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New taxa, including three new genera show uniqueness of Neotropical Nepticulidae (Lepidoptera)

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Abstract

After finding distinct clades in a molecular phylogeny for Nepticulidae that could not be placed in any known genera and discovering clear apomorphic characters that define these clades, as well as a number of Neotropical species that could be placed in known genera but were undescribed, three new genera and nine new species are here described from the Neotropics: *Stigmella gallicola* van Nieukerken & Nishida, **sp. n.** reared from galls on *Hampea appendiculata* (Malvaceae) in Costa Rica, representing the first example of a gall making *Stigmella*; *S. schinivora* van Nieukerken, **sp. n.** reared from leafmines on *Schinus terebinthifolia* (Anacardiaceae) in Argentina, Misiones; *S. costaricensis* van Nieukerken & Nishida, **sp. n.** and *S. intronia* van Nieukerken & Nishida, **sp. n.** each from a single specimen collected the same night in Costa Rica, Parque Nacional Chirripó; *S. molinensis* van Nieukerken & Snyers, **sp. n.** reared from leafmines on *Salix humboldtiana*, Peru, Lima, the first Neotropical species of the *Stigmella salicis* group sensu stricto; *Ozadelpha* van Nieukerken, **gen. n.** with type species *O. conostegiae* van Nieukerken & Nishida, **sp. n.**, reared from leafmines on *Conostegia oerstediana* (Melastomataceae) from Costa Rica; *Neotrifurcula* van Nieukerken, **gen. n.** with type species *N. gielisorum* van Nieukerken, **sp. n.** from Chile; *Hesperolyra* van Nieukerken, **gen. n.**. with type species *Fomoria diskusi* Puplesis & Robinson, 2000; *Hesperolyra saopaulensis* van Nieukerken, **sp. n.**, reared from an unidentified Myrtaceae, Sao Paulo, Brasil; and *Acalyptris janzeni* van Nieukerken & Nishida, **sp. n.** from Costa Rica, Guanacaste. Five new combinations are made: *Ozadelpha ovata* (Puplesis & Robinson, 2000), **comb. n.** and *Ozadelpha guajavae* (Puplesis & Diškus, 2002), **comb. n.**, *Hesperolyra diskusi* (Puplesis & Robinson, 2000), **comb. n.,** *Hesperolyra molybditis* (Zeller, 1877), **comb. n.** and *Hesperolyra repanda* (Puplesis & Diškus, 2002), **comb. n.** Three specimens are briefly described, but left unnamed: *Ozadelpha* specimen EvN4680*, Neotrifurcula* specimen EvN4504 and *Neotrifurcula* specimen RH2.

Keywords
New species, new genus, taxonomy, leafmines, gall, molecular phylogeny

Introduction

The nature of Latin America is generally known to be both very diverse and peculiar in its composition and Lepidoptera are no exception to this phenomenon. Biogeographically the region is usually known as the Neotropical region, or the Neotropics, although especially botanists often exclude the southern – non tropical – part (Antonelli and Sanmartín 2011; Morrone 2014). Probably more than one third of the globally named Lepidoptera species can be found in the Neotropics (Heppner 1991), although the number given by Heppner very likely is still a huge underestimate (Kristensen et al. 2007). The peculiarity is evident from many of the phylogenetically lower Lepidoptera, the non-Ditrysia, for example the endemic jaw moth family Heterobathmiidae in Patagonia, the endemic Andesianidae, the Palaephatidae, shared only with Australia, amongst which the supposed sister group to the Ditrysia is to be found and other rare southern families such as Cecidosidae and Neopseustidae (Nielsen 1985; Regier et al. 2015; Bazinet et al. 2016). Most of the families with typically leafmining larvae also include endemic New World or Neotropical groups or radiations: in Heliozelidae the basal Patagonian genus *Plesiozela* Karsholt & Kristensen, 2003 (Karsholt and Kristensen 2003), in Tischeriidae a radiation of the New World endemic *Astrotischeria* Puplesis & Diškus, 2003, specialised on Asteraceae (Diškus and Puplesis 2003) and in Opostegidae the endemic genera *Notiopostega* Davis, 1989 and *Neopostega* Davis & Stonis, 2007 (Davis 1989; Davis and Stonis 2007). Only the leafmining family Nepticulidae did not have endemic Neotropical genera.

Until fairly recently the nepticulid fauna of the Neotropics was almost completely unstudied, and twelve of the species described between 1877 and 1962 were tentatively placed in the large global genus *Stigmella* Schrank, 1802, with just a single species in the – at the time – monotypic genus *Enteucha* Meyrick, 1915 (Davis 1984). Collecting and rearing leafmines was rarely done in Latin America, with the notable exception of Bourquin (1961) who described the first two South American Asteraceae feeding nepticulids. During their expeditions to Patagonia in the 1970's and 80's both the Danish researchers Ebbe Nielsen and Ole Karsholt and Don Davis from the USA collected Nepticulidae, mostly adults, and other non-Ditrysian moth families (Nielsen 1985), but this material remained unstudied for some time. A research team led by the Lithuanian researcher Rimantas Puplesis (later named Jonas R. Stonis) started fieldwork in Latin America in the late 1990's and published a revision of Neotropical nepticulids early this century, bringing the total to 74 species in seven genera by 2002 (Puplesis and Robinson 2000; Puplesis et al. 2002a, 2002b), including several species only known from southern Florida. Since then they continued with papers describing

40 new species, bringing the total to 114 in July 2016 (Šimkevičiūtė et al. 2009; Stonis et al. 2013a, 2013b, 2013c, 2014, 2015, 2016; Diškus and Stonis 2014; Remeikis et al. 2014; Remeikis and Stonis 2015; Stonis and Remeikis 2015, 2016). These revisions continue, fieldwork continues and collections in Copenhagen, Washington and Vilnius still contain unnamed material (J. R. Stonis personal communication).

Even though almost all Neotropical species up to now have been placed in known nepticulid genera, which have been described from other parts of the world, several species show unique combinations of characters, and their placement is therefore disputable. Only the genera *Enteucha* Meyrick, 1915 and *Manoneura* Davis, 1979 were described originally from the Neotropics (respectively British Guyana and southern Florida), but *Enteucha* is not confined to the Neotropics, and also occurs in the Palearctic and Oriental regions (van Nieukerken 1986; van Nieukerken et al. 2016). The monotypic *Manoneura* was synonymised with *Enteucha* by van Nieukerken (1986). Puplesis and Robinson (2000) reinstated *Manoneura* as a good genus on the basis of autapomorphic characters, and described a second species, but it was synonymised again after it was placed with high confidence inside a monophyletic *Enteucha* clade in a molecular phylogeny with eight genes (Doorenweerd et al. 2016; van Nieukerken et al. 2016). Peculiar taxa include the species placed in *Glaucolepis* Braun, 1917, *Fomoria* Beirne, 1945 and several in *Enteucha*; also some species in *Acalyptris* Meyrick, 1921, particularly the *A. latipennata* group, show combinations of characters unknown in this genus elsewhere. Also the single Neotropical species in *Ectoedemia* Busck, 1907 (*E. fuscivittata* Puplesis & Robinson, 2000) has an aberrant morphology.

While working on the molecular phylogeny of global Nepticulidae, to be published almost simultaneously (Doorenweerd et al. 2016), the sampling initially lacked Neotropical material and EvN and CD thus attempted to obtain fresh material for DNA analysis through several sources. This comprised very limited collecting by EvN in 2000 and some material received from others, further KN had been actively collecting and rearing nepticulids in Costa Rica the last decades, and CS collected leafmines during his annual visits to Lima since 2010.

Even though we could still only include a limited set of material compared to the described diversity, the analyses based on DNA sequences yielded several surprises. Three clades with distinctly long branches in the phylogeny could not be placed in any known genus, and other Neotropical species that were studied and could be placed in known genera also appeared to be hitherto unnamed. Taxonomists working on Nepticulidae fortunately have the tradition to be reluctant in describing new genera, preventing the systematic chaos that has been evident in various other groups of Lepidoptera. It is only after careful consideration of the morphological and molecular evidence that we here name these genera as well as several species, of which the common denominators are Neotropics and availability of DNA sequences (minimally a DNA barcode), and often provide additional interesting information on biology.

We describe three new genera and nine new species, including the first nepticulid species from Brazil and Costa Rica and the first known gall-forming *Stigmella* species.

Material and methods

Material

Material was either collected by one of the authors or loaned from various institutions. The Costa Rica material was collected by Kenji Nishida, and made available as loan from the Museo de Zoología, Escuela de Biología, Universidad de Costa Rica (MZUCR), allowing for further study, including DNA analysis. Some of the specimens, including all holotypes were later donated to Naturalis (RMNH), because of its large collection of global Nepticulidae. Holotypes of the species from Brazil, collected by Erik van Nieukerken and Peru, collected by Chris Snyers are deposited respectively in DZUP and UNALM. On the basis of DNA barcodes, analysed by us, we could match several specimens from the global Malaise trapping program to three of our new species, for two of these we borrowed some material from BIOUG, stored in ethanol 96%, to check the genitalia. We also cite the other specimens from the Malaise trappings with matching DNA barcodes that we did not study. The Argentinean samples from this program are returned to MACN and the Costa Rican samples are donated to RMNH. We select a Holotype of each species, but refrain from designating and labelling paratypes, as these have no name-bearing function in Zoological Nomenclature (International Commission on Zoological Nomenclature 1999). All material is also listed in Suppl. material 1.

Abbreviations for depositories etc.

BIN	Barcode Index Number (Ratnasingham and Hebert 2013)
BIOUG	Biodiversity Institute of Ontario, University of Guelph, Canada
BMNH	Natural History Museum, London, UK
BOLD	Barcode of Life data Systems (http://www.barcodinglife.com/)
DZUP	Universidade Federal do Parana, Coleção de Entomológica Padre Jesus Santiago Moure, Brazil
MACN	Museo Argentino de Ciencias Naturales, Bernardino Rivadavia, Buenos Aires, Argentina
MZUCR	Museo de Zoología, Universidad de Costa Rica, San Pedro de Montes de Oca, San José, Costa Rica
RMNH	Naturalis Biodiversity Center, Zoological collections, Leiden, The Netherlands
UNALM	Museo de Entomología "Klaus Raven Büller", Universidad Agraria La Molina, Lima, Peru
ZMUC	Natural History Museum of Denmark, Zoological Museum, Copenhagen, Denmark

Methods

Collecting and rearing methods varied depending on the collector, but generally followed commonly used methods for the collection of leaf miners.

Genitalia were prepared according to our standard procedures, usually including DNA extraction, and described earlier in detail (van Nieukerken 1985; van Nieukerken et al. 2010). Wings were denuded in ethanol 70% and stained with phenosafranin before embedding in euparal.

Measurements. Measurements of genitalia were obtained from digital images, using calibrated scaling in the Zeiss AxioVision software, see below, 20× objective for male genitalia and 10× or 20× for females. Capsule length was measured from vinculum to middle of uncus; valva length from tip of posterior process to ventral edge, excluding the sublateral process; phallus length was measured from the sclerotized tube, from tip of ventral process/carina, excluding any protruding vesica parts. Total bursa length includes all of the internal genitalia from cloaca to anterior edge of bursa. Genitalia measurements are usually rounded off to nearest 5µm. Forewing length was measured from tip of fringe to attachment on thorax, usually at magnification of 20×, also preferably on photographs. Antennal segment counts include scape and pedicel; they were counted on photographs or directly using the stereo microscope.

Morphological terms. The terminology used largely follows our earlier treatments and other recent papers on Nepticulidae (van Nieukerken 1986; van Nieukerken et al. 1990), but is slightly adapted to follow Kristensen's (2003) detailed morphological treatment. We thus use phallus rather than aedeagus for the male intromittent organ, and adopt Wootton's (1979) venation nomenclature, meaning that R2–5 become Rs1–4 and Cu changes into CuA. See also Doorenweerd et al. (2016).

Photographs of mounted moths were made with an AxioCam digital camera attached to a motorized Zeiss SteREO Discovery V12, using the Module Extended Focus, Zeiss AxioVision software, to prepare a picture in full focus from a Z-stack of 10 to 35 individual photos. Leafmines were photographed by EvN with a similar camera on a Zeiss Stemi SV11 stereo-microscope, without extended focus; other illustrated leafmines are from field photographs. Genitalia and wing slides were photographed with a similar camera on a manually operated Zeiss Axioskop H, usually with just a single exposure. Photographs were edited with Adobe Photoshop, avoiding any change to the real object, but backgrounds are cleaned from excess debris and artefacts by using healing brush and clone tools; tone and contrast are adjusted and a little sharpening is used in some photos. Photographs of venation, some mines and some female genitalia were taken in sections, and combined with the photomerge tool in Photoshop.

The photographs in this paper were taken by: Figs 17–33 by Kenji Nishida, Figs 58–65 by Chris Snyers, Figs 7 and 8 by Els Baalbergen, Figs 68, 97, 99, 117, 120 by Camiel Doorenweerd, Figs 119, 142, 143 by Cees van den Berg, Figs 67 and 73 by Jonas R. Stonis and the remaining ones by Erik van Nieukerken.

Molecular methods were described in detail in previous studies (Doorenweerd et al. 2015; Doorenweerd et al. 2016). The DNA barcode data and GENBANK numbers are given both in Suppl. material 1 and in BOLD dataset DS-NEONEP (doi: 10.5883/DS-NEONEP).

Taxonomy

Checklist

Stigmella Schrank, 1802
Stigmella gallicola van Nieukerken & Nishida, **sp. n.**

Stigmella prunifoliella group
Stigmella schinivora van Nieukerken, **sp. n.**

Stigmella costaricensis van Nieukerken & Nishida, **sp. n.**
Stigmella intronia van Nieukerken & Nishida, **sp. n.**

Stigmella salicis group
Stigmella molinensis van Nieukerken & Snyers, **sp. n.**

Ozadelpha van Nieukerken, **gen. n.**
Ozadelpha conostegiae van Nieukerken & Nishida, **sp. n.**
Ozadelpha guajavae (Puplesis & Diškus, 2002), **comb. n.**
Ozadelpha ovata (Puplesis & Robinson, 2000), **comb. n.**
Ozadelpha specimen EvN4680

Neotrifurcula van Nieukerken, **gen. n.**
Neotrifurcula gielisorum van Nieukerken, **sp. n.**
Neotrifurcula specimen EvN4504
Neotrifurcula specimen RH2

Hesperolyra van Nieukerken, **gen. n.**
Hesperolyra diskusi (Puplesis & Robinson, 2000), **comb. n.**
Hesperolyra molybditis (Zeller, 1877), **comb.n.**
Hesperolyra repanda (Puplesis & Diškus, 2002), **comb.n.**
Hesperolyra saopaulensis van Nieukerken, **sp. n.**
Hesperolyra species 29122 (Puplesis & Robinson, 2000)

Acalyptris Meyrick, 1921
Acalyptris janzeni van Nieukerken & Nishida, **sp. n.**

Genus *Stigmella* Schrank, 1802

Stigmella gallicola van Nieukerken & Nishida, sp. n.

http://zoobank.org/033D9A5B-9C55-4EBE-B3A3-328F128C815A

Holotype male. Costa Rica, Puntarenas province, Monteverde, Estación Biológica Monteverde, 10°19'06.9"N, 084°48'29.3"W, 1530 m, 26.x.2001 (adult emergence), col./rear: Kenji Nishida; host plant: *Hampea appendiculata* (Malvaceae), gall inducer on young leaf veins, pupate outside of the gall, cocoon spun 20.x.2001; RMNH Lepidoptera, Genitalia slide EvN3672, RMNH.INS.23672 (RMNH).

Differential diagnosis. A large rather uniform moth, shining fuscous brown on almost all parts, with an orange frontal tuft and edged eye caps.

Description. *Male* (Figs 1, 33). Head: frontal tuft orange; antenna with 33–34 segments (n=2); scape cream, with broad grey edge, flagellum brown. Thorax, forewings and hindwings, including fringe, fuscous brown, with strong reflections on forewing and thorax. Abdomen also fuscous, no anal tufts. Legs brown.

Female (Fig. 2). Antenna with 30 (n=2), ovipositor slightly protruding, otherwise as male.

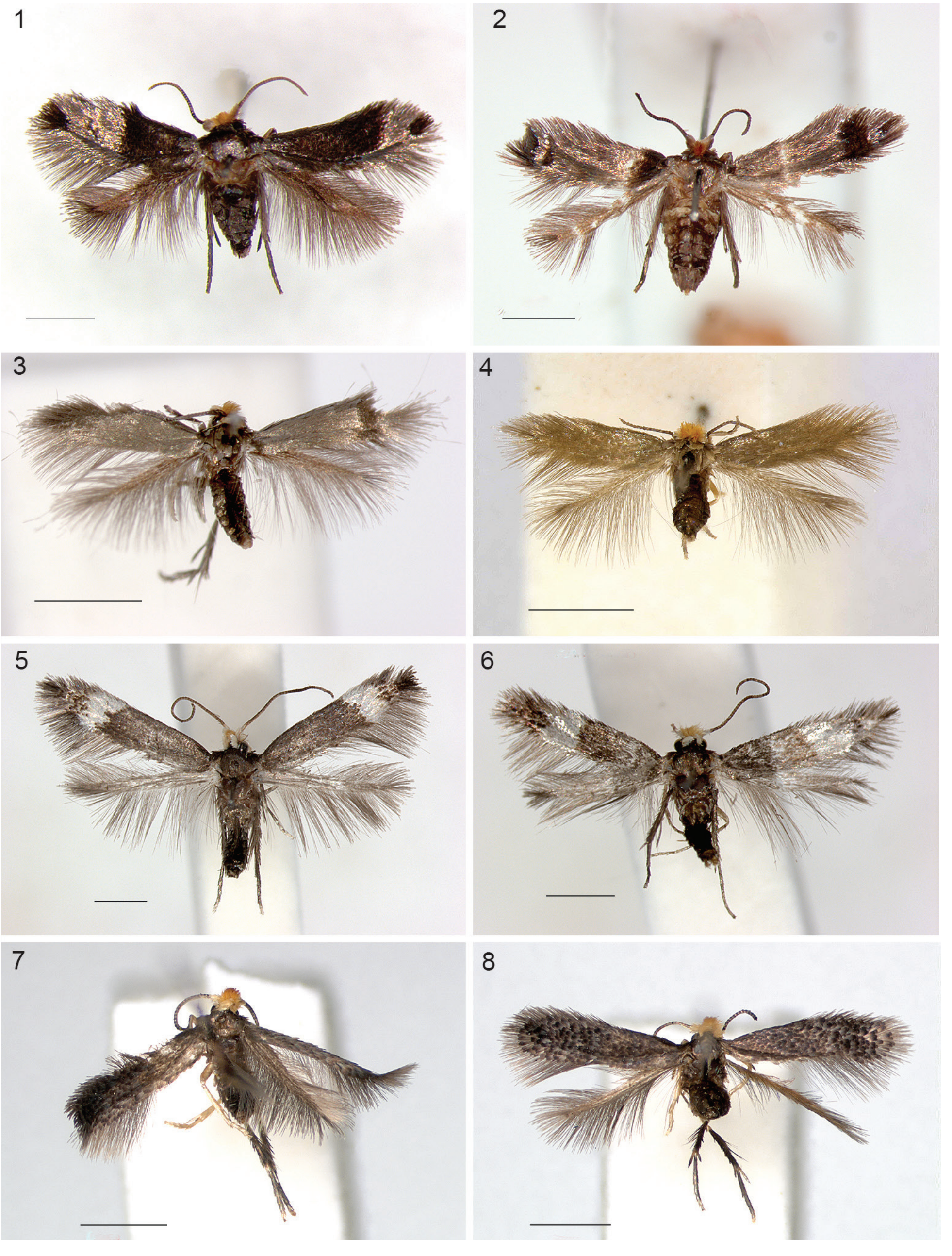
Measurements. Male: forewing length 2.5 mm (HT), wingspan: 6.0 mm. Female: forewing length 2.5 mm (n=2), wingspan *ca.* 5.8 mm.

Male genitalia (Figs 9–13). Total length 265–300 µm. Vinculum anteriorly bilobed. Tegumen a narrow band. Uncus rectangular, posterior edge indented to almost straight, with many setae. Gnathos with two curved posterior processes, widely apart, transverse bar curved. Valva length 175–200 µm, more or less triangular, pointed tip slightly curved inward, inner margin serrate in middle, an inward pointed process on dorsal surface; transtilla with long straight transverse bar. Juxta almost triangular with tip anteriorly between valvae, ventrally two prominent setae. Phallus (Figs 12, 13) length 365–375 µm, flask shaped, widest at base, vesica with two large curved cornuti, 145–150 µm long (measured from base to tip in straight line) and several small denticulate cornuti.

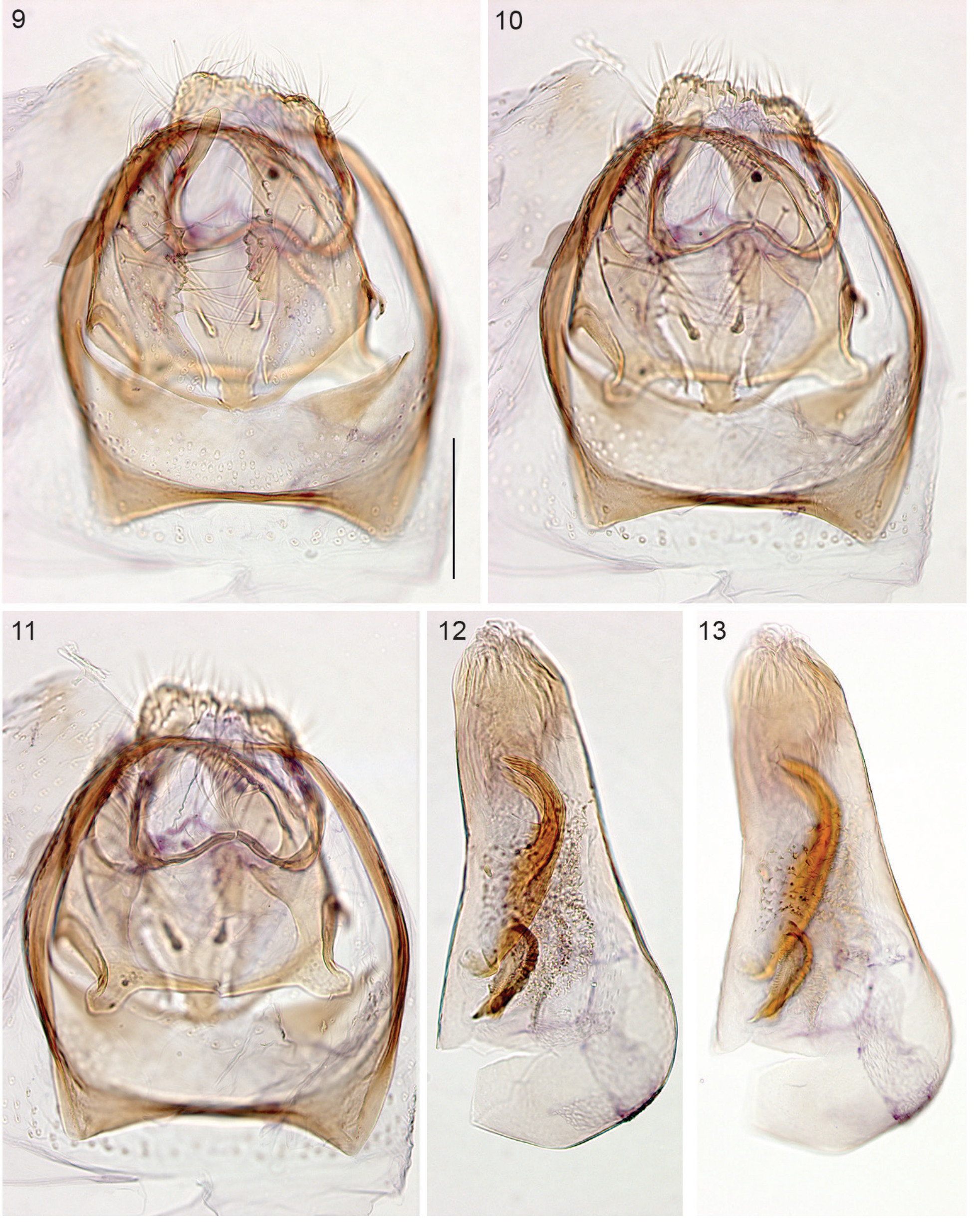
Female genitalia (Figs 14–16). Total length of bursa *ca.* 1 mm. Ovipositor pointed (Fig. 14), anterior apophyses longer than posterior ones. T8 narrow, with *ca.* 18 long setae. Bursa covered with pectinations in a reticulate pattern, more prominently in caudal part (Fig. 15). Ductus spermathecae without convolutions, a circular spermathecal vesicle (Fig. 16).

Biology. *Host plant* (Figs 19–20). Malvaceae: *Hampea appendiculata* (Donn.Sm.) Standl. A tree, occurring between Honduras and Panama from sea level to 1800 m on both the Caribbean and Pacific slopes in Costa Rica (Fryxell 2007).

Gall (Figs 21–30). Galls were induced on leaf veins of young leaves and on axillary leaf buds. Galls on leaf veins are ovoid when mature and more swollen on the leaf underside; length 7–18 mm diameter 3–8 mm (n=18). Galls on axillary leaf buds ovoid by swelling of entire buds (Fig. 25) length 8.7– 11.2 mm, diameter 4.1–5.5 mm, gall base of ca. 1.6 mm diameter (n=5). Galls can cause deformation of young leaves. Gall

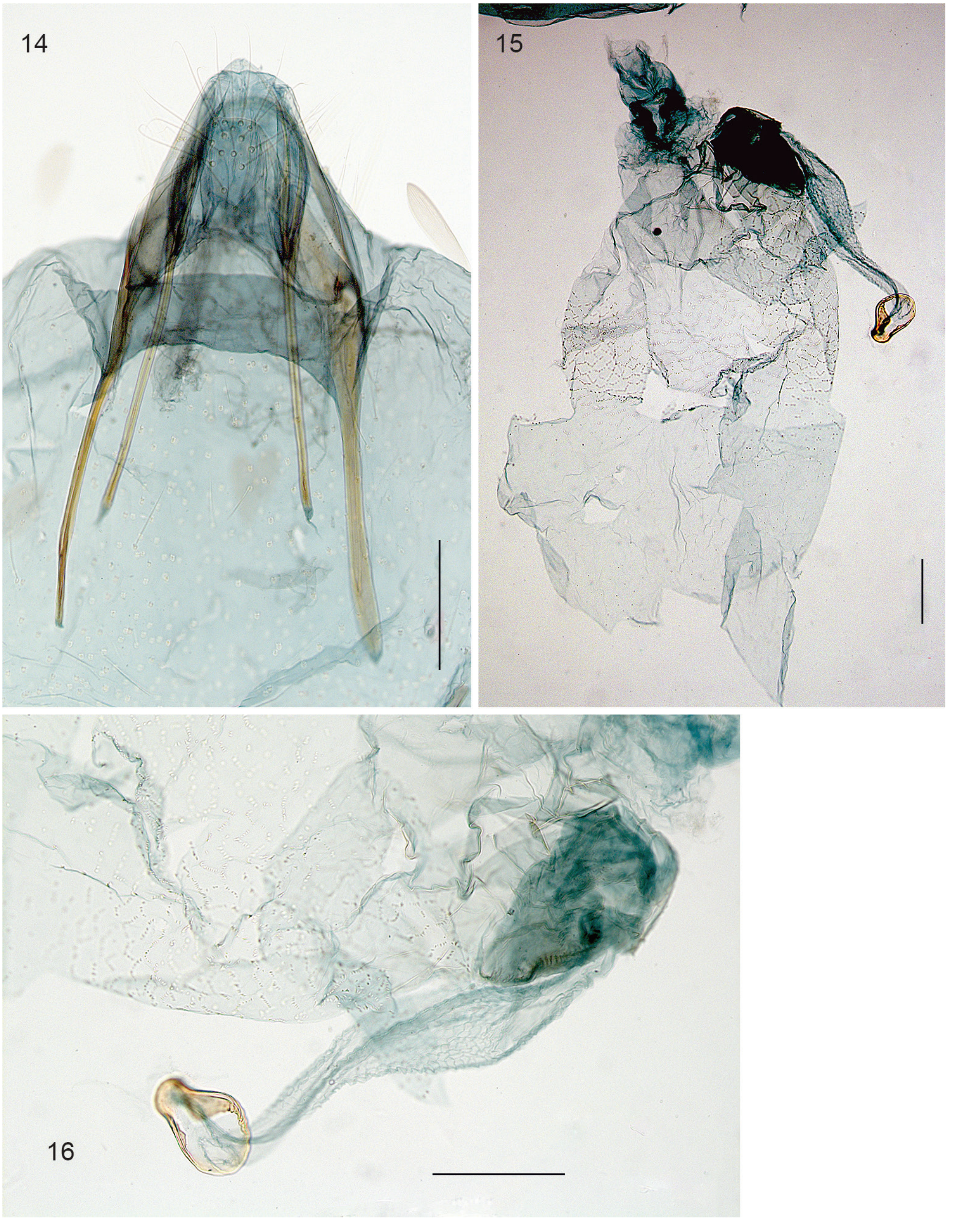


Figures 1–8. *Stigmella* species, adult habitus. **1** *S. gallicola*, male holotype **2** *S. gallicola*, female Heredia Province, Puerto Viejo de Sarapiquí **3** *S. schinivora*, male holotype **4** *S. schinivora*, female RMNH.INS.24681 **5** *S. costaricensis*, male holotype **6** *S. intronia*, male holotype **7** *S. molinensis*, male holotype **8** *S. molinensis*, female RMNH.INS.24219. Scale bars: 1 mm.



Figures 9–13. *Stigmella gallicola*, holotype, male genitalia at different levels of focus, phallus separate (**12, 13**). Scale bars: 100 µm, all to same scale.

chamber narrow, located longitudinally in central part of gall, and line with compacted dark brown frass on lower part of chamber, part of the frass reaching towards nectary gland (Figs 26, 27). Galls were found on ca. 2 meter-tall treelets or large trees of 8–25 m (n=7), however we were unable to examine higher parts of large trees. Most of the collected galls were empty, having a more or less rectangular-shaped exit slit of less



Figures 14–16. *Stigmella gallicola*, female genitalia, slide EvN3739. **14** Abdominal tip, focussed ventrally **15** Bursa, damaged **16** Detail of 15, with ductus spermathecae and vesicle. Scale bars: 100 µm.

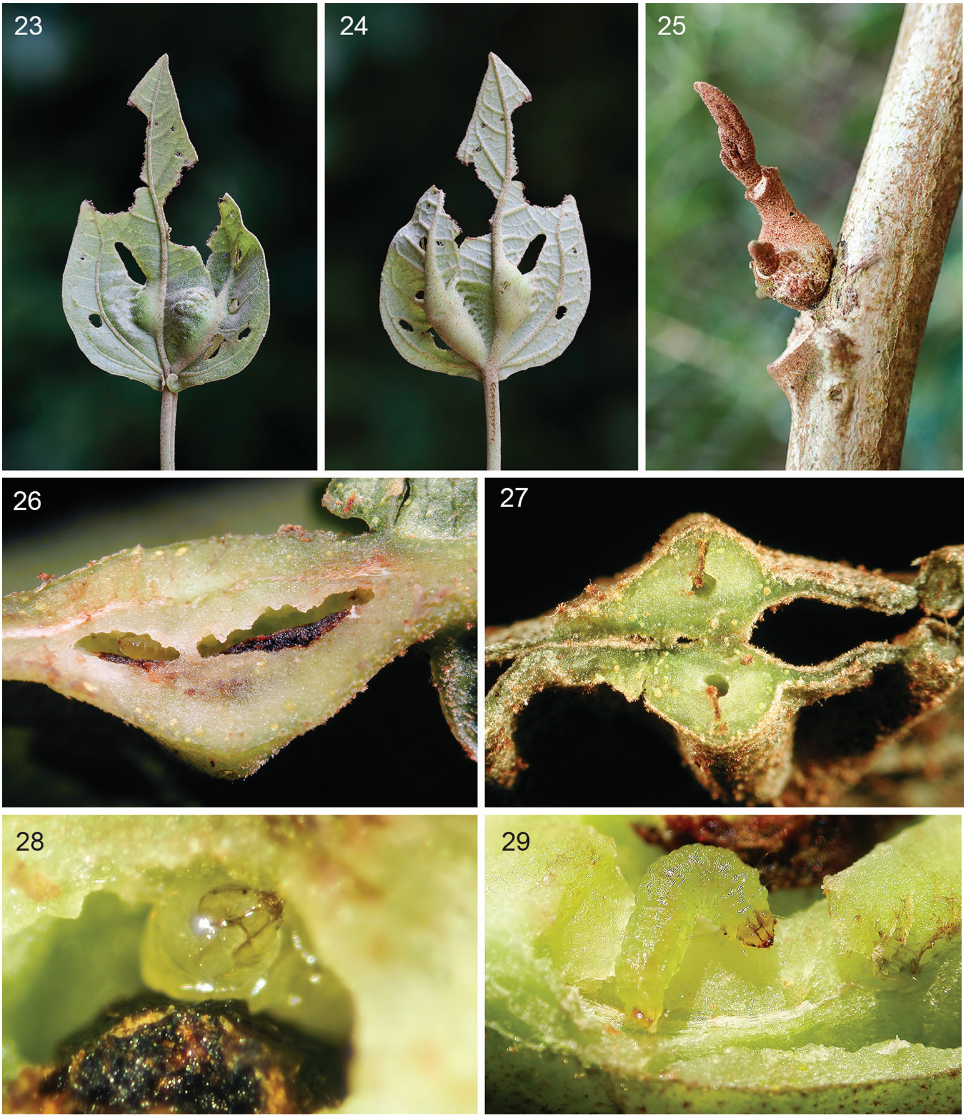
than 1 mm wide (Fig. 30). We found inquiline phorid fly larvae (Diptera: Phoridae) inhabiting old gall chambers. The gall was already recorded by Hanson et al. (2014).

Egg. Egg position unknown. Probably laid near or at foliar nectaries (nectar glands) abaxially on primary veins of leaf buds or very young leaves.

Figures 17–22. *Stigmella gallicola*, habitat and host plant. **17** General habitat at Alto Masis/Tierras Morenas, a premountain rainforest in Parque Nacional Volcán Tenorio, 13 June 2007 **18** same place, 1 June 2007 **19, 20** Habitat and host, *Hampea appendiculata* at same place, 955 m, 14 June 2007 **21, 22** Mature galls on primary leaf veins, respectively adaxial and abaxial view, Estación Biológica Monteverde 1530 m, 22 April 2016, arrows pointing at nectar glands.

Larva (Figs 28, 29, 32). Early to late instar translucent (n=7), mature last instar translucent yellowish green, 6.0 mm long (n=1).

Cocoon (Fig. 31). Pale brown to brown, oval, exit slit side is broad and opposite side tapered (apple seed-shaped), 2.8–3.2 mm long, 1.7–1.9 mm wide (n=2). Under rearing conditions inside plastic bags, cocoons were constructed on either host leaf



Figures 23–29. *Stigmella gallicola*, galls and larvae in *Hampea appendiculata*, details, all at Estación Biológica Monteverde, 1530 m. **23, 24** Galls on primary leaf veins of young leaf, respectively adaxial and abaxial view, 8 June 2016 **25** Old gall found at axillary leaf bud, same date **26** Longitudinal cut of mature gall with late instar larva in situ, 20 October 2001 **27** Transversely cut leaf (young gall in middle) showing gall chamber and frass mass line, 24 October 2001 **28** Late instar larva in situ, note packed frass in gall chamber, same date **29** Late instar larva, dorsal view, slightly ex situ after gall dissection, 4 April 2015.

surface or on paper towels (n=5). Under natural conditions in the field, no cocoons were found on host plant leaves or stems near the galls.

Voltinism and habits. Larvae were found inside the galls in March, May and June. Adult emergence has been recorded in January, April, May, June and October.

Figures 30–33. *Stigmella gallicola*, life history details on *Hampea appendiculata*, all at Estación Biológica Monteverde 1530 m. **30** Larval exit hole, 20 October 2001 **31** Cocoon spun on host plant under rearing conditions, same date **32** Recently exited mature larva, 29 April 2016 **33** Reared holotype male resting on host leaf, 26 October 2001.

Parasitoids. Braconidae: Adelinae: *Adelius* sp., endo-parasitoid, koinobiont of host larva and pupating inside host cocoon. It was reared from the Alto Masis Station site (n=2). Adelinae are specialised parasitoids of Nepticulidae (Yu et al. 2011).

Distribution. Costa Rica: Alajuela, Heredia and Puntarenas provinces. Galls have been recorded mostly from Caribbean/Atlantic slope in lowland Costa Rica. The type locality is near the continental divide on the Pacific slope.

DNA barcode. The Holotype (RMNH.INS.23672) and one female (RMNH.INS.23739) are barcoded, with less than 1% difference. Barcode Identification Number BOLD:ACG9386. The female was also sequenced for other genes and used in the molecular phylogeny (Doorenweerd et al. 2016). Sequences may be retrieved in BOLD and Genbank under voucher/sample ID RMNH.INS.23739.

Remarks. The genitalia of *Stigmella gallicola* resemble somewhat those of the *S. betulicola* group, but in our multi-gene molecular analysis it groups in the clade which contains the *S. prunifoliella* and *S. ultima* groups, without a strongly supported position.

There are only few cases of galling in Nepticulidae known, and this species is the first known in the genus *Stigmella*. Galling has evolved independently several times in

Nepticulidae: the North American *Ectoedemia populella* Busck, 1907 makes a petiole gall (Busck 1907; Wilkinson and Scoble 1979), but starts with a short leafmine along the midrib. Its behaviour caused Busck to name the new (then monotypic) genus *Ectoedemia* (= making an external swelling), but only a few species feeding on *Populus* have similar habits and all other species in the genus are leafminers. The European *Trifurcula pallidella* (Duponchel, 1843) makes a spindle shaped gall in the stem of *Cytisus* species (Fabaceae) (van Nieukerken et al. 2004), but this gall growth appears to be caused by the intense mining activity in a small portion of the stem. *Muhabettana nigrifasciata* (Walsingham, 1908) of the Canary Islands starts with a small gall on a vein, and later the larva makes a long leafmine in the leaf of *Periploca laevigata* (Apocynaceae) (Klimesch 1972); Klimesch uses the German word "Gallenmine". *Ectoedemia castaneae* (Busck 1913) was according to Busck reared from small galls on young twigs, but this is probably not a real gall-former, but an effect of a spiral barkmine in a thin branch: the species is synonymised with the barkminer *Zimmermannia bosquella* (Chambers, 1878) (van Nieukerken et al. 2016). Of all these species, *Stigmella gallicola* induces and forms the most conspicuous swellings, and its biology is adapted to live inside the gall chamber. Gall-forming nepticulids could have been overlooked, and further studies in gall-inducing Lepidoptera may reveal more species. It is worth mentioning that larvae of *Rhodoneura* cf. *terminalis* (Walker, 1865) (Thyrididae) induce spindle-shaped galls on the stem apex of *Hampea appendiculata*. They were reared at Estación Biológica Monteverde and OTS La Selva Biological Station (K. Nishida, personal observation).

Etymology. The specific name is a noun in apposition, derived from the Latin noun *galla* (= gall) and suffix *–cola*, "dweller in".

Other material examined. 6♂, 3♀, 5 adults, galls, larvae. **Costa Rica:** 1♂, Heredia Province, Puerto Viejo de Sarapiquí, Trimbina Biological Reserve, 10°24'59.81"N, 084°7'27.82"W, 161 m, gall inducer on young leaf veins of *Hampea appendiculata*, adult emergence18.i.2003, Kenji Nishida, Genitalia slide JCK15024; 2♀, Heredia Province, Puerto Viejo de Sarapiquí, OTS La Selva Station, main bridge, 10°25'53.42"N, 084°0'13.22"W, 50 m, gall inducer on young leaf veins of *Hampea appendiculata*, e.l. 2–5.v.2002, Kenji Nishida, Genitalia slide EvN3739, RMNH.INS.23739; 1♂, Alajuela Province, Parque Nacional Volcán Tenorio, Alto Masis Station, 10°36'39.99"N, 085°0'1.59"W, 955 m, gall maker on *Hampea appendiculata*, young leaf veins, adult emergence 20.vi.2007, Kenji Nishida; 4♂, 1 ♀, Puntarenas Province: Monteverde, Estación Biológica Monteverde, 10°19'06.9"N, 084°48'29.3"W, 1530m, gall inducer on young leaf veins of *Hampea appendiculata*, adult emergence 17.iii–10.iv.2015, cocoons spun approx. 20.iii.2015, Kenji Nishida (RMNH, MZUCR).

More data from BOLD [specimen not examined, same BIN]. 1 adult, **Costa Rica**, Guanacaste, Area de Conservacion Guanacaste, Sector San Cristobal, Estacion San Gerardo, 10.88 -85.389, 575 m, 17–24.ii.2014, DH Janzen, W Hallwachs, Malaise trap GMP#05845, laguna, BIOUG24701-G07 (BIOUG).

Stigmella prunifoliella group

Stigmella schinivora van Nieukerken, sp. n.

http://zoobank.org/00C3D062-71A9-400B-8A26-E416451048F9

Holotype male. Argentina (Misiones), Cataratas del Iguazú. 27.viii.2000, 21J YM5645, E.J. van Nieukerken; leafmines, rather cultivated part of park; *Schinus terebinthifolius,* e.l. 11–12.ix.2000, RMNH/EvN no 2000148–1, Genitalia slide EvN3986, RMNH.INS.23986 (RMNH).

Differential diagnosis. A completely leaden coloured species, with orange head and leaden edged scape, collar also leaden. The genitalia do not resemble any other Neotropical *Stigmella* species closely.

Description. *Male* (Fig. 3). Head with frontal tuft yellow, collar leaden grey, scape white, edged grey posteriorly, pedicel white, flagellum leaden; antenna with 23–24 segments (n=3). Thorax and forewings uniformly shining leaden grey, smoothly scaled, hindwings slightly darker. Underside forewing dark grey. Abdomen without anal tufts.

Female (Fig. 4). Antenna with 20–21 segments (n=2). Scape hardly with grey edging, hindwings paler than in male, same colour as forewings.

Measurements. Male: forewing length 1.7–1.8 mm (n=2), wingspan: 4.0 mm (n=2). Female: forewing length 1.7– 2.0 mm (n=2), wingspan 3.9–4.2 mm (n=2).

Male genitalia (Figs 34–37). Total length vinculum 185–200 μm, valva 135μm, phallus 260–285 μm (n=3). Phallus asymmetric, anteriorly bending to the left, vesica with many small cornuti.

Female genitalia (Figs 38–40). Length of bursa ca 340 μm. T8 apically pointed, with ca 15–20 setae total. Posterior apophyses longer than anterior ones. No sclerotisations or signa observed in the single relatively poor genitalia slide.

Biology. *Host plants*. Anacardiaceae: *Schinus terebinthifolia* Raddi, the Brazilian pepper tree.

Leafmines (Figs 41–43). The mine is a much contorted upper surface gallery, track often doubling back, usually confined to the small space between two lateral veins and the midrib; mine filled with black frass; larval exit hole on upperside. Mine poorly visible in transmitted light, or from underside, due to leaf thickness.

Egg. The egg is always deposited on leaf upperside, frequently against a lateral vein.

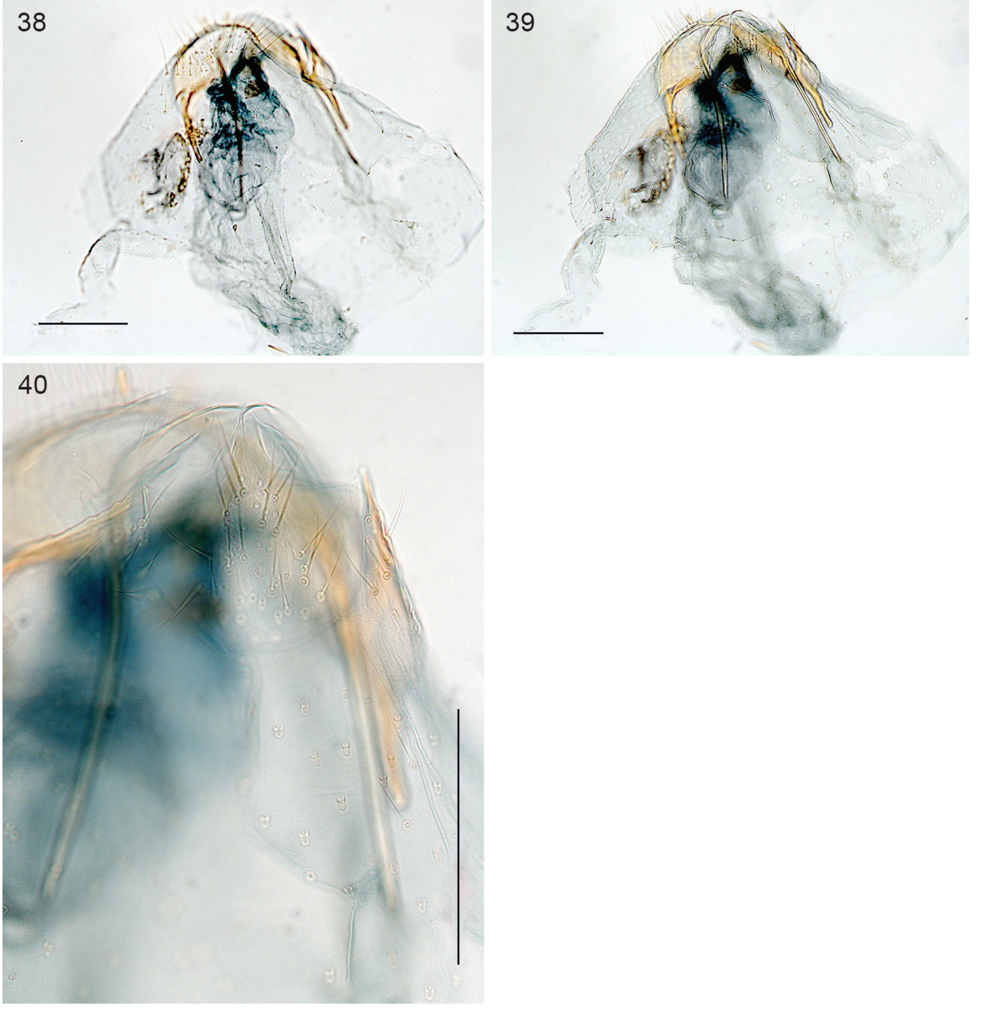
Larva: green.

Voltinism and habits. Larvae were collected in late August, adults emerged indoors in September, and were caught in malaise traps from late September to late October. We collected the mines on planted trees, together with large numbers of the then still undescribed *Leurocephala schinusae* Davis & McKay (Davis et al. 2011).

Distribution. Argentina: Misiones.

DNA barcode. We barcoded two specimens from our reared series (not the Holotype), that appeared to match with a large number of records from the Malaise traps in

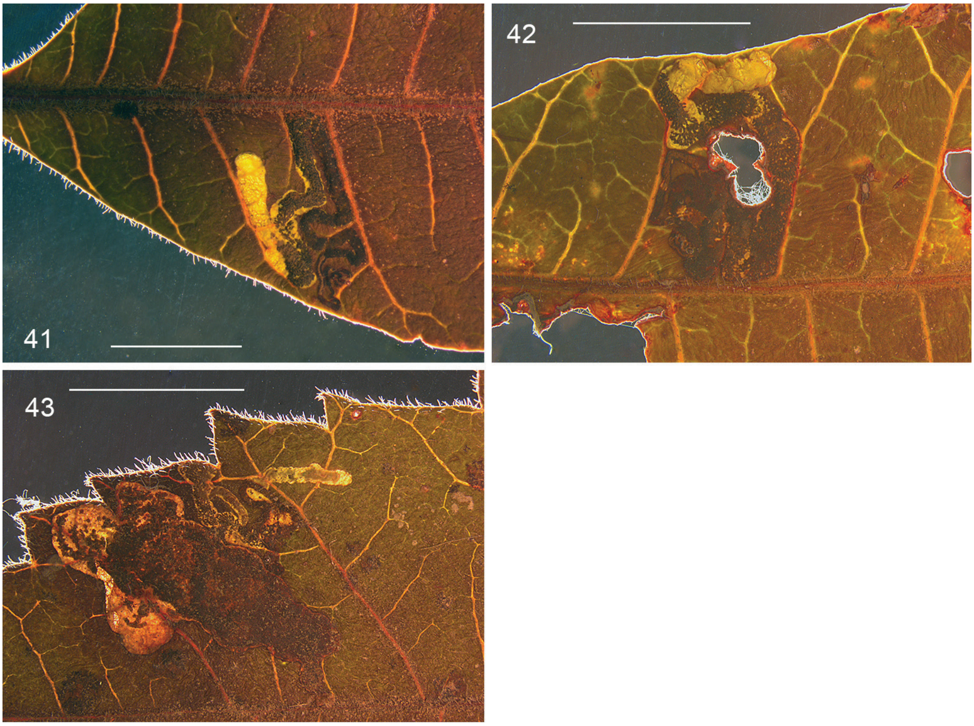
Figures 34–37. *Stigmella schinivora*, male genitalia. **34–36** Holotype, slide EvN3986, in different levels of focus **37** Detail of cornuti in phallus, slide EvN4500. Scale bars: 100 µm.



Figures 38–40. *Stigmella schinivora*, female genitalia, slide EvN4681 **38, 39** Overview at different focus levels **40** Details of tergum 8. Scale bars: 100 µm.

Misiones, giving a total of 26 barcodes, all in BIN BOLD:ACN0764. One specimen was also sequenced for other genes and will be used in a forthcoming analytical paper. Sequences may be retrieved in BOLD and later also in Genbank under voucher/sample ID RMNH.INS.24681.

Remarks. Molecular analysis suggest that *S. schinivora* is closely related to the North American Anacardiaceae feeding species in the *Stigmella prunifoliella* group, which suggests a single host-shift from Rosaceae or Rhamnaceae, but in some analyses it also groups with the European *S. diniensis* (Klimesch, 1975) that feeds on Cistaceae. It is currently the only known Neotropical species of this group of species.



Figures 41–43. *Stigmella schinivora*, leafmines on *Schinus terebinthifolia*. **41** EvN 2000148H, collected as vacated mine **42** EvN 2000148K, mine from which larva was reared **43** EvN 2000149K, mine with dead larva, next to a mine of *Leurocephala schinusae*, the large brown blotch. Scale bars: 5 mm.

Davis et al. (2011) described four gracillariid leafminers of the Brazilian pepper tree, partly aiming at finding suitable candidates to release as biological control against the invading pepper tree in Florida. They did not report on any nepticulid, but we assume that *S. schinivora* is also widespread with the host. It could be added to the list of potential control candidates, but we doubt its effectiveness, given the small size. Also the fact that several Anacardiaceae miners are not very host specific is a risk, as released control species might shift to native North American *Rhus* and *Toxicodendron* species.

Etymology. Schinivora: an adjective, derived from the Latin noun *Schinus* (host genus), stem schin-, and verb *voro* (=devour).

Other material examined. 4♂, 3♀, 4 larvae, leafmines. **Argentina:** 1♂, 1♀, 3 larvae in alcohol, leafmines, Misiones, Cataratas del Iguazú. 27.viii. 2000, leafmines, rather cultivated part of park; leafmines on *Schinus terebinthifolia*, e.l. 11–12.ix.2000, RMNH/EvN no 2000148–1, E.J. van Nieukerken; Genitalia slides EvN3986, RMNH.INS.23986 (RMNH); 1♂, 1♀, 1 larva in alcohol, leafmines, same locality, but e.l. 14–15.ix.2000, RMNH/EvN no 2000149–1, Genitalia slides ♂ EvN4500, ♀ EvN4681, RMNH.INS.24500, 24681 (RMNH); 1♂, 1♀ , in ethanol 96%, Misiones, Obera, CIAR, 26.ix.–3.x.2013, Pablo Tubaro, Malaise trap, GMP#05155,

-27.445, -54.94, 147 m, DNA-barcoded, BIOUG13587-H11 & BIOUG13589-E08 (MACN), 1♂, ditto, but 24–31.x.2013, GMP#05157, BIOUG13956-F02, whole specimen mounted on slide, EvN4834 (MACN).

More data from BOLD [specimens not examined, same BIN]. 21 adults, in ethanol 96%, Argentina, Misiones, Obera, CIAR, 23.v.–24.x.2013, Pablo Tubaro, Malaise trap: 1, trap GMP#05146, 23–30.v.2013, BIOUG12989-H09; 2 ad., trap GMP#05149, 26–4.vii.2013, BIOUG23823-E01, BIOUG23823-E11; 2 ad., trap GMP#05150, 11–18.vii.2013, BIOUG24501-C12, BIOUG24505-B08; 1 ad., trap GMP#04812, 18–25.vii.2013, BIOUG13317-B04; 4 ad., trap GMP#05151, 25–1.viii.2013, BIOUG24746-D11, BIOUG24746-E04, BIOUG24746-E06, BIOUG24746-H10; 5 ad., trap GMP#04813, 1–8.viii.2013, BIOUG13418-F06, BIOUG13418-G07, BIOUG13418-H11, BIOUG13420-A11, BIOUG13421-G02; 1 ad., trap GMP#04815, 22–29.viii.2013, BIOUG24913-G01; 2 ad., trap GMP#04816, 5–12.ix.2013, BIOUG25104-F01, BIOUG25104-F02; 1 ad., trap GMP#04817, 19–26.ix.2013, BIOUG25154-H01; 2 ad., trap GMP#04819, 17–24.x.2013, BIOUG24948-E10, BIOUG24952-A07 (all in MACN).

***Stigmella costaricensis* van Nieukerken & Nishida, sp. n.**

http://zoobank.org/DA4DC25D-B3CC-4ACE-9B46-18992520103F

Holotype male. Costa Rica, San José Province, Parque Nacional Chirripó, Llano Bonito, Refugio, 09°27'16"N, 083°32'41"W, 2492 m, 19–20.ii.2009, Light, Leg: Kenji Nishida. Genitalia slide EvN4037♂, RMNH.INS.24037 (RMNH).

Differential diagnosis. See under *S. intronia*.

Description. *Male* (Fig. 5). Head: frontal tuft yellow, collar white, scale and pedicel white, flagellum grey brown. Antenna with 45 segments. Thorax, legs, forewing and hindwing grey brown, with slight iridescence, cilia similarly coloured; a shining white fascia at 2/3, width ca 1/5 of wing length, wider at costa than at dorsum. Abdomen as thorax, no anal tufts.

Female. Unknown.

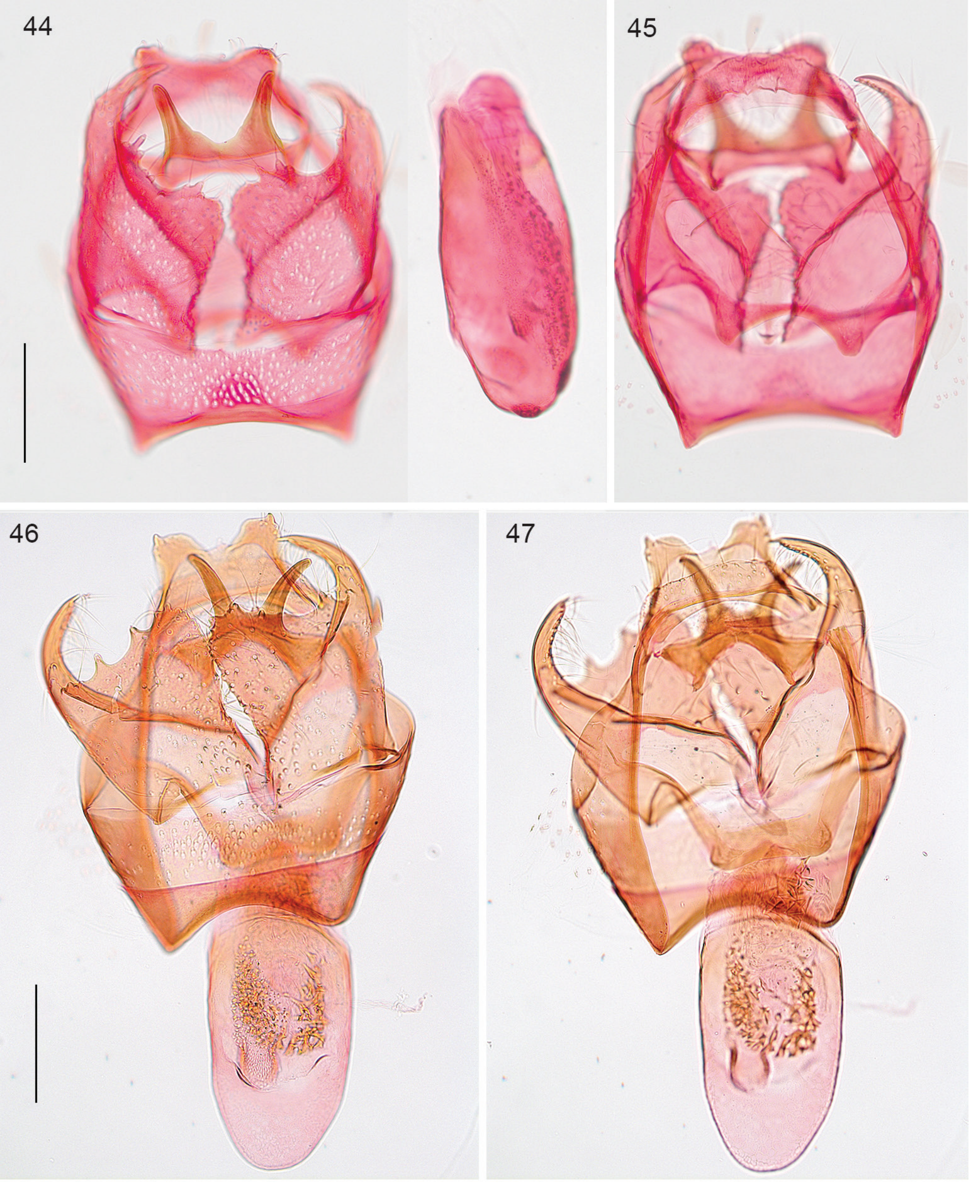
Measurements. Male: forewing length 3.5 mm (n=1), wingspan: ca 7.5 mm.

Male genitalia (Figs 44, 45). Total length capsule 305µm. Uncus deeply bilobed. Gnathos with posterior horns closely placed, diverging posteriorly. Valva length ca 225 µm, almost squarish with prominent curved distal process, posterior edge deeply serrate by setal sockets, internal edge almost straight, with slight notch; transtilla without sublateral processes. Phallus length ca 260 µm, tubular, no carinae or juxta present; vesica with many small cornuti.

Biology. *Host plants*. unknown.

Voltinism and habits. The moth was collected in February at a light sheet.

Distribution. Costa Rica: San José Province: Chirripó National Park: Llano Bonito area, a cloud forest surrounded by large oak trees.



Figures 44–47. *Stigmella* species, male genitalia. **44, 45** *S. costaricensis*, holotype **46, 47** *S. intronia*, holotype. Scale bars: 100 µm.

DNA barcode. Holotype BIN: BOLD:ACG8765. The holotype was also sequenced for three other genes and will be used in a forthcoming analytical paper. Sequences may be retrieved in BOLD and later also in Genbank under voucher/sample ID RMNH.INS.24037.

Remarks. This species and the next were collected the same night. They both belong in core *Stigmella*, in the clade with the *S. lapponica*, *S. rhamnella* and *S. sanguisorbae* groups, but do not belong to any of these groups.

Etymology. Costaricensis: an adjective, derived from the country name Costa Rica and the suffix *–ensis*, indicating geographical origin.

Stigmella intronia van Nieukerken & Nishida, sp. n.

http://zoobank.org/45DAED60-C96C-48D5-B074-EE768B49380E

Holotype male. Costa Rica, San José Province, Parque Nacional Chirripó, Llano Bonito, Refugio, 09°27'16"N– 083°32'41"W, 2492 m, 19–20.ii.2009, Light, Leg: Kenji Nishida. Genitalia slide EvN4036♂, RMNH.INS.24036 (RMNH).

Differential diagnosis. Externally *S. intronia* and *S. costaricensis* are very similar, but the fascia in *intronia* seems a bit wider and is placed more anteriorly. Both species resemble somewhat the North American *S. slingerlandella* (Kearfott, 1908). The species are best separated by the shape and spinosity of the valva and form of uncus and gnathos.

Description. *Male* (Fig. 6). Head: frontal tuft yellow, collar white, scape and pedicel white, flagellum grey brown. Antenna with 44 segments. Thorax, legs, forewing and hindwing grey brown, with slight iridescence, cilia similarly coloured; a shining white fascia at 1/2, width ca. 1/4 of wing length, wider at dorsum than at costa. Abdomen as thorax, no anal tufts.

Female. Unknown.

Measurements. Male: forewing length 2.8 mm (n=1), wingspan: ca 6.3 mm.

Male genitalia (Figs 46, 47). Total length capsule 300 µm. Uncus bilobed, lobes far apart. Gnathos with posterior horns separate, almost parallel. Valva length ca 240 µm, somewhat squarish, with prominent curved distal process, posterior edge partly serrate by setal sockets, internal edge curved outwards; transtilla with sublateral processes extremely short to almost absent. Phallus length ca 290 µm, tubular, no carinae or juxta present; vesica with many small cornuti.

Biology. *Host plants*. Unknown.

Voltinism and habits. The moth was collected in February at a light sheet.

Distribution. Costa Rica: San José Province: Chirripó National Park: Llano Bonito area, a cloud forest surrounded by large oak trees.

DNA barcode. Holotype BIN: BOLD:ACG8514. The holotype was also sequenced for other genes and used in the molecular phylogeny (Doorenweerd et al. 2016); here we discovered the presence of several introns in a copy of the gene Elongation Factor 1α. Sequences may be retrieved in BOLD and Genbank under voucher/sample ID RMNH.INS.24036.

Remarks. See under *S. costaricensis*.

Etymology. Intronia, a noun in apposition, arbitrarily derived from the word Intron (based on English: intragenic region), because of the presence of several introns in a copy of the gene Elongation Factor 1α (Doorenweerd et al. 2016).

Stigmella salicis group

Stigmella molinensis van Nieukerken & Snyers, sp. n.
http://zoobank.org/BD31E11A-6C3A-4D7D-9F9B-88677E9735BB

Holotype male. Peru, Lima, Universidad Agraria la Molina, 240 m, -12.0869, -76.9444, 1.xii.2010, leafmines on *Salix humboldtiana*, e.l. 16.xii.2010, C. Snyers, genitalia slide EvN4218, RMNH.INS.24218 (UNALM).

Differential diagnosis. Externally *S. molinensis* can be confused with other Neotropical *Stigmella* without fascia, with pale head and collar, such as *S. hamata* Puplesis & Robinson, 2000, *S. montanotropica* Puplesis & Diškus, 2002 and *S. austroamericana* Puplesis & Diškus, 2002, but the male genitalia are characteristic.

Description. *Male* (Figs 7, 64, 65). Head: frontal tuft orange, collar and scape yellowish white, flagellum brown. Antenna with 24 segments. Thorax and forewing fuscous, with dark tipped scales, a more or less distinct cilia line, demarcating the grey fringe; forewing without pale spots. Hindwing narrow, grey. Hindlegs fuscous with white parts, other legs yellowish white.

Female (Fig. 8). Antenna with 19–23 segments (n=4).

Measurements. Male: forewing length ca 1.9–2.0 mm (n=2), wingspan: 4.4–4.5 mm. Female: forewing length 2.3 mm, wingspan 5.1 mm.

Male genitalia (Figs 48–53). Total length capsule 240 µm (n=2). Uncus narrow, bilobed, with deep medial notch. Gnathos narrow, with posterior processes fused basally, distally just separate. Valva 155–170 µm long, with short pointed and curved distal process, inner lobe broad, rounded, with almost straight, parallel inner margins; transtilla with sublateral processes ca half as long as transverse bar. Phallus length 250–260 µm, vesica with many small denticulate cornuti.

Female genitalia (Figs 54–57). Total length bursa ca 730 µm. Abdominal tip rather narrow, but not pointed; T8 with 5–7 setae on either side, and a small patch of many small setae anteriorly; anal papillae without setae. Bursa covered with small pectinations, with a band of larger and stronger sclerotised ones, in 4 rows, running around bursa longitudinally; ductus spermathecae straight, without convolutions.

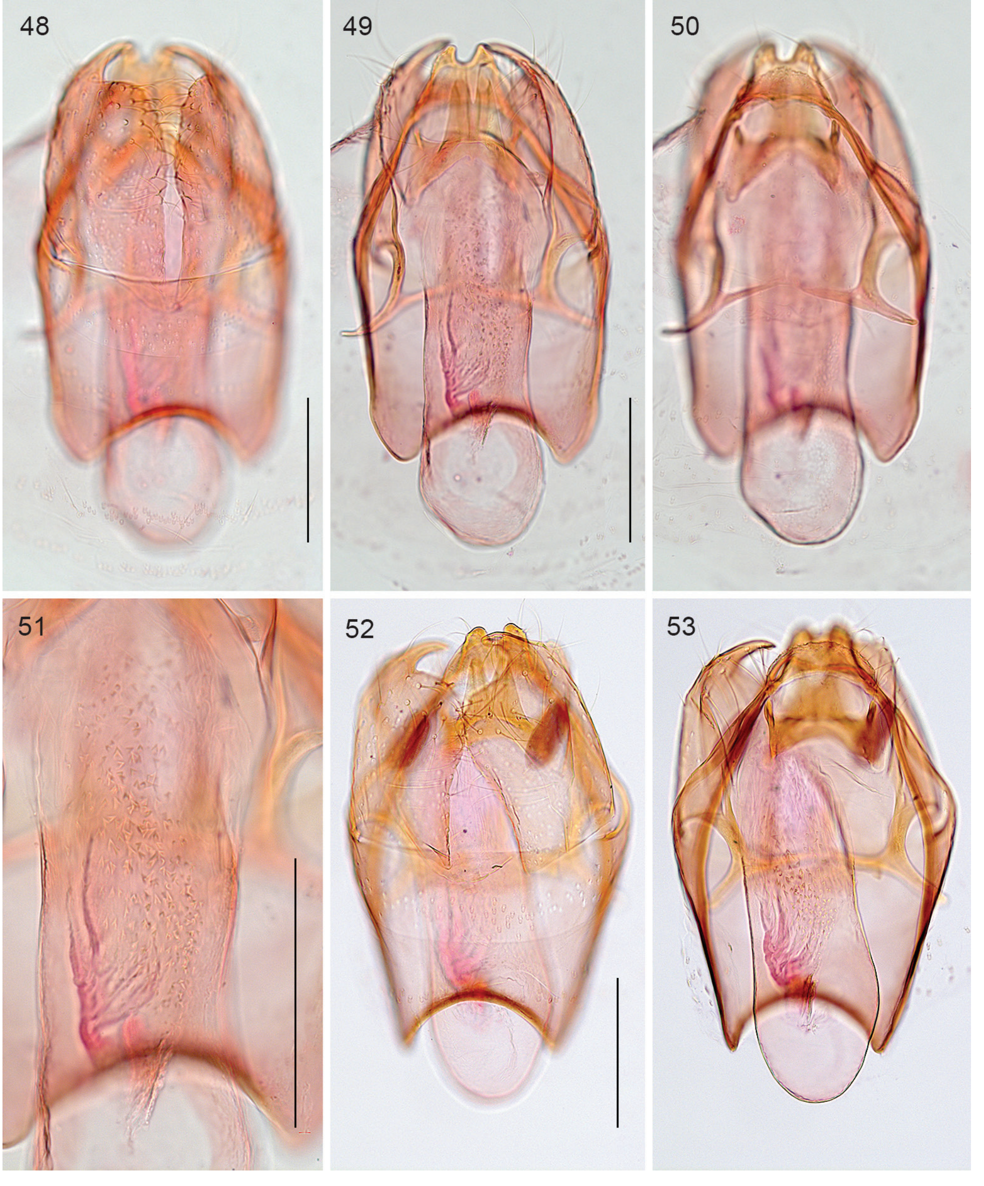
Biology. *Host plant* (Figs 58, 59). Salicaceae: *Salix humboldtiana* Willd., a small tree.

