Bark and Longhorn Beetles (Coleoptera: Curculionidae, Scolytinae et Cerambycidae) Caught by Multiple Funnel Traps at the Temporary Storages of Timbers and Wood in Lithuania

HENRIKAS OSTRAUSKAS[1] AND VYTAUTAS TAMUTIS[2,3*]

[1]State Plant Service under the Ministry of Agriculture, Ozo St. 4A, LT-08200 Vilnius, Lithuania, E-mail: henrikas.ostrauskas@vatzum.lt

[2]Kaunas T. Ivanauskas Zoological Museum, Laisvės al. 106, LT-44253 Kaunas, Lithuania,

[*]e-mail: dromius@yahoo.com

[3]Department of Biology and Plant Protection, Aleksandras Stulginskis University, Studentų 11, Akademija, Kaunas distr., LT-53361, Lithuania.

Ostrauskas, H. and Tamutis, V. 2012. Bark and Longhorn Beetles (Coleoptera: Curculionidae, Scolytinae et Cerambycidae) Caught by Multiple Funnel Traps at the Temporary Storages of Timbers and Wood in Lithuania. *Baltic Forestry* 18(2): 263–269.

Abstract

Multiple funnel traps have been used at the temporary storages in Lithuania to monitor the harmful bark and longhorn beetles transited by the timbers and wood in 2002-2005. A total of 807 specimens belonging to 26 species of bark beetles (Coleoptera: Scolytinae) and 68 specimens belonging to 17 species of longhorn beetles (Coleoptera: Cerambycidae) were collected from 7 sampling localities. *Polygraphus punctifrons* Thom. and *Trypodendron laeve* Egg. were not recorded for Lithuanian fauna or pointed out as imported before. *Trypodendron domesticum* (L.), *Trypophloeus granulatus* (Ratz.) and *Xyleborinus saxesenii* (Ratz.) - very rare species in Lithuania were also detected. All trapped species are considered native for Europe.

Key words: Scolytinae, Cerambycidae, funnel traps, timber, wood, Lithuania

Introduction

Non-European bark beetle species *Pityogenes irkutensis*, *Orthotomicus erosus*, *Ips subelongatus, Gnathotrichus materiarius*, *Xyleborus eurygraphus*, *Polygraphus proximus* have been intercepted in Europe (Siitonen 1990, 2000, Valkama et al. 1998, Lindelöw 2000, Baranchikov et al. 2010). Alien for Europe Scolytinae species are pointed out by Kirkendall and Faccoli (2010).

As all EU member states the National Plant Protection Service (NPPS), in Lithuania has strict inspection rules for wood consignments to prevent harmful alien organisms to establish in the country. A survey for non-European xylophagous organisms could be included among measures to facilitate early detection of new organisms and thus improve regulations. Lithuanian survey for *Dendroctonus rufipennis* (non-European bark beetle) carried out at Klaipeda port, nearby Vaidotai railway station (Vilnius county) and along roads of forests, in total 21 locality by cross-vane traps in 2000 (Ostrauskas and Ferenca 2010) represented a small number (7,8% of species) of the Scolytinae fauna known in Lithuania. *D. rufipennis* was not trapped.

In 2002-2005, a new survey was performed. Transportation and storage of timber and wood originating from Russia kept our attention. A surveillance programme to monitor xylophagous organisms was carried out at port, railway stations and truck control posts where timber and wood was stored temporary prior to entry into Lithuania or leaving the country. This paper reports the species composition of bark and longhorn beetles in the traps and the significance of records of interest.

Materials and methods

Multiple funnel traps (IBL-3, Chemipan Company, Poland) were used in 10 localities (Figure 1). The traps were baited with semiochemical attractants, produced

at the Laboratory of Chemical and Behavioural Ecology, Nature Research Centre, Lithuania (Table 1) to improve beetle trap catch. Each red rubber septa dispenser (1 cm long) was loaded with 10 mg attractant. Hexane was used as a solvent. During 2002 one attractant baited trap per locality was installed (8 localities were used, Figure 1). In 2003-2005 the attractant baited traps were supplemented by an additional control trap (no attractant) at each locality. The traps were placed 1.5 m above the ground on stakes adjacent to stored timber or in truck control posts at Lithuanian borders. Traps were rebaited every five week. The traps were operating from the middle of April until the end of October in each year. Traps were emptied once a week, and captured insects were collected for determination. All caught beetles were identified to species level according the keys by Nunberg (1954), Harde (1966), Grüne (1979), and Schedl (1981). The Student□s criterion (t) was applied to compare trapping intensity of bark beetles at different types of localities (Čekanauskas and Murauskas 2000, 2002). The Sørensen index (S) was used to measure similarity in species composition (Ludwig and Reynolds 1988).

