Zootaxa 3847 (2): 151–202
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3847.2.1
http://zoobank.org/urn:lsid:zoobank.org:pub:F85B24DA-AA58-4155-9240-D30F72BA1B6C

An updated checklist of Nepticulidae (Lepidoptera) of the Crimea, Sub-Mediterranean SE Europe

ASTA NAVICKAITĖ[1], ARŪNAS DIŠKUS[1] & JONAS R. STONIS[1, 2,3]

[1]*Institute for Scientific Research and Department of Biology, Faculty of Science and Technology, Lithuanian University of Educational Sciences, Studentu St. 39, Vilnius LT-08106, Lithuania*
[2]*Institute of Public Administration, Mykolas Romeris University, Valakupių St. 5, Vilnius LT-10101, Lithuania*
[3]*Corresponding author. E-mail: stonis@leu.lt*

Abstract

This updated checklist is intended to be a collaborative effort by a team of taxonomists to present a hitherto little known diversity of the Nepticulidae of the Crimea. A total of 64 species of Nepticulidae are listed. The following 26 species are recorded for the first time from the Crimea: *Stigmella confusella* (Wood & Walsingham, 1894), *S. tiliae* (Frey, 1856), *S. microtheriella* (Stainton, 1854), *S. alnetella* (Stainton, 1854), *S. glutinosae* (Stainton, 1858), *S. desperatella* (Frey, 1856), *S. torminalis* (Wood, 1890), *S. crataegella* (Klimesch, 1936), *S. hahniella* (Wörz, 1937), *S. catharticella* (Stainton, 1853), *S. malella* (Stainton, 1854), *S. rhamnella* (Herrich-Schäffter, 1860), *S. ulmivora* (Fologne, 1860), *S. trimaculella* (Haworth, 1828), *S. obliquella* (Heinemann, 1862), *S. tityrella* (Stainton, 1854), *S. carpinella* (Heinemann, 1862), *S. lemniscella* (Zeller, 1839), *S. plagicolella* (Stainton, 1854), *S. samiatella* (Zeller, 1939), *Bohemannia pulverosella* (Stainton, 1849), *Ectoedemia mahalebella* (Klimesch, 1936), *Fomoria septembrella* (Stainton, 1849), *Trifurcula silviae* van Nieukerken, 1990, *T. macedonica* Z. Laštůvka & A. Laštůvka, 1998, *T. eurema* (Tutt, 1899). One species, *Ectoedemia spinosella* (Joannis, 1908), is excluded here from the list of the Nepticulidae of the Crimea. Thirty-nine selected species are illustrated with photographs of the leaf-mines, and forty-five species with photographs of genitalia.

Key words: Nepticulidae, checklist, chorological groups, leaf-mines, Crimea, Sub-Mediterranean

Introduction

Nepticulidae is a family comprising the smallest known Lepidoptera, with plant-mining (predominantly leaf-mining, also bark, stem or fruit-mining) oligophagous or monophagous larvae (Puplesis & Diškus 2003). The world fauna of Nepticulidae comprises about 850 species, however the diversity of these moths is still poorly studied in many regions (Diškus & Puplesis 2003, Diškus 2014, Stonis 2014).

The mountainous Crimea (particularly the southern coast, figs 1–5) represents one of the world's greatest landmarks and a biodiversity hot-spot in South East Europe, including about 1700 species of moths and butterflies (Budashkin 2004). Some descriptions of the unique Crimean biota can be found in Kunijovy & Zharsky (2001) and Zibtsev & Borsuk (2013). The geographical position close to the Mediterranean (Figs 6, 7) and the partial isolation make the Crimean biota highly interesting for studies. The first surveys on the Nepticulidae of the Crimea were published by Puplesis (1994), Budashkin (1998, 2004), Stonis & Remeikis (2011), and by Stonis *et al*. (2013). In the later paper, the provisional checklist of the Crimean Nepticulidae included 39 species but it was mostly based on old collection material of 1977–1988 (almost all specimens were collected at light trap, very few were reared). In the same paper, the following three species were excluded from the list of the Crimean Nepticulidae: *Stigmella szoecsiella* (Borkowski, 1972), *Ectoedemia albifasciella* (Heinemann, 1871) and *E. pubescivora* (Weber, 1938) (see Stonis *et al.* 2013).

Recent field work, undertaken in June–August 2011 and August 2012 by the authors with the assistance of Simon R. Hill (London) and Giedrius Varačinskas (Vilnius), has resulted in the first reared material confirming many species known previously and revealing 26 species new to the fauna of the peninsula. The nepticulid species newly found during the recent field work comprise 40% of all species treated in the present updated checklist.

