins), 29.06.2016 (1, M. Nitcis, K. Aksjuta).

Apamea lithoxylaea (Denis & Schiffermüller, 1775) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23' 15.811" E, 56° 26' 40.897" N, 16.07.2015 (1, K. Aksjuta), 31.07.2016 (1, E. Dreijers); **Auce munic.**, Auce parish, “Slavietīņas”, 22° 59' 59.805" E, 56° 28' 6.195" N, 04.08.2016 (1, K. Aksjuta); **Priekuļi munic.**, Priekuļi parish, “Lejas Podiņi”, 25° 21' 54.764" E, 57° 20' 55.159" N, 13.07.2016 (1, L. Taube).

Calloplistria juvenina (Stoll, 1782) – **Vecumnieki munic.**, Bārbele parish, “Gērķi”, 24° 32' 25.085" E, 56° 27' 40.494" N, 14.07.2015 (1, J. Dreimanis), 29.06.2016 (1, J. Dreimanis); **Jaunjelgava munic.**, Sece parish, “Druvenieki”, 25° 21' 50.208" E, 56° 27' 20.557" N, 07.07.2015 (1, J. Dreimanis), 21.07.2016 (1, J. Dreimanis). **Calyptra thalictri** (Borkhausen, 1790) – **Priekuļi munic.**, Priekuļi parish, “Lejas Podiņi”, 25° 21' 54.764" E, 57° 20' 55.159" N, 13.07.2016 (1, L. Taube); **Rugāji munic.**, Lazdukalna parish,

Slavīti, 27° 3' 7.402" E, 56° 54' 5.288" N, 10.08.2015 (1, D. Vasiļevskis), 13.07.2016 (1, K. Aksjuta); **Kārsava munic.**, Malnava parish, “Reiziņmājas”, 27° 47' 26.795" E, 56° 48' 41.899" N, 11.08.2016 (1, M. Balalaikins, I. Jakubāne).

Conisania luteago (Denis & Schiffermüller, 1775) – **Jelgava munic.**, Eleja parish, “Kapteines”, 23° 43' 14.101" E, 56° 27' 44.829" N, 11.08.2016 (1, K. Aksjuta, M. Nitcis).

Cosmia affinis (Linnaeus, 1767) – **Jelgava munic.**, Eleja parish, “Kapteines”, 23° 43' 14.101" E, 56° 27' 44.829" N, 04.08.2015 (1, K. Aksjuta); **Vecumnieki munic.**, Bārbele parish, “Gērķi”, 24° 32' 25.085" E, 56° 27' 40.494" N, 04.08.2015 (1, J. Dreimanis), 29.06.2016 (1, J. Dreimanis); **Madona munic.**, Sarkaņi parish, “Kalna Lindes”, 26° 10' 51.900" E, 56° 53' 12.375" N, 21.07.2015 (1, G. Akmentins); **Krāslava munic.**, Robežnieki parish, “Dravieši”, 27° 37' 47.021" E, 55° 58' 31.871" N, 07.07.2016 (1, M. Balalaikins, I. Jakubāne).

Cucullia praecana Eversmann, 1843 – **Kuldīga munic.**, Pelēči parish, “Bišavas”, 22° 4' 7.229" E, 56° 53' 35.157" N, 21.07.2015 (1, K. Aksjuta), 29.06.2016 (1, M. Nitcis, K. Aksjuta); **Jelgava munic.**, Eleja parish, “Kapteines”, 23° 43' 14.101" E, 56° 27' 44.829" N, 07.07.2016 (1, K. Aksjuta, A. Pankjāns).

Deltote deceptoris (Scopoli, 1763) – **Jaunjelgava munic.**, Sece parish, “Druvenieki”, 25° 21' 50.208" E, 56° 27' 20.557" N, 31.07.2016 (1, J. Dreimanis).

Euchalcia modestoides (Denis & Schiffermüller, 1775) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23' 15.811" E, 56° 26' 40.897" N, 24.07.2015 (1, K. Aksjuta); **Kuldīga munic.**, Pelēči parish, “Bišavas”, 22° 4' 7.229" E, 56° 53' 35.157" N, 18.08.2015 (1, K. Aksjuta); **Auce munic.**, Auce parish, “Slavietīņas”, 22° 59' 59.805" E, 56° 28' 6.195" N, 25.07.2015 (1, K. Aksjuta), 20.06.2016 (1, M. Balalaikins); **Jelgava munic.**, Eleja parish, “Kapteines”, 23° 43' 14.101" E, 56° 27' 44.829" N, 21.07.2016 (1, Aksjuta, M. Nitcis).