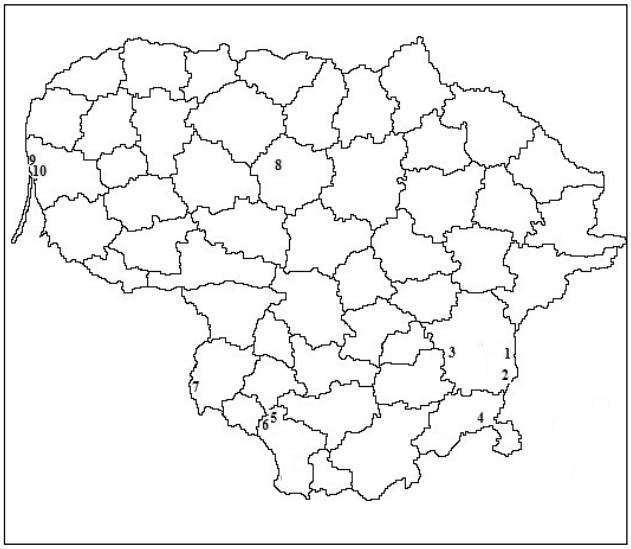

Figure 1. Scheme of localities where multiple funnel traps for beetle catch were deployed in Lithuania: 1 – Lavoriškės (Vilnius district), truck control post, 2002; 2 – Medininkai (Vilnius district), truck control post, 2002-2005; 3 – Vaidotai (Vilnius district), railway station, 2002; 4 – Pamūrinė (Šalčininkai district), truck control post, 2002-2004; 5 – Šeštokai I (Lazdijai district), railway station, 2002-2005; 6 – Šeštokai II (Lazdijai district), railway station, 2003-2005; 7 – Kybartai (Vilkaviškis district), truck control post, 2002; 8 – Radviliškis (Šiauliai district), railway station, 2002-2004; 9 – Klaipėda I (Klaipėda district), port, 2002-2005; 10 – Klaipėda II (Klaipėda district) port, 2004-2005

Table 1. List of attractants used during a survey for bark beetles in Lithuania

Attractant	Months, 2002	Months, 2003-2005
Alpha-Pinene	April-May, mid July-August	-
Myrcene	-	April-mid July
Cis-Verbenol	June-mid July, September-October	mid July-October

Results

In total, 807 specimens of bark beetles representing 26 native European species were collected from 7 sampling localities (Table 2). Trapping intensity of bark beetles (Table 3) at different types of localities – truck (T), railway (R), port (P) were the same ($t_{T\text{-}R}$=1,14,

Table 2. List of bark and longhorn beetle species, the number of specimens caught by IBL-3 traps during 2002-2005, finding localities (codes as prescribed in Figure 1) in Lithuania

Family (Subfamily) Species	The total number of trapped specimens	Finding localities
Cerambycidae		
Acanthocinus aedilis (L.)	2	4, 9
Anastrangalia reyi (Heyd.)	1	5
Asemum striatum (L.)	1	6
Corymbia rubra (L.)	1	5
Leptura quadrifasciata L.	4	2, 8
Molorchus minor (L.)	12	5, 6, 9, 10
Obrium cantharinum (L.)	2	6
Paracorymbia maculicornis (Deg.)	10	2, 5, 6, 9
Phymatodes testaceus L.	7	5, 6
Pseudovadonia livida (F.)	1	10
Rhagium inquisitor (L.)	6	5, 6, 10
Rhagium mordax (Deg.)	3	6, 9
Spondylis buprestoides (L.)	7	2, 4, 9, 10
Strangalia attenuata (L.)	1	8
Tetropium castaneum (L.)	3	6, 10
Tetropium fuscum (F.)	4	5, 9, 10
Xylotrechus rusticus (L.)	3	5
Total cerambycids	68	
Curculionidae (Scolytinae)		
Crypturgus cinereus (Hbst.)	64	5, 6, 9, 10
Crypturgus hispidulus Thom.	4	9, 10
Crypturgus pusillus (Gyll.)	1	9
Crypturgus subcribrosus Egg.	18	9, 10
Dryocoetes autographus (Ratz.)	14	5, 6, 8, 10
Hylastes ater (Payk.)	2	9, 10
Hylastes cunicularius Er.	3	6, 10
Hylesinus fraxini (Panz.)	44	5, 6, 8, 9, 10
Hylurgops palliatus (Gyll.)	11	6, 9, 10
Ips duplicatus (Sahlb.)	5	6, 9, 10
Ips typographus (L.)	135	2, 4, 5, 6, 8, 9, 10
Orthotomicus laricis (F.)	12	9, 10
Pityogenes chalcographus (L.)	132	2, 5, 6, 8, 9, 10
Pityogenes quadridens (Hart.)	1	5
Pityophthorus pityographus (Ratz.)	6	5, 8, 9, 10
Polygraphus poligraphus (L.)	90	2, 5, 6, 9, 10
Polygraphus punctifrons Thom.	9	5, 6, 9, 10
Polygraphus subopacus Thom.	1	10
Scolytus ratzeburgi Jans.	3	5
Tomicus piniperda (L.)	18	2, 5, 6, 9, 10
Trypodendron domesticum (L.)	7	5, 9, 10
Trypodendron laeve Egg.	1	
Trypodendron lineatum (Oliv.)	157	5, 6, 8, 9, 10
Trypodendron signatum (F.)	65	2, 5, 6, 8, 9, 10
Trypophloeus granulatus (Ratz.)	1	10
Xyleborinus saxesenii (Ratz.)	3	9, 10
Total scolytids	807	