Accepted by J.-F. Landry: 3 Jul. 2014; published: 7 Aug. 2014

Acknowledgements

We are indebted to Alla Leontjevna Morozova (Director of the Karadag Biological Research Station and Karadag Nature Reserve) for generous support and for providing research permits for our fieldwork in Karadag Nature Reserve. For previous collaboration on the genitalia preparations we thank Andrius Remeikis (Nature Research Centre, Vilnius) and Agnė Rocienė (Lithuanian University of Educational Sciences). For the loan of material and for valuable information, we thank Yu. I. Budashkin (Karadag Biological Research Station) and S. Yu. Sinev (Zoological Institute, Russian Academy of Sciences, St. Petersburg). We are grateful to Jean-François Landry (Agriculture & Agri-Food Canada, Ottawa) and anonymous referees for their corrections and suggestions.

References

Budashkin, Yu.I. (1988) Insects: Lepidoptera (Insecta: Lepidoptera) *In: Karadag Nature Reserve of the Academy of Sciences of Ukraine*. *Chronicles of Nature*, 5, 64–69. [in Russian, Academy of Sciences of Ukraine, A. O. Kovalevsky Institute of Biology of the Southern Seas, Karadag Affiliate, Simferopol]

Budashkin, Yu.I. (2004) Results of the twenty year survey of the Lepidoptera fauna in the Karadag Nature Reserve. *In*: Morozova, A.L. & Gnyubkin, V.F. (Eds.), *Karadag. History-Geology-Botanic-Zoology. The scientific works dedicated to 90-th an niversary of T. V. Vyasemsky Karadag scientific station and 25-th anniversary of Karadag Nature Reserve*. Sonat, Simferopol, pp. 323–366. [in Russian]

Dios de, R.S., Benito-Garzón, M. & Sainz-Ollero, H. (2009) Present and future extension of the Iberian submediterranean territories as determined from the distribution of marcescent oaks. *Plant Ecology*, 204 (2), 189–205. http://dx.doi.org/10.1007/s11258-009-9584-5

Diškus, A. (2014) Small insects, global issues. *Taxonomy for understanding biodiversity*. Available from: http://www.biotaxa.info/index.php (accessed 25 January 2014)

Diškus, A. & Puplesis, R. (2003) Catalogue of the world Nepticuloidea & Tischerioidea. *In:* Puplesis, R. & Diškus, A. (Eds.), *The Nepticuloidea & Tischerioidea (Lepidoptera) – a global review, with strategic regional revisions*. Lututė Publishers, Kaunas, pp. 318–436.

Diškus, A. & Stonis, J.R. (2012) *Leaf-mining insects of Lithuania. The Nepticulidae (Lepidoptera): taxonomy, chorological composition and trophic relationships*. Monograph. Lututė Publishers, Kaunas, 220 pp. [in Lithuanian]

Gerasimov, A.M. (1952) Gusenitsy. Nasekomye cheshuekrylye [Caterpillars. Insecta Lepidoptera]. *Fauna SSSR* [*Fauna of the USSR*], 1 (2), 1–338. [in Russian, Moskva, Leningrad]

Johansson, R., Nielsen, E.S., Nieukerken, E.J. van & Gustafsson, B. (1990) The Nepticulidae and Opostegidae (Lepidoptera) of north west Europe. *Fauna Entomologica Scandinavica*, 23 (1/2), 1–739.

Kubijovyč, V. & Zharsky, E. (2001) Crimean Mountains. *Internet Encyclopedia of Ukraine*. Canadian Institute of Ukrainian Studies, Edmonton, AB, Canada. Available from: http://www.encyclopediaofukraine.com/display.asp?linkpath=pages%5CC%5CR%5CCrimeanMountains.htm (accessed 25 January 2014)

Laštůvka, Z. & Laštůvka, A. (1998) Beitrag zur Kenntnis der Nepticulidenfauna Griechenlands (Lepidoptera, Nepticulidae). *Stapfia*, 55, 313–326.

Laštůvka, A. & Laštůvka, Z. (2009) Morphology, biology and distribution of *Stigmella irregularis* Puplesis (Lepidoptera: Nepticulidae). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 57 (5), 193–196.

Laštůvka, Z., Laštůvka, A. & van Nieukerken, E.J. van. (2013) The *Bupleurum* (Apiaceae) feeding species of *Trifurcula* (*Glaucolepis*): new species, biology and distribution (Lepidoptera: Nepticulidae). *Tijdschrift voor Entomologie*, 156, 191–210. http://dx.doi.org/10.1163/22119434-00002028

Navickaitė, A., Diškus, A., Stonis, J.R. & Dobrynina, V. (2011) Taxonomic catalogue of the world Nepticuloidea and Tischerioidea (Lepidoptera) described by members of the Biosystematics Research Group (Lithuania) up to 2009. *Acta Zoologica Lituanica*, 21 (2), 113–132. http://dx.doi.org/10.2478/v10043-011-0014-2

Nieukerken, E.J. van. (1985) A taxonomic revision of the Western Palaearctic species of the subgenera *Zimmermannia* Hering and *Ectoedemia* Busck s. str. (Lepidoptera, Nepticulidae), with notes on their phylogeny. *Tijdschrift voor Entomologie*, 128 (1), 1–164.