Hoplodrina ambigua (Denis & Schiffermüller, 1775) – **Jelgava munic.**, Eleja parish, “Kapteines”, 23° 43’ 14.101” E 56° 27’ 44.829” N, 31.07.2016 (1, M. Balalaikins); **Vecumnieki munic.**, Bārbele parish, Gerķi, 24° 32’ 25.085” E, 56° 27’ 40.494” N, 14.07.2015 (1, J. Dreimanis), 18.08.2016 (1, J. Dreimanis).

Hoplodrina respersa (Denis & Schiffermüller, 1775) – **Priekuļi munic.**, Priekuļi parish, “Lejas Podiņi”, 25° 21’ 54.764” E 57° 20’ 55.159” N, 21.07.2015 (1, R. Abaja), 13.07.2016 (1, L. Taube).

Platyperigea montana (Bremer, 1861) – **Talsi munic.**, Vandzene parish, “Dreimaņi”, 22° 57’ 35.279” E 57° 21’ 30.925” N, 04.08.2016 (1, R. Abaja).

Lacanobia w-latinum (Hufnagel, 1766) – Limbaži munic., Gravas parish, “Strautiņi 2”, 07.07.2015 (1, K. Aksjuta), 07.07.2016 (1, L. Taube); **Kārsava munic.**, Malnava parish, “Reiziņmājas”, 27° 47’ 26.795” E 56° 48’ 41.899” N, 21.07.2015 (1, M. Balalaikins).

Mythimna albipuncta (Denis & Schiffermüller, 1775) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23’ 15.811” E, 56° 26’ 40.897” N, 11.08.2016 (1, K. Aksjuta, M. Nitcis); **Auce munic.**, Auce parish, “Slavietīņas”, 22° 59’ 59.805” E 56° 28’ 6.195” N, 18.08.2016 (1, K. Aksjuta, A. Pankjāns); **Jelgava munic.**, Eleja parish, “Kapteines”, 23° 43’ 14.101” E 56° 27’ 44.829” N, 11.08.2016 (1, K. Aksjuta, M. Nitcis); **Vecumnieki munic.**, Bārbele parish, Gerķi, 24° 32’ 25.085” E, 56° 27’ 40.494” N, 20.06.2016 (1, J. Dreimanis); **Jaunjelgava munic.**, Sece parish, “Druvenieki”, 25° 21’ 50.208” E 56° 27’ 20.557” N, 04.08.2016 (1, J. Dreimanis); **Ilūkste munic.**, Bebrene parish, “Draudziņi”, 26° 7’ 36.276” E 55° 59’ 47.806” N, 13.07.2016 (1, I. Jakubāne); **Krāslava munic.**, Robežnieki parish, “Dravieši”, 27° 37’ 47.021” E 55° 58’ 31.871” N, 07.07.2016 (1, M. Balalaikins, I. Jakubāne).

Noctua interposita (Hübner, 1789) – **Priekuļi munic.**, Priekuļi parish, “Lejas Podiņi”, 25° 21’ 54.764” E 57° 20’ 55.159” N, 07.07.2016

(1, L. Taube); **Ilūkste munic.**, Bebrene parish, “Draudziņi”, 26° 7’ 36.276” E 55° 59’ 47.806” N, 21.07.2016 (1, I. Jakubāne); **Kārsava munic.**, Malnava parish, “Reiziņmājas”, 27° 47’ 26.795” E 56° 48’ 41.899” N, 13.07.2016 (1, M. Balalaikins, I. Jakubāne).

Noctua janthe (Borkhausen, 1792) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23’ 15.811” E, 56° 26’ 40.897” N, 21.07.2016 (1, K. Aksjuta, M. Nitcis).

Noctua janthina (Denis & Schiffermüller, 1775) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23’ 15.811” E, 56° 26’ 40.897” N, 07.07.2016 (1, K. Aksjuta, A. Pankjāns).

Opigena polygona (Denis & Schiffermüller, 1775) – **Jaunjelgava munic.**, Sece parish, “Druvenieki”, 25° 21’ 50.208” E, 56° 27’ 20.557” N, 07.07.2016 (1, J. Dreimanis).

Proxenus lepigone (Möschler 1860) – **Krāslava munic.**, Robežnieki parish, “Dravieši”, 27° 37’ 47.021” E, 55° 58’ 31.871” N, 13.07.2016 (1, M. Balalaikins, I. Jakubāne).

Xylomoia strix (Mikkola, 1980) – **Vecumnieki munic.**, Bārbele parish, Gerķi, 24° 32’ 25.085” E, 56° 27’ 40.494” N, 29.06.2016 (1, J. Dreimanis).