Table 3. Total number of bark beetle specimens trapped at localities during the investigation period

Type of locality, Localities	Investigation period, days	Total number of used traps, including control	Total number of beetle specimens
truck posts			
Kybartai	198	1	0
Lavoriškės	198	1	0
Šalčininkai	594	5	1
Medininkai	792	7	33
railway storage			
Vaidotai	198	1	0
Radviliškis	594	5	11
Šeštokai I	792	7	73
Šeštokai II	594	6	139
port storage			
Klaipėda I	792	7	227
Klaipėda II	396	4	323

p =0,297; $t_{T\text{-}P}$=2,41, p=0,0729; $t_{R\text{-}P}$=2,33, p=0,079). A majority of the bark beetle species were caught in low numbers during four seasons. Only *Ips typographus*, *Pityogenes chalcographus* and *Trypodendron lineatum* more than 100 specimens were caught.

A total of 68 longhorn beetles representing 17 species were collected from 7 sampling localities (Table 2). All trapped longhorn beetles species are native to Lithuania. All longhorn beetle species were caught in low number of specimens (in total less than 13) during four seasons.

The significance of records of interest present two species not detected before in Lithuania:

Polygraphus punctifrons Thoms., Klaipeda, 29 07-05 08 2004, 2 spec.; 06-20 09 2004, 1 spec; 29 06-06 07 2005, 2 spec.; 25 08-01 09 2005, 1 spec.; Šeštokai, 18-25 07 2005, 1 spec; 01-08 08 2005, 1 spec.; 22-29 08 2005, 1 spec.

Trypodendron laeve Egg., Klaipeda port, 29 04-07 05 2004, 1 spec.

Some rare or very rare longhorn and bark beetles (the category of rarity following Pileckis and Monsevičius 1997) have been trapped during this study:

Obrium cantharinum (L.) Šeštokai 11-12 07 2005, 2 spec.

Tetropium fuscum (F.) Klaipeda port, 03-11 06 2004, 2 spec., 29 06 - 06 07 2005, 1 spec., Šeštokai, 06-12 05 2004, 1 spec.

Crypturgus hispidulus Thom. Klaipeda port, 01-09 07 2004, 1 spec., 06-13 07 2005, 1 spec., 27 07 – 03 08 2005, 1 spec., 11-18 08 2005, 1 spec.

Crypturgus subcribrosus Eggers Klaipeda port, 01-09 07 2004, 3 spec., 08-15 06 2005, 3 spec. 15-22 06 2005, 2 spec., 29 06-06 07 2005, 6 spec., 06-13 07 2005, 3 spec.

Trypodendron domesticum (L.) Klaipeda port, 29 04-05 05 2003, 3 spec.; 15-22 04 2004, 1 spec.; 29 04-07 05 2004, 1 spec.; 13-24 08 2004, 1 spec.; Šeštokai 23-30 06 2003, 1 spec.

Trypophloeus granulatus (Ratz.), Klaipeda port, 18-25 08 2005, 1 spec.

Xyleborinus saxesenii (Ratz.), Klaipeda port, 15-22 04 2004, 1 spec.; 01-09 07 2004, 1 spec. 18-25 08 2005, 1 spec.