Nieukerken, E.J. van (1990) *Stigmella rolandi* sp. n.: a widespread southern European species on *Rosa* (Lepidoptera: Nepticulidae). *Tijdschrift voor Entomologie*, 133 (2), 239–243.

Nieukerken, E.J. van (2007) *Acalyptris* Meyrick: revision of the *platani* and *staticis* groups in Europe and the Mediterranean (Lepidoptera: Nepticulidae). *Zootaxa*, 1436, 1–48.

Nieukerken, E.J. van & Johansson, R. (2003) The *Quercus* feeding *Stigmella* species of the West Palaearctic: new species, key and distribution (Lepidoptera: Nepticulidae). *Tijdschrift voor Entomologie*, 146, 307–370. http://dx.doi.org/10.1163/22119434-900000129

Nieukerken, E.J. van, Zolotuhin, V.V. & Mistchenko, A. (2004) Nepticulidae from the Volga and Ural region. *Nota lepidopterologica*, 27 (2/3), 125–127.

Nieukerken, E.J., Laštůvka, A. & Laštůvka, Z. (2010) Western Palaearctic *Ectoedemia* (*Zimmermannia*) Hering and *Ectoedemia* Busck s. str. (Lepidoptera, Nepticulidae): five new species and new data on distribution, hostplants and recognition. *ZooKeys*, 32, 1–82.
http://dx.doi.org/10.3897/zookeys.32.282.app.1.ds

Puplesis, R. (1991) The *Stigmella paradoxa* species-group (Lepidoptera: Nepticulidae) in the USSR. *Entomologica Scandinavica*, 22 (1), 123–127.
http://dx.doi.org/10.1163/187631291x00345

Puplesis, R. (1994) *The Nepticulidae of Eastern Europe and Asia: western, central and eastern parts*. Backhuys Publishers, Leiden, 291 pp. + figs. 840.

Puplesis, R. (2002) *Biodiversity: an introduction to global animal and plant diversity* (in Lithuanian). Lututė Publishers, Kaunas, 152 pp.

Puplesis, R. & Diškus, A. (2003) *The Nepticuloidea & Tischerioidea (Lepidoptera) – a global review, with strategic regional revisions*. Lututė Publishers, Kaunas, 512 pp., figs. 612.

Puplesis, R. & Robinson, G.S. (2000) A review of the Central and South American Nepticulidae (Lepidoptera) with special reference to Belize. *Bulletin of the Natural History Museum, London* (Entomology), 69 (1), 3–114.

Rueda, M., Rodríguez, M.Á. & Hawkins, B.A. (2010) Towards a biogeographic regionalization of the European biota. *Journal of Biogeography*, 37 (11), 2067–2076.
http://dx.doi.org/10.1111/j.1365-2699.2010.02388.x

Stonis, J.R. (2014) Small insects, global issues. *Taxonomy for understanding biodiversity*. http://biotaxonomy.eu/index.php (accessed 25 January 2014)

Stonis, J.R. & Remeikis, A. (2011) *Acalyptris platani* (Müller-Rutz) in the Crimea, Ukraine – The Easternmost record of the Sub-mediterranean species in Europe (Insecta: Lepidoptera: Nepticulidae). *Acta Zoologica Lituanica*, 21 (2), 89–95.
http://dx.doi.org/10.2478/v10043-011-0011-5

Stonis, J.R., Navickaitė, A., Rocienė, A., Remeikis, A. & Diškus, A. (2013) A provisional checklist of the Nepticulidae (Insecta, Lepidoptera) of the Crimea. *Zoology and Ecology*, 23 (1), 20–28.
http://dx.doi.org/10.1080/21658005.2012.754150

Wilkinson, C. & Scoble, M.J. (1979) The Nepticulidae (Lepidoptera) of Canada. *Memoirs of the Entomological Society of Canada*, 107, 1–129.
http://dx.doi.org/10.4039/entm111107fv

Zibtsev, S. & Borsuk, A. (2013) General characteristics of Yalta Mountain-Forest Natural Reserve. *Yalta Mountain Forest Natural Reserve*. National University of Life and Environmental Sciences of Ukraine. Available from: Shttp://suppressfires.eu/index.php/project-study-areas/yalta-mountain-forest-natural-reserve (accessed 25 January 2014)

(* Stonis, J. R., formerly Puplesis, R.)