

REVIEW OF NEPTICULIDAE (INSECTA: LEPIDOPTERA) OCCURRING IN THE CURONIAN SPIT (BALTIC COAST OF LITHUANIA)

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Abstract. In this paper, 24 species of Nepticulidae belonging to 14 species groups and seven genera are reported from the Curonian Spit (the Baltic Coast of Lithuania). The species occurring in the peninsula are associated with host-plants of 14 genera belonging to eight families. About half of these nepticulid species feed on plants of Betulaceae and Rosaceae families. As far as distribution ranges of nepticulid species are concerned, the species occurring in the Curonian Spit fall into nine chorological groups: one third of the species are with broad Palaearctic distributions (Trans-Palaearctic, Amphi-Palaearctic, Euro-Siberian or West-Palaearctic), another third have broad European distribution ranges (Euro-Caucasian, Euro-Submediterranean or Euro-Mediterranean), while the remaining species have restricted European ranges (Euro-Nemoral or predominantly Sub-Baltic distribution). The current article presents the taxonomic list of all currently known nepticulid species occurring in the Curonian Spit together with data on host-plants, detailed information on species distribution and photographs of leaf-mines. Illustrations of adults and male genitalia of a rare species occurring in sand dunes of the peninsula (*Stigmella zelleriella*) are provided.

Key words: Lepidoptera, Nepticulidae, Curonian Spit, Lithuania, fauna, chorological groups

INTRODUCTION

Nepticulidae (Lepidoptera: Nepticuloidea) are among the most peculiar insects: they are the smallest moths on the planet, phylogenetically representing very primitive heteroneurans. What is more, they have been in existence for at least 100 million years. On the other hand, they are highly specialized: larvae live inside plant tissues and are predominantly monophagous. Because of the concealed mining life-style of larvae, difficulty in imago rearing and very small size of adults, Nepticulidae are still poorly studied in many regions.

The Curonian Spit stretches from the Sambian Peninsula in the south to its northern tip separated from the mainland of Lithuania by a narrow strait. On the other side of the strait there is the port city of Klaipėda (Fig. 1). The northern 52 km long stretch of the Curonian Spit peninsula belongs to Lithuania, while the rest part is under the jurisdiction of the Kaliningrad Region, Russia.

The Curonian Spit is an outstanding example of a landscape of sand dunes that is under a constant threat from natural forces (wind and tide) (Fig. 2). The unique and very fragile nature of the peninsula requires protection and strong control of economic activities. Both the Russian and Lithuanian parts of the Spit are national parks. The Curonian Spit is also included into the UNESCO World Heritage List aiming to help protect and preserve the world's greatest landmarks. However, until now



Figure 1. Outline map of the Curonian Spit.

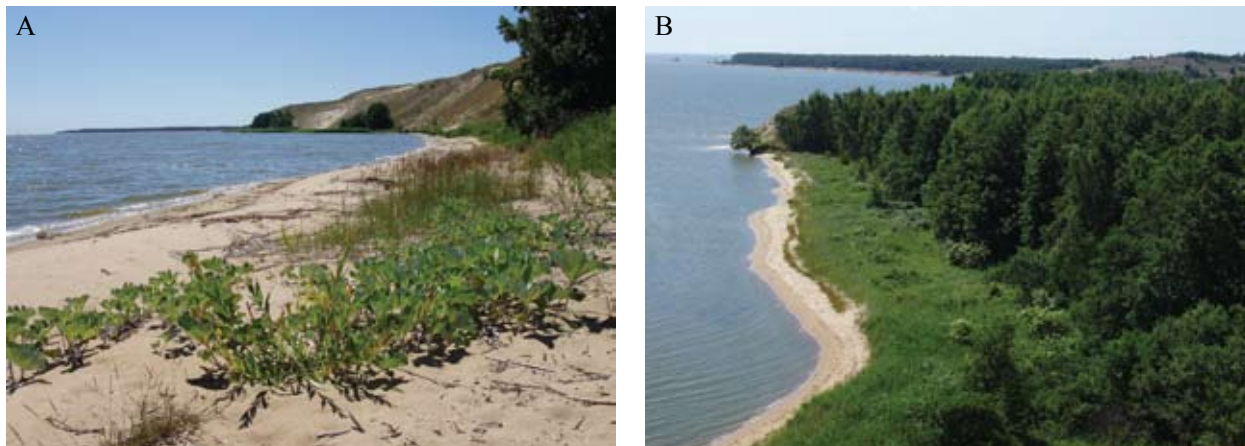


Figure 2. Habitats in the Curonian Spit: A – sand dunes; B – mixed forest.

there has been very little information on the biology and taxonomic diversity of Nepticulidae of the Curonian Spit.

The beginning of the purposeful study of Nepticulidae of the Curonian Spit dates back just to 1996, when A. Diškus started his field research in the peninsula. On the basis of reared nepticulid adults or collected leaf-mines, A. Diškus identified many species of the Curonian Spit fauna for the first time. The general review of the Lithuanian fauna by A. Diškus published later as a chapter in the monograph by Puplesis and Diškus (2003) included a total of 73 species of Nepticulidae of the Lithuanian fauna and all the available data on the geographical distribution of its species. Among the taxa listed in the review, 22 species were with the distribution that included the Curonian Spit. All other papers dealing with Lithuanian Nepticulidae (Puplesis 1994; Diškus & Juchnevič 2001; Navickaitė & Diškus 2008; Anisimov & Stonis 2008; Diškus & Lensbergaitė 2008), including the latest catalogue of Lithuanian Lepidoptera by Ivinskis (2004) provide no data about Nepticulidae of the Curonian Spit.