Discussion

In three localities of ten no bark beetles were caught (Table 3) due to negligible amount of wood for very short term, so after first year of survey no more traps used there. The biggest part (90%) of all specimens in total were caught in four localities (Šeštokai I, Šeštokai II, Klaipeda I and Klaipeda II) including 95% species of bark and longhorn beetles caught in this study could be explained by largest amount of stored timbers and wood, keeping that longer time and trapping beetles a few investigation years. The similarity (S) of bark beetle assemblages in traps baited with myrcene (M) and in traps without bait (control, C), in traps baited with cis-verbenol (CV) and in traps without bait (control, C) propose maybe importance of trap construction to the catches than attractant influence (Table 4).

Table 4. Sørensen index (S) of bark beetle assemblages compiled by traps baited with myrcene (M) and without bait (control, C), by traps baited with cis-verbenol (CV) and without bait (control, C) during the same monitoring period in separate years

Year	Number of traps used with bait	Number of traps without bait (control)	$S_{M\text{-}C}$	Monitoring period (days), when used bait myrcene and control	$S_{CV\text{-}C}$	Monitoring period (days), when used bait cis-verbenol and control
2003	6	6	0,71	66	0,54	132
2004	7	7	0,72	66	0,63	132
2005	5	5	0,59	66	0,62	132

Our study catches presented some part (30%) of known bark beetle species in Lithuania (Tamutis et al. 2011). *Ips typographus, Pityogenes chalcographus, Polygraphus polygraphus, Trypodendron lineatum* were most abundant species and in total comprised 63% of all caught scolytids. Bark beetles of these four species are economically important pests of spruce in Lithuania (Valenta 2000). Generally spruce assemblage of catches prevailed – 55% of longhorn beetles and 82% of bark beetles.

Polygraphus punctifrons and *Trypodendron leave* are not known to the Lithuanian fauna but their existence in the country can be expected. *P. punctifrons* is widely distributed in the Palaearctic region, develops

mostly on *Picea* sp., more rarely occur on *Pinus* species (Stark 1952, Burakowski et al. 1992), are known in Estonia (Voolma et al. 2000), Sweden (Lundberg and Gustafsson 1995), Belarus (Alexandrovitch et al. 1996), Poland (Nunberg 1954). *T. laeve* is insufficient known in Europe, sometimes considered as an alien species (Kenis 2005). Recent data of DAISIE (2009) reveals species distribution now throughout Europe and across Asia to Japan and looks like common conifer forest bark beetles, such as *Ips typographus* or *Tomicus piniperda* (Kirkendall and Faccoli 2010). So, this species may be distributed in Lithuania.

Obrium cantharinum (L.) is widely distributed in northern, central and south-eastern Europe, also known in Caucasus, western Siberia and Mongolia. The main hosts are noted *Populus* and *Quercus* sp. plants (Bílý and Mehl 1989). *O. cantharinum* is sporadically found in the whole Lithuania except Baltic Sea coast and Curonian Spit (Pileckis and Monsevičius 1997, Šablevičius 2004).

Tetropium fuscum (F.) is widely distributed in northern and central Europe, also known in Siberia and Japan (Burakowski et al. 1990), recently introduced in North America (Smith and Hurley 2000). *T. fuscum* prefer *Picea* species in Europe, more rarely occur on *Pinus* sp. The distribution in Lithuania is insufficiently studied, beetles noted for central, southern and eastern parts of territory before (Zawadzki 1936, Pileckis 1963, Monsevičius 1997, Tamutis and Zolubas 2001, Ivinskis et al. 2009).

Crypturgus hispidulus Thoms. is widely distributed in the Palaearctic region. Developing – in *Picea* species, rarely – *Larix, Abies, Pinus* (Stark 1952). *C. hispidulus*, like other *Crypturgus* species, is frequently found using the entrance hole of larger bark beetles (Jordal 2006) and probably can reduce their breeding success through interspecific larval competition and egg destruction (Choe and Crepsi 1997). The distribution of this species in Lithuania is a little known, a few findings have been published before (Monsevičius 1988, Pileckis and Monsevičius 1997). *C. hispidulus* is common species in Poland (Gutowski and Krzysztofiak 2005) and Estonia (Voolma et al. 2004).

Crypturgus subcribrosus Eggers distribution in Lithuania is still unclear, species status before (Pileckis and Monsevičius 1997) was considered as the synonym of *C. cinereus* (Herbst). However, *C. subcribrosus* was removed from the synonymy under *C. cinereus* after data based on DNA sequence and morphological features revise (Jordal and Knížek 2007). Although in the past some investigators (Stark 1952, Lekander et al. 1977, Lundberg and Gustafsson 1995, Silfverberg 2004) presented *C. subcribrosus* as a valid, widely distributed species in Europe. The host plant of this species is *Pinus sylvestris* (Stark 1952), but also it is common in dead *Picea* (Lindhe et al. 2005).

