DATA ON DISTRIBUTION OF HERMIT BEETLE (*OSMODERMA BARNABITA*, MOTSCHULSKY, 1845) (COLEOPTERA: CETONIIDAE) AND SOME OTHER RARE BEETLE (COLEOPTERA) SPECIES RELATED TO VETERAN TREES IN LITHUANIA

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Introduction

Over the recent decades, a large number of species have been threatened to become extinct due to the intensive exploitation of natural resources, industrial growth, urbanization and the increasing pollution of the environment. Rapid destruction of suitable habitats has expelled various insect species from densely populated regions of Europe. Hermit beetle (*Osmoderma barnabita,* Motschulsky, 1845) (Coleoptera: Cetoniidae) is species is linked to declining habitats – old hollow trees. Hermit beetle is the umbrella species for many invertebrates of primeval broadleaved forests with old hollow trees (Ranius, 2002). It prefers dead standing and living trees and was also reported to have been found on fallen trees (Oleksa *et al*., 2003). A tree serves as the habitat for a long time, until the whole inner part of the trunk gets rotten. Extensively decayed tree trunks are not used as habitats (Oleksa *et al*., 2003). A strong decline was suffered by this beetle throughout its distribution range, and extinction from some countries due to habitat loss and intensive forest management was reportedthe current population trend of this species in Europe is decreasing (Audisio *et al*., 2007, Alexander *et al*., 2010). This species is included in the Bern Convention (Annex II), EU Habitat Directive (Annexes II and IV) and the Red Data Book of Lithuania (Rašomavičius, 2007; Ivinskis, 2006, 2015), being the indicating species of the forest key habitats (Ivinskis *et al.*, 2018).

Mature oak woods are still being cut in Lithuania, some old trees were lost due to natural aging or bad management of old trees.

The aim of this publication is to present data about distribution of hermit beetle and some other rare beetle species related with veteran trees habitat.

Material and Methods

The investigation of beetles, associated with old deciduous trees was carried out from May to September in 2017–2018 in different parts of Lithuania. The majority of data were collected during field investigations by the author Sigitas Algis Davenis (S.A.D.), some data – by P. Ivinskis (P.I.), Romas Ferenca (R.F.). Non-destructive sampling method using the odour was carried out (pheromone–kairomone being the γ-Decalactone (>=98%, FCC, FG, $C_{10}H_{18}O_2$, W236004–1KG–K, Sigma–Aldrich®, St. Louis, USA), trapped beetles were released after inspection. Some insects have been

observed crawling and were caught in their habitats. Taxonomical treatment and distribution follow the Fauna Europaea database (Krell, 2013) and Audisio *et al*. 2007, 2009. The identification of specimens was checked by A. Meržijevskij, dr. R. Ferenca. The specimens are deposited in the collection of Nature Research Centre, Vilnius.