Leafmines (Figs 60–63). Mine first a narrow gallery, usually running towards leaf edge and leaf apex and not doubling back, occasionally running to leaf base and then often doubling back and ending towards apex. Later mine a wide irregular gallery, almost full depth. Frass black, in a narrow central line. larval exit hole on leaf upperside.

Egg. Always deposited on leaf upperside close to the midrib.

Larva yellow.

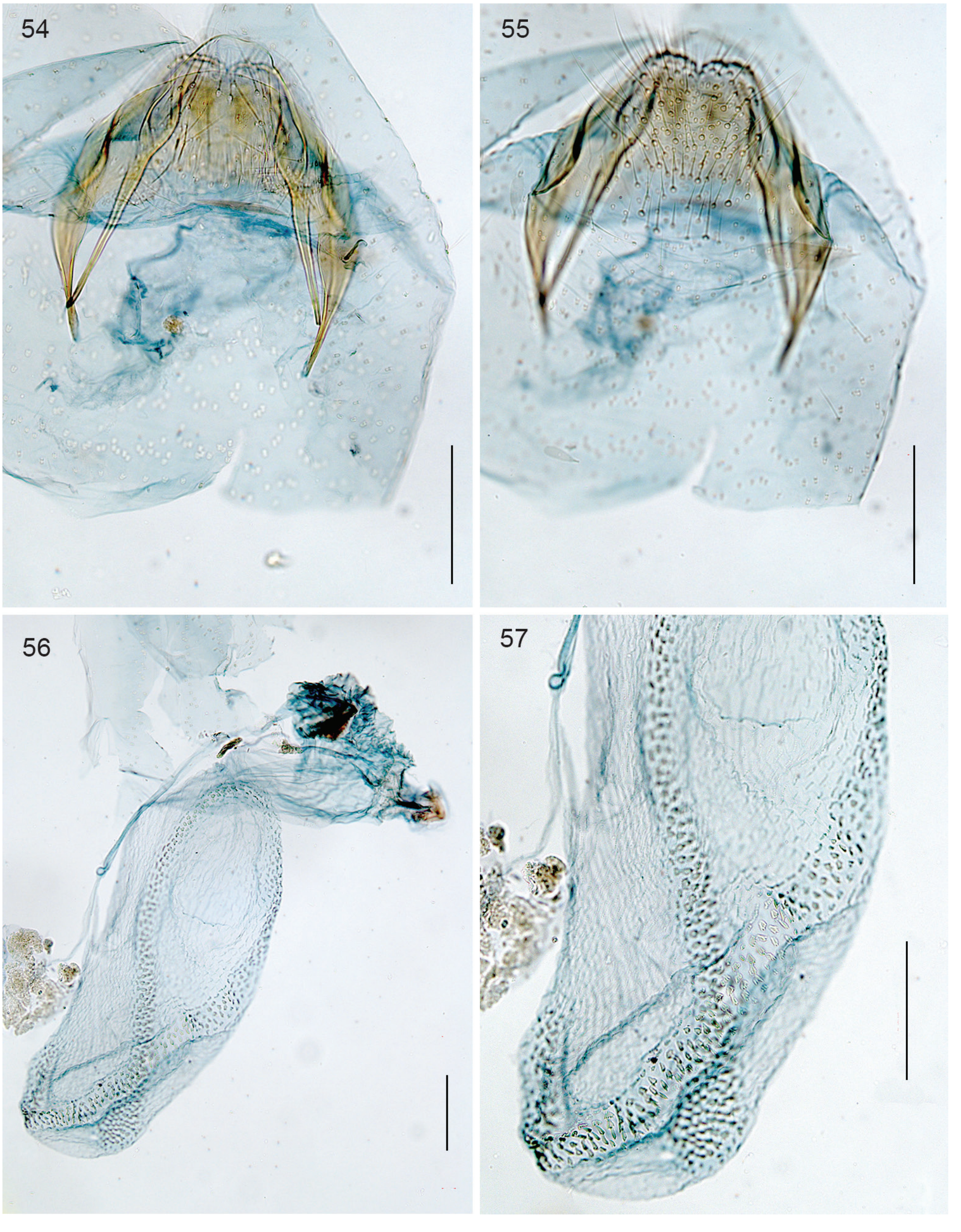
Voltinism and habits. Larvae were always present between December and late January. Adults usually emerged after two to three weeks after the cocoon was spun, suggesting multiple generations. The species has only been searched for between early December and late January, we have no information on other seasons. Mines were always found at the shady side of the trees.



Figures 48–53. *Stigmella molinensis*, male genitalia. **48–51** slide EvN4812 **52–53** Holotype, slide EvN4218. Scale bars:100 µm.

Distribution. Peru: Lima.

DNA barcode. We barcoded three specimens: the Holotype, the female RMNH.INS.24219 and the male RMNH.INS.24812. BIN: BOLD:ACG9223. The female was also sequenced for other genes and used in the molecular phylogeny (Doorenweerd et al. 2016). Sequences may be retrieved in BOLD and Genbank under voucher/sample ID RMNH.INS.24812.



Figures 54–57. *Stigmella molinensis*, female genitalia, slide EvN4219. **54, 55** Terminal segments, respectively focussed dorsally, showing T8 and ventrally, showing setae on S8 **56, 57** Bursa and detail. Scale bars:100 µm.

Remarks. This species clearly belongs to the *Stigmella salicis* group s.str., that is widespread in the Holarctic region and of which all but one species feed on Salicaceae (sensu stricto). However, morphologically it differs by the presence of numerous small

Figures 58–65. *Stigmella molinensis*, type locality Lima, Universidad Agraria la Molina, 240 m, host plant and life history. **58** Row of tall *Salix humboldtiana* trees, 9 December 2013 **59** Chris Snyers, collecting leafmines in *Salix humboldtiana*, 16 December 2013 **60–63** Vacated leafmines and leafmine with larva, 18 January 2010 **64–65** Male, emerged 18 January 2010.

cornuti in the phallus, whereas all other species have a reduced number of differently shaped cornuti; the latter thus is a good apomorphy for the Holarctic members of the group. The female shares the characteristic apomorphy: a band of signa around the bursa copulatrix. In our molecular phylogeny (Doorenweerd et al. 2016) *S. molinensis* is sister to all Holarctic species of the group. The other Neotropical species, included in the *salicis* group by Puplesis and Robinson (2000) are excluded by us and placed in the *Stigmella epicosma* group of which probably many feed on Asteraceae. Since the host plant, *Salix humboldtiana*, and ten other native *Salix* species (Alford and Belyaeva 2009) are widespread in South and Central America, we expect that *S. molinensis* and possibly related species are more widespread.

Etymology. The specific name, an adjective, is derived from La Molina, Spanish and Latin for Mill, and also the name of the district in Lima and the University where the species was collected.

Other material examined. Adults and leafmines: Same data as Holotype, **Peru**, 1♂, 18.i.2010, e.l. 1.ii.2010, damaged specimen (see Figs 64, 65); 1♀, Genitalia slide EvN4219, RMNH.INS.24219; 3♀, xii.2013, e.l. xii.2013; 1♀ i.2013, e.l. i.2013; 1♂, 1♀, 15.xii.2014, e.l. i. 2015, ♂ Genitalia slide EvN4812, RMNH.INS.24812 (all RMNH).

Ozadelpha van Nieukerken, gen. n.

http://zoobank.org/C69504F8-9528-480A-806A-BEAE4B2E0DB8

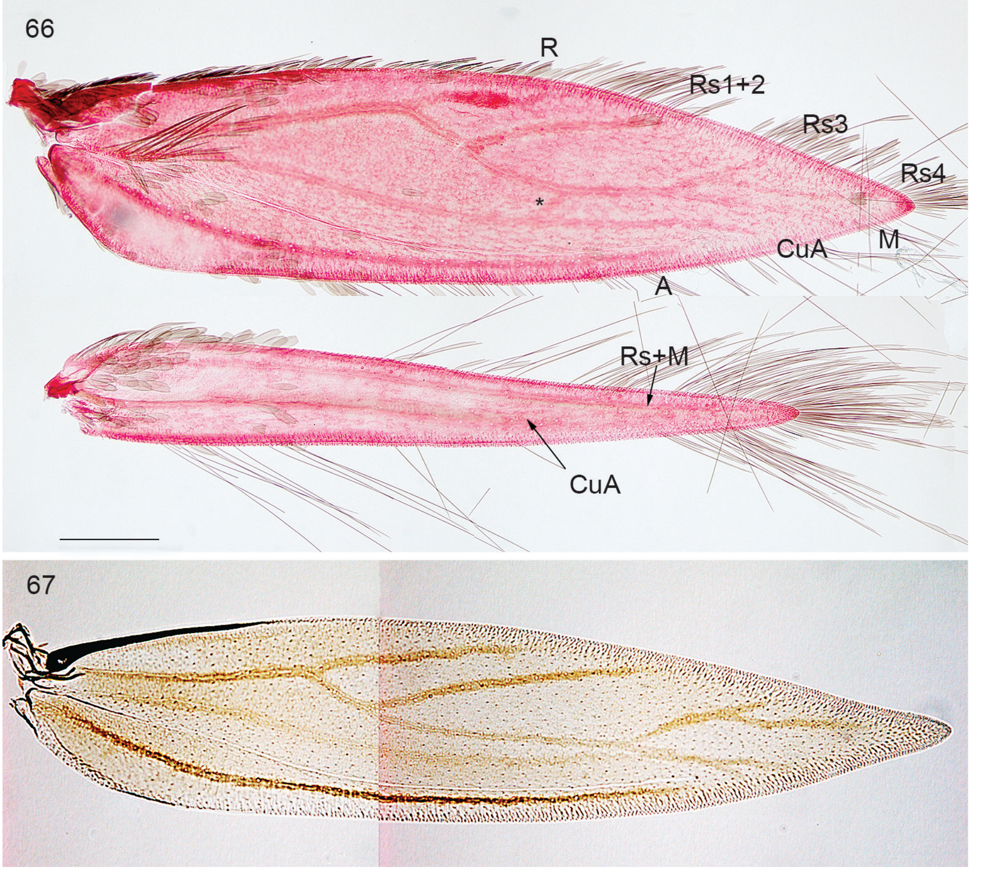
Type species. *Ozadelpha conostegiae* van Nieukerken & Nishida, sp. n. by present designation.

Differential diagnosis. *Ozadelpha* is recognised by the collar with lamellar scales (as in *Enteucha* and *Stigmella*), usually two fascia's on forewing; forewing venation without closed cell, but usually a very long separate CuA. Male genitalia are characterised by separate vinculum and tegumen, large vinculum, bilobed uncus and V-shaped gnathos.

Description. Adult (Figs 68, 69). Rather small nepticulid moths, forewing length 1.4–2.8 mm. Head with collar comprising lamellar scales, but piliform in *O. ovata*. Antenna with 21–32 segments in male, 19 in female (no more data available). Forewing usually with two pale, often metallic fasciae, sometimes joined along dorsal margin. Hindwing in male sometimes with androconial scales on wing (in *O. guajavae* and *O. ovata*) or a hairpencil near frenulum (*O. conostegiae*). Venation (Figs 66, 67): R+Rs+M coalescent from base, kinked at junction of R, with 5 branches: R, Rs1+2, Rs3, Rs4 and M, CuA separate and long, approaching Rs+M (what looks like a cross-vein between CuA and Rs+M in Fig. 68 is probably an artefact), absent in the drawing of *O. guajavae* (Puplesis et al. 2002a); A thickened; Hindwing very narrow, with 2 veins only (Rs+M and CuA), Rs+M close to costa.

Male genitalia. (Figs 70–73). Vinculum lateral arms articulate with sides of tegumen; ventral plate expanded, not bilobed. Tegumen band shaped. Uncus variously bilobed. Gnathos an inverted V. Valva more or less triangular, transtilla with transverse bar present or weakly sclerotised, sublateral processes absent or short. Phallus relatively short, without distinct carinal processes; cathrema a normal striate thickening around base of ejaculatory duct, vesica with variable number of cornuti.

Female genitalia (Figs 74–79). T8 with or without row of setae; no setose anal papillae. Anterior apophyses often broadened, posterior apophyses usually narrow, straight, and longer than anterior ones. Vestibulum folded, more strongly staining in Chlorazol Black, with indistinct or no sclerotizations; corpus bursae asymmetric, curved; wall completely devoid of spines or pectinations or with a group of numerous, large, blunt pectinations as in *O. guajavae* (Remeikis et al. 2014). Ductus spermathecae with 1–3.5 convolutions.



Figures 66–67. *Ozadelpha* gen. n., venation. **66** *O. conostegiae*, female, slide EvN4704, veins labelled **67** *O. ovata*, paratype male, forewing only, slide AD207. * this is probably a staining artefact, not a cross vein, Scale: 200 µm.

Larva. Green, where known.

Biology. Leafminers on Melastomataceae and Myrtaceae, both belonging to the order Myrtales. See also Remeikis et al. (2014).

Distribution. Central and South America, known from Costa Rica, Ecuador and Argentina, probably widespread.

Composition. We describe here one new species, *O. conostegiae*, as type species, plus a second one from the same host that we do not name. Both *Stigmella ovata* Puplesis & Robinson, 2000 and *Enteucha guajavae* Puplesis & Diškus, 2002 share many characters with the type species: an almost identical venation (albeit without recognisable CuA in the drawing of *E. guajavae*) and very similar male genitalia. We therefore transfer both to this genus as *Ozadelpha ovata* (Puplesis & Robinson, 2000), comb. n. and *O. guajavae* (Puplesis & Diškus, 2002), comb. n. It is possible that some species associated with the Myrtaceae genus *Myrceugenia* from Patagonia (Nielsen 1985) belong here as well, although we observe some differences in the few specimens available to us. The Vilnius group is planning to revise this group of species (J.R. Stonis, personal communication).

Etymology. *Ozadelpha*, a noun. The name is based on a combination of the Greek adelphe (αδελφη), meaning sister with the colloquial abbreviation "Oz" as often used for Australia. This to indicate the sister group relationship between *Ozadelpha* and the Australian clade with *Roscidotoga* Hoare, 2000, *Pectinivalva* Scoble, 1983, *Menurella* Hoare, 2013 and *Casanovula* Hoare, 2013. The name is to be treated as feminine.

Remarks. The series reared from *Conostegia* that KN reared and sent via the Museo de Zoología, Universidad de Costa Rica, to EvN was at first considered to constitute a single species. We were only able to successfully amplify several genes from one large female (RMNH.INS.24680) that on closer inspection appeared to be different from the rest of the series, even though the differences externally are small, apart from the size. The position of the genus as sister of the Australian genera was strongly supported on the basis of this specimen; however, we do not name that by lack of a male specimen and life history data. The few genes that we did amplify from other specimens show that both species belong to the same clade, and thus the same genus. In fact, there are probably more species feeding on different species of *Conostegia* throughout its distribution area; just before finalising this manuscript, Kenji Nishida reared another species from another species of *Conostegia*.

In the morphology *Ozadelpha* shows similarities with both *Stigmella, Enteucha* and the Australian genera. The venation resembles *Stigmella*, but also *Pectinivalva*, apart for the thickened A in forewing. In our molecular phylogeny *Ozadelpha* always groups with the Australian genera, either as sister to all of them together, or as sister to *Roscidotoga* (Doorenweerd et al. 2016). Where both *Ozadelpha* and *Pectinivalva* in the old sense feed on Myrtales, it is possible that the ancestral hosts were also Myrtales and that the ancestor was a rainforest inhabitant (Hoare and van Nieukerken 2013).

Ozadelpha conostegiae **van Nieukerken & Nishida, sp. n.**

http://zoobank.org/40CDDC2D-0672-4289-B525-03CCBBFC8FEC

Holotype male. Costa Rica, Puntarenas Province, Monteverde, Estación Biológica Monteverde, 10°19'06.9"N, 084°48'29.3"W, 1530 m, 2.iii.2012 collected leafmines, 31.iii.2012 adult emergence, host plant: *Conostegia oerstediana* (Melastomataceae), photos/leg/rear: Kenji Nishida, RMNH Lepidoptera, Genitalia slide EvN4506, RMNH.INS.24506 (RMNH).

Differential diagnosis. Externally recognised by leaden collar of lamellar scales and forewing with two fasciae, the first indistinctly joined to basal leaden area. Male genitalia unique and can not be confused with other Nepticulidae. However, there are as yet unnamed rather similar species. See also next species.

Description. *Male* (Figs 68, 89). Head: frontal tuft yellow orange, scape white; antenna with 24–25 segments (n=2). Collar comprising lamellar scales, leaden. Thorax and forewings dark fuscous, forewing with basal leaden patch, poorly separated from

Figures 68–69. *Ozadelpha* gen. n., adult habitus. **68** *O. conostegiae*, holotype male **69** *O.* specimen EvN4680, female. Scale bars:1 mm.

silver fascia at 1/3, a second silver fascia at 2/3, often broken or narrowed in middle, at dorsum widened in both directions, silver scales along dorsum may reach other fascia, usually not; more distal silver scales usually separated from fascia. Hindwing with a narrow ochreous hairpencil inserted near frenulum of 1/3 hindwing length, hindwing scaling brown-grey. Leg upperside and abdomen dark fuscous, tarsi paler. Abdomen with indistinct grey anal tufts.

Female (Fig. 90). Antenna with 19 segments (n=2). Hairpencil absent. Ovipositor broadly rounded.

Measurements. Male: forewing length 1.7–1.9 mm (n=2), wingspan: 3.8–4.3 mm. Female: forewing length 1.7–1.8 mm (n=3), wingspan 3.9–4.0 mm.

Male genitalia (Figs 70–72). Total length capsule 385–405µm (n=2), ventral plate very large and anteriorly rounded; tegumen rounded. Uncus distinctly bilobed, with setose lobes; gnathos with triangular pointed central element. Valva length 140–150 µm; transtilla well sclerotised, without sublateral processes. Phallus length 290 µm, flask shaped vesica with ca. 9 larger triangular cornuti; two elongate sclerotisations may represent the cathrema, no striate cathrema observed.

Female genitalia (Figs 74–76). Total length of bursa ca 660 µm. T8 with row of ca 8 setae on either side, partly on distinct sockets; no setose anal papillae. Anterior apophyses broadly rounded, posterior apophyses narrow, straight, longer than anterior ones. Vestibulum more strongly stained, with indistinct sclerotisation; ductus bursae not demarcated from corpus bursae, corpus asymmetric, curved; wall completely devoid of spines or pectinations. Ductus spermathecae slightly curved, only one incomplete convolution at vesicle.

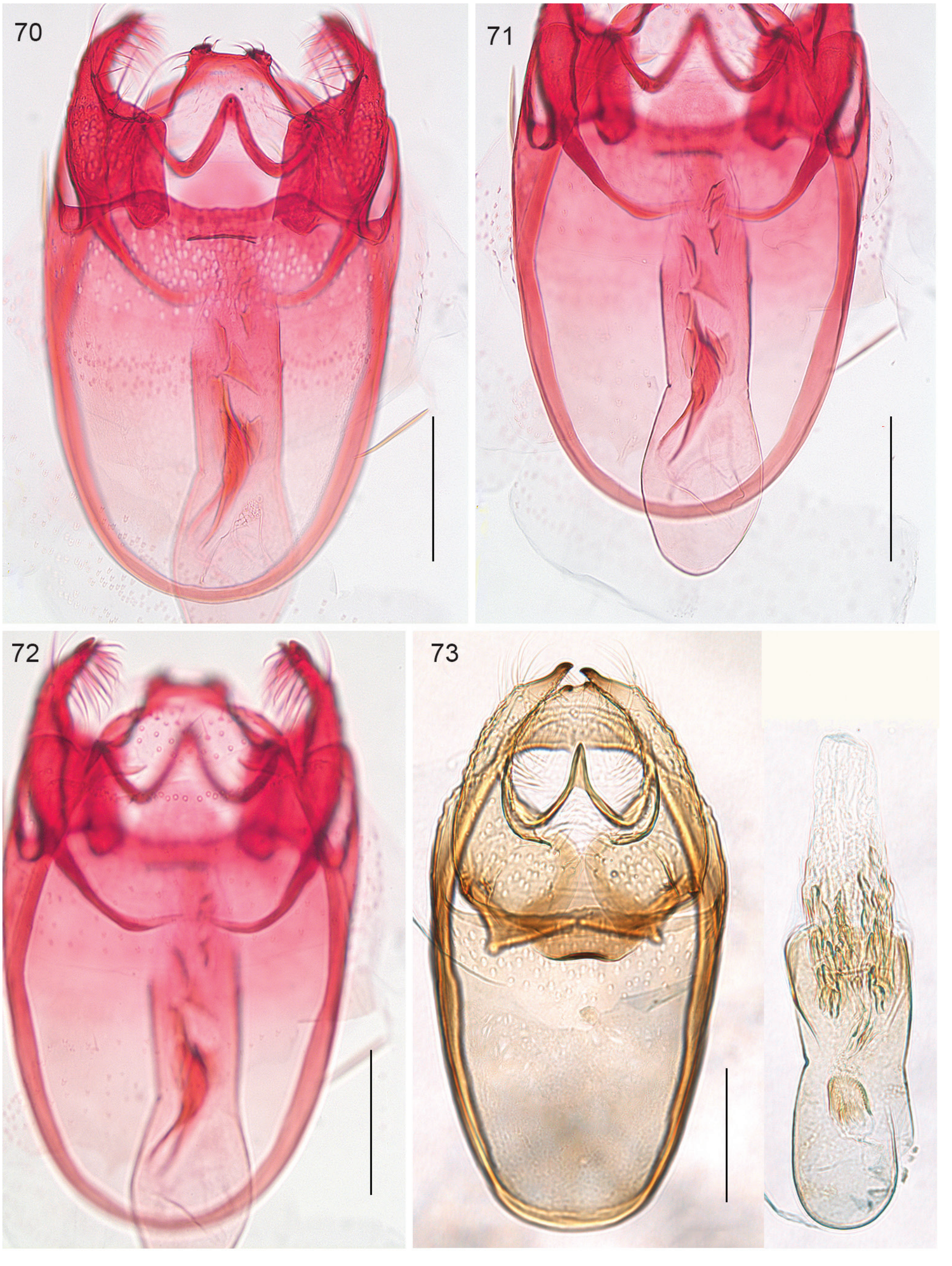
Biology. *Host plants* (Fig. 81). Melastomataceae: *Conostegia oerstediana* O. Berg ex Triana and *C. pitierri* Cogn., evergreen trees. Both species are distributed from Nicaragua to Panama, and recorded between 700 and 2400 m elevations in Costa Rica (Almeda 2007). *C. oerstediana* is one of the widespread trees in the mid-elevation cloud forest of Costa Rica (K. Nishida, personal observation).

Leafmines (Figs 82, 83, 88). Narrow zigzag linear mine, pale brown in colour, on upperside leaf (n=42). Mature mine approximately 50 mm long (n=42). Some mines were found along leaf veins, i.e. mines were angular or square (n=7). The mines were mostly found on mature broad leaves of small treelets of less than a meter tall (n=ca 30). We recorded from a single mine up to 20 mines per leaf, with an average of 5 mines/leaf (n=15). Central portion of leaf mines filled with black frass, deposited in zigzag arcs (Fig. 86). Exit hole on underside of leaf at tip of mine, ellipsoid, 0.6–0.9 mm wide (n=5). Mines were found on leaves with a length of ca. 7–20 cm (mean 15.5) and width of ca. 4–13 cm (mean 9.75) (n=20).

Egg (Fig. 87). Laid singly, translucent with pale gold tint, oval, flat, egg case ca. 0.2 mm long, located contiguously to secondary leaf veins on upperside leaf (n=30). Some vacated egg cases were filled with frass (n=7).

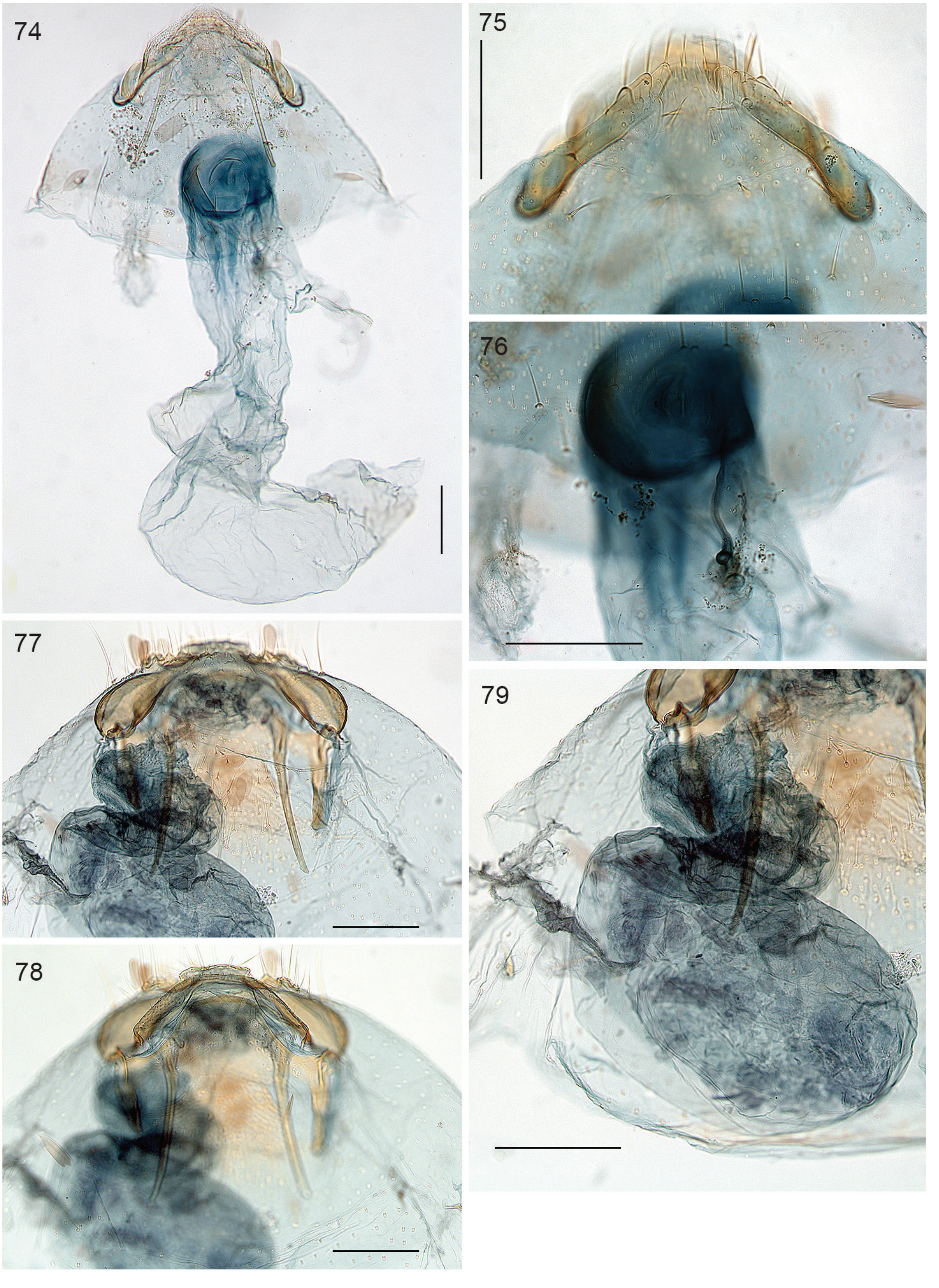
Larva (Figs 84, 85, 93). Late to final instar larva translucent green, final instar larva 3.7 mm long (n=1).

Cocoon (Figs 92, 93). Oval shaped, flat, double chambered, outer cocoon 2.3–3.3 mm long and 1.3–2.0 mm wide, inner cocoon 1.6–2.0 mm long and 0.8–1.3 mm wide, pale brown to brown (n=4). Exit slit side of cocoon slightly thinner and paler than opposite end. Under rearing conditions inside plastic bags, the larvae pupated

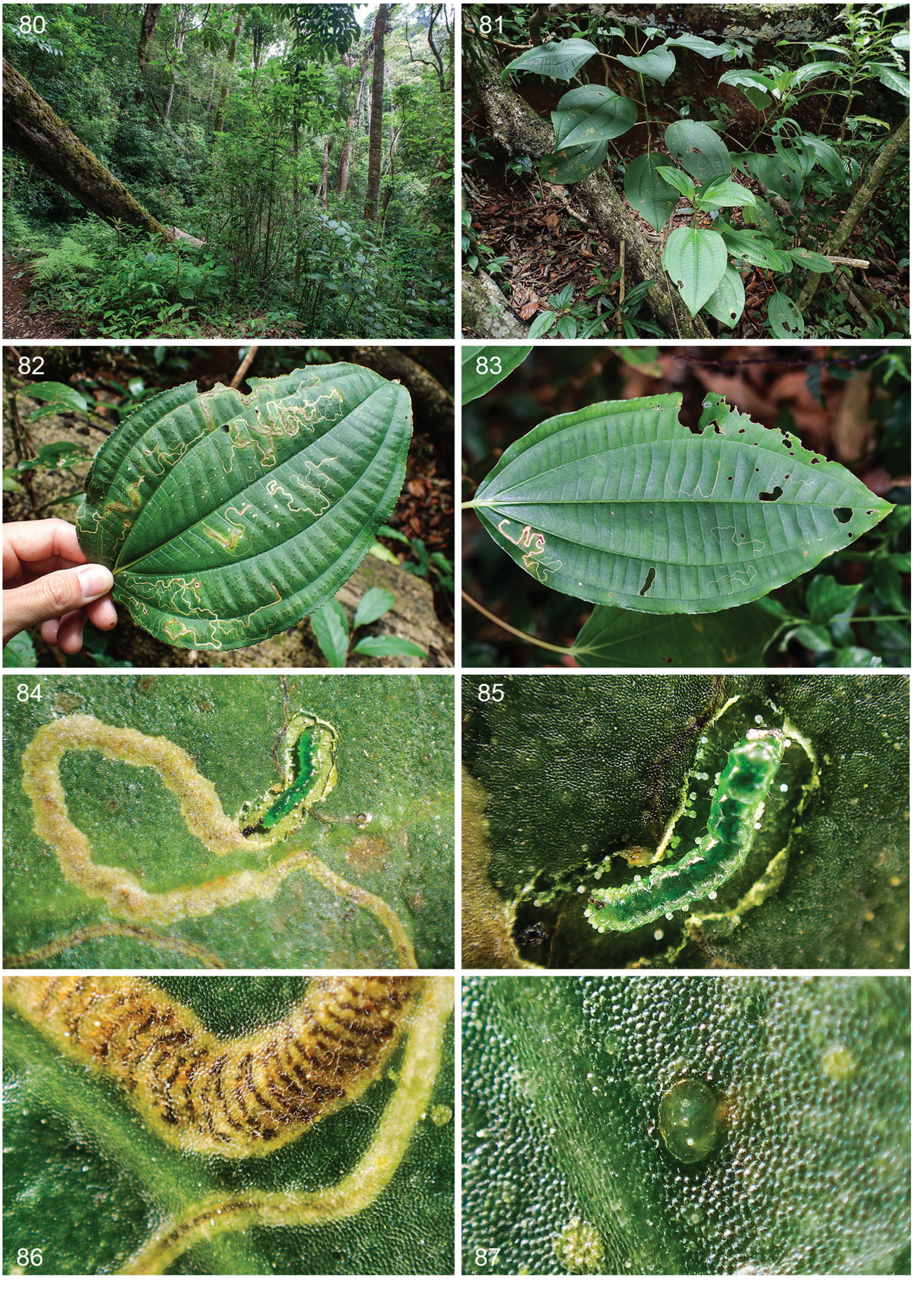


Figures 70–73. *Ozadelpha* gen. n., male genitalia. **70–72** *O. conostegiae*, holotype, at different levels of focus **73** *O. ovata*, holotype. Scale bars: 100 µm.

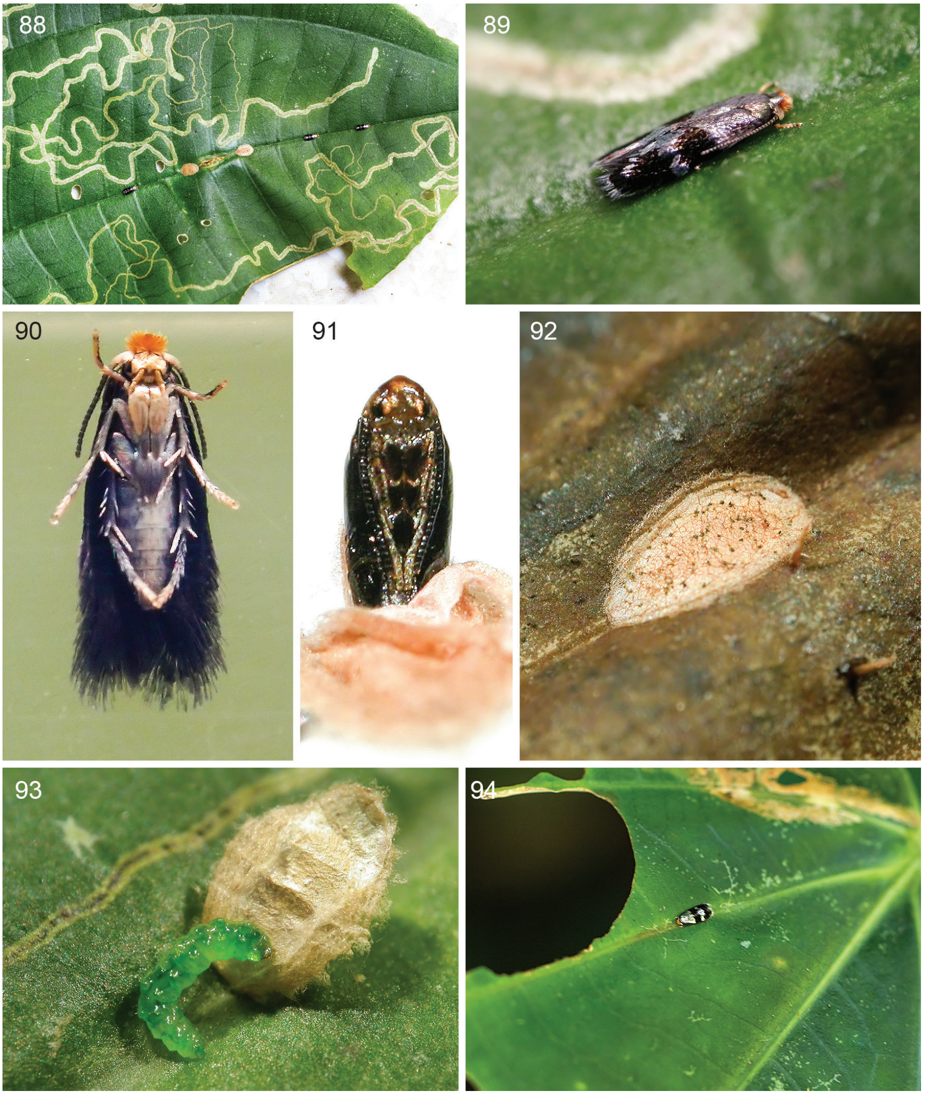
on host plant leaf, next to leaf veins or vein grooves either on upper or underside leaf (n=20) (Figs 88, 92). A species of a solitary koinobiont-endo parasitoid wasp was found inside the inner chamber of cocoon (n=2).



Figures 74–79. *Ozadelpha* gen. n., female genitalia. **74** *O. conostegiae*, dorsal view, slide 4847 **75** ditto, detail of T8 in dorsal view **76** ditto, detail of ductus spermathecae **77–79** *O.* specimen EvN4680. Scale bars: 100 μm.



Figures 80–87. *Ozadelpha conostegiae*, habitat, host plant, *Conostegia oerstediana* and leafmines at Costa Rica, Estación Biológica Monteverde 1530 m. **80** Habitat, a cloud forest (lower mountain wet forest), 8 June 2016 **81** Treelets, infested with some leaf-mining larvae **82** Old leaf mines on host leaf, 24 March 2016 **83** Old leaf and young mines, 25 April 2016 **84, 85** Late instar larva in situ, upper epidermis removed to show larva, calcium oxalate crystals (druses) are not eaten and left behind, 18 May 2016 **86** Close-up of leaf mine, upper mine is of late instar larva, note the zigzag frass line, lower mine is of early instar, 7 June 2016 **87** Egg scale, dorsal view, attached to upperside of host leaf, 7 June 2016.



Figures 88–94. *Ozadelpha conostegiae*, life history details, Costa Rica, Estación Biológica Monteverde 1530 m. **88** Leaf mines, 2 cocoons and 3 adults on midrib on upperside host plant leaf, 29 March 2012 **89** Close up of one adult male **90** Adult female resting on plastic bag under rearing conditions, ventral view, 1 December 2013 **91** Pupa, ventral view, cocoon detached and removed, 7 June 2016 **92** Cocoon spun on upperside on secondary vein under captive conditions, 7 June 2016 **93** Cocoon-spinning mature larva, outer layer cocoon is removed to show larva, 19 June 2016 **94** *Ozadelpha* specimen EvN4680, female, resting on upper side leaf along one of the primary veins, 3 February 2012.

Pupa (Fig. 91). General appearance of mature pupa flat and dark brown, 1.5–1.7 mm long (n=2).

Voltinism and habits. Old and young leaf mines were seen all year round on treelets found along trails in forest understory at the Estación Biológica Monteverde. The larvae pupate away from the mine and host plant under natural conditions; however, it is unknown where the larvae spin their cocoons except for a single cocoon that was found on the underside of a mined leaf, but this was parasitized by a parasitoid wasp. Late stage to mature mines collected on 2.iii.2016 produced adults on 28–29.iii.2016. Mines collected on 21.v.2016 produced mature pupae (n=2) and mature pupae of a parasitoid wasp inside the moth cocoon (n=2) on 7.vi.2016. Mines collected on 25.v.2016 produced 6 cocoons between 2–6.vi.2016. Two eggs on a single leaf collected on 7.vi.2016 produced very early mines of ca. 1.2 mm and 8.6 mm long on 19.vi.2016. White, circular, pellet-like micro objects were found inside mines surrounding mining larvae (n=2) (Figs 84, 85). The pellets are calcium oxalate crystals (druses) according to R. Kriebel (personal communication). Thus the larvae appear to avoid feeding on druses.

Parasitoid. Eulophidae: Entedoninae: *Cornugon diabolos* Hansson (Hansson 2011), endoparasitoid, koinobiont of host larva which pupates inside host cocoon (n=2). This comprises a new host record for the genus *Cornugon* (Hansson 2011 and personal communication).

Distribution. Costa Rica: Alajuela, Guanacaste and Puntarenas Provinces.

DNA barcode. We failed to produce a DNA barcode from the DNA extracts, but we obtained sequences for 28S and COII from the holotype, RMNH.INS.24506. They will be made available through GENBANK with another paper in preparation.

Remarks. *Ozadelpha conostegiae* represents the first published record of a Nepticulidae feeding on Melastomataceae. However, we also collected and reared unnamed *Acalyptris* species from the genus *Melastoma* from Australia: Queensland and Indonesia: Borneo. The genus *Conostegia* comprises 77 species of shrubs and trees in Central America, northern South America and the Carribean (Kriebel 2014).

Etymology. The epithet *conostegiae* is a noun in genitive case, derived from the generic name of the host plant *Conostegia*.

Other material examined. 8♂, 6♀. **Costa Rica**: 1♂, Alajuela Province, Grecia, Reserva Forestal Grecia - Bosque del Niño, 10°.08'32.1"N, 084°.14'49.5"W, 1678 m, leafmines on *Conostegia oerstediana*, xii.2012 adult emergence, Kenji Nishida (RMNH); 1♂, 3♀, Guanacaste Province, Monteverde, Santa Elena, going towards Bosque Eterno de los Niños, San Gerardo Biological Station, 10°.21'25"N, 084°.47'35.1"W, 1500 m, leaf miner *Conostegia oerstediana*, emerged 23.iv.2012, Kenji Nishida, male abdomen missing, 3 female abdomens together in gelatin capsule, wing slide EvN4704, RMNH.INS.24704 (RMNH); 1♂, Puntarenas Province, Monteverde, Estación Biológia Monteverde, 10°19'06.9"N, 084°48'29.3"W, 1530 m, 2.iii.2012 leafmines, 31.iii.2012 adult emergence, *Conostegia oerstediana,* Kenji Nishida; 2♂, 2♀, same data, but 29.iii.2012 adult emergence, genitalia slide ♂ EvN4679, RMNH.INS.24679 (RMNH); 2♂, 1♀, same data, but late stage leaf mines collected 18–19.v.2016, adult emergence 18.vi.2016 (MZUCR); 1♂, Puntarenas Province, Monteverde, Estación Biológia Monteverde, 10°.19'13.95"N, 084°.48'20.83"W, 1600 m, 29.viii.2007 adult emergence, host plant: *Conostegia pitierri*, slide EvN 4844 [preparation of broken exuviae] (RMNH).

Ozadelpha specimen EvN4680

Differential diagnosis. Externally very similar to *O. conostegiae*, but markedly larger (forewing length 2.8 mm against 1.8–2.0). Female genitalia recognised by longer anterior apophyses and very short bursa.

Female (Figs 69, 94). Head: frontal tuft yellow orange, scape white; antenna broken. Collar indistinct, comprising lamellar scales, leaden. Thorax shining brass, forewing with basal leaden patch, a silver fascia at 2/3, narrowed in middle, at dorsum widened in both directions, silver scales along dorsum reaching basal patch. Hindwing scaling shining brown-grey. Abdomen dark fuscous, broadly rounded at tip.

Measurements. Female: forewing length 2.8 mm (n=1).

Female genitalia (Figs 77–79). T8 without setae. Anterior apophyses widened, ending in pointed process; posterior apophyses straight and narrow, longer than anterior ones. Total length bursa ca 340 µm, ductus bursae with one coil, corpus bursae asymmetric curved sac, devoid of any spines or pectinations. Ductus spermathecae without convolutions.

Biology. *Host plants.* Unknown. The moth was found resting on the upperside of a *Conostegia oerstediana* (Melastomataceae) leaf along one of the main veins, thus this may well be the host.

Voltinism and habits. The moth was collected on March 2nd, 2012.

Distribution. Costa Rica: Puntarenas Province.

Remarks. We leave this species presently unnamed, as we only have a single female and no data on life history. There appear to be more closely related species of *Ozadelpha* feeding on *Conostegia* in Costa Rica, and we therefore rather await more material in order to be able to discriminate the various species better.

DNA barcode. We barcoded the single specimen, currently the only DNA barcode we obtained from the genus *Ozadelpha*. This specimen was also sequenced for other genes and used in the molecular phylogeny (Doorenweerd et al. 2016). Sequences may be retrieved in BOLD and Genbank under voucher/sampled ID RMNH.INS.24680.

Material examined. Costa Rica: 1♀, Puntarenas Province, Monteverde, Estación Biológica Monteverde, 1530 m, 10°19'06.9"N, 084°48'29.3"W, 2.iii.2012 resting on upperside of *Conostegia oerstediana* leaf along the vein, Kenji Nishida & Yuriko Demura; genitalia slide ♀ EvN4680, RMNH.INS.24680 (RMNH).

Neotrifurcula van Nieukerken, gen. n.

http://zoobank.org/E1E59003-CB86-45C0-B41A-E3E03BEF56FA

Type species. *Neotrifurcula gielisorum* van Nieukerken sp. n. by present designation.

Diagnosis. *Neotrifurcula* can be recognised by the hindwing venation with trifurcate Rs+M, and a very long and separate CuA in forewing, collar with hairscales, in the genitalia male phallus with a long curved flagellum-like appendix; female with reticulate signa and complex vaginal sclerite. *Glaucolepis* has a similar venation, but usually a velvet patch of special scales on hindwing and three pairs of anal tufts.

Description. *Adult* (Figs 97–99). Medial to large nepticulid moths, forewing length 2.7–4.8 mm, largest over 10 mm wingspan. Head with collar comprising piliform scales; antenna with 42–58 segments in male (n=4), 47 in female (n=1). Forewing with distinct or less distinct fascia, sometimes metallic, no subdorsal retinaculum in male. Hindwing in male with costal bristles, no androconial scales observed. Venation (Fig. 95): very complete, with closed cell, R+Rs+M with 6 terminal branches: R, Rs1+2, Rs3, Rs4, M1 and M2, CuA separate and long, approaching Rs+M; A thickened; Hindwing broad, with 5 veins, Rs+M trifurculate: Rs, M1, M2. Abdomen: anterior part of sternum 2 with two lobes on posterior margin (Fig. 96). Tergum 8 with distinct anal tufts, tergum 3–7 with lateral groups of many setae and scales.

Male genitalia. (Figs 100–104). Vinculum ring shaped, fused with tegumen; ventral plate expanded, not bilobed. Uncus Y shaped. Gnathos with large triangular central element. Valva elongate to triangular, transtilla without transverse bar, sublateral processes distinct. Juxta V-shaped. Phallus long, gradually tapering caudally; a peculiar long curved process at left side; vesica with small group of several cornuti.

Female genitalia (Figs 107–110). T9 a pair of setose anal papillae; T8 rounded, with a few setae. Anterior apophyses, slightly longer than posterior ones. Vestibulum with sclerotisation; corpus bursae with a pair of reticulate signa. Ductus spermathecae with 3.5 convolutions.

Biology. Hostplant and immature stages unknown. Adults collected in *Nothofagus* forests from November to January.

Distribution. Chile and Argentina, southern parts at low and medial altitudes.

Composition. Next to the type species, we include two unnamed species, for one of which we only have one female that was sequenced, another one only one worn male on loan from Copenhagen (ZMUC). We find the DNA barcode distance too large to include the female in *N. gielisorum* and the male is much smaller and shows some differences in the genitalia. According to Jonas Rimantas Stonis (personal communication) there is a group of several closely related species of *Neotrifurcula* in Patagonia, estimated to comprise at least five species.

Etymology. *Neotrifurcula*, a noun, a combination of the prefix *neo-*, new, here derived from Neotropics, and the Latin noun *Trifurcula* (= a three-pronged fork), another nepticulid genus with a 3-forked Rs+M in the hindwing. The name is to be treated as feminine.

Remarks. The anterior sclerite of sternum 2 (S2A) has anterior apodemes similar to *Bohemannia* Stainton, 1859. The venation also has several similarities to *Bohemannia*, although the latter seems more reduced by the fusing of CuA with Rs+M and the reduction of the closed cell. This supports the possible sistergroup relationship to *Bohemannia* or *Bohemannia* + *Hesperolyra* that we found in our molecular analyses (Doorenweerd et al. 2016). Overall the species of *Neotrifurcula* resemble *Glaucolepis* in several ways: the venation is almost identical, the transverse bar of transtilla is absent, but *Neotrifurcula* does not have the male "velvet patch", the phallotrema spines. The flagellum-like appendix of the phallus is a remarkable character of as yet unknown function. This character requires further detailed morphological study. It is likely an apomorphy for the genus.

Neotrifurcula gielisorum van Nieukerken, sp. n.

http://zoobank.org/A2E86BAF-5CB2-41A7-8F54-DDB5CF7D1BCA

Holotype male. Chile, Ñuble, Bio-Bio (VIII), 2 km N Las Trancas, 70 km E Chilan, 1400 m, 36.54S-71.28W, 6.i.2001, C. Gielis & H. W. van der Wolf, sta 53, genitalia slide EvN4503, RMNH.INS.24503 (RMNH).

Differential diagnosis. One of the largest nepticulids with a wingspan of almost 10 mm. Recognised by very broad cream fascia, male genitalia characteristic by flagellum-like appendix on phallus, but several closely related, but smaller species have very similar genitalia.

Description. *Male* (Figs 97, 98). Head with frontal tuft pale yellow ochreous, collar similar, comprising hairscales; scale and pedicel similar, flagellum grey-brown. Antenna with 54–58 segments (n=3). Thorax fuscous, forewing fuscous with a very wide, irregular, pale cream medial fascia of ca. half wing length, with scattered fuscous scales; distally a double cilia line, separated by a cream patch. Hindwing broad, brown, costal bristles present, no androconials.

Female. Unknown.

Measurements. Male: forewing length 4.0–4.8 mm (n=3), wingspan: 8.7–10.1 mm.

Male genitalia (Figs 100–104, 111–114). Capsule length 460–480 µm. Tegumen fused with vinculum, ring-shaped; vinculum extended anteriorly. Uncus with medial truncate process, slightly dilated apically. Gnathos with large triangular central element. Valva length ca 265–270 µm, narrow, elongate, inner margin slightly sinuous, tip triangular. Transtilla without transverse bar, sublateral processes distinct. Juxta V-shaped, joining valvae and phallus. Phallus length 450–490 µm, gradually tapering caudally; a long curved process left side, first curved anteriorly, then making a 180 degrees turn to the dorsal side and ending posteriorly, close to phallotrema; vesica with small group of cornuti.

Biology. *Host plants.* Unknown.

Voltinism and habits. The moth was collected from mid-December to mid-January.

Distribution. Chile: Curoco, Ñuble and Valparaiso. In both localities with dense forest of large *Nothofagus* trees at middle altitudes (1100–1500 m) (Fig. 105).

DNA barcode. We barcoded two specimens, including the holotype, both in BIN BOLD ACG8607. One specimen was also sequenced for other genes and used in the molecular phylogeny (Doorenweerd et al. 2016). Sequences may be retrieved in BOLD and Genbank under voucher/sample ID RMNH.INS.23527.

Etymology. The specific name *gielisorum* is a noun in plural genitive, based on the family name Gielis, to honour Cees and Siska Gielis for their efforts not only to collect this species, but to explore and collect Microlepidoptera widely in South America, and to publish in particular about the plume moths, Pterophoridae.

Other material examined. Chile: 1♂, Curico, Maule (VII), 60 km SE Molina, RN Radal Seite Tazas, 1100 m, 18–19.xii.2000, 35.28S-71.00W, C. Gielis & FK Gielis, sta. 45, genitalia + wing slide EvN4703 (RMNH); 1♂, Nuble, Bio-Bio (VIII), 2 km N Las Trancas, 70 km E Chilan, 1400 m, 36.54S-71.28W, 14.i.2001, C. Gielis & H. W. van der Wolf, sta 63, genitalia + wing slide EvN3527 (RMNH).

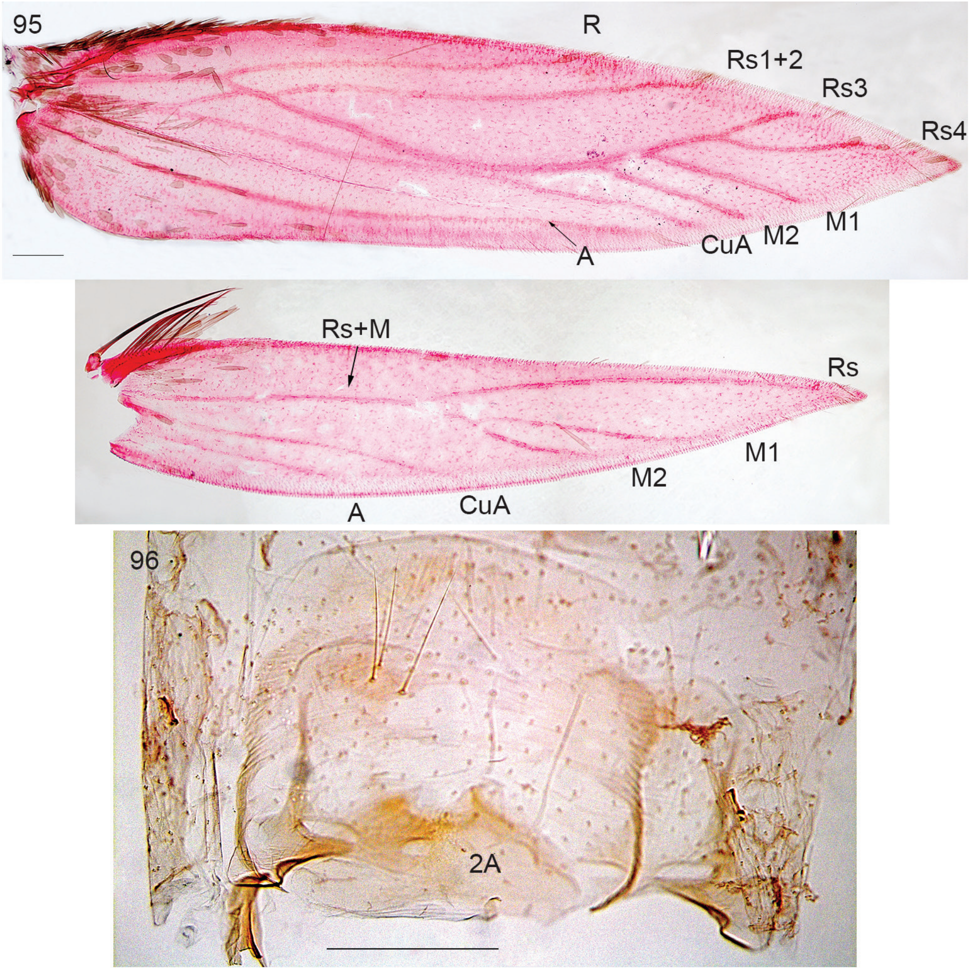


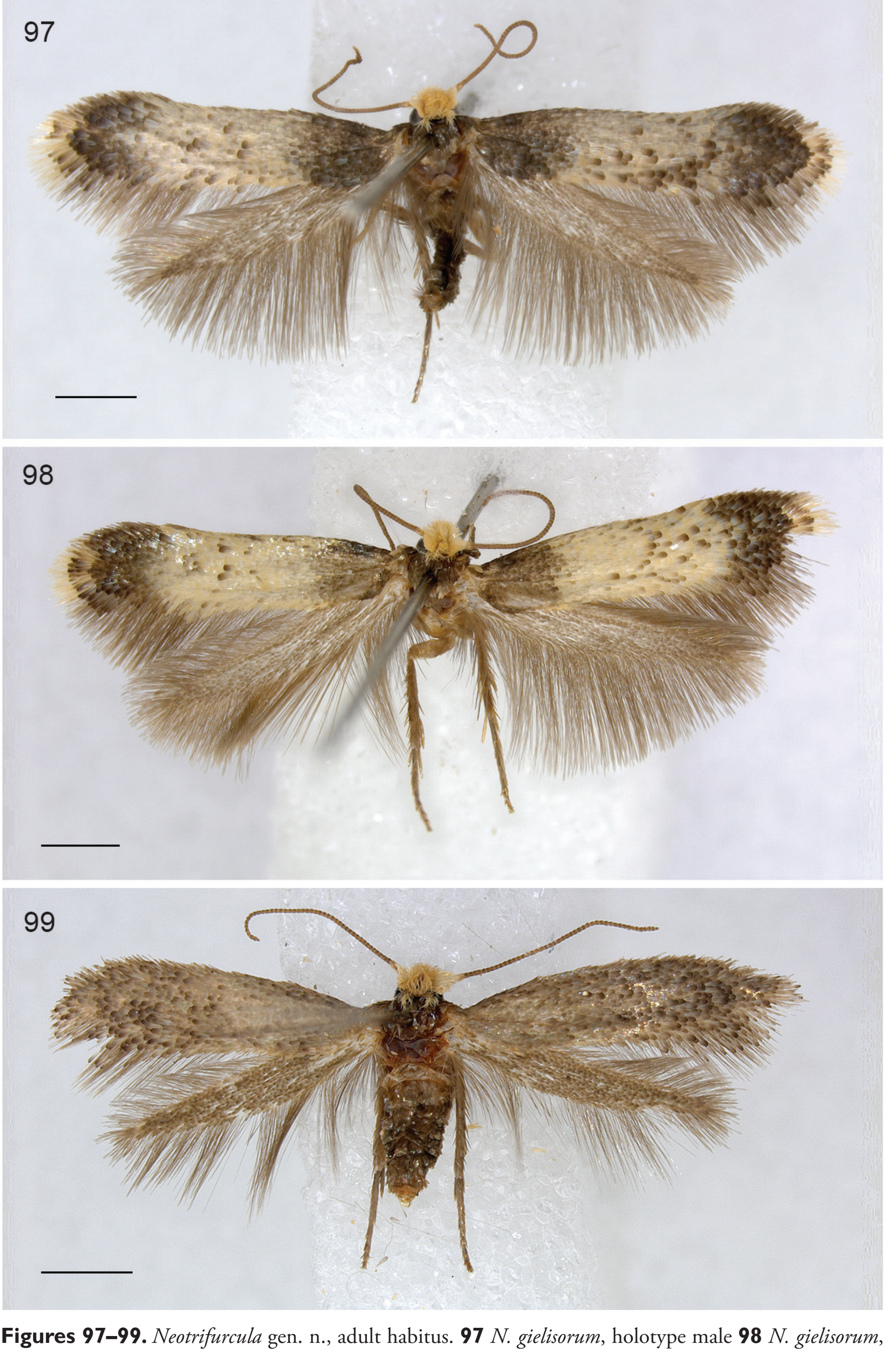
Figure 95–96. *Neotrifurcula gielisorum* gen. n., sp.n., male. **95** venation, veins labelled, slide EvN4703 **96** Abdominal segment 2, showing 2A, slide EvN4703. Scale bars: 200 µm.

Neotrifurcula specimen EvN4504

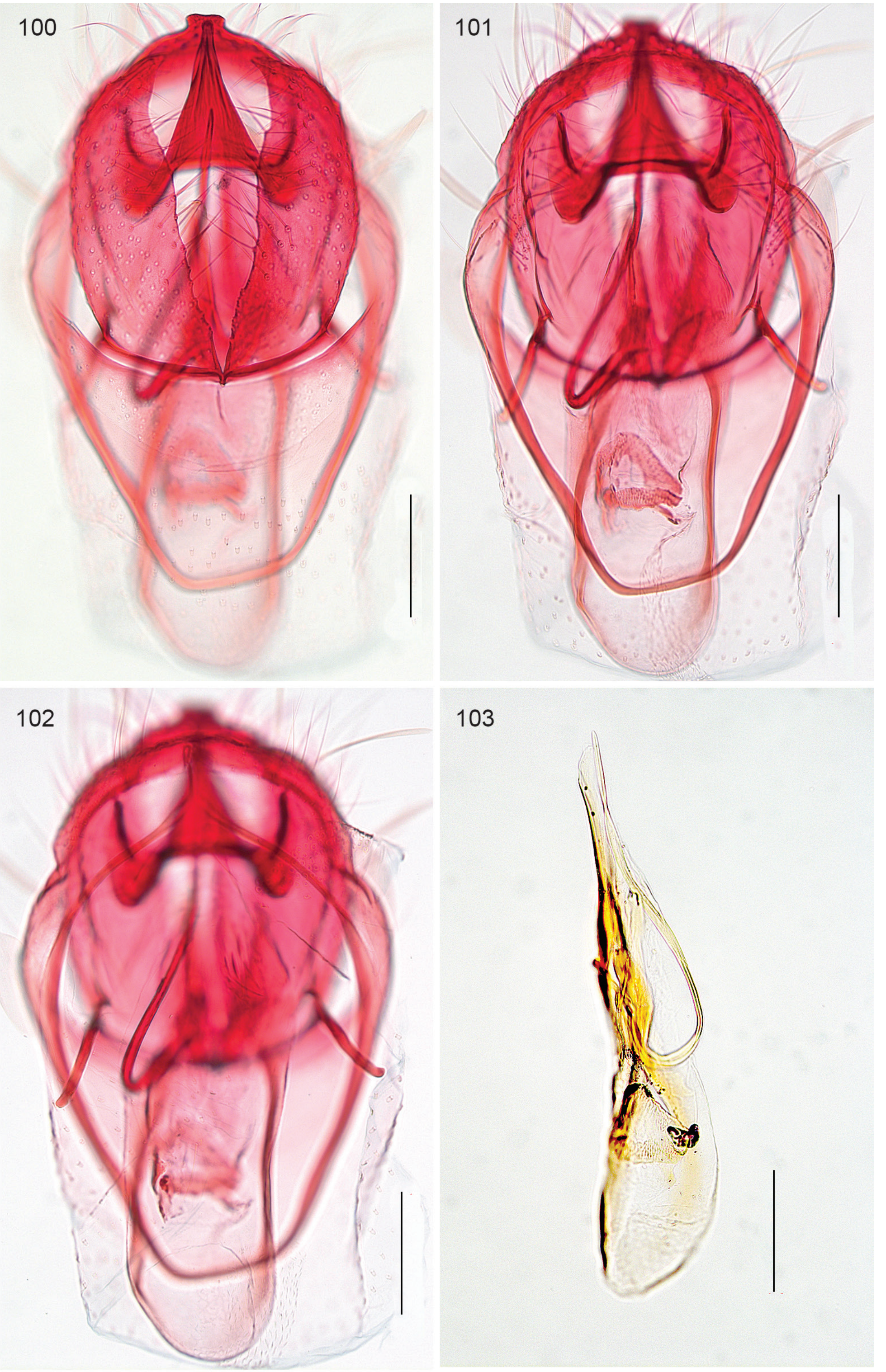
Differential diagnosis. Externally similar to *N. gielisorum*, but no distinct fascia. Female genitalia characterised by ductus spermathecae with 3.5 convolutions, distinct reticulate signa and omega-shaped sclerotisation in vestibulum.

Description. *Male.* Unknown.

Female (Fig. 99). Head with frontal tuft pale yellow ochreous, collar similar, comprising hairscales; scale and pedicel similar, flagellum grey-brown. Antenna with 47 segments. Thorax descaled, forewing somewhat worn, fuscous with pale cream basal patch of ca. half wing length, with scattered fuscous scales and some metallic silver scales. Hindwing broad, brown, costal bristles present. Ovipositor rounded.



Figures 97–99. *Neotrifurcula* gen. n., adult habitus. **97** *N. gielisorum*, holotype male **98** *N. gielisorum*, male, RMNH.INS.23627 **99** *N.* specimen EvN4504, female, RMNH.INS.24504. Scale bars: 1 mm.



Figures 100–103. *Neotrifurcula gielisorum*, male genitalia. **100–102** holotype, various levels of focus **103** Phallus separate, lateral view, slide EvN4703. Scale bars: 100 µm.

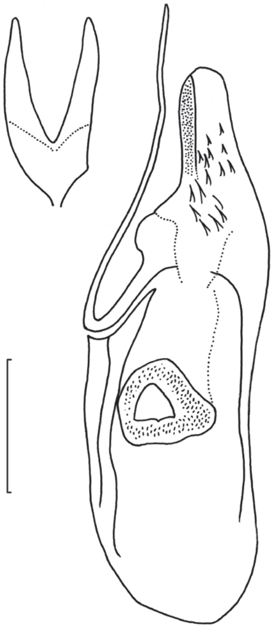


Figure 104. *Neotrifurcula gielisorum*, phallus and juxta (top left), ventral view, holotype. Scale: 100 µm.

Measurements. Female: forewing length 3.8mm, wingspan 8.2 mm.

Female genitalia (Figs 107–110). T9 forming a pair of protruding anal papillae with 12 setae each; T8 rounded, with a few setae. Anterior apophyses anteriorly widened, slightly longer than posterior ones. Total bursa length 1160 µm long. Vestibulum with an omega shaped sclerotisation surrounding entrance of ductus bursae (Fig. 109); a pair of reticulate signa of ca 340 µm long, maximum 5 cells wide (Fig. 110); wall of bursa devoid of pectinations. Ductus spermathecae with 3.5 convolutions.

Biology. *Host plant.* Unknown.

Voltinism and habits. The moth was collected in February.

Distribution. Chile: Valparaiso. Collected in open shrubby habitat, with shrubby species of *Nothofagus* (Fig. 106).

DNA barcode. We obtained a full barcode of the specimen, with BIN BOLD:ACU6693, showing a distance to barcodes of *N. gielisorum* of ca 12%.

Remarks. The huge barcode distance to *N. gielisorum* and the differences in the wing pattern show clearly the species status of this specimen. It could possibly be the female of the next species, but difference in size and number of antennal segments make this rather unlikely.

Material examined. 1♀, **Chile**: Valparaiso, Parque Nat. La Campana, 6 km E of Olmue, 450 m, 33.00S-71.03W, 19.ii.2001, R.T.A. Schouten & H. W. van der Wolf, station 90, Nothofagus forest near brooklet, genitalia slide EvN4504 (RMNH).

Figures 105–106. *Neotrifurcula* sp., habitats in Chile **105** (top), Type locality *N. gielisorum*, Nuble, Bio-Bio, 2 km N Las Trancas, 1400 m, 6 January 2001, edge of *Nothofagus* forest **106** (bottom) Locality for *Neotrifurcula* specimen EvN4504 Valparaiso, Parque Nat. La Campana, 450 m, *Nothofagus* forest near brooklet, photo 8 November 2000, specimen collected here 19 February 2001.

Neotrifurcula specimen RH2

Differential diagnosis. The moth is markedly smaller than the previous two species, but too worn to see external diagnostics. Male genitalia similar to *N. gielisorum*, but smaller, valva more triangular and more distinct and cornuti larger.

Description. *Male* Antenna with 42 segments, forewing length 2.7 mm. Head pale, forewings and thorax brown, very worn, pattern not visible.

Female unknown.

Measurements. Male: forewing length 2.7mm.

Male genitalia (Figs 111–114). Capsule length 430 µm. Tegumen fused with vinculum, ring-shaped; vinculum extended anteriorly. Uncus with medial truncate process. Gnathos with large triangular central element. Valva length ca 215 µm, approximately triangular, tip pointed. Transtilla without transverse bar, sublateral processes distinct but rather short. Juxta V-shaped, joining valvae and phallus. Phallus length 450 µm, gradually tapering caudally; a long curved process left side, first curved anteriorly, then making a 180 degrees turn to the dorsal side and ending posteriorly, close to phallotrema; vesica with group of distinct cornuti.

Biology. *Host plant.* Unknown.

Voltinism and habits. The moth was collected in November, around the conifer *Podocarpus salignus* D. Don (on the label incorrectly cited as *saligna*). It is unlikely that this represents the host.

