

New Lithuanian records of moths captured in beetle traps

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Moths were captured in multiple funnel traps used to survey xylophagous beetles in nine localities of Lithuania in 2002–2004. A total of 176 moths were caught, representing 117 species. *Loxostege virescalis* (Guenée 1854) was collected at e tokai and is a new record for the Lithuanian fauna. Two very rare Lithuanian moth species, *Ochsenheimeria vacculella* Fisher von Röslerstamm 1842 and *Spargania luctuata* (Denis, Schiffermüller, 1775), were trapped at two and one new localities, respectively. In addition, new distribution records are presented for 10 moth species that are considered to be rare in Lithuania.

Key words: traps, Lepidoptera, species distribution, Lithuania

INTRODUCTION

The last catalogue of Lithuanian moths was issued six years ago, and it comprised 2 455 species found in Lithuania (Ivinskis, 2004). Moth fauna in Lithuania was studied thoroughly, but the following investigations (Kazlauskas, 2006b; Kazlauskas, Šlėnys, 2007; Paukštė, 2009) provided new important results. Some moths such as *Phyllonorycter robiniella*, *Parectopa robiniella* (Noreika, 2007; Ivinskis, Rimšaitė, 2008) reached Lithuania by natural way, while others (*Tuta absoluta* (Ostrauskas, Ivinskis, 2010)) spread with the help of man through trade.

Economically important insect pests could be imported with timbers from other continents. A surveillance program to monitor the incursion of xylophagous beetles was carried out at ports, railway stations and truck control posts where timber was stored temporarily prior to entry into Lithuania. In addition to xylophagous beetles, a number of moth species were also trapped. This paper reports the species composition of moths in the traps and the significance of records of interest.

MATERIALS AND METHODS

Multiple funnel traps (IBL-3, Chemipan, Poland) were baited with semiochemical attractants (produced by the Laboratory of Chemical and Behavioural Ecology, Nature Research Cen-

tre, Lithuania, Table 1) to maximise beetle trap catch. A survey for xylophagous beetles was conducted in nine localities (Figure). During 2002, one attractant-baited trap per locality was installed. In 2003–2004, the attractant-baited traps were supplemented with an additional control trap (no attractant) in 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. Baits were assumed to be effective for at least a six-week period after which they were changed to fresh lures. The traps operated from the middle of April until the end of October each year. Traps were checked once per week, and the captured insects were collected for analysis. Moth genitalia were slide-mounted after the method published by Ivinskis (1996). All caught moths were identified up to the species level according to the keys and descriptions presented by Medvedev (eds. 1978, 1981, 1986), Nowacki (1998), Elsner et al. (1999), Razowski (1990, 2001), Mironov (2003). The frequency of species (%) was calculated as a ratio of the number of localities where a species was recorded to the number of all the localities investigated. The Sørensen index (S) was used to measure similarity in species composition (Ludwig, Reynolds, 1988).

RESULTS AND DISCUSSION

A total of 176 moths representing 117 species were collected from nine sampling localities (Table 2). All species were represented by fewer than 11 specimens and most species by a single individual. Species frequency was low, suggesting a

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Figure. Scheme of localities where moths were trapped (investigated localities during a survey of xylophagous beetles): 1 – Lavoriškės (Vilnius district), truck control post, 2002; 2 – Medininkai (Vilnius district), truck control post, 2002–2004; 3 – Vaidotai (Vilnius district), railway station, 2002; 4 – Pamūrinė (Šalčininkai district), truck control post, 2002–2004; 5 – Šeštokai (Lazdijai district), railway station, 2002–2004; 6 – Kybartai (Vilkaviškis district), truck control post, 2002; 7 – Radviliškis (Šiauliai district), railway station, 2002–2004; 8 – Klaipėda (Klaipėda district), port, 2002–2004; 9 – Klaipėda (Klaipėda district), port, 2003–2004

