TAXONOMICAL LIST OF NEPTICULIDAE (LEPIDOPTERA) NEW TO KAUNAS LAGOON REGIONAL PARK

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Introduction

Nepticulidae (pigmy moths) are the smallest moths in Lithuania and the whole world is belonging to the superfamily Nepticuloidea due to abnormally enlarged bases of their antennae, partially or completely covering their eyes, when insects are resting - eyecaps (Stonis et al., 2015). The most important ecological specification of these primitive animals – their endobiotic lifestyle in the assimilation tissues of plants called mining (Puplesis, Diškus, 2003). It is believed this adaptation has allowed to survive for the Nepticulidae in our planet for the last 100-120 million years, making them an excellent "tool for better understanding evolutionary tendencies" (Stonis et al., 2011).

There are more than 850 described species of pigmy moths in the world, meanwhile, 78 species have been identified in Lithuania (Navickaitė, 2014). However, the distribution ranges of these living relics are from Early Cretaceous (Doorenweerd et al., 2015) and they are infinitely distinctive and extensive (Stonis et al., 2018), a chorological analysis of Lithuanian fauna species is dependency required.

Researches carried out by members of Vytautas Magnus University Biosystematics Research Center and unexpected discovery of a new species of Nepticulidae for Lithuania and the world fauna (Ivinskis et al., 2012) in Kaunas district in 2012 inspired the first author of this article to start these researches at Kaunas Lagoon Regional park (KLRP), that is located at Kaunas city, Kaunas and Kaišiadorys districts.

During the last researches at KLRP, conducted by S. Bikinaitė in 2011–2013, there were identified 23 species of Nepticulidae miners with their host plants (Bikinaitė, 2014).

This study was conducted as a very small part of the Bachelor (Banytė, 2017) and Master thesis (Banytė, 2019) of Inga Banytė, that was prepared in Lithuanian University of Educational Sciences (now Vytautas Magnus University), Biosystematics Research Center in period of 2014–2017 and Vilnius University, Life Science Centre, Institute of Biosciences in the year of 2018–2019.

Material and Methods

Methods and protocols for collecting, dissecting and identifying species are described in Diškus & Stonis (2012). All the material was collected by Inga Banytė. The species were identified by Inga Banytė and Arūnas Diškus mostly using the collected leaf-mine samples, which were very specific.

The material is deposited in Museum of Zoology of Vilnius University (MZVU).

List of localities

The research was carried out in 2014–2016 and 2018 in the central part of Lithuania - in 8 localities all around the area of KLRP.

Locality	Administrative district	Coordinates (LAT, LONG)
Girionys town	Kaunas district	54.85963, 24.04971
Žiegždriai town	Kaunas district	54.56567, 23.95116
Gervėnupis village	Kaunas district	54.56567, 23.95116
Arlaviškės village	Kaunas district	54.81229, 24.19536
Pažaislis	Kaunas city	54.87699, 24.02334
Karčiupis village	Kaišiadorys district	54.91425, 24.11993
Grabuciškės village	Kaišiadorys district	54.91425, 24.11993
Rumšiškės	Kaišiadorys district	54.87485, 24.21532

List of species new to KLRP

***Ectoedemia intimella* (Zeller, 1848)** (Fig. 1.)

Gervėnupis, 2018 10 10, 1 leaf mine on *Stigmella fragilis*, field card no. 613.

***Ectoedemia minimella* (Zetterstedt, 1839)** (Fig. 2.)

Rumšiškės, 2014 10 03, 1 leaf mine on *Betula pendula*, field card no. 37.

***Ectoedemia turbidella* (Zeller, 1848)** (Fig. 3.)

Žiegždriai, 2014 10 26, 2 leaf mines on *Populus alba*, field card no. 77; Arlaviškės, 2016 10 20, 6 leaf mines on *P. alba*, field card no. 393.

***Fomoria septembrella* (Stainton, 1849)** (Fig. 4.)

Karčiupis, 2015 07 08, 2 leaf mines on *Hypericum perforatum*, field card no. 95; Rumšiskės, 2015-09-14, 7 leaf mines on *H. perforatum*, field card no. 151.