Distribution. Chile: Valdivia.

Remarks. The moth had been studied by Robert Hoare for his thesis, and is part of a larger series that is under study with the group of J.R. Stonis (Vilnius) and probably will be described by them.

Material examined. 1♂, **Chile**, Valdivia, 20 km S Valdivia, Rincon de la Piedra, 15.xi.1981, Nielsen & Karsholt, station 15, caught around *Podocarpus saligna*, Genitalia and wing slide R. Hoare South America 2 (ZMUC).

Hesperolyra van Nieukerken, gen. n.

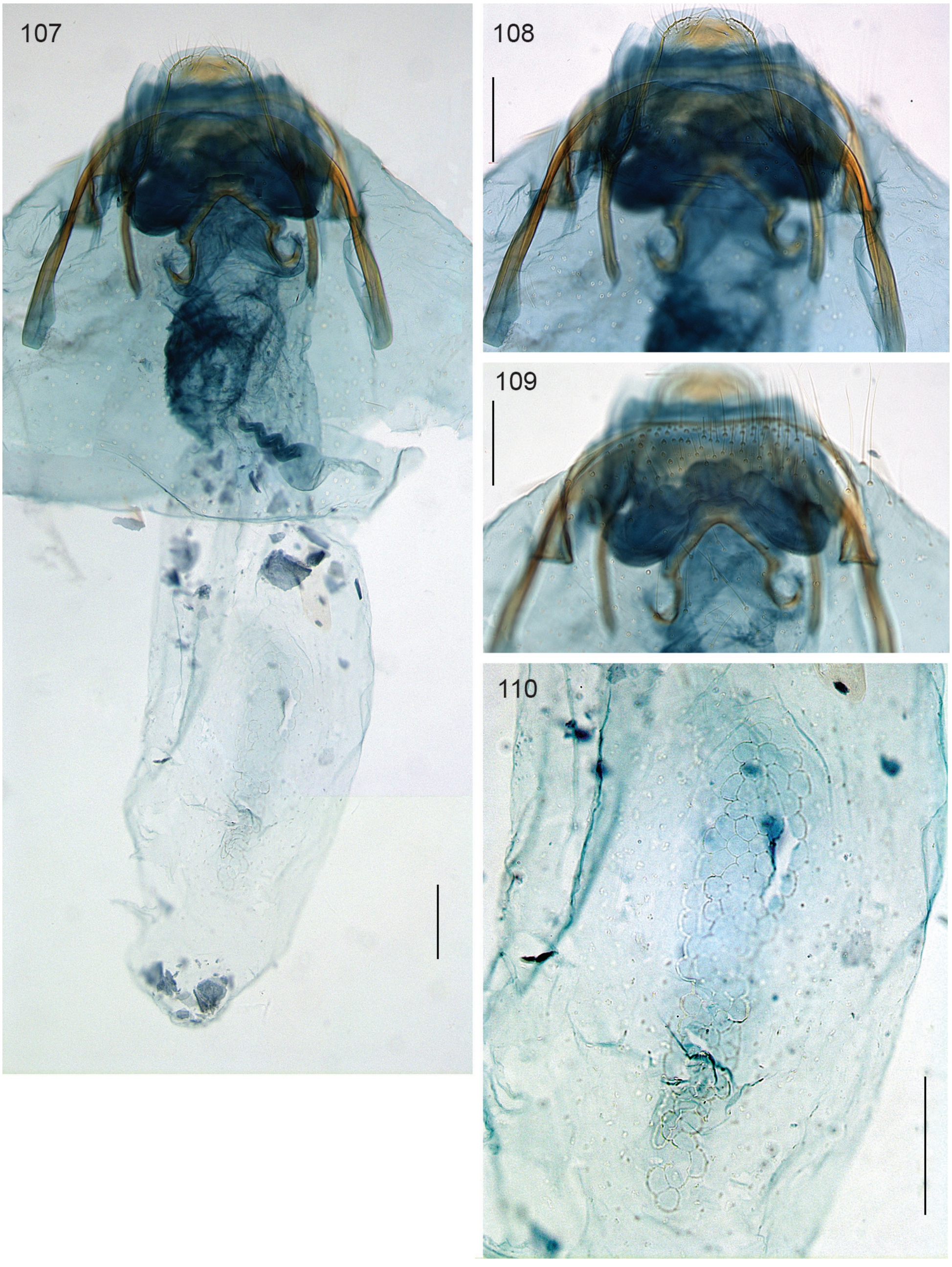
http://zoobank.org/BDA8170A-00CA-4613-8944-8DDE631A01D2

Fomoria molybditis group Puplesis et al. 2002b: 66.

Type species. *Fomoria diskusi* Puplesis & Robinson, 2000: 43, by present designation.

Diagnosis. There are no obvious external characters apart from the venation: broad forewing with a straight main vein with 4 branches, CuA absent, rather resembling *Acalyptris*, but no vestigial closed cell present and wings broader. The most obvious characters are in the male genitalia: bifurcate pseuduncus, deeply divided valva and long extended lyre-shaped transtilla. Female genitalia without reticulate signa, small bursa.

Description. *Adult* (Figs 117–121). Small to large nepticulid moths, forewing length 1.8–4.0 mm. Head with collar comprising piliform scales. Antenna with 24–40 segments in male, 23–33 in female. Forewing variously patterned, no subdorsal reti-



Figures 107–110. *Neotrifurcula* specimen EvN4504, female genitalia, slide EvN4504. Scale bars: 100 µm.

naculum in male. Hindwing in male without costal bristles, no androconial scales observed. Forewing fold with group of hidden androconials in *H. diskusi* (Figs 126, 127). Venation (Figs 115, 116): simplified, forewing rather broad, R separate from base, a straight main Rs+M, without closed cell, with 3 branches: Rs1+2, Rs3+4 and M; CuA

Figures 111–114. *Neotrifurcula* specimen RH2. Male genitalia, slide RH SA2. Scale bars: 100 µm.

absent (or fused), A thickened; Hindwing broad, with 3 or 4 visible veins, a bifurcate Rs+M, CuA and A. Tergum 8 with anal tufts.

Male genitalia. (Figs 121–125). Vinculum ring shaped, fused with tegumen; ventral plate expanded, very long, slightly excavated. Tegumen forming a bilobed pseuduncus. Uncus Y shaped. Gnathos with small central element. Valva complex, usually deeply divided, elongate to triangular, transtilla with enlarged transverse bar, forming a lyre-shaped anterior extension, comprising distinct but small sublateral processes. Various elaborate long spines either as part of valva or as ventral process (juxta). Phallus long, vesica often with many cornuti.

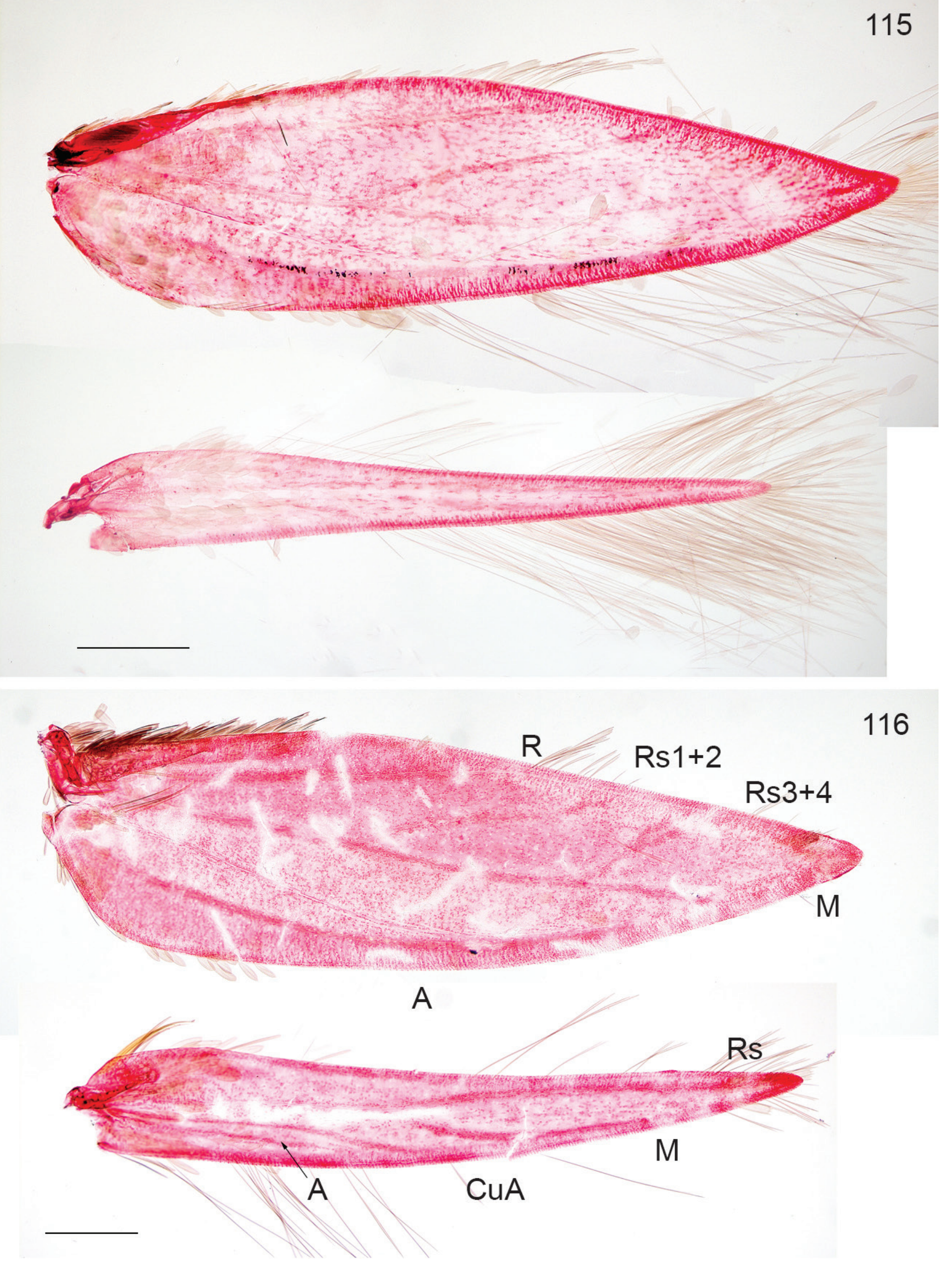
Female genitalia (Figs 129–136). T9 a pair of setose anal papillae; T8 broadly rounded, with some setae. Anterior apophyses slightly shorter than posterior ones. Vestibulum without sclerotisation; corpus bursae without signa, rather flimsy, a small folded accessory sac leading to a coiled ductus spermathecae with 2–7 convolutions.

Pupa (Figs 140–141). Frons in eclosion separated from scape. Abdominal tergites 2–8 with each ca 4 rows of spines.

Biology. So far the host plant is only known for one species, *H. saopaulensis*: Myrtaceae, on which the larva makes normal gallery mines (Figs 137–138).

Distribution. Only known from the Neotropics: Belize, Brazil, Colombia and Ecuador.

Composition. We recombine here the species previously placed in the *Fomoria molybditis* group: *Hesperolyra diskusi* (Puplesis & Robinson, 2000), comb. n., *H. molybditis* (Zeller, 1877), comb. n., *H. repanda* (Puplesis & Diškus, 2002), comb. n. and describe one new species, *Hesperolyra saopaulensis* van Nieukerken sp. n. One unnamed species also belongs here: *Hesperolyra* species 29122 (Puplesis & Robinson, 2000).



Figures 115–116. *Hesperolyra* gen. n., venation. **115** *H. diskusi*, male paratype, slide EvN4501 **116** *H. saopaulensis*, female, veins labelled, slide EvN4505. Scale bars: 200 µm.

Etymology. The name *Hesperolyra* is a combination of Hespero- from Hesperus (the evening star), referring to the occurrence in the western hemisphere, and lyra (lyre), referring to the lyre shaped transtilla, a common character for species where the male is known. The name is to be treated as feminine.

Remarks. The present genus was recognised first in our molecular analysis by the new species *H. saopaulensis*, that consistently grouped outside any known genus, often together with *Neotrifurcula*, but at a large distance. Since we did not have a male of *H. saopaulensis*, a generic description seemed problematic, until we noticed similarity to the recently obtained DNA barcode of *Fomoria diskusi* and the unusual venation of both species, quite different from any other *Fomoria*. *Fomoria diskusi* was placed with some other species in the *Fomoria molybditis* group (Puplesis et al. 2002b), here treated as a synonym of *Hesperolyra*. Puplesis and Robinson (2000) placed *H. molybditis* and *diskusi* in *Fomoria* on the basis of superficial similarity of male genitalia, even though the venation is markedly different, resembling more that of *Acalyptris*. The authors even stated that "the unusually reduced wing venation lends additional support." The lack of apomorphies for *Fomoria* s. str. make assignment of any species to that genus difficult without molecular support, and even with eight genetic markers the support is not high (Doorenweerd et al. 2016). After careful comparison we are convinced that the species in this group and *H. saopaulensis* are congeneric. We selected *H. diskusi* as type species, because it is the only species for which males and females are known. By this action, *Fomoria tabulosa* Puplesis & Diškus, 2002 remains the only known Neotropical species of *Fomoria*. Whether this indeed belongs to the clade to which the type species of *Fomoria*, *F. weaveri* (Stainton, 1855), belongs, remains unclear, the genitalia are rather atypical and the venation has not been studied.

Hesperolyra diskusi **(Puplesis & Robinson, 2000), comb. n.**

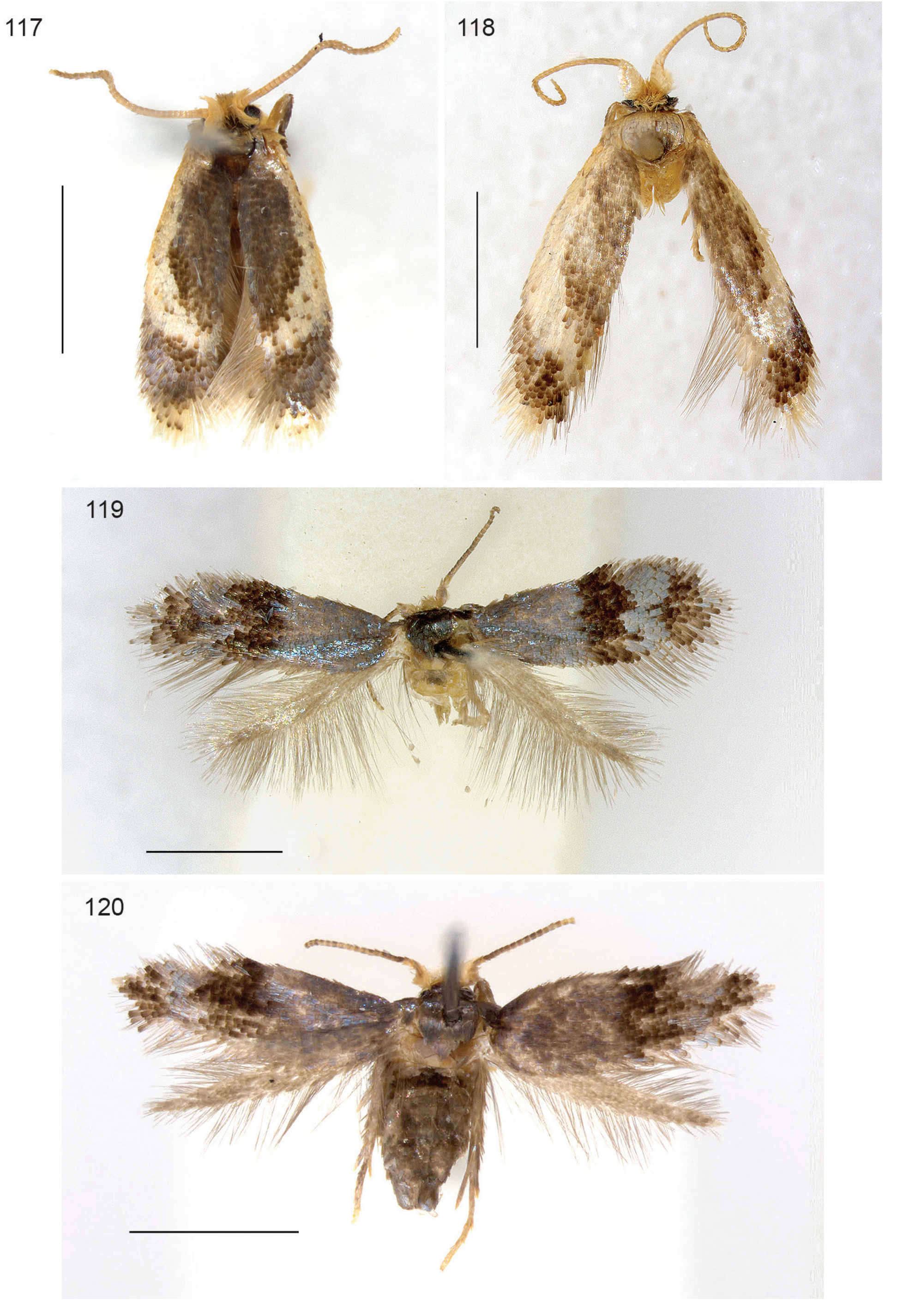
Fomoria diskusi Puplesis & Robinson, 2000: 43. Holotype ♂: BELIZE: Cayo Distr., Chiquibul For. Res., Las Cuevas, 3–16.iv.1998, R. Puplesis & S. Hill, Genitalia slide BM28844 (BMNH). [examined]

Differential diagnosis. *Hesperolyra diskusi* is easily recognisable by its striking pattern: the pale costal streak that turns into an outward oblique fascia at 2/3. In the male genitalia the characteristic long spines separate it from congeners.

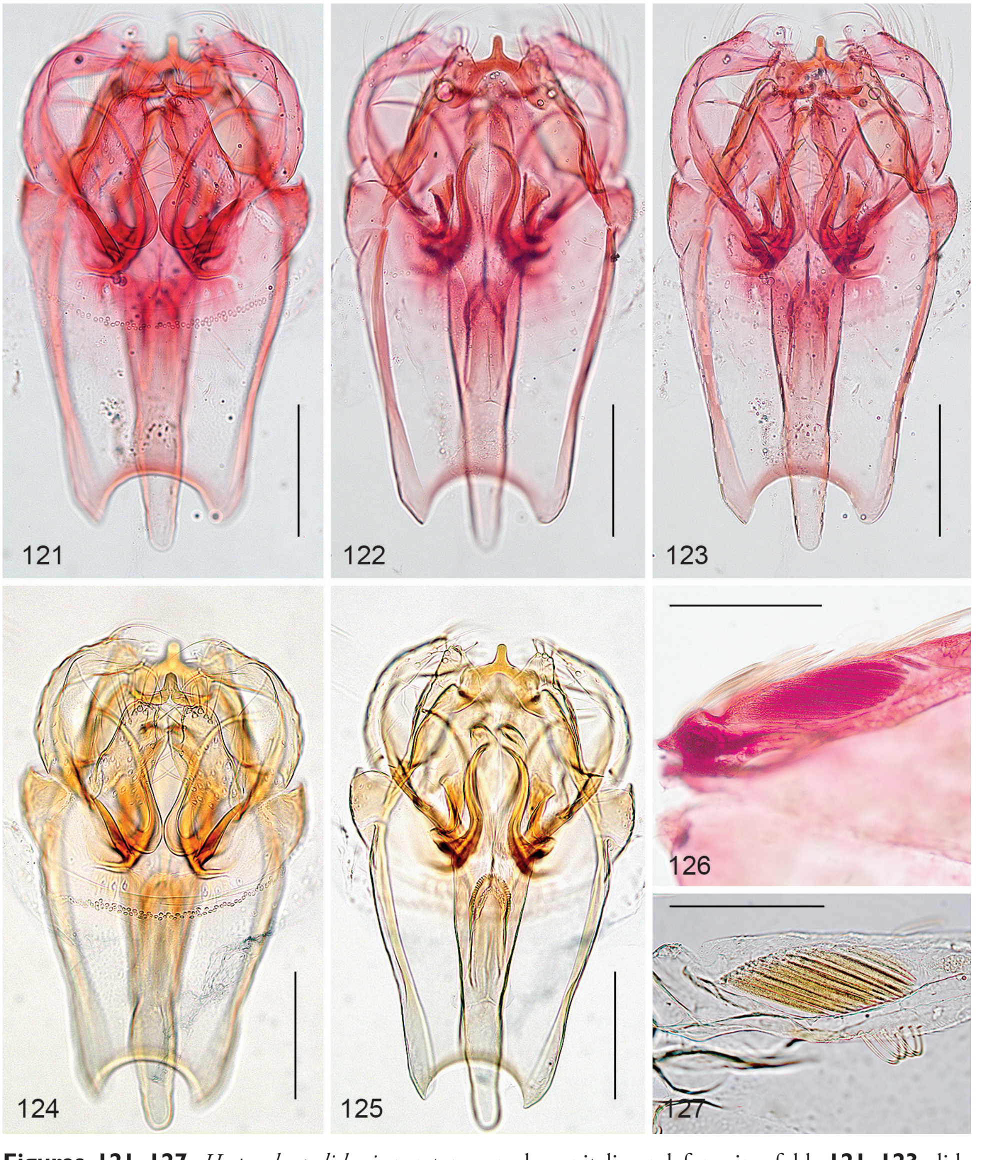
Redescription. *Male* (Fig. 117). Frontal tuft yellow to orange; scape shining yellowish white, antenna with 37–39 segments. Collar of hairscales similar to frontal tuft. Thorax and forewing fuscous; yellowish white pattern comprising a costal streak running from wing base to slightly over 1/2, then changing into an outwards oblique fascia running to 2/3 of dorsum, and becoming narrower towards dorsum; scales along costa stronger yellow; terminal cilia yellowish white beyond an irregular cilia line. Thorax anteriorly pale, posteriorly fuscous, in rest joining to the forewing pattern. Forewing under fold with a conspicuous row of special scales, only visible in descaled wings (Figs 126, 127).

Female (Fig. 118). Antenna with 33 segments. Otherwise as male.

Measurements. Male: forewing length 1.8–2.3 mm (n=2), wingspan 4.0–5.0 mm. Female: forewing length 2.1 mm (n=1), wingspan 4.6 mm.



Figures 117–120. *Hesperolyra* gen. n., adult habitus. **117** *H. diskusi*, male paratype, RMNH.INS.24501 **118** *H. diskusi*, female paratype, BMNH(E)1625477 **119** *H. saopaulensis*, female holotype **120** *H. saopaulensis*, female RMNH.INS.24505. Scale bars: 1 mm.



Figures 121–127. *Hesperolyra diskusi*, paratypes, male genitalia and forewing fold. **121–123** slide EvN4501 **124–125** slide BM29130 **126–127** Forewing fold and costal retinaculum, showing special scales hidden under fold, stained slide EvN4501, unstained, slide BM28847. Scale bars: 100 µm.

Male genitalia (Figs 121–125, 128) (n=3). Total length capsule ca 330–350 µm. Vinculum long, anteriorly with small excavation; tegumen in middle with excavation, resulting in bilobed pseuduncus; uncus inverted Y-shaped; gnathos almost similar in shape to uncus. Valva 165–190 µm, elaborate bilobed structure, with curved outer lobe and rather straight flat inner lobe, and three elaborate long and curved spines that attach to the anellus; transtilla without sublateral processes, transverse bar extending

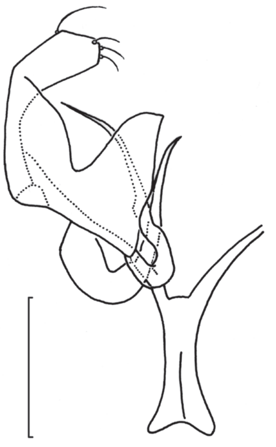
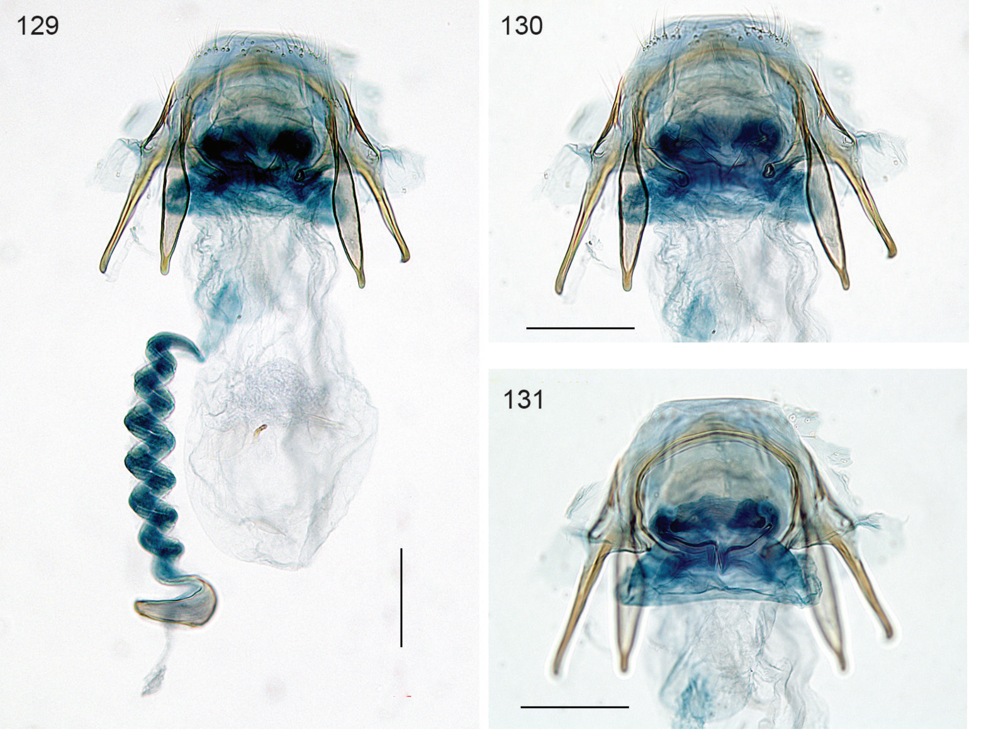


Figure 128. *Hesperolyra diskusi*, paratype, slide EvN4501, detail of left valva and lyre-shaped transtilla. Scale: 100 µm.



Figures 129–131. *Hesperolyra diskusi*, female genitalia, paratype, slide BM28846. Scale bars: 100 µm.

anteriorly in a lyre-shaped plate. Phallus ca 320–350 µm long, tapering anteriorly, posteriorly attached to the long valval spines, some of which may actually be carinal processes.

Female genitalia (Figs 129–131). T9 forming broad pair of anal papillae with each ca 15 setae. T8 with rather square posterior margin, some setae on either side. Anterior apophyses narrow, posterior apophyses slightly widened, of about same length. Total length of bursa 460 µm. Bursa without signa or other ornamentation. Ductus spermathecae distinct and longer than corpus bursae, with 7 convolutions and ending in wide and pointed vesicle.

Biology. Host plant unknown. Collected at light in April, during the dry season in secondary forest (Puplesis and Robinson 2000).

Distribution. Only known from Belize (*ca.* N16.732, W88.988).

DNA barcode. We barcoded one paratype (RMNH.INS.24501), BOLD:ACY4502.

Other material examined. 4♂, 1♀, paratypes: **Belize:** Cayo District, Chiquibul Forest Reserve, Las Cuevas, 3–16.iv.1998, R. Puplesis & S. Hill, Genitalia slides ♂ EvN4501 (+ wings), BM28845, BM29130, ♀ BM28846, wing slide BM28847, resp. RMNH.INS.24501 (RMNH), BMNH(E)1625433, 1625439, 1625481, 1625477 (♀) (BMNH).

Hesperolyra saopaulensis van Nieukerken, sp. n.

http://zoobank.org/70F29918-65D6-457C-A635-400809BCEA3A

Holotype female. Brazil, São Paulo, Garulhos, park near airport terminal, 19.viii.2000, EvN no 2000133 [rearing number], leafmines on unidentified Myrtaceae, E.J. van Nieukerken, adult emergence 11–14.ix.2000, RMNH.INS.23553, genitalia slide EvN3553, type number DZ 33.340 (DZUP).

Differential diagnosis. Externally recognised by silver to leaden basal half of forewing and postmedial silvery fascia, with cilia line present and slightly edged scape. Female genitalia simple, without signa.

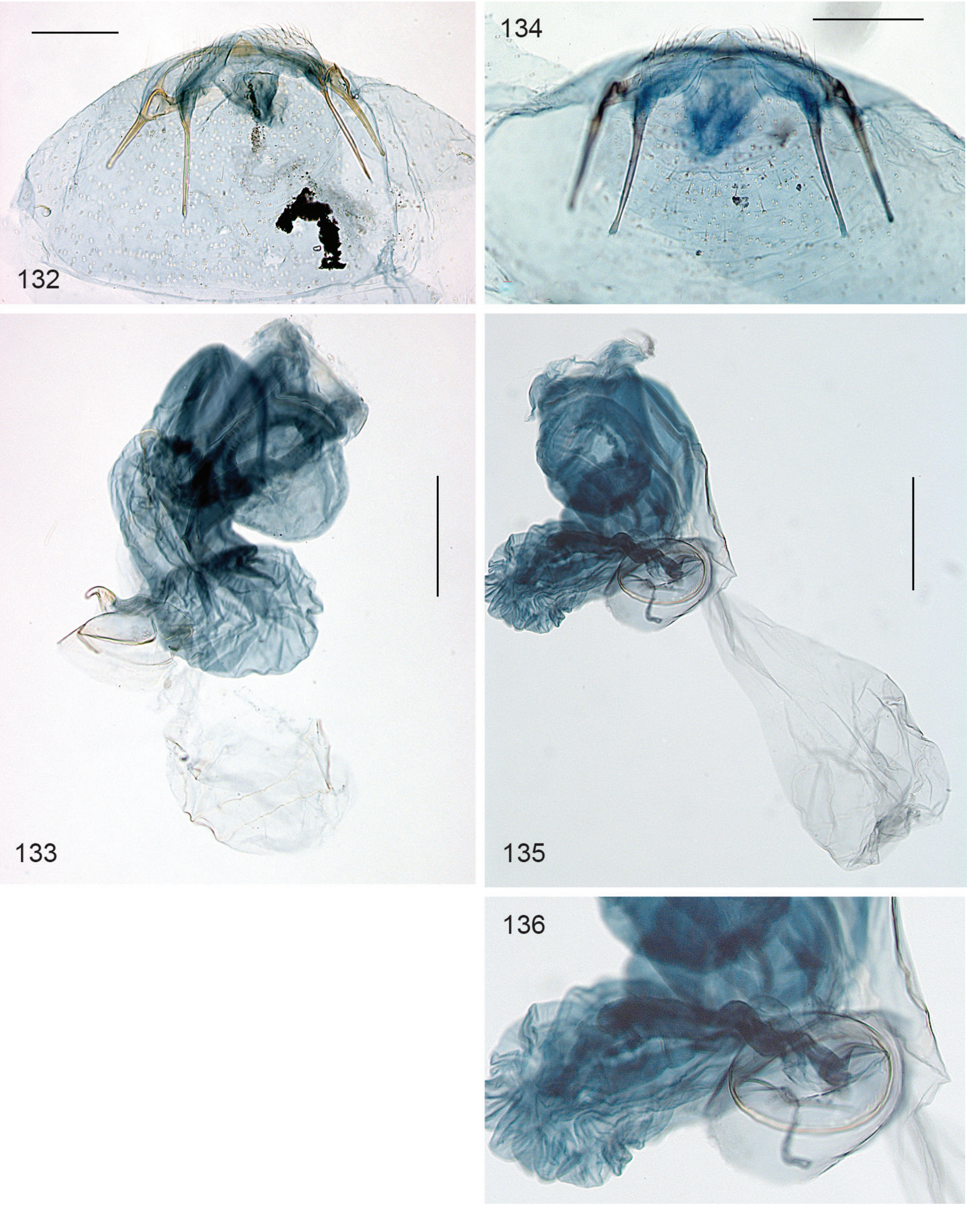
Description. *Male*. Unknown.

Female (Figs 119, 120). Frontal tuft pale yellow; scape white, slightly edged with grey, antenna with 23 segments (n=1). Collar of hairscales similar to frontal tuft. Thorax and basal half of forewing shining leaden to silver; followed by a slightly postmedial fuscous fascia, then a silver fascia at 2/3 and a fuscous wingtip; terminal cilia silvery white beyond cilia line. Hindwing pale. Abdomen with blunt tip.

Measurements. Female: forewing length 1.9–2.1 mm (2.0 ± 0.1, 14), wingspan 4.0–4.6 mm.

Female genitalia (Figs 132–136). T9 forming broad pair of anal papillae with each ca 16–17 setae. T8 with truncate posterior margin, some setae on either side. Anterior and posterior apophyses narrow, posterior apophyses slightly longer. Total length of bursa 450–500 µm. Bursa without signa or other ornamentation; vestibulum folded and more sclerotised. Ductus spermathecae distinct, but short, with 2–3 indistinct convolutions and ending in wide and pointed vesicle.

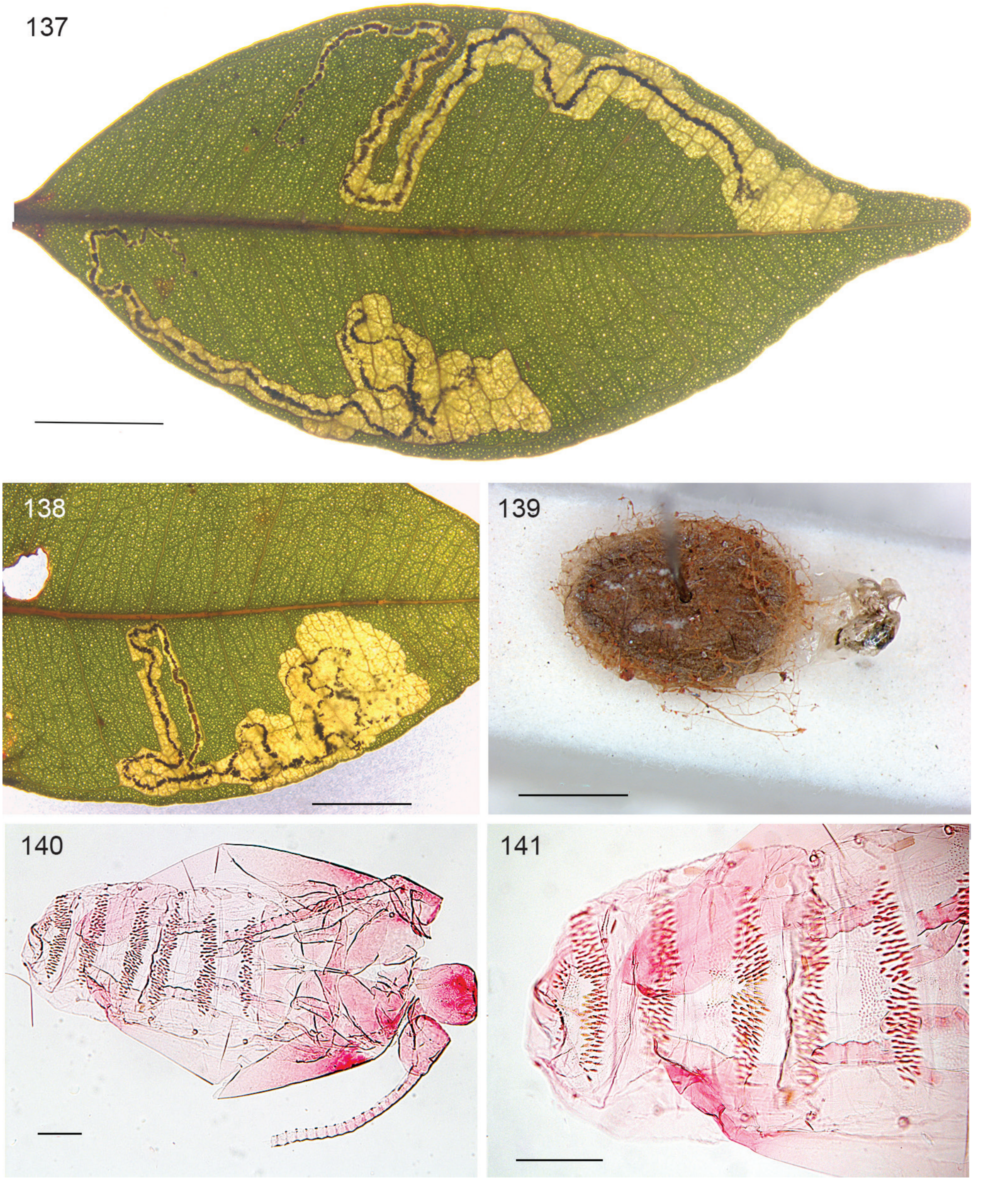
Biology. *Host plants.* Myrtaceae: unidentified tree (probably an *Eugenia* or *Myrcia* sp.).



Figures 132–136. *Hesperolyra saopaulensis*, female genitalia. **132–133** Holotype, slide EvN3553 **134–136** Slide EvN4505 **136** enlargement of 135, detail of ductus spermathecae and vesicle. Scale bars: 100 µm.

Leafmines (Figs 137, 138). The leafmine is a contorted gallery, with linear broken black frass throughout, sometimes forming a false blotch at the end. Larval emergence exit at leaf upperside.

Egg. The egg is deposited on leaf upperside, often on a lateral vein.



Figures 137–141. *Hesperolyra saopaulensis*, biology and immatures. **137–138** leafmines on unidentified Myrtaceae, sample EvN2000133K from which both adults were reared **139–141** Holotype cocoon and pupal exuviae, slide EvN3553. Scales: 5 mm (leaf mines), 1 mm (cocoon), 200 µm (pupa).

Larva. Not described.

Cocoon (Fig. 139). Brown, exuviae protruding.

Voltinism and habits. Larvae found in August, moths emerged in September.

Distribution. Brazil: São Paulo.

DNA barcode. We barcoded both specimens, resulting in BIN: BOLD:ACG9057. The Holotype was also sequenced for other genes and used in the molecular phylogeny (Doorenweerd et al. 2016). Sequences may be retrieved in BOLD and Genbank under voucher/sample ID RMNH.INS.23553.

Remarks. Even though we have no males, we decided to name this species, of which we know the biology, several genes, and which is characteristic both externally and in female genitalia. Furthermore it is the species that was decisive in erecting the new genus *Hesperolyra*. Collecting new material should be easy, in the small park forest in front of the entrance of Garulhos airport.

Etymology. Saopaulensis: an adjective, derived from the province and city name São Paulo and the suffix *–ensis*, indicating geographical origin.

Other material examined. 1♀, leafmines, **Brazil**, São Paulo, Garulhos, park near airport terminal, 19.viii.2000, EvN no 2000133 [rearing number], leafmines on unidentified Myrtaceae, E.J. van Nieukerken, adult emergence 11–14.ix.2000, genitalia slide Ev4505, RMNH.INS.24505 (RMNH).

Acalyptris Meyrick, 1921

Acalyptris janzeni van Nieukerken & Nishida, sp. n.

http://zoobank.org/06E144D5-A691-4923-A9EF-24274CC65610

Holotype male. Costa Rica, Guanacaste Province, ACG Santa Rosa Station, 10°50'22.30"N, 085°37'6.43"W, 293 m, 22.vi.2003, light sheet, Kenji Nishida, Genitalia slide EvN3673, RMNH.INS.23673 (RMNH).

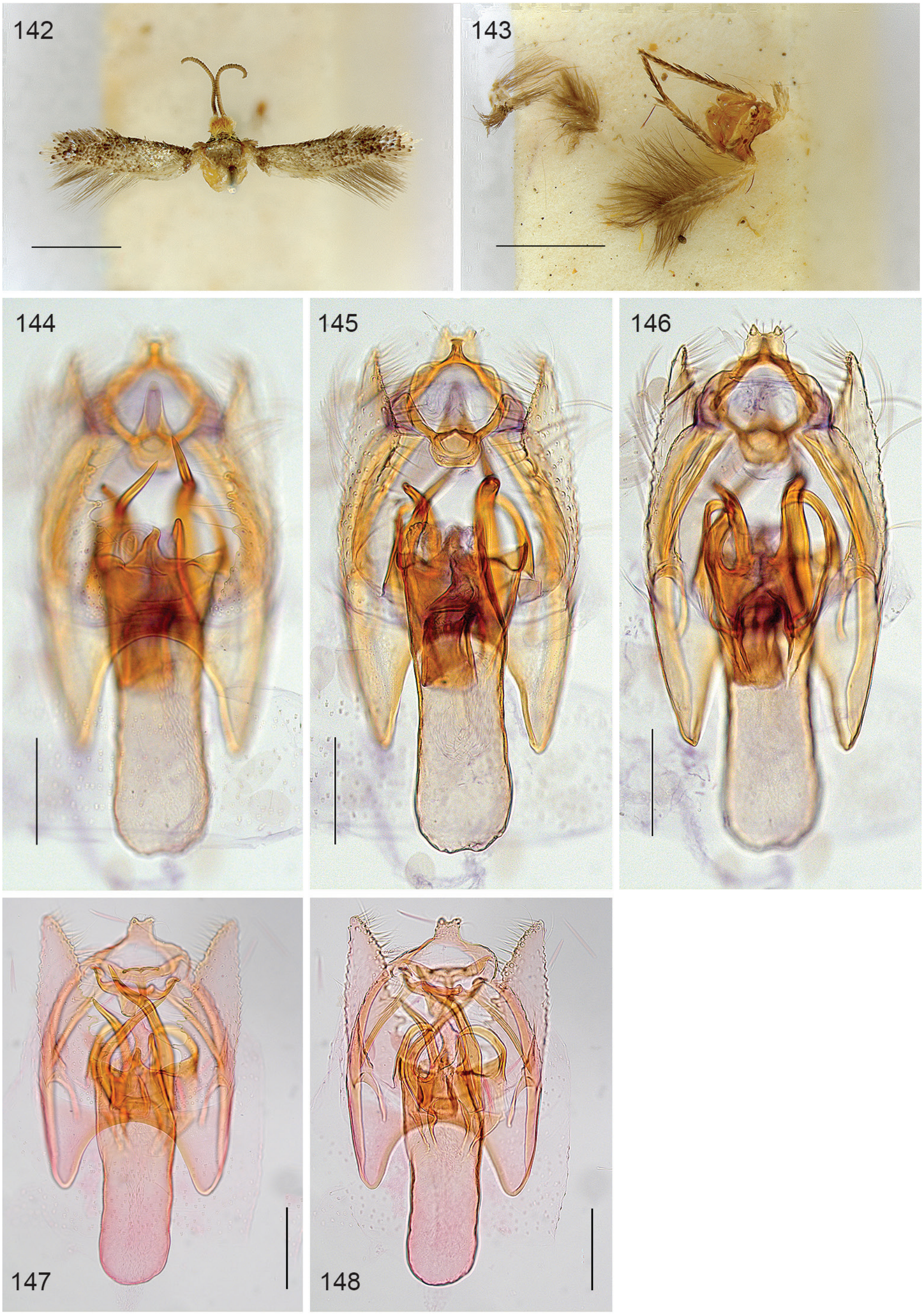
Differential diagnosis. Externally a dull species, not distinguishable from others without obvious colour pattern. The male genitalia are characterised by the bifid pseuduncus, lateral support rods and several large curved carinal spines.

Description. *Male* (Figs 142, 143). Head: frontal tuft and collar pale yellow, scape and pedicel white, flagellum brown, antenna with 35–40 segments (n=4). Thorax and forewing irrorate yellowish white with brown, caused by dark tipped scales; an indistinct cilia line, terminal fringe white. Hindwing grey brown, no special scales; costal bristles present.

Female. Unknown.

Measurements. Male: forewing length 1.7 mm, wingspan: 4.2 mm.

Male genitalia (Figs 144–149). Capsule length 250–280 µm. Vinculum ventral plate deeply bilobed; a pair of lateral support rods running from valval attachment to gnathos. Tegumen forming a bilobed pseuduncus. Uncus inverted Y-shaped, with lateral arms expanded, and central process distally widened. Gnathos with narrow triangular central element. Valva length ca 250–255 µm, narrow, with prominent setal sockets along inner margin, tip straight and pointed; sublateral processes distinct, transverse bar of transtilla absent. Phallus length ca 300 µm, carinal processes excluded; phallus wall ventrally with finger-shaped medial process; in total 5 long and curved



Figures 142–148. *Acalyptris janzeni*. **142–133** Holotype, metathorax and hindwings broken off and glued to the polyporus strip, scales 1 mm **144–146** Holotype, male genitalia. Slide EvN3673 **147–148** Male genitalia, slide JCK8232. Scales: 1 mm (**142–143**), 100 µm (rest).

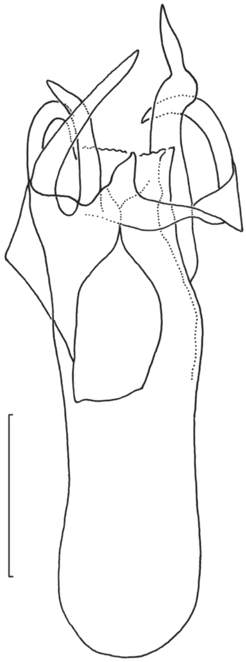


Figure 149. *Acalyptris janzeni*, phallus, holotype. Scale: 100 µm.

carinal processes, the dorsal pair curving almost 180 degrees; vesica with indistinct plate-like sclerotisation, no cornuti observed.

Biology. *Host plant.* Unknown.

Voltinism and habits. Adults found from late June to early August and again November to mid-March. Collected at light and in malaise traps.

Distribution. Costa Rica: Guanacaste Province, Área de Conservación Guanacaste. Coordinates type locality: N10.83400, W85.61200. It is a sub-humid to humid tropical dry (deciduous) forest with five to six months of dry season (Herrera Soto and Gómez Pignataro 1993).

DNA barcode. We have DNA barcodes of all ten known specimens, the holotype differs 2.3% from the other specimens.

Remarks. The combination of the venation, absence of transverse bar of transtilla and presence of lateral support rods makes this a typical New World *Acalyptris* species, probably belonging to the *A. scirpi* group. The DNA barcode does not place it close to any *Acalyptris* species of which the barcode is known. Morphologically there are similarities to several species described from Belize: *A. bifidus* Puplesis & Robinson, 2000 and *A. unicornis* Puplesis & Robinson, 2000. It is remarkable that the holotype barcode has a 2.3% distance to the Malaise trapped specimens, found in almost the same locality. More material is needed to see whether this is a case of cryptic species, or a unusual high variation in the population.

Etymology. Janzeni: a noun in genitive case, based on the family name Janzen, to honour Daniel H. Janzen, collector of part of the material, for his long time dedication to study the tropical Lepidoptera fauna of the Guanacaste Conservation area in great detail, both ecologically and taxonomically, and his enthusiastic support of DNA barcoding (eg. Janzen et al. 2009).

Other material examined. 6♂ [DNA barcoded ethanol material]: **Costa Rica**, Guanacaste, Área de Conservación Guanacaste, Sector Santa Rosa, Bosque San Emilio, Forest, Malaise trap, 300 m, 10.8438, -85.6138, Dan Janzen: 1♂, trap GMP#00624, 31.vii–6.viii.2012, BIOUG05419-H06, genitalia slide JCK8232; 1♂, trap GMP#01813, 6–13.xi.2012, BIOUG09432-B01; 2♂, trap GMP#01815, 20–27.xi.2012, BIOUG09436-B12, BIOUG09436-C06; 1♂, trap GMP#01817, 4–11.xii.2012, BIOUG09441-C02; 1♂, trap GMP#01825, 29.i–5.ii.2013, BIOUG10108-C05 (RMNH).

More data from BOLD [specimens not examined, same BIN] 3 adults, same locality: trap GMP#01824, 22–29.i.2013, BIOUG18276-D11; trap GMP#01826, 5–12.ii.2013, BIOUG18337-A10; trap GMP#01830, 12–19.iii.2013, BIOUG18605-F04 (BIOUG).

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Supplementary material 1

Specimen data for Neotropical Nepticulidae with BOLD data

Authors: Erik J. van Nieukerken, Camiel Doorenweerd, Kenji Nishida, Chris Snyers

Data type: Microsoft Excel (xls)

Explanation note: The 87 records are all records of the new taxa described in this paper. Records are listed alphabetically by species, country, stateProvince, AdminDivision2, AdminDivision3, Locality.

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Revised classification and catalogue of global Nepticulidae and Opostegidae (Lepidoptera, Nepticuloidea)

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Abstract

A catalogue of all named Nepticulidae and Opostegidae is presented, including fossil species. The catalogue is simultaneously published online in the scratchpad http://nepticuloidea.info/ and in Catalogue of Life (http://www.catalogueoflife.org/col/details/database/id/172). We provide a historical overview of taxonomic research on Nepticuloidea and a brief 'state of the art'. A DNA barcode dataset with 3205 barcodes is made public at the same time, providing DNA barcodes of ca. 779 species, of which 2563 are identified as belonging to 444 validly published species. We recognise 862 extant and 18 fossil species of Nepticulidae in 22 extant genera and the fossil form genus *Stigmellites*. We count 192 valid Opostegidae species in 7 genera, without fossils. We also list seven dubious Nepticulidae names that cannot be placed due to absent type material and poor descriptions, 18 unavailable names in Nepticulidae that cannot be placed and we also list the 33 names (including four fossils) that once were placed as Nepticulidae or Opostegidae but are now excluded. All synonyms and previous combinations are listed. The generic classification follows the Molecular phylogeny that is published almost simultaneously. Subfamilies and tribes are not recognised, Trifurculinae Scoble, 1983 is synonymised with Nepticulidae Stainton, 1854 and Opostegoidinae Kozlov, 1987 is synonymised with Opostegidae Meyrick, 1893. The status of *Casanovula* Hoare, 2013, *Etainia* Beirne, 1945, *Fomoria* Beirne, 1945, *Glaucolepis* Braun, 1917, *Menurella* Hoare, 2013, *Muhabbetana* Koçak & Kemal, 2007 and *Zimmermannia* Hering, 1940 is changed from subgenus to full genus, whereas two genera are considered synonyms again: *Manoneura* Davis, 1979, a synonym of *Enteucha* Meyrick, 1915 and *Levarchama* Beirne, 1945, a synonym of *Trifurcula* Zeller, 1848. We propose 87 new combinations in Nepticulidae and 10 in Opostegidae, largely due to the new classification, and re-examination of some species. We propose the following 37 new synonymies for species (35 in Nepticulidae, 2 in Opostegidae):

Stigmella acerifoliella Dovnar-Zapolski, 1969 (unavailable, = *S. acerna* Puplesis, 1988), *Stigmella nakamurai* Kemperman & Wilkinson, 1985 (= *S. palionisi* Puplesis, 1984), *Nepticula amseli* Skala, 1941 (unavailable = *S. birgittae* Gustafsson, 1985), *Stigmella cathepostis* Kemperman & Wilkinson, 1985 (= *S. microtheriella* (Stainton, 1854)), *Stigmella populnea* Kemperman & Wilkinson, 1985 (= *S. nivenburgensis* (Preissecker, 1942)), *Nepticula obscurella* Braun, 1912 (revised synonymy, = *S. myricafoliella* (Busck, 1900)), *Nepticula mandingella* Gustafsson, 1972 (= *S. wollofella* (Gustafsson, 1972)), *Stigmella rosaefoliella pectocatena* Wilkinson & Scoble, 1979 (= *S. centifoliella* (Zeller, 1848)), *Micropteryx pomivorella* Packard, 1870 (= *S. oxyacanthella* (Stainton, 1854)), *Stigmella crataegivora* Puplesis, 1985 (= *S. micromelis* Puplesis, 1985), *Stigmella scinanella* Wilkinson & Scoble, 1979 (= *S. purpuratella* (Braun, 1917)), *Stigmella palmatae* Puplesis, 1984 (= *S. filipendulae* (Wocke, 1871)), *Stigmella sesplicata* Kemperman & Wilkinson, 1985 (= *S. lediella* (Schleich, 1867)), *Stigmella rhododendrifolia* Dovnar-Zapolski & Tomilova, 1978 (unavailable, = *S. lediella* (Schleich, 1867)), *Stigmella oa* Kemperman & Wilkinson, 1985 (= *S. spiculifera* Kemperman & Wilkinson, 1985), *Stigmella gracilipae* Hirano, 2014 (= *S. monticulella* Puplesis, 1984), *Nepticula chaoniella* Herrich-Schäffer, 1863 (= *S. samiatella* (Zeller, 1839)), *Bohemannia piotra* Puplesis, 1984 (= *B. pulverosella* (Stainton, 1849)), *Bohemannia nipponicella* Hirano, 2010 (= *B. manschurella* Puplesis, 1984), *Sinopticula sinica* Yang, 1989 (= *Glaucolepis oishiella* (Matsumura, 1931)), *Trifurcula collinella* Nel, 2012 (= *Glaucolepis magna* (A. Laštuvka & Z. Laštuvka, 1997)), *Obrussa tigrinella* Puplesis, 1985 (= *Etainia trifasciata* (Matsumura, 1931)), *Microcalyptris vittatus* Puplesis, 1984 and *M. arenosus* Falkovitsh, 1986 (both = *Acalyptris falkovitshi* (Puplesis, 1984)), *Ectoedemia castaneae* Busck, 1913, *E. heinrichi* Busck, 1914 and *E. helenella* Wilkinson, 1981 (all three = *Zimmermannia bosquella* (Chambers, 1878)), *Ectoedemia chloranthis* Meyrick, 1928 and *E. acanthella* Wilkinson & Newton, 1981 (both = *Zimmermannia grandisella* (Chambers, 1880)), *Ectoedemia coruscella* Wilkinson, 1981 (= *Zimmermannia mesoloba* (Davis, 1978)), *Ectoedemia piperella* Wilkinson & Newton, 1981 and *E. reneella* Wilkinson, 1981 (both = *Zimmermannia obrutella* (Zeller, 1873)), *Ectoedemia similigena* Puplesis, 1994 (= *E. turbidella* (Zeller, 1848)), *Ectoedemia andrella* Wilkinson, 1981 (= *E. ulmella* (Braun, 1912)), *Nepticula canadensis* Braun, 1917 (= *E. minimella* (Zetterstedt, 1839)), *Opostega rezniki* Kozlov, 1985 (= *O. cretatella* Chrétien, 1915), *Pseudopostega cyrneochalcopepla* Nel & Varenne, 2012 (= *P. chalcopepla* (Walsingham, 1908)). *Stigmella caryaefoliella* (Clemens, 1861) and *Zimmermannia bosquella* (Chambers, 1878) are taken out of synonymy and re-instated as full species. Lectotypes are designated for *Trifurcula obrutella* Zeller, 1873 and *Nepticula grandisella* Chambers, 1880.

Keywords

Taxonomy, leaf miners, checklist, history, new synonyms, new combinations

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Introduction

Names of organisms are the key to the biological literature, but even in our digital age it is often a challenge to find and apply the correct names. Taxonomic internet databases, spawned from global projects such as GBIF (Gbif Secretariat 2016) and Species 2000 (Catalogue of Life: Roskov et al. 2015) are growing in number and are impressively linked together, but in many cases lack informative and reliable content. Catalogue of Life is especially poor for Lepidoptera, being based on an online version of the Cardindex of the Natural History Museum in London (LepIndex: Beccaloni et al. 2005). This is a wonderful resource for taxonomists, but not an authoritative catalogue with modern classification and names. The plans for an update depend on external funding and may never materialize with the current taxonomic funding climate (I. Kitching personal communication).

Any online only publication of a catalogue has the disadvantage that nomenclatorial changes are unavailable and still need to be published in a unchangeable format on paper or as pdf file following the amendments made to the Code (International Commission on Zoological Nomenclature 2012). It is understandable that many taxonomists prefer paper publications, evident from several recent catalogues for Lepidoptera (Pterophoridae, Coleophoridae, Psychidae, Notodontidae, Yponomeutoidea) that cannot yet be found in an online database (Gielis 2003; Baldizzone et al. 2006; Sobczyk 2011; Schintlmeister 2013; Lewis and Sohn 2015). Fortunately other authors followed a printed catalogue soon with an online database version, e.g. for Gracillariidae (De Prins and De Prins 2005; De Prins and De Prins 2016) and Tortricidae (Brown et al. 2003; Gilligan et al. 2014) and for other groups there are online-only catalogues that are actively maintained, e.g. Pyraloidea (Nuss et al. 2003–2015) and part of the butterflies (Häuser et al. 2012). Still, for the largest part of Lepidoptera there are still no global catalogues available. With our contribution we hope to fill a very small gap of the megadiverse order Lepidoptera.

For some years we have been preparing an online catalogue of Nepticuloidea in a so-called scratchpad (van Nieukerken 2016), which has several advantages, but also the cited disadvantage and the lack of an easy overview. The most recent Nepticuloidea catalogue was published in a book (Diškus and Puplesis 2003), using a somewhat different generic classification. Our phylogenetic study, to be published simultaneously with this catalogue (Doorenweerd et al. 2016a), resulted in the need for a new classification, which has consequences for the names of many taxa. We therefore decided to publish this static catalogue to fix the state of the art, make the necessary nomenclatorial changes, whereas at the same time the Nepticuloidea scratchpad version 2.0 (http://nepticuloidea.info/) is released with additional information and illustrations, and will be updated continuously. We are also happy to announce that at the same time this catalogue is made available to the Catalogue of Life (http://www.catalogueoflife.org/col/details/database/id/172) and GBIF. This catalogue is not only the taxonomic summary of the published knowledge on these families, it also contains many original data, such as new synonymies and taxonomic placement of species, based on our many years of research of these insects worldwide; some of these results are formalised here, but will be detailed elsewhere. In the material and methods section we discuss our various choices for this catalogue, such as species concepts, use of DNA barcodes, and nomenclatorial issues.

To place the list in a broader context we give an account of the taxonomic history and history of research on Nepticulidae and Opostegidae. We begin the results section with a review of the "state of the art" of Nepticuloidea in the various biogeographic regions.

History of taxonomic research on Nepticulidae

The first species of Nepticulidae that was described, was *Stigmella anomalella* (Goeze, 1783) of which Degeer (1752) described and illustrated the larva in detail, while using the term "miner" ("mineuse") for the first time (van Nieukerken 2008). Later, Degeer (1771) described the adult that he reared from these mines. Degeer's descriptions are still interesting reading these days, and were fully copied and translated by Stainton et al. (1855). Since Degeer did not use binominal nomenclature in these works, the species was only validly named later by Goeze (1783) as *Phalaena anomalella*. This makes *Ectoedemia occultella* (Linnaeus, 1767) the first formally named nepticulid (as *Phalaena (Tinea) occultella*), although Linnaeus himself had yet no notion of the life history of the small moth that he found on his windows (Robinson and Nielsen 1983). Five more names were given to Nepticulidae in the 18th century, all named in *Tinea*, but just two of these are still considered valid: *Stigmella aurella* and *S. hybnerella*. Even though Schrank already in 1802 gave the generic name *Stigmella* to his rose leafminer *Tinea rosella* (a junior synonym of *S. anomalella*), this was overlooked by most 19th century authors, and in the first decades of the 19th century, species were still placed in *Tinea* (e.g. by Haworth 1828), the first author to describe a number of species from the London area, nine in total) or in a number of other "tineid" genera such as *Microsetia* (Stephens 1834; Be-

Figures 1–9. Portraits of Lepidopterists who described Nepticuloidea. **1** Philipp Christoph Zeller (Stainton 1883) **2** Henry Tibats Stainton from Douglas and Mclachlan (1893) **3** Gottlieb August Wilhelm Herrich-Schäffer, ca 1870 (Kraatz 1875) **4** Maximilian Ferdinand Wocke (Dittrich 1907) **5** Edward Meyrick (Clarke 1955) **6** Lord Walsingham (Durrant 1920) **7** Annette Francis Braun, in 1973 in her home in Cincinnati, Ohio (photo Mignon Davis) **8** Pierre Chrétien, Digne, May 1903 (Oberthür 1915) **9** Erich Martin Hering. Figs 1–6 and 8 from Biodiversity Heritage Library, 9 from Zobodat.

dell 1848), *Oecophora* and *Elachista* (Kollar 1832; Zetterstedt 1838–1840; Duponchel [1842–1845]) and *Caloptilia* (Hübner 1816–1826), now all belonging in different families, but together these authors named only about ten species of Nepticulidae.

Towards the second half of the 19th century, things changed rapidly, in Europe attributable to four naturalists: in Germany Philipp Christoph Zeller (1808–1883) (Fig. 1) and Gottlieb August Wilhelm Herrich-Schäffer (1799–1874, Regensburg) (Fig. 3), in Great Britain Henry Tibbats Stainton (1822–1892) (Fig. 2) and in Switzerland Heinrich Frey (1822–1890). All four were lepidopterists with a broad interest, studying not only all Lepidoptera from their own country, but also from many exotic countries.

The genus *Nepticula* was formally erected in a meeting report by von Heyden (1843), but he did not publish much on this genus, and it was Zeller (1848) who made a detailed description of the genus and several species. Some years earlier Zeller (1839) had described several Nepticulidae (in his "Versuch einer naturgemässen Eintheilung der Schaben") together with other leafminers in the genus *Lyonetia*, subgenus *Bucculatrix*, in which he placed ten nepticulid species together with six that we still consider as *Bucculatrix* (Bucculatricidae). All these descriptions were based on adults that were collected in the field without knowledge of the life history (except DeGeer's work!). Stainton and his British followers drastically changed this situation, by eagerly rearing leafminers and many other microlepidoptera, resulting in a proliferation of new species discoveries. Following a few initial species descriptions, his book "Insecta Brittanica. Lepidoptera: Tineina" (Stainton 1854) contained the first extensive treatment of Nepticulidae – at that point recognised as a family with two genera (*Nepticula* and *Trifurcula*) – with detailed information on leafmines and biology of 32 species in total (see Table 1). Stainton continued publishing discoveries the next decades, partly using his own periodicals "The Entomologist's Weekly Intelligencer" and "The Entomologist's Annual", and later in the still running journal "Entomologist's Monthly Magazine" that he founded with entomologist friends (Emmet 1992). His magnum opus is the 13 volume work "The natural history of the Tineina", that he wrote collaboratively with Zeller, Frey and J.W. Douglas. Nepticulidae are treated in volumes 1 and 7 (Stainton et al. 1855; Stainton et al. 1862). These books are best known for the exquisite hand coloured plates with details of all life stages of many Microlepidoptera. During his life Stainton described 39 species of Nepticulidae, of which currently 30 are still considered valid names. With that record he is the most productive 19th century nepticulid taxonomist.

Soon after Stainton's Insecta Britannica, Frey wrote two books dealing with respectively Swiss and European Nepticulidae (Frey 1856; 1857), that he also partly had reared himself. In the same period, Herrich-Schäffer's large multivolume work "Systematische Bearbeitung der Schmetterlinge von Europa" (1843–1855) was concluded by volumes 5 and 6, dealing with Nepticulidae in volume 5, heft 67 (Herrich-Schäffer 1855a) (the book was issued in parts, the plates often earlier than the text, and the bibliography is very complicated, see Hemming 1937). He apparently did not rear nepticulids himself, but included information on rearing from others, such as Frey and Heyden. He also named several species that Frey intended to name (as he did later, in 1856), but changed the endings of the names deliberately into "–ella". This explains pairs of names such as: *Nepticula aeneofasciella* Herrich-Schäffer, 1855 and *Nepticula*

Table 1. Number of Nepticulidae species (valid and invalid) described per first author for authors who described at least ten valid species, including extant and fossil species.

First author	Valid spp	Invalid spp	Total
Puplesis (Stonis)	176	22	198
Scoble	73	1	74
Meyrick	67	6	73
van Nieukerken	55		55
Klimesch	38	10	48
Stainton	30	9	39
Braun	26	11	37
Remeikis	24		24
Kemperman	23	13	36
Laštuvka, A.	21		21
Vári	20		20
Laštuvka, Z.	17		17
Diškus	15		15
Donner	14		14
Clemens	13	7	20
Zeller	12	5	17
Chambers	12	12	24
Hoare	12		12
Herrich-Schäffer	11	10	21
Frey	10	8	18
Hirano	10	2	12
96 authors	201		
Total	**880**		

aeneofasciata Frey, 1856. The practice to use consistent endings for larger groups of Lepidoptera dated from Linnaeus, who used –ella for what he called *Tinea*, -ana for *Tortrix*, -alis for *Pyralis* etc. (Emmet 1991). In the 19th century there were no hard nomenclatorial rules yet, and specialists often changed names deliberately following this practice, see e.g. also several listed synonyms (incorrect subsequent spellings) by Doubleday (1859). Herrich-Schäffer named several nepticulids hidden in catalogues and a report on a collecting trip to Engadin (Herrich-Schäffer 1863b; c), names that have completely been forgotten and were never listed in catalogues, but only cited in two other papers (Snellen 1873; Segerer 1997). As far as these names are valid, they can be considered nomina oblita once their identities have been established, since they were never used as valid names since 1899 (ICZN art. 23.9.1.1), and do not compete with junior synonyms (reversal of precedence, ICZN art. 23).

By 1860 the number of species (all from Europe) had been tripled since 1848: from 24 to 77 (see Fig. 24B). In Europe the work on describing Nepticulidae continued both in Britain and in Central Europe, particularly with Herman von Heinemann (1812–1871) in Braunschweig (Heinemann 1861; 1862a; b) and Maximilian Ferdinand Wocke (1820–1906) (Fig. 4) in Breslau, who contributed many shorter papers (Wocke 1862;

1865; 1877). Jointly they wrote a larger fauna: Die Schmetterlinge Deutschlands und der Schweiz, partly finished after Heinemann's death (Heinemann and Wocke [1876]). After *ca* 1880 taxonomic work on Nepticulidae in Europe slowed down considerably.

Meanwhile, in the United States, James Brackenridge Clemens (1825–1867) in Easton, Pennsylvania, had started studies on microlepidoptera. He collected the leafmines actively and described them in a few papers, but in contrast to Stainton he did not wait for successful rearing results and described many new species solely on the basis of leafmines (Clemens 1861; 1862a; Clemens 1862b; Clemens 1865), often resulting in a conundrum for future taxonomists. There are no types of the mines left, and more than once multiple species are known to feed on the host plant from which he described a single species. Such species have to be interpreted carefully and sometimes Neotypes need to be selected (Busck 1903; Wilkinson and Scoble 1979). A second North American pioneer was Vactor Tousey Chambers (1830–1883) from Covington, Kentucky, who added more species on the basis of mines and larvae, but also many on the basis of adults (Chambers 1873; 1875b; 1878a). There are more types left of his species (in the Museum of Comparative Zoology, Cambridge, Mass.), but also many missing and reconstructing identities can still be cumbersome (Busck 1903; Miller and Hodges 1990). Here we resolve three of his names.

The first Nepticulidae described from other regions than Europe or the USA, were two species described from Colombia by Zeller (1877), although Francis Walker's (Walker 1864) *Stigmella maoriella* from New Zealand already predated these. However, Walker, often criticised for his numerous useless descriptions, was totally unaware he was naming a nepticulid and placed it in *Tinea*.