Table 1. List of attractants used for xylophagous beetles in Lithuania

Attractant	Months, 2002	Months, 2003	Months, 2004
Alpha-pinene	April – May, mid July – August	–	–
Myrcene	–	April – mid July	April – mid July
Cis-verbenol	June – mid July, September–October	mid July – October	mid July – October

rapid turnover in species composition among the localities. Fewer moths were trapped in control traps (31% of total specimens and 38% of total species) compared to those baited with xylophagous beetle attractants (69% of total specimens and 74% of total species). Only 11% of total species were trapped in both types of traps. The similarity of moth species composition from different types of traps was low ($S = 0.25$). There were no control traps during the first year, so the difference between the two treatments is not reliable. If we eliminate a segment of material (moth species collected in 2002), the numbers of trapped species in control traps compared to those baited with xylophagous beetle attractants tend to be more equal (54% and 57% of total species, respectively). In this case, 10% of all species were trapped in both types of

traps. The similarity of moth species composition from different types of traps was also low ($S = 0.22$).

The greatest abundance and diversity of moths (39% of total specimens and 44% of total species) was collected at Pamūrinė during all the study period (three years). The exact cause of this high abundance is unknown, but it could reflect the high-intensity lighting at this location because the trap was attached to a light tower.

According to the reference (Ivinskis, 2004), the hosts of trapped moth species are not interfaced with timbers or wood. The reason why moths were trapped in general is that they could use traps as a refuge during the period of rain. Finally, we suggest that none-target moths in the traps partly represent the local environment around the traps.

Table 2. Frequency (%) of species and the number of moth specimens caught by traps for xylophagous beetles in 2002–2004