The first purposeful attempt to report on Nepticulidae of the Curonian Spit was a conference abstract (Navickaitė *et al.* 2010). However, this summary lacked a comprehensive list, taxonomic, trophical, chorological analyses and leaf-mine photographs. It should be noted that there are no published data on Nepticulidae of the Russian part of the Curonian Spit.

The recent fieldwork in the Curonian Spit (2010) has resulted in the discovery of two species that are new to the regional fauna (*Stigmella aceris* and *S. tityrella*). In addition, it confirmed the presence of 22 other nepticulid species, which were previously known as occurring on the peninsula. During our study, more information was collected about *Stigmella zelleriella*, which is very rare and mainly occurs on coastal dunes along the North Sea and the Baltic Sea.

MATERIAL AND METHODS

Nepticulid larvae were collected and reared. Mined leaves were placed in Petri dishes which were checked regularly for emerged adults. Rearing of adults was conducted under laboratory (indoors) conditions. A detailed description of the method is given in Puplesis and Diškus (2003). Genitalia were prepared following the methods described in Robinson (1976), Puplesis (1994) and Puplesis and Diškus (2003). After maceration of the abdomen in 10% KOH and subsequent cleaning, male genital capsules were mounted ventral side up. Genitalia were studied in glycerine using a stereoscopic microscope MBS-10 and a research microscope AU-12. Permanent slides were photographed using a Leica DM2500 microscope and a Leica DFC420 camera. Adults were photographed under a microscope Leica S6D with a camera DFC290. The collected material (leaf-mines and reared adults) is deposited in the collection of Biosystematics Research Group of Vilnius Pedagogical University (Vilnius, Lithuania).

RESULTS

A taxonomic list of nepticulid species occurring in the Curonian Spit

The taxonomic nomenclature of the presented species follows Puplesis 1994 and Puplesis & Diškus 2003. Distribution data are after Puplesis 1994; van Nieuwerkerken 1996; Puplesis & Diškus 2003; van Nieuwerkerken *et al.* 2004; Diškus & Juchnevič 2001; Navickaitė & Diškus 2008; Anisimov & Stonis 2008; Diškus & Lensbergaitė 2008, and original.

Stigmella lapponica (Wocke, 1862)