In the late 19th century Edward Meyrick (1854–1939) (Fig. 5) started his long career of describing numerous exotic Microlepidoptera, totalling approximately 20,000 species, including 68 Nepticulidae and 54 Opostegidae. The first Nepticulidae he described were three species from New Zealand (Meyrick 1889) where he lived in 1882–1883 (Hudson 1938). Up to 1935 Meyrick described many Nepticulidae from southern Africa, India, Australia, New Zealand and South America. His descriptions are typically very short, without illustrations, and only some of the species were reared (by other collectors who sent the specimens to him). When studying genitalia became more common practice, Meyrick refused to see the necessity and continued in a similar manner, relying almost completely on venation and colour pattern (Clarke 1955). As a result almost none of the species he described can be recognised from the description alone and the study of types is essential. Fortunately, most of those are kept in the Natural History Museum in London, and some in other collections, including the Ditsong Museum of Natural History in Pretoria. Those types that still exist have been studied by Malcolm Scoble, Erik van Nieukerken, Robert Hoare and co-authors and Rimantas Puplesis (now Jonas Stonis). Meyrick named only two nepticulid genera: *Acalyptris* and *Enteucha*, the latter he placed in Opostegidae (Davis 1985).

Quite a different approach was followed in the early 20th century in North America, where August Busck (1870–1944), a Danish immigrant, started his studies at the Division of Entomology of the U.S. Department of Agriculture and somewhat later Annette Frances Braun (1884–1978) (Fig. 7), who became the leading microlepidopterists of North America. Both made many careful descriptions of often reared species, but most of these before genitalia studies became fashionable (Busck 1900; 1913; 1914a; Braun 1912; 1914; 1917; 1923; 1925b).

In Europe, in addition to *Nepticula*, only two additional small genera were recognised on the basis of the venation: *Trifurcula* Zeller, 1848 and *Bohemannia* Stainton, 1859 (Zeller 1848; Stainton 1859a). Although many treatments of the family were published in Europe, the classification did not change for almost a century (Heinemann 1862a; b; Frey 1880; Snellen 1882; Meyrick 1895; Tutt 1899; Spuler and Meess 1910; Heinemann and Wocke [1876]). Walsingham (1908a) had shown that the senior name *Stigmella* Schrank, 1802 should be used instead of *Nepticula*, but few authors followed him until this case was settled by Wilkinson (1978) in favour of the senior name *Stigmella*. Between them, Busck and Braun erected four more genera on the basis of venation: *Ectoedemia* Busck, 1907 (also based on the galling habit), *Obrussa* Braun, 1915, *Glaucolepis* Braun, 1917 and *Microcalyptris* Braun, 1925 (Busck 1907; Braun 1915; 1917; 1925b) (see Table 2). It is strange that these authors who relied so much on venation in describing genera, did not scrutinize the many *Nepticula* species, amongst which were still many species with venation different from *Stigmella*, and more similar to their new genera. Also the name *Trifurcula* was several times misapplied to species with completely different venations, now belonging in *Zimmermannia* (*atrifrontella* Stainton, *obrutella* Zeller), *Bohemannia* (*pulverosella* Stainton) or *Acalyptris* (*minimella* Rebel).

In Europe, during the first decades of the 20th century, some more southern areas were explored by Lord Walsingham (Thomas de Grey, 6th Baron Walsingham, 1843–1919) (Fig. 6), who collected in France, Spain, the Canary Islands, Morocco and Algeria (Walsingham 1891; 1904; 1908a; b; 1911) and reared several of these species from their mines. Also Pierre Chrétien (1846–1934) (Fig. 8) reared several species from hitherto unexpected host plants in France and Algeria (*Bupleurum* in Apiaceae, *Linum* in Linaceae, *Launaea* [as *Zollikofferia*] in Asteraceae); these species are now all placed in *Glaucolepis* (Chrétien 1904; 1907; 1914).

In the 20th century the study of genitalia gradually became standard in Lepidoptera and the first study on nepticulids was by Petersen (1930b), who divided *Nepticula* into a number of species groups based on the male genitalia. The first following him was Hering (Hering 1942; 1943), but his first genitalia drawings were published by Klimesch (Klimesch 1940a; b; c; d), who in the last of these papers also shows his first own genitalia drawing (of *Acalyptris platani*). The single contribution by Bryan P. Beirne (1918–1998) was particularly important. He finished the British series of Lepidoptera genitalia started by Pierce and Metcalfe (1935) – who excluded most Nepticulidae, apart from *Trifurcula*, in their 'tineid' volume, referring to Petersen's work – , and described the male genitalia of the British species (Beirne 1945). While doing so he also erected five new genera with names based on Irish mythology (*Dechtiria*, *Levarchama*, *Fedalmia*, *Etainia* and *Fomoria*) and split *Stigmella* into *Stigmella* and *Nepticula*. From then on describing a new species without illustrating the male genitalia seldom occurred anymore, and the late 1940's showed several examples of this (Doets 1947; Janse 1948; Klimesch 1948a; b; Hartig 1949; Ford 1950a). Josef Wilhelm Klimesch (1902–1997) (Fig. 10) was one of the most productive authors of this period, and again in the 1970's after his

Table 2. Number of genera of Nepticuloidea named per author, including replacement names.

Author	# Valid genera	# Invalid genera
Davis (1 with Stonis)	4	3
Scoble	4	1
Hoare	3	
van Nieukerken	3	1
Beirne	2	3
Kozlov	2	
Meyrick	2	
Zeller	2	
Borkowski	1	1
Braun	1	2
Busck	1	
Hering	1	
Koçak	1	1
Schrank	1	
Stainton	1	
Müller-Rutz		2
Börner		1
Heyden		1
Puplesis		1
Strand		1
Yang		1

retirement (Gusenleitner 1988; Deschka 1998; Aspöck 2003). He not only carefully illustrated the genitalia, he also paid considerable attention to the leafmines and biology, with detailed illustrations and descriptions. Possibly because of the greater demands that including genitalia imposed on authors, the descriptions of new species decreased considerably during the 1950's and 1960's, only to rise again from 1978 on. Between 1950 and 1978 only 60 new species were named, most by Josef Klimesch in Europe and Lajos Vári in South Africa (Klimesch 1951b; 1953a; b; 1975c; Vári 1955; 1963).

Quite a reverse development occurred in the first half of the 20th century that involved an increased interest in the mine form and the host plant, especially promoted by Erich Martin Hering (1893–1967) (Fig. 9), an entomologist in Berlin. Although he was also a very active and experienced taxonomist in Lepidoptera and Diptera, who introduced the use of genitalia characters, he also gave often undue weight to characters of leafmines, for example in the *Stigmella ulmivora* group, where he recognised three species on the basis of leafmine form and frass pattern, that are in fact ecological forms of one species. However, with his many publications, Hering's work was an outstanding contribution to the study of leafminers, and his identification keys are still a much used reference (Hering 1957), as is his general book on the biology of leafminers (Hering 1951). Also Victor Hugo Otto Skala (1875–1952) studied leafminers intensively, but he also named many species on the basis of the mines only (which are unavailable after 1930, ICZN art. 13.6.2), provided with very poor and minute illustrations and brief descriptions (example: Skala 1939a; b;

Figures 10–16. Specialists on Nepticuloidea in 20th century. **10** Joseph Klimesch, in his house, Linz, October 1983 **11** Donald R. Davis in his office, December 2006, USNM, Washington DC **12** Christopher Wilkinson, April 1982, Cambridge, European Congress of Lepidopterology **13** Arthur Maitland Emmet, with C Wilkinson, Essex, UK, October 1979 **14** Meeting for preparation of the Nepticulidae volumes for Fauna Entomologica Scandinavica, Copenhagen, October 1980: from left: Ebbe S. Nielsen, Roland Johansson, Chris Wilkinson, Bert Gustafsson, Niels Peder Kristensen **15** Rimantas Puplesis, standing (now Jonas R. Stonis), Erik J. van Nieukerken, in Zoological Institute, Leningrad, September 1985 **16** Get together of leafminer enthusiasts at house of Aleš Laštůvka, Prostejov, Czech Rep., September 1994, from left: Steven Whitebread, Zdeněk Laštůvka, Roland Johansson, Aleš Laštůvka. Scans from transparencies by Erik J. van Nieukerken.

c; d; e; f; g; h), and only few of the names he introduced, and based on adults, remain valid today (*Ectoedemia klimeschi* (Skala, 1933), *Fomoria groschkei* (Skala, 1943)).

During the 1970's the study of nepticulids suddenly received considerable increase in support from several sources, following a general trend for greater investment in taxonomy and science at large and an increase of amateur interest. In Sweden amateur Roland Johansson (Figs 14, 16) revised the confusing oak feeding *Stigmella ruficapitella* group (Johansson 1971). In the same paper he provided an updated checklist of Scandinavian and British species, within a new framework of two genera: *Nepticula* and *Trifurcula*, the latter embracing all of Beirne's genera. He also introduced the use of species groups. At about the same time Alfred Borkowksi wrote a number of papers on the faunistics and taxonomy of Nepticulidae in Poland (Borkowski 1969; 1970a; b; 1972a; b). In one of these, he introduced a new generic classification, following partly Beirne (1945), using male genitalia, and combined this with the study of venation (Borkowski 1972a). In Britain Arthur Maitland Emmet (1908–2001) (Harley 2001) (Fig. 13) started to work on this group and many other Microlepidoptera for the new series "The Moths and Butterflies of Great Britain and Ireland" (MBGBI). He followed upon Johansson's and Borkowski's work and treated the Nepticulidae in the first volume (Emmet 1976), but his many shorter and longer papers in The Entomologist's Record, often made in preparation of the book, illustrated his in-depth knowledge, and are also enjoyable reading (for example: Emmet 1973a; b; c; 1974a; d; e; f; g). Also in the 1970's, Josef Klimesch, now retired, started working on the material he collected in southern Europe and the Canary Islands, and described a number of new species from that area (Klimesch 1975c; 1977; 1978b).

Before 1970, most work on Nepticulidae was carried out independently by either amateur entomologists or isolated professional biologists, but during the 1970's scientific interest in taxonomy was boosted by funding and for the first time University groups started to work on the taxonomy and phylogeny of the family. Christopher Wilkinson (1936–2010) (Figs 12, 14) developed an interest in the Nepticulidae during a sabbatical at the Canadian National Collection of Insects, Arachnids and Nematodes in Ottawa in the early 1970's. Bryan P. Beirne (see above), then an applied entomologist in Burnaby, British Columbia, encouraged Wilkinson to revise this group for Canada and the USA. Wilkinson brought this research back to Portsmouth Polytechnic University, where he had worked since 1965, and two of his graduate students (Philip J. Newton and Malcolm J. Scoble) worked jointly with him on North American Nepticulidae, resulting in five papers dealing with all known species and several new ones (Wilkinson 1979; Wilkinson and Scoble 1979; Wilkinson 1981; Wilkinson and Newton 1981; Newton and Wilkinson 1982). Later, Malcolm Scoble (Fig. 17) obtained an academic position at the Transvaal Museum in Pretoria and continued working on the Nepticulidae of South Africa in a global context, gaining his PhD in 1983 (Scoble 1978a; b; 1979; 1980a; b; 1982; 1983). He presented the first cladistic analysis and classification of the family, dividing the family into two subfamilies, Pectinivalvinae and Nepticulinae, and the latter into two tribes, Nepticulini and Trifurculini. He also introduced the use of subgenera in the genus *Ectoedemia* and he named no fewer than 73 species. After these studies, Scoble turned his attention to other microlepidopterans, larger Lepidoptera and management while working, respectively, in the Oxford University Museum of Natural History and the Natural History Museum, London.

Christopher Wilkinson became professor of Animal Systematics and Zoogeography at the Free University of Amsterdam in 1977, and employed Erik J. van Nieukerken (Figs 15, 20) as PhD student and Georgina Bryan, Steph B. J. Menken and later Jacobus J. (Koos) Boomsma as postdocs, all to work on various aspects of the systematics and evolution of Nepticulidae. In Amsterdam, several MSc students worked with Wilkinson on the taxonomy of *Stigmella* species groups in Europe, and the taxonomy of *Stigmella* in Japan and New Zealand (Kemperman et al. 1985; Schoorl et al. 1985; Schoorl and Wilkinson 1986; Donner and Wilkinson 1989). The nepticulid research group (Wilkinson 1982) also published a joint paper on the *Ectoedemia angulifasciella* complex (Wilkinson et al. 1983). Unfortunately, the department was short lived being closed down after budget cuts in 1985, cuts that were particularly detrimental to taxonomy. EvN finished his degree in 1986 after the group had been disbanded (van Nieukerken 1983b; 1985b; 1986b; van Nieukerken and Dop 1987). His thesis built upon Scoble's results, but mainly based on the Holarctic fauna. He largely kept Scoble's classification, added two more subgenera to *Ectoedemia*, and included larval and detailed new adult characters in the character matrix. Together with his MSc student, Henk Dop, he also extensively studied antennal ultrastructure. Van Nieukerken and Dop discovered a novel sensillum, which they named sensillum vesiculocladum (van Nieukerken and Dop 1987). The work led to a first checklist of the Western Palearctic species (van Nieukerken 1986a). Steph Menken's research adopted new methods in the systematics of Nepticulidae by using allozyme characters, not only for species discrimination, but also for studies of population structure and parthenogenesis. Long before the advent of DNA barcoding, studies of allozymes facilitated species identification (Menken and Brouwer 1984; Menken and Wiebosch Steeman 1988; Menken 1990). After these studies, Steph Menken continued working on insect host relationships, particularly on Yponomeutidae as professor at the University of Amsterdam and Koos Boomsma continued his ecological studies, working as a professor in Copenhagen, particularly on social insects. The collaboration started by Menken, Boomsma and van Nieukerken resulted in a review paper published in 2010 on diet breadth in Lepidoptera, which also included important information on the host plants of Nepticulidae (Menken et al. 2010).

Wilkinson had also initiated collaboration to study Chinese Nepticulidae with professor Liu Youqiao from Beijing (Academia Sinica), resulting in a joint collecting trip by Erik van Nieukerken and Hans van Driel to China with Chinese counterparts in 1984 (van Driel and van Nieukerken 1985). After closing of the Amsterdam department, this research was unfortunately not continued. Only much later, van Nieukerken picked up the collaboration with Liu Youqiao and completed one joint paper on Chinese *Stigmella* (van Nieukerken and Liu 2000). Also plans by Wilkinson and Donald R. Davis (Fig. 11) for a volume in the series MONA (Moths of North America north of Mexico) never materialized, but checklists for the North American (Davis and Wilkinson 1983) and Neotropical Nepticulidae (Davis 1984) were completed.

At the same time that the Amsterdam group was active, Rimantas Puplesis (Fig. 15) started his PhD at the Zoological Institute of the Academy of Sciences in Leningrad,

Figures 17–23. Specialists on Nepticuloidea in 20th and 21st century. **17** Malcolm Scoble, April 1992, Helsinki, Congress SEL **18** Robert J. B. Hoare, collecting *Menurella quintiniae* at type locality, Lamington Park, Queensland, August 2004 **19, 20** Camiel Doorenweerd and Erik J. van Nieukerken collecting leafminers on *Fagus hayatae*, Taiwan, Taipingshan, October 2012 **21** Nagao Hirano and Toshiya Hirowatari, at Hirano's house, Matsumoto, Japan, September 2014 **22** Arūnas Diškus **23** Andrius Remeikis. Photos by Erik J. van Nieukerken (17, 18, 21) and Shipher Wu (19, 20).

Soviet Union, and this resulted in many papers describing new species of Nepticulidae that he and colleagues had collected in Far East Russia (Primorskij Kraj) and Central Asia (Puplesis 1984a; b; c; e; 1985b; c; Puplesis and Ivinskis 1985). He also produced a phylogeny, although not strictly following Hennigian cladistics. From 1985, Rimantas continued his work in Vilnius (Lithuania), Pedagogical University and while his earlier papers were all in the Russian language, from 1988 he published mostly in English, and an important summary of all his earlier work was a book dealing with the Nepticulidae of the former Soviet Union, including 21 new species (Puplesis 1994). He continued his work first in Central Asia, where he had travelled extensively, usually together with his colleague Arūnas Diškus (Fig. 22), who received his PhD in 2005. From 2000 onwards their main interest shifted to the Neotropical fauna, and they travelled and collected particularly in Belize and Ecuador, and studied also the very interesting material earlier collected by Ebbe Nielsen and Ole Karsholt in Argentina and Chile (Nielsen 1980; Nielsen 1985). Puplesis made the first revisions of the Neotropic fauna in collaboration with Gaden S. Robinson (1949–2009) (Beccaloni et al. 2009) from the Natural History Museum in London (Puplesis and Robinson 2000; Puplesis et al. 2002a; 2002b). In 2003, Diškus and Puplesis published a book (Puplesis and Diškus 2003b) – partly in Lithuanian, partly in English – with several revisions of Nepticulidae from Asia and Europe and a first comprehensive global catalogue including both the Nepticuloidea and Tischerioidea (Diškus and Puplesis 2003). In 1996 Rimantas had become professor in Vilnius, and from 2007 onwards published under the name Jonas Rimantas Stonis. With a group of co-workers, including Arūnas Diškus (Fig. 22), Asta Navickaite, Agnė Rocienė and Andrius Remeikis (Fig. 23) he continued working on the Neotropical fauna and collecting, now also in Guatemala, Colombia, Mexico, Peru, Bolivia and Chile (Stonis et al. 2013c; 2013d; 2014; 2016b; Remeikis and Stonis 2015; Stonis and Remeikis 2015), but also revised the earlier described Far East Russian Nepticulidae (Rocienė and Stonis 2013; Stonis and Rocienė 2013) and worked on the Lithuanian and Crimean fauna (Navickaitė et al. 2011; 2014). Puplesis-Stonis and his co-authors have contributed by far the largest number of new species in Nepticulidae, by July 2016 in total ca 225 valid names.

In 1986 Erik van Nieukerken obtained a position at the Rijksmuseum van Natuurlijke Historie in Leiden (now Naturalis Biodiversity Center), but his initial responsibilities left him little opportunity to continue taxonomic work before he got a position as curator for microlepidoptera and Arachnida in 1999. Still he was able to finish some studies that he had started in Amsterdam, and continued collaborations with especially Roland Johansson and other Scandinavians: Ebbe Schmidt Nielsen (1950–2001) (Fig. 14), Bert Gustafsson (Fig. 14) and Ole Karsholt. This collaboration led to the two volume set in the series Fauna Entomologica Scandinavica (Johansson et al. 1990), very beautifully illustrated with water colours and line art by Roland Johansson (for examples see Figs 25–40) and also containing the first treatment of all nepticulid larvae of a single fauna (Gustafsson and van Nieukerken 1990). Nielsen, who had moved from Denmark to Canberra, Australia, had been the driving force for completion of this multi-authored work, and he was that again for the completion of the study of the previously described Australian Nepticulidae by him, Johansson and van Nieukerken. It was speeded up when Nielsen had been able to hire in 1994 Robert J. B. Hoare (Fig. 18) as PhD student to work on Australian Nepticulidae (Hoare et al. 1997). Hoare finished his study of Australian Nepticulidae in an unpublished PhD thesis (Hoare 1998), of which most relevant parts have since been published, including the description of the new genus *Roscidotoga* and a revision of *Pectinivalva*, including two subgenera (Hoare 2000a; Hoare 2000b; Hoare and van Nieukerken 2013), that are raised here to genus. After moving to Auckland, New Zealand, Hoare shifted his attention to the Lepidoptera of New Zealand in general.

In the late 1980's and early 1990's the Czech brothers Aleš and Zdeněk Laštůvka (Fig. 16) developed an interest in leafmining Lepidoptera, particularly Nepticulidae and Gracillariidae, and the opening of the Iron Curtain provided them with the opportunity to start extensive collecting in the Mediterranean region: Spain, Portugal, France, Italy, Croatia and Greece. They published a general guide for Central European species (Laštůvka and Laštůvka 1997) and many descriptions of new species (e.g. Laštůvka and Laštůvka 1990; 1994; 1998; 2000b; 2007). They also extensively collaborate with van Nieukerken on this fauna, resulting in several of the papers cited below. Aleš Laštůvka also started to illustrate the moths with water colours, as can be seen in several of their papers.

Moving into the 21st century, Roland Johansson and Erik van Nieukerken renewed their collaboration, resulting in a second revision of the oak mining *Stigmella* (van Nieukerken and Johansson 2003). The initiation of a molecular laboratory at Naturalis prompted van Nieukerken to include sampling material for DNA analysis during his extensive collecting in many parts of the world, including Vietnam, Australia, Borneo and from 2010 onwards in the USA, Taiwan, Korea and Japan. Early molecular results in 2004 were shown at the International Entomological Congress in Brisbane (van Nieukerken et al. 2004a), but still considered insufficient for a full publication. Most publications by him and co-authors in the early 2000's concern detailed European faunistics (van Nieukerken et al. 2004b; 2004c; 2006; van Nieukerken 2006) and two small and one large revision of West Palearctic *Acalyptris*, the subgenus *Trifurcula* (*Levarchama*) and *Ectoedemia*, subgenera *Ectoedemia* and *Zimmermannia* (van Nieukerken 2007a; b; van Nieukerken et al. 2010). Meanwhile in Naturalis the DNA barcoding project was adopted, and extracting DNA for barcoding (Ratnasingham and Hebert 2007) became a routine during dissection. Several papers provided barcodes as support for the taxonomy (van Nieukerken 2007a; 2010; Ivinskis et al. 2012; Laštůvka et al. 2013), and with MSc student Camiel Doorenweerd (Fig. 19), they published two larger papers concentrating on DNA barcodes and how to use them in Nepticulidae (van Nieukerken et al. 2012a; 2012b). Camiel Doorenweerd continued as PhD student from 2012 and analysed more genes. This resulted in several phylogeny papers (Doorenweerd et al. 2015a; Doorenweerd et al. 2016a), and some that are still in preparation. In order to improve calibration points for molecular phylogenies, all Nepticulidae fossils were re-assessed and catalogued (Doorenweerd et al. 2015b), and the named ones with formal descriptions are also included in the present catalogue.

After a paper on *Stigmella* from Japan (Kemperman et al. 1985), a collaboration between the Free University of Amsterdam group of Wilkinson and two Japanese leafminer specialists: Hiroshi Kuroko and Tosio Kumata, work on that fauna had slowed down, but a few species were named or discussed (Kuroko 1989; 1990; Kumata and Nakatani 1995; Kuroko 1999; Kuroko 2004; van Nieukerken and

Kuroko 2005). The collaboration with Japan is now picked up again by van Nieukerken and Doorenweerd with Toshiya Hirowatari (Fig. 21), first in Osaka University, now professor in Kyushu University in Fukuoka and is expected to soon yield new publications. The study received further impetus from an amateur, Nagao Hirano (Fig. 21), who had collected and reared Nepticulidae extensively and described 12 new species (Hirano 2010; 2014); he also wrote the Nepticulidae texts for the book series "The standard of moths in Japan", written in Japanese (Hirano 2013). At the same time some small-scale collaborations with China (prof. Li Houhun) and Korea (Bong Woo Lee) resulted in new material for study and will hopefully result in new publications.

Also work on North American Nepticulidae is now being continued collaboratively by van Nieukerken, Doorenweerd, in collaboration with Davis, David Wagner, Charley Eiseman, Greg Pohl and others, and this includes extensive DNA barcoding studies. A checklist of Lepidoptera of Canada with our contribution is now in preparation (Greg Pohl and Jean-François Landry, editors) and some of our data are presented in this catalogue.

Taxonomic history of Opostegidae

The first opostegids to be named were *Tinea auritella* Hübner, 1813 (now *Pseudopostega auritella*) and *Elachista salaciella* Treitschke, 1833 (now *Opostega salaciella*). Zeller (1839) erected the genus *Opostega* for these two species and his new *O. crepusculella*, but he also included other small white species, that are now included in respectively *Phyllocnistis* Zeller, 1848 (Gracillariidae) and *Leucoptera* Hübner, 1825 (Lyonetiidae). Zeller did not select a type species, only much later Walsingham (1914) selected *salaciella* as such. In 1848 Zeller narrowed *Opostega* and only included species now still regarded as Opostegidae, by removing the other species to his new genera *Phyllocnistis* and *Cemiostoma* Zeller, 1848 (a junior synonym of *Leucoptera*). In 1855 five out of the six known European species had been named and two species from North America followed in the next 20 years (Clemens 1862a; Chambers 1875b).

Most early authors placed *Opostega* in the family Lyonetiidae (Stainton 1854; Frey 1856; Stainton 1859a), but Heinemann and Wocke ([1876]) already recognised the similarity with *Nepticula* and placed them in the Nepticulidae. The family name was first used by Meyrick (1893) as Opostegides, but Meyrick considered it to be a subfamily of Tineidae.

After the early descriptions, for a long period new species, mostly from other continents, were almost all named by Edward Meyrick and Lord Walsingham (66 in all) (Table 3). Just single species are attributed to Busck, Chrétien, Eyer, and Kuroko. A. Jefferis Turner (1923) described some species from Australia and O.H. Swezey (1921) discovered that the opostegids in Hawaii (now *Paralopostega*) make leafmines on *Melicope* (Rutaceae) (then named *Pelea*), whereas the life history of most Opostegidae remained a mystery. Only that of *Opostegoides scioterma* had been extensively described by Grossenbacher (1910), under the incorrect name *Opostega nonstrigella* (Davis and

Table 3. Number of Opostegidae species (valid and invalid) described per first author for authors who described at least six valid species.

First Author	# spp
Davis	74
Meyrick	53
Puplesis (Stonis)	21
Walsingham	11
Turner	6
17 authors	27
Total	**192**

Stonis 2007). This species is a cambium miner of *Ribes* (Grossulariaceae), and another species of the same genus, *Opostegoides minodensis* (Kuroko, 1982) was later discovered to be a cambium miner of *Betula*.

In the 20th century there was still no agreement about placement of the single genus *Opostega*, some textbooks placed it in the Nepticulidae, sometimes as subfamily (Spuler and Meess 1910; Hering 1932a), others kept it in Lyonetiidae, including the book first describing the male genitalia of three British species (Pierce and Metcalfe 1935). The first paper that recognised a grouping of families very similar to what we know nowadays was Busck (1914b), who considered the Opostegidae as family, close to Nepticulidae and Tischeriidae, in the Lepidoptera "Aculeates", rather similar to what we now call lower Heteroneura. This placement was confirmed by larval studies a few years later (Heinrich 1918).

When studying the Opostegidae from the Asian parts of the Soviet Union, Kozlov (1985) realised that the differences in the genitalia of the single recognised genus *Opostega* were large and he erected a new genus, *Opostegoides* Kozlov, and split *Opostega* in two subgenera: *Opostega* and *Pseudopostega* Kozlov. Soon thereafter Davis (1989) completed a generic revision of the family and a phylogenetic analysis, finally resulting in the recognition of three new genera and raising *Pseudopostega* to full genus. The most peculiar new genus was *Notiopostega*, with the single species *N. atrata* Davis, 1989, with a wingspan of 13–18 mm by far the largest opostegid and largest species of the superfamily, of which the larvae make extremely long mines of up to seven meters in the cambium of *Nothofagus* trees (Carey et al. 1978; Davis 1989).

The four Northern European Opostegidae were reviewed and keyed by van Nieukerken (1990a), and a key for all six European species was presented by van Nieukerken et al. (2004b). Erik van Nieukerken also discovered and confirmed host plants for the northern European *Pseudopostega* species: *Lycopus europaeus* (Lamiaceae) for *P. auritella* and *Mentha aquatica* (Lamiaceae) for *P. crepusculella.* Both make long linear mines in the bark and gradually go deeper in the stem (van Nieukerken 1990a; Regier et al. 2015).

Rimantas Puplesis also worked extensively on Opostegidae, and revised the Oriental species together with Gaden Robinson (Puplesis and Robinson 1999) and together with Donald Davis they revised the New World species, including 70 new species and one new genus (Davis and Stonis 2007).

Material and methods

Taxonomic practice

Species

Ultimately, a catalogue or checklist is a list of species, arranged in a linear classification framework. Few taxonomists describe the methodology and philosophy they follow to recognise and delimit species. They often use the simple species concept: "a species is what a taxonomist calls a species" (Kalkman 1987). There are many species concepts, see eg Mallet (2001) for an overview. If we have to choose, we probably adhere most to the phylogenetic or diagnostic species concept (Mallet 2001; Isaac et al. 2004), but agree with Mallet's notion that "agreement on a unified species-level taxonomy is possible, but will be forthcoming only if we accept that species lack a single, interpretable biological reality over their geographic range and across geological time". In the taxonomic literature on Nepticuloidea, only Scoble (1983) discussed how he recognised species, but also he concluded that the practice is rather different from the theory. With the explosion of genetic data we have much more information nowadays than just two decades ago, but that does not mean that it has become much easier to recognise species. DNA barcodes are helpful, but can also complicate species discrimination, especially for allopatric populations (see below). In practice we recognise species by a combination of morphological characters, where genitalia are important, but not the only characters, and of the biology: host plant and mine morphology and of DNA data, particularly DNA barcodes and also of distribution data.

All species recognised here are in fact just hypotheses of species, open to further testing by more data and subject to ever ongoing evolution. We change the status of previously recognised species whenever our own research or our interpretation of published research has given reason to do so. This is particularly the case for several North American and Asian species that we (EvN and CD) have been studying the last years, and for which several publications are in preparation.

Subspecies

We do not recognise any subspecies. The systematic category in itself is problematic, and is particularly a part of the polytypic biological species concept, that can only be used for species where distributions are known in detail and the amount of hybridisation in border areas has been studied; as such subspecies are mostly used in charismatic groups such as vertebrates and butterflies, and even in these there is a tendency given by the phylogenetic species concept to abandon subspecies and raise them often to full species, particularly in birds (Isaac et al. 2004).

If allopatric populations are morphologically (almost) inseparable, and also share most of the biology, we simply use the same species name over the entire area (e.g. *Ectoedemia occultella* in the entire Palearctic and Nearctic, making the same characteristic mines on *Betula* and morphologically indistinguishable). In the case that there are more differences, we opt for separate species (e.g. *E. intimella* and *E. insularis*), particularly when consistent morphological differences are paired with a large diagnostic difference in DNA barcodes.

Very few subspecies have been described in the last 50 years in Nepticuloidea; for the few that were named (eg in two species of Neotropical *Pseudopostega*, (Davis and Stonis 2007)) we have raised the subspecies to full species when we see sufficient differences, or just left them as synonyms in other cases (e.g. *Stigmella anomalella pacifica* Puplesis, 1987). More than 50 years ago, the subspecies category had been used sometimes for biological forms (host plant races) and these are treated either as synonyms or raised to species level in a few cases.

Higher categories

Our classification of Nepticulidae follows our molecular phylogeny (Doorenweerd et al. 2016a), of which Fig. 24A shows the results in summary. Since the earlier recognised subfamily Nepticulinae and the tribe Nepticulini are not recovered, we abandon the use of subfamily and tribus here. After consultation with various lepidopterists we also choose to drop the subgenus category entirely, after we had to abandon them in *Ectoedemia* to maintain manageable monophyletic entities. In this way our classification resembles that of Diškus and Puplesis (2003).

The genus *Enteucha* is sister to all other Nepticulidae and therefore listed first. *Stigmella* is always split into two large clades that we name "Core *Stigmella*" for the clade with the type species *S. anomalella* and "Non-core *Stigmella*" for the other one. Splitting *Stigmella* was considered impractical, due to a lack of good morphological apomorphies for these clades and the fact that *Stigmella* remains a well supported and recognisable entity.

The new Neotropical genus *Ozadelpha* (van Nieukerken et al. 2016) forms a clade with the former Pectinivalvinae. Also in *Pectinivalva* we have raised the three recently recognised subgenera to full genus (Hoare and van Nieukerken 2013).

This clade is sistergroup to the remaining genera, previously collectively named Trifurculini. Within this clade one can recognise three groups: A poorly supported clade of *Bohemannia* together with the new Neotropic genera *Neotrifurcula* and *Hesperolyra*, a clade of *Glaucolepis* + *Trifurcula* and a clade of the former *Ectoedemia* plus *Acalyptris* and *Parafomoria*. Following the principle of abandoning subgenera, we split *Trifurcula* now into *Trifurcula* and *Glaucolepis*, whereas *Levarchama* is reduced to a species group in *Trifurcula*.

Whereas the finding of the large "*Ectoedemia* clade" occurs in all our analyses, the order of the various genera changes in different analyses. The classification we adopt here follows the best supported phylogeny. The raising of *Muhabbetana* and *Zimmermannia* to full genus is novel, even though Hering (1940) already proposed *Zimmermannia* as full genus, this was never adopted until now.

The classification of Opostegidae follows the treatments by Davis (1989) and Davis and Stonis (2007), but also here we abandon the use of subfamilies, and we do not follow the splitting of *Pseudopostega* in species groups (see below).

Species groups

Species groups are a practical category to combine groups of species within large genera that share morphological and biological characters, and have been extensively used in Nepticulidae, particularly *Stigmella* since Johansson (1971). Our molecular studies show that many of these species groups are indeed monophyletic entities (Doorenweerd et al. 2015a; 2016a), but on the other hand there has also been a proliferation of often monotypic species groups for species with different genitalia that cannot be placed easily. We have here recognised especially the well diagnosable species groups that often are also supported by molecular data. These include many of the Holarctic groups in *Stigmella* and *Ectoedemia*. Groups for which we have no or insufficient molecular data have been recognised when morphologically uniform and comprising more than one species, others are listed as unplaced within genera, or the larger clades that we recognise in *Stigmella*. When several groups together form a monophyletic clade, we sometimes use the term "cluster" for that clade.

In *Pseudopostega* we have abandoned all species groups for the time being, and list the species alphabetically by geographic region. We have been unable to find phylogenetic or molecular support for the groupings and found them hard to use. For details for these groups we refer to the revisions that introduced them (Puplesis and Robinson 1999; Davis and Stonis 2007).

Species group names are not governed by the ICZN rules, and for practical reasons we have therefore changed some names that were based on junior synonyms, or in one case replaced it by the name of the type species that is included in the group (*Acalyptris psammophricta* group rather than *repeteki* group). We give the authors who used the group name for the first time, even though they may have used a different composition. Synonyms are not complete, and many group names for single species are not given in synonymy, nor are the many names for *Pseudopostega* groups.

We group a few sibling species in species complexes, but only in cases where these species are really very hard to almost impossible to separate morphologically, or only by either biological or molecular data. This applies only to three complexes in European *Ectoedemia* (van Nieukerken et al. 2012b). Recently, Stonis and Remeikis (2015) recognised two species complexes in Neotropical *Acalyptris*, but since these are simply groupings of rather similar, but diagnosable species, we do not concur to use the term "complex" for such assemblages, because there are multiple similar examples in global Nepticuloidea. The *Stigmella nigriverticella* complex (Remeikis and Stonis 2015) is indeed a complicated group, but the *saginella* group to which the complex belongs, is overall still a taxonomic puzzle that requires more study both morphologically and genetically.

Order of the list

We order the genera and species groups according to our preferred phylogeny (Doorenweerd et al. 2016a), see also above. Species groups for which we do not have molecular data are listed at the end of each genus, monotypic species groups are largely abandoned, except in cases with an almost fully resolved phylogeny, where a single species does not group with any species group, as in the *Ectoedemia terebinthivora* group (Doorenweerd et al. 2015a), or when we know unnamed species that clearly group with the single species. The form genus *Stigmellites* for unplaced fossils is listed at the end of Nepticulidae and dubious taxa are listed at the end of each family. At the end of the checklist we list excluded taxa with their current taxonomic placement. These taxa were either originally described in *Nepticula* or *Opostega*, or once combined with these genera, but are now considered to belong to other families, in all 29 names, now belonging to 23 species in ca. eight to ten families. The list also includes four taxa of fossil leafmines, previously considered to possibly belong to Nepticulidae (Doorenweerd et al. 2015b).

Species are only listed in a phylogenetic order for those genera and groups where we have a detailed phylogeny, in practice only in *Ectoedemia* and a few species groups in *Stigmella*. Otherwise species are grouped by geographical region (order: WP, EP, OR, AFR, AUS, NEA, NEO) and listed alphabetically. Following the valid name we list the original combination plus those of the junior synonyms, followed by all now invalid subsequent combinations. Usually unavailable names are given at the end of the list of synonyms.

Distribution

For each species we give the biogeographical region(s) of occurrence with an abbreviation. When the abbreviation is placed in square brackets the species is assumed to be an introduction. For type localities and simple maps of country records we refer to the scratchpad http://nepticuloidea.info/, which is regularly updated, and the Catalogue of Life.

DNA barcodes and specimen data

Obtaining DNA barcodes has been standard in our taxonomic workflow since ca 2000, particularly for recent material or taxonomic relevant material such as types; in many cases additional genes have been sequenced. Our methodology has been explained in detail elsewhere (van Nieukerken et al. 2012a; 2012b; Doorenweerd et al. 2015a; 2016a). Where our classification in the first place is based on the phylogenetic analyses of several genes, we have used DNA barcodes often to place species that were not involved in those analyses. Further we used the barcodes as additional arguments in deciding about species status, even though there is no absolute criterion. The judgement of the value of barcode distances is particularly problematic in vicariant populations, such as island populations, where exchange of genetic material has ceased often a long time ago (Mutanen et al. 2012; 2016). We only opted for separate species when a large distance was paired with morphological and/or biological differences, shown in sufficient material. In cases when single specimens on an island show large Barcode distances, but hardly any morphological ones, we usually decide against splitting until further material and data are available. This is for instance the case in *Pseudopostega chalcopepla* and some island populations of *Stigmella perpygmaeella*. We have discussed the use of barcodes extensively for *Ectoedemia* and some groups of *Stigmella* (van Nieukerken et al. 2012a; 2012b). Barcodes have also been of great use to couple the unknown sex, eg. in some *Zimmermannia* species, or to link species with unknown life histories to barcoded larvae. We would like to stress the added value of DNA barcodes to taxonomy, and plea for adding barcode data to all taxonomic treatments, whenever possible.

We release here our dataset of barcodes of well identified material as BOLD Dataset DS-NEPCAT (DOI: 10.5883/DS-NEPCAT). This means that identities of specimens included were either identified by us or by colleagues providing the data. Obviously various barcoded larvae that did not match any adult barcodes and could not otherwise be identified may still belong to named species with unknown hosts. This dataset includes DNA barcodes of 3205 specimens, belonging to 779 species (733 Nepticulidae and 46 Opostegidae) of which 2574 specimens belong to 444 formally named species (409 Nepticulidae and 35 species of Opostegidae). The remaining 642 specimens belong to ca. 335 unnamed (or as yet unidentified) species (324 Nepticulidae and 11 Opostegidae). In the dataset 3071 barcodes are assigned a Barcode Identification Number (BIN), representing 900 BIN's, which belong to 749 recognised species (717 Nepticulidae and 32 Opostegidae). A neighbour joining tree of the barcode data is supplied here as Supplementary material S2. Even though NJ trees contain phylogenetic signal, they cannot be considered as real phylogenetic trees, and species may be completely misplaced on the basis of barcodes alone.

Data for specimens to which we refer in our notes are listed in Supplementary material S1, and when barcoded these data are also available in dataset DS-NEPCAT.

Host plants

We refrain from compiling a list of host plants here, even though it would have made the catalogue much more complete. A critical catalogue of host plant records requires considerable work on checking literature records, verifying host plant identifications and nomenclature and interpretation. We are working on such a catalogue to publish in the future, including many records of yet unnamed and unidentified species, to provide an insight into the host plant choices of the family. A catalogue of hosts without reference to sources was given by Diškus and Puplesis (2003), and for the West Palearctic and northern European alone by respectively van Nieukerken (1986a) and

Johansson et al. (1990) and several more local revisions provide detailed host records. An analysis of all global host records on family level was used for the paper on the evolution of host associations in Lepidoptera (Menken et al. 2010).

Nomenclatorial practice

The most important source for nomenclatorial practice is the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature 1999), that helps solving most nomenclatorial issues. However, interpreting the code is often difficult and we therefore highlight how we dealt with some cases in general, whereas in notes we discuss our individual choices where needed.

We include only names that were published as real scientific names, all available names according to ICZN, but also all unavailable names that are formed as real binomial or trinomial names. Unavailable names are marked with a double dagger (‡). For completeness' sake we also include infrasubspecific names, that are not available according to the Code (ICZN 1.3.4). Many names based on leafmines only (the work of an animal) are unavailable when published after 1930 (ICZN 13.6.2), these are marked with the abbreviation "NNLM" (see below). After screening some of these descriptions, they appeared to be available after all, since part of the description dealt with the larva, eg. the colour, thus making the description available, even though it often is of little use in recognising the species.

We do not include any informal intermittent names (eg *Acalyptris* species 29135) or names given to unnamed barcoded species, as such names easily become obsolete and often are not published on paper or another fixed media anyway. Some of these intermittent names are listed on our scratchpad, though (van Nieukerken 2016) and many are used in the DNA barcodes dataset.

References

All original descriptions and references with new combinations and synonymies have been examined by EvN (mostly from his own collection of reprints, copies and pdf's), always trying to establish correct publication dates, which lead to changing a few publication dates of taxa. The Biodiversity Heritage Library (BHL) has been a particular great help, since this contains fully scanned volumes, allowing checking of dates on wrappers of issues and volumes, in addition to those available in our libraries. Nowadays there are many more repositories with scanned journals and books of particular countries, but since they do not always contain scans of wrappers and title pages, this checking is not always easy. It would be a great improvement if all these repositories were accessible through a single online source (BHL?); now it is not always easy to find these.

In the catalogue proper we present citations in the form as recommended by the Code (ICZN art. 50, 51, recommendations 51B–G), thus with comma, and use of ampersand rather than “and”. We always cite the page for the first description and for other nomenclatorial actions.

All references are listed here, and all references for original descriptions are also available in the scratchpad (van Nieukerken 2016). Where possible we added here the doi or url to the references.

Combinations

We here introduce several new combinations, that became necessary after raising subgenera to full genus. While doing this, we realised that it is often difficult to find where new combinations have been made in the past, since ICZN (in contrast to the Botanical Code) does not have special requirements for new combinations, other than that the publication fulfils availability. In practice many new combinations have been made unintentionally in checklists, faunistic papers, faunas, without marking these, whereas several of the new combinations marked as such in literature (including some of our own) appeared not to have been new at all. In Nepticulidae this is particularly the case with the combinations of many species with *Stigmella*: after the recognition by Walsingham (1908a) that in fact *Stigmella* is valid rather than *Nepticula*, some authors started to use this generic name, but many did not, and this uncertainty continued for 70 years (Wilkinson 1978)! There are in fact not many “official” new combinations in *Stigmella* and for European species many were given without further notice in two faunal works (Gerasimov 1952; Hering 1957). To document the combination history for all names in Nepticuloidea, we here give the first author using the combination – as far as we have been able to ascertain – as author name after the brackets, in a similar fashion as botanists do and as has been recommended by ICZN (Recommendation 51G). Combinations only published online on webpages or databases (including the scratchpad) and not in online journals, are not accepted as validly published, and thus are given here as new combinations when valid. When these combinations are no longer valid and have been used only online, we mention this by adding “online comb.”

One deviation from the code is that we do not change the ending of species-group names to agree with the gender of the generic name (ICZN article 34.2). This follows the practice by most lepidopterists in leading catalogues and checklists, duly discussed by Sommerer (2002) and formally adopted by the Societas Europaea Lepidopterologica in a Resolution during their General Meeting at the 13th European Congress of Lepidopterology in Kørsør (Denmark) on June 4, 2002 (Sommerer *loc. cit.*). In Nepticuloidea this affects only few names anyway, since most generic names are feminine (except *Varius*, which is masculine).

Synonyms

Similar to the combinations, finding the source for new synonyms is often difficult, and we therefore give the source for all subjective synonymies that we have been able to find. The few cases where we did not find it we leave this open, and we do not give a synonymy author for objective synonyms (names with the same type, such as new names, incorrect subsequent spellings) or for (infra)subspecific names within the same nominal species.

Types

We have tried to include information on the primary types for each name in the scratchpad (van Nieukerken 2016), including information on the depository, the genitalia slide number and the host plant of the type – when reared. Information on types is provided here only for cases discussed in the notes. We also started adding photos of types to the scratchpad, but this will be far from complete when this paper is published.

Type species of genera and type genera of family group names are always given in the list, using several similar abbreviations as suggested by Pullen et al. (2014).

Abbreviations and symbols used

AFR	Afrotropical region
AUS	Australian and Pacific regions
BIN	Barcode Identification number
BOLD	Barcoding of Life Database
EP	East Palearctic region
ICZN	International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature 1999)
IOS	Incorrect original spelling
ISS	Incorrect subsequent spelling
JH	Junior Homonym [of Genus]
JPH	Junior Primary Homonym [of Species]
JSH	Junior Secondary Homonym [of Species]
ND	Nomen dubium, dubious name, of which identity is unknown and untraceable
NEA	Nearctic region
NEO	Neotropical region
NN	Nomen nudum, unavailable name failing to conform to ICZN art 12 or 13
NNLM	Nomen nudum, for a name after 1931 based on the description of a leafmine (ICZN 13.6.2)
NO	Nomen oblitum, forgotten name, not used as valid name after 1900
OR	Oriental region
RN	Replacement name
syn	Synonymised by
TG	Type Genus

TS/OD	Type Species by Original Designation
TS/OD,M	Type Species by Original Designation and Monotypy
TS/M	Type Species by Monotypy
TS/SD	Type Species by Subsequent Designation
UE	Unjustified emendation
URN	Unnecessary replacement name
WP	West Palearctic region
†	Fossil species
‡	The double dagger is given before an nomenclatorially unavailable name.
[1]	Superscript numbers refer to the taxonomic notes after the list. In the online html version of the list automatically hyperlinked.

Global Nepticuloidea: the state of the art

Table 4 provides an overview of the diversity of global Nepticuloidea for region and genus. Here we report 862 extant named species of Nepticulidae and 192 Opostegidae, a total of 1054. For the 18 fossil species we refer to our earlier catalogue (Doorenweerd et al. 2015b). We illustrate most genera with watercolours by Roland Johansson in Figures 25–40.

There is a strong bias for the West Palearctic with 321 Nepticulidae, but the highest number of Opostegidae is for the Neotropics (89), which probably better reflects the reality. Fig. 24B shows that there is a constant increase in numbers of described species over time, and we are already aware of large numbers of unnamed species from most areas, but particularly the tropics and East Asia. The following lines present a short summary of our current knowledge of Nepticuloidea per region.

Europe. As has also become clear from the taxonomic history, until recently most work concentrated on the European fauna, and probably the majority of species have been described by now. Europe, excluding Cyprus, but including Macaronesia, contains 280 named species. We know of about 20 unnamed species of *Trifurcula*, eight *Parafomoria* and a small number of *Stigmella*, particularly *Rhamnus* feeders and several species belonging to the *Stigmella salicis* complex (van Nieukerken et al. 2012a), but otherwise do not expect many more to be discovered. Several key works deal with parts of Europe (Johansson et al. 1990; Laštůvka and Laštůvka 1997; Bengtsson et al. 2008), but this still excludes southern Europe.

The largest genus is *Stigmella*, as in most regions, but also *Ectoedemia* is very diverse here with a particularly rich fauna associated with oaks (van Nieukerken et al. 2010; 2012b). Both genera feed particularly on Fagaceae, Rosaceae, Betulaceae and Salicaceae, and *Stigmella* also on Rhamnaceae and a few other families. Although Europe has no endemic genera, the three Mediterranean genera *Parafomoria*, *Glaucolepis* and *Trifurcula* have by far their largest diversity here, particularly in the Iberian Peninsula, and to a lesser extent in Italy and Greece. Most of these feed on shrubs and some herbs in the typical Mediterranean habitats as Garrigue or Maquis, with *Parafomoria* specialising

Table 4. Diversity of extant Nepticuloidea per geographic region and globally. Numbers are validly described species. When only unnamed species of a certain genus are known from a region this is indicated by a plus sign, brackets indicate occurrence just at the edge of the region. When generic assignment is uncertain, the number is given in *italics*.

	WP	EP	OR	AUS	AFR	NEA	NEO	Global
Enteucha	1	+	1			(2)	9	**11**
Varius					1			**1**
Simplimorpha	1				1			**2**
Stigmella	138	115	17	31	50	51	61	**428**
Ozadelpha							3	**3**
Roscidotoga				4				**4**
Casanovula				2				**2**
Menurella			1	11				**12**
Pectinivalva				7				**7**
Neotrifurcula							1	**1**
Hesperolyra							4	**4**
Bohemannia	3	5						**7**
Areticulata					1			**1**
Glaucolepis	34	2	1	+		1	*2*	**40**
Trifurcula	34		**?**		*2*			**36**
Fomoria	12	7	3	3	22	3	*1*	**48**
Muhabbetana	4				28			**32**
Parafomoria	8							**8**
Etainia	7	4	+		4	2		**16**
Acalyptris	23	1	7	+	22	9	32	**93**
Zimmermannia	9	4	+			5	+	**17**
Ectoedemia	47	29	+		5	14	*1*	**89**
Nepticulidae Total	**321**	**167**	**30**	**58**	**136**	**85**	**114**	**862**
# genera	**13**	**8**	**6**	**6**	**10**	**7**	**9**	**22**
Notiopostega							1	**1**
Eosopostega		1	1	+				**2**
Neopostega							6	**6**
Paralopostega				6				**6**
Opostegoides	1	6	15	1	4	1		**28**
Opostega	5	3	(1)					**7**
"Opostega"				17	3			**20**
Pseudopostega	3	2	22	+	8	9	82	**122**
Opostegidae total	**9**	**12**	**39**	**24**	**15**	**10**	**89**	**192**
# genera	**3**	**4**	**3**	**4**	**3**	**2**	**3**	**8**
Nepticuloidea Total	**330**	**179**	**69**	**82**	**151**	**95**	**203**	**1054**
# genera	**16**	**12**	**9**	**10**	**13**	**9**	**12**	**30**

on Cistaceae, *Trifurcula* on Fabaceae, mostly brooms (Genisteae) and Loteae, whereas *Glaucolepis* has groups of species feeding on Lamiaceae, Apiaceae: *Bupleurum* and Plantaginaceae: *Globularia*. *Fomoria* has a centre of diversity in Greece and Turkey with at

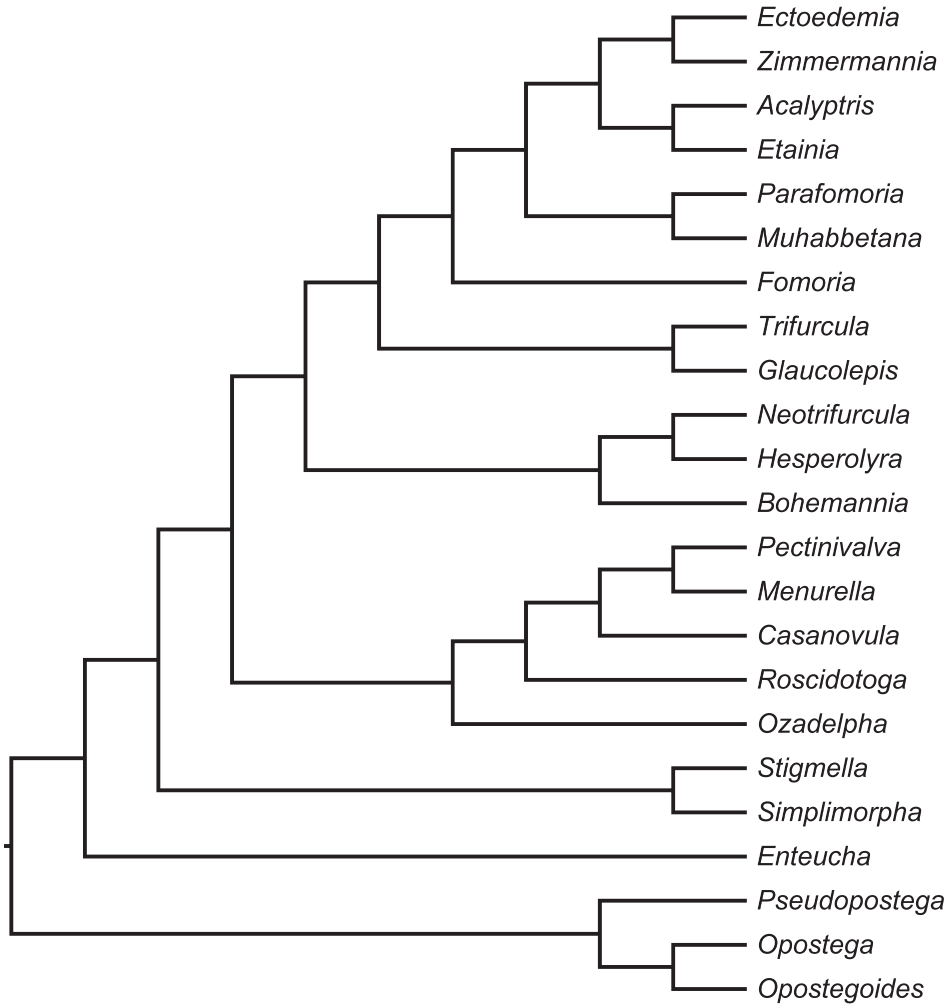


Figure 24A. Schematic phylogram of Nepticulidae genera based on the best resolved tree of our Molecular phylogeny (Doorenweerd et al. 2016a).

least six species feeding on *Hypericum*. *Acalyptris* also has most species in South East Europe, with the *staticis* group specialised on Plumbaginaceae and often occurring along the sea coast, and four species in the *platani* group on Platanaceae, Loranthaceae and Anacardiaceae. *Etainia* and *Zimmermannia* are widespread in Europe, the first associated with Sapindaceae (*Acer*) and Ericaceae (*Arctostaphylos*), whereas most *Zimmermannia* are barkminers in Fagaceae, and one in *Ulmus*. *Simplimorpha* has one species, *S. promissa*, oligophagous on Anacardiaceae in southern Europea, whereas the single *Enteucha, E. acetosae* occurs in Central and Eastern Europe on *Rumex* species (Polygonaceae).

Western Palearctic Region. Obviously Europe is part of this region, and its fauna continues along the Mediterranean coasts, but there is a great difference in the know-

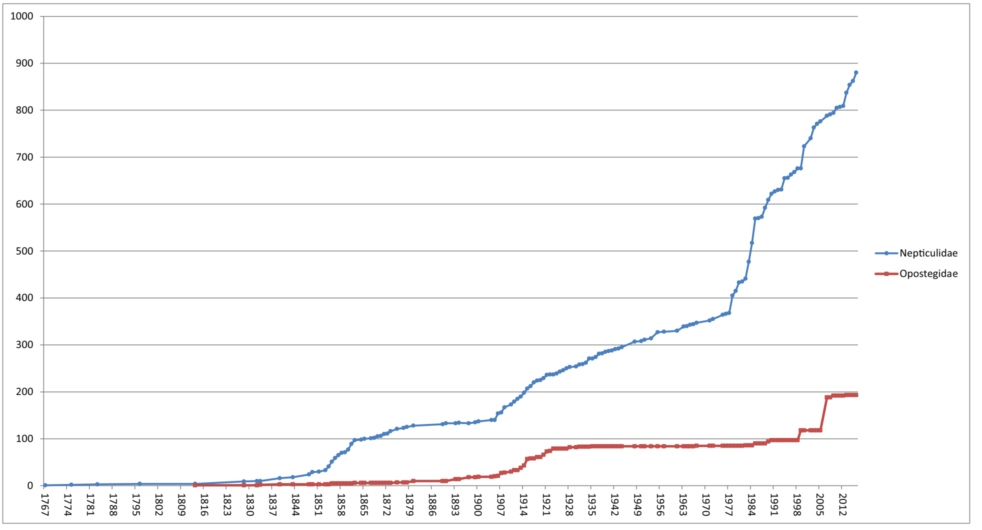
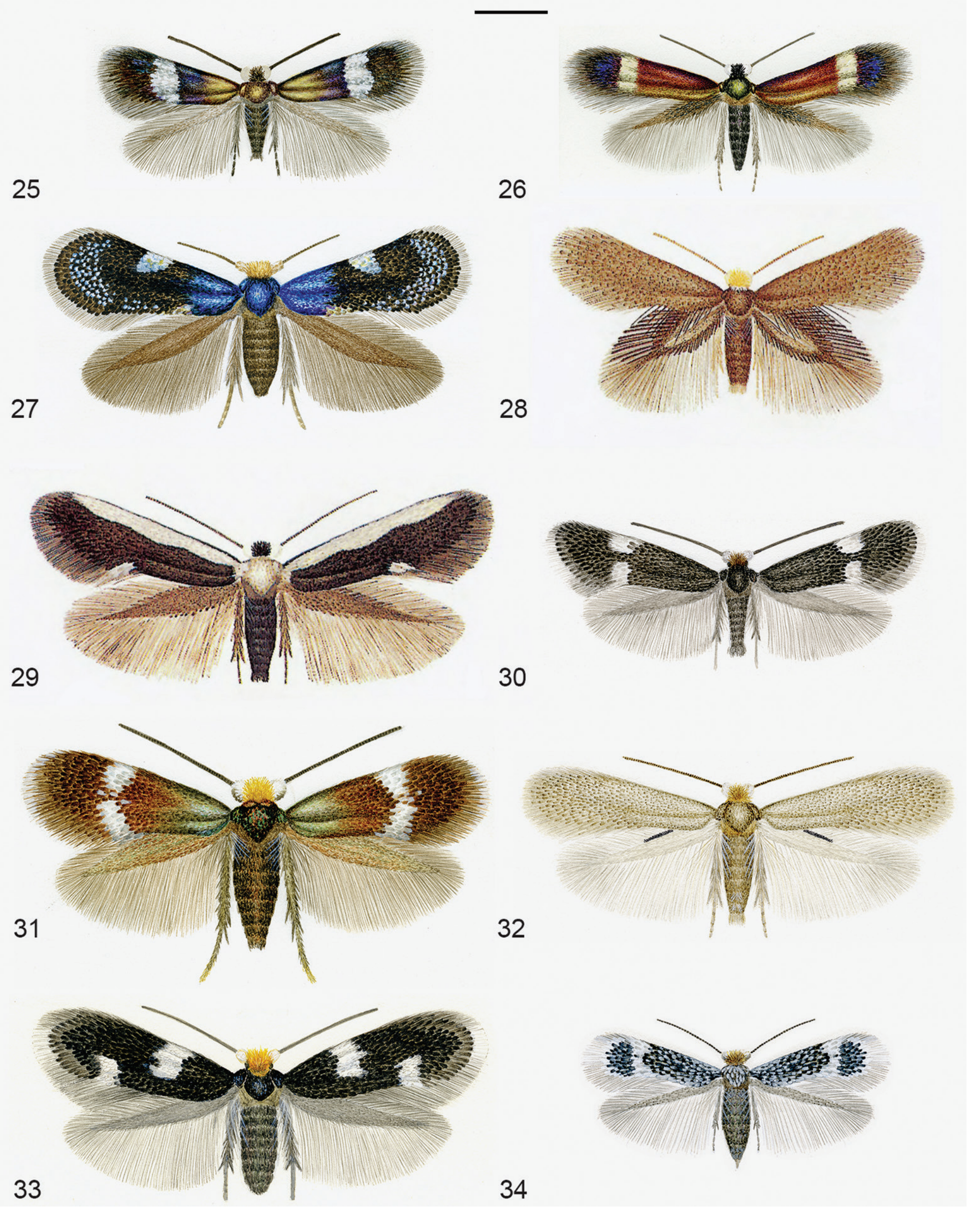


Figure 24B. Cumulative number of valid species of Nepticulidae and Opostegidae described per year. Notice the long period that no Opostegidae were described (1935–1967) and the sudden increase in numbers of Nepticulidae since 1978.

ledge of the faunas inside and outside of Europe. The region has only 50 species that are not known from Europe (the total of 330 minus 280). The typical Mediterranean fauna continues in North Africa, Turkey and the Levant, but has been poorly sampled and will probably contain still many new taxa to discover. Turkey and Iran in particular are promising countries for high diversities, Turkey has a large diversity in such host plant genera as *Quercus* and *Hypericum*. In the desert areas of the Middle East, North Africa and the Arabian peninsula other groups become important, such as the *Acalyptris psammophricta* and *shafirkanus* groups (Puplesis et al. 1996; van Nieukerken 2010) and *Ectoedemia* and *Zimmermannia* are almost absent. Probably the best studied area in this region is Turkmenistan with nearly 50 recorded species (Puplesis and Diškus 2003a).

Eastern Palearctic Region. We separate West and East Palearctic more or less following the 64–65 East meridian, from North to South along the rivers Ob, Tobol, Turgay, Aral Sea, Karakum desert and the border between Iran and Afghanistan/Pakistan. In practice this means that we treat in Central Asia Turkmenistan and Iran as West Palearctic, and Afghanistan, Tadzhikistan and most of Uzbekistan and Kazakhstan as East Palearctic. This is a huge area, with major differences between the rather dry and mountainous Central Asia and the almost subtropical forested areas of the Sino-Japanese zone. The 167 named Nepticulidae and 12 Opostegidae certainly only represent the tip of the iceberg. Much work has been done on parts of the former Soviet Union: Central Asia and the Russian Far East (Puplesis 1994; Puplesis and Diškus 2003a; Rocienė and Stonis 2013; Stonis and Rocienė 2013), but for other regions descriptive work is only just beginning. In central Asia the best studied and most diverse country is Tadzhikistan with ca 40 species (Puplesis and Diškus 2003a). In this area



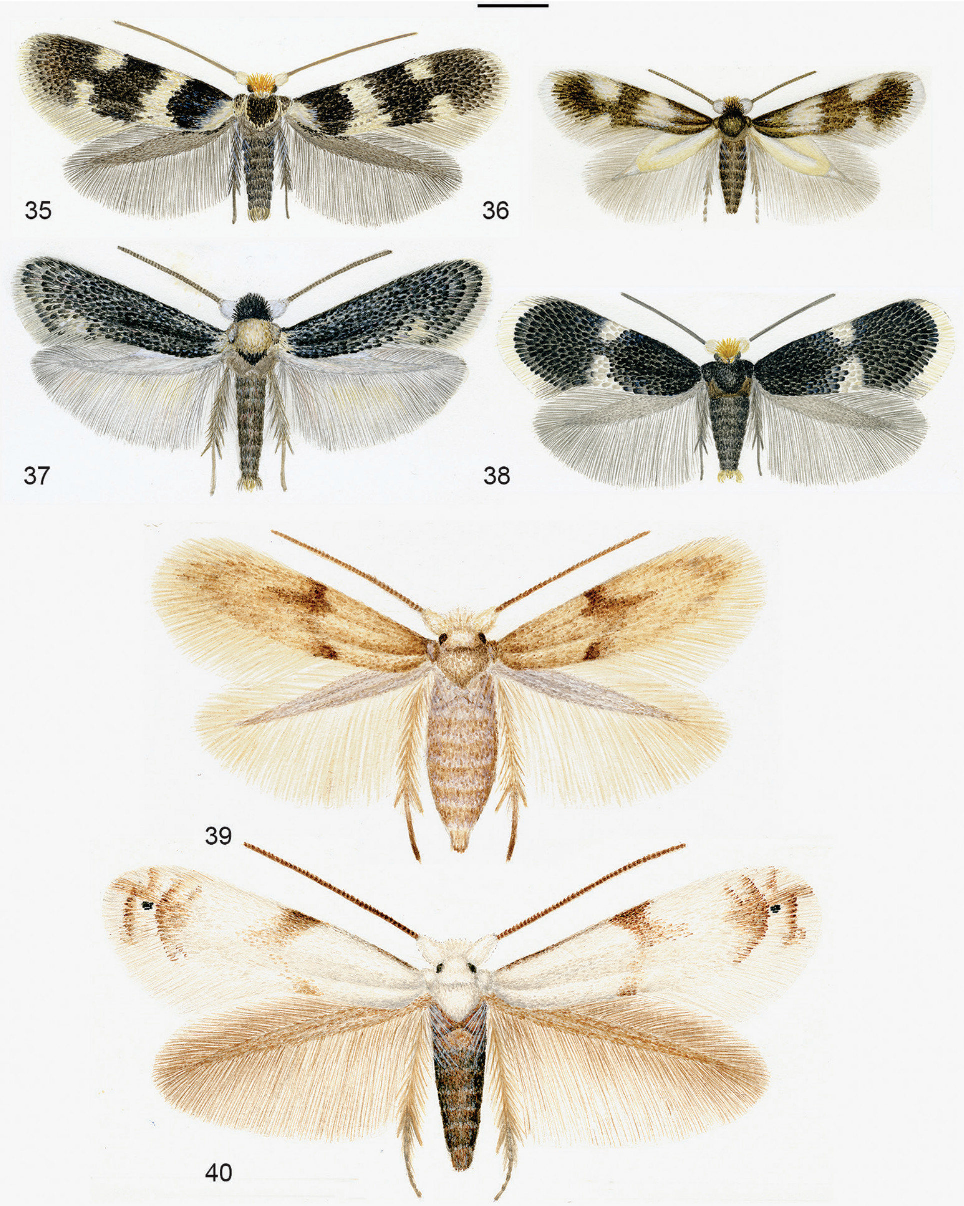
Figures 25–34. Diversity of Nepticulidae, all on same scale. **25** *Enteucha acetosae*, male, Austria **26** *Stigmella mespilicola*, male, Switzerland, holotype **27** *Roscidotoga callicomae*, female paratype, Australia, NSW **28** *Menurella libera*, male holotype, Australia, NSW **29** *Pectinivalva caenodora*, male holotype, Australia, NSW **30** *Glaucolepis lituanica* , male, Austria **31** *Bohemannia auriciliella*, male, The Netherlands **32** *Trifurcula iberica*, male paratype, Spain **33** *Fomoria weaveri*, female, Sweden **34** *Parafomoria helianthemella*, female, Czech Republic. Scale 1 mm. Watercolours by Roland Johansson, 25, 26, 31 and 33 published earlier by Johansson et al. (1990), 28 and 29 by Hoare et al. (1997). The left wings of 32 and 34 are digitally mirrored images of the right wings. These figures may be reproduced given that their author Roland Johansson and the present publication are credited.

Stigmella and *Ectoedemia* are particularly common in the mountainous areas, with species feeding particularly on Rosaceae, Salicaceae and Rhamnaceae, but in desert areas *Acalyptris* becomes an important element with members of the *psammophricta* and *shafirkanus* groups of which biologies are mostly completely unknown.

The northern part of the area, Siberia, has many trans-palearctic species, particularly *Stigmella* and *Ectoedemia* species feeding on *Betula* and Ericaceae feeders as *Stigmella lediella* on *Rhododendron* and *Fomoria weaveri* on *Vaccinium vitis-idaea*. A paper on Siberian nepticulids is in preparation (van Nieukerken, Kirichenko et al.).