Family, species	Species frequency, %	Number of specimens	Family, species	Species frequency, %	Number of specimens
Hepialidae			<i>Endothenia ericetana</i> (Humphreys & Westwood 1845)		
<i>Triodia sylvina</i> (Linnaeus 1761)	11	1		11	1
Incurvariidae			<i>Celypha rosaceana</i> Schläger 1847		
<i>Incurvaria oehlmanniella</i> (Hübner 1796)	11	1		22	5
Tineidae			<i>Celypha cespitana</i> (Hübner 1817)		
<i>Tineola bisselliella</i> (Hummel 1823)	11	1		11	1
<i>Tinea pellionella</i> Linnaeus 1758	11	1	<i>Thiodia citrana</i> (Hübner 1799)		
<i>Niditinea fuscella</i> (Linnaeus 1758)	11	1		11	1
Gracillariidae			<i>Rhopobota stagnana</i> (Denis & Schiffermüller 1775)		
<i>Calybites phasianipennella</i> (Hübner 1813)	11	2		11	1
Yponomeutidae			<i>Rhopobota naevana</i> (Hübner 1817)		
<i>Yponomeuta evonymella</i> (Linnaeus 1758)	11	1		11	1
Ypsolophidae			<i>Eucosma obumbratana</i> (Lienig & Zeller 1846)		
<i>Ypsolopa sylvella</i> (Linnaeus 1767)	11	1		11	1
<i>Ochsenheimeria vacculella</i> Fisher von Röslerstamm 1842	22	4	<i>Eucosma cana</i> (Haworth 1811)		
Acrolepiidae			<i>Cydia pactolana</i> (Zeller 1840)		
<i>Acrolepia autumnitella</i> Curtis 1838	11	1		11	1
Depressariidae			Pyralidae		
<i>Agonopterix arenella</i> (Denis & Schiffermüller 1775)	11	1	<i>Dioryctria abietella</i> (Denis & Schiffermüller 1775)		
<i>Agonopterix heracliana</i> (Linnaeus 1758)	11	1		11	1
<i>Depressaria (Depressaria) radiella</i> (Goeze 1783)	11	1	<i>Anerastia lotella</i> (Hübner 1813)		
Batrachedridae				22	5
<i>Batrachedra praeangusta</i> (Haword 1828)	22	10	Crambidae		
<i>Batrachedra pinicolella</i> (Zeller 1839)	11	1	<i>Eudonia truncicolella</i> (Stainton 1849)		
Coleophoridae				11	1
<i>Coleophora prunifoliae</i> Doets 1944	11	1	<i>Chrysoteuchia culmella</i> (Linnaeus 1758)		
<i>Coleophora striatipennella</i> Nylander in Tengström 1848	11	1		11	2
Gelechiidae			<i>Crambus silvella</i> (Hübner 1813)		
<i>Chrysoesthia drurella</i> (Fabricius 1775)	11	1		11	1
<i>Chrysoesthia sexguttella</i> (Thunberg 1794)	11	1	<i>Crambus perlella</i> (Scopoli 1763)		
<i>Metzneria lappella</i> (Linnaeus 1758)	11	1		11	1
<i>Monochroa sepicolella</i> (Herrich-Schäffer 1854)	11	1	<i>Agriphila tristella</i> (Denis & Schiffermüller 1775)		
<i>Eulamprotes wilkella</i> (Linnaeus 1758)	11	1		22	3
<i>Gelechia (Gelechia) rhombella</i> (Denis & Schiffermüller 1775)	11	1	<i>Agriphila selasella</i> (Hübner 1813)		
<i>Gelechia (Gelechia) scotinella</i> Herrich-Schäffer 1854	11	1		11	2
<i>Aroga velocella</i> (Duponchel 1838)	11	1	<i>Platytes alpinella</i> (Hübner 1813)		
<i>Sophronia sicariellus</i> (Zeller 1839)	11	1		11	1
<i>Aproaerema anthyllidella</i> (Hübner 1813)	11	1	<i>Loxostege virescalis</i> (Guenée 1854)		
<i>Anacamptis populella</i> (Clerck 1759)	11	6		11	1
Tortricidae			Lasiocampidae		
<i>Aethes smeathmanniana</i> (Fabricius 1781)	11	1	<i>Poecilocampa populi</i> (Linnaeus 1758)		
<i>Cochylidia implicitana</i> (Wocke 1856)	11	1		11	5
<i>Acleris emargana</i> (Fabricius 1775)	11	1	<i>Malacosoma (Clisiocampa) neustria</i> (Linnaeus 1758)		
<i>Eana (Eutrachia) osseana</i> (Scopoli 1763)	11	1		11	1
<i>Cnephasia (Cnephasia) stephensiana</i> (Doubleday 1849)	33	3	<i>Eutrix potatoria</i> (Linnaeus 1758)		
<i>Cnephasia (Cnephasia) alticolana</i> (Herrich-Schäffer 1851)	11	1	Sphingidae		
<i>Pandemis heparana</i> (Denis & Schiffermüller 1775)	11	1	<i>Sphinx pinastri</i> Linnaeus 1758		
			Hesperiidae		
			<i>Thymelicus lineola</i> (Ochsenheimer 1808)		
			<i>Ochlodes sylvanus</i> (Esper 1777)		
			Nymphalidae		
			<i>Apatura iris</i> (Linnaeus 1758)		
			<i>Coenonympha pamphilus</i> (Linnaeus 1758)		
			Drepanidae		
			<i>Thyatira batis</i> (Linnaeus 1758)		
			<i>Tethea or</i> (Denis & Schiffermüller 1775)		
			Geometridae		
			<i>Chiasmia clathrata</i> (Linnaeus 1758)		
			<i>Geometra papilionaria</i> (Linnaeus 1758)		
			<i>Timandra comae</i> Schmidt 1931		
			<i>Scopula (Scopula) immorata</i> (Linnaeus 1758)		
			<i>Scopula (Scopula) nigropunctata</i> (Hufnagel 1767)		
			<i>Scopula (Calothysanis) immutata</i> (Linnaeus 1758)		
			<i>Idaea straminata</i> (Borkhausen 1794)		
			<i>Xanthorhoe ferrugata</i> (Clerck 1759)		
			<i>Pelurga comitata</i> (Linnaeus 1758)		
			<i>Eulithis populata</i> (Linnaeus 1758)		
			<i>Spargania luctuata</i> (Denis & Schiffermüller 1775)		

Table 2. (continued)