Larvae mine leaves of *Betula pendula* Roth, *B. pubes-*

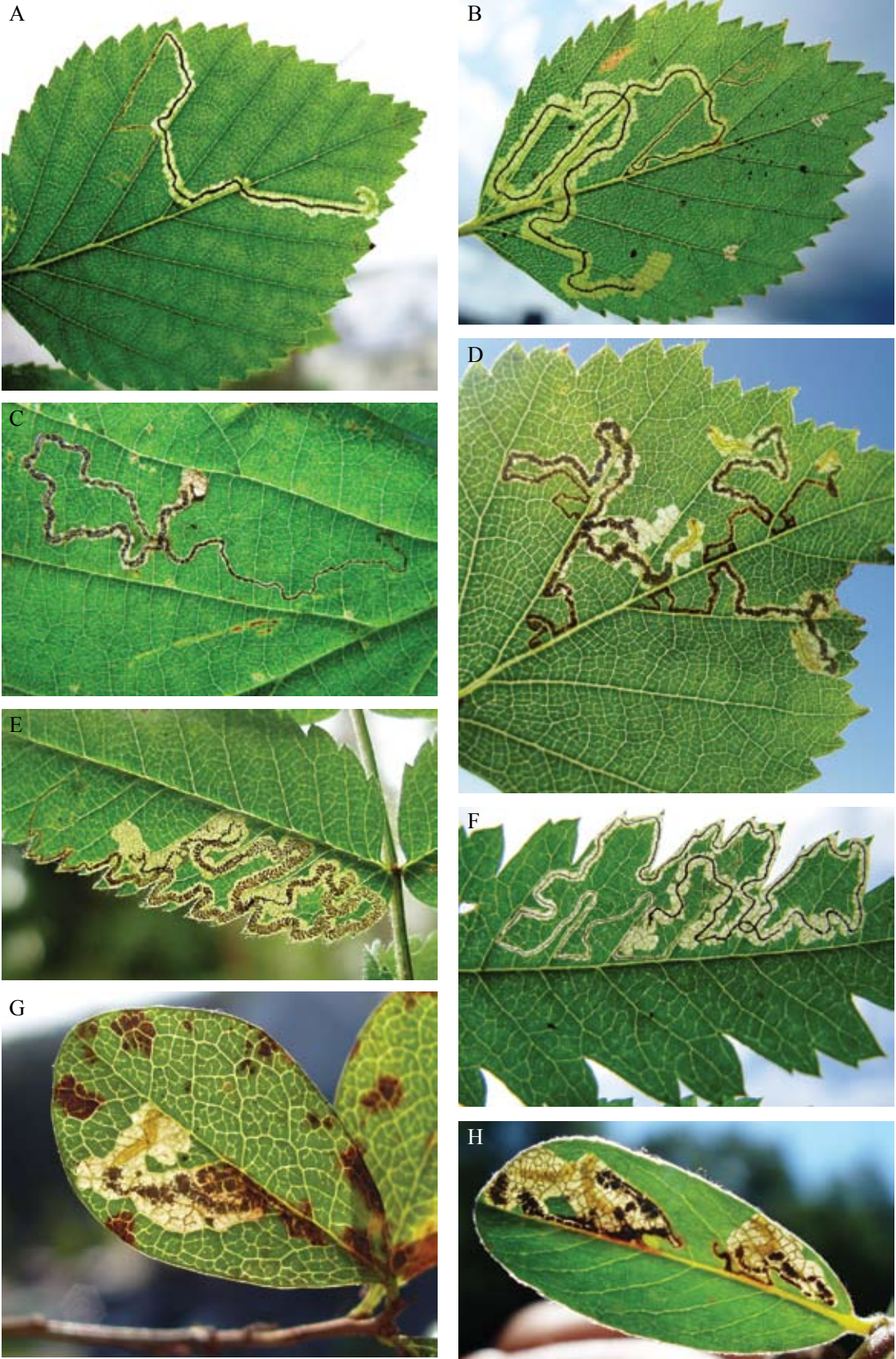


Figure 3. Leaf-mines of Nepticulidae: A – *Stigmella lapponica*; B – *S. confusella*; C – *S. microtheriella*; D – *S. betulicola*; E – *S. nylandriella*; F – *S. magdalenaë*; G – *S. myrtillella*; H – *S. zelleriella*.

cons Ehrh. (Fig. 3A). Occurs (but not common) in the Curonian Spit.

General distribution: Portugal, Italy, Switzerland, France, Great Britain, Ireland, Belgium, Luxembourg, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western, North-Western and Central European incl. Murmansk, Karelia, St. Petersburg, the Ulyanovsk Region and, possibly, all over the country), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Slovenia, Croatia; its occurrence is also expected in Siberia (Russia: the Irkutsk Territory).

Stigmella confusella (Wood & Walsingham, 1894)

Larvae mine leaves of *Betula pubescens* Ehrh. (Fig. 3B). Very common in the Curonian Spit.

General distribution: Switzerland, France, Great Britain, Ireland, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western, North-Western, incl. Karelia, Central Europe), Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Bulgaria, Slovenia; it is also expected to occur in Siberia (Russia: the Chita Region), however, no reliable data are available.

Stigmella microtheriella (Stainton, 1854)

Larvae mine leaves of *Carpinus betulus* L. (Fig. 3C). Very common in the Curonian Spit.

General distribution: Spain, Italy (incl. Sardinia), Switzerland, France (incl. Corsica), Great Britain, Ireland, Belgium, Luxembourg, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Central European, incl. the Ulyanovsk and Samara Regions), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Bulgaria, Slovenia, Croatia, Greece.

Stigmella betulicola (Stainton, 1856)

Larvae mine leaves of *Betula pendula* Roth, *B. pubescens* Ehrh. (Fig. 3D). Common in the Curonian Spit.

General distribution: Italy, Switzerland, France, Great Britain, Ireland, Belgium, Luxembourg, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western and North-Western, incl. Murmansk, Karelia and St. Petersburg, and Central European, incl. the Ulyanovsk, Samara Regions and Tatarstan), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Slovenia, Croatia; the species also occurs in East Asia: China and Japan (Honshu).

Stigmella alnetella (Stainton, 1856)

Larvae mine leaves of *Alnus glutinosa* (L.) Gaertn. (Fig. 4C). Very rare in the Curonian Spit.

General distribution: Portugal, Spain, Italy (incl. Sar-

dinia and Sicily), Switzerland, France (incl. Corsica), Great Britain, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Lithuania, Russia (Western: the Kaliningrad Region), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Slovenia, Croatia.

Stigmella glutinosae (Stainton, 1858)

Larvae mine leaves of *Alnus glutinosa* (L.) Gaertn. (Fig. 4D). Rare in the Curonian Spit.

General distribution: Portugal, Italy (incl. Sardinia, Sicily), Switzerland, France (incl. Corsica), Great Britain, Ireland, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western: the Kaliningrad Region and Central European: the Ulyanovsk Region), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Slovenia, Croatia.

Stigmella aceris (Frey, 1857)

Larvae mine leaves of *Acer platanoides* L. (Fig. 4E). With very restricted distribution in the Curonian Spit.

General distribution: Italy, Switzerland, France (incl. Corsica), Great Britain, Belgium, Germany, Denmark, Sweden, Norway, Estonia, Lithuania, Russia (Western, Southern European and Central European, incl. the Ulyanovsk Region), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Bulgaria, Slovenia, Croatia, Greece; it also occurs in Asia Minor, and probably in the western part of the Caucasus.

Stigmella nylandriella (Tengström, 1848)

Larvae mine leaves of *Sorbus aucuparia* L. (Fig. 3E). Occurs (but not common) in the Curonian Spit.

General distribution: Italy, Switzerland, France (incl. Corsica), Great Britain, Ireland, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western, North-Western, incl. Murmansk, Karelia and St. Petersburg, and Central European Russia, incl. the Bryansk, Voronezh and Ulyanovsk Regions), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Bulgaria, Slovenia, Croatia.

Stigmella magdaleneae (Klimesch, 1950)

Larvae mine leaves of *Sorbus aucuparia* L. (Fig. 3F). Very common in the Curonian Spit.

General distribution: Italy, Switzerland, France, Great Britain, Ireland, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western, North-Western, incl. St. Petersburg, and Central European, incl. the Ulyanovsk Region), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Bulgaria, Slovenia.