Trypodendron domesticum (L.), often have been designated as "European hardwood ambrosia beetle", is widely distributed in Europe from the coast of Mediterranean Sea, Crimea and Caucasus in the south (Stark 1952) to northern Sweden and Finland in the north (Lundberg and Gustafsson 1995), introduced in North America (Bright and Skidmore 2002). Beetles have been noted as common on various deciduous trees in Poland (Nunberg 1954) and one of the main pests of living beeches (*Fagus sylvatica*) in Belgium (Grégoire et al. 2003). *T. domesticum* is known from two localities in Lithuania, in Jonava and Kaunas districts (Gaidienė and Ferenca 1988, Monsevičius 1988).

Trypophloeus granulatus (Ratz.) is distributed in central and southern Europe, Crimea and Caucasus (Stark 1952), according to some authors also known in Norway, Sweden and Denmark (Silfverberg 2010). The hosts of these beetles are *Populus* and *Salix* sp. plants (Stark 1952, Nunberg 1954). Only our record is real finding of this species in Lithuania, because Stark (1952) noted this species for Lithuania without any data on its distribution and this notification has been cited later (Mastauskis and Pileckis 1959, Pileckis 1960, 1976). Pileckis and Monsevičius (1997) also not rendered data on concrete locality.

Xyleborinus saxesenii (Ratz.) - Eurasian species is widely distributed in the Palaearctic region, is invasive species in the North and South America, southern Africa, Philippines, Oceania region (Wood and Bright 1992). Beetles are polyphagous, use different trees and shrubs as hosts, but prefer *Quercus* sp. (Burakowski et al. 1992). Pileckis and Monsevičius (1997) firstly noted this rare species for Lithuania without detail distribution information, later these bark beetles have been caught in Kaunas and Alytus districts (Tamutis and Zolubas 2001).

Conclusions

1. Native for Europe 26 species of bark beetles and 17 species of longhorn beetles were detected by multiple funnel traps at Lithuanian port, railway stations and truck control posts.

2. No alien species was trapped during the survey at temporary storages of timber and wood in 2002-2005.

3. *Polygraphus punctifrons* Thom. and *Trypodendron laeve* Egg. were not recorded for Lithuanian fauna or pointed out as imported before, 3 very rare and 4 rare beetle species were detected.

Acknowledgements

We are grateful to the regional specialists from the former Lithuanian State Plant Protection Service for setting the traps, to Dr. Vincas Būda (Nature Research Centre, Lithuania) for the attractants, to Dr. Åke Lindelöw (University of Agricultural Sciences, Sweden) for the verification of some bark beetles.

References

Alexandrovitch, O.R., Lopatin, I.K., Pisanenko, A.D., Tsinkevitch, V.A. and Snitko, S.M. [Александрович, О.Р, Лопатин, И.К, Писаненко, А.Д, Цинкевич, В.А, Снитко, С.М.] 1996. Каталог жесткокрылых (Coleoptera, Insecta) Беларуси [A catalogue of Coleoptera (Insecta) of Belarus]. Minsk, Belarus, 103 pp. (in Russian).

Baranchikov, Y., Akulov, E. and Astapenko, S. 2010. Bark beetle *Polygraphus proximus*: a new aggressive Far Eastern invader on *Abies* species in Siberia and European Russia. U.S. interagency research forum on invasive species. Proceedings 21st Gen. Tech. Rep. NRS-P-75. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station, 64–65.

Bílý, S. and Mehl, O. 1989. Longhorn beetles (Coleoptera: Cerambycidae) of Fennoscandia and Denmark. Leiden: Brill E.J., 203 pp.

Bright, D.E. and Skidmore, R.E. 2002. A catalog of Scolytidae and Platypodidae (Coleoptera). Supplement 2 (1995-1999). National Research Center of Canada, Ottawa, 525 pp.

Burakowski, B., Mroczkowski, M. and Stefańska, J. 1990. Katalog fauny Polski, Część 23, Tom 15: Chrząszcze – Coleoptera. Cerambycidae i Bruchidae [Catalogue of Polish fauna, Part 23, Vol. 15: Beetles – Coleoptera. Cerambycidae and Bruchidae]. Państwowe Wydawnictwo Naukowe, Warszawa, 312 pp. (in Polish).