Family, species	Species frequency, %	Number of specimens
<i>Epirrita dilutata</i> (Denis & Schiffermüller 1775)	11	1
<i>Operophtera fagata</i> (Scharfenberg 1805)	11	1
<i>Eupithecia innotata</i> (Hufnagel 1767)	11	1
<i>Eupithecia pusillata</i> (Denis & Schiffermüller 1775)	11	1
Notodontidae		
<i>Clostera pigra</i> (Hufnagel 1766)	11	2
<i>Ptilophora plumigera</i> (Denis & Schiffermüller 1775)	11	1
<i>Phalera bucephala</i> (Linnaeus 1758)	11	1
Noctuidae		
<i>Acronicta (Hyboma) strigosa</i> (Denis & Schiffermüller 1775)	11	1
<i>Acronicta (Viminia) rumicis</i> (Linnaeus 1758)	11	1
<i>Catocala fulminea</i> (Scopoli 1763)	11	2
<i>Rivula sericealis</i> (Scopoli 1763)	11	2
<i>Abrostola tripartita</i> (Hufnagel 1766)	11	1
<i>Amphipyra (Amphipyra) pyramidea</i> (Linnaeus 1758)	11	2
<i>Diloba caeruleocephala</i> (Linnaeus 1758)	11	1
<i>Pyrrhia umbra</i> (Hufnagel 1766)	11	1
<i>Elaphria venustula</i> (Hübner 1790)	11	1
<i>Actinotia polyodon</i> (Clerck 1759)	11	1
<i>Cosmia (Calymnia) trapezina</i> (Linnaeus 1758)	11	1
<i>Apamea monoglypha</i> (Hufnagel 1766)	11	1
<i>Apamea lithoxylaea</i> (Denis & Schiffermüller 1775)	11	1
<i>Apamea lateritia</i> (Hufnagel 1766)	11	2
<i>Oligia strigilis</i> (Linnaeus 1758)	11	1
<i>Mesapamea secalis</i> (Linnaeus 1758)	21	2
<i>Lacanobia (Dianobia) thalassina</i> (Hufnagel 1766)	11	1
<i>Polia nebulosa</i> (Hufnagel 1766)	11	1
<i>Mythimna (Mythimna) conigera</i> (Denis & Schiffermüller 1775)	11	1
<i>Mythimna (Hyphilare) ferrago</i> (Fabricius 1787)	11	1
<i>Tholera decimalis</i> (Poda 1761)	11	1
<i>Rhyacia simulans</i> (Hufnagel 1766)	11	1
<i>Spaelotis ravidata</i> (Denis & Schiffermüller 1775)	11	1
<i>Xestia (Megasema) c-nigrum</i> (Linnaeus 1758)	21	7
<i>Xestia (Xestia) baja</i> (Denis & Schiffermüller 1775)	11	1
<i>Agrotis clavis</i> (Hufnagel 1766)	11	1
<i>Lymantria monacha</i> (Linnaeus 1758)	21	3
<i>Thumatha senex</i> (Hübner 1808)	11	1
<i>Eilema griseola</i> (Hübner 1803)	11	1
<i>Eilema lurideola</i> (Zincken 1817)	11	1
<i>Phragmatobia fuliginosa</i> (Linnaeus 1758)	33	5
<i>Spilosoma lutea</i> (Hufnagel 1766)	22	3
<i>Spilosoma urticae</i> (Esper 1789)	11	1
<i>Diacrisia sannio</i> (Linnaeus 1758)	11	1
<i>Arctia caja</i> (Linnaeus 1758)	11	1

As such, insect by-catch provides important data that add to our knowledge of the Lithuanian fauna. Some interesting records are presented below (species name, locality, date, number of specimens (abbr. spec.)).

One moths species was trapped that had not been reported before as part of the Lithuanian fauna:

Loxostege virescalis (Guenée, 1854), Šeštokai, June 30 – July 07, 2003, 1 spec.