Eastern Asia is a very rich faunistic area, with very diverse forests containing many potential host plants. The northernmost portion, Far east Russia, notably the Primorye region, has been best studied, with around 70 species known (Puplesis 1994; Rocienė and Stonis 2013; 2014, Stonis and Rocienė 2013). Initial fieldwork in China has resulted in the recognition of a very rich fauna of at least some 200 species, but to date only few have been described (van Driel and van Nieukerken 1985; van Nieukerken and Liu 2000). For Japan we have a working list of at least 120 species, the recent fauna work listed ca 75 (Hirano 2013; Hirowatari 2013). Obviously all these faunas have a large overlap, and are characterised by dominance of *Ectoedemia* and *Stigmella* (Kemperman et al. 1985; Hirano 2010; 2014). On many tree species there are multiple species in both genera, particularly in Fagaceae, Betulaceae, Juglandaceae, Rosaceae, Ulmaceae and Salicaceae, but also the fauna on Ericaceae and Sapindaceae is comparatively rich. Linking species names from species described from adults only to leafmines from which no adults have emerged is still a challenge, but due to an increasing number of available barcodes more and more of these are linked and publications are being prepared. In *Stigmella* there are also a few species feeding on monocots: the grass genus *Oplismenus* with *S. oplismeniella* (Kemperman et al. 1985) and an unnamed species on *Carex* in Japan. The smaller genera *Etainia*, *Fomoria* and *Bohemannia* are relatively rich in this area, and in the more southern parts *Acalyptris* and *Enteucha* become more important, the latter with a number of species feeding on Polygonaceae, to date all unnamed (van Nieukerken 1986b). In the Opostegidae the genus *Opostegoides* is particularly rich with six named species.

Oriental region. The number of named species for the oriental region is still very low with only 30 Nepticulidae, but the Opostegidae have been revised (Puplesis and Robinson 1999) and number 39 species. Most of the species were described by Meyrick from India, and some from Nepal by Puplesis and Diškus (2003a). From our fieldwork in Vietnam, Borneo and Taiwan, it is clear that there is a rich fauna of leafmining Nepticulidae in this region, but it is a challenge to find sufficient numbers of larvae that can be reared to adults. We have never been very successful with light collecting adults in this region, but some – often poor – material is available in various collections. The genera *Stigmella* and *Acalyptris* are most diverse in this area, *Ectoedemia* is becoming much rarer further away from the Palearctic, but still occurs on *Rubus* from the North as far as Borneo, forming a complex of closely related species. In Borneo we also discovered the first non-Australian species in the genus *Menurella* (formerly in *Pectinivalva*): *M. xenadelpha* on *Syzygium acuminatissimum* (Myrtaceae)



Figures 35–40. Diversity of Nepticulidae and Opostegidae, all on same scale. **35** *Etainia sericopeza*, male, Sweden **36** *Acalyptris platani*, male, Italy **37** *Zimmermannia atrifrontella*, male, Germany **38** *Ectoedemia klimeschi*, male, Austria **39** *Opostega spatulella*, female, Hungary **40** *Pseudopostega crepusculella*, male, Sweden. Scale 1 mm. Watercolours by Roland Johansson, published earlier by Johansson et al. (1990). These figures may be reproduced given that their author Roland Johansson and the present publication are credited.

(Hoare and van Nieukerken 2013). *Stigmella* species have a wide variety of hosts, including tropical groups such as Dipterocarpaceae, Meliaceae, Phyllanthaceae and Moraceae (*Ficus* species), the large majority belonging to non-core *Stigmella*. There are also species in the *S. betulicola* group feeding on grasses such as *Oplismenus* and Cyperaceae (*Cyperus*): *S. xystodes* (van Nieukerken 2010). *Acalyptris* have an even wider range of hosts throughout the eudicots, most species belonging to the *A. platani* group.

The Opostegidae are characterised by many species in *Opostegoides* and *Pseudopostega*, and single species in *Opostega* and *Eosopostega* (Puplesis and Robinson 1999).

The fauna of northern parts of the Oriental region, Nepal, northern Vietnam, Taiwan, has a much more Palearctic character, often sharing the same host plant genera and comprises for instance also several *Ectoedemia*, the Polygonaceae feeding *Enteucha* species, including the only named one, *E. diplocosma* and *Fomoria* species feeding both on Lamiaceae: *Callicarpa* and *Vitex* and Hypericaceae (van Nieukerken 2008).

Afrotropical Region. The knowledge of the African fauna is very unbalanced, of the 136 named Nepticulidae species the great majority is known from southern Africa, thanks to the diligent rearing work by Lajos Vári, who also named several species (Vári 1955; 1963) and the revisions by Malcolm Scoble (Scoble 1978a; b; 1980a; b; 1983). Further just a few were described from Gambia (Gustafsson 1985) and outside that area just five species have been named; also collections are poor in unidentified material. But even in South Africa much of the diversity is still unknown, and every new collection contains unnamed species. Two monotypic endemic genera *Varius* and *Areticulata* have an uncertain placement and may be synonyms to existing genera. The genera *Simplimorpha* and *Muhabbetana* are near endemic, both also occur in the adjacent Mediterranean region. *Simplimorpha* is specialised on Anacardiaceae, and most African *Muhabbetana* feed on Ebenaceae and Celastraceae. *Fomoria* and *Acalyptris* are relatively diverse genera with broad host ranges. *Stigmella* is the largest genus, as everywhere, but with a dominance of species belonging to non-core *Stigmella*. The *Ectoedemia commiphorella* group has several species feeding on Burseraceae and is possibly sister to the northern hemisphere *Ectoedemia* (Doorenweerd et al. 2015a). Also the group of African *Etainia* species seems to be sister to the Holarctic *Etainia*, but hosts and biology are completely unknown. The two species assigned to *Trifurcula* (Scoble 1980a) may not belong there, a closer study of these species is needed.

The island fauna of the Indian Ocean is still poorly known: two species occur on Aldabra (Seychelles), see below under note 21, and one is named from Madagascar (*Fomoria scobleella*). However, we have seen examples or DNA barcodes of Nepticulidae from Madagascar that show the presence of the genera *Acalyptris*, *Muhabbetana*, *Ectoedemia* and *Stigmella*. No species are known from Réunion or Mauritius.

The African Opostegidae, with 15 named species, have not yet been revised, but we have been able to recombine several "*Opostega*" species here with *Opostegoides* or *Pseudopostega*, the only genera known with certainty from Africa.

Australian Region. Australia proper has a very rich and special fauna with an estimate of about 250 species of Nepticulidae as currently available in collections (Hoare 1998), of which approximately 30 have been named. Australia has four (almost) endemic genera: the small genus *Roscidotoga* (4 species) in the eastern rainforest, specialised on plants in the Oxalidales (Hoare 2000a; van Nieukerken et al. 2011), and *Casanovula*, *Menurella* and *Pectinivalva* with around 160 species, all but one (that feeds on

Quintinia, Paracryphiaceae) feeding on Myrtaceae, with a large number feeding on *Eucalyptus* (Hoare and van Nieukerken 2013). The other large genus is *Stigmella* with an estimated number of at least 80 species, with the most important host families being Rutaceae, Fabaceae (including *Acacia*), Sapindaceae, Euphorbiaceae, Phyllanthaceae and Rhamnaceae (Hoare 1998); a large number of these species belong to non-core *Stigmella*. *Fomoria* has just a few species in the *vannifera* group on Brassicaceae and one in the *weaveri* group on Salicaceae (Hoare 2000b; Doorenweerd et al. 2016a), *Acalyptris* includes ca. seven unnamed species in the *A. platani* group (hosts Phyllanthaceae, Melastomataceae, Loranthaceae) and there is also one *Glaucolepis* in the *raikhonae* group. There is a rich opostegid fauna with 24 named species, but they have not yet been revised. The genera *Opostegoides* and *Pseudopostega* at least occur here, and there is possibly also a species of *Eosopostega* (Hoare 1998).

The fauna of New Guinea is virtually unknown, we have only seen a few species of *Stigmella*.

New Zealand has a fauna quite unrelated to Australia, only the genus *Stigmella*, with the *S. ogygia* group occurs here, with 27 named and ca 12 unnamed species. Interestingly, its sistergroup is the *epicosma* group in South America. Many New Zealand species feed on shrubby and herbaceous Asteraceae, such as *Olearia* or *Senecio*, but there are also species feeding on Malvaceae, Ericaceae and Nothofagaceae (Donner and Wilkinson 1989). There are no opostegids known from New Zealand.

On the many Pacific islands only few Nepticulidae are known, *S. ebbenielseni*, feeding on *Pipturus* (Urticaceae) was described from Guam (van Nieukerken and van den Berg 2003), and a few other Urticaceae feeding *Stigmella* are reported in the same paper from Polynesia and Fiji. No nepticulids are known from Hawaii, but there occurs the interesting endemic genus *Paralopostega*, with a small radiation of species, making leafmines on *Melicope* (formerly *Pelea*, Rutaceae) (Swezey 1921; Zimmerman 1978, Davis, 1989).

On New Caledonia many mines of Nepticulidae have been seen (RJBH), several on Cunoniaceae, but no serious collecting has taken place. The adults of two species are known, but these have not been placed to genus, and require further study. The fauna could well be diverse and important, in common with the very rich and unusual flora of this island.

Nearctic region. The fauna of the Nearctic is relatively poor with 85 named Nepticulidae and ten Opostegidae. The Nepticulidae were revised in the early 1980's (Wilkinson 1979; 1981; Wilkinson and Scoble 1979; Wilkinson and Newton 1981; Newton and Wilkinson 1982) and the Opostegidae recently (Davis and Stonis 2007), but much material remained unstudied and a lot has been collected since the 1980's. Two of us (EvN and CD) have been collecting leafmines throughout North America, whereas Davis has draft descriptions of 20 new species and several other people are contributing to a much better knowledge. Some of our results are shown in this list with notes, and several manuscripts are underway. Even though there are still quite a few unnamed species to describe, overall the fauna is not as rich as in the Palearctic, or even Europe alone. We do not know the cause, but it is interesting to note that other groups of leafminers are much more diverse in the Nearctic than in the Palearctic (Tischeriidae, Bucculatricidae, several groups of Gracillariidae).

By far the largest genus is *Stigmella*, with groups specialising on amongst others Fagaceae, Betulaceae, Juglandaceae, Rhamnaceae, Rosaceae and Anacardiaceae; typical species groups for this region are the *saginella* and *quercipulchella* groups with oak feeding species and the *prunifoliella* group feeding on Anacardiaceae, Rhamnaceae (*Ceanothus*) and Rosaceae (*Prunus*); most other species groups are shared with the Palearctic. Particularly in California and Arizona there are largely unstudied radiations of species on *Quercus* and *Ceanothus*. *Ectoedemia* is not nearly as diverse as in the Palearctic, and for instance has not more than three species feeding on oaks, but it has some other hosts including Platanaceae and Cornaceae (*Nyssa*). The genus *Acalyptris* still has a large undiscovered diversity, with several species specialising on Cyperaceae in wetlands, like the type species of *Microcalyptris*, *A. scirpi*. *Fomoria*, *Etainia* and *Glaucolepis* are small genera with just a few species, but the barkmining *Zimmermannia* has a few more species (even though we synonymise here eight names) and is a widespread element, with associations with Fagaceae, Salicaceae and possibly Betulaceae. The fauna of southern Florida is more Neotropical with its two species of *Enteucha* on seagrape *Coccoloba uvifera* (Polygonaceae) and various other species in *Acalyptris*, *Stigmella* and *Pseudopostega*. In northern North America there are several Holarctic species, particularly feeding on *Betula* (eg *Ectoedemia occultella*, *minimella*) or Ericaceae (*Fomoria weaveri*) and some European species have been introduced (paper in preparation).

Neotropical Region. Currently 123 named species of Nepticulidae (plus 13 informally named species) and 89 Opostegidae are known, but due to active research new species are added regularly, particularly by Stonis and co-authors (reviewed by van Nieukerken et al. (2016) and see above). The fauna differs remarkably from most other regions, with three endemic genera in Nepticulidae: *Ozadelpha*, *Neotrifurcula* and *Hesperolyra*, and two endemic genera in Opostegidae: *Notiopostega* and *Neopostega*. Most of the named Nepticulidae belong to *Stigmella*, but also here with endemic species groups: the *epicosma* group, the *eurydesma* group, the *barbata* group and the *purpurimaculae* group. Host plant relationships are also special: as in the New Zealand *ogygia* group, many species in the *epicosma* group, particularly common in the Andes, feed on Asteraceae (Stonis et al. 2015a; 2016b). The *Nothofagus* forest of austral South America is the locality for several endemics, and *Notiopostega* is known to make extremely long mines in the cambium of *Nothofagus* trees. It is possible that species of *Neotrifurcula* are also barkminers of *Nothofagus*, and for the *Stigmella purpurimaculae* group there is a strong suspicion that they make leafmines in *Nothofagus* (Stonis et al. 2014). *Ozadelpha* species are associated with Myrtales: Melastomataceae and Myrtaceae, and the only species of *Hesperolyra* where the host is known also feeds on Myrtaceae. There are nine species of *Enteucha*, and where known they feed on Polygonaceae: *Coccoloba*. For the large number of *Acalyptris* species there are only few host records, including Fabaceae and Verbenaceae. In the northern part of the Neotropics there is greater similarity with the Nearctic fauna, and this is particularly the case for the recently discovered diversity of *Quercus* miners in Guatemala and Colombia (Stonis et al. 2013e; Remeikis and Stonis 2015).

The generic placement of the few Neotropical species now placed in *Ectoedemia*, *Fomoria* and *Glaucolepis* requires further study, *Zimmermannia* occurs in Mesoamerica with an unnamed species with genitalia very similar to *Z. bosquella* (Puplesis and Robinson 2000).

In the Opostegidae the genus *Pseudopostega* is remarkably diverse with 82 species, unfortunately as yet without any knowledge of host associations (Davis and Stonis 2007).

Atlantic Islands. Not a single nepticuloid species is known from the Oceanic Atlantic islands south of Macaronesia (such as St. Helena, Ascension, Tristan da Cunha, the Falklands), but their occurrence still could be possible. The fauna of Macaronesia is mostly endemic, particularly on the Canarian Islands, with mostly Mediterranean or African elements of *Glaucolepis*, *Muhabbetana*, *Fomoria*, *Acalyptris* and *Stigmella*. The fauna of the Azores and Madeira is very poor with respectively one and four species, some of which have been introduced (Karsholt and Vieira 2005; Aguiar and Karsholt 2006). No nepticulids are yet known from Cabo Verde, but are expected to occur there, and in the North Atlantic there are no Nepticulidae known from Greenland or Iceland, nor any of the smaller islands.

Catalogue

SUPERFAMILY **NEPTICULOIDEA** Stainton, 1854: 295

FAMILY **NEPTICULIDAE** Stainton, 1854: 295 (TG: *Nepticula* Heyden, 1843)

Family Stigmellidae Hampson, 1918: 387 (TG: *Stigmella* Schrank, 1802)

Subfamily Pectinivalvinae Scoble, 1983: 12 (TG: *Pectinivalva* Scoble, 1983) (syn.: Puplesis, 1994: 36)

Subfamily Nepticulinae Stainton, 1854

Subfamily Stigmellinae Hampson, 1918

Subfamily Trifurculinae Scoble, 1983: 16 (TG: *Trifurcula* Zeller, 1848), **syn. n.**

Tribe Nepticulini Stainton, 1854: 295

Tribe Stigmellini Hampson, 1918

Tribe Trifurculini Scoble, 1983: 16 **syn. n.**

Enteucha Meyrick, 1915a: 241 (TS/M: *Enteucha cyanochlora* Meyrick, 1915) [1]

Johanssonia Borkowski, 1972a: 702; JH of *Johanssonia* Selensky, 1914 (Annelida, Hirudinea) (TS/OD,M: *Nepticula acetosae* Stainton, 1854) (syn: van Nieukerken, 1986a: 7)

Artaversala Davis, 1978: 219 (TS/OD,M: *Artaversala gilvafascia* Davis, 1978) (syn: van Nieukerken, 1986a: 7)

Oligoneura Davis, 1978: 217; JH of *Oligoneura* Bigot, 1878 (Brachiopoda) (TS/OD,M: *Oligoneura basidactyla* Davis, 1978) (syn: van Nieukerken, 1986a: 7)

Manoneura Davis, 1979: 276; RN for *Oligoneura* Davis, 1978 (syn: van Nieukerken, 1986a: 7) [1]

Johanssoniella Koçak, 1981: 99; RN for *Johanssonia* Borkowski (syn: van Nieukerken, 1986a: 7)

Enteucha acetosae (Stainton, 1854) van Nieukerken, 1986a: 7 (Fig. 25) WP

‡ *Nepticula acetosae* Shield, 1853: 4153 NN

Nepticula acetosae Stainton, 1854: 303

Nepticula acetosella Doubleday, 1859: 36 UE

Nepticula arifoliella Klimesch, 1940b: 92

Stigmella acetosae (Stainton, 1854) Beirne, 1945: 200

Johanssonia acetosae (Stainton, 1854) Borkowski, 1972a: 702

Johanssoniella acetosae (Stainton, 1854) Koçak, 1981: 99

Stigmella arifoliella (Klimesch, 1940) Hering, 1957: 912

‡ *Nepticula arifoliella* var. *altvateri* Skala, 1941b: 79

Enteucha diplocosma (Meyrick, 1921) Diškus & Puplesis, 2003: 321 OR

Nepticula diplocosma Meyrick, 1921a: 411

Enteucha acuta Puplesis & Diškus in Puplesis et al., 2002: 21 NEO

Enteucha basidactyla (Davis, 1978) van Nieukerken, 1986a: 54 [1] NEA,NEO

Oligoneura basidactyla Davis, 1978: 218

Manoneura basidactyla (Davis, 1978) Davis, 1979: 276

Enteucha contracolorea Puplesis & Robinson, 2000: 20 NEO

Enteucha cyanochlora Meyrick, 1915a: 241 NEO

Enteucha gilvafascia (Davis, 1978) van Nieukerken, 1986a: 54 NEA,NEO

Artaversala gilvafascia Davis, 1978: 221

Enteucha hilli Puplesis & Robinson, 2000: 19 NEO

Enteucha snaddoni Puplesis & Robinson, 2000: 21 NEO

Enteucha trinaria (Puplesis & Robinson, 2000), **comb. n.** NEO

Manoneura trinaria Puplesis & Robinson, 2000: 23

Enteucha terricula Puplesis & Robinson, 2000: 20 NEO

Varius Scoble, 1983: 14 (TS/OD,M: *Stigmella ochnicola* Vári, 1955)

Varius ochnicola (Vári, 1955) Scoble, 1983: 14 AFR

Stigmella ochnicola Vári, 1955: 336

Varius ochnicolus (Vári, 1955) Scoble, 1983: 14 [variant]

Simplimorpha Scoble, 1983: 15 (TS/OD,M: *Stigmella lanceifoliella* Vári, 1955)

Simplimorpha promissa (Staudinger, 1871) van Nieukerken, 1986a: 6 WP

Nepticula promissa Staudinger, 1871: 325

Nepticula robiniella Gustafsson, 1973: 197 (syn: van Nieukerken, 1986a: 6)

Stigmella promissa (Staudinger, 1871) Klimesch, 1951b: 64

Simplimorpha lanceifoliella (Vári, 1955) Scoble, 1983: 15 AFR

Stigmella lanceifoliella Vári, 1955: 331

Stigmella Schrank, 1802: 169 (TS/SD (Walsingham, 1908a: 1007) [2]: *Phalaena* (*Tinea*) *anomalella* Goeze, 1783)
Nepticula Heyden, 1843: 208 (TS/SD (Walsingham, 1908a: 1007): *Tinea aurella* Fabricius, 1755) (syn: Walsingham, 1908a: 1008) [2]
Dysnepticula Börner, 1925: 370 (TS/OD: *Phalaena* (*Tinea*) *anomalella* Goeze, 1783)
Astigmella Puplesis, 1984a: 111 (TS/OD: *Astigmella dissona* Puplesis, 1984) (syn: van Nieukerken, 1986a: 7)
[*Microsetia* Stephens, 1834 *sensu* Kirby, 1897: 313 (TS/incorrect SD by Kirby, 1897: *Nepticula microtheriella* Stainton, 1854) (see Wilkinson 1978: 17)]

Non-core *Stigmella* [3]

ungrouped species in Non-core *Stigmella*

Stigmella freyella (Heyden, 1858) Vári, 1950: 182 WP
Nepticula freyella Heyden, 1858: 175
Stigmella kurilensis Puplesis, 1987: 8 EP
Stigmella ebbenielseni van Nieukerken & Van den Berg, 2003: 28 AUS
Stigmella resplendensella (Chambers, 1875) Newton & Wilkinson, 1982: 456 [4] NEA
Nepticula resplendensella Chambers, 1875b: 118
Stigmella unifasciella (Chambers, 1875) Newton & Wilkinson, 1982: 438 NEA
Nepticula unifasciella Chambers, 1875b: 119
Stigmella gallicola van Nieukerken & Nishida in van Nieukerken et al., 2016: 7 NEO

***Stigmella prunifoliella* group** (Newton & Wilkinson, 1982: 385) [5]
Stigmella prunetorum group (Johansson, 1971: 245)
Stigmella bifasciella group (Wilkinson & Scoble, 1979: 59)

Stigmella prunetorum (Stainton, 1855) Beirne, 1945: 198 WP,EP
Nepticula prunetorum Stainton, 1855: 72
Nepticula dimidiatella Herrich-Schäffer, 1855a: 352 (syn: Herrich-Schäffer, 1860: 59)
Nepticula perpusillella Herrich-Schäffer, 1855a: 353 (syn: Frey, 1856: 390)
Nepticula prunetella Doubleday, 1859: 36 UE
Nepticula ligustrella Rössler, 1867: 395 (syn: van Nieukerken & Johansson, 1987: 461)
Nepticula punctella Threlfall, 1884: 113 ISS
‡ *Nepticula prunetorum* var. *aviella* Skala, 1934b: 6 NNLM
‡ *Stigmella prunetorum* var. *aviella* (Skala, 1934b) NNLM
Stigmella diniensis (Klimesch, 1975) Leraut, 1980: 49 WP
Nepticula diniensis Klimesch, 1975c: 5
Stigmella ceanothi (Braun, 1910) Newton & Wilkinson, 1982: 387 NEA
Nepticula ceanothi Braun, 1910: 172
Stigmella cerea (Braun, 1917) Newton & Wilkinson, 1982: 407 NEA
Nepticula cerea Braun, 1917: 172
Stigmella intermedia (Braun, 1917) Wilkinson & Scoble, 1979: 62 NEA
Nepticula intermedia Braun, 1917: 171

Stigmella prunifoliella (Clemens, 1861) Newton & Wilkinson, 1982: 385 NEA
Nepticula prunifoliella Clemens, 1861: 84
Nepticula bifasciella Clemens, 1862: 133 (syn: Newton & Wilkinson, 1982: 385)
Nepticula serotinaeella Chambers, 1873: 126 (syn: Braun, 1917: 170)
Stigmella bifasciella (Clemens, 1862) Wilkinson & Scoble, 1979: 59
Stigmella rhoifoliella (Braun, 1912) Newton & Wilkinson, 1982: 391 NEA
Nepticula rhoifoliella Braun, 1912: 93
Stigmella gossypii (Forbes & Leonard, 1930) Newton & Wilkinson, 1982: 404 NEO
Nepticula gossypii Forbes & Leonard, 1930: 149
Stigmella schinivora van Nieukerken, 2016 in van Nieukerken et al., 2016: 15 NEO

***Stigmella ultima* group** (Puplesis, 1984a: 116)
Stigmella aceris (Frey, 1857) Gerasimov, 1952: 222 WP
Nepticula aceris Frey, 1857: 386
Nepticula penicillata Heinemann & Wocke, [1876]: 744 [6] (syn: van Nieukerken & Johansson, 1987: 461)
Nepticula szöcsi Klimesch, 1956: 423 (syn: Klimesch, 1978a: 246)
Nepticula szoecsi Klimesch, 1956: 423 ISS (syn: Klimesch, 1978a: 246)
Stigmella acerna Puplesis, 1988: 277 [7] WP
‡ *Stigmella acerifoliella* Dovnar-Zapolski, 1969: 20 NNLM; **syn. n.** [7]
Stigmella bicolor Puplesis, 1988: 276 EP
Stigmella bumbegerensis Puplesis, 1984d: 509 EP
Stigmella kozlovi Puplesis, 1984a: 118 EP
Stigmella monella Puplesis, 1984a: 117 EP
Stigmella orientalis Kemperman & Wilkinson, 1985: 21 EP
Stigmella semiaurea Puplesis, 1988: 275 WP,EP
Stigmella tegmentosella Puplesis, 1984a: 117 EP
Stigmella ultima Puplesis, 1984a: 117 EP
Stigmella japonica Kemperman & Wilkinson, 1985: 20 (syn: Puplesis, 1994: 81)

***Stigmella ulmivora* group** (Johansson, 1971: 244)
Stigmella kazakhstanica Puplesis in Puplesis et al. 1991: 70 WP,EP
Stigmella pimschoorli Puplesis, 1994: 64 (syn: Puplesis et al., 1996: 192)
Stigmella ulmiphaga (Preissecker, 1942) Klimesch, 1948b: 62 WP
Nepticula ulmiphaga Preissecker, 1942: 208
Nepticula gracilivora Skala, 1942: 6 (syn: Klimesch, 1975c: 4)
Stigmella ulmivora (Fologne, 1860) Beirne, 1945: 199 [8] WP
Nepticula ulmivora Fologne, 1860: 92
Nepticula ulmifoliae Hering, 1931: 531 (syn: Emmet, 1974d: 151)
Nepticula ulmicola Hering, 1932: 569 (syn: Emmet, 1974d: 151)
Stigmella ulmifoliae (Hering, 1931) Vári, 1944b: xxv
Stigmella ulmicola (Hering, 1932) Vári, 1944b: xxv
‡ *Nepticula ulmella* Hofmann, 1858: 191 NN (syn: Segerer, 1997: 188) [8]

Stigmella viscerella (Stainton, 1853) Beirne, 1945: 199 WP
Nepticula viscerella Stainton, 1853: 3958
Nepticula subvirescens Meyrick, 1934b: 523 (syn: Diškus & Puplesis, 2003: 343)
Nepticula tauromeniella Groschke, 1944: 117 (syn: Klimesch, 1975c: 2)
Stigmella tauromeniella (Groschke, 1944) Hering, 1957: 1090
Stigmella alisa Puplesis, 1985c: 63 EP
Stigmella amuriella Puplesis, 1985c: 62 EP
Stigmella auricularia Puplesis, Diškus & Juchnevič in Puplesis & Diškus, 2003a: 245 EP
Stigmella multispicata Rocienė & Stonis in Stonis & Rocienė, 2014: 205 [9] EP
Stigmella nireae Kemperman & Wilkinson, 1985: 18 EP
Stigmella palionisi Puplesis, 1984b: 596[7] EP
Stigmella nakamurai Kemperman & Wilkinson, 1985: 16 **syn. n.** [10]

***Stigmella eurydesma* group** (Puplesis & Robinson, 2000: 32)
Stigmella albilamina Puplesis & Robinson, 2000: 33 NEO
Stigmella eurydesma (Meyrick, 1915a) Davis, 1984: 18 NEO
Nepticula eurydesma Meyrick, 1915a: 255
Stigmella fuscilamina Puplesis & Robinson, 2000: 34 NEO

***Stigmella saginella* group** (Wilkinson & Scoble, 1979: 39)
Stigmella castaneaefoliella (Chambers, 1875b) Wilkinson & Scoble, 1979: 44 NEA
Nepticula castaneaefoliella Chambers, 1875b: 117
Stigmella flavipedella (Braun, 1914) Wilkinson & Newton, 1981: 31 NEA
Nepticula flavipedella Braun, 1914: 19
Stigmella macrocarpae (Freeman, 1967), **comb. n.** [11] NEA
Nepticula latifasciella Chambers, 1878: 106 JPH of *Nepticula latifasciella* Herrich-Schäffer, 1855 [11] (syn: Wilkinson & Scoble, 1979: 47)
Nepticula macrocarpae Freeman, 1967: 19
Stigmella latifasciella (Chambers, 1878) Wilkinson & Scoble, 1979: 47
Stigmella nigriverticella (Chambers, 1875b) Newton & Wilkinson, 1982: 423 NEA
Nepticula nigriverticella Chambers, 1875b: 118
Nepticula maculosella Chambers, 1880a: 193 (syn: Braun, 1917: 194)
Stigmella saginella (Clemens, 1861) Wilkinson & Scoble, 1979: 39 NEA
Nepticula saginella Clemens, 1861: 85
Nepticula fuscocapitella Chambers, 1873: 128 (syn: Braun, 1917: 195)
Nepticula quercicastanella Chambers, 1873: 127 (syn: Braun, 1917: 195)
Stigmella sclerostylota Newton & Wilkinson, 1982: 429 NEA
Stigmella aurifasciata Diškus & Stonis in Stonis et al., 2013c: 8 NEO
Stigmella crassifoliae Remeikis & Stonis, 2015: 410 NEO
Stigmella jaguari Remeikis & Stonis in Stonis et al., 2013c: 6 NEO
Stigmella lauta Diškus & Stonis in Stonis et al., 2013c: 6 NEO
Stigmella robleae Remeikis & Stonis, 2015: 411 NEO
Stigmella sublauta Remeikis & Stonis in Stonis et al., 2013c: 8 NEO

Stigmella paliurella **group** (van Nieukerken, 1986a: 8)
Stigmella birgittae Gustafsson, 1985: 171 [12] WP,AFR
Stigmella omani Puplesis & Diškus, 2003a: 207 (syn: van Nieukerken, 2010: 493)
‡ *Nepticula amseli* Skala, 1941b: 78 NNLM; **syn. n.** [12]
Stigmella abaiella Klimesch, 1979: 21 [13] WP
Stigmella ficulnea Puplesis & Krasnilnikova, in Puplesis, 1994: 65 [13] WP
Stigmella longicornuta Puplesis & Diškus, 2003a: 217 WP
Stigmella paliurella Gerasimov, 1937: 285 [14] WP
Nepticula paliurella (Gerasimov, 1937) Klimesch, 1940a: 177 [14]
Nepticula paliurella Klimesch, 1940c
Stigmella turbatrix Puplesis, 1994: 66 [15] WP,EP
‡ *Stigmella celtivora* Dovnar-Zapolski, 1969: 39 NNLM
Stigmella zizyphi Walsingham, 1911: 190 WP,AFR
Stigmella ziziphivora Gustafsson, 1985: 171 (syn: van Nieukerken, 2010: 495)
Nepticula zizyphi (Walsingham, 1911) Skala, 1938a: 45
Stigmella morivora Hirano, 2010: 128 EP
Stigmella sruogai Puplesis & Diškus, 2003a: 204 EP
Stigmella isochalca (Meyrick, 1916b) Diškus & Puplesis, 2003: 325 OR
Nepticula isochalca Meyrick, 1916b: 6
Stigmella nepali Puplesis & Diškus, 2003a: 206 OR
Stigmella phyllanthina (Meyrick, 1906b) Common, 1990: 156 AUS
Nepticula phyllanthina Meyrick, 1906b: 60

Stigmella naturnella **group** (new)
Stigmella dissona group (Puplesis, 1994: 58)
Stigmella naturnella (Klimesch, 1936) Klimesch, 1948b: 65 WP,EP
Nepticula naturnella Klimesch, 1936: 205
Astigmella dissona Puplesis, 1984a: 112 (syn: van Nieukerken et al., 2004a: 133)
Stigmella dissona (Puplesis, 1984a) Puplesis, 1994: 58
Stigmella mirabella (Puplesis, 1984a) Puplesis, 1994: 58 EP
Astigmella mirabella Puplesis, 1984a: 112

Stigmella tiliae **group** (Johansson, 1971: 245)
Stigmella tiliae (Frey, 1856) Beirne, 1945: 198 WP
Nepticula tiliae Frey, 1856: 375
Stigmella sashai Puplesis, 1984b: 594 EP
Stigmella regina Puplesis, 1984b: 596 (syn: Rocienė & Stonis, 2013: 95)

Stigmella betulicola **group** (Johansson, 1971: 245)
Stigmella corylifoliella group (Wilkinson & Scoble, 1979: 50)
Stigmella alnetella (Stainton, 1856) Beirne, 1945: 198 WP
Nepticula alnetella Stainton, 1856: 43

Stigmella betulicola (Stainton, 1856) Beirne, 1945: 198 WP,EP,NEA
Nepticula betulicola Stainton, 1856: 42
Nepticula betulicolella Doubleday, 1859: 36 UE
Nepticula betulicola var. *nanivora* Petersen, 1930: 61 (syn: Johansson, 1971: 245)
Stigmella nanivora (Petersen, 1930) Hering, 1957: 183

Stigmella glutinosae (Stainton, 1858) Beirne, 1945: 198 WP
Nepticula glutinosae Stainton, 1858: 96
Nepticula distinguenda Heinemann, 1862b: 305 (syn: Schoorl & Wilkinson, 1986: 234)
Nepticula rubescens Heinemann, 1871: 214 (syn: Klimesch, 1950a: 27)
Nepticula glutinosella Porritt, 1883: 173 UE
Stigmella rubescens (Heinemann, 1871) Gerasimov, 1952: 256
‡ *Nepticula glutinosae* var. *alni-viridis* Skala, 1939e: 111 NNLM (syn: Klimesch, 1950a: 27)
‡ *Nepticula rubescens* var. *incanae* Skala, 1941a: 57 NNLM (syn: Klimesch, 1950a: 27)

Stigmella gutlebiella A. Laštuvka & Huemer, 2002: 604 WP

Stigmella luteella (Stainton, 1857a) Beirne, 1945: 198 WP,EP
Nepticula luteella Stainton, 1857a: 110
Nepticula luteellina Skala, 1941b: 79 (syn: Skala, 1948: 121)

Stigmella microtheriella (Stainton, 1854) Fletcher & Clutterbuck, 1945: 59 [16] WP,EP,[NEA,AUS]
Nepticula microtheriella Stainton, 1854: 302
Stigmella cathepostis Kemperman & Wilkinson, 1985: 10 **syn. n.** [16]
Microsetia microtheriella (Stainton, 1854) Kirby, 1897: 313

Stigmella nivenburgensis (Preissecker, 1942) Klimesch, 1951b: 59 [17] WP,EP
Nepticula nivenburgensis Preissecker, 1942: 209
Stigmella populnea Kemperman & Wilkinson, 1985: 13 **syn. n.** [17]

Stigmella sakhalinella Puplesis, 1984a: 115 WP,EP
Stigmella discidia Schoorl & Wilkinson, 1986: 237 (syn: van Nieukerken & Johansson, 1987: 470)
Nepticula distinguenda auct. [misapplied] (syn: van Nieukerken & Johansson, 1987: 470)
Stigmella distinguenda auct. [misapplied]

Stigmella attenuata Puplesis, 1985c: 62 EP

Stigmella betulifoliae Puplesis & Diškus, 2003a: 179 EP

Stigmella conchyliata Kemperman & Wilkinson, 1985: 11 EP

Stigmella cornuta Rocienė & Stonis in Stonis et al., 2013e: 206 [18] EP

Stigmella excelsa Puplesis & Diškus, 2003a: 182 EP

Stigmella kumashidei Hirano, 2014: 20 EP

Stigmella oplismeniella Kemperman & Wilkinson, 1985: 12 EP

Stigmella pamirbetulae Puplesis & Diškus, 2003a: 180 EP

Stigmella titivillitia Kemperman & Wilkinson, 1985: 14 EP
Stigmella caryaefoliella (Clemens, 1861), **stat. rev., comb. n.** [19] NEA
Nepticula caryaefoliella Clemens, 1861: 84
Stigmella corylifoliella (Clemens, 1861) Wilkinson & Scoble, 1979: 50 NEA
Nepticula corylifoliella Clemens, 1861: 83
Nepticula virginiella Clemens, 1861: 83 (syn: Braun, 1917: 179)
Nepticula minimella Chambers, 1873: 179 (syn: Braun, 1917: 179)
Nepticula opulifoliella Braun, 1914: 22 (syn: Wilkinson & Scoble, 1979: 50)
Nepticula paludicola Braun, 1917: 177 (syn: Wilkinson & Scoble, 1979: 51)
Nepticula exasperata Braun, 1930: 17 (syn: Wilkinson & Scoble, 1979: 51)
Stigmella juglandifoliella (Clemens, 1861) Wilkinson & Scoble, 1979: 57 NEA
Nepticula juglandifoliella Clemens, 1861: 84
Stigmella longisacca Newton & Wilkinson, 1982: 436 NEA
Stigmella myricafoliella (Busck, 1900) Grossbeck, 1917: 145 [20] NEA
Nepticula myricafoliella Busck, 1900: 238
Nepticula obscurella Braun, 1912: 95 **syn. n.** [20]
Stigmella ostryaefoliella (Clemens, 1861) Wilkinson & Scoble, 1979: 54 [21] NEA
Nepticula ostryaefoliella Clemens, 1861: 83
Stigmella himalayai Puplesis & Diškus, 2003a: 208 OR
Stigmella xystodes (Meyrick, 1916b) Diškus & Puplesis, 2003: 328 WP,OR
Nepticula xystodes Meyrick, 1916b: 6
Nepticula liochalca Meyrick, 1916b: 6 (syn: van Nieukerken, 2010: 496)
Nepticula homophaea Meyrick, 1918b: 181 (syn: van Nieukerken, 2010: 496)
Stigmella liochalca (Meyrick, 1916b) Diškus & Puplesis, 2003: 328
Stigmella homophaea (Meyrick, 1918b) Diškus & Puplesis, 2003: 363
Stigmella allophylica Scoble, 1978b: 97 AFR
Stigmella allophylivora Gustafsson, 1985: 167 AFR
Stigmella androflavus Scoble, 1978b: 104 AFR
Stigmella generalis Scoble, 1978b: 102 AFR
Stigmella geranica Scoble, 1978b: 96 AFR
Stigmella hortorum Scoble, 1978b: 99 AFR
Stigmella pelanodes (Meyrick, 1920b), **comb. n.** [22] AFR
Nepticula pelanodes Meyrick, 1920b: 116
Stigmella potgieteri Scoble, 1978b: 99 AFR
Stigmella satarensis Scoble, 1978b: 97 AFR
Stigmella tragilis Scoble, 1978b: 98 AFR
Stigmella tropicatella Legrand, 1965: 27 [23] AFR
Stigmella triumfettica Scoble, 1978b: 107 AFR

***Stigmella divina* group** (Puplesis & Diškus, 2003a: 212)
Stigmella divina Puplesis, Diškus & van Nieukerken, 1997: 55 WP
Stigmella maculifera Puplesis & Diškus, 2003a: 212 WP
Stigmella skulei Puplesis & Diškus, 2003a: 213 WP

Unplaced tropical species - most probably in non-core *Stigmella*

African species

Stigmella fluida group (Scoble, 1978b: 92)
Stigmella ingens group (Scoble, 1978b: 111)
Stigmella abachausi (Janse, 1948) Scoble, 1978b: 104 AFR
Nepticula abachausi Janse, 1948: 162
Stigmella abutilonica Scoble, 1978b: 93 AFR
Stigmella ampullata Scoble, 1978b: 108 AFR
Stigmella angustivalva Scoble, 1978b: 113 AFR
Stigmella caliginosa (Meyrick, 1921b) Scoble, 1983: 43 AFR
Nepticula caliginosa Meyrick, 1921b: 140
Stigmella celtifoliella Vári, 1955: 338 AFR
Stigmella charistis Vári, 1963: 71 AFR
Stigmella confinalis Scoble, 1978b: 111 AFR
Stigmella crotonica Scoble, 1978b: 100 AFR
Stigmella dombeyivora Scoble, 1978b: 107 AFR
Stigmella ficivora Gustafsson, 1985: 170 AFR
Stigmella fluida (Meyrick, 1911a) Scoble, 1978b: 94 AFR
Nepticula fluida Meyrick, 1911a: 236
Stigmella galactacma (Meyrick, 1924b) Diškus & Puplesis, 2003: 364 AFR
Nepticula galactacma Meyrick, 1924b: 89
Stigmella grewiae Scoble, 1978b: 112 AFR
Stigmella gustafssoni (Căpuşe, 1975) Diškus & Puplesis, 2003: 366 AFR
Nepticula gustafssoni Căpuşe, 1975: 211
Stigmella ingens (Meyrick, 1913) Scoble, 1978b: 112 AFR
Nepticula ingens Meyrick, 1913: 327
Stigmella irrorata (Janse, 1948) Scoble, 1978b: 95 AFR
Nepticula irrorata Janse, 1948: 168
Stigmella letabensis Scoble, 1978b: 113 AFR
Stigmella liota Vári, 1963: 73 AFR
Stigmella maytenivora Gustafsson, 1985: 174 AFR
Stigmella naibabi Mey, 2004: 29 AFR
Stigmella nigrata (Meyrick, 1913) Scoble, 1978b: 106 AFR
Nepticula nigrata Meyrick, 1913: 326
Stigmella panconista (Meyrick, 1920a) Diškus & Puplesis, 2003: 363 AFR
Nepticula panconista Meyrick, 1920a: 312
Stigmella parinarella Vári, 1955: 337 AFR
Stigmella perplexa (Janse, 1948) Scoble, 1978b: 103 AFR
Nepticula perplexa Janse, 1948: 172
Stigmella platyzona Vári, 1963: 67 AFR
Stigmella porphyreuta (Meyrick, 1917a) Scoble, 1978b: 110 AFR
Nepticula porphyreuta Meyrick, 1917a: 13

Stigmella pretoriata Scoble, 1978b: 109 AFR
Stigmella protosema (Meyrick, 1921b) Scoble, 1978b: 109 AFR
Nepticula protosema Meyrick, 1921b: 140
Stigmella rhomboivora Gustafsson, 1985: 167 AFR
Stigmella rhynchosiella Vári, 1955: 338 AFR
Stigmella urbica (Meyrick, 1913) Scoble, 1978b: 103 AFR
Nepticula urbica Meyrick, 1913: 326
Stigmella uwusebi Mey, 2004: 30 AFR
Stigmella varii Scoble, 1978b: 95 AFR
Stigmella wollofella (Gustafsson, 1972) Gustafsson, 1985: 174 [24] AFR
Nepticula wollofella Gustafsson, 1972: 158
Nepticula mandingella Gustafsson, 1972: 157 **syn. n.** [24]
Stigmella mandingella (Gustafsson, 1972) Diškus & Puplesis, 2003: 366
Stigmella worcesteri Scoble, 1983: 16 RN for *S. pallida* Scoble, 1978 AFR
Stigmella pallida Scoble, 1978b: 105 JSH of *Stigmella pallida* (Braun, 1917)

Australian species
Stigmella leucargyra (Meyrick, 1906b) Nielsen, 1996: 16 AUS
Nepticula leucargyra Meyrick, 1906b: 57
Stigmella symmora (Meyrick, 1906b) Nielsen, 1996: 16 AUS
Nepticula symmora Meyrick, 1906b: 59

Oriental species
Stigmella aeriventris (Meyrick, 1932) Diškus & Puplesis, 2003: 364 OR
Nepticula aeriventris Meyrick, 1932: 312
Stigmella alicia (Meyrick, 1928) Diškus & Puplesis, 2003: 364 OR
Nepticula alicia Meyrick, 1928b: 461
Stigmella argyrodoxa (Meyrick, 1918) Fletcher, 1933: 83 OR
Nepticula argyrodoxa Meyrick, 1918b: 181
Stigmella auxozona (Meyrick, 1934) Diškus & Puplesis, 2003: 365 OR
Nepticula auxozona Meyrick, 1934a: 468
Stigmella elachistarcha (Meyrick, 1934) Diškus & Puplesis, 2003: 365 OR
Nepticula elachistarcha Meyrick, 1934a: 467
Stigmella hoplometalla (Meyrick, 1934) Puplesis & Diškus, 2003a: 215 OR
Nepticula hoplometalla Meyrick, 1934a: 467
Stigmella ipomoeella (Gustafsson, 1976) Diškus & Puplesis, 2003: 328 OR
Nepticula ipomoeella Gustafsson, 1976: 45
Stigmella neodora (Meyrick, 1918) Diškus & Puplesis, 2003: 363 OR
Nepticula neodora Meyrick, 1918b: 182
Stigmella oligosperma (Meyrick, 1934) Diškus & Puplesis, 2003: 365 OR
Nepticula oligosperma Meyrick, 1934a: 468
Stigmella polydoxa (Meyrick, 1911) Diškus & Puplesis, 2003: 363 OR
Nepticula polydoxa Meyrick, 1911c: 107

Core *Stigmella* [3]

***Stigmella rhamnella/lapponica/sanguisorbae* cluster**

***Stigmella tiliella* group** (Puplesis et al., 2002: 63)
Stigmella tiliella (Braun, 1912) Newton & Wilkinson, 1982: 442 NEA
Nepticula tiliella Braun, 1912: 90
Stigmella kimae Puplesis & Robinson, 2000: 35 NEO

***Stigmella rhamnella* group** (new)
Stigmella alaternella (Le Marchand, 1937) Klimesch, 1948b: 63 WP
Nepticula alaternella Le Marchand, 1937: 234
Stigmella armeniana Puplesis, 1994: 90 WP
Stigmella catharticella (Stainton, 1853) Beirne, 1945: 199 WP
Nepticula catharticella Stainton, 1853: 3955
Stigmella crenulatae (Klimesch, 1975) van Nieukerken, 1986a: 8 WP
Nepticula crenulatae Klimesch, 1975c: 2
Stigmella kopetdagica Puplesis, 1994: 92 WP
Stigmella pyrellicola (Klimesch, 1978) van Nieukerken, 1986a: 9 WP
Nepticula pyrellicola Klimesch, 1978b: 264
Stigmella rhamnella (Herrich-Schäffer, 1860) Klimesch, 1951b: 56 WP
Nepticula rhamnella Herrich-Schäffer, 1860: 60
Nepticula rhamnella var. *rhamnipumilae* Klimesch, 1950a: 49
Stigmella rhamnophila (Amsel, 1934) van Nieukerken, 1986a: 8 WP
Nepticula rhamnella rhamnophila Amsel, 1934: 317
‡ *Nepticula rhamnophila* Amsel & Hering, 1931: 142 NNLM
Stigmella klimeschi Puplesis, 1988: 274 EP
Stigmella kurotsubarai Kemperman & Wilkinson, 1985: 15 EP
Stigmella taigae Puplesis, 1984a: 112 EP
Stigmella condaliafoliella (Busck, 1900) Grossbeck, 1917: 145 NEA
Nepticula condaliafoliella Busck, 1900: 238
Stigmella diffasciae (Braun, 1910) Newton & Wilkinson, 1982: 398 NEA
Nepticula diffasciae Braun, 1910: 172
Stigmella inconspicuella Newton & Wilkinson, 1982: 400 NEA
Stigmella rhamnicola (Braun, 1916) Newton & Wilkinson, 1982: 393 NEA
Nepticula rhamnella Braun, 1912: 96 JPH of *Nepticula rhamnella* Herrich-Schäffer, 1860
Nepticula rhamnicola Braun, 1916: 55 RN for *N. rhamnella* Braun, 1912
Stigmella maya Remeikis & Stonis in Stonis et al., 2013b: 224 NEO

***Stigmella sanguisorbae* group** (van Nieukerken, 1986a: 10)
Stigmella rosaefoliella group (Wilkinson & Scoble, 1979: 14)
Stigmella muricatella (Klimesch, 1978) van Nieukerken, 1986a: 9 WP,EP
Nepticula muricatella Klimesch, 1978b: 266

Stigmella polymorpha Puplesis & Diškus, 2003a: 183 WP
Stigmella rolandi van Nieukerken, 1990c: 239 WP,EP
Stigmella sanguisorbae (Wocke, 1865) Gerasimov, 1952: 258 WP
Nepticula sanguisorbae Wocke, 1865: 269
Stigmella thuringiaca (Petry, 1904) Gerasimov, 1952: 263 WP,EP
Nepticula thuringiaca Petry, 1904: 267
Nepticula nickerli Rebel in Nickerl, 1908: 116 (syn: Rebel, 1909: (269))
Stigmella fasciola Puplesis & Diškus, 2003a: 185 EP
Stigmella trisyllaba Puplesis in Puplesis et al., 1992: 51 EP
Stigmella rosaefoliella (Clemens, 1861) Wilkinson & Scoble, 1979: 14 [25] NEA
Nepticula rosaefoliella Clemens, 1861: 85
Stigmella rosaefoliella rosaefoliella (Clemens, 1861) Wilkinson & Scoble, 1979: 14[25]

***Stigmella lapponica* group** (Johansson, 1971: 245)
Stigmella malella group (Johansson, 1971: 245)
Stigmella confusella (Wood & Walsingham, 1894) Vári, 1944a: 215 WP,EP,NEA
Nepticula confusella Wood & Walsingham, 1894: 272
Stigmella lapponica (Wocke, 1862) Fletcher & Clutterbuck, 1945: 61 WP,EP,NEA
Nepticula lapponica Wocke, 1862: 251
Nepticula lapponicella Herrich-Schäffer, 1863c: 23 UE
Nepticula lusatica Schütze, 1905: 204 (syn: Johansson & Nielsen, 1990: 141)
Nepticula vossensis Grønlien, 1928: 217 (syn: Krogerus, 1971: 31)
Stigmella lusatica (Schütze, 1905) Beirne, 1945: 200
Stigmella vossensis (Grønlien, 1928) Gerasimov, 1952: 269
Stigmella malella (Stainton, 1854) Beirne, 1945: 199 WP
Nepticula malella Stainton, 1854: 304
Nepticula angustella Heinemann & Wocke, [1876]: 756 [6] (syn: van Nieukerken & Johansson, 1987: 461)
Nepticula nigrobrunnella Groschke, 1939: 716 (syn: van Nieukerken & Johansson, 1987: 461)
Nepticula nigrobrunella auct. ISS
Stigmella nigrobrunnella (Groschke, 1939) Hering, 1957: 837
‡ *Nepticula malella* var. *prunicola* Skala, 1939f: 126 NN
Stigmella maloidica Puplesis in Puplesis & Arutyunova, 1991: 573 EP
Stigmella braunella (Jones, 1933) Wilkinson & Scoble, 1979: 13 NEA
Nepticula braunella Jones, 1933: 49
Stigmella slingerlandella (Kearfott, 1908) Wilkinson & Scoble, 1979: 19 NEA
Nepticula slingerlandella Kearfott, 1908: 187

unplaced in *rhamnella/lapponica/sanguisorbae* cluster
Stigmella boehmeriae Kemperman & Wilkinson, 1985: 54 EP
Stigmella costaricensis van Nieukerken & Nishida in van Nieukerken et al., 2016: 19 NEO
Stigmella intronia van Nieukerken & Nishida in van Nieukerken et al., 2016: 21 NEO

***Stigmella salicis* cluster**

***Stigmella ogygia* group** (new) [26]

Stigmella aigialeia Donner & Wilkinson, 1989: 17 AUS
Stigmella aliena Donner & Wilkinson, 1989: 17 AUS
Stigmella atrata Donner & Wilkinson, 1989: 18 AUS
Stigmella cassiniae Donner & Wilkinson, 1989: 18 AUS
Stigmella childi Donner & Wilkinson, 1989: 19 AUS
Stigmella cypracma (Meyrick, 1916) Dugdale, 1988: 53 AUS
Nepticula cypracma Meyrick, 1916c: 419
Nepticula perissopa Meyrick, 1919: 354 (syn: Donner & Wilkinson, 1989: 20)
Stigmella perissopa (Meyrick, 1919) Dugdale, 1988: 54
Stigmella erysibodea Donner & Wilkinson, 1989: 21 AUS
Stigmella fulva (Watt, 1921) Dugdale, 1988: 53 AUS
Nepticula fulva Watt, 1921: 215
Stigmella hakekeae Donner & Wilkinson, 1989: 22 AUS
Stigmella hamishella Donner & Wilkinson, 1989: 23 AUS
Stigmella hoheriae Donner & Wilkinson, 1989: 24 AUS
Stigmella ilsea Donner & Wilkinson, 1989: 25 AUS
Stigmella insignis (Philpott, 1927) Dugdale, 1988: 53 AUS
Nepticula insignis Philpott, 1927: 89
Stigmella kaimanua Donner & Wilkinson, 1989: 26 AUS
Stigmella laquaeorum (Dugdale, 1971) Dugdale, 1988: 53 AUS
Nepticula laquaeorum Dugdale, 1971: 117
Stigmella lucida (Philpott, 1919) Dugdale, 1988: 54 AUS
Nepticula lucida Philpott, 1919: 225
Stigmella maoriella (Walker, 1864) Dugdale, 1988: 54 AUS
Tinea maoriella Walker, 1864: 1008
Stigmella ogygia (Meyrick, 1889) Dugdale, 1988: 54 AUS
Nepticula ogygia Meyrick, 1889: 187
Nepticula erechtitus Watt, 1924: 686 (syn: Donner & Wilkinson, 1989: 20)
Stigmella erechtitus (Watt, 1924) Dugdale, 1988: 53
Stigmella oriastra (Meyrick, 1917) Dugdale, 1988: 54 AUS
Nepticula oriastra Meyrick, 1917b: 247
Stigmella palaga Donner & Wilkinson, 1989: 31 AUS
Stigmella platina Donner & Wilkinson, 1989: 32 AUS
Stigmella progama (Meyrick, 1924) Dugdale, 1988: 54 AUS
Nepticula progama Meyrick, 1924a: 662
Stigmella progonopis (Meyrick, 1921) Dugdale, 1988: 54 AUS
Nepticula progonopis Meyrick, 1921c: 336
Stigmella propalaea (Meyrick, 1889) Dugdale, 1988: 54 AUS
Nepticula propalaea Meyrick, 1889: 187
Stigmella sophorae (Hudson, 1939) Dugdale, 1988: 54 AUS
Nepticula sophorae Hudson, 1939: 469

Stigmella tricentra (Meyrick, 1889) Dugdale, 1988: 54 AUS
Nepticula tricentra Meyrick, 1889: 187
Stigmella watti Donner & Wilkinson, 1989: 35 AUS

***Stigmella epicosma* group** (new) [27]
Stigmella andina (Meyrick, 1915) Davis, 1984: 18 NEO
Nepticula andina Meyrick, 1915a: 255
Stigmella baccharicola Diškus & Stonis in Stonis et al., 2016b: 119 NEO
Stigmella bipartita Diškus & Stonis in Stonis et al., 2016b: 107 NEO
Stigmella confertae Diškus & Stonis in Stonis et al., 2016b: 124 NEO
Stigmella costalimai (Bourquin, 1961) Davis, 1984: 18 [28] NEO
Nepticula costalimai Bourquin, 1961: 31
Stigmella cuprata (Meyrick, 1915) Davis, 1984: 18 NEO
Nepticula cuprata Meyrick, 1915a: 255
Stigmella emarginatae Diškus & Stonis in Stonis et al., 2016b: 104 NEO
Stigmella epicosma (Meyrick, 1915) Davis, 1984: 18 NEO
Nepticula epicosma Meyrick, 1915a: 255
Stigmella guittonae (Bourquin, 1961) Davis, 1984: 18 [28] NEO
Nepticula guittonae Bourquin, 1961: 32
Stigmella hamata Puplesis & Robinson, 2000: 30 NEO
Stigmella imperatoria Puplesis & Robinson, 2000: 30 NEO
Stigmella johannis (Zeller, 1877) Davis, 1984: 18 NEO
Nepticula johannis Zeller, 1877: 454
Stigmella latifoliae Remeikis, Diškus & Stonis in Stonis et al., 2016b: 115 NEO
Stigmella marmorea Puplesis & Robinson, 2000: 26 NEO
Stigmella mevia Remeikis & Stonis in Stonis & Remeikis, 2016: 311 NEO
Stigmella montanotropica Puplesis & Diškus in Puplesis et al., 2002: 23 NEO
Stigmella nubimontana Puplesis & Diškus in Puplesis et al., 2002: 24 NEO
Stigmella olyritis (Meyrick, 1915) Davis, 1984: 18 NEO
Nepticula olyritis Meyrick, 1915a: 256
Stigmella pangorica Diškus & Stonis in Stonis et al., 2015a: 580 NEO
Stigmella peruanica Puplesis & Robinson, 2000: 27 NEO
Stigmella podanthae Diškus & Stonis in Stonis et al., 2016a: 120 NEO
Stigmella racemifera Šimkevičiūtė & Stonis in Šimkevičiūtė et al., 2009: 270 NEO
Stigmella rubeta Puplesis & Diškus in Puplesis et al., 2002: 24 NEO
Stigmella rudis Puplesis & Robinson, 2000: 26 NEO
Stigmella schoorli Puplesis & Robinson, 2000: 29 NEO
Stigmella serpentina Diškus & Stonis in Stonis et al., 2015a: 576 NEO
Stigmella sinuosa Remeikis & Stonis in Stonis & Remeikis, 2016: 310 NEO
Stigmella tripartita Diškus & Stonis in Stonis et al., 2016b: 110 NEO

***Stigmella salicis* group** (Johansson, 1971: 244)
Stigmella fuscotibiella group (Newton & Wilkinson, 1982: 385)

Stigmella aiderensis Puplesis, 1988: 277 WP
Stigmella arbusculae (Klimesch, 1951) Hering, 1957: 930 WP
Nepticula arbusculae Klimesch, 1951c: 149
Stigmella assimilella (Zeller, 1848) Fletcher & Clutterbuck, 1945: 61 WP,EP
Nepticula assimilella Zeller, 1848: 327
Nepticula tremulaefoliella Sorhagen, 1922: 48 (syn: Johansson & Nielsen, 1990: 200)
Stigmella tremulaefoliella (Sorhagen, 1922) Gerasimov, 1952: 265
‡ *Lyonetia nigricornella* Mann in Zeller, 1848: 327 NN
Stigmella benanderella (Wolff, 1955) Hering, 1957: 930 WP
Nepticula benanderella Wolff, 1955b: 49
‡ *Nepticula scandicella* Jonasson in Krogerus et al., 1971: 30 NN
Stigmella flavescens Puplesis, 1994: 131 WP, EP
Stigmella myrtillella (Stainton, 1857b) Vári, 1944a: 215 WP
Nepticula myrtillella Stainton, 1857b: 44
‡ *Nepticula myrtillella* var. *uliginosi* Skala, 1941b: 80 NNLM
Stigmella obliquella (Heinemann, 1862) Vári, 1944a: 215 WP,EP
Nepticula obliquella Heinemann, 1862b: 316
Nepticula wockeella Heinemann, 1871: 223 (syn: Johansson & Nielsen, 1990: 198)
Nepticula diversa Glitz, 1872: 24 (syn: Glitz, 1887: 277)
Stigmella babylonicae Hartig, 1949: 94 (syn: van Nieukerken, 1986a: 11)
Stigmella wockeella (Heinemann, 1871) Gerasimov, 1952: 269
Stigmella pallidiciliella Klimesch, 1948a: 165 [29] WP
Nepticula purpureae Skala, 1948: 121 (syn: van Nieukerken, 1986a: 11)
Nepticula pallidiciliella (Klimesch, 1948a) Wolff, 1955a: 86
Stigmella salicis (Stainton, 1854) Fletcher & Clutterbuck, 1945: 60 [30] WP,EP,NEA
Nepticula salicis Stainton, 1854: 302
Nepticula salicella Herrich-Schäffer, 1855a: 354 UE
Nepticula salicivorella Doubleday, 1859: 36 UE
Nepticula uniformis Heinemann, 1871: 210 (syn: van Nieukerken, 1986a: 11)
Nepticula dewitziella Sorhagen, 1885: 285 (syn: Johansson & Nielsen, 1990: 192)
Nepticula auritella Skala, 1939f: 128 (syn: van Nieukerken, 1986a: 11)
Stigmella libiezi Dufrane, 1949: 8 (syn: van Nieukerken, 1986a: 11)
Stigmella uniformis (Heinemann, 1871) Gerasimov, 1952: 267
Stigmella auritella (Skala, 1939) Hering, 1957: 929
‡ *Nepticula salicis* ab. *crombruggheella* Dufrane, 1930: 30
‡ *Nepticula salicis* ab. *februella* Crombrugghe, 1907: 14
‡ *Nepticula salicis* ab. *interrupta* Skala, 1933a: 32
Stigmella trimaculella (Haworth, 1828) Fletcher & Clutterbuck, 1945: 61 WP,EP
Tinea trimaculella Haworth, 1828: 583
Lyonetia rufella Zeller, 1839: 215 (syn: Herrich-Schäffer, 1855a: 358)

Nepticula populella Herrich-Schäffer, 1855a: 357 (syn: Frey, 1856: 381)
Nepticula albicornella Kollar in Nowicki, 1860: 231 (syn: Rebel, 1901: 228)
Nepticula gilvella Rössler, 1867: 395 (syn: van Nieukerken & Johansson, 1987: 461)
Nepticula populicola Sorhagen, 1922: 88 (syn: Skala, 1948: 121)
Stigmella subtrimaculella Dufrane, 1949: 10 (syn: Borkowski, 1969: 107)
Microsetia trimaculella (Haworth, 1828) Stephens, 1834: 269
Nepticula trimaculella (Haworth, 1828) Stainton, 1849: 29
Nepticula rufella (Zeller, 1839) Zeller, 1848: 328
Stigmella populicola (Sorhagen, 1922) Gerasimov, 1952: 252
‡ *Nepticula trimaculella* ab. *semipictella* Steudel in Steudel & Hoffmann, 1882: 244

Stigmella vimineticola (Frey, 1856) Fletcher & Clutterbuck, 1945: 60 WP
Nepticula vimineticola Frey, 1856: 382

Stigmella zelleriella (Snellen, 1875) van Nieukerken, 1983a: 60 WP
Nepticula zelleriella Snellen, 1875: 116
Nepticula repentiella Wolff, 1955a: 82 (syn: van Nieukerken, 1983a: 60)
Nepticula lappovimella Svensson, 1976: 204 (syn: van Nieukerken, 1983a: 60)
Stigmella repentiella (Wolff, 1955) Hering, 1957: 929
Stigmella lappovimella (Svensson, 1976) Svensson, 1985: 78

Stigmella azusa Hirano, 2010: 129 EP

Stigmella johanssoni Puplesis & Diškus, 1996c: 181 EP

Stigmella juratae Puplesis, 1988: 279 EP

Stigmella kondarai Puplesis, 1988: 277 EP

Stigmella sexcornuta Rocienė & Stonis in Stonis & Rocienė, 2014: 205 EP

Stigmella tenryuensis Hirano, 2014: 26 EP

Stigmella tranocrossa Kemperman & Wilkinson, 1985: 27 EP
Stigmella ussurica Puplesis, 1987: 8 (syn: Puplesis, 1994: 128)

Stigmella vittata Kemperman & Wilkinson, 1985: 28 EP

Stigmella fibigeri Puplesis & Diškus, 2003a: 209 OR

Stigmella aromella Wilkinson & Scoble, 1979: 27 NEA

Stigmella fuscotibiella (Clemens, 1862) Wilkinson & Scoble, 1979: 23 NEA
Nepticula fuscotibiella Clemens, 1862: 133
Nepticula ciliaefuscella Chambers, 1873: 128 (syn: Chambers, 1875a: 117)
Nepticula discolorella Braun, 1912: 86 (syn: Braun, 1917: 185)

Stigmella pallida (Braun, 1912) Newton & Wilkinson, 1982: 418 NEA
Nepticula pallida Braun, 1912: 85

Stigmella populetorum (Frey & Boll, 1878) Wilkinson & Scoble, 1979: 26 NEA
Nepticula populetorum Frey & Boll, 1878: 276

Stigmella molinensis van Nieukerken & Snyers in van Nieukerken et al., 2016: 22 NEO

Stigmella quercipulchella/anomalella/oxyacanthella **cluster**

Stigmella quercipulchella **group** (Wilkinson & Scoble, 1979: 65)
 Stigmella altella (Braun, 1914) Wilkinson & Newton, 1981: 58 NEA
  Nepticula altella Braun, 1914: 21
 Stigmella quercipulchella (Chambers, 1882) Wilkinson & Scoble, 1979: 65 NEA
  Nepticula quercipulchella Chambers, 1882: 105
  Nepticula terminella Braun, 1914: 23 (syn: Wilkinson & Scoble, 1979: 65)
 Stigmella variella (Braun, 1910) Wilkinson & Scoble, 1979: 67 NEA
  Nepticula variella Braun, 1910: 173
 Stigmella guatemalensis Diškus & Stonis in Stonis et al., 2013c: 10 NEO

Stigmella anomalella **group** (Johansson, 1971: 245)
 Stigmella anomalella (Goeze, 1783) Walsingham, 1908a: 1008 [2] WP,EP,[NEA]
  Phalaena anomalella Goeze, 1783: 168
  Phalaena grisearosae Retzius, 1783: 55
  Tinea penicilla Thunberg, 1794: 88 (syn: Karsholt & Nielsen, 1986: 452)
  Tinea rosella Schrank, 1802: 139 (syn: Stainton, 1854: 297)
  Nepticula aeneella Heinemann, 1862a: 254 (syn: Schoorl et al., 1985: 98)
  Nepticula fletcheri Tutt, 1899: 211 (syn: Krogerus, 1971: 30)
  Nepticula laticuniculella Sauber, 1904: 55 (syn: Hering, 1957: 902)
  Stigmella rubicurrens Walsingham, 1908a: 1009 [2] (syn: van Nieukerken & Johansson, 1987: 461)
  Nepticula rosarum Sorhagen, 1922: 30 (syn: van Nieukerken & Johansson, 1987: 470)
  Nepticula zermattensis Weber, 1936: 668 (syn: van Nieukerken, 1986a: 9)
  Nepticula helbigi Hartig, 1941: 160 (syn: van Nieukerken & Johansson, 1987: 468)
  Stigmella caulescentella Klimesch, 1948a: 162 [29] (syn: van Nieukerken, 1986a: 9)
  Stigmella anomalella pacifica Puplesis, 1987: 10
  Nepticula anomalella (Goeze, 1783) Stainton, 1854: 297
  Dysnepticula anomalella (Goeze, 1783) Börner, 1925: 370
  Nepticula rosella (Schrank, 1802) Sand, 1879: 200
  Stigmella rosella (Schrank, 1802) Walsingham, 1908a: 1008[1]
  Stigmella fletcheri (Tutt, 1899) Fletcher & Clutterbuck, 1945: 59
  Nepticula rubicurrens (Walsingham, 1908a) Rebel, 1910: 373
  Stigmella rosarum (Sorhagen, 1922) Gerasimov, 1952: 256
  Stigmella zermattensis (Weber, 1936) Gerasimov, 1952: 270
  Stigmella anomalella fletcheri (Tutt, 1899) Hering, 1957: 902
  Stigmella anomalella helbigi (Hartig, 1941) Hering, 1957: 902
 Stigmella centifoliella (Zeller, 1848) Beirne, 1945: 199 [31] WP,[NEA]
  ‡ *Nepticula centifoliella* Heyden, 1843: 208 NN
  Nepticula centifoliella Zeller, 1848: 315
  Nepticula hodgkinsoni Stainton, 1884: 103 (syn: Bradley et al., 1972: 2)