Burakowski, B., Mroczkowski, M. and Stefańska, J. 1992. Katalog fauny Polski, Część 23, Tom. 18: Chrząszcze – Coleoptera, Ryjkowcowate prócz ryjkowców – Curculionoidea prócz Curculionidae. [Catalogue of Polish fauna, Part 23, Vol. 18: Beetles – Coleoptera. Curculionoidea except Curculionidae] Muzeum i Institut Zoologii, Polskiej Academii Nauk, Warszawa, 324 pp. (in Polish).

Choe, J.C. and Crepsi, B.J. 1997. The Evolution of social behaviour in insects and arachnids. Cambridge University Press, Cambridge, 543 pp.

Čekanauskas, V. and Murauskas, G. 2000. Statistika ir jos taikymai. I. [Statistics and its practice. I.] TEV, Vilnius, 239 pp. (in Lithuanian).

Čekanauskas, V. and Murauskas, G. 2002. Statistika ir jos taikymai. II. [Statistics and its practice. II.] TEV, Vilnius, 272 pp. (in Lithuanian).

DAISIE. 2009. DAISIE European Invasive Alien Species Gateway. Available at: http://www.europe-aliens.org. [accessed 12-10-2011].

Gaidienл, E. and Ferenca, R. [Гайдене, Э.К. и Ференца, Р.В.] 1988. 10 новых для Литовской ССР видов жестокрылых, обнаруженных в 1968-1986 гг. В: В. Йонайтис (ред.), Новые и редкие для Литовской ССР виды насекомых Сообщения и описания 1987 года. [10 species of beetles new to the Lithuanian SSR, found in 1968–1986. In: V. Jonaitis (Editor), New and rare for the Lithuanian SSR insect species. Records and descriptions of 1987]. Institute of Zoology and Parasitology, Vilnius, p. 15–21 (in Russian with English summary).

Grégoire, J-C., Piel, F., Proft, M. and Gilbert, M. 2001. Spatial distribution of ambrosia-beetle catches: a possibly useful knowledge to improve mass-trapping. *Integrated pest management reviews* 6 (3-4): 237–242.

Grüne, S. 1979. Brief illustrated key to European bark beetles. M. and H. Schaper, Hannover, 182 pp.

Gutowski, J.M. and Krzysztofiak, L. 2005. Directions and intensity of migration of the spruce bark beetles and accompanying species at the border between strict reserves and managed forests in north-eastern Poland. *Ecological Questions* 6: 81–92.

Harde, K.W. 1966. 87. Familie: Cerambycidae, Bockkäfer In: H. Freude, K.W. Harde and G.A. Lohse (Editors), Die Käfer Mitteleuropas. Bd. 9. Phytophaga (Cerambycidae, Chrysomelidae). Goecke and Evers – Krefeld, p. 7–94.

Ivinskis, P., Meržijevskis, A. and Rimšaitė, J. 2009. Data on new and rare for the Lithuanian fauna species of Coleoptera. *New and rare for Lithuania insect species. Records and descriptions* 21: 45–63.

Jordal, B.H. 2006. Community structure and reproductive biology of bark beetles (Coleoptera: Scolytinae) associated with Macaronesian euphorbiae shrubs. *European Journal of Entomology* 103: 1–10.

Jordal, B.H. and Knížek, M. 2007. Resurrection of *Crypturgus subcribrosus* Eggers 1933 stat. n. and its close phylogenetic relationship to Nearctic *Crypturgus* (Coleoptera, Scolytinae). *Zootaxa* 1606: 41–50.

Kenis, M. 2005. Insects – Insecta. In: R. Wittenberg (Editor), Invasive alien species in Switzerland. An inventory of alien species and their threat to biodiversity and economy in Switzerland. CABI Bioscience Switzerland Centre report to the Swiss Agency for Environment, Forests and Landscape. The environment in practice No. 0629. Federal Office for the Environment, Bern, p. 72–100.

Kirkendall, L.R., and Faccoli, M. 2010. Bark beetles and pinhole borers (Curculionidae: Scolytinae, Platypodinae) alien to Europe. *ZooKeys* 56: 227–251.

Lekander, B., Petersen, B.B., Kangas, E. and Bakke, A. 1977. The distribution of bark beetles in the Nordic countries. *Acta Entomologica Fennica* 32: 1–37.

Lindelöw, Å. 2000. Bark- and wood-living insects in timber imported to Sweden – aspects on the risks for establishments of new species. *Aktuelt fra skogforskningen* 4/00: 5-10.

Lindelöw, Å. 2010. New bark beetle (Coleoptera: Curculionidae, Scolytinae) species found in Lithuania. *New and rare for Lithuania insect species. Records and descriptions* 22: 30–32.

Lindhe, A., Lindelöw, Å. and Åsenblad, N. 2005. Saproxylic beetles in standing dead wood density in relation to substrate sun-exposure and diametre. *Biodiversity and Conservation* 14(12): 3033-3053.