List of localities

Locality	Administrative district	Coordinates (LAT, LONG)
Bingelių Miškas f.	Varėna district	54.14782, 24.22990
Daudžgiriai Manor Park	Biržai district	56.16830, 24.65099
Dubingiai Piliavietė Park	Molėtai district	55.06055, 25.44691
Dūkštų Ąžuolynas f.	Vilnius district	54.83169, 24.95333
Dūkštų Miškas f.	Vilnius district	54.80857, 25.00180
Karmazinų Miškas f.	Vilnius district	54.81942, 24.93302
Kaunas (1)	Kaunas municipality	54.89861, 23.94251
Kaunas (2)	Kaunas municipality	54.89919, 23.92974
Kaunas (3)	Kaunas municipality	54.89607, 23.93109
Kelpšiškių Miškas f.	Zarasai district	55.76061, 25.97673
Kuodžių Miškas f.	Lazdijai district	53.94455, 23.57992
Markučiai Park	Vilnius municipality	54.67307, 25.32405
Miškas Gojus f. (1)	Prienai district	54.56680, 24.27356
Miškas Gojus f. (2)	Prienai district	54.56603, 24.27261
Netiesos	Varėna district	54.18451, 24.08280
Punios Šilas f.	Alytus district	54.53142, 24.04994
Raudonė Castle Park	Jurbarkas district	55.09584, 23.13073
Ribiškių Miškas f.	Vilnius municipality	54.66133, 25.31051
Rodai I	Panevėžys district	55.55691, 24.12407
Skrebio Miškas f.	Trakai district	54.58574, 24.55573
Smalininkai Alley	Jurbarkas district	55.07869, 22.59644
Šunupio Miškas f.	Varėna district	54.06462, 24.18535
Šventa	Švenčionys district	55.19129, 26.19406
Varnikų Miškas f.	Trakai district	54.66020, 24.96445
Vidkiemis Alley	Jurbarkas district	55.07101, 22.55568
Vidzgirio Miškas f.	Alytus municipality	54.37823, 24.00753
Vievio Miškas f.	Elektrėnai municipality	54.74054, 24.90288
Vingis Park	Vilnius municipality	54.68212, 25.23361
Žagarė Manor Park	Joniškis district	56.36089, 23.26317

List of species

CERAMBYCIDAE

***Prionus coriarius* (Linnaeus, 1758)**

Punios Šilas f., 05 07 2018, 1 imago, on the forest path, beside maple trees (*Acer platanoides*) (S.A.D.).

CETONIIDAE

***Osmoderma barnabita* (Motschulsky, 1845)**

Bingelių Miškas f., 24 07 2018, 1 imago, found in odour trap height (further in the text – h) 4.0 m, on a *Quercus robur*, (S.A.D.); Daudžgiriai Manor Park, 09 07 2018, 2 larvae, hollow in the trunks of *Q. robur*, found h 0.5 m (P.I.), 1 cocoon, hollow in the trunks of *Q. robur*, found h 0.5m (P.I.); Dubingių Piliavietė Park, 19 07–24 07 2017, 2 imago, found in odour trap h 3.0 m, on a *Q. robur*, 27 07 2018, 1 imago, found in odour trap h 4.0 m, on a *Q. robur*; Dūkštų Ąžuolynas f., 01 08–25 08 2017, 13 imago, found in odour traps h 1.0-4.0 m, on a *Q. robur*, 2 imago, found on a *Q. robur* h 3.0-5.0 m; Dūkštų Miškas f., 11 08–13 08 2017, 2 imago, found in odour trap h 1.0-3.0 m, on a *Q. robur*; Karmazinų Miškas f., 10 08 2017, 2 imago, found in odour trap h 4.0m, on a *Q. robur*; Kaunas (1), 29 07–21 08 2017, 4 imago, found in odour traps h 4.0 m, on a *Q. robur*, 1 imago, found on a *Q. robur* h 1.5 m; Kelpšiškių Miškas f., 27 06–10 08 2018, 3 imago, found in odour traps h 3.0-4.0 m, on a *Q. robur*; Kuodžių Miškas f., 05 07–24 07 2018, 3 imago, found in odour traps h 4.0 m, on a *Q. robur*; Miškas Gojus f. (1), 26 06–23 07 2018, 17 imago, found in odour trap h 4.0 m, on a *Q. robur*, 1 imago, found on a *Q. robur* h 2.0 m; Kaunas (2), 29 07–17 08 2017, 3 imago, found in odour trap h 4.0 m, on a *Q. robur*, 3 imago, found on a *Q. robur* h 0.5-2.0 m; Punios Šilas f., 13 06–23 07 2018, 42 imago, found in odour traps h 4.0 m, on a *Q. robur*; Raudonė Castle Park, 08 08 2018, 2 imago, found in odour trap h 4.0 m, on a *Q. robur*, 1 imago, found in odour trap h 4.0 m, on a *Populus nigra*; Rodai I, 21 07 2018, 2 imago, found in odour trap h 3.0-4.0 m, on a *Populus nigra*,; Smalininkai Alley, 08 09 2017, 1 imago, found in odour trap h 3.0 m, on a *Tilia cordata*; Skrebio Miškas f., 12 07 2018, 2 imago, found in odour trap h 4.0 m, on a *Acer platanoides*; Šventa, 08 07 2018, 1 imago, found in odour trap h 4.0 m, on a *Q. robur*; Vidzgirio Miškas f., 26 06–23 07 2018, 25 imago, found in odour traps h 4.0 m, on a *Q. robur*; Vievio Miškas f., 23 07 2018, 2 imago, found in odour trap h 4.0 m, on a *Q. robur*; Kaunas (3), 27 07–10 08 2017, 3 imago, found in odour trap h 4.0 m, on a *Q. robur*, 10 imago, found on a *Q. robur* h 0.5-4.0 m; Žagarė Manor Park, 10 07 2018, 3 imago, found on a *Fraxinus excelsior* h 4.0 m, 21 07 2018, 2 imago, found in odour trap h 4.0 m, on a *Q. robur*, 2 imago, found in odour trap h 4.0 m, on a *Fagus sylvatica*, 17 08 2018, 5 imago, found in odour trap h 4.0 m, on a *F. sylvatica*, (Fig. 1A) (all S.A.D.).