***Stigmella atricapitella* (Haworth, 1828)** (Fig. 5.)

Rumšiškės, 2016 07 16, 2 leaf mines on *Quercus robur*, field card no. 276; Arlaviškės, 2018 06 27, 17 leaf mines on *Q. robur*, field card no. 398; Pažaislis, 2018 08 06, 14 leaf mines on *Q. robur*, field card no. 461; Grabuciškės, 2018 09 11, 1 leaf mine on *Q. robur*, field card no. 574; Rumšiškės, 2018 10 07, 7 leaf mines on *Q. robur*, field card no. 604.

***Stigmella aurella* (Fabricius, 1775)** (Fig. 6.)

Pažaislis, 2016 07 06, 1 leaf mine on *Fragaria vesca*, field card no. 237.

***Stigmella carpinella* (Heinemann, 1862)** (Fig. 7.)

Girionys, 2018 08 21, 2 leaf mines on *Carpinus betulus*, field card no. 520; Rumšiškės, 2018 10 07, 16 leaf mines on *C. betulus*, field card no. 602.

***Stigmella confusella* (Wood, Walsingham, 1894)** (Fig. 8.)

Arlaviškės, 2018 08 24, 1 leaf mine on *Betula pendula*, field card no. 538.

***Stigmella glutinosae* (Stainton, 1858)** (Fig. 9.)

Girionys, 2014 10 11, 14 leaf mines on *Alnus glutinosa*, field card no. 66; Arlaviškės, 2015 09 25, 4 leaf mines on *A. glutinosa*, field card no. 174; Grabuciškės, 2015 09 27, 5 leaf mines on *A. glutinosa*, field card no. 207; Arlaviškės, 2016 10 20, 1 leaf mine on *A. glutinosa*, field card no. 388.

***Stigmella nivenburgensis* (Preissecker, 1942)** (Fig. 10.)

Pažaislis, 2015 09 12, 1 leaf mine on *Salix fragilis*, field card no. 131; Grabuciškės, 2015 09 27, 3 leaf mines on *S. fragilis*, field card no. 199.

***Stigmella obliquella* (Heinemann, 1862)** (Fig. 11.)

Karčiupis, 2015 07 08, 3 leaf mines on *S. fragi*lis, field card no. 94; Karčiupis, 2015 07 17, 6 leaf mines on *S. fragilis*, field card no. 98; Rumšiskės, 2015 09 14, 1 leaf mine on *S. fragilis*, field card no. 140; Gervėnupis, 2016 09 06, 4 leaf mines on *S. fragilis*, field card no. 327; Rumšiškės, 2016 10 11, 3 leaf mines on *S. fragilis*, field card no. 350; Karčiupis, 2016 10 12, 2 leaf mines on *S. fragilis*, field card no. 369; Girionys, 2018 06 27, 2 leaf mines on *S. caprea*, field card no. 434; Girionys, 2018 06 27, 8 leaf mines on *S. fragilis*, field card no. 435; Pažaislis, 2018 08 06, 11 leaf mines on *S. fragilis*, field card no. 454; Grabuciškės, 2018 08 12, 3 leaf mines on *S. fragilis*, field card no. 495; Gervėnupis, 2018 08 14, 29 leaf mines on *S. fragilis*, field card no. 513; Girionys, 2018 08 21, 5 leaf mines on *S. fragilis*, field card no. 519; 2018 09 11, Karčiupis, 1 leaf mine on *S. caprea*, field card no. 554; Pažaislis, 2018 09 11, 2 leaf mines on *S. fragilis*, field card no. 577; Rumšiškės, 2018 10 07, 1 leaf mine on *S. fragilis*, field card no. 594; Girionys, 2018 10 28, 1 leaf mine on *S. fragilis*, field card no. 623.

***Stigmella samiatella* (Zeller, 1839)** (Fig. 12.)

Pažaislis, 2014 08 11, 3 leaf mines on *Q. robur*, field card no. 6; Pažaislis, 2016 07 06, 1 leaf mine on *Q. robur*, field card no. 231; Rumšiškės, 2016 07 16, 1 leaf mine on *Q. robur*, field card no. 277; Žiegždriai, 2016 09 06, 5 leaf mines on *Q. robur*, field card no. 309; Arlaviškės, 2018 06 27, 4 leaf mines on *Q. robur*, field card no. 399; Grabuciškės, 2018 08 12, 2 leaf mines on *Q. robur*, field card no. 500; Arlaviškės, 2018 08 24, 2 leaf mines on *Q. robur*, field card no. 548; Grabuciškės, 2018 09 11, 1 leaf mine on *Q. robur*, field card no. 572; Pažaislis**,** 2018 09 11, 6 leaf mines on *Q. robur*, field card no. 587.