Moths of very rare species (the category after Ivinskis, 2004) captured during this study were:

Ochsenheimeria vacculella Fisher von Röslerstamm 1842, Šeštokai, July 14–21, 2003, 1 spec.; Pamūrinė, June 01–07, 2004, 1 spec.; July 01–28, 2004, 1 spec.; October 1–10, 2004, 1 spec.

Spargania luctuata (Denis, Schiffermüller, 1775), Pamūrinė, June 01–07, 2004, 1 spec.

Moths of rare species (the category after Ivinskis, 2004) trapped in Lithuania during our investigation were:

Monochroa sepicolella (Herrich-Schäffer, 1854), Pamūrinė, June 15–22, 2003, 1 spec.

Cnephasia (Cnephasia) alticolana (Herrich-Schäffer, 1851), Medininkai, June 28 – July 04, 2002, 1 spec.

Cydia pactolana (Zeller, 1840), Šeštokai, June 02–09, 2003, 1 spec.

Eudonia truncicolella (Stainton, 1849), Medininkai, August 01–08, 2004, 1 spec.

Crambus silvella (Hübner, 1813), Pamūrinė, August 12–19, 2003, 1 spec.

Apatura iris (Linnaeus, 1758), Medininkai, August 01–08, 2004, 1 spec.

Idaea straminata (Borkhausen, 1794), Pamūrinė, July 19–26, 2003, 1 spec.

Amphipyra (Amphipyra) pyramidea (Linnaeus, 1758), Radviliškis, September 09–17, 2002, 1 spec.; August 13–20, 2003, 1 spec.

Apamea lithoxylaea (Denis, Schiffermüller, 1775), Pamūrinė, August 12–19, 2003, 1 spec.

Spaelotis ravidata (Denis, Schiffermüller, 1775), Klaipėda, August 31 – September 06 2004, 1 spec.

These records extend the known distribution (Ivinskis, 2004; Kazlauskas, 2006a, 2006b; Ūsaitis, 2007; Bačianskas, 2009; Lukoševičius, 2009; Paukštė, 2009; Ostrauskas et al., 2010) of two very rare moth species (three new localities) and 10 rare moth species (10 new localities).

CONCLUSIONS

In Lithuania, using multiple funnel traps for xylophagous beetles, 117 non-target moths species were trapped. Each species was represented by fewer than 11 specimens (most species by a single individual), and the turnover of species among the localities was very high (resulting in a low species frequency). *Loxostege virescalis* (Guenée, 1854) was caught at Šeštokai and is a new record for Lithuania. The very rare for Lithuania moth species, such as *Ochsenheimeria vacculella*

Fisher von Röslerstamm, 1842, *Spargania luctuata* (Denis, Schiffermüller, 1775), were recorded from two and one new localities, respectively, whilst 10 rare for Lithuania moth species were detected at new 10 localities (each species found only at one new locality).

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NAUJI DRUGIŲ, SUGAUTŲ VABALŲ GAUDYKLĖSE LIETUVOJE, DUOMENYS

Santrauka

Drugiai pakliuvo į gaudyklės, naudotas vabalų ksilofagų paieškai 9 Lietuvos vietovėse 2002–2004 metais. Daugianarės piltuvėlinės gaudyklės buvo išdėstytos prie laikinai sandėliuojamų rąstų uosto aikštelėse ir traukinių stotyse, sunkvežimių įvažiavimo į Lietuvą kontrolės postuose. Iš viso pakliuvo 176 drugiai, atstovaujantys 117 rūšių. *Loxostege virescalis* (Guenée 1854) drugys aptiktas Šeštokuose, ir ši rūšis papildė Lietuvos fauną. Žinios apie labai retų Lietuvoje drugių *Ochsenheimeria vacculella* Fisher von Röslerstamm 1842 ir *Spargania luctuata* (Denis, Schiffermüller, 1775) paplitimą papildytos atitinkamai dviem ir viena naujomis vietovėmis, o 10 retų rūšių radavietės – 10 vietovių (kiekviena rūšis po 1 vietovę).

Raktažodžiai: gaudyklės, Lepidoptera, rūšių paplitimas, Lietuva