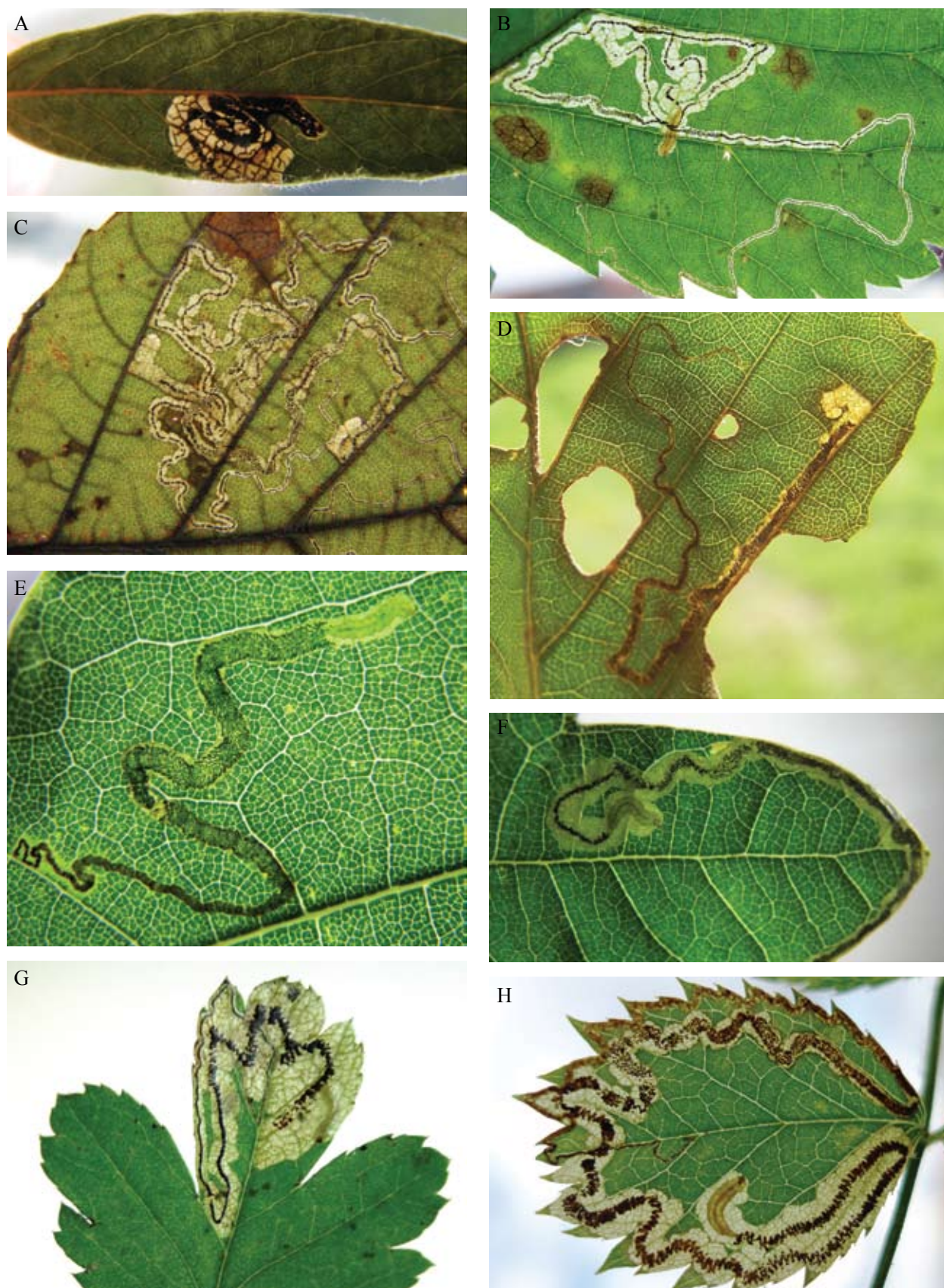


Figure 4. Leaf-mines of Nepticulidae: A – *Stigmella benanderella*; B – *S. splendidissimella*; C – *S. alnetella*; D – *S. glutinosae*; E – *S. aceris*; F – *S. ruficapitella*; G – *S. hybnerella*; H – *S. anomalella*.

Stigmella hybnerella (Hübner, 1796)

Larvae mine leaves of *Crataegus monogyna* Jacq. (Fig. 4G). Common in the Curonian Spit.

General distribution: Portugal, Spain, Italy (incl. Sicily), Switzerland, France (incl. Corsica), Great Britain, Ireland, Belgium, the Netherlands, Germany, Denmark, Sweden, Finland, Estonia, Latvia, Lithuania, Russia (Central European: the Ulyanovsk Region), the Ukraine (incl. the Crimea), Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Slovenia, Croatia, Greece; it also occurs in the Caucasus (Azerbaijan) and Central Asia (Turkmenistan: Kopet Dag).

Stigmella anomalella (Göze, 1783)

Larvae mine leaves of *Rosa canina* L. (Fig. 4H). Common in the Curonian Spit.

General distribution: Portugal, Spain (incl. the Canary Islands), Italy, Switzerland, France (incl. Corsica), Great Britain, Ireland, Luxembourg, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (North-Western European: St. Petersburg), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Bulgaria, Slovenia, Croatia; it also occurs in Central Asia (Kazakhstan) and Eastern Asia (Russian Far East: Primorskiy Krai).

Stigmella assimilella (Zeller, 1848)

Larvae mine leaves of *Populus tremula* L. (Fig. 5A). Very rare in the Curonian Spit.

General distribution: Spain, Italy, Switzerland, France, Great Britain, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western and Central European), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Bulgaria, Slovenia, Croatia; it also occurs in the southern part of the Ural Region and the Russian Far East: Primorskiy Krai).

Stigmella salicis (Stainton, 1854)

Larvae mine leaves of *Salix daphnoides* Vill., *S. rosmarinifolia* L. and other species of *Salix* (Fig. 5C). Very common in the Curonian Spit.