***Stigmella sorbi* (Stainton, 1861)** (Fig. 13.)

Rumšiškės, 2014 10 03, 14 leaf mines on *Sorbus acuparia*, field card no. 34.

***Stigmella tityrella* (Stainton, 1854)** (Fig. 14.)

Girionys, 2016 07 18, 29 leaf mines on *Fagus sylvatica*, field card no. 281; Girionys, 2016 09 26, 302 leaf mines on *F. sylvatica*, field card no. 328.

***Stigmella viscerella* (Stainton, 1853)** (Fig. 15.)

Rumšiškės, 2016 10 11, 2 leaf mines on *Ulmus leavis*, field card no. 349; Pažaislis, 2018 08 06, 6 leaf mines on *U. leavis*, field card no. 449.

Discussion

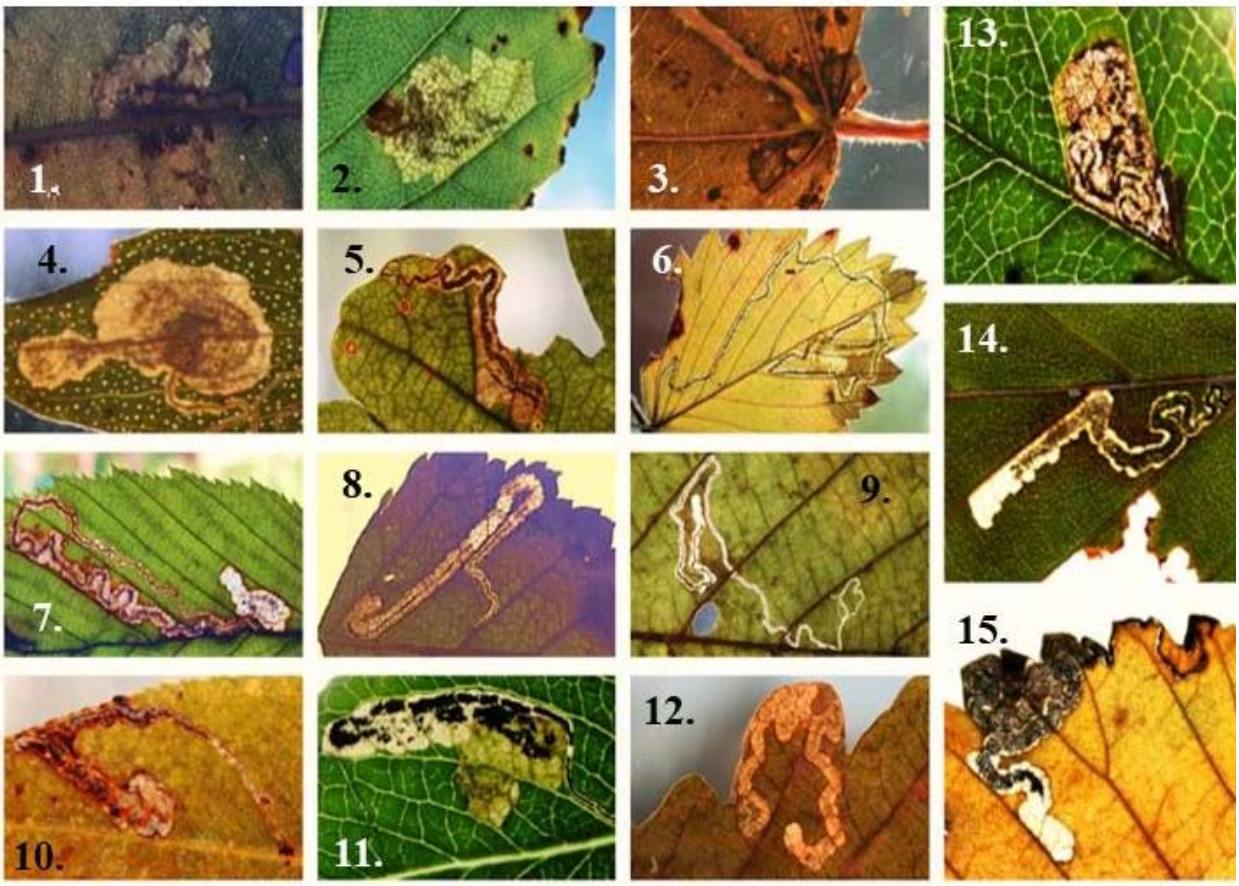
During the period of the research 60 of 78 species of Nepticulidae fauna of Lithuania were found in KLRP. The result of research revealed that most species belongs to the genus Stigmella (47 species) and the least – one species to each genus of Enteucha, Bohemannia and Etainia.