***Protaetia (Cetonischema) aeruginosa* (Linnaeus, 1767) (Fig. 1B)**

Punios Šilas f., 13 06 2018, 1 dead imago was found on the grass near the path in old oaks alley, (S.A.D.); Miškas Gojus f. (2), 16 07 2013, found body fragment – right elytra of beetles, (R.F.).

***Protaetia (Liocola) lugubris* (Herbst, 1786)**

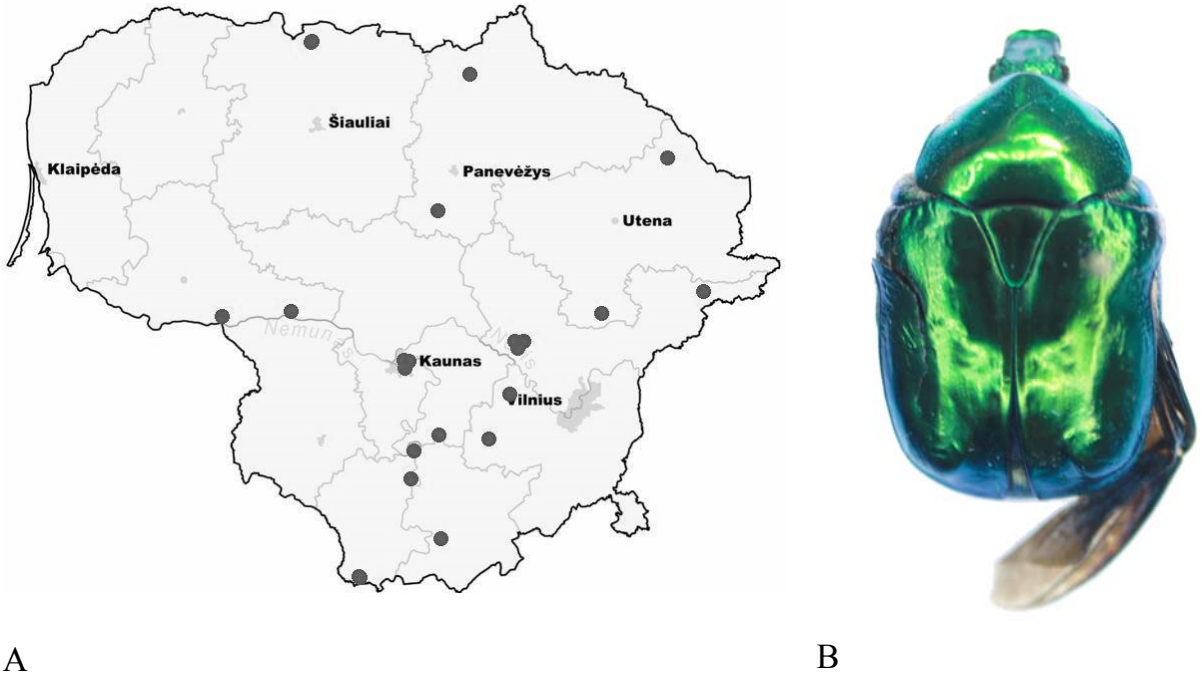
Daudžgiriai Manor Park, 09 07 2018, 3 larvae, hollow in the trunks of *Q. robur*, found h 0.5 m (P.I.); Dūkštų Ąžuolynas f., 10 06 2017, 5 larvae, hollow in the trunks of *Q. robur*, h 0.5–2.0 m; Markučiai Park, 23 08 2017, 1 cocoon in hollow in the trunks of *Q. robur*, found h 0.0 m (hollow opened to the ground,), 29 06 2018, 1 imago, found in odour trap h 4.0 m, on a *Q. robur*; Kaunas (1) 27 07–21 08 2017, 6 larvae, hollow in the trunks of *Q. robur*, found h 1.5 m; Kuodžių Miškas f., 07 08 2018, 1 imago, found in odour trap h 4.0 m, on a *Q. robur*; Miškas Gojus f., 23 07 2018, 3 cocoons, hollow in the trunks of *Quercus robur*, h 1.0 m; Netiesos, 11 07 2018, 1 cocoon, hollow in the trunks of *Q. robur*, found h 0.0 m; Punios Šilas f., 30