General distribution: Portugal, Spain, Italy (incl. Sardinia, Sicily), Switzerland, France (incl. Corsica), Great Britain, Ireland, Belgium, Luxembourg, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Russia (Western, North-Western, incl. Murmansk and Karelia, and Central European, incl. the Samara and Ulyanovsk Regions), the Ukraine (incl. the Crimea), Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Bulgaria, Slovenia, Croatia; it also occurs in Asia: the Caucasus and Japan (Honshu and Kyushu).

Stigmella myrtillella (Stainton, 1857)

Larvae mine leaves of *Vaccinium myrtillella* L., *V. uliginosum* L. (Fig. 3G). Rare in the Curonian Spit.

General distribution: Italy, Switzerland, France, Great Britain, Ireland, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western: the Kaliningrad Region, and North-Western: Murmansk), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Bulgaria, Slovenia.

Stigmella zelleriella (Snellen, 1875)

Larvae mine leaves of *Salix repens* L. (Fig. 3H). Rare and with very restricted distribution in the Curonian Spit.

General distribution: Great Britain, Ireland, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Lithuania, Russia (Western: the Kaliningrad Region, North-Western: Murmansk and St. Petersburg, and Central European: the Ulyanovsk Region), Poland, the Czech Rep.

Stigmella benanderella (Wolff, 1955)

Larvae mine leaves of *Salix rosmarinifolia* L. (Fig. 4A). Rare and with very restricted distribution in the Curonian Spit.

General distribution: Denmark, Sweden, Norway, Finland, Latvia, Lithuania, Russia (Western: the Kaliningrad Region), Slovakia, Hungary.

Stigmella tityrella (Stainton, 1854)

Larvae mine leaves of *Fagus sylvatica* L. (Fig. 5E). Very rare in the Curonian Spit.

General distribution: Spain, Italy, Switzerland, France, Great Britain, Ireland, Belgium, Luxembourg, the Netherlands, Germany, Denmark, Sweden, Norway, Lithuania, Russia (Western: the Kaliningrad Region), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Bulgaria, Slovenia, Greece; it also occurs in the western part of the Caucasus.

Stigmella carpinella (Heinemann, 1862)

Larvae mine leaves of *Carpinus betulus* L. (Fig. 5D). Common in the Curonian Spit.

General distribution: Italy, Switzerland, France, Great Britain, Belgium, the Netherlands, Germany, Denmark, Sweden, Lithuania, Russia (Southern European), the Ukraine, Poland, Slovakia, Czech Rep., Austria, Hungary, Romania, Slovenia, Croatia, Greece; it also occurs in the western part of the Caucasus.

Stigmella splendidissimella (Herrich-Schäffer, 1855)

Larvae mine leaves of *Rubus idaeus* L. (Fig. 4B). Occurs (but not common) in the Curonian Spit.