The largest number of pigmy moths species were found in Kaišiadorys district, Rumšiškės town (43 species) and least in Kaunas district, Karčiupis village (29 species).

From the results of the research of Nepticulidae at KLRP (Banytė, 2019), it became clear that pigmy moths of Kaunas Lagoon Regional Park are associated with 13 families of plants, mainly with the Rosaceae family (associated with 20 species of Nepticulidae).

According to their trophic specialization, the largest number of species (75% of fauna) are monophages. Among the host plants, woody plants (81%) predominate herbaceous plants (19% of mined flora).

During the period of investigation 15 new Nepticulidae species for Kaunas and Kaišiadorys districts and Kaunas city fauna were found: *Ectoedemia intimella, E. minimella, E. turbidella, Fomoria septembrella, Stigmella atricapitella, S. aurella, S. carpinella, S. confusella, S. glutinosae, S. nivenburgensis, S. obliquella, S. samiatella, S. sorbi, S. tityrella, S. viscerella*.



Figs. 1–15. Leaf mines. 1 – *Ectoedemia intimella* on *Salix fragilis*; 2 - *Ectoedemia minimella* on *Betula pendula*; 3 – *Ectoedemia turbidella* on *Populus alba*; 4 – *Fomoria septembrella* on *Hypericum perforatum*; 5 – *Stigmella atricapitella* on *Quercus robur*; 6 – *Stigmella aurella* on *Fragaria vesca*; 7 – *Stigmella carpinella* on *Carpinus betulus*; 8 – *Stigmella confusella* on *Betula pendula*; 9 – *Stigmella glutinosae – Alnus glutinosa*; 10 – *Stigmella nivenburgensis* on *Salix fragilis*; 11 – *Stigmella obliquella* on *Salix fragilis*; 12 – *Stigmella samiatella* on *Quercus robur*; 13 – *Stigmella sorbi* on *Sorbus aucuparia*; 14 – *Stigmella tityrella* on *Fagus sylvatica*; 15 – *Stigmella viscerella* on *Ulmus leavis*.

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Naujų Kauno marių regioniniam parkui mažųjų gaubtagalvių (Nepticulidae, Lepidoptera) rūšių sąrašas

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Santrauka

Straipsnyje aprašomi 2014–2016 ir 2018 metais aštuoniose Kauno marių regioninio parko vietovėse atliktų Nepticulidae šeimos drugių tyrimų rezultatai bei tyrimų metu aptiktų 15 rūšių, kurios yra naujos Kauno ir Kaišiadorių rajonų bei Kauno miesto Nepticulidae faunai taksonominis sąrašas.

Daugiausiai mažųjų gaubtagalvių rūšių aptikta Kaišiadorių rajone, Rumšiškių miestelyje (43 rūšys), o mažiausiai Kauno rajone, Karčiupio kaime (29 rūšys).

Kauno marių regioniniame parke minuojantys mažieji gaubtagalviai yra susiję su 13 iš 14 Lietuvoje jų minuojamų mitybinių augalų šeimų. Daugiausiai su erškėtinių (Rosaceae) šeimos augalais, kuriuos minuoja 20 Nepticulidae rūšių. Pagal savo mitybinę specializaciją daugiausiai rūšių (73 proc. faunos) yra monofagai. Tarp Nepticulidae minuojamų augalų Kauno marių regioniniame parke, kaip ir visoje Lietuvoje vyrauja sumedėję augalai, žoliniai augalai sudaro tik 19 proc. minuojamos floros.

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