05 2018, 1 imago, found on a *Q. robur* h 1,3 m; Ribiškių Miškas f., 21 05 2018, 1 cocoon and 1 larva, hollow in the trunks of *Q. robur*, found h 1.0 m; Rodai I, 10 07 2018, 1 imago, found in odour trap h 4.0 m, on a *Populus nigra*; Smalininkai Alley, 08 09 2017, 5 cocoons, hollow in the trunks of *T. cordata*, found h 0.0 m; Skrebio Miškas f., 23 07 2018, 6 larvae, hollow in the trunks of *Q. robur*, found h 1.0 m; Šunupio Miškas f., 24 07 2018, 5 cocoons, hollow in the trunks of *Q. robur*, found h 2.0 m; Varnikų Miškas f., 27 07 2017, 3 cocoons, hollow in the trunks of *Q. robur*, found h 0.5 m; Vidkiemis Alley, 17 08–08 09 2017, 1 larvae, hollow in the trunks of *Q. robur*, found h 0.0, 1 larvae found in odour trap h 4.0 m on a *Q. robur*; Vidzgirio Miškas f., 26 06 2018, 1 imago, found in odour trap h 4.0 m, on a *Q. robur*; Vingis Park, 12 06 2018, 1 imago, found in odour trap h 4.0 m, on a *Q. robur* (all S.A.D.).

ELATERIDAE

***Elater ferrugineus* (Linnaeus, 1758)**

Kaunas (2), 01 08 2017, 1 imago, found in odour trap h 4.0 m, on a *Q. robur*; Kaunas (3), 17 08 2017, 1 imago, found in odour trap h 4.0 m, on a *Q. robur* (all S.A.D.).



A B

Fig. 1. A. The finding localities of hermit beetles in 2017–2018. B. The habitus of *Protaetia (Cetonischema) aeruginosa,* found in Punios Šilas f., 13 06 2018. (photo R. Markevičiūtė).

Discussion

Prionus coriarius is rarely found in Lithuania, larvae develop in the wood of old, dry oaks and other deciduous trees (Ferenca, 2007). The species is associated with coarse roots of dead, decaying trees, both coniferous and deciduous (Ehnström & Holmer 2007; Sarac, 2016). *Prionus coriarius* distributed in most of Europe and it is present in North Africa and in the Near East: Turkey, Caucasus, Transcaucasia, Iran (Sama, 2013). This species of beetles was included in the Red Data Book of Lithuania (Rašomavičius,

2007). In Punia Šilas forest this beetle is reported for the first time.