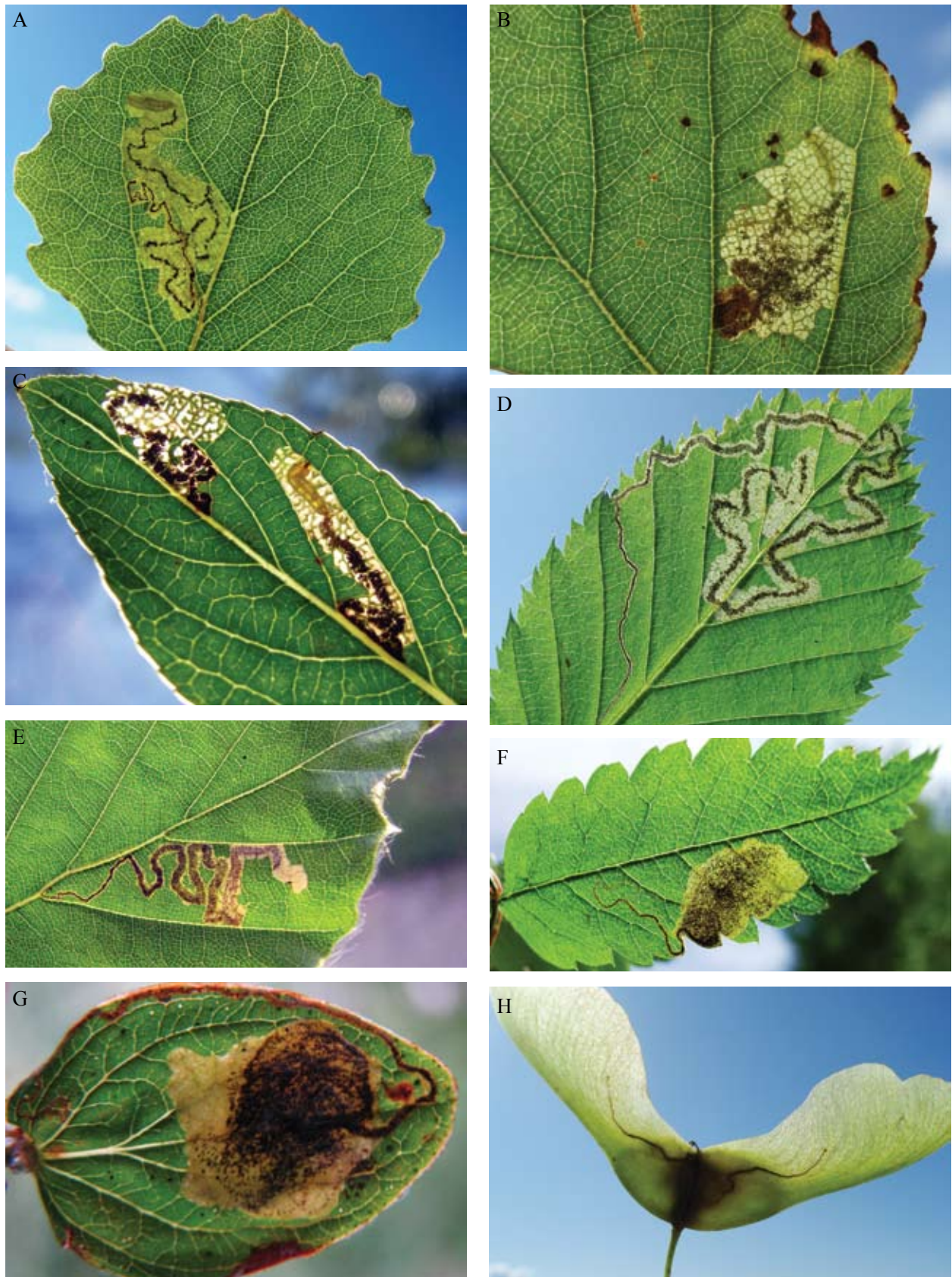


Figure 5. Leaf-mines and samara-mines of Nepticulidae: A – *Stigmella assimilella*; B – *Ectoedemia minimella*; C – *Stigmella salicis*; D – *S. carpinella*; E – *S. tityrella*; F – *S. sorbi*; G – *Fomoria septembrella*; H – *Etainia sericopeza*.

General distribution: Italy, Switzerland, France, Great Britain, Ireland, Luxembourg, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western: the Kaliningrad Region, and North-Western European), the Ukraine (incl. the Crimea), Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Bulgaria, Slovenia, Croatia.

Stigmella sorbi (Stainton, 1861)

Larvae mine leaves of *Sorbus aucuparia* L. (Fig. 5F). Common in the Curonian Spit.

General distribution: Spain, Italy, Switzerland, France, Great Britain, Ireland, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western, North-Western, incl. Murmansk, Karelia, St. Petersburg, and Central European, incl. the Kaluga Region and Tatarstan), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Romania, Bulgaria, Slovenia, Greece; it also occurs in Siberia (Eastern Russia: Chita).

Stigmella ruficapitella (Haworth, 1828)

Larvae mine leaves of *Quercus robur* L. (Fig. 4F). Common in the Curonian Spit.

General distribution: Portugal, Spain, Italy, Switzerland, France (incl. Corsica), Great Britain, Ireland, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western: the Kaliningrad Region, North-Western and Central European), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Slovenia, Bosnia and Herzegovina, Greece.

Ectoedemia minimella (Zetterstedt, 1839)

Larvae mine leaves of *Betula pubescens* Ehrh. (Fig. 5B). Very rare in the Curonian Spit.

General distribution: Italy, Switzerland, France, Great Britain, Ireland, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western: the Kaliningrad Region), Poland, the Czech Rep., Austria.

Fomoria septembrella (Stainton, 1849)

Larvae mine leaves of *Hypericum perforatum* L. (Fig. 5G). Common in the Curonian Spit.

General distribution: Portugal, Spain, Italy (incl. Sardinia), Switzerland, France (incl. Corsica), Great Britain, Ireland, Belgium, Luxembourg, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Lithuania, Russia (Western: the Kaliningrad Region), Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Slovenia, Croatia, Greece; it also

occurs in the Caucasus (Georgia, Azerbaijan) and Central Asia (Turkmenistan: Kopet Dag).

Etainia sericopeza (Zeller, 1839)

Larvae mine buds and samaras (never leaves) of *Acer platanoides* L. (Fig. 5H). Common in the Curonian Spit.

General distribution: Italy, Switzerland, France, Great Britain, Belgium, the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Latvia, Lithuania, Russia (North-Western, incl. St. Petersburg, and Central European, incl. the Kaluga and Ulyanovsk Regions), the Ukraine, Poland, Slovakia, the Czech Rep., Austria, Hungary, Romania, Slovenia, Croatia.

DISCUSSION

Taxonomic analysis. New data provided in this publication have increased the number of species known for the fauna of Nepticulidae of the Curonian Spit. In total, 24 species are currently known for the fauna of the peninsula, which account for about 1/3 (32%) of nepticulid species recorded in the whole territory of Lithuania. The species occurring in the Curonian Spit belong to seven genera (*Stigmella* very strongly predominates: Fig. 6), and fall into 14 species groups (Fig. 7). Among *Stigmella*, *betulicola* and *salicis* groups are predominant (each group comprises four nepticulid species).

Trophic analysis. The species occurring in the Curonian Spit are associated with host-plants representing 14 genera (Fig. 8) belonging to 8 families: Fagaceae, Betulaceae, Corylaceae, Hypericaceae, Salicaceae, Rosaceae, Ericaceae and Aceraceae (Fig. 9). Half of the nepticulid species occurring in the Curonian Spit (12, or 50%) feed on plants of Betulaceae and Rosaceae. All recorded species are leaf-miners, except *Etainia sericopeza*, which mines samaras (fruit) of maple.

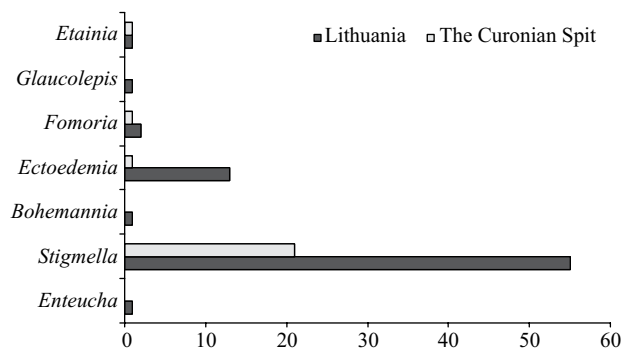


Figure 6. The taxonomic composition and number of recorded species per genus in the nepticulid fauna of the Curonian Spit and Lithuania.