Stigmella rosaefoliella pectocatena Wilkinson & Scoble, 1979: 18 **syn. n.** [31]
Stigmella hodgkinsoni (Stainton, 1884) Gerasimov, 1952: 243
Stigmella spinosissimae (Waters, 1928) Beirne, 1945: 198 WP,EP
Nepticula spinosissimae Waters, 1928: 105

***Stigmella hybnerella* group** (Johansson, 1971: 245)
Stigmella nitidella group (Johansson, 1971: 245)
Stigmella paradoxa group (Emmet, 1976: 238)
Stigmella irregularis group (Puplesis, 1994: 61)
Stigmella hybnerella (Hübner, 1796) Fletcher & Clutterbuck, 1945: 59 WP
Tinea hybnerella Hübner, 1796: pl. 34: 236
Caloptilia ampelipennella Hübner, [1825]: 427 URN
Tinea posticella Haworth, 1828: 584 (syn: Stainton, 1849: 29)
Oecophora gratiosella Duponchel, 1843: 323 (syn: Fletcher & Clutterbuck, 1945: 59)
Nepticula ignobilella Stainton, 1849: 29 (syn: Emmet, 1974c: 77)
Nepticula latifasciella Herrich-Schäffer, 1855a: 352 (syn: Herrich-Schäffer, 1855a: 352)
Microsetia posticella (Haworth, 1828) Stephens, 1834: 269
Lyonetia hübnerella (Hübner, 1796) Zeller, 1839: 215
Nepticula gratiosella (Duponchel, 1843) Stainton, 1849: 29
Lithocolletis gratiosella (Duponchel, 1843) Bruand, [1851]: 86
Stigmella gratiosella (Duponchel, 1843) Beirne, 1945: 200
Stigmella ignobilella (Stainton, 1849) Fletcher & Clutterbuck, 1945: 60
Nepticula ignobiliella auct. ISS
Stigmella mespilicola (Frey, 1856) Klimesch, 1948b: 57 (Fig. 26) WP
Nepticula mespilicola Frey, 1856: 392
Nepticula ariella Herrich-Schäffer, 1860: 60 (syn: Frey, 1880: 422)
Stigmella ariella (Herrich-Schäffer, 1860) Klimesch, 1948b: 57
Stigmella irregularis Puplesis, 1994: 61 WP
Stigmella inopinata A. Laštuvka & Z. Laštuvka, 1990: 197 WP
Stigmella paradoxa (Frey, 1858) Emmet, 1970: 3 WP
Nepticula paradoxa Frey, 1858a: 14
Nepticula nitidella Heinemann, 1862a: 257 (syn: Heinemann & Wocke, [1876]: 734) [6]
Stigmella juryi Puplesis, 1991: 125 (syn: van Nieukerken et al., 2004a: 140)
Stigmella nitidella (Heinemann, 1862) Gerasimov, 1952: 249
Stigmella pyrivora Gustafsson, 1981: 457 WP
Stigmella malifoliella Puplesis in Puplesis & Arutyunova, 1991: 571 EP
Stigmella montana Puplesis, 1991: 126 EP
Stigmella taeniola (Braun, 1925) Newton & Wilkinson, 1982: 382 NEA
Nepticula taeniola Braun, 1925b: 226
Stigmella stigmaciella Wilkinson & Scoble, 1979: 38 NEA

***Stigmella incognitella* group** (new)
Stigmella pomella group (Johansson, 1971: 244)
Stigmella azaroli (Klimesch, 1978) van Nieukerken, 1986a: 13 [32] WP
Nepticula azaroli Klimesch, 1978b: 261
Stigmella fuscacalyptriella Puplesis, 1994: 149 WP
Stigmella incognitella (Herrich-Schäffer, 1855) van Nieukerken, 1986a: 13 WP
Nepticula incognitella Herrich-Schäffer, 1855a: 349
Nepticula pomella Vaughan, 1858: 43 (syn: van Nieukerken, 1986a: 13)
Nepticula mali Hering, 1932: 568 (syn: van Nieukerken, 1986a: 13)
Stigmella mali (Hering, 1932) Gerasimov, 1952: 247
Stigmella pomella (Vaughan, 1858) Fletcher & Clutterbuck, 1945: 58
Stigmella perpygmaeella (Doubleday, 1859) Karsholt & Nielsen, 1976: 18 [32] WP
Tinea pygmaeella Haworth, 1828: 586; JPH of *Tinea pygmaeella* [Denis & Schiffermüller], 1775), now *Argyresthia pygmaeella* (Argyresthiidae)
Nepticula perpygmaeella Doubleday, 1859: 36; RN for *Tinea pygmaeella* Haworth, 1828
Microsetia pygmaeella (Haworth, 1828) Stephens, 1834: 269
Nepticula pygmaeella (Haworth, 1828) Stainton, 1853: 3958
Stigmella pygmaeella (Haworth, 1828) Klimesch, 1951b: 55
Stigmella elegantiae Puplesis & Diškus, 2003a: 210 OR

***Stigmella oxyacanthella* group** (Johansson, 1971: 245)
Stigmella crataegifoliella group (Wilkinson & Scoble, 1979: 29)
Stigmella caspica Puplesis, 1994: 109 WP
Stigmella crataegella (Klimesch, 1936) Klimesch, 1948b: 62 WP
Nepticula crataegella Klimesch, 1936: 200
Stigmella indigena Puplesis, 1994: 111 (syn: Puplesis et al., 1996: 192)
Nepticula gratiosella sensu Tutt, 1899: 253
Stigmella desperatella (Frey, 1856) Beirne, 1945: 200 WP
Nepticula desperatella Frey, 1856: 374
Nepticula pyricola Wocke, 1877: 49 (syn: Schoorl et al., 1985: 94)
Stigmella pyricola (Wocke, 1877) Klimesch, 1951b: 57
Stigmella hahniella (Wörz, 1937) Gerasimov, 1952: 241 WP
Nepticula hahniella Wörz, 1937: 290
Stigmella lanceolata Puplesis, 1994: 111 WP
Stigmella magdalenae (Klimesch, 1950) Emmet, 1979: 25 [33] WP
Nepticula nylandriella var. *magdalenae* Klimesch, 1950b: 72
Nepticula nylandriella auct. [misapplied, before 1972] (syn: Borkowski, 1975: 523)
Stigmella nylandriella magdalenae (Klimesch, 1950b) Klimesch, 1961: 752
Nepticula magdalenae Klimesch, 1950b (Borkowski, 1975: 523)
Stigmella minusculella (Herrich-Schäffer, 1855) Beirne, 1945: 198 WP,[NEA]
Nepticula minusculella Herrich-Schäffer, 1855a: 348
Nepticula chalybeia Braun, 1914: 20 (syn: Schoorl et al., 1985: 92)

Nepticula embonella Klimesch, 1978b: 259 (syn: Schoorl et al., 1985: 92)
Stigmella chalybeia (Braun, 1914) Wilkinson & Scoble, 1979: 35
Stigmella nylandriella (Tengström, 1848) Beirne, 1945: 200 [34] WP
Lyonetia nylandriella Tengström, 1848: 152
Nepticula aucupariae Frey, 1857: 376 (syn: Borkowski, 1975: 522)
Nepticula aucupariella Porritt, 1883: 172 UE
Nepticula nylandriella (Tengström, 1848) Herrich-Schäffer, 1855: 359 [34]
Stigmella aucupariae (Frey, 1857) Beirne, 1945: 199
Stigmella oxyacanthella (Stainton, 1854) Beirne, 1945: 200 [35] WP,[NEA]
Nepticula oxyacanthella Stainton, 1854: 298
Nepticula oxyacanthaecolella Doubleday, 1859: 298 URN
Micropteryx pomivorella Packard, 1870: 237 **syn. n.** [35]
Nepticula cotoneastri Sorhagen, 1922: 42 (syn: Schoorl et al., 1985: 87)
Nepticula aeneella auct. [misapplied, before 1985]
Stigmella aeneella auct. [misapplied, before 1985]
Nepticula pomivorella (Packard, 1870) Busck, 1901: 52
Stigmella pomivorella (Packard, 1870) Wilkinson & Scoble, 1979: 33
Stigmella cotoneastri (Sorhagen, 1922) Klimesch, 1948b: 60
‡ *Nepticula chaenomelis* Skala, 1936: 79 NNLM (syn: van Nieukerken, 1986a: 10)
‡ *Nepticula oxyacanthella* var. *mespili* Skala, 1940: 144 NNLM
‡ *Nepticula oxyacanthella* var. *oxymalella* Skala, 1933b: 130 NNLM
‡ *Nepticula oxyacanthella* var. *oxysorbi* Skala, 1933b: 130 NNLM
‡ *Stigmella chaenomelis* (Skala, 1936) Hering, 1957: 275
Stigmella pyri (Glitz, 1865) Vári, 1944a: 214 WP
Nepticula pyri Glitz, 1865: 42
Stigmella regiella (Herrich-Schäffer, 1855) Vári, 1944a: 214 WP
Nepticula regiella Herrich-Schäffer, 1855a: 351
Nepticula corvimontana Hering, 1935: 6 (syn.: Borkowski, 1969: 103)
Stigmella corvimontana (Hering, 1935) Gerasimov, 1952: 234
Stigmella stettinensis (Heinemann, 1871) Gerasimov, 1952: 262 WP
Nepticula stettinensis Heinemann, 1871: 210
Stigmella torminalis (Wood, 1890) Beirne, 1945: 200 WP
Nepticula torminalis Wood, 1890: 209
Stigmella alaurulenta Kemperman & Wilkinson, 1985: 23 EP
Stigmella aurora Puplesis, 1984a: 119 WP,EP
Stigmella chaenomelae Kemperman & Wilkinson, 1985: 23 EP
Stigmella crataegi Gerasimov, 1937: 283 EP
Stigmella hissariella Puplesis, 1994: 112 EP
Stigmella honshui Kemperman & Wilkinson, 1985: 24 EP
Stigmella micromelis Puplesis, 1985c: 59 [36] EP
Stigmella crataegivora Puplesis, 1985c: 60 **syn. n.** [36]
Stigmella nostrata Puplesis, 1984a: 113 EP
Stigmella sorbivora Kemperman & Wilkinson, 1985: 25 EP

Stigmella zumii Kemperman & Wilkinson, 1985: 26 EP
Stigmella amelanchierella (Clemens, 1861) Davis & Wilkinson, 1983: 3 [37] NEA
Nepticula amelanchierella Clemens, 1861: 84
Stigmella crataegifoliella (Clemens, 1861) Wilkinson & Scoble, 1979: 30 NEA
Nepticula crataegifoliella Clemens, 1861: 83
Stigmella heteromelis Newton & Wilkinson, 1982: 405 NEA
Stigmella purpuratella (Braun, 1917) Newton & Wilkinson, 1982: 381 [38] NEA
Nepticula purpuratella Braun, 1917: 176
Stigmella scinanella Wilkinson & Scoble, 1979: 36 **syn. n.** [38]
Stigmella scintillans (Braun, 1917) Wilkinson & Scoble, 1979: 33 NEA
Nepticula scintillans Braun, 1917: 167

***Stigmella argentifasciella* group** (new)
Stigmella argentifasciella (Braun, 1912) Newton & Wilkinson, 1982: 453 NEA
Nepticula argentifasciella Braun, 1912: 100

***Stigmella aurella/ruficapitella* cluster** [39]

***Stigmella styracicolella* group** (new)
Stigmella styracicolella (Klimesch, 1978) van Nieukerken, 1986a: 14 WP
Nepticula styracicolella Klimesch, 1978b: 267
Stigmella egonokii Kemperman & Wilkinson, 1985: 53 EP

***Stigmella speciosa* group** (new) [39]
Stigmella kuznetzovi Puplesis, 1994: 152 WP
Stigmella speciosa (Frey, 1858) Walsingham, 1916: 159 WP
Nepticula speciosa Frey, 1858b: 27
Nepticula pseudoplatanella Weber, 1936: 671 (syn: Borkowski, 1969: 98)
Stigmella pseudoplatanella (Weber, 1936) Gerasimov, 1952: 254
‡ *Nepticula aceris* var. *pseudoplatanella* Skala, 1933b: 132 NNLM
‡ *Nepticula speciosa* var. *monspessulani* Skala, 1939d: 144 NNLM
Stigmella lonicerarum (Frey, 1857) Gerasimov, 1952: 246 WP
Nepticula lonicerarum Frey, 1857: 383
Nepticula lonicerarum var. *lentinensis* Skala, 1935: 79 (syn: van Nieukerken, 1986a: 13)
Nepticula lonicerarum var. *livonica* Skala, 1935: 79 (syn: van Nieukerken, 1986a: 13)
Nepticula lonicerarum var. *teutonica* Skala, 1935: 79 (syn: van Nieukerken, 1986a: 13)
Stigmella monticulella Puplesis, 1984a: 114 [40] EP
Stigmella gracilipae Hirano, 2014: 22 **syn. n.** [40]

***Stigmella aurella* group** (Johansson, 1971: 243) [39]
Stigmella lediella group (Puplesis, 1984b:583)

Stigmella aeneofasciella (Herrich-Schäffer, 1855) Gerasimov, 1952: 222 WP
Nepticula aeneofasciella Herrich-Schäffer, 1855a: 353
Nepticula aeneofasciata Frey, 1856: 376 UE
Stigmella aurella (Fabricius, 1775) Walsingham, 1908a: 1009 [2] WP
Tinea aurella Fabricius, 1775: 666
Nepticula fragariella Heinemann, 1862a: 263 (syn: Borkowksi, 1975: 503)
Nepticula nitens Fologne, 1862: 164 (syn: Klimesch, 1981: 114)
Nepticula gei Wocke, 1871: 336 (syn: Borkowksi, 1975: 503)
Nepticula albicomella Heinemann & Wocke, [1876]: 748 [6] (syn: Johansson & Nielsen, 1990: 207)
Nepticula fruticosella Müller-Rutz in Vorbrodt & Müller-Rutz, 1914: 591 (syn: van Nieukerken, 1986a: 12)
Microsetia aurella (Fabricius, 1775) Stephens, 1834: 268
Nepticula aurella (Fabricius, 1775) Heyden, 1843: 209
Stigmella fragariella (Heinemann, 1862a) Vári, 1944a: 214
Stigmella nitens (Fologne, 1862) Vári, 1944a: 214
Stigmella gei (Wocke, 1871) Gerasimov, 1952: 240
Stigmella fruticosella (Müller-Rutz in Vorbrodt & Müller-Rutz, 1914) Gerasimov, 1952: 240
‡ *Nepticula gei* ab. *semicolorella* Eppelsheim, 1891: 351 NNLM
‡ *Nepticula gei* var. *geirubi* Skala, 1940: 143 NNLM
Stigmella auromarginella (Richardson, 1890) Gerasimov, 1952: 229 WP
Nepticula auromarginella Richardson, 1890: 30
Stigmella dryadella (Hofmann, 1868) Klimesch, 1951b: 58 WP
Nepticula dryadella Hofmann, 1868: 29
Stigmella filipendulae (Wocke, 1871) Gerasimov, 1952: 238 [41] WP,EP
Nepticula filipendulae Wocke, 1871: 338
Nepticula ulmariae Wocke, 1879: 79 (syn: van Nieukerken et al., 2012a: 250)
Stigmella palmatae Puplesis, 1984a: 115 **syn. n.** [41]
Stigmella ulmariae (Wocke, 1879) Gerasimov, 1952: 266
Stigmella geimontani (Klimesch, 1940) Klimesch, 1961: 754 WP
Nepticula geimontani Klimesch, 1940b: 89
Stigmella lediella (Schleich, 1867) Gerasimov, 1952: 245 [42] WP,EP
Nepticula lediella Schleich, 1867: 449
Stigmella magica Puplesis, 1985c: 63 (syn: Puplesis, 1994: 146)
Stigmella rhododendri Puplesis, 1985c: 65 (syn: Puplesis, 1994: 146)
Stigmella sesplicata Kemperman & Wilkinson, 1985: 36 **syn. n.** [42]
‡ *Nepticula lediella* ab. *auromarginata* Petersen, 1930
‡ *Stigmella rhododendrifolia* Dovnar-Zapolski & Tomilova, 1978: 29 NNLM; **syn. n.** [42]
Stigmella poterii (Stainton, 1857) Fletcher & Clutterbuck, 1945: 59 WP
Nepticula poterii Stainton, 1857c: 116
Nepticula poteriella Doubleday, 1859: 36 UE

Nepticula comari Wocke, 1862: 253 (syn: Borkowksi, 1975: 506)
Nepticula geminella Frey, 1870: 288 (syn: Karsholt & Nielsen, 1976: 17)
Nepticula palustrella Frey, 1870: 287 (syn: van Nieukerken, 1986a: 12)
Nepticula occultella Heinemann, 1871: 215 (syn: Borkowksi, 1975: 506)
Nepticula tengströmi Nolcken, 1871: 776 (syn: Borkowksi, 1975: 506)
Nepticula potentillae Glitz, 1872: 24 (syn with *occultella*: Heinemann &Wocke, [1876]: 749)
Nepticula diffinis Wocke, 1874: 100 (syn: Borkowksi, 1975: 506)
Nepticula serella Stainton, 1888a: 260 (syn: Borkowksi, 1975: 506)
Nepticula elisabethella Szőcs, 1957: 321 (syn: van Nieukerken, 1986a: 12)
Stigmella comari (Wocke, 1862) Gerasimov, 1952: 234
Stigmella geminella (Frey, 1870) Gerasimov, 1952: 240
Stigmella occultella (Heinemann, 1871) Gerasimov, 1952: 250
Stigmella tengstroemi (Nolcken, 1871) Gerasimov, 1952: 263
Stigmella diffinis (Wocke, 1874) Gerasimov, 1952: 236
Stigmella serella (Stainton, 1888a) Gerasimov, 1952: 259

Stigmella pretiosa (Heinemann, 1862) Gerasimov, 1952: 253 WP
Nepticula pretiosa Heinemann, 1862a: 261
Nepticula bollii Frey, 1873: 144 (syn: van Nieukerken, 1986a: 12)
Stigmella geimontani tatrensis Borkowski, 1970b: 546 (syn: Borkowksi, 1975: 507)
Stigmella bollii (Frey, 1873) Gerasimov, 1952: 231

Stigmella splendidissimella (Herrich-Schäffer, 1855) Klimesch, 1951b: 58 WP
Nepticula splendidissimella Herrich-Schäffer, 1855a: 353
Nepticula splendidissima Frey, 1856: 393 UE
Nepticula dulcella Heinemann, 1862a: 267 (syn: Karsholt & Nielsen, 1976: 17)
Nepticula inaequalis Heinemann, 1862b: 302 (syn: Johansson & Nielsen, 1990: 209)
Nepticula fragarivora Carolsfeld-Krause, 1944: 158 (syn: Karsholt & Nielsen, 1976: 17)
Stigmella dulcella (Heinemann, 1862a) Gerasimov, 1952: 237
Stigmella inaequalis (Heinemann, 1862b) Gerasimov, 1952: 244
Stigmella fragarivora (Carolsfeld-Krause, 1944) Hering, 1957: 455
‡ *Nepticula peterseniella* Skala, 1941b: 78 NN (syn: van Nieukerken, 1986a: 12)
‡ *Stigmella fragarivora peterseniella* (Skala, 1941b) Hering, 1957: 455

Stigmella stelviana (Weber, 1938) Klimesch, 1948b: 67 WP
‡ *Nepticula stelviana* Wocke, 1881: 205 NN
Nepticula stelviana Weber, 1938: 5
Nepticula crantziella Weber, 1945: 401 (syn: Klimesch, 1950a: 27)
Stigmella crantziella (Weber, 1945) Klimesch, 1948b: 69

Stigmella tormentillella (Herrich-Schäffer, 1860) Gerasimov, 1952: 264 WP
Nepticula tormentillella Herrich-Schäffer, 1860: 60

Stigmella acrochaetia Kemperman & Wilkinson, 1985: 31 EP

Stigmella alikurokoi Kemperman & Wilkinson, 1985: 31 EP

Stigmella ichigoiella Kemperman & Wilkinson, 1985: 35 EP
Stigmella longispina Puplesis, 1994: 166 [43] WP,EP
Stigmella spiculifera Kemperman & Wilkinson, 1985: 37 [44] EP
Stigmella oa Kemperman & Wilkinson, 1985: 52 **syn. n.** [44]
Stigmella villosella (Clemens, 1861) Newton & Wilkinson, 1982: 410 NEA
Nepticula villosella Clemens, 1861: 84
Nepticula dallasiana Frey & Boll, 1876: 288 (syn: Braun, 1917: 174)

***Stigmella sorbi* group** (Johansson, 1971: 244) [36]
Stigmella amygdali group (van Nieukerken, 1986a: 13)
Stigmella amygdali (Klimesch, 1978) van Nieukerken, 1986a: 13 WP
Nepticula amygdali Klimesch, 1978b: 264
Stigmella cerasi Puplesis & Diškus, 1996b: 178 WP
Stigmella plagicolella (Stainton, 1854) Fletcher & Clutterbuck, 1945: 60 WP
Nepticula plagicolella Stainton, 1854: 303
‡ *Nepticula plagicolella* var. *avianella* Skala, 1934c: 30 NNLM
‡ *Stigmella plagicolella avianella* (Skala, 1934c) Hering, 1957: 839 NNLM
Stigmella sorbi (Stainton, 1861) Fletcher & Clutterbuck, 1945: 60 WP,EP
Nepticula sorbi Stainton, 1861: 91
Nepticula sorbiella Porritt, 1883: 171 UE
Nepticula sorbi var. *cotoneastrella* Weber, 1936: 670
Stigmella cotoneastrella (Weber, 1936) Hering, 1957: 338
‡ *Nepticula plagicolella* var. *malicola* Skala, 1939d: 95 NNLM
‡ *Stigmella plagicolella malicola* (Skala, 1939) Hering, 1957: 664 NNLM
Stigmella aflatuniae Puplesis & Diškus, 1996b: 180 EP
Stigmella azukinashii Hirano, 2014: 25 EP
Stigmella hamamelella Hirano, 2014: 20 EP
Stigmella lurida Puplesis, 1994: 132 [45] EP
Stigmella motiekaitisi Puplesis, 1994: 135 WP,EP
Stigmella pourthiaeella Hirano, 2014: 24 EP
Stigmella subsorbi Puplesis, 1994: 134 EP
Stigmella tenebrica Puplesis & Diškus, 2003a: 214 OR

***Stigmella lemniscella* group** (new) [39]
Stigmella marginicolella group (Johansson, 1971: 243)
Stigmella continuella (Stainton, 1856) Fletcher & Clutterbuck, 1945: 59 WP,EP
Nepticula continuella Stainton, 1856: 42
Stigmella uigurica Puplesis, 1985c: 62 (syn: Puplesis, 1994: 137)
Stigmella lemniscella (Zeller, 1839) van Nieukerken, 1986a: 11 WP
Lyonetia lemniscella Zeller, 1839: 215
Nepticula marginicolella Stainton, 1853: 3958 (syn: van Nieukerken, 1986a: 12)
Nepticula suberosella Toll, 1934b: 76 (syn: Hering, 1957: 1089)
Nepticula fulvomacula Skala, 1936: 79 (syn: Borkowski, 1969: 114)

Nepticula lemniscella (Zeller, 1839) Zeller, 1848: 313
Stigmella marginicolelia (Stainton, 1853) Fletcher & Clutterbuck, 1945: 59
Stigmella fulvomacula (Skala, 1936) Gerasimov, 1952: 239
Stigmella zagulaevi Puplesis, 1994: 139 WP
Stigmella gimmonella (Matsumura, 1931) Kuroko, 1982a: 448 EP
Nepticula gimmonella Matsumura, 1931: 1114
Stigmella talassica Puplesis in Puplesis et al., 1992: 54 EP
Stigmella apicialbella (Chambers, 1873) Newton & Wilkinson, 1982: 413 NEA
Nepticula apicialbella Chambers, 1873: 127
Nepticula leucostigma Braun, 1912: 88 (syn: Braun, 1914: 21)

***Stigmella floslactella* group** (Johansson, 1971: 244) [39]
Stigmella carpinella (Heinemann, 1862) Gerasimov, 1952: 232 WP
Nepticula carpinella Heinemann, 1862a: 251
Stigmella floslactella (Haworth, 1828) Fletcher & Clutterbuck, 1945: 61 WP
Tinea floslactella Haworth, 1828: 585
Nepticula saxatilella Grönlien, 1932: 114 (syn: van Nieukerken & Johansson, 1987: 461)
Microsetia floslactella (Haworth, 1828) Stephens, 1834: 268
Nepticula floslactella (Haworth, 1828) Stainton, 1849: 29
Stigmella saxatilella (Grönlien, 1932) Gerasimov, 1952: 258
‡ *Stigmella floslactella* f. *interrupta* Dufrane, 1949: 10
Stigmella johanssonella A. Laštuvka & Z. Laštuvka, 1997: 70 WP
Stigmella tityrella (Stainton, 1854) Hering, 1957: 439 WP
Nepticula tityrella Stainton, 1854: 304
Nepticula turicella Herrich-Schäffer, 1855a: 355 (syn: Carolsfeld-Krausé, 1949: 310)
Nepticula turicensis Frey, 1856: 391 UE
Nepticula castanella Stainton, 1859a: 123 (syn: van Nieukerken & Johansson, 1987: 461)
Nepticula hemargyrella auct. [misapplied] (syn: Carolsfeld-Krausé, 1949: 304)
Stigmella turicella (Herrich-Schäffer, 1855a) Fletcher & Clutterbuck, 1945: 60
Stigmella castanella (Stainton, 1859a) Gerasimov, 1952: 232

***Stigmella ruficapitella* group - s.l.** (Johansson, 1971: 245) [39]
Stigmella hemargyrella group (Johansson, 1971: 244)
Stigmella procrastinella group (Wilkinson & Scoble, 1979: 69)
Stigmella castanopsiella group (Puplesis, 1984b: 583)
Stigmella hemargyrella (Kollar, 1832) Gerasimov, 1952: 242 WP
Oecophora hemargyrella Kollar, 1832: 98
Nepticula basalella Herrich-Schäffer, 1855a: 354 (syn: Carolsfeld-Krausé, 1949: 310)
Nepticula fagella Herrich-Schäffer, 1855a: 354 (syn: van Nieukerken & Johansson, 1987: 461)

Nepticula fagi Frey, 1856: 384 (syn: van Nieukerken & Johansson, 1987: 461)
Nepticula nobilella Heinemann & Wocke, [1876]: 755 [6] (syn: van Nieukerken & Johansson, 1987: 461)
Nepticula fulgens Stainton, 1888b: 12 (syn: Carolsfeld-Krausé, 1949: 310)
Nepticula tityrella auct. [misapplied] (see: Carolsfeld-Krausé, 1949: 307)
Lyonetia hemargyrella (Kollar, 1832) Zeller, 1839: 215
Nepticula hemargyrella (Kollar, 1832) Zeller, 1848: 323
Stigmella basalella (Herrich-Schäffer, 1855) Fletcher & Clutterbuck, 1945: 60
Stigmella castanopsiella (Kuroko, 1978) Kuroko, 1982a: 448 EP
Nepticula castanopsiella Kuroko, 1978: 1
Stigmella kurokoi Puplesis, 1984b: 594 EP
Stigmella valvaurigemmata Kemperman & Wilkinson, 1985: 45 (syn: Puplesis, 1994: 161)
Stigmella lithocarpella van Nieukerken & Liu, 2000: 169 EP
Stigmella vandrieli van Nieukerken & Liu, 2000: 171 EP
Stigmella circumargentea van Nieukerken & Liu, 2000: 165 EP
Stigmella kao van Nieukerken & Liu, 2000: 166 EP,OR
Stigmella alba Wilkinson & Scoble, 1979: 73 NEA
Stigmella procrastinella (Braun, 1927) Wilkinson & Scoble, 1979: 70 NEA
Nepticula procrastinella Braun, 1927: 59
Stigmella humboldti Remeikis & Stonis, 2015: 412 [46] NEO

Stigmella ruficapitella **group - s.s.** (Johansson, 1971: 245) [39]
Stigmella atricapitella group (Emmet, 1976: 239)
Stigmella caesurifasciella group (Kemperman & Wilkinson, 1985: 38)
Stigmella suberivora group (Kemperman & Wilkinson, 1985: 38)
Stigmella atricapitella (Haworth, 1828) Beirne, 1945: 198 WP
Tinea atricapitella Haworth, 1828: 585
Nepticula discrepans Sorhagen, 1922: 41 (syn: van Nieukerken & Johansson, 1987: 461)
Microsetia atricapitella (Haworth, 1828) Stephens, 1834: 269
Nepticula atricapitella (Haworth, 1828) Stainton, 1849: 28
Stigmella discrepans (Sorhagen, 1922) Gerasimov, 1952: 237
Stigmella basiguttella (Heinemann, 1862) Vári, 1944b: xxv WP
Nepticula basiguttella Heinemann, 1862a: 258
Stigmella cerricolella Klimesch, 1948a: 160 [29] (syn: Johansson, 1971: 253)
Nepticula cerricolella (Klimesch, 1948) Johansson, 1971: 253
Nepticula basiguttella cerricolella (Klimesch, 1948) Johansson, 1971: 253
Stigmella bicuspidata van Nieukerken & Johansson, 2003: 341 WP
Stigmella cocciferae van Nieukerken & Johansson, 2003: 329 WP
Stigmella dorsiguttella (Johansson, 1971) Pröse, 1984: 107 WP
Nepticula dorsiguttella Johansson, 1971: 251
Stigmella eberhardi (Johansson, 1971) Kasy, 1979: 4 WP
Nepticula eberhardi Johansson, 1971: 258

Stigmella fasciata van Nieukerken & Johansson, 2003: 321 WP
Stigmella ilicifoliella (Mendes, 1918) Gómez Bustillo, 1981: 18 WP
Nepticula ilicifoliella Mendes, 1918: 127
Stigmella ilicivora nigra Dufrane, 1955: 192 (syn: van Nieukerken & Johansson, 2003: 326)
Stigmella karsholti van Nieukerken & Johansson, 2003: 343 WP
Stigmella macrolepidella (Klimesch, 1978) van Nieukerken, 1986b: 13 WP
Nepticula macrolepidella Klimesch, 1978b: 257
Stigmella roborella (Johansson, 1971) Emmet, 1976: 241 WP
Nepticula roborella Johansson, 1971: 258
Nepticula ruficapitella auct. partim before 1971
Stigmella ruficapitella (Haworth, 1828) Beirne, 1945: 198 WP
Tinea ruficapitella Haworth, 1828: 586
Tinea violacella Haworth, 1828: 585 (syn: Stainton, 1849: 28)
Microsetia ruficapitella (Haworth, 1828) Stephens, 1834: 269
Nepticula ruficapitella (Haworth, 1828) Stainton, 1849: 28
Microsetia violaceella (Haworth, 1828) Stephens, 1834: 269
‡ *Nepticula lamprotornella* Heyden in Herrich-Schäffer, 1855b: 69 NN (syn: Herrich-Schäffer, 1855b: 69)
‡ *Nepticula ruficapitella* var. *ruficastaneae* Skala, 1949: 129 NNLM
Stigmella samiatella (Zeller, 1839) Vári, 1950: 180 [47] WP
Lyonetia samiatella Zeller, 1839: 215
Nepticula chaoniella Herrich-Schäffer, 1863b: 170 NO **syn. n.** [47]
Nepticula quercella Herrich-Schäffer, 1863a: 23 NN (syn: Segerer, 1997: 190) [47]
Nepticula samiatella (Zeller, 1839) Zeller, 1848: 303
Stigmella suberivora (Stainton, 1869) Beirne, 1945: 197 WP
Nepticula suberivora Stainton, 1869b: 228
Nepticula aureocapitella Millière, 1876 (syn: van Nieukerken & Johansson, 1987: 461)
Nepticula aureocaputella Millière, 1876: 374 IOS
Nepticula ilicivora Peyerimhoff, 1871: 413 (syn: Johansson, 1971: 246)
Nepticula ilicella Walsingham, 1891: 152 (syn: van Nieukerken, 2004: 111)
Stigmella ilicivora (Peyerimhoff, 1871) Gerasimov, 1952: 244
Stigmella ilicella (Walsingham, 1891) Le Marchand, 1946b: 284
Stigmella svenssoni (Johansson, 1971) Emmet, 1976: 243 WP
Nepticula svenssoni Johansson, 1971: 249
Stigmella szoecsiella (Borkowski, 1972) van Nieukerken, 1986a: 13 WP
Nepticula szoecsiella Borkowski, 1972b: 776
Stigmella tristis (Wocke, 1862) Gerasimov, 1952: 265 WP
Nepticula tristis Wocke, 1862: 251
Stigmella trojana Z. Laštuvka & A. Laštuvka, 1998: 313 WP
Stigmella zangherii (Klimesch, 1951) Zangheri, 1969: 1014 WP
Nepticula zangherii Klimesch, 1951d: 61

Stigmella acuta Diškus, Navickaitė & Remeikis in Stonis et al., 2013e: 202 EP
Stigmella aladina Puplesis, 1984a: 115 EP
Stigmella quercifaga Kemperman & Wilkinson, 1985: 44 (syn: van Nieukerken & Liu, 2000: 161)
Stigmella azuminoensis Hirano, 2010: 125 EP
Stigmella caesurifasciella Kemperman & Wilkinson, 1985: 38 EP
Stigmella egregilustrata Kemperman & Wilkinson, 1985: 39 (syn: van Nieukerken & Liu, 2000: 174)
Stigmella clisiotophora Kemperman & Wilkinson, 1985: 48 EP
Stigmella crenatiella Hirano, 2010: 125 EP
Stigmella dentatae Puplesis, 1984a: 114 EP
Stigmella pulla Kemperman & Wilkinson, 1985: 43 (syn: Puplesis, 1994: 162)
Stigmella fervida Puplesis, 1984b: 593 EP
Stigmella fumida Kemperman & Wilkinson, 1985: 42 EP
Stigmella chrysopterella Kemperman & Wilkinson, 1985: 48 (syn: van Nieukerken & Liu, 2000: 157)
Stigmella kurii Kemperman & Wilkinson, 1985: 51 (syn: van Nieukerken & Liu, 2000: 157)
Stigmella hisaii Kuroko, 2004: 238 EP
Stigmella hisakoae Hirano, 2010: 126 EP
Stigmella kasyi van Nieukerken & Johansson, 2003: 331 EP
Stigmella omelkoi Puplesis, 1984b: 593 EP
Stigmella kumatai Kemperman & Wilkinson, 1985: 50 (syn: Puplesis, 1994: 163)

Unplaced Species groups

***Stigmella barbata* group** (Puplesis et al., 2002: 63)
Stigmella plumosetaeella Newton & Wilkinson, 1982: 455 NEA
Stigmella austroamericana Puplesis & Diškus in Puplesis et al., 2002: 25 NEO
Stigmella barbata Puplesis & Robinson, 2000: 37 NEO

***Stigmella purpurimaculae* group** (Remeikis & Stonis in Stonis et al., 2014: 351)
Stigmella cana Remeikis & Stonis in Stonis et al., 2014: 324 NEO
Stigmella concreta Remeikis & Stonis in Stonis et al., 2014: 328 NEO
Stigmella pseudoconcreta Remeikis & Stonis in Stonis et al., 2014: 329 NEO
Stigmella purpurimaculae Remeikis & Stonis in Stonis et al., 2014: 323 NEO
Stigmella quadrata Remeikis & Stonis in Stonis et al., 2014: 329 NEO
Stigmella sceptra Remeikis & Stonis in Stonis et al., 2014: 327 NEO
Stigmella truncata Remeikis & Stonis in Stonis et al., 2014: 326 NEO

***Stigmella* unplaced and ungrouped species**
Stigmella arbatella (Chrétien, 1922) Rungs, 1979: 25 WP
Nepticula arbatella Chrétien, 1922: 373
Stigmella georgiana Puplesis, 1994: 165 WP

Stigmella grandistyla Puplesis, 1994: 113 WP
Stigmella brutea Remeikis & Stonis in Stonis et al., 2014: 331 NEO
Stigmella hylomaga (Meyrick, 1931a) Davis, 1984: 18 NEO
Nepticula hylomaga Meyrick, 1931a: 415
Stigmella pruinosa Puplesis & Robinson, 2000: 38 NEO
Stigmella pseudodigitata Remeikis & Stonis in Stonis et al., 2014: 332 NEO
Stigmella semilactea Remeikis & Stonis in Stonis et al., 2014: 330 NEO

Ozadelpha van Nieukerken in van Nieukerken et al., 2016: 26 (TS/OD: *Ozadelpha conostegiae* van Nieukerken & Nishida, 2016)
Ozadelpha conostegiae van Nieukerken & Nishida in van Nieukerken et al., 2016: 28 NEO
Ozadelpha guajavae (Puplesis & Diškus, 2002) van Nieukerken et al., 2016: 27 NEO
Enteucha guajavae Puplesis & Diškus in Puplesis et al., 2002: 22
Ozadelpha ovata (Puplesis & Robinson, 2000) van Nieukerken et al., 2016: 27 NEO
Stigmella ovata Puplesis & Robinson, 2000: 39

Roscidotoga Hoare, 2000a: 293 (TS/OD: *Roscidotoga callicomae* Hoare, 2000)
Roscidotoga callicomae Hoare, 2000a: 295 (Fig. 27) AUS
Roscidotoga eucryphiae Hoare, 2000a: 296 AUS
Roscidotoga lamingtonia van Nieukerken, van den Berg & Hoare, 2011: 194 AUS
Roscidotoga sapphiripes Hoare, 2000a: 297 AUS

Casanovula Hoare in Hoare & van Nieukerken, 2013: 24 (TS/OD: *Pectinivalva brevipalpa* Hoare, 2013), **stat. n.**
Casanovula brevipalpa (Hoare, 2013), **comb. n.** AUS
Pectinivalva brevipalpa Hoare in Hoare & van Nieukerken, 2013: 27
Casanovula minotaurus (Hoare, 2013), **comb. n.** AUS
Pectinivalva minotaurus Hoare in Hoare & van Nieukerken, 2013: 29

Menurella Hoare in Hoare & van Nieukerken, 2013: 35 (TS/OD: *Pectinivalva scotodes* Hoare, 2013), **stat. n.**
Menurella acmenae (Hoare, 2013), **comb. n.** AUS
Pectinivalva acmenae Hoare in Hoare & van Nieukerken, 2013: 41
Menurella anazona (Meyrick, 1906), **comb. n.** AUS
Nepticula anazona Meyrick, 1906b: 58
Pectinivalva anazona (Meyrick, 1906) Nielsen, 1996: 16
Menurella funeralis (Meyrick, 1906), **comb. n.** AUS
Nepticula funeralis Meyrick, 1906b: 59
Pectinivalva funeralis (Meyrick, 1906) Nielsen, 1996: 16
Menurella libera (Meyrick, 1906), **comb. n.** (Fig. 28) AUS
Nepticula libera Meyrick, 1906b: 61

Pectinivalva libera (Meyrick, 1906) Nielsen, 1996: 16

Menurella planetis (Meyrick, 1906), **comb. n.** AUS

Nepticula planetis Meyrick, 1906b: 58

Pectinivalva planetis (Meyrick, 1906) Nielsen, 1996: 16

Menurella primigena (Meyrick, 1906), **comb. n.** AUS

Nepticula primigena Meyrick, 1906b: 58

Pectinivalva primigena (Meyrick, 1906) Nielsen, 1996: 16

Menurella quintiniae (Hoare & van Nieukerken, 2013), **comb. n.** AUS

Pectinivalva quintiniae Hoare & van Nieukerken, 2013: 47

Menurella scotodes (Hoare, 2013), **comb. n.** AUS

Pectinivalva scotodes Hoare in Hoare & van Nieukerken, 2013: 37

Menurella trepida (Meyrick, 1906), **comb. n.** AUS

Nepticula trepida Meyrick, 1906b: 61

Pectinivalva trepida (Meyrick, 1906) Nielsen, 1996: 16

Menurella tribulatrix (van Nieukerken & Hoare, 2013), **comb. n.** AUS

Pectinivalva tribulatrix van Nieukerken & Hoare in Hoare & van Nieukerken, 2013: 48

Menurella warburtonensis (Wilson, 1939), **comb. n.** AUS

Nepticula warburtonensis Wilson, 1939: 239

Pectinivalva warburtonensis (Wilson, 1939) Nielsen, 1996: 16

Menurella xenadelpha (van Nieukerken & Hoare, 2013), **comb. n.** OR

Pectinivalva xenadelpha van Nieukerken & Hoare in Hoare & van Nieukerken, 2013: 44

Pectinivalva Scoble, 1983: 12

Pectinivalva caenodora (Meyrick, 1906) Nielsen, 1996: 16 (Fig. 29) AUS

Nepticula caenodora Meyrick, 1906b: 58

Pectinivalva chalcitis (Meyrick, 1906) Nielsen, 1996: 16 AUS

Nepticula chalcitis Meyrick, 1906b: 60

Pectinivalva commoni Scoble, 1983: 13 AUS

Pectinivalva endocapna (Meyrick, 1906) Nielsen, 1996: 16 AUS

Nepticula endocapna Meyrick, 1906b: 60

Pectinivalva gilva (Meyrick, 1906b) Nielsen, 1996: 16 AUS

Nepticula gilva Meyrick, 1906b: 59

Pectinivalva melanotis (Meyrick, 1906) Nielsen, 1996: 16 AUS

Nepticula melanotis Meyrick, 1906b: 59

Pectinivalva mystaconota Hoare in Hoare & van Nieukerken, 2013: 20 AUS

Neotrifurcula van Nieukerken, 2016 in van Nieukerken et al., 2016: 36 (TS/OD: *Neotrifurcula gielisorum* van Nieukerken, 2016)

Neotrifurcula gielisorum van Nieukerken, 2016 in van Nieukerken et al., 2016: 38 NEO

Hesperolyra van Nieukerken, 2016 in van Nieukerken et al., 2016: 44 (TS/OD: *Fomoria diskusi* Puplesis & Robinson, 2000)
Fomoria molybditis group Puplesis et al., 2002
Hesperolyra diskusi (Puplesis & Robinson, 2000) van Nieukerken et al., 2016: 44 NEO
Fomoria diskusi Puplesis & Robinson, 2000: 43
Hesperolyra molybditis (Zeller, 1877) van Nieukerken et al., 2016: 46 NEO
Nepticula molybditis Zeller, 1877: 453
Stigmella molybditis (Zeller, 1877) Davis, 1984: 18
Fomoria molybditis (Zeller, 1877) Puplesis & Robinson, 2000: 43
Hesperolyra repanda (Puplesis & Diškus, 2002) van Nieukerken et al., 2016: 46 NEO
Fomoria repanda Puplesis & Diškus in Puplesis et al., 2002: 26
Hesperolyra saopaulensis van Nieukerken, 2016 in van Nieukerken et al., 2016: 52 NEO

Bohemannia Stainton, 1859a: 439 (TS/M: *Nepticula quadrimaculella* Boheman, 1853)
Scoliaula Meyrick, 1895: 727; URN for *Bohemannia* Stainton, 1859 (TS/OD,M: *Nepticula quadrimaculella* Boheman, 1853)
Bohemannia aschaueri Fischer, 2013: 88 WP†
Bohemannia butzmanni Fischer, 2013: 86 WP†
Bohemannia auriciliella (Joannis, 1909) van Nieukerken, 1986a: 16 (Fig. 31) WP
Nepticula auriciliella Joannis, 1909: 822
Ectoedemia bradfordi Emmet, 1974: 269 (syn: van Nieukerken, 1986a: 16)
Stigmella auriciliella (Joannis, 1909) Lhomme, [1963]: 1192
Bohemannia pulverosella (Stainton, 1849) van Nieukerken, 1982: 105 [48] WP,EP,[NEA]
Trifurcula pulverosella Stainton, 1849: 30
Bohemannia piotra Puplesis, 1984b: 586 **syn. n.**[48]
Nepticula pulverosella (Stainton, 1849) Meyrick, 1895: 726
Stigmella pulverosella (Stainton, 1849) Fletcher & Clutterbuck, 1945: 61
Dechtiria pulverosella (Stainton, 1849) Beirne, 1945: 206
Ectoedemia pulverosella (Stainton, 1849) Bradley et al., 1972: 3
Scoliaula pulverosella (Stainton, 1849) Borkowski, 1975: 489
‡ *Nepticula cineretella* Frey in Herrich-Schäffer, 1855b: 70 NN (syn: Herrich-Schäffer, 1855b: 70)
Bohemannia quadrimaculella (Boheman, 1853) Stainton, 1859a: 439 [49] WP
Nepticula quadrimaculella Boheman, 1853: 167
Bucculatrix antispilella Meess, 1907: 129 (syn: Disqué, 1912: 75) [49]
Scoliaula quadrimaculella (Boheman, 1853) Meyrick, 1895: 727
Trifurcula quadrimaculella (Boheman, 1853) Johansson, 1971: 246
Bohemannia ussuriella Puplesis, 1984b: 588 EP
Bohemannia manschurella Puplesis, 1984b: 587 [50] EP
Bohemannia nipponicella Hirano, 2010: 129 **syn. n.** [50]

Bohemannia nubila Puplesis, 1985c: 69 EP
Bohemannia suiphunella Puplesis, 1984b: 588 EP

Areticulata Scoble, 1983: 11 (key), 40 (TS/OD,M: *Areticulata leucosideae* Scoble, 1983)
Areticulata leucosideae Scoble, 1983: 40 AFR

Glaucolepis Braun, 1917: 161 (key), 201 (TS/OD,M: *Nepticula saccharella* Braun, 1912)
Fedalmia Beirne, 1945: 207 (TS/OD,M: *Nepticula headleyella* Stainton, 1854) (syn: Puplesis, 1985a: 11)
Sinopticula Yang, 1989: 79 [81] (TS/OD,M: *Sinopticula sinica* Yang, 1989: 80) (syn: van Nieukerken & Puplesis, 1991: 202)

***Glaucolepis raikhonae* group** (van Nieukerken & Puplesis, 1991: 202)
Glaucolepis melanoptera (van Nieukerken & Puplesis, 1991) Puplesis, 1994: 219 WP
Trifurcula melanoptera van Nieukerken & Puplesis, 1991
Glaucolepis oishiella (Matsumura, 1931), **comb. n.** [51] EP
Trifurcula oishiella Matsumura, 1931: 1114
Sinopticula sinica Yang, 1989: 80 **syn. n.** [51]
Trifurcula sinica (Yang, 1989) van Nieukerken & Puplesis, 1991: 205
Glaucolepis sinica (Yang, 1989) Diškus & Puplesis, 2003: 404
Glaucolepis raikhonae Puplesis, 1985c: 71 EP
Trifurcula raikhonae (Puplesis, 1985) van Nieukerken, 1986a: 68

***Glaucolepis saccharella* group** (new)
Glaucolepis saccharella (Braun, 1912) Braun, 1917: 201 NEA
Nepticula saccharella Braun, 1912: 97
Trifurcula saccharella (Braun, 1912) van Nieukerken, 1986a: 68

***Glaucolepis headleyella* group** (Puplesis, 1994: 219)
Glaucolepis albiflorella (Klimesch, 1978) Diškus & Puplesis, 2003: 406 WP
Trifurcula albiflorella Klimesch, 1978b: 274
Glaucolepis alypella (Klimesch, 1975) Diškus & Puplesis, 2003: 406 WP
Trifurcula alypella Klimesch, 1975c: 12
Glaucolepis andalusica (Z. Laštuvka & A. Laštuvka, 2007), **comb. n.** WP
Trifurcula andalusica Z. Laštuvka & A. Laštuvka, 2007: 102
Glaucolepis bleonella (Chrétien, 1904) Puplesis, 1994: 219 WP
Nepticula bleonella Chrétien, 1904: 164
Stigmella bleonella (Chrétien, 1904) Gerasimov, 1952: 231
Ectoedemia bleonella (Chrétien, 1904) Klimesch, 1975a: 861
Trifurcula bleonella (Chrétien, 1904) Leraut, 1980: 49
Glaucolepis bupleurella (Chrétien, 1907) Diškus & Puplesis, 2003: 405 WP
Nepticula bupleurella Chrétien, 1907: 91
Stigmella bupleurella (Chrétien, 1907) Gerasimov, 1952: 232

Ectoedemia bupleurella (Chrétien, 1907) Klimesch, 1975a: 863
Trifurcula bupleurella (Chrétien, 1907) Leraut, 1980: 49
Glaucolepis chretieni (Z. Laštůvka, A. Laštůvka & van Nieukerken, 2013), **comb. n.** WP
Trifurcula chretieni Z. Laštůvka, A. Laštůvka & van Nieukerken, 2013: 198
Glaucolepis corleyi (Z. Laštuvka & A. Laštuvka, 2007), **comb. n.** WP
Trifurcula corleyi Z. Laštuvka & A. Laštuvka, 2007: 102
Glaucolepis globulariae (Klimesch, 1975) Diškus & Puplesis, 2003: 406 WP
Trifurcula globulariae Klimesch, 1975c: 7
Glaucolepis hamirella (Chrétien, 1915) Diškus & Puplesis, 2003: 406 [52] WP
Nepticula hamirella Chrétien, 1915: 364
Ectoedemia hamirella (Chrétien, 1915) Klimesch, 1975a: 863
Trifurcula hamirella (Chrétien, 1915) van Nieukerken, 1986a: 15
Glaucolepis saturejae (Parenti, 1963) Diškus & Puplesis, 2003: 406 [52] WP
Stigmella saturejae Parenti, 1963: 101
Fedalmia saturejae (Parenti, 1963) Klimesch, 1976: 45
Trifurcula saturejae (Parenti, 1963) van Nieukerken, 1986a: 15
Glaucolepis headleyella (Stainton, 1854) Puplesis, 1994: 219 WP
Nepticula headleyella Stainton, 1854: 298
Nepticula argyrostigma Frey, 1856: 379 (syn: Frey, 1880: 425)
Nepticula dubiella Hauder, 1912: 273 (syn: Klimesch, 1948b: 76)
Trifurcula rodella Svensson, 1982: 299 (syn: van Nieukerken, 1986a: 15)
Fedalmia headleyella (Stainton, 1854) Beirne, 1945: 207
Stigmella headleyella (Stainton, 1854) Klimesch, 1948b: 76
Trifurcula headleyella (Stainton, 1854) Johansson, 1971: 245
Stigmella dubiella (Hauder, 1912) Klimesch, 1948b: 76
Glaucolepis helladica (Z. Laštuvka & A. Laštuvka, 2007), **comb. n.** WP
Trifurcula helladica Z. Laštuvka & A. Laštuvka, 2007: 101
Glaucolepis istriae (A. Laštuvka & Z. Laštuvka, 2000) Diškus & Puplesis, 2003: 406 WP
Trifurcula istriae A. Laštuvka & Z. Laštuvka, 2000a: 290
Glaucolepis kalavritana (Z. Laštuvka & A. Laštuvka, 1998) Diškus & Puplesis, 2003: 407 WP
Trifurcula kalavritana (Z. Laštuvka & A. Laštuvka, 1998): 314
Glaucolepis lavandulae (Z. Laštuvka & A. Laštuvka, 2007), **comb. n.** WP
Trifurcula lavandulae Z. Laštuvka & A. Laštuvka, 2007: 104
Glaucolepis liskai (A. Laštuvka & Z. Laštuvka, 2000) Diškus & Puplesis, 2003: 407 WP
Trifurcula liskai A. Laštuvka & Z. Laštuvka, 2000a: 291
Glaucolepis lituanica (Ivinskis & van Nieukerken, 2012), **comb. n.** (Fig. 30) WP
Trifurcula lituanica Ivinskis & van Nieukerken, 2012: 43
Glaucolepis magna (A. Laštuvka & Z. Laštuvka, 1997) Diškus & Puplesis, 2003: 407 [53] WP

Trifurcula magna (A. Laštuvka & Z. Laštuvka, 1997): 132
Trifurcula collinella Nel, 2012: 24 **syn. n.** [53]
Glaucolepis megaphallus (van Nieukerken, Z. Laštůvka & A. Laštůvka, 2013), **comb. n.** WP
Trifurcula megaphallus van Nieukerken, Z. Laštůvka & A. Laštůvka in Z. Laštůvka et al., 2013: 195
Glaucolepis micromeriae (Walsingham, 1908) Diškus & Puplesis, 2003: 405 WP
Stigmella micromeriae Walsingham, 1908a: 1010[1]
Nepticula micromeriae (Walsingham, 1908) Rebel, 1910: 374
Trifurcula micromeriae (Walsingham, 1908) Klimesch, 1977: 196
Glaucolepis montana (Z. Laštuvka, A. Laštuvka & van Nieukerken), **comb. n.** WP
Trifurcula montana Z. Laštuvka, A. Laštuvka & van Nieukerken in Z. & A. Laštuvka, 2007: 103
Glaucolepis pederi (Z. Laštuvka & A. Laštuvka, 2007), **comb. n.** WP
Trifurcula pederi Z. Laštuvka & A. Laštuvka, 2007: 102
Glaucolepis rosmarinella (Chrétien, 1914) Diškus & Puplesis, 2003: 405 WP
Nepticula rosmarinella Chrétien, 1914: 270
Stigmella rosmarinella (Chrétien, 1914) Gerasimov, 1952: 256
Trifurcula rosmarinella (Chrétien, 1914) Klimesch, 1975b: 23
Glaucolepis salicinae (Klimesch, 1975) Diškus & Puplesis, 2003: 406 WP
Trifurcula salicinae Klimesch, 1975c: 10
Glaucolepis salvifoliae (Z. Laštuvka & A. Laštuvka, 2007), **comb. n.** WP
Trifurcula salvifoliae Z. Laštuvka & A. Laštuvka, 2007: 103
Glaucolepis sanctaecrucis (Walsingham, 1908) Diškus & Puplesis, 2003: 405 WP
Stigmella sanctaecrucis Walsingham, 1908a: 1010[1]
Nepticula sanctaecrucis (Walsingham, 1908) Rebel, 1910: 374
Fedalmia sanctaecrucis (Walsingham, 1908) Klimesch, 1976: 44
Trifurcula sanctaecrucis (Walsingham, 1908) Klimesch, 1977: 196
Glaucolepis sanctibenedicti (Klimesch, 1979) Diškus & Puplesis, 2003: 406 WP
Trifurcula sanctibenedicti Klimesch, 1979: 24
Glaucolepis siciliae (Z. Laštůvka, A. Laštůvka & van Nieukerken, 2013), **comb. n.** WP
Trifurcula siciliae Z. Laštůvka, A. Laštůvka & van Nieukerken, 2013: 201
Glaucolepis stoechadella (Klimesch, 1975) Diškus & Puplesis, 2003: 406 WP
Trifurcula stoechadella Klimesch, 1975c: 23
Glaucolepis teucriella (Chrétien, 1914) Diškus & Puplesis, 2003: 405 WP
Nepticula teucriella Chrétien, 1914: 270
Stigmella teucriella (Chrétien, 1914) Gerasimov, 1952: 263
Trifurcula teucriella (Chrétien, 1914) Leraut, 1980: 49
Glaucolepis thymi (Szőcs, 1965) Diškus & Puplesis, 2003: 406 WP
Nepticula thymi Szőcs, 1965: 89
Fedalmia thymi Borkowski, 1970a: 74; JSH of *Nepticula thymi* Szőcs, 1965
Trifurcula thymi (Szőcs, 1965) van Nieukerken, 1986a: 15

Glaucolepis trilobella (Klimesch, 1978) Diškus & Puplesis, 2003: 406 WP
Trifurcula trilobella Klimesch, 1978b: 271
Glaucolepis zollikofferiela (Chrétien, 1914) Diškus & Puplesis, 2003: 405 WP
Nepticula zollikofferiela Chrétien, 1914: 271
Stigmella zollikofferiela (Chrétien, 1914) Gerasimov, 1952: 270
Ectoedemia zollikofferiela (Chrétien, 1914) Klimesch, 1975a: 862
Trifurcula zollikofferiela (Chrétien, 1914) van Nieukerken, 1986a: 15
Glaucolepis rusticula (Meyrick, 1916) Diškus & Puplesis, 2003: 406 OR
Nepticula rusticula Meyrick, 1916b: 7
Trifurcula rusticula (Meyrick, 1916) online comb.

Unassigned to group [54]
Glaucolepis aerifica (Meyrick, 1915) Puplesis & Robinson, 2000: 56 NEO
Nepticula aerifica Meyrick, 1915a: 255
Stigmella aerifica (Meyrick, 1915) Davis, 1984: 18
Trifurcula aerifica (Meyrick, 1915) online comb.
Glaucolepis argentosa Puplesis & Robinson, 2000: 57 [54] NEO
Trifurcula argentosa (Puplesis & Robinson, 2000) online comb.

Trifurcula Zeller, 1848: 249 (key), 330 (TS/SD (Tutt, 1899: 355): *Trifurcula pallidella* Zeller, 1848)
Trifurcella Chambers, 1878: 165 ISS
Levarchama Beirne, 1945: 206 (TS/OD: *Nepticula cryptella* Stainton, 1856) (syn: Johansson, 1971: 246)

***Trifurcula cryptella* group** (new)
Trifurcula anthyllidella Klimesch, 1975c: 14 WP
Trifurcula cryptella (Stainton, 1856) Johansson, 1971: 246 WP
Nepticula cryptella Stainton, 1856: 41
Nepticula trifolii Sorhagen, 1885: 280 (syn: Hering, 1957: 1067)
Stigmella cryptella (Stainton, 1856) Fletcher & Clutterbuck, 1945: 61
Levarchama cryptella (Stainton, 1856) Beirne, 1945: 207
Trifurcula eurema (Tutt, 1899) Johansson, 1971: 246 WP
Nepticula eurema Tutt, 1899: 332
Nepticula heurema Meess, 1910: 481 UE
Nepticula dorycniella Suire, 1928: 128 (syn: van Nieukerken, 1986a: 15)
Nepticula gozmanyi Szőcs, 1959: 417 (syn: van Nieukerken, 1986a: 15)
Levarchama eurema (Tutt, 1899) Beirne, 1945: 207
Stigmella eurema (Tutt, 1899) Klimesch, 1951b: 66
Stigmella heurema (Meess, 1910) Gerasimov, 1952: 243
Stigmella dorycniella (Suire, 1928) Klimesch, 1951b: 66
Trifurcula manygoza van Nieukerken, A. Laštuvka & Z. Laštuvka in van Nieukerken, 2007b: 125 WP

Trifurcula ortneri (Klimesch, 1951) van Nieukerken, 1986a: 15 WP
Nepticula ortneri Klimesch, 1951b: 66
Stigmella ortneri (Klimesch, 1951) Klimesch, 1961: 763
Trifurcula peloponnesica van Nieukerken, 2007b: 118 WP
Trifurcula ridiculosa (Walsingham, 1908) Klimesch, 1975b: 15 WP
Stigmella ridiculosa Walsingham, 1908a: 1011[1]
Nepticula ridiculosa (Walsingham, 1908) Rebel, 1910: 364

***Trifurcula subnitidella* group** (van Nieukerken, 1990b: 208)
Trifurcula coronillae van Nieukerken, 1990b: 217 WP
Trifurcula iberica van Nieukerken, 1990b: 228 (Fig. 32) WP
Trifurcula josefklimeschi van Nieukerken, 1990b: 225 WP
Trifurcula luteola van Nieukerken, 1990b: 215 WP
Trifurcula puplesisi van Nieukerken, 1990b: 215 WP,EP
Trifurcula silviae van Nieukerken, 1990b: 230 WP
Trifurcula subnitidella (Duponchel, 1843) van Nieukerken & Johansson, 1987: 462 WP
Elachista subnitidella Duponchel, 1843: 326
Trifurcula griseella Wolff, 1957: 21 (syn: van Nieukerken & Johansson, 1987: 462)
Lyonetia subnitidella (Duponchel, 1843) Duponchel, 1844: 378
Nepticula subnitidella (Duponchel, 1843) Zeller, 1848: 305
Trifurcula victoris van Nieukerken, 1990b: 219 WP

***Trifurcula pallidella* group** (van Nieukerken, 1990b: 208)
Trifurcula aurella Rebel, 1933: 82 WP
Trifurcula austriaca van Nieukerken, 1990b: 213 WP
Trifurcula baldensis A. Laštuvka & Z. Laštuvka, 2005a: 8 WP
Trifurcula beirnei Puplesis, 1984a: 124 WP
Trifurcula bicolorella (Chrétien, 1915), **comb. n.** [55] WP
Bucculatrix bicolorella Chrétien, 1915: 364
Trifurcula calycotomella A. Laštuvka & Z. Laštuvka, 1997: 148 WP
Trifurcula chamaecytisi A. Laštuvka & Z. Laštuvka, 1994: 207 WP
Trifurcula corothamni A. Laštuvka & Z. Laštuvka, 1994: 202 WP
Trifurcula cytisanthi A. Laštuvka & Z. Laštuvka, 2005a: 8 WP
Trifurcula etnensis A. Laštuvka & Z. Laštuvka, 2005a: 7 WP
Trifurcula graeca Z. Laštuvka & A. Laštuvka, 1998: 315 WP
Trifurcula immundella (Zeller, 1839) Zeller, 1848: 332 WP
Lyonetia immundella Zeller, 1839: 215
Trifurcula macedonica Z. Laštuvka & A. Laštuvka, 1998: 315 WP
Trifurcula moravica A. Laštuvka & Z. Laštuvka, 1994: 205 WP
Trifurcula orientella Klimesch, 1953a: 168 WP
Trifurcula pallidella (Duponchel, 1843) Joannis, 1915: 129 WP
Oecophora pallidella Duponchel, 1843: 339

Trifurcula pallidella Zeller, 1848: 332; JSH of *Trifurcula pallidella* (Duponchel, 1843)
Lithocolletis pallidella (Duponchel, 1843) Bruand, [1851]: 86
Trifurcula incognitella Toll, 1936: 409 (syn: van Nieukerken, 1986a: 15)
‡ *[no genus] pallidulella* Herrich-Schäffer, 1853: pl 108 NN
Trifurcula serotinella Herrich-Schäffer, 1855a: 359 WP
Trifurcula confertella Fuchs, 1895: 47 (syn: van Nieukerken, 1986a: 15)
Trifurcula squamatella Stainton, 1849: 30 WP
Trifurcula maxima Klimesch, 1953a: 167 (syn: van Nieukerken, 1987b: 180)
Trifurcula trasaghica A. Laštuvka & Z. Laštuvka, 2005a: 9 WP

***Trifurcula barbertonensis* group** (new)
Trifurcula barbertonensis Scoble, 1980a: 142 AFR
Trifurcula pullus Scoble, 1980a: 140 AFR

Fomoria Beirne, 1945: 208 (TS/OD: *Nepticula weaveri* Stainton, 1855)

***Fomoria vannifera* group** (Hoare, 2000b: 300)
Fomoria asiatica group (Puplesis, 1994: 208)
Fomoria asiatica Puplesis, 1988: 27 EP
Ectoedemia asiatica (Puplesis, 1988) Hoare, 2000a: 301
Fomoria glycystrota (Meyrick, 1928) Diškus & Puplesis, 2003: 385 OR
Nepticula glycystrota Meyrick, 1928b: 462
Ectoedemia glycystrota (Meyrick, 1928b) Hoare, 2000a: 302
Fomoria fuscata (Janse, 1948) Diškus & Puplesis, 2003: 385 AFR
Nepticula fuscata Janse, 1948: 165
Ectoedemia fuscata (Janse, 1948) Scoble, 1983: 36
Fomoria hobohmi (Janse, 1948) Diškus & Puplesis, 2003: 385 AFR
Nepticula hobohmi Janse, 1948: 167
Ectoedemia hobohmi (Janse, 1948) Scoble, 1983: 38
Fomoria kharuxabi (Mey, 2004), **comb. n.** AFR
Ectoedemia kharuxabi Mey, 2004: 32
Fomoria uisebi (Mey, 2004), **comb. n.** AFR
Ectoedemia uisebi Mey, 2004: 32
Fomoria vannifera (Meyrick, 1914) Diškus & Puplesis, 2003: 385 AFR
Nepticula vannifera Meyrick, 1914: 203
Ectoedemia vannifera (Meyrick, 1914) Scoble, 1983: 37
Fomoria hadronycha (Hoare, 2000) Diškus & Puplesis, 2003: 385 AUS
Ectoedemia hadronycha Hoare, 2000b: 307
Fomoria pelops (Hoare, 2000) Diškus & Puplesis, 2003: 385 AUS
Ectoedemia pelops Hoare, 2000b: 304
Fomoria squamibunda (Hoare, 2000) Diškus & Puplesis, 2003: 385 AUS
Ectoedemia squamibunda Hoare, 2000b: 304

Fomoria groschkei **group** (Hoare, 2000b: 313)

Fomoria aegaeica (Z. Laštuvka, A. Laštuvka & Johansson, 1998) Diškus & Puplesis, 2003: 391 WP

Ectoedemia aegaeica Z. Laštuvka, A. Laštuvka & Johansson in Z. & A. Laštuvka, 1998: 316

Fomoria groschkei (Skala, 1943) Diškus & Puplesis, 2003: 388 WP

Nepticula groschkei Skala, 1943: 86

Stigmella groschkei (Skala, 1943) Klimesch, 1948b: 77

Ectoedemia groschkei (Skala, 1943) van Nieukerken, 1986a: 17

Fomoria thermae (Scoble, 1983) Diškus & Puplesis, 2003: 390 AFR

Ectoedemia thermae Scoble, 1983: 36

Fomoria weaveri **group** (Puplesis, 1994: 205)

Fomoria degeeri (van Nieukerken, 2008), **comb. n.** WP

Ectoedemia degeeri van Nieukerken, 2008: 124

Fomoria deschkai (Klimesch, 1978) Diškus & Puplesis, 2003: 384 WP

Trifurcula deschkai Klimesch, 1978b: 274

Ectoedemia deschkai (Klimesch, 1978b) van Nieukerken, 1986a: 17

Fomoria empetrifolii (A. Laštuvka & Z. Laštuvka, 2000) Diškus & Puplesis, 2003: 385 WP