The investigation of hermit beetle in Lithuania was insufficient for a long time. A lot of information about the distribution of this species was accumulated by identifying the larval excrements. Sometimes misidentifications occurred or some old habitat could have changed and became unsuitable. In total, 162 specimens of *O. barnabita* were collected using odour traps during two years of our study: 47 specimens in 2017 and 115 – in 2018. During the research time the hermit beetles were found on *Quercus robur*, *Populus nigra, Tilia cordata, Acer platanoides, Fraxinus excelsior, Fagus sylvatica.* Hermit beetles were found in 15 administrative districts of Lithuania (Fig. 1). The hermit beetle is a relict of broadleaf forests, it's microhabitat are hollows of veteran trees (Antonsson, 2002, Balčiauskas *et al.,* 2016). The main habitats in Central Europe are parks or forest parks, trees along the roads, or solitary trees (Oleksa, 2003). Suitable trees in many cases are found in human living environment, because old trees with hollows growing in sunny places are often found in cultural landscape (Ranius *et al.,* 1997). During our study we found the beetles in various semi natural habitats – mostly in old parks. Kaunas city parks are one of the most important places for *O. barnabita* and probably the most important among natural territories is Punios Šilas forest, where large number of adult beetles was caught.

The same odour traps that were used for investigation of *O. barnabita*, also attracted specimens of *Protaetia lugubris.* It's habitats are similar or the same as those of the hermit beetle, and the species in some cases were found together, but the hermit beetle usually live higher in the trunk, while *Protaetia lugubris* were often observed in the lower parts of trees. During our study beetles or larvae of *P. lugubris* were found in 10 administrative districts. In total 48 specimens were found, among them only 6 were imago in odour traps, the rest – larvae or cocoons found in hollow trees. *P. lugubris* is included in the Lithuanian Red Data Book (Rašomavičius, 2007). This species is described as threatened over its whole distributional range, including Germany and Austria; in Sweden it's range contracted during the 20th century and the species completely dissappeared from the south-west (Oleksa *et al.,* 2006). In Hungary the species is regarded as not rare in its localities, in Romania it is well represented in pure oak forests, but not as high in numbers of individuals as is *P. aeruginosa* (Mannerkoski *et.al.,* 2010). *P. lugubris* is not a rare species in Lithuania, is found in suitable habitats. Study of *P. lugubris* in Poland (Oleksa *et al.,* 2006) showed that beetles of this species colonized only decidous trees thicker than 200 cm circumference and prefered those above 300 cm circumference, very large trees (over 600 cm) seemed to be avoided (Oleksa *et al*., 2006).

Distribution and population abundance of *Protaetia aeruginosa* is a poorly studied in Lithuania. Only one record of this species from Kleboniškis forest since the year 2000 (Inokaitis, 2004; Tamutis *et al.,* 2011) was known with several earlier notifications about this species (Pileckis, Monsevičius, 1995; Tamutis *et al.,* 2011). The species is distributed in the West, Central and South, South-Eastern Europe, Lithuania is in the northern edge of the species distribution area (Krell, 2013). Larvae develop in tree hollows situated in the upper parts of trunks and branches, and in crowns of deciduous trees, especially oaks Beetles are flying very high, but sometimes can be observed in sunny places on flowering shrubs or ripe fruit (Burakowski *et al.,* 1983). Their distribution in Poland indicates that the beetle favours oaks growing in ice-marginal valleys of large rivers (Byk & Cieślak, 2011).