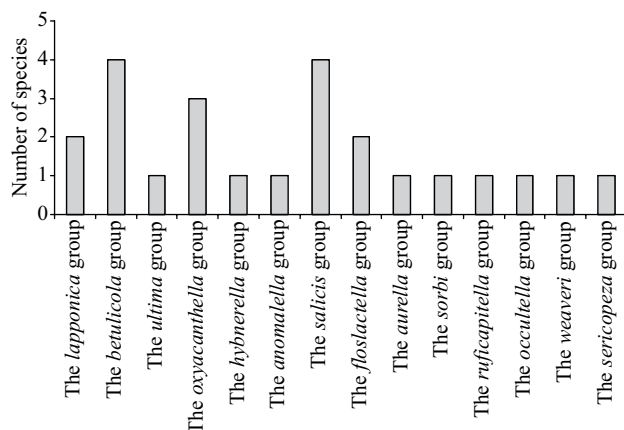


Figure 7. The number of species per species-group in the nepticulid fauna of the Curonian Spit.

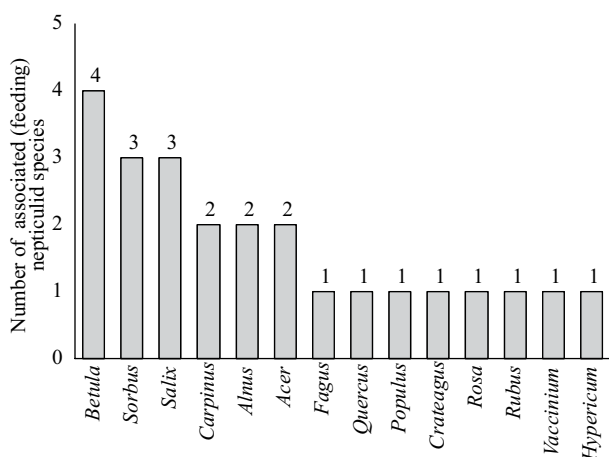


Figure 8. The number of species of the nepticulid fauna of the Curonian Spit associated with host-plant genera.

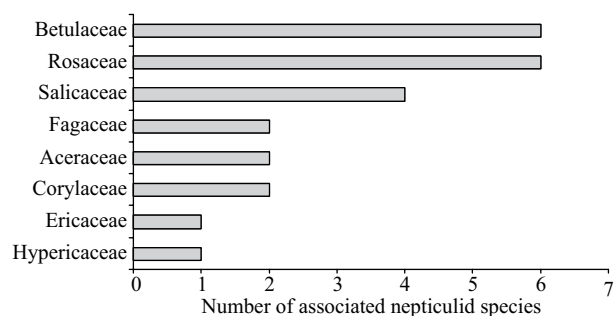


Figure 9. Predominance of Betulaceae and Rosaceae host-plants of the nepticulid fauna of the Curonian Spit.

Chorologic analysis. According to geographical distribution, the species occurring in the Curonian Spit fall into nine chorologic groups (Fig. 10). One third of the species have broad Palaearctic distributions (Trans-Palaearctic – 13%, Amphi-Palaearctic – 4%, Euro-Siberian and West-Palaearctic – 8% each). Another third of the species are characterized by broad European distribution

(Euro-Caucasian – 8%, Euro-Submediterranean and Euro-Mediterranean – 13% each). The remaining species are with restricted European distribution. About 25% of the species have Euro-Nemoral distribution, and two species (8%) may be treated as belonging to a very restricted, Sub-Baltic chorologic group: *Stigmella benanderella* and *S. zelleriella*.

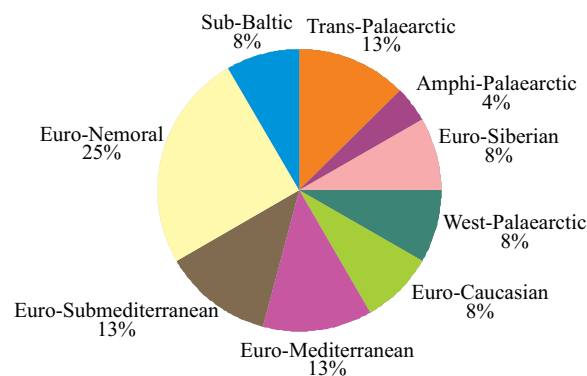


Figure 10. Chorologic composition (i.e. species groups by geographical distribution ranges) of the nepticulid fauna of the Curonian Spit.



Figure 11. Adults of *Stigmella zelleriella*, Preila, 6 km N of Nida, the Curonian Spit, 2010: A – female; B – male.