Ludwig, J.A. and Reynolds, J.F. 1988. Statistical Ecology. A Primer on Methods and Computing. John Wiley and Sons, New York-Singapore, 337 pp.

Lundberg, S. and Gustafsson, B. 1995. Catalogus coleopterorum Sueciae. Natural History Museum, Stockholm, 302 pp.

Mastauskis, S. and Pileckis, S. 1959. Kinivarpos (Ipidae), aptiktos Lietuvos TSR. *LŽŪA mokslo darbai* [The bark beetles (Ipidae) found in Lithuanian SSR. *Scientific works of LAA*] 5: 144–146 (in Lithuanian).

Monsevičius, V. [Монсявичюс, Видм. С.] 1988. 43 новых для Литовской ССР видов жестокрылых, обнаруженных в 1975-1987 гг. В: В. Йонайтис (ред.), Новые и редкие

для Литовской ССР виды насекомых Сообщения и описания 1987 года. [43 species of Coleoptera new to the Lithuanian SSR, found in 1975–1987. In: V. Jonaitis (Editor), New and rare for the Lithuanian SSR insect species. Records and descriptions of 1987]. Institute of Zoology and Parasitology, Vilnius, p. 27–34 (in Russian with English summary).

Monsevičius, V. 1997. Vabalai (Coleoptera). Knygoje M. Lapelė (Redaktorius) Lietuvos valstybinių rezervatų flora ir fauna. [The beetles (Coleoptera). In: M. Lapelė (Editor), The fauna and flora of Lithuanian State reserves]. Ministry of Environmental Protection, Vilnius, p. 68–101.

Nunberg, M. 1954. Klucze do oznaczania owadów Polski. Część XIX, Chrząszcze – Coleoptera. Zeszyt 99–100, Korniki – Scolytidae, Wyrynniki – Platypodidae. [The key for identification of Polish species, Part 19, Beetles – Coleoptera. Books 99, 100, Bark beetles – Scolytidae, ambrosia beetles – Platypodidae]. State Scientific publishing, Warszawa, 106 pp. (in Polish).

Ostrauskas, H. and Ferenca, R. 2010. Beetles (Coleoptera) caught in traps baited with pheromones for *Dendroctonus rufipennis* (Kirby) (Curculionidae: Scolytinae) in Lithuania. *Ekologija* 56(1-2): 41-46.

Pileckis, S. 1960. Indėlis į Lietuvos vabalų (Coleoptera) faunos pažinimą. *LŽŪA mokslo darbai* [Contribution to the knowledge of beetles (Coleoptera) fauna in Lithuania. *Scientific works of LAA*] 7(3): 303–336. (in Lithuanian).

Pileckis, S. 1963. Naujos vabalų (Coleoptera) rūšys Lietuvos TSR. *LŽŪA mokslo darbai* [New species of beetles (Coleoptera) in Lithuanian SSR. *Scientific works of LAA*] 10(19): 53–64 (in Lithuanian with Russian summary).

Pileckis, S. 1976. Lietuvos vabalai [The beetles of Lithuania]. Mokslas, Vilnius, 244 pp. (in Lithuanian with Russian summary).

Pileckis, S. and Monsevičius, V. 1997. Lietuvos fauna. 2. Vabalai [Lithuanian fauna. The beetles Book 2]. Mokslas, Vilnius, 216 pp. (in Lithuanian with English summary)

Schedl, K.E. 1981. Familie: Scolytidae (Borken- und Ambrosiakäfer) (Ipidae). In: H. Freude, K.W. Harde and G.A. Lohse (Editors), Die Käfer Mitteleuropas. Bd. 10. Goecke and Evers, Krefeld, p. 34–99.

Siitonen, J. 1990. Potential forest pest beetles conveyed to Finland on timber imported from the Soviet Union. *Silva Fennica* 24(3): 315-321.

Siitonen, J. 2000. Beetles (Coleoptera) imported to Finland on Russian roundwood. *Aktuelt fra skogforskningen* 4/00: 11-18.

Silfverberg, H. 2010. Enumeratio renovata Coleopterorum Fennoscandiae, Daniae et Baltiae. *Sahlbergia*, 16(2): 1-144.

Smith, G., and Hurley, J. E. 2000. First North American record of the Palaearctic species *Tetropium fuscum* (Fabricius) (Coleoptera: Cerambycidae). *The Coleopterists Bulletin* 54(4): 540–540.