Elater ferrugineus was previously found in Lithuania only in one area – in the central part of Kaunas city – in Vytautas park (Meržijevskis & Tamutis, 2010). During our investigation, we found this beetle in two sites of Kaunas: Vytautas park and beside this park –the Parodos Kalnas square, in both cases – in odour traps. This western Palaearctic species (Laibner, 2000) is known from Spain across to the east of Europe, and from Italy to Sweden (Tolasch *et al.,* 2007). It is also found in the Caucasus and Ukraine (it in the western part of the forest-steppe zone) (Mannerkoski *et al.*, 2010). This beetle is rare and its population is decreasing in the whole Europe (Mannerkoski *et al.*, 2010). *Elater ferrugineus* is listed in the IUCN Red list as Near Threatened. This species is entirely dependent upon veteran trees as it inhabits decaying heartwood, the rate of loss of veteran trees has not been quantified, but it is significant, and it may potentially exceed 20% in the next ten years (= three generations). Once the existing veteran trees have died, there will be no replacements in many areas (Mannerkoski *et al.*, 2010). In the neighbouring country of Latvia, *E. ferrugineus* was found for the first time in 2011 using odour traps in one place – in North East part of country (Barševskis, Nitcis 2011). In Poland only very poor records about this species existed prior 2011, the greatest increase in data was from 2011 to 2013, when the species was recorded as many as 105 times, when the odour traps were put into use (Kadej *et. al*., 2015). Because of the co-occurrence of the two species in the same habitats, surveying *O. barnabita* made it possible to detect also *E. ferrugineus* using the same odour traps (Kadej *et. al*., 2015), so was the case in our study as well. More data on ecology, some external features of this species were given by Meržijevskis and Tamutis (2010).

The protection and appropriate management of ancient and veteran trees (wherever they occur, including cultural landscapes and urban areas) is the key conservation measure for the beetle species (*O. barnabita, P. lugubris, P. aeruginosa, E. ferruginea* and others) associated with those veteran trees. For those poorly-dispersing species, measures to retain connectivity between habitat fragments are essential to ensure long-term survival (Alexander *et al.,* 2010). Those species often can be found together, each of them has its own microhabitat, but main habitat requirement is the same.

Acknowledgements

We are grateful to the colleagues Inga Bačelytė, Akvilė Bialoglovytė, Drąsutis Brazauskas, Šarūnas Brazys, Raimundas Giedraitis, Raimondas Ginkus, Renatas Jakaitis, Mindaugas Janušonis, dr. Regina Juodkaitė, Gitana Kolienė, Andžela Kriaučiūnienė, dr. Mindaugas Lapelė, Daiva Letukaitė, Aleksandras Meržijevskis, Diana Milašauskienė, Jolanta Naruševičiūtė, Marius Semaška, dr. Audrius Skridaila, Talvydas Špiliauskas for the help during this research. Many thanks to Radvilė Markevičiūtė for photographing the specimen of *Protaetia aeruginosa*.

References

Alexander K., Buche B., Dodelin B., Schlaghamersky J. 2010. *Osmoderma barnabita*. *The IUCN Red List of Threatened Species* 2010: e.T157901A5169119. http://dx.doi.org/10.2305/IUCN.UK.2010-1.RLTS.T157901A5169119.en. Downloaded on 03November, 2018.

Antonsson K. 2002. *The Hermit beetle (Osmoderma eremita). Ecology and Habitat* Management. Swedish Environmental Protection Agency.

Audisio P., Brustel H., Carpaneto G. M., Coletti G., Mancini E., Piatella E., Trizzino M., Dutto M., Antonini, G. & De Biase A. 2007. Updating the taxonomy and distribution of the European *Osmoderma*, and strategies for their conservation. *Fragmenta entomologica*, Roma 39: 73–290.

Audisio P., Brustel H., Carpaneto G. M., Coletti G., Mancini E., Trizzino M., Antonini G. & De Biase A. 2009. Data on molecular taxonomy and genetic diversification of the European Hermit beetles, a species complex of endangered insects (Coleoptera: Scarabaeidae, Cetoniinae, Osmoderma). *Journal of Zoological Systematics and Evolutionary Research* 47: 88– 95.