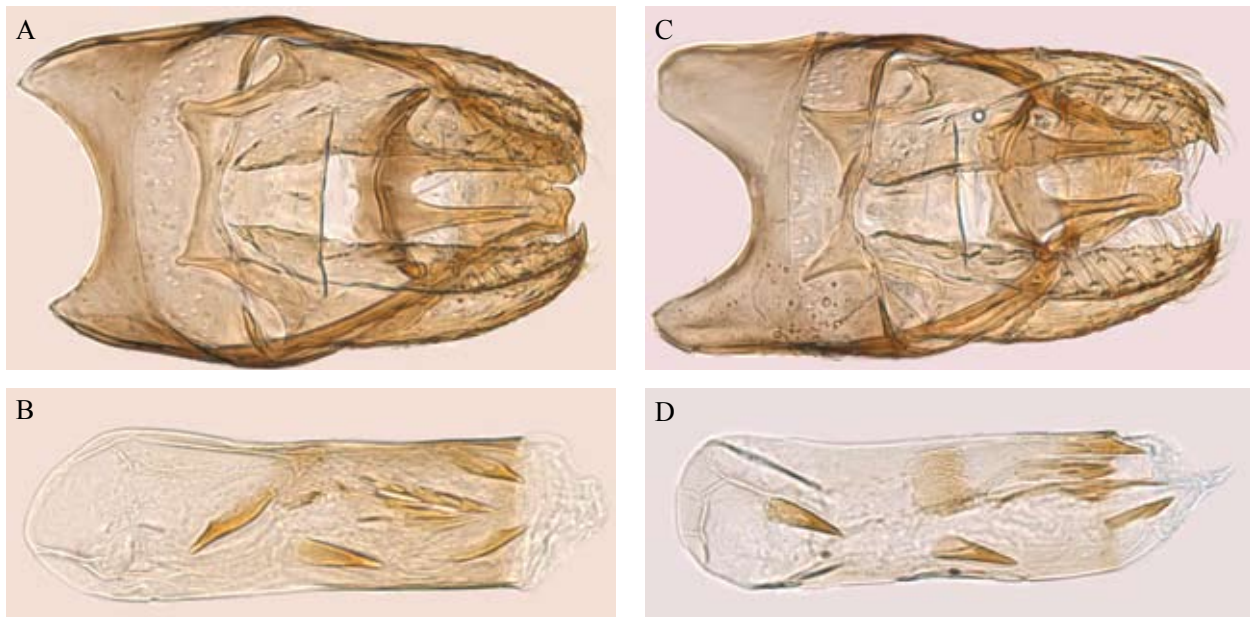


Figure 12. Male genitalia of *Stigmella zelleriella*, Preila, 6 km N of Nida, the Curonian Spit, 2010: A – capsule, slide No AN 219; B – the same, aedeagus; C – capsule, slide No AN 220; D – the same, aedeagus.

The latter species, *S. zelleriella* (Figs 3H, 11, 12), has been known from the Curonian Spit since 1994 from a single male specimen, collected by P. Ivinskis in 1975, and dissected/identified by J. R. Stonis (formerly R. Puplesis) (Puplesis 1994). The occurrence of this species in the peninsula (Puplesis & Diškus 2003) was later confirmed during A. Diškus' fieldwork in the Curonian Spit (2002). During our recent fieldwork in 2010, *S. zelleriella* was re-discovered only in a few very restricted localities of coastal dunes near Pervalka, 17 km N of Nida, and Preila, 6 km N of Nida (both along the Curonian Lagoon, not on the Baltic Sea coast). In the Curonian Spit *Salix repens* L. is the only host-plant. However, in mountain tundra of North Europe the species is also associated with *Salix arenaria* L. and *S. lapponum* L. The most amazing record of *S. zelleriella*, which has been considered to be a Sub-Baltic species, is its recent discovery in Central European Russia, the Ulyanovsk Region (far away from any previously known localities). There it was found in a river-valley forest in a steppe area, probably associated with *Salix trianda* L. (van Nieukerken *et al.* 2004). The most widespread and abundant nepticulid species in the Curonian Spit are *Stigmella confusella*, *S. microtheriella*, *S. magdalenae* and *S. salicis* (the first three species are with European distribution ranges, the last one – with Trans-Palaearctic distribution). All of them are also common across the mainland of Lithuania. Nepticulid species that are rare in the Curonian Spit (*Stigmella glutinosae*, *S. alnetella*, *S. assimilella*, *S. zelleriella*, *S. benanderella*, *S. tityrella* and *Ectoedemia minimella*) are also rare in continental Lithuania with the exception

of *S. glutinosae* (quite common in continental Lithuania) and *S. zelleriella* or *S. benanderella* (totally absent from the mainland of the country).

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- KURŠIŲ NERIJOJE APTINKAMŲ MAŽŪJŲ GAUBTAGALVIŲ (INSECTA, LEPIDOPTERA: NEPTICULIDAE) TAKSONOMINĖ APŽVALGA**
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- Straipsnyje publikuojami duomenys apie 24 mažųjų gaubtagalvių (Nepticulidae) rūšis, aptinkamas Kuršių nerijoje, kurios priklauso 14 rūšių grupių ir 7 gentims. Kuršių nerijoje aptinkamos gaubtagalvių rūšys trofiškai yra susijusios su 14 mitybinių augalų genčių, priklausančių 8 šeimoms. Apie pusę visų Nepticulidae rūšių minuoja Betulaceae ir Rosaceae augalų lapus. Chorologinė analizė parodė, kad Kuršių nerijoje aptinkamos rūšys gali būti suskirstytos į 9 chorologines grupes. Maždaug trečdaliui visų nerijoje aptiktų rūšių būdingi platūs arealai Palearktės biogeografiniame regione (srityje); visos kitos rūšys yra įvairiai paplitusios vien Europoje. Tik dviem rūšims (*Stigmella benanderella* ir *S. zelleriella*) yra būdingas geografiškai itin ribotas, pusiau Baltijinis, arealas. Straipsnyje pirmą kartą pateikiamas visų šiuo metu žinomų Kuršių nerijos Nepticulidae taksonominis rūšių sąrašas, nurodyti duomenys apie kiekvienos rūšies mitybinius augalus ir geografinį paplitimą. Nuotraukose pavaizduojami visų nagrinėjamų rūšių gyvybinės veiklos pėdsakai – minos, ir itin retos, tik kopose aptinkamos rūšies (*Stigmella zelleriella*) suaugėliai bei patino genitalinės struktūros.
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