Ectoedemia empetrifolii A. Laštuvka & Z. Laštuvka, 2000b: 22

Fomoria eriki (A. Laštuvka & Z. Laštuvka, 2000) Diškus & Puplesis, 2003: 385 WP

Ectoedemia eriki A. Laštuvka & Z. Laštuvka, 2000b: 21

Fomoria luisae Klimesch, 1978a: 89 WP

Ectoedemia luisae (Klimesch, 1978) van Nieukerken, 1986a: 17

Fomoria septembrella (Stainton, 1849) Beirne, 1945: 209 WP

Nepticula septembrella Stainton, 1849: 29

Stigmella septembrella (Stainton, 1849) Fletcher & Clutterbuck, 1945: 61

Trifurcula septembrella (Stainton, 1849) Johansson, 1971: 246

Ectoedemia septembrella (Stainton, 1849) Scoble, 1983: 32

Fomoria variicapitella (Chrétien, 1908) Diškus & Puplesis, 2003: 384 WP

Nepticula variicapitella Chrétien, 1908: 363

Stigmella variicapitella (Chrétien, 1908) Gerasimov, 1952: 263

Trifurcula variicapitella (Chrétien, 1908) Klimesch, 1977: 197

Ectoedemia variicapitella (Chrétien, 1908) van Nieukerken, 1986a: 17

Fomoria weaveri (Stainton, 1855) Beirne, 1945: 209 (Fig. 33) WP,EP,NEA

Nepticula weaveri Stainton, 1855: 49

Nepticula weaweri Herrich-Schäffer, 1855a: 346 ISS

Nepticula weaverella Doubleday, 1859: 36 UE

Stigmella weaveri (Stainton, 1855) Gerasimov, 1952: 269

Trifurcula weaveri (Stainton, 1855) Johansson, 1971: 246

Ectoedemia weaveri (Stainton, 1855) Scoble, 1983: 32

‡ *Fomoria weaveri* f. *fuliginella* Vári, 1947: 523

Fomoria festivitatis (van Nieukerken, 2008), **comb. n.** OR, EP
Ectoedemia festivitatis van Nieukerken, 2008: 117
Fomoria hypericifolia Kuroko, 1982: 49 EP
Ectoedemia hypericifolia (Kuroko, 1982) van Nieukerken, 1986a: 84
Fomoria permira Puplesis, 1984b: 592 EP
Ectoedemia permira (Puplesis, 1984) van Nieukerken, 1986a: 84
Fomoria hypericella (Braun, 1925) Wilkinson, 1979: 84 NEA
Nepticula hypericella Braun, 1925a: 17
Ectoedemia hypericella (Braun, 1925a) van Nieukerken, 2008: 116
Fomoria pteliaeella (Chambers, 1880) Wilkinson, 1979: 84 NEA
Nepticula pteliaeella Chambers, 1880c: 137
Ectoedemia pteliaeella (Chambers, 1880) van Nieukerken, 2008: 117
Fomoria ruwenzoriensis (Bradley, 1965), **comb. n.** AFR
Stigmella ruwenzoriensis Bradley, 1965: 120
Acalyptris ruwenzoriensis (Bradley, 1965) Diškus & Puplesis, 2003: 394
Ectoedemia ruwenzoriensis (Bradley, 1965) van Nieukerken, 2008: 117

***Fomoria lacrimulae* group** (Diškus & Puplesis, 2003: 386)
Fomoria lacrimulae Puplesis & Diškus, 1996c: 185 WP
Ectoedemia lacrimulae (Puplesis & Diškus, 1996) online comb.
Fomoria knysnaensis (Scoble, 1983) Diškus & Puplesis, 2003: 386 AFR
Ectoedemia knysnaensis Scoble, 1983: 33

African unplaced *Fomoria*
Fomoria alexandria (Scoble, 1983) Diškus & Puplesis, 2003: 390 AFR
Ectoedemia alexandria Scoble, 1983: 35
Fomoria gambiana (Gustafsson, 1972) Diškus & Puplesis, 2003: 389 AFR
Nepticula gambiana Gustafsson, 1972: 156
Ectoedemia gambiana (Gustafsson, 1972) online comb.
Fomoria incisaevora (Scoble, 1983) Diškus & Puplesis, 2003: 390 AFR
Ectoedemia incisaevora Scoble, 1983: 35
Fomoria indicaevora (Scoble, 1983) Diškus & Puplesis, 2003: 390 AFR
Ectoedemia indicaevora Scoble, 1983: 33
Fomoria leptodictyae (Scoble, 1983) Diškus & Puplesis, 2003: 390 AFR
Ectoedemia leptodictyae Scoble, 1983: 35
Fomoria lucidae (Scoble, 1983) Diškus & Puplesis, 2003: 390 AFR
Ectoedemia lucidae Scoble, 1983: 34
Fomoria malelanensis (Scoble, 1983) Diškus & Puplesis, 2003: 390 AFR
Ectoedemia malelanensis Scoble, 1983: 36
Fomoria myrtinaecola (Scoble, 1983) Diškus & Puplesis, 2003: 390 AFR
Ectoedemia myrtinaecola Scoble, 1983: 34
Fomoria oleivora (Vári, 1955) Diškus & Puplesis, 2003: 388 AFR
Stigmella oleivora Vári, 1955: 336
Ectoedemia oleivora (Vári, 1955) Scoble, 1983: 32

Fomoria pappeivora (Vári, 1963) Diškus & Puplesis, 2003: 388 AFR
Stigmella pappeivora Vári, 1963: 68
Ectoedemia pappeivora (Vári, 1963) Scoble, 1983: 32
Fomoria portensis (Scoble, 1983) Diškus & Puplesis, 2003: 390 AFR
Ectoedemia portensis Scoble, 1983: 36
Fomoria primaria (Meyrick, 1913) Diškus & Puplesis, 2003: 388 AFR
Nepticula primaria Meyrick, 1913: 326
Ectoedemia primaria (Meyrick, 1913) Scoble, 1983: 38
Fomoria scobleella (Minet, 2004), **comb. n.** [56] AFR
Ectoedemia scoblei Minet, 1990: 220; JPH of *Ectoedemia scoblei* Puplesis, 1984a
Ectoedemia scobleella Minet, 2004: 366; RN for *E. scoblei* Minet, 1990
Fomoria scoblei (Minet, 1990) Diškus & Puplesis, 2003: 391
Fomoria tecomariae (Vári, 1955) Diškus & Puplesis, 2003: 388 AFR
Stigmella tecomariae Vári, 1955: 333
Ectoedemia tecomariae (Vári, 1955) Scoble, 1983: 34

other unplaced *Fomoria*
Fomoria viridissimella (Caradja, 1920) Diškus & Puplesis, 2003: 385 WP
Nepticula viridissimella Caradja, 1920: 162
Nepticula nowakowskii Toll, 1957: 199 (syn: van Nieukerken, 1987a: 142)
Ectoedemia viridissimella (Caradja, 1920) van Nieukerken, 1987a: 142
Ectoedemia nowakowskii (Toll, 1957) van Nieukerken, 1986a: 17
Fomoria argyraspis (Puplesis & Diškus, 1995), **comb. n.** [57] EP
Acalyptris argyraspis Puplesis & Diškus, 1995: 51
Fomoria flavimacula Puplesis & Diškus, 1996c: 183 EP
Ectoedemia flavimacula (Puplesis & Diškus, 1996c) online comb.
Fomoria sporadopa (Meyrick, 1911), **comb. n.** [58] OR
Nepticula sporadopa Meyrick, 1911c: 108
Acalyptris sporadopa (Meyrick, 1911) Diškus & Puplesis, 2003: 393
Fomoria tabulosa Puplesis & Diškus in Puplesis et al., 2002: 27 NEO

Muhabbetana Koçak & Kemal, 2007: 5 **stat. n.**; RN for *Laqueus* Scoble, 1983
Laqueus Scoble, 1983: 12 (key), 20; JH of *Laqueus* Dall, 1870 (Brachiopoda) (TS/OD: *Nepticula grandinosa* Meyrick, 1911) [as subgenus of *Ectoedemia*]

***Muhabbetana grandinosa* group** (new)
Muhabbetana furcella (Scoble, 1983), **comb. n.** AFR
Ectoedemia furcella Scoble, 1983: 24
Fomoria furcella (Scoble, 1983) Diškus & Puplesis, 2003: 387
Muhabbetana grandinosa (Meyrick, 1911), **comb. n.** AFR
Nepticula grandinosa Meyrick, 1911a: 236
Ectoedemia grandinosa (Meyrick, 1911) Scoble, 1983: 21
Fomoria grandinosa (Meyrick, 1911) Diškus & Puplesis, 2003: 386

Muhabbetana guerkiae (Scoble, 1983), **comb. n.** AFR
Ectoedemia guerkiae Scoble, 1983: 22
Fomoria guerkiae (Scoble, 1983) Diškus & Puplesis, 2003: 387
Muhabbetana jupiteri (Scoble, 1983), **comb. n.** AFR
Ectoedemia jupiteri Scoble, 1983: 25
Fomoria jupiteri (Scoble, 1983) Diškus & Puplesis, 2003: 387
Muhabbetana macrochaeta (Meyrick, 1921), **comb. n.** AFR
Nepticula macrochaeta Meyrick, 1921b: 140
Ectoedemia macrochaeta (Meyrick, 1921) Scoble, 1983: 23
Fomoria macrochaeta (Meyrick, 1921) Diškus & Puplesis, 2003: 387
Muhabbetana maritima (Scoble, 1983), **comb. n.** AFR
Ectoedemia maritima Scoble, 1983: 24
Fomoria maritima (Scoble, 1983) Diškus & Puplesis, 2003: 387
Muhabbetana scabridae (Scoble, 1983), **comb. n.** AFR
Ectoedemia scabridae Scoble, 1983: 24
Fomoria scabridae (Scoble, 1983) Diškus & Puplesis, 2003: 387
Muhabbetana simiicola (Scoble, 1983), **comb. n.** AFR
Ectoedemia simiicola Scoble, 1983: 22
Fomoria simiicola (Scoble, 1983) Diškus & Puplesis, 2003: 387
Muhabbetana stimulata (Meyrick, 1913), **comb. n.** AFR
Nepticula stimulata Meyrick, 1913: 326
Ectoedemia stimulata (Meyrick, 1913) Scoble, 1983: 21
Fomoria stimulata (Meyrick, 1913) Diškus & Puplesis, 2003: 386
Muhabbetana umdoniella (Scoble, 1983), **comb. n.** AFR
Ectoedemia umdoniella Scoble, 1983: 24
Fomoria umdoniella (Scoble, 1983) Diškus & Puplesis, 2003: 387
Muhabbetana wilkinsoni (Scoble, 1983), **comb. n.** AFR
Ectoedemia wilkinsoni Scoble, 1983: 21
Fomoria wilkinsoni (Scoble, 1983) Diškus & Puplesis, 2003: 387

***Muhabbetana euphorbiella* group** (new)
Muhabbetana euphorbiella (Stainton, 1869), **comb. n.** WP
Nepticula euphorbiella Stainton, 1869b: 229
Nepticula tergestina Klimesch, 1940a: 79 (syn: Laštůvka & Laštůvka, 1997: 167)
Stigmella euphorbiella (Stainton, 1869) Gerasimov, 1952: 238
Ectoedemia euphorbiella (Stainton, 1869) van Nieukerken, 1986a: 17
Fomoria euphorbiella (Stainton, 1869) Diškus & Puplesis, 2003: 384
Stigmella tergestina (Klimesch, 1940) Hering, 1957: 434
Ectoedemia tergestina (Klimesch, 1940) van Nieukerken, 1986a: 17
Muhabbetana jubae (Walsingham, 1908), **comb. n.** WP
Stigmella jubae Walsingham, 1908a: 1011 [2]
Nepticula jubae (Walsingham, 1908) Rebel, 1910: 364

Trifurcula jubae (Walsingham, 1908) Klimesch, 1977: 197
Ectoedemia jubae (Walsingham, 1908) van Nieukerken, 1986b: 17
Fomoria jubae (Walsingham, 1908) Diškus & Puplesis, 2003: 384
Muhabbetana nigrifasciata (Walsingham, 1908), **comb. n.** WP
Stigmella nigrifasciata Walsingham, 1908a: 1011 [2]
Nepticula nigrifasciata (Walsingham, 1908) Rebel, 1910: 364
Dechtiria nigrifasciata (Walsingham, 1908) Klimesch, 1972: 1
Trifurcula nigrifasciata (Walsingham, 1908) Klimesch, 1977: 200
Fomoria nigrifasciata (Walsingham, 1908) Diškus & Puplesis, 2003: 387
Ectoedemia nigrifasciata (Walsingham, 1908) van Nieukerken, 1986b: 17
Muhabbetana vincamajorella (Hartig, 1964), **comb. n.** WP
Nepticula vincamajorella Hartig, 1964: 8
Fomoria vincamajorella (Hartig, 1964) Diškus & Puplesis, 2003: 389
Ectoedemia vincamajorella (Hartig, 1964) van Nieukerken, 1986a: 17

***Muhabbetana* – unplaced species**
Muhabbetana bicarina (Scoble, 1983), **comb. n.** AFR
Ectoedemia bicarina Scoble, 1983: 27
Fomoria bicarina (Scoble, 1983) Diškus & Puplesis, 2003: 389
Muhabbetana capensis (Scoble, 1983), **comb. n.** AFR
Ectoedemia capensis Scoble, 1983: 28
Fomoria capensis (Scoble, 1983) Diškus & Puplesis, 2003: 389
Muhabbetana craspedota (Vári, 1963), **comb. n.** AFR
Stigmella craspedota Vári, 1963: 73
Ectoedemia craspedota (Vári, 1963) Scoble, 1983: 27
Fomoria craspedota (Vári, 1963) Diškus & Puplesis, 2003: 388
Muhabbetana crispae (Scoble, 1983), **comb. n.** AFR
Ectoedemia crispae Scoble, 1983: 31
Fomoria crispae (Scoble, 1983) Diškus & Puplesis, 2003: 390
Muhabbetana denticulata (Scoble, 1983), **comb. n.** AFR
Ectoedemia denticulata Scoble, 1983: 26
Fomoria denticulata (Scoble, 1983) Diškus & Puplesis, 2003: 389
Muhabbetana digitata (Scoble, 1983), **comb. n.** AFR
Ectoedemia digitata Scoble, 1983: 27
Fomoria digitata (Scoble, 1983) Diškus & Puplesis, 2003: 389
Muhabbetana gymnosporiae (Vári, 1955), **comb. n.** AFR
Stigmella gymnosporiae Vári, 1955: 334
Ectoedemia gymnosporiae (Vári, 1955) Scoble, 1983: 29
Fomoria gymnosporiae (Vári, 1955) Diškus & Puplesis, 2003: 388
Muhabbetana insulata (Meyrick, 1911), **comb. n.** AFR
Nepticula insulata Meyrick, 1911b: 79
Ectoedemia insulata (Meyrick, 1911) Scoble, 1983: 29
Fomoria insulata (Meyrick, 1911) Diškus & Puplesis, 2003: 388

Muhabbetana kowynensis (Scoble, 1983), **comb. n.** AFR
Ectoedemia kowynensis Scoble, 1983: 30
Fomoria kowynensis (Scoble, 1983) Diškus & Puplesis, 2003: 389

Muhabbetana limburgensis (Scoble, 1983), **comb. n.** AFR
Ectoedemia limburgensis Scoble, 1983: 28
Fomoria limburgensis (Scoble, 1983) Diškus & Puplesis, 2003: 389

Muhabbetana nigrisquama (Scoble, 1983), **comb. n.** AFR
Ectoedemia nigrisquama Scoble, 1983: 26
Fomoria nigrisquama (Scoble, 1983) Diškus & Puplesis, 2003: 389

Muhabbetana nylstroomensis (Scoble, 1983), **comb. n.** AFR
Ectoedemia nylstroomensis Scoble, 1983: 30
Fomoria nylstroomensis (Scoble, 1983) Diškus & Puplesis, 2003: 389

Muhabbetana psarodes (Vári, 1963), **comb. n.** AFR
Stigmella psarodes Vári, 1963: 70
Ectoedemia psarodes (Vári, 1963) Scoble, 1983: 29
Fomoria psarodes (Vári, 1963) Diškus & Puplesis, 2003: 388

Muhabbetana rhabdophora (Scoble, 1983), **comb. n.** AFR
Ectoedemia rhabdophora Scoble, 1983: 31
Fomoria rhabdophora (Scoble, 1983) Diškus & Puplesis, 2003: 390

Muhabbetana royenicola (Vári, 1955), **comb. n.** AFR
Stigmella royenicola Vári, 1955: 335
Ectoedemia royenicola (Vári, 1955) Scoble, 1983: 25
Fomoria royenicola (Vári, 1955) Diškus & Puplesis, 2003: 388

Muhabbetana subnitescens (Meyrick, 1937), **comb. n.** AFR
Trifurcula subnitescens Meyrick, 1937: 90
Ectoedemia subnitescens (Meyrick, 1937) Scoble, 1983: 28
Fomoria subnitescens (Meyrick, 1937) Diškus & Puplesis, 2003: 387

Muhabbetana undatae (Scoble, 1983), **comb. n.** AFR
Ectoedemia undatae Scoble, 1983: 27
Fomoria undatae (Scoble, 1983) Diškus & Puplesis, 2003: 389

Parafomoria Borkowski, 1975: 498 (TS/OD: *Nepticula helianthemella* Herrich-Schäffer, 1860: 60)
Parafomoria van Nieukerken, 1983b: 454 JH of *Parafomoria* Borkowski, 1975

Parafomoria liguricella **group** (new)

Parafomoria ladaniphila (Mendes, 1910) van Nieukerken, 1983b: 468 WP
Nepticula ladaniphila Mendes, 1910a: 102
Stigmella ladaniphila (Mendes, 1910) Klimesch, 1948a: 170
Ectoedemia ladaniphila (Mendes, 1910) Gómez Bustillo, 1981: 19

Parafomoria liguricella (Klimesch, 1948) van Nieukerken, 1983b: 466 [29] WP
Stigmella liguricella Klimesch, 1948a: 170 [29]

Parafomoria tingitella (Walsingham, 1904) van Nieukerken, 1983b: 469 WP
Nepticula tingitella Walsingham, 1904: 8
Stigmella tingitella (Walsingham, 1904) Gerasimov, 1952: 264

Parafomoria helianthemella **group** (new)
Parafomoria cistivora (Peyerimhoff, 1871) van Nieukerken, 1983b: 458 WP
Nepticula cistivora Peyerimhoff, 1871: 414
Stigmella cistivora (Peyerimhoff, 1871) Suire, 1951: 71
Parafomoria fumanae A. Laštuvka & Z. Laštuvka, 2005b: 15 WP
Parafomoria halimivora van Nieukerken, 1985a: 24 WP
Parafomoria helianthemella (Herrich-Schäffer, 1860) Borkowski, 1975: 498 (Fig. 34) WP
Nepticula helianthemella Herrich-Schäffer, 1860: 60
Stigmella helianthemella (Herrich-Schäffer, 1860) Klimesch, 1948a: 171
Trifurcula helianthemella (Herrich-Schäffer, 1860) Leraut, 1980: 49
Parafomoria pseudocistivora van Nieukerken, 1983b: 460 WP

Etainia Beirne, 1945: 208 (TS/OD: *Lyonetia sericopeza* Zeller, 1839)
Obrussa Braun, 1915: 196 JH of *Obrussa* Heyden, 1891 (Lepidoptera: Geometridae) (TS/M: *Nepticula ochrefasciella* Chambers, 1873) (syn: van Nieukerken, 1986a: 16)
Etainia albibimaculella (Larsen, 1927) Puplesis & Diškus, 1996a: 5 WP,NEA
Nepticula albibimaculella Larsen, 1927: 5
Stigmella albibimaculella (Larsen, 1927) Hering, 1957: 112
Trifurcula albibimaculella (Larsen, 1927) Johansson, 1971: 246
Ectoedemia albibimaculella (Larsen, 1927) van Nieukerken, 1986a: 16
Etainia biarmata Puplesis, 1994: 233 WP
Ectoedemia biarmata (Puplesis, 1994) van Nieukerken & Laštůvka, 2002: 89
Etainia decentella (Herrich-Schäffer, 1855) Beirne, 1945: 207 WP
Nepticula decentella Herrich-Schäffer, 1855a: 358
Nepticula monspessulanella Jäckh, 1951: 171 (syn: van Nieukerken, 1986a: 16)
Stigmella decentella (Herrich-Schäffer, 1855) Gerasimov, 1952: 234
Trifurcula decentella (Herrich-Schäffer, 1855) Johansson, 1971: 246
Ectoedemia decentella (Herrich-Schäffer, 1855) van Nieukerken, 1986a: 16
Stigmella monspessulanella (Jäckh, 1951) Hering, 1957: 19
Etainia leptognathos Puplesis & Diškus, 1996a: 44 WP
Ectoedemia leptognathos (Puplesis & Diškus, 1996) van Nieukerken & Laštůvka, 2002: 89
Etainia louisella (Sircom, 1849) Bradley et al., 1972: 3 WP
Nepticula louisella Sircom, 1849: XIII
Nepticula sphendamni Hering, 1937: 561 (syn: van Nieukerken, 1986a: 16)
Ectoedemia louisella (Sircom, 1849) van Nieukerken, 1986a: 16
Stigmella sphendamni (Hering, 1937) Klimesch, 1951b: 64

Trifurcula sphendamni (Hering, 1937) Johansson, 1971: 246
Etainia sphendamni (Hering, 1937) Bradley et al., 1972: 3
Etainia obtusa Puplesis & Diškus, 1996a: 46 WP
Ectoedemia obtusa (Puplesis & Diškus, 1996) Krenek, 2000: 36
Etainia sericopeza (Zeller, 1839) Beirne, 1945: 207 (Fig. 35) WP,[NEA]
Lyonetia sericopeza Zeller, 1839: 215
Oecophora sericopezella Duponchel, 1843: 344 UE
Tinea maryella Duponchel, 1843: 464 (syn: Frey, 1857: 402)
Nepticula acerella Goureau, 1860: xxiii (syn: Joannis, 1915: 131)
Nepticula sericopeza (Zeller, 1839) Heyden, 1843: 209
Stigmella sericopeza (Zeller, 1839) Walsingham, 1916: 160
Trifurcula sericopeza (Zeller, 1839) Johansson, 1971: 246
Obrussa sericopeza (Zeller, 1839) Wilkinson & Scoble, 1979: 101
Ectoedemia sericopeza (Zeller, 1839) van Nieukerken, 1986b: 16
Lyonetia sericopezella (Duponchel, 1843) Duponchel, 1844: 378
‡ *Stigmella sericopeza* f. *palliolella* Le Marchand, 1944: 358
Etainia capesella (Puplesis in Puplesis & Ivinskis, 1985) Puplesis, 1994: 232 EP
Obrussa capesella Puplesis in Puplesis & Ivinskis, 1985: 39
Ectoedemia capesella (Puplesis in Puplesis & Ivinskis, 1985) Hirano, 2013: 93
Etainia peterseni (Puplesis in Puplesis & Ivinskis, 1985) Puplesis, 1994: 231 EP
Obrussa peterseni Puplesis in Puplesis & Ivinskis, 1985: 41
Ectoedemia peterseni (Puplesis in Puplesis & Ivinskis, 1985) Hirano, 2013: 92
Etainia sabina (Puplesis in Puplesis & Ivinskis, 1985) Puplesis, 1994: 231 EP
Obrussa sabina Puplesis in Puplesis & Ivinskis, 1985: 43
Ectoedemia sabina (Puplesis in Puplesis & Ivinskis, 1985) online comb.
Etainia trifasciata (Matsumura, 1931) Diškus & Puplesis, 2003: 408 [59] EP
Nepticula trifasciata Matsumura, 1931: 1114
Obrussa tigrinella Puplesis in Puplesis & Ivinskis, 1985: 40 **syn. n.** [59]
Stigmella trifasciata (Matsumura, 1931) Kuroko, 1982a: 448
Ectoedemia trifasciata (Matsumura, 1931) Hirano, 2013: 93
Ectoedemia tigrinella (Puplesis in Puplesis & Ivinskis, 1985) Hirano, 2013: 92
Etainia tigrinella (Puplesis in Puplesis & Ivinskis, 1985) Puplesis, 1994: 232
Etainia crypsixantha (Meyrick, 1918) Vári & Kroon, 1986: 153 AFR
Nepticula crypsixantha Meyrick, 1918a: 43
Obrussa crypsixantha (Meyrick, 1918) Scoble, 1983: 17
Ectoedemia crypsixantha (Meyrick, 1918) online comb.
Etainia krugerensis (Scoble, 1983) Vári & Kroon, 1986: 153 AFR
Obrussa krugerensis Scoble, 1983: 19
Ectoedemia krugerensis (Scoble, 1983) online comb.
Etainia nigricapitella (Janse, 1948) Vári & Kroon, 1986: 153 AFR
Nepticula nigricapitella Janse, 1948: 170
Obrussa nigricapitella (Janse, 1948) Scoble, 1983: 18
Ectoedemia nigricapitella (Janse, 1948) online comb.

Etainia zimbabwiensis (Scoble, 1983) Vári & Kroon, 1986: 153 AFR
Obrussa zimbabwiensis Scoble, 1983: 18
Ectoedemia zimbabwiensis (Scoble, 1983) online comb.
Etainia ochrefasciella (Chambers, 1873) Puplesis & Diškus, 1996a: 4 NEA
Nepticula ochrefasciella Chambers, 1873: 128
Obrussa ochrefasciella (Chambers, 1873) Braun, 1915: 196
Ectoedemia ochrefasciella (Chambers, 1873) van Nieukerken, 1986a: 19

Acalyptris Meyrick, 1921a: 410 (TS/OD,M: *Acalyptris psammophricta* Meyrick, 1921: 410)
Microcalyptris Braun, 1925b: 224 (TS/OD,M: *Microcalyptris scirpi* Braun, 1925: 225) (syn: van Nieukerken, 1986a: 14)
Weberia Müller-Rutz, 1934a: 122 JH of *Weberia* Robineau-Desvoidy, 1830 (Diptera: Tachinidae) (TS/OD,M: *Weberia platani* Müller-Rutz, 1934: 122) (syn: van Nieukerken, 1986a: 14)
Niepeltia Strand, 1934: 241; RN for *Weberia* Müller-Rutz, 1934 (syn: van Nieukerken, 1986a: 14)
Weberina Müller-Rutz, 1934b: Errata, 148; RN for *Weberia* Müller-Rutz, 1934 (syn: van Nieukerken, 1986a: 14)

***Acalyptris scirpi* group** (new)
Acalyptris bicornutus (Davis, 1978) Puplesis & Robinson, 2000: 53 NEA
Microcalyptris bicornutus Davis, 1978: 212
Acalyptris bipinnatellus (Wilkinson, 1979) van Nieukerken, 1986a: 16 NEA
Microcalyptris bipinnatellus Wilkinson, 1979: 75
Acalyptris lotella (Wagner, 1987) Diškus & Puplesis, 2003: 397 NEA
Microcalyptris lotella Wagner, 1987: 278
Acalyptris punctulata (Braun, 1910) Diškus & Puplesis, 2003: 393 NEA
Nepticula punctulata Braun, 1910: 174
Microcalyptris punctulata (Braun, 1910) Wilkinson, 1979: 71
Acalyptris scirpi (Braun, 1925) Diškus & Puplesis, 2003: 393 NEA
Microcalyptris scirpi Braun, 1925b: 225
Acalyptris thoracealbella (Chambers, 1873) Diškus & Puplesis, 2003: 393 NEA
Microcalyptris thoracealbella (Chambers, 1873) Davis, 1978: 214
Nepticula thoracealbella Chambers, 1873: 127
Nepticula badiocapitella Chambers, 1876: 160 (syn: Braun, 1917: 189)
Acalyptris tenuijuxtus (Davis, 1978) Puplesis & Robinson, 2000: 51 NEA,NEO
Microcalyptris tenuijuxtus Davis, 1978: 216
Acalyptris basicornis Remeikis & Stonis in Stonis et al., 2013d: 102 NEO
Acalyptris basihastatus Puplesis & Diškus in Puplesis et al., 2002: 29 NEO
Acalyptris bifidus Puplesis & Robinson, 2000: 50 NEO
Acalyptris bovicorneus Puplesis & Robinson, 2000: 45 NEO
Acalyptris caribbicus Diškus & Stonis in Stonis et al., 2013d: 106 NEO
Acalyptris dominicanus Remeikis & Stonis in Stonis & Remeikis, 2015: 85 NEO

Acalyptris fortis Puplesis & Robinson, 2000: 47 NEO
Acalyptris hispidus Puplesis & Robinson, 2000: 48 NEO
Acalyptris janzeni van Nieukerken & Nishida in van Nieukerken et al., 2016: 55 NEO
Acalyptris lascuevella Puplesis & Robinson, 2000: 49 NEO
Acalyptris laxibasis Puplesis & Robinson, 2000: 52 NEO
Acalyptris martinheringi Puplesis & Robinson, 2000: 46 NEO
Acalyptris nigrisignum Remeikis & Stonis in Stonis & Remeikis, 2015: 79 NEO
Acalyptris novenarius Puplesis & Robinson, 2000: 48 NEO
Acalyptris paradividua Šimkevičiūtė & Stonis in Šimkevičiūtė et al., 2009: 272 NEO
Acalyptris peteni Diškus & Stonis in Stonis et al., 2013d: 102 NEO
Acalyptris pseudohastatus Puplesis & Diškus in Puplesis et al., 2002: 30 NEO
Acalyptris statuarius Diškus & Stonis in Stonis et al., 2013d: 109 NEO
Acalyptris terrificus Šimkevičiūtė & Stonis in Šimkevičiūtė et al., 2009: 275 NEO
Acalyptris trifidus Puplesis & Robinson, 2000: 50 NEO
Acalyptris trigonijuxtus Remeikis & Stonis in Stonis & Remeikis, 2015: 83 NEO
Acalyptris unicornis Puplesis & Robinson, 2000: 51 NEO

***Acalyptris staticis* group** (van Nieukerken, 2007a: 17)
Acalyptris lesbia van Nieukerken & Hull in van Nieukerken, 2007a: 22 WP
Acalyptris limoniastri van Nieukerken, 2007a: 23 WP
Acalyptris limonii Z. Laštuvka & A. Laštuvka, 1998: 314 WP
Acalyptris maritima A. Laštuvka & Z. Laštuvka, 1997: 119 WP
Acalyptris pyrenaica A. Laštuvka & Z. Laštuvka, 1993: 158 WP
Acalyptris staticis (Walsingham, 1908) van Nieukerken, 1986b: 14 WP
Stigmella staticis Walsingham, 1908a: 1009 [1]
Nepticula staticis (Walsingham, 1908) Rebel, 1910: 373

***Acalyptris psammophricta* group** (new)
Acalyptris repeteki group (Puplesis, 1988: 509)
Acalyptris falkovitshi (Puplesis, 1984) van Nieukerken, 1986a: 14 [60] WP,EP
Microcalyptris falkovitshi Puplesis, 1984c: 499
Microcalyptris turanicus Puplesis, 1984c: 497 (syn: van Nieukerken, 2010: 501)
Microcalyptris vittatus Puplesis, 1984c: 491 **syn. n.** [60]
Microcalyptris arenosus Falkovitsh, 1986: 168 **syn. n.** [60]
Acalyptris turanicus (Puplesis, 1984) van Nieukerken, 1986a: 14
Acalyptris vittatus (Puplesis, 1984) van Nieukerken, 1986a: 14
Acalyptris arenosus (Falkovitsh, 1986) Puplesis, 1990: 66
Acalyptris galinae (Puplesis, 1984) van Nieukerken, 1986a: 14 WP,EP
Microcalyptris galinae Puplesis, 1984c: 502
Microcalyptris galinae mesasiaticus Puplesis, 1984c: 503
Acalyptris galinae mesasiaticus (Puplesis, 1984) Puplesis, 1990: 84

Acalyptris pallens (Puplesis, 1984) van Nieukerken, 1986a: 14 WP,EP
Microcalyptris pallens Puplesis, 1984c: 501
Acalyptris psammophricta Meyrick, 1921a: 410 WP,EP,OR
Microcalyptris lvovskyi Puplesis, 1984c: 494 (syn: van Nieukerken, 2010: 501)
Acalyptris lvovskyi (Puplesis, 1984) van Nieukerken, 1986a: 14
Acalyptris repeteki (Puplesis, 1984) van Nieukerken, 1986a: 14 WP
Microcalyptris repeteki Puplesis, 1984c: 494
Acalyptris turcomanicus (Puplesis, 1984) van Nieukerken, 1986a: 14 WP
Microcalyptris turcomanicus Puplesis, 1984c: 499

***Acalyptris shafirkanus* group** (Puplesis, 1988: 506)
Acalyptris brevis Puplesis, 1990: 86 WP
Acalyptris desertellus (Puplesis, 1984) van Nieukerken, 1986a: 14 WP
Microcalyptris desertellus Puplesis, 1984c: 493
Acalyptris egidijui Puplesis, 1990: 87 WP
Acalyptris kizilkumi (Falkovitsh, 1986) Puplesis, 1990: 86 WP,EP
Microcalyptris kizilkumi Falkovitsh, 1986: 167
Acalyptris piculus Puplesis, 1990: 85 EP
Acalyptris shafirkanus (Puplesis, 1984) van Nieukerken, 1986a: 14 WP
Microcalyptris shafirkanus Puplesis, 1984c: 493
Acalyptris vannieukerkeni Puplesis, 1994: 218 WP

***Acalyptris platani* group** (van Nieukerken, 2007a: 7)
Acalyptris gielisi van Nieukerken, 2010: 500 WP
Acalyptris loranthella (Klimesch, 1937) van Nieukerken, 1986a: 14 WP
Nepticula loranthella Klimesch, 1937: 33
Stigmella loranthella (Klimesch, 1937) Klimesch, 1948b: 78
Weberina loranthella (Klimesch, 1937) Szőcs, 1978: 268
Niepeltia loranthella (Klimesch, 1937) van Achterberg, 1983: 30
Acalyptris minimella (Rebel, 1926) van Nieukerken, 1986a: 14 WP
Trifurcula minimella Rebel, 1926: (110)
Weberina lentiscella Groschke, 1944: 117 (syn: Klimesch, 1978a: 256)
Nepticula minimella (Rebel, 1926); Klimesch, 1953a: 162 JSH of *Nepticula minimella* Chambers, 1873
Niepeltia lentiscella (Groschke, 1944) Hering, 1957: 781
Niepeltia minimella (Rebel, 1926) Scoble, 1980a: 207
Acalyptris pistaciae van Nieukerken, 2007a: 14 WP
Acalyptris platani (Müller-Rutz, 1934) van Nieukerken, 1986a: 14 (Fig. 36) WP
Weberia platani Müller-Rutz, 1934a: 122
Niepeltia platani (Müller-Rutz, 1934) Strand, 1934: 241
Weberina platani (Müller-Rutz, 1934) Müller-Rutz, 1934b: slip
Trifurcula platani (Müller-Rutz, 1934) Klimesch, 1978a: 253

Acalyptris acontarcha (Meyrick, 1926) Diškus & Puplesis, 2003: 393 OR
Nepticula acontarcha Meyrick, 1926: 295
Stigmella acontarcha (Meyrick, 1926) Fletcher, 1933: 82
Acalyptris auratilis Puplesis & Diškus, 2003a: 219 OR
Acalyptris clinomochla (Meyrick, 1934) Diškus & Puplesis, 2003: 394 OR
Nepticula clinomochla Meyrick, 1934a: 468
Trifurcula clinomochla (Meyrick, 1934) Gustafsson, 1976: 49
Niepeltia clinomochla (Meyrick, 1934) Scoble, 1980a: 216
Acalyptris heteranthes (Meyrick, 1926) Diškus & Puplesis, 2003: 393 OR
Nepticula heteranthes Meyrick, 1926: 296
Acalyptris melanospila (Meyrick, 1934) Puplesis & Diškus, 2003a: 218 OR
Nepticula melanospila Meyrick, 1934a: 468
Acalyptris nigripexus Puplesis & Diškus, 2003: 220 OR
Acalyptris acumenta (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia acumenta Scoble, 1980b: 213
Acalyptris bispinata (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia bispinata Scoble, 1980b: 213
Acalyptris combretella (Vári, 1955) Vári et al., 2002: 8 AFR
Stigmella combretella Vári, 1955: 332
Niepeltia combretella (Vári, 1955) Scoble, 1980a: 206
Acalyptris fagarivora (Vári, 1955) Vári et al., 2002: 8 AFR
Stigmella fagarivora Vári, 1955: 334
Niepeltia fagarivora (Vári, 1955) Scoble, 1980a: 209
Acalyptris fulva (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia fulva Scoble, 1980b: 214
Acalyptris fuscofascia (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia fuscofascia Scoble, 1980b: 210
Acalyptris krooni (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia krooni Scoble, 1980b: 212
Acalyptris krugeri (Vári, 1963) Diškus & Puplesis, 2003: 394 AFR
Stigmella krugeri Vári, 1963: 71
Acalyptris lanneivora (Vári, 1955) Vári et al., 2002: 8 AFR
Stigmella lanneivora Vári, 1955: 332
Niepeltia lanneivora (Vári, 1955) Scoble, 1980a: 215
Acalyptris lorantivora (Janse, 1948) Vári et al., 2002: 8 AFR
Nepticula lorantivora Janse, 1948: 169
Niepeltia lorantivora (Janse, 1948) Scoble, 1980a: 211
Acalyptris lundiensis (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia lundiensis Scoble, 1980b: 214
Acalyptris mariepsensis (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia mariepsensis Scoble, 1980b: 214
Acalyptris molleivora (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia molleivora Scoble, 1980b: 207

Acalyptris obliquella (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia obliquella Scoble, 1980b: 209
Acalyptris pundaensis (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia pundaensis Scoble, 1980b: 211
Acalyptris rubiaevora (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia rubiaevora Scoble, 1980b: 208
Acalyptris sellata (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia sellata Scoble, 1980b: 213
Acalyptris umdoniensis (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia umdoniensis Scoble, 1980b: 210
Acalyptris vacuolata (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia vacuolata Scoble, 1980b: 215
Acalyptris vepricola (Vári, 1963) Vári et al., 2002: 8 AFR
Stigmella vepricola Vári, 1963: 68
Niepeltia vepricola (Vári, 1963) Scoble, 1983: 44
Acalyptris vumbaensis (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia vumbaensis Scoble, 1980b: 207
Acalyptris zeyheriae (Scoble, 1980) Vári et al., 2002: 8 AFR
Niepeltia zeyheriae Scoble, 1980b: 208

***Acalyptris latipennata* group** (Puplesis et al., 2002: 66)
Acalyptris dividua Puplesis & Robinson, 2000: 54 NEO
Acalyptris ecuadoriana Puplesis & Diškus in Puplesis et al., 2002: 27 NEO
Acalyptris latipennata (Puplesis & Robinson, 2000) Puplesis et al., 2002: 66 NEO
Fomoria latipennata Puplesis & Robinson, 2000: 45
Acalyptris onorei Puplesis & Diškus in Puplesis et al., 2002: 28 NEO

unplaced *Acalyptris* [61]
Acalyptris distaleus (Wilkinson, 1979) Diškus & Puplesis, 2003: 395 [61] NEA
Microcalyptris distaleus Wilkinson, 1979: 78
Acalyptris postalatratus (Wilkinson, 1979) Diškus & Puplesis, 2003: 395 NEA
Microcalyptris postalatratus Wilkinson, 1979: 77
Acalyptris amazonius Puplesis & Diškus in Puplesis et al., 2002: 32 NEO
Acalyptris articulosus Puplesis & Diškus in Puplesis et al., 2002: 30 NEO
Acalyptris insolentis Puplesis & Diškus in Puplesis et al., 2002: 33 NEO
Acalyptris platygnathos Puplesis & Robinson, 2000: 54 NEO
Acalyptris rotundus Puplesis & Diškus in Puplesis et al., 2002: 31 NEO
Acalyptris yucatani Remeikis & Stonis in Stonis et al., 2013b: 227 NEO

Zimmermannia Hering, 1940: 266 (TS/OD,M: *Ectoedemia liebwerdella* Zimmermann, 1940) [62]
Ectoedemia castaneae group (Wilkinson & Newton, 1981: 72)
Zimmermannia amani (Svensson, 1966), **comb. n.** WP,EP
Ectoedemia amani Svensson, 1966: 200

Ectoedemia emendata Puplesis, 1985c: 69 (syn: Puplesis, 1994: 15)
Trifurcula amani (Svensson, 1966) Johansson, 1971: 245

Zimmermannia atrifrontella (Stainton, 1851), **comb. n.** (Fig. 37) WP
Trifurcula atrifrontella Stainton, 1851: 11
Zimmermannia heringiella Doets, 1947: 504 (syn: Klimesch, 1953a: 191)
Ectoedemia atrifrontella (Stainton, 1851) Klimesch, 1953b: 191
Ectoedemia heringiella (Doets, 1947) Klimesch, 1953b: 191

Zimmermannia hispanica (van Nieukerken, 1985), **comb. n.** WP
Ectoedemia hispanica van Nieukerken, 1985b: 22

Zimmermannia liebwerdella (Zimmermann, 1940) Hering, 1940: 266 WP
Ectoedemia liebwerdella Zimmermann, 1940: 264

Zimmermannia liguricella (Klimesch, 1953), **comb. n.** WP
Ectoedemia liguricella Klimesch, 1953b: 194

Zimmermannia longicaudella (Klimesch, 1953), **comb. n.** WP
Ectoedemia longicaudella Klimesch, 1953b: 193
Stigmella peiuii Nemeş, 1972: 153 (syn: van Nieukerken, 1985b: 21)
Trifurcula longicaudella (Klimesch, 1953) Johansson, 1971: 245

Zimmermannia monemvasiae (van Nieukerken, 1985), **comb. n.** WP
Ectoedemia monemvasiae van Nieukerken, 1985b: 23

Zimmermannia reichli (Z. Laštuvka & A. Laštuvka, 1998), **comb. n.** WP
Ectoedemia reichli Z. Laštuvka & A. Laštuvka, 1998: 316

Zimmermannia vivesi (A. Laštuvka, Z. Laštuvka & van Nieukerken, 2010), **comb. n.** WP
Ectoedemia vivesi A. Laštuvka, Z. Laštuvka & van Nieukerken in van Nieukerken et al., 2010: 12

Zimmermannia admiranda (Puplesis, 1984), **comb. n.** EP
Ectoedemia admiranda Puplesis, 1984b: 588

Zimmermannia nuristanica (van Nieukerken, 1985), **comb. n.** EP
Ectoedemia nuristanica van Nieukerken, 1985b: 25

Zimmermannia sivickisi (Puplesis, 1984), **comb. n.** EP
Ectoedemia sivickisi Puplesis, 1984b: 590
Ectoedemia laura Puplesis, 1985c: 68 (syn: Rocienė & Stonis, 2013: 108)

Zimmermannia bosquella (Chambers, 1878), **stat rev., comb. n.** [62] NEA
Nepticula bosquella Chambers, 1878a: 106
Nepticula bosqueella Chambers, 1878b: 157 ISS
Ectoedemia castaneae Busck, 1913: 103 **syn. n.** [62]
Ectoedemia heinrichi Busck, 1914: 149 **syn. n.** [62]
Ectoedemia helenella Wilkinson, 1981: 105 **syn. n.** [62]
Ectoedemia bosquella (Chambers, 1878) Braun, 1917: 200
Opostega bosqueella (Chambers, 1878) Dyar et al., 1903: 547
Ectoedemia obrutella sensu Wilkinson & Newton, 1981: 72 [misapplied]

Zimmermannia grandisella (Chambers, 1880), **comb. n.** [62] NEA
Nepticula grandisella Chambers, 1880a: 193

Ectoedemia chloranthis Meyrick, 1928b: 462 **syn. n.** [62]
Ectoedemia acanthella Wilkinson & Newton, 1981: 75 **syn. n.** [62]
Ectoedemia grandisella (Chambers, 1880) Wilkinson, 1981: 96
Zimmermannia mesoloba (Davis, 1978), **comb. n.** [62] NEA
Ectoedemia mesoloba Davis, 1978: 209
Ectoedemia coruscella Wilkinson, 1981: 99 **syn. n.** [62]
Zimmermannia obrutella (Zeller, 1873), **comb. n.** [62] NEA
Trifurcula obrutella Zeller, 1873: 316
Ectoedemia piperella Wilkinson & Newton, 1981: 77 **syn. n.** [62]
Ectoedemia reneella Wilkinson, 1981: 104 **syn. n.** [62]
Ectoedemia obrutella (Zeller, 1873) Busck, 1913: 103
Zimmermannia phleophaga (Busck, 1914), **comb. n.** NEA
Ectoedemia phleophaga Busck, 1914: 3

Ectoedemia Busck, 1907: 97 (TS/OD,M: *Ectoedemia populella* Busck, 1907: 98)
Dechtiria Beirne, 1945: 204 (TS/OD: *Tinea subbimaculella* Haworth, 1828: 583) (syn: Svensson, 1966: 200)

***Ectoedemia commiphorella* group** (Doorenweerd et al., 2015: 9)
Ectoedemia commiphorella Scoble, 1978a: 82 AFR
Ectoedemia expeditionis Mey, 2004: 30 AFR
Ectoedemia mauni Scoble, 1979: 36 AFR
Ectoedemia nigrimacula (Janse, 1948) Scoble, 1978a: 84 AFR
Nepticula nigrimacula Janse, 1948: 171
Ectoedemia tersiusi Mey, 2004: 31 AFR

***Ectoedemia terebinthivora* group** (van Nieukerken, 1985b: 63)
Ectoedemia terebinthivora (Klimesch, 1975) van Nieukerken, 1985b: 63 WP
Trifurcula terebinthivora Klimesch, 1975c: 19

***Ectoedemia populella* group** (Wilkinson & Newton, 1981: 41)
Ectoedemia intimella (Zeller, 1848) Bradley et al., 1972: 3 WP
Nepticula intimella Zeller, 1848: 323
Stigmella intimella (Zeller, 1848) Fletcher & Clutterbuck, 1945: 61
Dechtiria intimella (Zeller, 1848) Beirne, 1945: 205
Trifurcula intimella (Zeller, 1848) Johansson, 1971: 245
Ectoedemia insularis Puplesis, 1985c: 68 [63] EP
Ectoedemia sinevi Puplesis, 1985c: 67 [64] EP
Ectoedemia populella Busck, 1907: 98 NEA
Ectoedemia hannoverella (Glitz, 1872) Borkowski, 1972a: Fig. 7 WP,EP
Nepticula hannoverella Glitz, 1872: 25
Stigmella hannoverella (Glitz, 1872) Klimesch, 1951b: 64
Trifurcula hannoverella (Glitz, 1872) Johansson, 1971: 245

Ectoedemia canutus Wilkinson & Scoble, 1979: 81 NEA
Ectoedemia turbidella (Zeller, 1848) Bradley et al., 1972: 3 [65] WP
Nepticula argyropeza var. *turbidella* Zeller, 1848: 321
‡ [no genus] *argyropeza* Herrich-Schäffer, 1853: pl106 NN
Nepticula argyropezella Herrich-Schäffer, 1855a: 357 UE
Nepticula populi-albae Hering, 1935: 7 (syn: van Nieukerken, 1985b: 31)
Stigmella marionella Ford, 1950: 39 (syn: Bradley et al., 1972: 3)
Ectoedemia similigena Puplesis, 1994: 180 **syn. n.** [65]
Dechtiria turbidella (Zeller, 1848) Vári, 1950: 182
Stigmella turbidella (Zeller, 1848) Klimesch, 1951b: 64
Trifurcula turbidella (Zeller, 1848) Johansson, 1971: 245
Stigmella populialbae (Hering, 1935) Gerasimov, 1952: 252
Ectoedemia populialbae (Hering, 1935) Borkowski, 1975: 495
Ectoedemia albida Puplesis, 1994: 179 WP
Ectoedemia klimeschi (Skala, 1933) Borkowski, 1975: 495 (Fig. 38) WP
Nepticula klimeschi Skala, 1933a: 31
Stigmella niculescui Nemeş, 1970: 33 (syn: van Nieukerken, 1985b: 34)
Stigmella klimeschi (Skala, 1933) Gerasimov, 1952: 244
Ectoedemia argyropeza (Zeller, 1839) Bradley et al., 1972: 3 WP,EP,[NEA]
Lyonetia argyropeza Zeller, 1839: 215
Lyonetia argyropezella Duponchel, 1844: 378 UE
Nepticula apicella Stainton, 1854: 300 (syn: Heinemann & Wocke, [1876]: 768) [6]
Nepticula argyropezella Doubleday, 1859: 36 UE
Nepticula turbulentella Wocke, 1861: 129 URN
Nepticula simplicella Heinemann, 1862b: 319 (syn: van Nieukerken, 1985b: 35)
Ectoedemia argyropeza downesi Wilkinson & Scoble, 1979: 80
Nepticula argyropeza (Zeller, 1839) Zeller, 1848: 320
Stigmella argyropeza (Zeller, 1839) Fletcher & Clutterbuck, 1945: 61
Dechtiria argyropeza (Zeller, 1839) Emmet, 1971a: 243
Trifurcula argyropeza (Zeller, 1839) Johansson, 1971: 245
‡ *Nepticula argyropeza* ab. *houzeaui* Dufrane, 1942: 11
‡ *Nepticula argyropeza* ab. *morosella* Steudel in Steudel & Hoffmann, 1882: 244

***Ectoedemia subbimaculella* group - satellite taxa** (Doorenweerd et al., 2015)
Ectoedemia preissseckeri group (van Nieukerken, 1985b: 37)
Ectoedemia arisi Puplesis, 1984a: 120 EP
Ectoedemia scoblei Puplesis, 1984a: 122 EP
Ectoedemia christopheri Puplesis, 1985c: 69; RN for *E. wilkinsoni* Puplesis, 1984a EP
Ectoedemia wilkinsoni Puplesis, 1984a: 122; JPH of *Ectoedemia wilkinsoni* Scoble, 1983
Ectoedemia trinotata (Braun, 1914) Wilkinson & Newton, 1981: 46 NEA
Nepticula trinotata Braun, 1914: 18

Ectoedemia philipi Puplesis, 1984b: 590 EP
Ectoedemia preisseckeri (Klimesch, 1941) Borkowski, 1975: 493 WP,EP
Nepticula preisseckeri Klimesch, 1941: 162
Stigmella preisseckeri (Klimesch, 1941) Hering, 1957: 1092
Ectoedemia quadrinotata (Braun, 1917) Wilkinson & Scoble, 1979: 95 NEA
Nepticula quadrinotata Braun, 1917: 168

***Ectoedemia subbimaculella* group** (van Nieukerken, 1985b: 43)
Ectoedemia gilvipennella (Klimesch, 1948) van Nieukerken, 1985b: 45 [29] WP
Stigmella gilvipennella Klimesch, 1948a: 168 [29]
Nepticula gilvipennella (Klimesch, 1948) Szőcs, 1968: 228
Ectoedemia quinquella (Bedell, 1848) Bradley et al., 1972: 2 WP
Microsetia quinquella Bedell, 1848: 1986
Nepticula quinquella (Bedell, 1848) Stainton, 1849: 29
Dechtiria quinquella (Bedell, 1848) Beirne, 1945: 206
Stigmella quinquella (Bedell, 1848) Gerasimov, 1952: 255
Trifurcula quinquella (Bedell, 1848) Johansson, 1971: 245
Ectoedemia coscoja van Nieukerken, A. Laštuvka & Z. Laštuvka, 2010: 45 WP
Ectoedemia algeriensis van Nieukerken, 1985b: 44 WP
Ectoedemia leucothorax van Nieukerken, 1985b: 46 WP
Ectoedemia haraldi (Soffner, 1942) Klimesch, 1975a: 864 WP
Nepticula haraldi Soffner, 1942: 56
Stigmella prinophyllella Le Marchand, 1946: 285 (syn: Le Marchand, 1948: 298)
Stigmella haraldi (Soffner, 1942) Hering, 1957: 867
Trifurcula haraldi (Soffner, 1942) Leraut, 1980: 49
Ectoedemia pseudoilicis Z. Laštuvka & A. Laštuvka, 1998: 317 WP
Ectoedemia ilicis (Mendes, 1910b) van Nieukerken, 1985b: 48 WP
Nepticula ilicis Mendes, 1910b: 164
Stigmella ilicis (Mendes, 1910b) Gerasimov, 1952: 243
Ectoedemia heringella (Mariani, 1939) van Nieukerken, 1985b: 49 WP
Nepticula heringella Mariani, 1939: 5
Stigmella heringella (Mariani, 1939) Hering, 1957: 868
‡ *Nepticula heringella* f. *alliatae* Mariani, 1939: 7
Ectoedemia alnifoliae van Nieukerken, 1985b: 50 WP
Ectoedemia aligera Puplesis, 1985c: 67 EP
Ectoedemia ermolaevi Puplesis, 1985c: 68 EP
Ectoedemia cerviparadisicola Sato in Shinozaki et al., 2012: 578 EP
Ectoedemia maculata Puplesis, 1987: 11 EP
Ectoedemia rufifrontella (Caradja, 1920) van Nieukerken, 1987a: 142 WP
Trifurcula rufifrontella Caradja, 1920: 161
Nepticula nigrosparsella Klimesch, 1940b: 91 (syn: van Nieukerken, 1987a: 142)
Stigmella nigrosparsella (Klimesch, 1940b) Klimesch, 1948a: 170
Ectoedemia nigrosparsella (Klimesch, 1940b) Kasy, 1983: 5

Ectoedemia albifasciella complex (van Nieukerken, 1985b: 52) (next 4 species)
Ectoedemia pubescivora (Weber, 1937) van Nieukerken, 1985b: 55 WP
Nepticula pubescivora Weber, 1937: 212
Stigmella pubescivora (Weber, 1937) Klimesch, 1948b: 73
Trifurcula pubescivora (Weber, 1937) Kasy, 1979: 4
Ectoedemia albifasciella (Heinemann, 1871) Bradley et al., 1972: 3 WP
Nepticula albifasciella Heinemann, 1871: 222
Nepticula subapicella Stainton, 1886: 238 (syn: Emmet, 1974b: 274)
Dechtiria albifasciella (Heinemann, 1871) Beirne, 1945: 205
Stigmella albifasciella (Heinemann, 1871) Klimesch, 1951b: 66
Trifurcula albifasciella (Heinemann, 1871) Johansson, 1971: 245
Ectoedemia contorta van Nieukerken, 1985b: 55 WP
Ectoedemia cerris (Zimmermann, 1944) Szőcs, 1978: 266 WP
Nepticula cerris Zimmermann, 1944: 121
Nepticula montissancti Skala, 1948: 121 (syn: van Nieukerken, 1985b: 54)
Stigmella cerris (Zimmermann, 1944) Hering, 1957: 866
Ectoedemia subbimaculella complex (van Nieukerken, 1985b: 56) (next 4 species)
Ectoedemia subbimaculella (Haworth, 1828) Bradley et al., 1972: 3 WP
Tinea subbimaculella Haworth, 1828: 583
‡ *Microsetia nigrociliella* Stephens, 1829: 208 NN (syn: van Nieukerken, 1985b: 57)
Microsetia nigrociliella Stephens, 1834: 267 (syn: van Nieukerken, 1985b: 57)
‡ *Nepticula cursoriella* Heyden, 1843: 209 NN (syn: Herrich-Schäffer, 1855a: 356)
Nepticula cursoriella Zeller, 1848: 326 (syn: Herrich-Schäffer, 1855a: 356)
Nepticula bistrimaculella Heyden, 1861: 40 (syn: van Nieukerken & Johansson, 1987: 462)
Microsetia subbimaculella (Haworth, 1828) Stephens, 1829: 208
Nepticula subbimaculella (Haworth, 1828) Stainton, 1849: 29
Stigmella subbimaculella (Haworth, 1828) Fletcher & Clutterbuck, 1945: 61
Dechtiria subbimaculella (Haworth, 1828) Beirne, 1945: 206
Trifurcula subbimaculella (Haworth, 1828) Johansson, 1971: 245
Stigmella bistrimaculella (Heyden, 1861) Gerasimov, 1952: 231
Ectoedemia phyllotomella (Klimesch, 1948) van Nieukerken, 1985b: 62 [29] WP
Stigmella phyllotomella Klimesch, 1948a: 166 [29]
Ectoedemia heringi (Toll, 1934) Borkowski, 1975: 491 WP
Nepticula heringi Toll, 1934a: 3
Nepticula quercifoliae Toll, 1934b: 71 (syn: Borkowski, 1975: 491)
Nepticula sativella Klimesch, 1936: 208 (syn: van Nieukerken, 1985b: 59)
Nepticula zimmermanni Hering, 1942: 26 (syn: van Nieukerken, 1985b: 59)
Stigmella heringi (Toll, 1934) Hering, 1957: 867
Trifurcula heringi (Toll, 1934) Kasy, 1979: 4
Stigmella sativella (Klimesch, 1936) Klimesch, 1948b: 74
Stigmella quercifoliae (Toll, 1934) Hering, 1957: 867
Ectoedemia quercifoliae (Toll, 1934) Bradley et al., 1972: 3

Stigmella zimmermanni (Hering, 1942) Klimesch, 1951a: 65
Trifurcula zimmermanni (Hering, 1942) Kasy, 1979: 4
Ectoedemia zimmermanni (Hering, 1942) Szőcs, 1981: 210
Ectoedemia liechtensteini (Zimmermann, 1944) Szőcs, 1978: 266 WP
Nepticula liechtensteini Zimmermann, 1944: 119
Stigmella liechtensteini (Zimmermann, 1944) Hering, 1957: 866

***Ectoedemia platanella* group** (Wilkinson & Newton, 1981: 51)
Ectoedemia similella (Braun, 1917) Wilkinson & Newton, 1981: 56 NEA
Nepticula similella Braun, 1917: 188
Ectoedemia platanella (Clemens, 1861) Wilkinson & Scoble, 1979: 89 NEA
Nepticula platanella Clemens, 1861: 83
Nepticula maximella Chambers, 1873: 126 (syn: Braun, 1917: 187)
Ectoedemia clemensella (Chambers, 1873) Wilkinson & Scoble, 1979: 86 NEA
Nepticula clemensella Chambers, 1873: 125
Ectoedemia virgulae (Braun, 1927) Wilkinson & Newton, 1981: 59 NEA
Nepticula virgulae Braun, 1927: 198

***Ectoedemia ornatella* group** (Puplesis, 1984b: 584)
Ectoedemia ivinskisi Puplesis, 1984a: 120 EP
Ectoedemia olvina Puplesis, 1984a: 119 EP
Ectoedemia ornatella Puplesis, 1984a: 120 EP

***Ectoedemia suberis* group** (van Nieukerken, 1985b: 38)
Ectoedemia chasanella Puplesis, 1984a: 124 EP
Ectoedemia aegilopidella (Klimesch, 1978) van Nieukerken, 1985b: 42 WP
Trifurcula aegilopidella Klimesch, 1978b: 269
Ectoedemia caradjai (Groschke, 1944) Szőcs, 1981: 211 WP
Nepticula caradjai Groschke, 1944: 118
Stigmella caradjai (Groschke, 1944) Klimesch, 1951b: 65
Trifurcula caradjai (Groschke, 1944) Klimesch, 1978a: 250
Ectoedemia andalusiae van Nieukerken, 1985b: 41 WP
Ectoedemia suberis (Stainton, 1869) van Nieukerken, 1985b: 40 WP
Nepticula suberis Stainton, 1869b: 229
Nepticula viridella Mendes, 1910b: 165 (syn: van Nieukerken, 1985b: 40)
Stigmella suberis (Stainton, 1869) Gerasimov, 1952: 262
Stigmella viridella (Mendes, 1910) Gerasimov, 1952: 260
Ectoedemia phaeolepis van Nieukerken, A. Laštuvka & Z. Laštuvka, 2010: 38 WP
Ectoedemia hendrikseni A. Laštuvka, Z. Laštuvka & van Nieukerken in van Nieukerken et al., 2010: 31 WP
Ectoedemia heckfordi van Nieukerken, A. Laštuvka & Z. Laštuvka, 2010: 34 WP
Ectoedemia ortiva Rocienė & Stonis, 2013: 76 EP
Ectoedemia paraortiva Rocienė & Stonis in Stonis & Rocienė, 2013: 210 EP

Ectoedemia angulifasciella **group** (Wilkinson et al., 1983: 211)
Ectoedemia rubifoliella group (Wilkinson & Newton, 1981: 61)
Ectoedemia occultella group (van Nieukerken, 1985b: 78)
Ectoedemia hexapetalae (Szőcs, 1957) van Nieukerken, 1985b: 68 WP
Nepticula utensis var. *hexapetalae* Szőcs, 1957: 322
Nepticula hexapetalae Szőcs, 1957 (Szőcs, 1965:79)
Trifurcula hexapetalae (Szőcs, 1957) Kasy, 1980: 47
Ectoedemia rosae van Nieukerken & Berggren, 2011: 182 WP
Ectoedemia rosiphila Puplesis in Puplesis et al., 1992: 55 EP
Ectoedemia marmaropa (Braun, 1925) Wilkinson & Newton, 1981: 49 NEA
Nepticula marmaropa Braun, 1925b: 225
Ectoedemia spiraeae Gregor & Povolny, 1983: 174 [66] WP,EP?
‡ *Stigmella spireae* Gregor & Povolny, 1955: 124 NNLM
‡ *Nepticula spireae* (Gregor & Povolny, 1955) Szőcs, 1968: 229 NNLM
Ectoedemia jacutica Puplesis, 1988: 26 [66] EP
Ectoedemia agrimoniae (Frey, 1858) Bradley et al., 1972: 2 WP
Nepticula agrimoniae Frey, 1858c: 44
Nepticula agrimoniae Hofmann, 1858: 188
Nepticula agrimoniella Herrich-Schäffer, 1860: 60 UE
Dechtiria agrimoniae (Frey, 1858) Beirne, 1945: 205
Stigmella agrimoniae (Frey, 1858) Gerasimov, 1952: 224
Trifurcula agrimoniae (Frey, 1858) Johansson, 1971: 245
Stigmella agrimoniella (Herrich-Schäffer, 1860) Le Marchand, 1946a: 217
‡ *Nepticula agrimomella* Rössler, 1881: 337 ISS
Ectoedemia nyssaefoliella (Chambers, 1880) Wilkinson & Newton, 1981: 67 NEA
Nepticula nyssaefoliella Chambers, 1880b: 66
Ectoedemia pilosae Puplesis, 1984a: 123 EP
Ectoedemia picturata Puplesis, 1985c: 65 EP
Ectoedemia minimella (Zetterstedt, 1839) van Nieukerken, 1985b: 80 [67] WP,EP,NEA
Elachista minimella Zetterstedt, 1839: 1011
Nepticula woolhopiella Stainton, 1887: 262 (syn: van Nieukerken, 1985b: 80)
Nepticula canadensis Braun, 1917: 185 **syn. n.** [67]
Nepticula viridicola Weber, 1938: 211 (syn: van Nieukerken, 1985b: 80)
Nepticula vividicola Weber, 1938: 211 IOS
Stigmella woolhopiella (Stainton, 1887) Fletcher & Clutterbuck, 1945: 60
Dechtiria woolhopiella (Stainton, 1887) Beirne, 1945: 205
Trifurcula woolhopiella (Stainton, 1887) Johansson, 1971: 245
Ectoedemia woolhopiella (Stainton, 1887) Borkowski, 1975: 493
Ectoedemia mediofasciella auct. [misapplied] Bradley et al., 1972: 2
Trifurcula mediofasciella auct. [misapplied] Karsholt & Nielsen, 1976: 18
Stigmella viridicola (Weber, 1938) Klimesch, 1948b: 70
Stigmella canadensis (Braun, 1917) Davis & Wilkinson, 1983: 3
Ectoedemia canadensis (Braun, 1917) Wilkinson, 1981: 94

Ectoedemia occultella (Linnaeus, 1767) Robinson & Nielsen, 1983: 221 [68] WP,EP,NEA

Phalaena occultella Linnaeus, 1767: 899
Tinea strigilella Thunberg, 1794: 87 (syn: Robinson & Nielsen, 1983: 221)
Tinea mucidella Hübner, 1817: pl. 65: Fig. 435 (syn: Zeller, 1839: 215)
Tinea mediofasciella Haworth, 1828: 584 (syn: van Nieukerken, 1985b: 78)
Lyonetia argentipedella Zeller, 1839: 215 (syn: Robinson & Nielsen, 1983: 221)
Nepticula flexuosella Fologne, 1859: 140 (syn: van Nieukerken & Johansson, 1987: 462)
Nepticula lindquisti Freeman, 1962: 899 (syn: van Nieukerken, 1985b: 80) [68]
Elachista mucidella (Hübner, 1817) Treitschke, 1833: 179
Lyonetia mucidella (Hübner, 1817) Duponchel, 1844: 378
Nepticula argentipedella (Zeller, 1839) Heyden, 1843: 209
Stigmella argentipedella (Zeller, 1839) Fletcher & Clutterbuck, 1945: 60
Dechtiria argentipedella (Zeller, 1839) Beirne, 1945: 205
Ectoedemia argentipedella (Zeller, 1839) Bradley et al., 1972: 2
Trifurcula argentipedella (Zeller, 1839) Johansson, 1971: 245
Ectoedemia lindquisti (Freeman, 1962) Wilkinson & Scoble, 1979: 83
Microsetia mediofasciella (Haworth, 1828) Stephens, 1829: 208

Ectoedemia angulifasciella (Stainton, 1849) Bradley et al., 1972: 2 (Fig. 38) WP

Nepticula angulifasciella Stainton, 1849: 29
Nepticula schleichiella Frey, 1870: 286 (syn: van Nieukerken, 1985b: 69)
Nepticula brunniella Sauber, 1904: 55 (syn: van Nieukerken, 1985b: 69)
Nepticula utensis Weber, 1937: 669 (syn: van Nieukerken, 1985b: 69)
Nepticula minorella Zimmermann, 1944: 118 (syn: van Nieukerken, 1985b: 69)
Stigmella angulifasciella (Stainton, 1849) Vári, 1944b: xxv
Dechtiria angulifasciella (Stainton, 1849) Beirne, 1945: 205
Trifurcula angulifasciella (Stainton, 1849) Johansson, 1971: 245
Stigmella schleichiella (Frey, 1870) Gerasimov, 1952: 259
Stigmella utensis (Weber, 1937) Klimesch, 1948b: 72
Stigmella minorella (Zimmermann, 1944) Klimesch, 1961: 739

Ectoedemia rubivora complex (van Nieukerken et al., 2012a: 7) (next 3 species)

Ectoedemia arcuatella (Herrich-Schäffer, 1855) Bradley et al., 1972: 2 WP,EP

Nepticula arcuatella Herrich-Schäffer, 1855a: 354
Nepticula arcuosella Doubleday, 1859: 36 UE
Stigmella arcuatella (Herrich-Schäffer, 1855) Fletcher & Clutterbuck, 1945: 60
Dechtiria arcuatella (Herrich-Schäffer, 1855) Beirne, 1945: 206
Trifurcula arcuatella (Herrich-Schäffer, 1855) Johansson, 1971: 245

Ectoedemia atricollis (Stainton, 1857) Bradley et al., 1972: 2 WP,EP

Nepticula atricollis Stainton, 1857a: 112
Nepticula atricolella Doubleday, 1859: 36 UE
Nepticula aterrima Wocke, 1865: 270 (syn: van Nieukerken, 1985b: 71)
Nepticula staphyleae Zimmermann, 1944: 117 (syn: van Nieukerken, 1985b: 71)
Stigmella atricollis (Stainton, 1857) Vári, 1944b: xxv