Balčiauskas L., Baranauskas K., Ferenca R., Gudžinskas Z., Gurskas A., Ivinskis P., Kesminas V., Ložys L., Rimšaitė J., Sinkevičienė Z., Staponkus R., Steponėnas A., Trakimas G., Virbickas T., 2016. *Europos bendrijos svarbos rūšių monitorinio metodikos. Žinduoliai, žuvys, varliagyviai, ropliai, moliuskai, vabzdžiai ir augalai.* Vilnius.

Barševskis A., Nitcis M. 2011. *Elater ferrugineus* Linnaeus, 1758 (Coleoptera: Elateridae) – a new species for the fauna of Latvia. Baltic Journal of Coleopterologia 11(2): 187–195.

Burakowski B., Mroczkowski M., Stefańska J. 1983. Chrząszcze – Coleoptera. Scarabaeoidea, Dascilloidea, Byrrhoidea i Parnoidea. Katalog Fauny Polski, XXIII (9). Warszawa

Byk A., Cieślak R. 2011. Kwietnica okazała *Protaetia aeruginosa* (Coleoptera: Scarabaeidae) w Polsce. *Chrońmy Przyrodę Ojczystą* 67 (5):449–457.

Ehnström B., Holmer M. 2007. *Nationalnyckeln till Sveriges flora och fauna*. *Skalbaggar: Långhorningar*. Artdatabanken. Uppsala.

Ferenca R. 2007. Pjūklaūsis kelmagraužys (*Prionus coriarius*). Rašomavičius V. (ed.) *Red Data Book of Lithuania*. Vilnius, 87.Inokaitis V. 2004. Naujos ir retos Lietuvos entomofaunos vabalų (Coleoptera) rūšys, aptiktos 2000–2003 metais. *New and Rare for Lithuania Insects species* 16: 7–10.

Ivinskis P. 2006. Vabzdžiai. *Europos Sąjungos Buveinių direktyvos saugomos rūšys*. Vadovas. Kaunas, 28–49.

Ivinskis P., Rimšaitė J. 2015. Niūriaspalvis auksavabalis. In Vaitonis G. (sud.) *Lietuvos griežtai saugomos rūšys*. Vilnius, 9–12.

Ivinskis P., Rimšaitė J., Davenis S.A. 2018. *Medžiai senoliai*. Vilnius.

Kadej M., Zając K., Ruta R., Gutowski J. M., Tarnawski D., Smolis A., Olbrycht T., Malkiewicz A., Myśków E., Larsson M. C., Andersson F., Hedenström E. 2015. Sex pheromones as a tool to overcome the Wallacean shortfall in conservation biology: a case of *Elater ferrugineus* Linnaeus, 1758 (Coleoptera: Elateridae). *Journal of Insect Conservation* 19 (1): 25–32.

Krell F.T. 2013. *Fauna Europaea: Cetoniidae*. In: Alonso-Zarazaga M. 2013. Fauna Europaea: Coleoptera, Beetles. Fauna Europaea version 2017.06, https://fauna-eu.org

Laibner S. 2000. *Elateridae of the Czech and Slovak Republics*. Kabourek, Zlin.

Meržijevskis A., Tamutis V. 2010 *Elater ferrugineus* Linnaeus, 1758 (Coleoptera: Elateridae) – a new species for Lithuania. *Acta zoologica Lituanica* 20 (4): 242–245.

Mannerkoski I., Hyvärinen, E., Alexander K., Büche B., Mico E. & Pettersson R. 2010. *Elater ferrugineus*. *The IUCN Red List of Threatened Species* 2010: e.T157529A5089131. Downloaded on 16 November 2018.