Stark, V.N. [Старк, В.Н.] 1952. Короеды., Фауна СССР. Жесткокрылые. Том 31. Издательство Академии Наук СССР, Москва, Ленинград [The bark beetles. Fauna of USSR. The beetles. Vol 31. Academy of Science USSR Publishing, Moscow, Leningrad]. 462 pp. (in Russian).

Šablevičius, B. 2004. New and rare for Lithuania beetle (Coleoptera) species collected in 1988-2004. *New and rare for Lithuania insect species. Records and descriptions* 16: 27–31.

Tamutis, V. 2003. Eighty-two new for Lithuania beetle (Coleoptera) species. *New and rare for Lithuania insect species* 15: 54–62.

Tamutis, V. and Zolubas, P. 2001. Non-target beetles trapped in *Ips typographus* L. pheromone traps. *Baltic Journal of Coleopterology* 1(1-2): 65–70.

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

Telnov, D. 2004. Check-List of Latvian Beetles (Insecta: Coleoptera). In: D. Telnov (Editor) Compendium of Latvian Coleoptera 1. Petrovskis & Ko, Riga, p. 1–113.

Valenta, V. 2000. Liemenų kenkėjai (ksilofagai). Kn: A. Žiogas (Sudarytojas), Miško apsaugos vadovas [The pests of trunks (xilophagous). In: A. Žiogas (Compiler), The quide of forest protection]. Lututė, Kaunas, p. 135–163.

Valkama, H., Martikainen, P. and Räty, M. 1998. First record of North American ambrosia beetle *Gnathotrichus materiarius* (Fitch) (Coleoptera, Scolytidae) in Finland – a new potential forest pest? *Entomologica Fennica* 8: 193–195.

Voolma, K., Õunap, H. and Süda, I. 2000. Eesti putukate levikuatlas, kd. 2, kaardid 98-165: Ürasklased – Scolytidae (Distribution maps of Estonian Insects, vol. 2, maps 98–165: Scolytidae). Eesti Loodusfoto, Tartu, 84 pp.

Voolma, K., Mandelshtam, M.J., Shcherbakov, A.N., Yakovlev, E.B., Õunap, H., Süda, I., Popovichev, B.G., Sharapa, T.V., Galasjeva, T.V., Khairetdinov, R.R., Lipatkin, V.A. and Mozolevskaya, E.G. 2004. Distribution and spread of bark beetles (Coleoptera: Scolytidae) around the Gulf of Finland: a comparative study with notes on rare species of Estonia, Finland, and north-western Russia. *Entomologica Fennica* 15: 198–210.

Wanat, M. and Mokrzycki, T. 2005. A new checklist of the weevils of Poland (Coleoptera: Curculionoidea). *Genus* 16(1): 69–117.

Wood, S.L. and Bright, D.E. 1992. A catalog of Scolytidae and Platypodidae (Coleoptera), Part 2: *Taxonomic index. Great Basin Naturalist Memoirs* 13: 1-1553.

Zawadzki, Z. 1935–1936. Kózki ziemi Wileńskiej. *Polskie pismo entomologiczne* [The longhorn beetles of Vilnius region. *Polish entomological works*], 14–15: 281–305 (in Polish).

Received 27 April 2012
Accepted 30 November 2012

КОРОЕДЫ И УСАЧИ (COLEOPTERA: CURCULIONIDAE, SCOLYTINAE ET CERAMBYCIDAE), ПОЙМАННЫЕ СОСТАВНЫМИ ВОРОНКООБРАЗНЫМИ ЛОВУШКАМИ НА ВРЕМЕННЫХ СКЛАДАХ БРЕВЕН И ДРЕВЕСИНЫ В ЛИТВЕ

Г. Остраускас и В. Тамутис

Резюме

Составные воронкообразные ловушки применялись на временных складах в Литве в 2002-2005 гг. для мониторинга вредных короедов и усачей, перевозимых с бревнами и древесиной. На 7 исследованных местностях собрано 807 короедов (Coleoptera: Scolytinae), принадлежавших 26 видам, и 68 усачей (Coleoptera: Cerambycidae), принадлежавших 17 видам. *Polygraphus punctifrons* Thom. и *Trypodendron laeve* Egg. ранее не были зарегистрированы в литовской фауне или известны как ввезенные в страну. Также были установлены жуки очень редких в Литве видов *Trypodendron domesticum* (L.), *Trypophloeus granulatus* (Ratz.) и *Xyleborinus saxesenii* (Ratz.). Все виды попавших в ловушки жуков оказались автохтонными для Европы.

Ключевые слова: Scolytinae, Cerambycidae, воронкообразные ловушки, бревна, древесина, Литва