Yigoga signifera (Denis & Schiffermüller, 1775) – **Krāslava munic.**, Robežnieki parish, “Dravieši”, 27° 37’ 47.021” E, 55° 58’ 31.871” N, 13.07.2016 (1, M. Balalaikins, I. Jakubāne).

Nolidae Hampson, 1894

Bena bicolorana (Fuessly, 1775) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23’ 15.811” E, 56° 26’ 40.897” N, 31.07.2015 (1, K. Aksjuta), 18.08.2016 (1, K. Aksjuta, A. Pankjāns); **Auce munic.**, Auce parish, “Slavietīņas”, 22° 59’ 59.805” E, 56° 28’ 6.195” N, 14.07.2015 (1, K. Aksjuta), 21.07.2015 (1, K. Aksjuta); **Jelgava munic.**, Eleja parish, “Kapteines”, 23° 43’ 14.101” E, 56° 27’ 44.829” N, 22.06.2016 (1, M. Balalaikins), 31.07.2016 (1, M. Balalaikins).

Nycteola revayana (Scopoli, 1772) – **Grobiņa munic.**, Gavieze parish, “Brieži”, 21° 23’ 15.811” E, 56° 26’ 40.897” N, 11.08.2016 (1, K. Aksjuta, M. Nitcis); **Jelgava munic.**, Eleja parish, “Kapteines”, 23° 43’ 14.101” E 56° 27’ 44.829” N, 21.07.2016 (1, Aksjuta, M. Nitcis); **Krāslava munic.**, Robežnieki parish, “Dravieši”, 27° 37’ 47.021” E 55° 58’ 31.871” N, 20.06.2016 (1, M. Balalainis).

Notodontidae Stephens, 1829

Pygaera timon (Hubner, 1803) – **Vecumnieki munic.**, Bārbele parish, Gerķi, 24° 32’ 25.085” E, 56° 27’ 40.494” N, 14.07.2015 (1, J. Dreimanis), 20.06.2016 (1, J. Dreimanis); **Madona munic.**, Sarkaņi parish, “Kalna Lindes”, 26° 10’ 51.900” E 56° 53’ 12.375” N, 21.07.2015 (1, G. Akmentins), 21.07.2016 (1, G. Akmentiņš).

Nymphalidae Rafinesque, 1815

Coenonympha hero (Linnaeus, 1761) – **Grobiņa munic.**, Nature Reserve “Brienamais purvs”, 21° 20’ 14.530” E 56° 25’ 19.382” N, 01.07.2015 (1, U. Valainis); **Jaunjelgava munic.**, to the N from Tīrais purvs, 25° 19’ 45.816” E 56° 28’ 13.658” N, 03.06.2016 (1, E. Ēmanis); **Rugāji munic.**, River Pīsteņa, to the N from Bierzpiļš pūrs, 26° 59’ 42.435” E 56° 54’ 46.999” N, 19.06.2016 (1, G. Akmentiņš), 26° 59’ 23.576” E 56° 54’ 41.970” N, 19.06.2016 (1, G. Akmentiņš).

Euphydryas aurinia (Rottemburg, 1775) – **Grobiņa munic.**, Strēļi, 21° 24’ 6.691” E 56° 26’ 23.238” N, 10.06.2015 (1, U. Valainis); **Limbaži munic.**, Garkalni, 24° 36’ 24.172” E 57° 21’ 26.827” N, 20.06.2016 (1, U. Piterāns), 24° 36’ 21.038” E 57° 21’ 26.598” N, 02.07.2015 (1, U. Piterāns), Megari, 24° 37’ 2.074” E 57° 21’ 23.452” N, 20.06.2016 (1, U. Piterāns), Saulgrieži, 24° 37’ 10.280” E 57° 21’ 33.560” N, 20.06.2016 (1, U. Piterāns), 24° 37’ 12.567” E 57° 21’ 43.049” N 02.07.2015 (1, U. Piterāns).

Limenitis camilla (Linnaeus 1764) – **Auce munic.**, Slavietīņas, 23° 0’ 7.431” E 56° 27’ 52.780” N, 23.06.2016 (1, N. Savenkovs);

Grobiņa munic., Mētrāji, 21° 23’ 12.291” E 56° 26’ 25.445” N, 01.07.2015 (1, U. Valainis); **Limbaži munic.**, Garkalni, 24° 36’ 4.719” E 57° 21’ 25.390” N, 20.06.2016 (1, U. Piterāns); **Mērsrags munic.**, 1,2 km to the S from the road Vandzene – Uguņciems, 22° 57’ 10.348” E 57° 20’ 56.081” N, 19.07.2016 (1, K. Vilks); **Priekuli munic.**, Leukādijas, 25° 22’ 5.723” E 57° 22’ 4.120” N, 13.06.2016 (1, U. Piterāns).