Mannerkoski, I., Hyvärinen, E., Campanaro, A., Alexander, K., Büche, B., Dodelin, B.,

Mason, F., Pettersson, R., Mico, E. & Méndez, M. 2010. *Protaetia lugubris*. *The IUCN Red List of Threatened Species* 2010: e.T157932A5176205. Downloaded on 18 November 2018

Oleksa A., Swalko P., Gawronski R. 2003. Pachnica *Osmoderma eremita* (Scopoli, 1763) (Coleoptera, Scarabaeoidea) w Polsce– występowanie, zagrozenia i ochrona. *Rocznik Naukowy Polskiego Towarzystwa Ochrony Przyrody Salamandra* 7: 101–123.

Oleksa A., Ulrich W. and Gawronski R. 2006. Occurrence of the marbled rose-chafer (*Protaetia lugubris* Herbst, Coleoptera, Cetoniidae) in rural avenues in northern Poland. *Journal of Insect Conservation* 10: 241–247.

Pileckis S., Monsevičius V. 1995. *Lietuvos fauna. Vabalai* I. Vilnius.

Ranius, T., Nilsson, G.S. 1997. Habitat of *Osmoderma eremita* Scop. (Coleoptera: Scarabaeidae), a beetle living in hollow trees. *Journal of Insect Conservation*, 1, 193–204.

Ranius, T. 2002. Osmoderma eremita as an indicator of species richness of beetles in tree hollows. *Biodiversity and Conservation* 11:931–941.

Rašomavičius V. (Ed.). 2007. Lietuvos Raudonoji knyga. Kaunas.

Sama G. 2013. *Fauna Europaea: Cerambicidae*. In: Audisio P. 2013. Fauna Europaea: Coleoptera, Cucujiformia. Fauna Europaea version 2017.06, https://fauna-eu.org

Sarac I. 2016. *Explaining population size of the saproxylic beetle Prionus coriarius as a function of available dead wood resources*. Alnarp.

Tamutis V., Tamutė B., Ferenca R. 2011. A Catalogue of Lithuanian beetles (Insecta, Coleoptera). *ZooKeys* 121: 1–494.

Tolasch T., von Fragstein M., Steidle J.L.M. 2007. Sex pheromone of *Elater ferrugineus* L. (Coleoptera: Elateridae). *Journal of Chemical Ecology 33:2156–2166.*

Duomenys apie niūriaspalvio auksavabalio (*Osmoderma barnabita*, Motschulsky, 1845) (Coleoptera: Cetoniidae) ir kai kurių kitų retų vabalų (Coleoptera) rūšių, susijusių su medžiais senoliais, paplitimą Lietuvoje

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Santrauka

Atliekant tyrimus 2017–2018 m.m. rastos kelios saugomų vabalų rūšys – *Prionus coriarius* (Cerambycidae), *Osmoderma barnabita*, *Protaetia lugubris* (Cetoniidae), įrašytos į Lietuvos Raudonąją knygą, ir dvi retos rūšys: *Elater ferrugineus* (Elateridae) ir *Protaetia aeruginosa* (Cetoniidae). Visos rastos rūšys yra medžių senolių drevių gyventojai ir daugiausia gyvena senuose ąžuolynuose. *Prionus coriarius* pirmą kartą rastas Punios šile. *Osmoderma barnabita* buvo aptiktas tiek kvapiosiomis gaudyklėmis, tiek stebėti aktyvūs vabalai, tiek pagal gyvybinius veiklos pėdsakus. Tyrimų metu ši rūšis buvo aptikta 21 šalies vietoje. Straipsnyje pateikti nauji duomenys apie labai retai randamą vabalų rūšį – *Protaetia aeruginosa*. Marmurinis auksavabalis (*Protaetia lugubris*), kaip parodė tyrimai, yra plačiai paplitęs Lietuvoje jam tinkamose buveinėse. Spragšis *Elater ferrugineus* iki šiol buvo rastas tik Kaune, Vytauto parke, mūsų tyrimų metu šis vabalas rastas Kaune ne tik Vytauto parke, bet ir netoliese esančioje Kauno dalyje, vadinamoje Parodos kalnu.

Received: 4 November, 2018