Lopinga achine (Scopoli, 1763) – **Limbaži munic.**, Garkalni, 24° 36’ 15.289” E 57° 21’ 26.178” N, 20.06.2016 (1, U. Piterāns), 24° 36’ 50.220” E 57° 21’ 30.598” N, 20.06.2016 (1, U. Piterāns), Saulgrieži, 24° 37’ 9.926” E 57° 21’ 38.994” N, 08.06.2016 (1, U. Piterāns).

Papilionidae Latreille, 1802

Parnassius mnemosyne (Linnaeus, 1758) – **Kuldīga munic.**, Līči, 22° 3’ 34.353” E 56° 54’ 29.697” N, 11.06.2016 (1, N. Savenkovs), 22° 3’ 39.980” E 56° 54’ 28.916” N, 11.06.2016 (1, N. Savenkovs).

Beetles (Coleoptera)

Carabidae Latreille, 1802

Amara nigricornis Thomson, 1857 – **Madona munic.**, Stalīdzēni, 26° 9’ 31.291” E 56° 53’ 33.518” N, 13.06.2016 (3, K. Aksjuta).

Carabus convexus Fabricius, 1775 – **Kuldīga munic.**, Novadnieki, 22° 4’ 13.852” E 56° 54’ 19.696” N, 11.08.2015 (1, M. Nitcis, K. Aksjuta); **Talsi munic.**, “Cepliņi”, 22° 57’ 39.568” E 57° 21’ 54.391” N, 05.08.2015 (1, M. Nitcis, K. Aksjuta), 320 m to the E from “Silmāji”, 22° 58’ 39.498” E 57° 21’ 23.043” N, 08.06.2015 (1, M. Nitcis, K. Aksjuta); **Mērsrags munic.**, 1,2 km to The S from road Vandzene – Uguņciems, 22° 57’ 42.360” E 57° 20’ 49.985” N, 05.08.2016 (1, M. Nitcis, K. Aksjuta), 22° 57’ 41.461” E 57° 20’ 49.520” N, 08.06.2015 (1, M. Nitcis, K. Aksjuta).

Carabus coriaceus Linnaeus, 1758 – **Grobiņa munic.**, 1,6 km to the SW from “Susta”, 21° 20’

54.002" E 56° 26' 1.225" N, 10.06.2015 (1, M. Nitcis, K. Aksjuta), 10.06.2016 (1, M. Nitcis, K. Aksjuta), 21° 20' 54.338" E 56° 26' 1.683" N, 10.08.2015 (1, M. Nitcis, K. Aksjuta), "Susta", 21° 21' 50.621" E 56° 26' 35.000" N, 18.08.2016 (1, A. Pankjāns, K. Aksjuta), 1,2 km to the SW from "Brieži", 21° 22' 51.200" E 56° 26' 4.174" N, 10.08.2015 (1, M. Nitcis, K. Aksjuta), 21° 22' 50.795" E 56° 26' 3.584" N, 10.06.2016 (1, M. Nitcis, K. Aksjuta), 17.08.2015 (1, A. Pankjāns, K. Aksjuta), 18.06.2016 (1, A. Pankjāns, M. Nitcis), "Lielais mežs", 1,5 km to the E from "Brienamais purvs", 21° 21' 54.572" E 56° 25' 30.145" N, 10.08.2015 (1, M. Nitcis, K. Aksjuta), 18.06.2015 (1, M. Nitcis, K. Aksjuta); **Auce munic.**, 1 km to the N from Lielvaicēni, 22° 58' 10.475" E 56° 27' 27.915" N, 11.06.2015 (1, M. Nitcis, K. Aksjuta), 10.08.2015 (1, M. Nitcis, K. Aksjuta), 800 m to the W from "Slavietīņās", 22° 59' 8.156" E 56° 28' 0.821" N, 10.08.2015 (1, M. Nitcis, K. Aksjuta), 2km to the NE from Lielvaicēni, 23° 0' 7.673" E 56° 27' 29.145" N, 17.08.2015 (1, M. Nitcis, K. Aksjuta), 18.06.2016 (1, A. Pankjāns).

Olisthopus rotundatus (Paykull, 1790) – **Jelgava munic.**, Eleja parish, Zizma, 23° 43' 57.809" E 56° 27' 43.344" N, 17.06.2016 (1, A. Pankjāns, K. Aksjuta).

Sphaeritidae Shuckard, 1839

Sphaerites glabratus (Fabricius, 1792) – **Madona munic.**, Stalīdzēni, 26° 11' 28.658" E 56° 53' 30.490" N, 13.06.2016 (1, K. Aksjuta).

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