Dechtiria atricollis (Stainton, 1857) Vári, 1951: 197
Trifurcula atricollis (Stainton, 1857) Johansson, 1971: 245
Stigmella aterrima (Wocke, 1865) Gerasimov, 1952: 228
Stigmella staphyleae (Zimmermann, 1944) Hering, 1957: 1027
Ectoedemia staphyleae (Zimmermann, 1944) Borkowski, 1975: 493
‡ *Nepticula malivora* Toll, 1934b: 70 NNLM (syn: Skala, 1948: 121)
‡ *Nepticula atricollis* var. *aterrimoides* Skala, 1940: 143 NNLM (syn: Skala, 1948: 121)
‡ *Nepticula atricollis* var. *prunivora* Skala, 1941b: 77 NNLM
Ectoedemia rubivora (Wocke, 1860) Bradley et al., 1972: 2 WP
Nepticula rubivora Wocke, 1860: 132
Stigmella rubivora (Wocke, 1860) Fletcher & Clutterbuck, 1945: 60
Dechtiria rubivora (Wocke, 1860) Beirne, 1945: 205
Trifurcula rubivora (Wocke, 1860) Johansson, 1971: 245
Ectoedemia spinosella (Joannis, 1908) Bradley et al., 1972: 2 WP
Nepticula spinosella Joannis, 1908: 328
Ectoedemia albiformae Puplesis & Diškus, 2003a: 186 (syn: van Nieukerken et al., 2010: 70)
Stigmella spinosella (Joannis, 1908) Klimesch, 1951b: 62
Dechtiria spinosella (Joannis, 1908) Emmet, 1971b: 244
Trifurcula spinosella (Joannis, 1908) Johansson, 1971: 245
Ectoedemia mahalebella (Klimesch, 1936) Szőcs, 1978: 266 WP
Nepticula mahalebella Klimesch, 1936: 207
Stigmella mahalebella (Klimesch, 1936) Lhomme, 1945: 155
Ectoedemia erythrogenella (Joannis, 1908) Emmet, 1974a: 129 WP
Nepticula erythrogenella Joannis, 1908: 327
Stigmella erythrogenella (Joannis, 1908) Gerasimov, 1952: 238
Trifurcula erythrogenella (Joannis, 1908) Leraut, 1980: 49
‡ *Stigmella erythrogenella* ab. *juncta* Dufrane, 1949: 9
Ectoedemia rubifoliella (Clemens, 1860) Wilkinson & Scoble, 1979: 90 NEA
Nepticula rubifoliella Clemens, 1860: 214
Ectoedemia ulmella (Braun, 1912) Wilkinson & Scoble, 1979: 91 [69] NEA
Nepticula ulmella Braun, 1912: 87
Ectoedemia andrella Wilkinson, 1981: 102 **syn. n.** [69]
Ectoedemia ingloria Puplesis, 1988: 280 EP
Ectoedemia insignata Puplesis, 1988: 281 EP
Ectoedemia petrosa Puplesis, 1988: 282 EP
Ectoedemia tadshikiella Puplesis, 1988: 25 WP,EP

***Ectoedemia* - unplaced species**
Ectoedemia fuscivittata Puplesis & Robinson, 2000: 42 NEO

Stigmellites Kernbach, 1967: 104 (TS/OD,M: *Stigmellites heringi* Kernbach, 1967)
Ophiheliconoma Krassilov, 2008: 100 (TS/OD,M: *Ophiheliconoma resupinata* Krassilov, 2008) (syn: Doorenweerd et al., 2015a: 309)
Stigmellites almeidae (Martins-Neto, 1989) Doorenweerd et al., 2015a: 315 NEO†
Nepticula almeidae Martins-Neto, 1989: 381
Stigmella almeidae (Martins-Neto, 1989) Sohn et al., 2012: 22
Stigmellites baltica Kozlov, 1988: 30 WP†
Stigmellites carpiniorientalis Straus, 1977: 60 WP†
Stigmellites centennis Jarzembowski, 1989: 448 WP†
Stigmellites fossilis (Heyden, 1862) Kozlov, 1988: 31 WP†
Nepticula fossilis Heyden, 1862: 77
Stigmellites gossi Jarzembowski, 1989: 448 WP†
Stigmellites heringi Kernbach, 1967: 104 WP†
Stigmellites kzyldzharica Kozlov, 1988: 32 EP†
Stigmellites messelensis Straus, 1976: 445 WP†
Stigmellites pliotityrella Kernbach, 1967: 105 WP†
Stigmellites resupinata (Krassilov, 2008) Doorenweerd et al., 2015a: 309 WP†
Ophiheliconoma resupinata Krassilov, 2008: 100
Stigmellites samsonovi Kozlov, 1988: 33 EP†
Stigmellites serpentina Kozlov, 1988: 32 EP†
Stigmellites sharovi Kozlov, 1988: 33 EP†
Stigmellites tyshchenkoi Kozlov, 1988: 33 EP†
Stigmellites zelkovae Straus, 1977: 61 WP†

Nomina dubia et oblita

Nepticula alpinella Herrich-Schäffer, 1863b: 170 [70] NO WP
Nepticula alticolella Herrich-Schäffer, 1863c: 182 [70] NO WP
Nepticula reuttiella Herrich-Schäffer, 1863c: 182 [70] NO WP
Nepticula oritis Meyrick, 1910: 229 [71] ND OR
Nepticula xuthomitra Meyrick, 1921b: 140 [72] ND AFR
Nepticula anguinella Clemens, 1861: 85 [73] ND NEA
Ectoedemia anguinella (Clemens, 1861) Wilkinson, 1981: 98 ND
Nepticula platea Clemens, 1861: 85 [73] ND NEA
Ectoedemia platea (Clemens, 1861) Wilkinson, 1981: 98 ND

unplaced unavailable names [74]

‡ *Nepticula brunensis* Skala, 1939g: 144 NNLM WP
‡ *Nepticula buhri* Skala, 1938: 43 NNLM WP
‡ *Nepticula sorbifoliella* Skala, 1939g: 144 NNLM WP
‡ *Nepticula tentationis* Hoffmann, 1893: 215 NN WP
‡ *Nepticula ulmi* Skala, 1934a: 51 NNLM WP
‡ *Stigmella acernella* Dovnar-Zapolski & Tomilova, 1978: 27 NNLM EP
‡ *Stigmella amygdaliella* Dovnar-Zapolski, 1969: 23 NNLM EP
‡ *Stigmella apocynella* Gerasimov, 1937: 284 NNLM EP

‡ *Stigmella atraphaxidella* Dovnar-Zapolski, 1969: 29 NNLM EP
‡ *Stigmella betulivora* Dovnar-Zapolski, 1969: 32 NNLM EP
‡ *Stigmella crataegifolia* Dovnar-Zapolski, 1969: 49 NNLM EP
‡ *Stigmella loniceraefolia* Dovnar-Zapolski, 1969: 67 NNLM EP
‡ *Stigmella loniceraevora* Dovnar-Zapolski, 1969: 67 NNLM EP
‡ *Stigmella prunivora* Dovnar-Zapolski, 1969: 90 NNLM WP
‡ *Stigmella pseudoanomalella* Dovnar-Zapolski, 1969: 94 NNLM EP
‡ *Stigmella roseifolia* Dovnar-Zapolski, 1969: 94 NNLM EP
‡ *Stigmella roseivora* Dovnar-Zapolski, 1969: 94 NNLM EP
‡ *Stigmella rosella* Dovnar-Zapolski, 1969: 95 NNLM EP

FAMILY **OPOSTEGIDAE** Meyrick, 1893: 479 (TG: *Opostega* Zeller, 1839)
Family Opostegides Meyrick, 1893: 479 (TG: *Opostega* Zeller, 1839)
Subfamily Opostegoidinae Kozlov, 1987: 856 (TG: *Opostegoides* Kozlov, 1985), **syn. n.**
Subfamily Oposteginae Meyrick, 1893 (TG: *Opostega* Zeller, 1839)

Notiopostega Davis, 1989: 30 (TS/OD,M: *Notiopostega atrata* Davis, 1989)
Notiopostega atrata Davis, 1989: 32 NEO

Eosopostega Davis, 1989: 41 (TS/OD,M: *Eosopostega issikii* Davis, 1989)
Eosopostega issikii Davis, 1989: 42 EP
Eosopostega armigera Puplesis & Robinson, 1999: 29 OR

Neopostega Davis & Stonis, 2007: 34 (TS/OD: *Neopostega petila* Davis & Stonis, 2007: 38)
Neopostega asymmetra Davis & Stonis, 2007: 37 NEO
Neopostega distola Davis & Stonis, 2007: 39 NEO
Neopostega falcata Davis & Stonis, 2007: 36 NEO
Neopostega longispina Davis & Stonis, 2007: 36 NEO
Neopostega nigrita Heppner & Davis, 2009: 31 NEO
Neopostega petila Davis & Stonis, 2007: 38 NEO

Paralopostega Davis, 1989: 52 (TS/OD: *Opostega callosa* Swezey, 1921)
Paralopostega callosa (Swezey, 1921) Davis, 1989: 72 AUS
Opostega callosa Swezey, 1921: 532
Paralopostega dives (Walsingham, 1907) Davis, 1989: 72 AUS
Opostega dives Walsingham, 1907: 711
Paralopostega filiforma (Swezey, 1921) Davis, 1989: 72 AUS
Opostega filiforma Swezey, 1921: 534
Paralopostega maculata (Walsingham, 1907) Davis, 1989: 72 AUS
Opostega maculata Walsingham, 1907: 711
Paralopostega peleana (Swezey, 1921) Davis, 1989: 73 AUS
Opostega peleana Swezey, 1921: 534

Paralopostega serpentina (Swezey, 1921) Davis, 1989: 73 AUS
Opostega serpentina Swezey, 1921: 533

Opostegoides Kozlov, 1985: 54 (TS/OD: *Opostega minodensis* Kuroko, 1982) [75]
Opostegoides menthinella (Mann, 1855) Davis, 1989: 72 WP
Opostega menthinella Mann, 1855: 568
Opostega snelleni Nolcken, 1882: 197 (syn: van Nieukerken, 1996: 300)
Opostegoides albella Sinev, 1990: 102 EP
Opostegoides bicolorella Sinev, 1990: 105 EP
Opostegoides minodensis (Kuroko, 1982) Kozlov, 1985: 54 EP
Opostega minodensis Kuroko, 1982: 50, 448
Opostegoides omelkoi Kozlov, 1985: 57 EP
Opostegoides padiensis Sinev, 1990: 105 EP
Opostegoides sinevi Kozlov, 1985: 55 EP
Opostegoides argentisoma Puplesis & Robinson, 1999: 22 OR
Opostegoides auriptera Puplesis & Robinson, 1999: 28 OR
Opostegoides cameroni Puplesis & Robinson, 1999: 27 OR
Opostegoides epistolaris (Meyrick, 1911b) Puplesis & Robinson, 1999: 20 OR
Opostega epistolaris Meyrick, 1911b: 108
Opostegoides flavimacula Puplesis & Robinson, 1999: 27 OR
Opostegoides gorgonea Puplesis & Robinson, 1999: 22 OR
Opostegoides index (Meyrick, 1922) Puplesis & Robinson, 1999: 20 OR
Opostega index Meyrick, 1922: 557
Opostegoides longipedicella Puplesis & Robinson, 1999: 26 OR
Opostegoides malaysiensis Davis, 1989: 52 OR
Opostegoides nephelozona (Meyrick, 1915) Puplesis & Robinson, 1999: 19 OR
Opostega nephelozona Meyrick, 1915b: 352
Opostegoides pelorrhoa (Meyrick, 1915) Puplesis & Robinson, 1999: 18 OR
Opostega pelorrhoa Meyrick, 1915b: 352
Opostegoides spinifera Puplesis & Robinson, 1999: 26 OR
Opostegoides tetroa (Meyrick, 1907) Puplesis & Robinson, 1999: 18 OR
Opostega tetroa Meyrick, 1907: 986
Opostegoides thailandica Puplesis & Robinson, 1999: 23 OR
Opostegoides uvida (Meyrick, 1915) Puplesis & Robinson, 1999: 19 OR
Opostega uvida Meyrick, 1915b: 352
Opostegoides granifera (Meyrick, 1913), **comb. n.** [75] AFR
Opostega granifera Meyrick, 1913: 327
Opostegoides melitardis (Meyrick, 1918), **comb. n.** [75] AFR
Opostega melitardis Meyrick, 1918a: 41
Opostegoides pelocrossa (Meyrick, 1928), **comb. n.** [75] AFR
Opostega pelocrossa Meyrick, 1928a: 396
Opostegoides praefusca (Meyrick, 1913), **comb. n.** [75] AFR
Opostega praefusca Meyrick, 1913: 327

Opostegoides gephyraea (Meyrick, 1880) Davis, 1989: 72 AUS
Opostega gephyraea Meyrick, 1880: 176
Opostegoides scioterma (Meyrick, 1920) Kozlov, 1985: 55 NEA
Opostega scioterma Meyrick, 1920c: 358

Opostega Zeller, 1839: 214 (TS/SD (Walsingham, 1914: 349): *Elachista salaciella* Treitschke, 1833)
Opostega cretatella Chrétien, 1915: 364 [76] WP,EP
Opostega rezniki Kozlov, 1985: 51 **syn. n.** [76]
Opostega kuznetzovi Kozlov, 1985: 53 WP,EP
Opostega salaciella (Treitschke, 1833) Zeller, 1939: 214 WP
Elachista salaciella Treitschke, 1833: 180
Opostega reliquella Zeller, 1848: 282
Opostega spatulella Herrich-Schäffer, 1855a: 360 (Fig. 39) WP,EP
Opostega nepticulella Bruand, 1859: 691 (syn: Leraut, 1997: 80)
Opostega bimaculatella N.R. Rothschild, 1912: 29 (syn: van Nieukerken, 1990a: 368)
Opostega costantiniella Costantini in Turati, 1923: 70 (syn: van Nieukerken, 1990a: 368)
Opostega angulata Gerasimov, 1930: 45 (syn: Puplesis et al., 1996: 192)
Opostega heringella Mariani, 1937: 12 (syn: van Nieukerken, 1990a: 368)
Opostega stekolnikovi Kozlov, 1985: 53 WP
Opostega afghani Davis, 1989: 62 EP
Opostega chalcophylla Meyrick, 1910: 229 OR

"*Opostega*" (unplaced African species) [77]
"Opostega" cirrhacma Meyrick, 1911a: 237 AFR
"Opostega" diplardis Meyrick, 1921b: 123 AFR
"Opostega" radiosa Meyrick, 1913: 327 AFR

"*Opostega*" (unplaced Australian species) [77]
"Opostega" arthrota Meyrick, 1915b: 352 AUS
"Opostega" atypa Turner, 1923: 179 AUS
"Opostega" basilissa Meyrick, 1893: 606 AUS
"Opostega" brithys Turner, 1923: 179 AUS
"Opostega" chalcoplethes Turner, 1923: 178 AUS
"Opostega" chalinias Meyrick, 1893: 607 AUS
"Opostega" chordacta Meyrick, 1915b: 351 AUS
"Opostega" diorthota Meyrick, 1893: 607 AUS
"Opostega" horaria Meyrick, 1921d: 457 AUS
"Opostega" luticilia Meyrick, 1915b: 351 AUS
"Opostega" monotypa Turner, 1923: 179 AUS
"Opostega" nubifera Turner, 1900: 23 AUS
"Opostega" orestias Meyrick, 1880: 175 AUS

"Opostega" phaeospila Turner, 1923: 179 AUS
"Opostega" scoliozona Meyrick, 1915b: 351 AUS
"Opostega" stiriella Meyrick, 1880: 175 AUS
"Opostega" xenodoxa Meyrick, 1893: 608 AUS

Pseudopostega Kozlov, 1985: 53 (TS/OD: *Tinea auritella* Hübner, 1813)
Palearctic species
Pseudopostega auritella (Hübner, 1813) Davis, 1989: 76 WP,EP
Tinea auritella Hübner, 1813: Pl. 57: Fig. 387
Leucoptera auritella (Hübner, 1813) Hübner, 1825: 426
Opostega auritella (Hübner, 1813) Zeller, 1939: 214
Pseudopostega chalcopepla (Walsingham, 1908) van Nieukerken, 1996: 27 [78] WP
Opostega chalcopepla Walsingham, 1908b: 228
Pseudopostega cyrneochalcopepla Nel & Varenne, 2012: 11 **syn. n.** [78]
‡ *Opostega rosmarinella* Staudinger, 1894 (syn: Walsingham, 1908b: 228) NN
Pseudopostega crepusculella (Zeller, 1839) Davis, 1989: 76 (Fig. 40) WP,EP
Opostega crepusculella Zeller, 1839: 214
Oecophora crepusculella Duponchel, 1843: 337 JSH
Opostega crepusculella lvovskyi Kozlov, 1985: 54

Oriental species
Pseudopostega alleni Puplesis & Robinson, 1999: 40 OR
Pseudopostega amphivittata Puplesis & Robinson, 1999: 39 OR
Pseudopostega brevicaudata Remeikis & Stonis in Stonis et al., 2013a: 183 OR
Pseudopostega epactaea (Meyrick, 1907) Puplesis & Robinson, 1999: 32 OR
Opostega epactaea Meyrick, 1907: 985
Pseudopostega euryntis (Meyrick, 1907) Puplesis & Robinson, 1999: 44 OR
Opostega euryntis Meyrick, 1907: 985
Pseudopostega frigida (Meyrick, 1906) Puplesis & Robinson, 1999: 32 OR
Opostega frigida Meyrick, 1906a: 416
Pseudopostega fungina Puplesis & Robinson, 1999: 42 OR
Pseudopostega indonesica Puplesis & Robinson, 1999: 41 OR
Pseudopostega javae Puplesis & Robinson, 1999: 39 OR
Pseudopostega machaerias (Meyrick, 1907) Puplesis & Robinson, 1999: 30 OR
Opostega machaerias Meyrick, 1907: 986
Pseudopostega myxodes (Meyrick, 1916) Puplesis & Robinson, 1999: 34 OR
Opostega myxodes Meyrick, 1916a: 619
Pseudopostega nepalensis Puplesis & Robinson, 1999: 37 OR
Pseudopostega nigrimaculella Puplesis & Robinson, 1999: 40 OR
Pseudopostega parvilineata Puplesis & Robinson, 1999: 31 OR
Pseudopostega saturella Puplesis & Robinson, 1999: 38 OR
Pseudopostega similantis Puplesis & Robinson, 1999: 33 OR
Pseudopostega spilodes (Meyrick, 1915b) Puplesis & Robinson, 1999: 45 OR
Opostega spilodes Meyrick, 1915b: 351

Pseudopostega strigulata Puplesis & Robinson, 1999: 45 OR
Pseudopostega subviolacea (Meyrick, 1920) Puplesis & Robinson, 1999: 45 OR
Opostega subviolacea Meyrick, 1920c: 357
Pseudopostega sumbae Puplesis & Robinson, 1999: 37 OR
Pseudopostega velifera (Meyrick, 1920) Puplesis & Robinson, 1999: 34 OR
Opostega velifera Meyrick, 1920c: 357
Pseudopostega zelopa (Meyrick, 1905) Puplesis & Robinson, 1999: 43 OR
Opostega zelopa Meyrick, 1905: 613

African species [79]
Pseudopostega amphimitra (Meyrick, 1913), **comb. n.** [79] AFR
Opostega amphimitra Meyrick, 1913: 328
Pseudopostega bellicosa (Meyrick, 1911a) Davis, 1989: 76 AFR
Opostega bellicosa Meyrick, 1911a: 236
Pseudopostega clastozona (Meyrick, 1913) Davis, 1989: 76 AFR
Opostega clastozona Meyrick, 1913: 327
Pseudopostega idiocoma (Meyrick, 1918), **comb. n.** [79] AFR
Opostega idiocoma Meyrick, 1918a: 42
Pseudopostega orophoxantha (Meyrick, 1921), **comb. n.** [79] AFR
Opostega orophoxantha Meyrick, 1921b: 124
Pseudopostega phaeosoma (Meyrick, 1928), **comb. n.** [79] AFR
Opostega phaeosoma (Meyrick, 1928a): 396
Pseudopostega symbolica (Meyrick, 1914), **comb. n.** [79] AFR
Opostega symbolica Meyrick, 1914: 203
Pseudopostega tincta (Meyrick, 1918), **comb. n.** [79] AFR
Opostega tincta Meyrick, 1918a: 41

Nearctic species
Pseudopostega acidata (Meyrick, 1915) Davis, 1989: 75 NEA,NEO
Opostega acidata Meyrick, 1915a: 240
Pseudopostega albogaleriella (Clemens, 1862) Davis, 1989: 76 NEA
Opostega albogaleriella Clemens, 1862: 131
Opostega napaeella Clemens, 1872: 42 (syn: Davis, 1983: 3)
Opostega bistrigulella Braun, 1918: 245 (syn: Davis & Stonis, 2007: 71)
Opostega nonstrigella Chambers, 1881: 296 (syn: Forbes, 1923: 161)
Pseudopostega napaeella (Clemens, 1872) Davis, 1989: 76
Pseudopostega bistrigulella (Braun, 1918) Davis, 1989: 76
Pseudopostega nonstrigella (Chambers, 1881) Davis, 1989: 76
Pseudopostega cretea (Meyrick, 1920) Davis, 1989: 76 NEA
Opostega cretea Meyrick, 1920c: 358
Pseudopostega floridensis Davis & Stonis, 2007: 57 NEA
Pseudopostega kempella (Eyer, 1967) Davis, 1989: 76 NEA,NEO
Opostega kempella Eyer, 1967: 39
Pseudopostega parakempella Davis & Stonis, 2007: 100 NEA,NEO

Pseudopostega quadristrigella (Chambers, 1875) Davis, 1989: 77 NEA
Opostega quadristrigella Chambers, 1875b: 106
Opostega accessoriella Frey & Boll, 1876: 216 (syn: McDunnough, 1939: 100)
Pseudopostega accessoriella (Frey & Boll, 1876) Davis, 1989: 75
Pseudopostega texana Davis & Stonis, 2007: 115 NEA
Pseudopostega venticola (Walsingham, 1897) Davis, 1989: 77 NEA,NEO
Opostega venticola Walsingham, 1897: 140

Neotropic species
Pseudopostega abrupta (Walsingham, 1897) Davis, 1989: 75 NEO
Opostega abrupta Walsingham, 1897: 139
Pseudopostega acrodicra Davis & Stonis, 2007: 122 NEO
Pseudopostega acuminata Davis & Stonis, 2007: 89 NEO
Pseudopostega adusta (Walsingham, 1897) Davis, 1989: 76 NEO
Opostega adusta Walsingham, 1897: 140
Pseudopostega apoclina Davis & Stonis, 2007: 131 NEO
Pseudopostega latifurcata apoclina Davis & Stonis, 2007: 131
Pseudopostega apotoma Davis & Stonis, 2007: 65 NEO
Pseudopostega attenuata Davis & Stonis, 2007: 76 NEO
Pseudopostega beckeri Davis & Stonis, 2007: 136 NEO
Pseudopostega bicornuta Davis & Stonis, 2007: 138 NEO
Pseudopostega bidorsalis Davis & Stonis, 2007: 127 NEO
Pseudopostega brachybasis Davis & Stonis, 2007: 142 NEO
Pseudopostega breviapicula Davis & Stonis, 2007: 85 NEO
Pseudopostega brevifurcata Davis & Stonis, 2007: 120 NEO
Pseudopostega brevivalva Davis & Stonis, 2007: 121 NEO
Pseudopostega caulifurcata Davis & Stonis, 2007: 123 NEO
Pseudopostega clavata Davis & Stonis, 2007: 105 NEO
Pseudopostega colognatha Davis & Stonis, 2007: 90 NEO
Pseudopostega concava Davis & Stonis, 2007: 119 NEO
Pseudopostega congruens (Walsingham, 1914) Davis, 1989: 76 NEO
Opostega congruens Walsingham, 1914: 350
Pseudopostega conicula Davis & Stonis, 2007: 78 NEO
Pseudopostega constricta Davis & Stonis, 2007: 141 NEO
Pseudopostega contigua Davis & Stonis, 2007: 129 NEO
Pseudopostega crassifurcata Davis & Stonis, 2007: 117 NEO
Pseudopostega curtarama Davis & Stonis, 2007: 116 NEO
Pseudopostega denticulata Davis & Stonis, 2007: 74 NEO
Pseudopostega didyma Davis & Stonis, 2007: 109 NEO
Pseudopostega diskusi Davis & Stonis, 2007: 67 NEO
Pseudopostega divaricata Davis & Stonis, 2007: 128 NEO
Pseudopostega dorsalis Davis & Stonis, 2007: 98 NEO
Pseudopostega dorsalis dorsalis Davis & Stonis, 2007: 98 NEO
Pseudopostega duplicata Davis & Stonis, 2007: 108 NEO

Pseudopostega ecuadoriana Davis & Stonis, 2007: 134	NEO
Pseudopostega elachista (Walsingham, 1914) Davis, 1989: 76	NEO
Opostega elachista Walsingham, 1914: 350	
Pseudopostega fasciata Davis & Stonis, 2007: 99	NEO
Pseudopostega dorsalis fasciata Davis & Stonis, 2007: 99	
Pseudopostega ferruginea Davis & Stonis, 2007: 54	NEO
Pseudopostega fumida Davis & Stonis, 2007: 62	NEO
Pseudopostega galapagosae Davis & Stonis, 2007: 93	NEO
Pseudopostega gracilis Davis & Stonis, 2007: 63	NEO
Pseudopostega lateriplicata Davis & Stonis, 2007: 59	NEO
Pseudopostega latiapicula Davis & Stonis, 2007: 133	NEO
Pseudopostega latifurcata Davis & Stonis, 2007: 130	NEO
Pseudopostega latifurcata latifurcata Davis & Stonis, 2007: 130	NEO
Pseudopostega latiplana Remeikis & Stonis in Remeikis et al., 2009: 283	NEO
Pseudopostega latisaccula Davis & Stonis, 2007: 75	NEO
Pseudopostega lobata Davis & Stonis, 2007: 104	NEO
Pseudopostega longifurcata Davis & Stonis, 2007: 141	NEO
Pseudopostega longipedicella Davis & Stonis, 2007: 102	NEO
Pseudopostega mexicana Remeikis & Stonis in Remeikis et al., 2009: 282	NEO
Pseudopostega microacris Davis & Stonis, 2007: 61	NEO
Pseudopostega microlepta (Meyrick, 1915) Davis, 1989: 76	NEO
Opostega microlepta Meyrick, 1915a: 239	
Pseudopostega mignonae Davis & Stonis, 2007: 86	NEO
Pseudopostega monosperma (Meyrick, 1931) Davis, 1989: 76	NEO
Opostega monosperma Meyrick, 1931b: 162	
Pseudopostega monstruosa Davis & Stonis, 2007: 68	NEO
Pseudopostega obtusa Davis & Stonis, 2007: 91	NEO
Pseudopostega ovatula Davis & Stonis, 2007: 52	NEO
Pseudopostega paraplicatella Davis & Stonis, 2007: 82	NEO
Pseudopostega paromias (Meyrick, 1915a) Davis, 1989: 77	NEO
Opostega paromias Meyrick, 1915a: 240	
Pseudopostega perdigna (Walsingham, 1914) Davis, 1989: 77	NEO
Opostega perdigna Walsingham, 1914: 349	
Pseudopostega pexa (Meyrick, 1920) Davis, 1989: 77	NEO
Opostega pexa Meyrick, 1920c: 358	
Pseudopostega plicatella Davis & Stonis, 2007: 82	NEO
Pseudopostega pontifex (Meyrick, 1915) Davis, 1989: 77	NEO
Opostega pontifex Meyrick, 1915a: 240	
Pseudopostega protomochla (Meyrick, 1935) Davis, 1989: 77	NEO
Opostega protomochla Meyrick, 1935: 567	
Pseudopostega pumila (Walsingham, 1914) Davis, 1989: 77	NEO
Opostega pumila Walsingham, 1914: 350	
Pseudopostega resimafurcata Davis & Stonis, 2007: 124	NEO
Pseudopostega robusta Remeikis & Stonis in Remeikis et al., 2009: 281	NEO

Pseudopostega rotunda Davis & Stonis, 2007: 51 NEO
Pseudopostega sacculata (Meyrick, 1915) Davis, 1989: 77 NEO
Opostega sacculata Meyrick, 1915a: 240
Pseudopostega saltatrix (Walsingham, 1897) Davis, 1989: 77 NEO
Opostega saltatrix Walsingham, 1897: 140
Pseudopostega sectila Davis & Stonis, 2007: 113 NEO
Pseudopostega serrata Davis & Stonis, 2007: 52 NEO
Pseudopostega spatulata Davis & Stonis, 2007: 70 NEO
Pseudopostega sublobata Davis & Stonis, 2007: 107 NEO
Pseudopostega subtila Davis & Stonis, 2007: 88 NEO
Pseudopostega suffuscula Davis & Stonis, 2007: 139 NEO
Pseudopostega tanygnatha Davis & Stonis, 2007: 90 NEO
Pseudopostega tenuifurcata Davis & Stonis, 2007: 112 NEO
Pseudopostega triangularis Davis & Stonis, 2007: 79 NEO
Pseudopostega trinidadensis (Busck, 1910) Davis, 1989: 77 NEO
Opostega trinidadensis Busck, 1910: 245
Pseudopostega truncata Davis & Stonis, 2007: 67 NEO
Pseudopostega tucumanae Davis & Stonis, 2007: 64 NEO
Pseudopostega turquinoensis Davis & Stonis, 2007: 119 NEO
Pseudopostega uncinata Davis & Stonis, 2007: 60 NEO

Taxa excluded from Nepticuloidea

See further van Nieukerken & Johansson (1987), Davis (1989), Puplesis & Robinson (1999) and for the fossils Doorenweerd et al. (2015b).

FAMILY **ARGYRESTHIIDAE**
Argyresthia abdominalis Zeller, 1839: 205 WP
Nepticula abdominalella (Duponchel, [1845]) Bruand, 1859: 686

FAMILY **BUCCULATRICIDAE**
Bucculatrix cristatella (Zeller, 1839) Zeller, 1848: 300 WP
Lyonetia concolorella Tengström, 1848 (syn: Rebel, 1901: 220)
Nepticula concolorella (Tengström, 1848) Heydenreich, 1851: 92
Bucculatrix frangutella (Goeze, 1783) WP
Elachista rhamnifoliella Treitschke, 1833: 183
Opostega rhamnifoliella (Treitschke, 1833) Bruand, [1851]: 86
Bucculatrix centrospila (Turner, 1923) Davis, 1989: 2 AUS
Opostega centrospila Turner, 1923: 179

FAMILY **COSMOPTERIGIDAE**
Stagmatophora heydeniella (Fischer von Röslerstamm, 1841) WP
Oecophora heydeniella Fischer von Röslerstamm, 1841: 256
‡ *Opostega torquillaepennella* Bruand, [1851]: 86 NN (syn: Bruand, [1851]: 86)

FAMILY **GELECHIIDAE**

Nepticula belfrageella Chambers, 1875a: 75 [80] NO NEA

Stigmella belfrageella (Chambers, 1875) Newton & Wilkinson, 1982: 456 NO

FAMILY **GRACILLARIIDAE**

Metriochroa latifoliella (Millière, 1886) Vári, 1961: 196 WP

Nepticula latifoliella Millière, 1886: 220

Phyllocnistis saligna (Zeller, 1839) WP

Tinea cerasifoliella Hübner, 1796: pl 28: 190 NO (syn: Stainton, 1848: 2158)

Opostega saligna Zeller, 1839: 214

Opostega salicifoliella Duponchel, 1844: 377

Opostega salignatella Bruand, [1851]: 86 UE

Opostega lugdunensella Bruand, 1859: 691

Opostega cerasifoliella (Hübner, 1796) Bruand, 1859: 691

Phyllocnistis unipunctella (Stephens, 1834) WP

Argyromyges unipunctella Stephens, 1834: 260

Opostega suffusella Zeller, 1847: 894 [type species of *Phyllocnistis*]

‡ *Opostega tremulella* Fischer von Röslerstamm in Zeller, 1843: 21 NN (syn: Zeller, 1848: 266)

Opostega tremulella Heeger, 1852: 278

Phyllocnistis argentella (Bradley, 1957) Puplesis & Robinson, 1999: 18 AUS

Opostega argentella Bradley, 1957: 108

Phyllonorycter populifoliella (Treitschke, 1833) WP

Elachista populifoliella Treitschke, 1833: 188

Nepticula pilosissimella Bruand, 1859 : 686

FAMILY **HELIOZELIDAE**

Heliozela sericiella (Haworth, 1828) WP

Tinea sericiella Haworth, 1828: 585

Aechmia saltatricella Fischer von Röslerstamm, 1841: 249

Nepticula saltatricella (Fischer von Röslerstamm, 1841) Bruand, 1859: 687

Heliozela lithargyrellum (Zeller, 1850) WP

Tinagma lithargyrellum Zeller, 1850: 158

Nepticula lithargyrella (Zeller, 1850) Bruand, 1859: 687

FAMILY **LYONETIIDAE**

Leucoptera malifoliella (O. Costa, 1836) WP

Elachista malifoliella O. Costa, 1836: [239] Elachista 3

Opostega scitella Zeller, 1839: 214 (syn: Stainton, 1869a: 269)

Leucoptera sinuella (Reutti, 1853) WP

Cemiostoma sinuella Reutti, 1853: 208

Cerniostoma susinella Herrich-Schäffer, 1855: 342

Opostega susinella (Herrich-Schäffer, 1855) Bruand, 1859: 691

Leucoptera spartifoliella (Hübner, 1813) Hübner, 1825: 426 WP
Tinea spartifoliella Hübner, 1813: 49
Opostega spartifoliella (Hübner, 1813) Zeller, 1839: 214
Leucoptera phaeopasta (Turner, 1923) Davis, 1989: 2 AUS
Opostega phaeopasta Turner, 1923: 180
Lyonetia clerkella (Linnaeus, 1758) WP,EP
Phalaena clerkella Linnaeus, 1758: 542
Opostega magnimaculella Bruand, 1859: 691 (syn: Leraut, 1997: 101)
Lyonetia leucoprepes (Bradley, 1961) Davis, 1989: 2 AUS
Opostega leucoprepes Bradley, 1961: 160
Petasobathra ischnophaea (Meyrick, 1930) Davis, 1989: 2 OR
Opostega ischnophaea Meyrick, 1930: 7

FAMILY **TISCHERIIDAE**

Coptotriche angusticollella (Duponchel, 1843) Diškus & Puplesis, 2003: 430 WP,EP
Nepticula suberoidella Walsingham, 1891: 152 (syn: Diškus & Puplesis, 2003: 430)
Stigmella suberoidella (Walsingham, 1891) Le Marchand, 1946b: 284 (see van Nieukerken, 2004: 112)

FAMILY **UNKNOWN**

Tinea minimella O.G. Costa, 1836: [230] Tinea 18, JH of *Tinea minimella* [Denis & Schiffermüller], 1775, now *Nemophora minimella* (Adelidae) WP
Nepticula minimella (O.G. Costa, 1836) Stainton, 1869a: 267

FAMILY **UNKNOWN, may be Trichoptera, Hydroptilidae**

Tinea commatella Schrank, 1802: 133 ND WP
Nepticula commatella (Schrank, 1802) Stainton et al., 1855: 264

UNPLACED FOSSILS

Tinea araliae Fritsch, 1882: 6 [may be Gracillariidae] WP†
Stigmellites araliae (Fritsch, 1882) Kozlov, 1988: 30
Foliofossor cranei Jarzembowski, 1989: 448 WP†
Troponoma curvitracta Krassilov, 2008: 101 WP†
Troponoma festunata Krassilov, 2008: 102 WP†

Notes

1 The genus *Manoneura* Davis, 1979 had been synonymised with *Enteucha* Meyrick, 1915 by van Nieukerken (1986a), but resurrected as separate genus by Puplesis and Robinson (2000) on the basis of its aberrant genitalia. In two independent molecular analyses, the type species *Manoneura basidactyla* (Davis, 1978) clearly groups inside the genus *Enteucha* (Regier et al. 2015, Doorenweerd et al. 2016a) and we thus regard it here again as synonym.

2 The paper by Walsingham on the Tenerife fauna (Walsingham 1908a), where also the validity of the name *Stigmella* was established, has often been cited as Walsingham, 1907. This paper is published in the last issue of the Entomologist's Monthly Magazine for 1907, but issued on June, 4th, 1908 as can be seen on the wrappers of volume 1908 (1), page iv (http://biodiversitylibrary.org/page/31209657) (see also Sattler 1973), thus the citations should be Walsingham 1908.

3 The genus *Stigmella* is divided into two large clades (Doorenweerd et al. 2016a) that are termed respectively "core *Stigmella*" for the clade containing the type species of both *Stigmella* and *Nepticula* (*S. anomalella* and *S. aurella*) and non-core *Stigmella* for the other clade (containing the type species of *Astigmella*: *S. naturnella*). We refrain from recognising different genera, since recognising these clades morphologically is not always possible. Several species groups could not be placed due to lack of molecular information, they are listed at the end of *Stigmella*.

4 *Stigmella resplendensella* (Chambers, 1875) was placed as species with uncertain affinities due to the lacking abdomen in the lectotype (Newton and Wilkinson 1982). We re-examined the lectotype and could match the characteristic metallic forewing colour pattern to two males and one female we had on loan, of which the female had been barcoded (see also BugGuide: http://bugguide.net/node/view/391014/bgpage). Barcode and genitalia confirm that *S. resplendensella* is closely related to *S. unifasciella* (Chambers, 1875), as earlier suggested by Braun (1917). Further details to be published elsewhere. Material: Lectotype female, MCZ-ENT00014954 (designated by Newton & Wilkinson, 1982: 456, [USA: Kentucky, Covington], captured May 23rd, under hackberry trees (Celtis occidentalis), V.T. Chambers, Type14954 [head and abdomen missing].

5 We prefer the name *prunifoliella* group rather than the older "*prunetorum* group", since the *prunifoliella* group contains several North American species, whereas the name "*prunetorum* group" was based on a single European species only.

6 The date of publication of "Die Schmetterlinge Deutschlands und der Schweiz. Zweite Abtheilung. Kleinschmetterlinge. Band 2. Die Motten und Federmotten. Heft 2" has previously often been cited as 1877, the date that also figures on the Title page (https://archive.org/details/dieschmetterlin01heingoog). However, already Kirby concluded in the Zoological Record 13 (published 1878) on page 187: "Band ii, Die Motten .... though bearing date 1877, was published not later than November, 1876" (see also Sattler 1973). We therefore cite the paper as Heinemann and Wocke ([1876]).

7 *Stigmella acerna* Puplesis, 1988. We synonymise the unavailable name *Stigmella acerifoliella* Dovnar-Zapolski, 1969, which was collected from *Acer turcomanicum* in Turmenistan, Kopet-Dag, the same type locality and host as for *S. acerna* and with a similar mine form. The paper by Dovnar-Zapolski (1969) is poorly known, but contains a number of new names for Nepticulidae and other leafminers, all based on the mine alone. They are therefore not available (ICZN art. 13.6.2), and in many cases it is impossible to determine the identity of these names with the little information provided, but they do provide some interesting records.

8 *Stigmella ulmivora* (Fologne, 1860). Hofmann (1858) named a species *Nepticula ulmella* HS. from Regensburg. This name should be regarded as an unavailable name (*nomen nudum*), since there is no description nor indication. This name is also a *nomen oblitum*, never cited again until Segerer (1997) synonymised it with *S. ulmivora*. Thus no further action needs to be taken to reverse precedence to avoid rejecting the junior synonym *S. ulmivora* or junior homonym *Nepticula ulmella* Braun, 1917 (now *Ectoedemia ulmella*).

9 Stonis and Rocienė (2014) placed *Stigmella multispicata* Rocienė & Stonis, 2014 in the *Stigmella malella* group (that previously also contained the species of our *S. rhamnella* group and in their vision also the *prunifoliella* group), but in fact the species is in all aspects extremely similar to *Stigmella ulmivora*, that only can be separated by details in the genitalia. It is therefore moved here, and it is highly likely that it feeds on *Ulmus*.

10 *Stigmella palionisi* Puplesis, 1984. We synonymise *Stigmella nakamurai* Kemperman & Wilkinson, 1985 from Japan with *S. palionisi* from Russia: Primorye, on the basis of a comparison of descriptions, a male paratype slide of *S. nakamurai* (Fig. 41, 42) and detailed photos of *S. palionisi* genitalia (Rocienė and Stonis 2013; Stonis and Rocienė 2013) (also Fig. 43). This also confirms *Ulmus* as host for *S. palionisi*. This species is also morphologically very similar to European *S. viscerella* (Stainton, 1853), but the mines are somewhat different. Material: 1♂, Paratype *S. nakamurai*, Hokkaido, Sapporo, em. 20.viii.1981, S. Nakamura, Host 0360 Ulmus davidiana v. japonica, slide VU no. 0790 (collection Sapporo).

11 *Stigmella macrocarpae* (Freeman, 1967). We use the junior name for this North American oak mining species, earlier known as *S. latifasciella* (Chambers, 1878), because its original combination *Nepticula latifasciella* is a junior primary homonym of *Nepticula latifasciella* Herrich-Schäffer, 1855, a junior synonym of *Stigmella hybnerella* (Hübner, 1796).

12 *Stigmella birgittae* Gustafsson, 1985. We place the unavailable name *Nepticula amseli* Skala, 1941 as synonym under *S. birgittae*. *N. amseli* was described from mines from *Zizyphus spina-christi* in Jericho, Palestine. *Stigmella birgittae* is a common and widespread species in the Middle East on this host (van Nieukerken 2010).

13 *Stigmella abaiella* Klimesch, 1979 and *S. ficulnea* Puplesis & Krasnilnikova, 1994. The illustrated genitalia of both species are extremely similar. Study of the holotype and some paratypes of *S. abaiella* confirmed this (Figs 44–47). It is possible that this represents a single species, but we hesitate to synonymize them, since *S. abaiella* allegedly was reared from *Pyrus* and *S. ficulnea* clearly is a *Ficus* miner. Since these hosts are totally unrelated, it is not very likely that one species feeds on both. Dr. Mansour Abaii (Teheran, e-mail 26.xii.2015 to EvN) confirmed that the identification of *Pyrus* must be correct, but no mines are kept. Awaiting

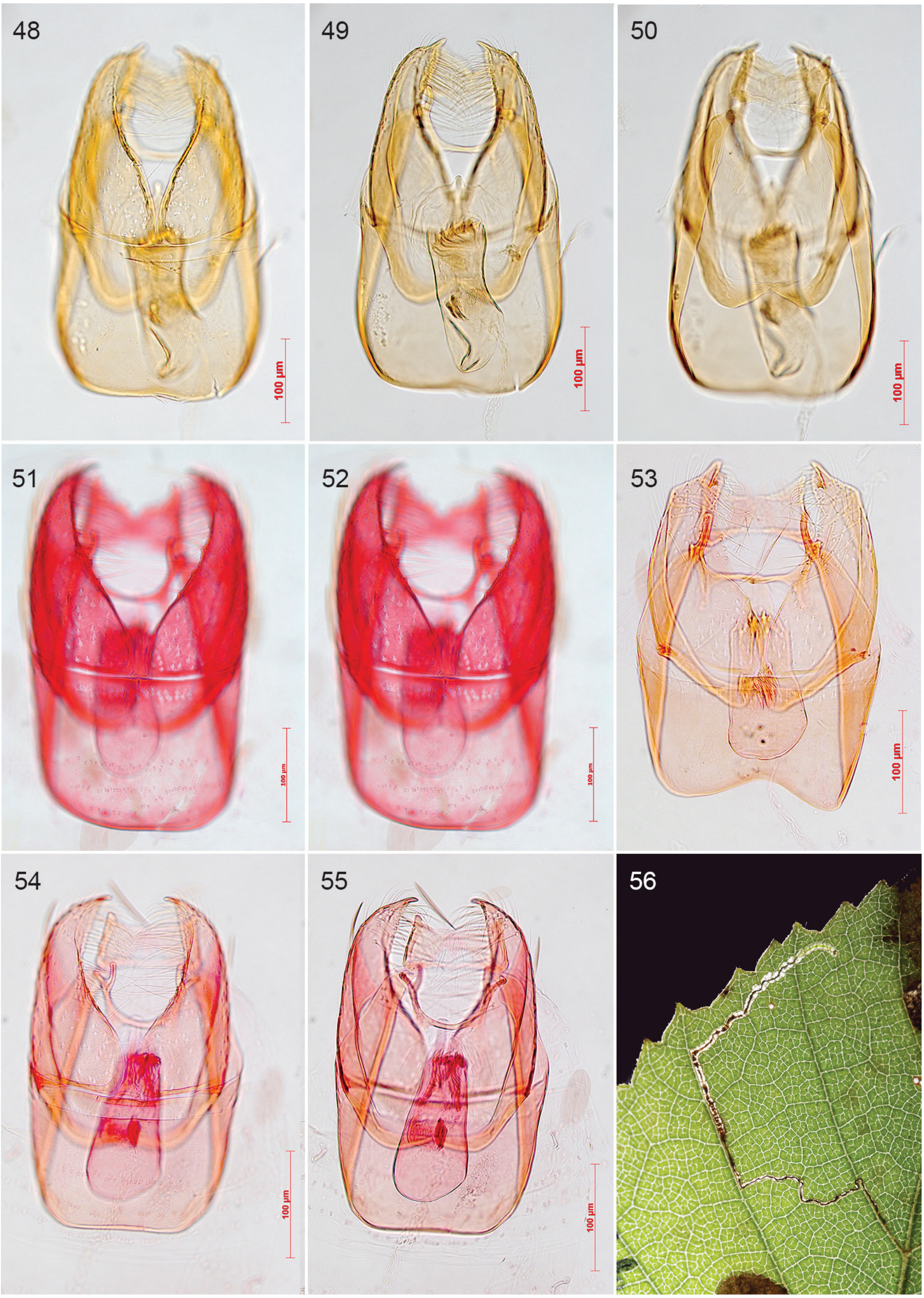
Figures 41–47. *Stigmella* species. **41–43** *S. palionisi* Puplesis, 1984 **41, 42** Male genitalia of paratype of *Stigmella nakamurai* Kemperman & Wilkinson, Japan, slide VU 0790 **43** Male genitalia of specimen from Russia, Primorye, slide JCK8111. **44–47** *Stigmella abaiella* Klimesch, 1979 **44** Holotype male with labels **45, 46** Male genitalia of holotype, slide EvN4759 **47** Female genitalia, paratype, slide Klimesch 866.

further information from freshly collected larvae, we keep the species separate, but a synonymy is not excluded.
Material: Holotype ♂ *S. abaiella*, Iran, Teheran, 20.ix.1978, Abai, *Pyrus communis*, Genitalia slide EvN4759 (Staatliches Museum für Naturkunde Karlsruhe).

14 *Stigmella paliurella* Gerasimov, 1937. Previously the author for this species was given as (Klimesch, 1941), because Gerasimov (1937) based the name on the leafmine (van Nieukerken 1986a), following the rule that names based on the work of an animal published after 1930 are excluded from zoological nomenclature (ICZN art. 13.6.2). However, since Gerasimov also describes characters of the larva, the description fulfils the code (article 13.1), despite the brief description (van Nieukerken 2013) and the name is available and valid.

15 *Stigmella turbatrix* Puplesis, 1994. We synonymise the unavailable name *Stigmella celtivora* Dovnar-Zapolski, 1969, which was described from leafmines on *Celtis* in Kazakhstan, Alma-Ata. See also note 4.

16 *Stigmella microtheriella* (Stainton, 1854) was recorded from China (van Nieukerken and Liu 2000) and Japan (Hirano 2013). During our recent fieldwork in Korea and Japan we found larvae on *Carpinus*, *Corylus* and *Betula* (Hokkaido: RMNH. INS.29748; new host record, Fig. 56) (in Japan also found on *Ostrya*, N. Hirano pers. comm.) of which the DNA barcode shows a very short distance (1.11%) to European *S. microtheriella*, still clustering together (BIN Korea/Japan: BOLD:ACU7085, Europe: BOLD:AAI0007) (see Fig. 57). We reared both males and females from these Asian specimens, whereas in most of Europe *S. microtheriella* is parthenogenetic (but we reared males from Greece and Laštůvka and Laštůvka 1997 recorded males from Croatia). Originally we considered the presence of *S. microtheriella* in East Asia as an introduction, but the separate, but similar barcode, suggests the species is an indigenous element of the East Asian fauna. By comparing male genitalia to the type of *S. cathepostis* Kemperman & Wilkinson, 1985 (Figs 48–50), we realised that the latter is nothing else than male *S. microtheriella* and hence synonymise it here, even though the uncus of east Palearctic specimens seems to have a deeper indentation than European males (compare Figs 48–53 with 54 and 55). *S. cathepostis* was also recorded from Russia: Primorye (Rocienė and Stonis 2013), and we here also illustrate a male from Primorye (Fig. 53). It is unclear whether *Stigmella microtheriella* is a trans Palearctic species, since its best known hosts, *Corylus, Carpinus* and *Ostrya* do not have a continuous distribution, but show a gap between the Urals and the middle of China (Sokolov et al. 1980; Fang et al. 2011). A continuous distribution, however, might still be a possibility, since apparently *Betula*, that occurs throughout Siberia, can be an alternative host (see above and Fig. 56). Recently, *S. microtheriella* was also recorded from North America (Eiseman and van Nieukerken 2015), but DNA barcodes show that here indeed it is an introduced species, as it is in New Zealand (Donner and Wilkinson 1989).
Material: Holotype ♂: [Japan, Kyushu], Hikosan, Buzen, 30.vii.1954, H. Kuroko, Host: *Carpinus tschonoskii* Maxim., genitalia slide VU no. 0783 (Entomological Laboratory, University of Osaka Prefecture).



Figures 48–56 *Stigmella microtheriella*, male genitalia and leafmine (56). **48–50** Holotype of *Stigmella cathepostis* Kemperman & Wilkinson, 1985, slide VU0783 **51–52** slide EvN4629, Korea (Jeollanam-do) Wando Island, Hwaheung-ri, from *Carpinus tschonoskii*, slide EvN4629 **53** Russia, Primorye, slide JCK8117 **54–55** Greece (Messinía) Taygetos Mts, from *Ostrya carpinifolia*, slide EvN4430 **56** larva in leafmine on *Betula platyphylla*, Japan, Hokkaido, RMNH.INS.29748.

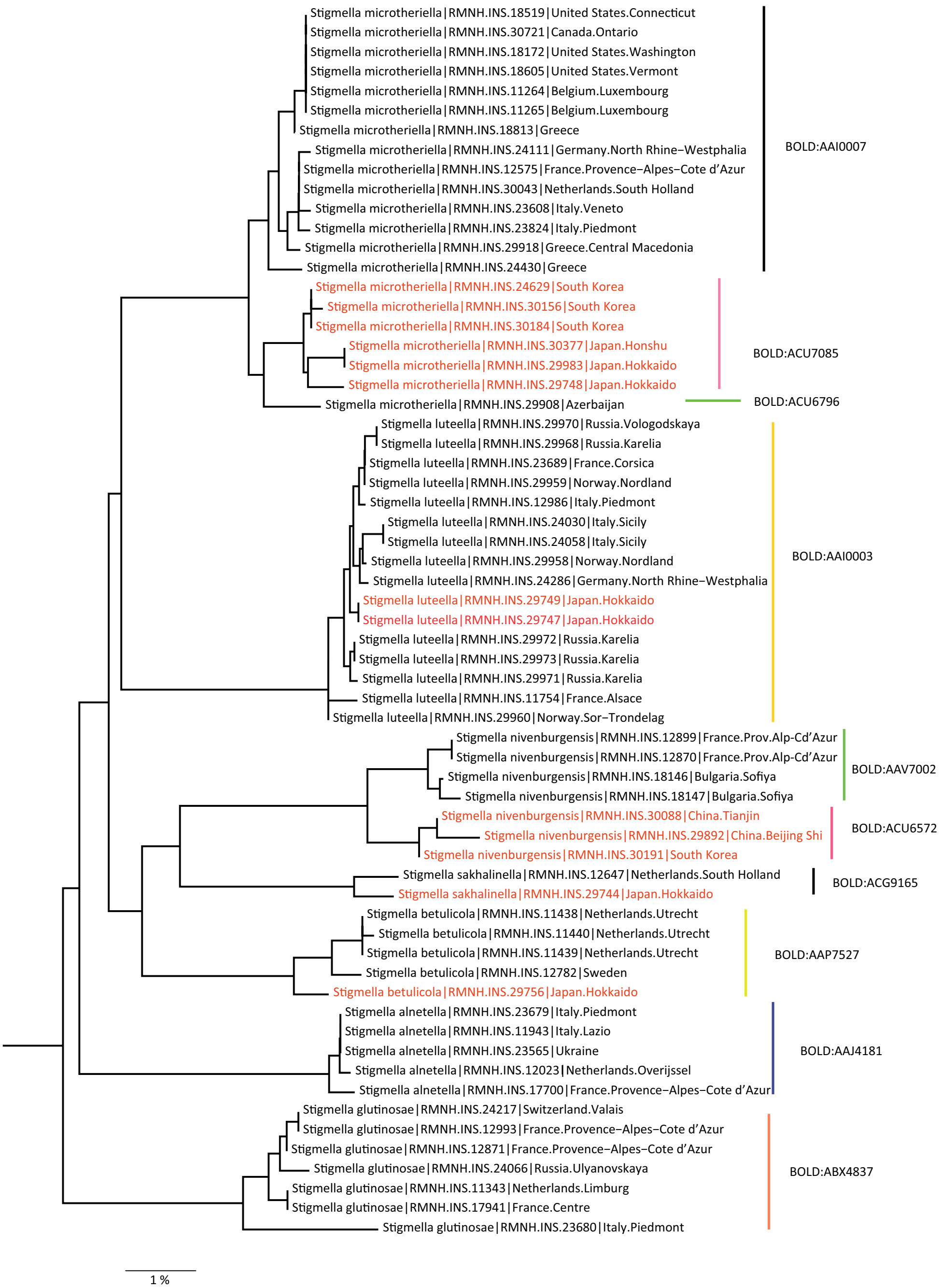


Figure 57. Neighbor Joining tree of DNA Barcodes of Palearctic members of the *Stigmella betulicola* group. East Palearctic records are presented in red, West Palearctic and imported North American records in black. Barcode Identification numbers are given at the right.

17 *Stigmella nivenburgensis* (Preissecker, 1942). We here synonymise *Stigmella populnea* Kemperman & Wilkinson, 1985. We found *Stigmella nivenburgensis* commonly on *Salix* in South Korea and China and DNA barcodes (BOLD:ACU6572) are rather close to European specimens (BOLD:AAV7002) (see Fig. 57). Although we did not yet collect mines on *Salix* in Japan, we consider it more likely that the mine on *Populus* from which the single specimen of *S. populnea* was reared is *S. nivenburgensis*, rather than a separate species, as in many other leafminers that feed both on *Salix* and *Populus*. The female genitalia are not different from European specimens, but are not very diagnostic in this group. The male genitalia figured as *Stigmella betulicola* from Russia: Primorye (Rocienė and Stonis 2013) belong in our opinion in fact also to *S. nivenburgensis*.

18 *Stigmella cornuta* Rocienė & Stonis, 2013. The authors of this Chinese *Quercus* feeding species erected a separate species group for it (Stonis et al. 2013e), but we think that the morphology fits well in the somewhat enlarged *betulicola* group as we define it here. Also *S. xystodes* has relatively large cornuti, comparable to *S. cornuta*.

19 *Stigmella caryaefoliella* (Clemens, 1861). Wilkinson and Scoble (1979) synonymized *S. caryaefoliella* and *S. obscurella* (Braun, 1912) (see note 17) with *ostryaefoliella* on the basis of the male genitalia. We remove these synonyms here and recognize three good species feeding on different hosts and having quite different DNA barcodes and morphologies. Details to be published elsewhere.

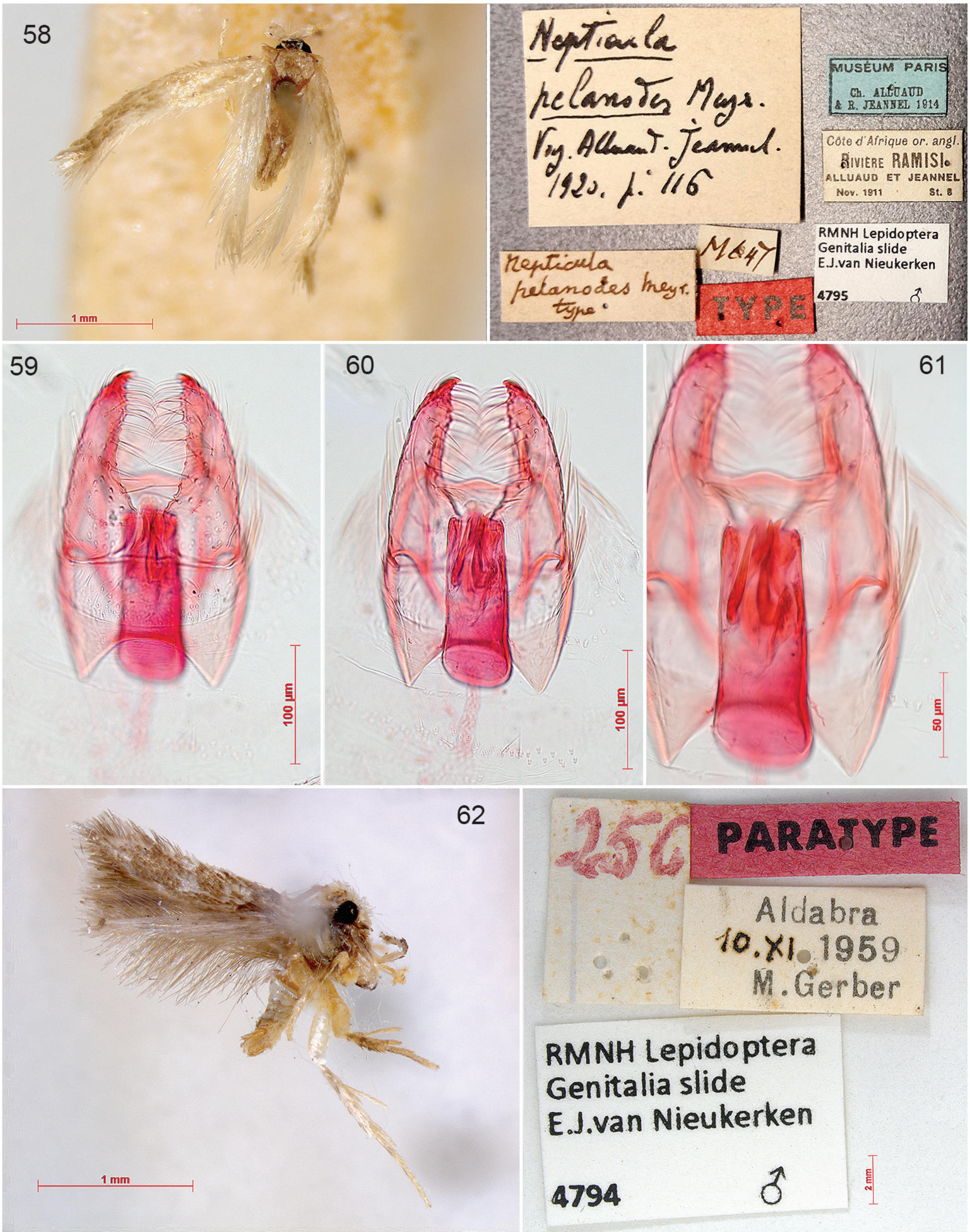
20 *Stigmella myricafoliella* (Busck, 1900) was described from Florida, Palm Beach, and reared from leafmines on *Morella cerifera* (as *Myrica cerifera*). We revise the synonymy of *N. obscurella* Braun, 1912 as a synonym of *S. myricafoliella*, on the basis of the host plant and genitalia. Details to be published elsewhere.

21 *Stigmella ostryaefoliella* (Clemens, 1861). Wilkinson and Scoble (1979) synonymized *S. caryaefoliella* (Clemens, 1861) and *S. obscurella* (Braun, 1912) (see notes 16 and 17) with *ostryaefoliella* on the basis of the male genitalia. We remove these synonyms here and recognize three good species feeding on different hosts and having quite different DNA barcodes and morphologies. Details to be published elsewhere.

22 *Stigmella pelanodes* (Meyrick, 1920). The holotype was examined by EvN (Figs 58–61): the genitalia are rather similar to *Stigmella xystodes*, we therefore place this species in the *betulicola*-group, together with several other African species that had been placed there before (Diškus and Puplesis 2003).

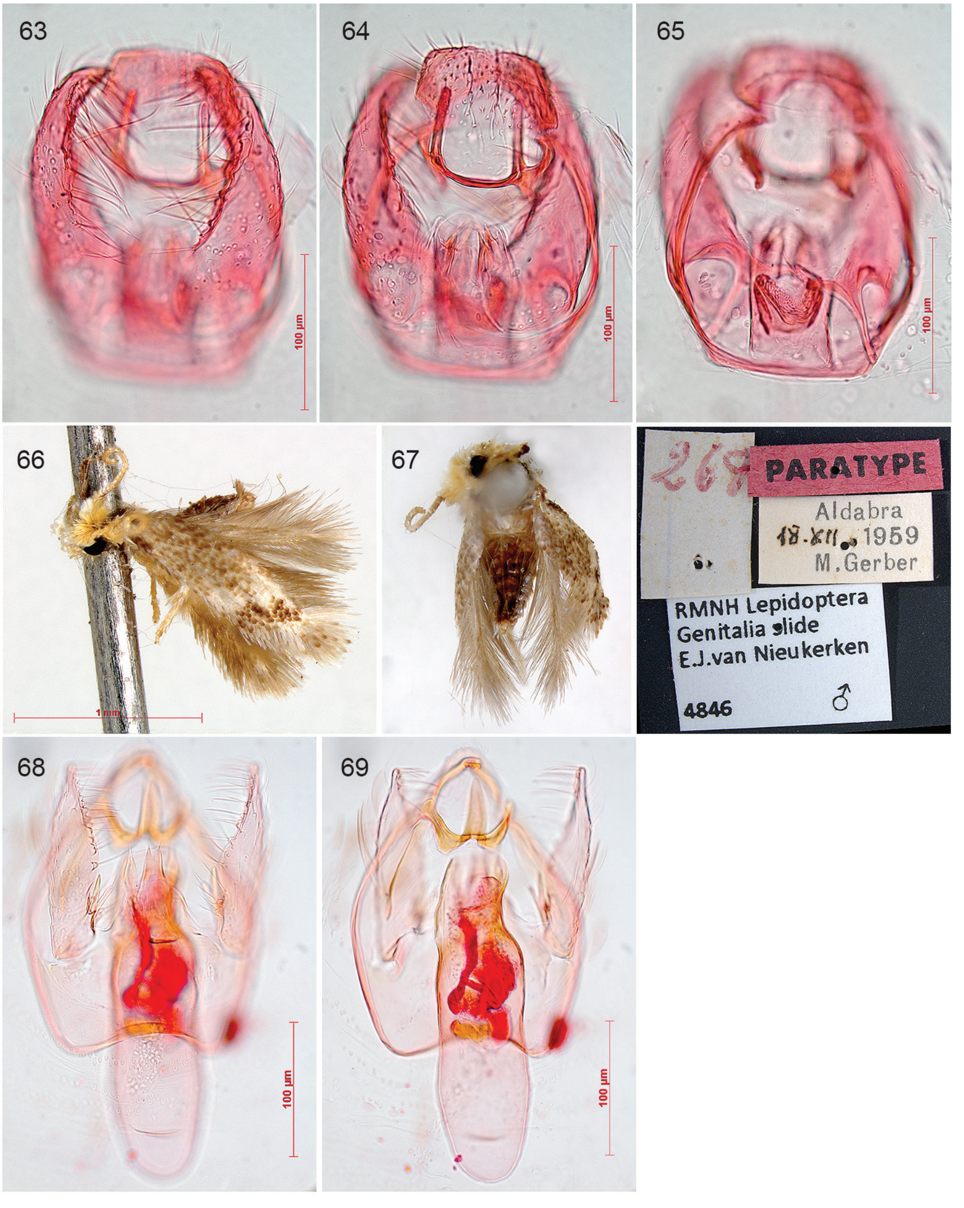
Material: Holotype ♂: [Kenya, Kwale] *Côte d'Afrique or. angl.*, Rivière RAMISI, ALLUAUD ET JEANNEL, Nov. 1911, St. 8;TYPE; "M.647"[Meyrick's hand]; MUSÉUM PARIS, Ch. ALUAUD & R. JEANNEL, 1914; Nepticula pelanodes Meyr. type; RMNH Lepidoptera Genitalia Slide EvN4795 ♂ (MNHN).

23 *Stigmella tropicatella* Legrand, 1965 is the only nepticulid species known from the islands in the Indian Ocean off the African continent (Madagascar excluded) as found on the atoll of Aldabra. The holotype, unfortunately, is almost completely destroyed, only a head and part of the thorax remain on the minuten pin. There are



Figures 58–62. African *Stigmella* species. **58–61** *S. pelanodes* (Meyrick, 1920), male holotype, labels and genitalia, slide EvN4795. **62** *Stigmella tropicatella* Legrand, 1965, male paratype and labels.

several paratypes, three of which EvN examined. Two are males of a *Stigmella*, the third is a male of an unnamed *Acalyptris*. Comparing the remains of the holotype and the description, we are convinced that the *Stigmella* paratypes are the real *S. tropicatella*, and hence base the identity on these (Figs 62–65). It is a typical tropical



Figures 63–69. *Stigmella tropicatella* Legrand, 1965, paratypes. **63–65** Male genitalia of male in Fig. 62, slide EvN4794, on which identity of species is based **66–69** *Acalyptris* sp., misidentified paratype of *S. tropicatella*, male, labels and male genitalia, slide EvN4846.

Stigmella species in the *betulicola* group, rather similar to *S. satarensis* Scoble, 1978. The unnamed *Acalyptris* is illustrated in Figs 66–69.

Material: Adult Holotype, [specimen almost completly disappeared, only a head on pin, [Seychelles], Aldabra, 11.xi.1959, M. Gerber (Muséum National d'Histoire Naturelle, Paris). Further specimens see S1.

Figures 70–75. *Stigmella wollofella* (Gustafsson, 1972), male genitalia. **70–71** *Nepticula mandingella* Gustafsson, 1972, holotype, slide NHRS4874 **72–75** *Nepticula wollofella* Gustafsson, 1972, holotype, slide NHRS5103.

24 *Stigmella wollofella* (Gustafsson, 1972). Study of the slides of the holotypes of *Nepticula wollofella* Gustafsson, 1972 (Figs 72–75) and *N. mandingella* Gustafsson, 1972 (Figs 70–71), both collected together in Gambia, showed that the genitalia are in fact identical, but the slide of *S. mandingella* is more squashed, obscuring some of the characters. Gustafsson (1985) gave the shape of the juxta as distinguishing character. The juxta is arrow shaped, with many small spines on the lateral apexes of the arrow head. These were not figured in the original drawing of *N. mandingella*, but are present in the slide, although difficult to separate from spines on the phallus tube. Because both *N. mandingella* and *N. wollofella* were described in the same publication, we determine here as first reviser the relative priority of *N. wollofella* (ICZN article 24.2) and synonymise *N. mandingella*. The much better genitalia preparation of *N. wollofella* was the first criterion and the second one is that the name *wollofella* has been used again by Gustafsson (1985) when describing the biology of the species as leafminer of *Zizyphus*.

Material: Holotype ♂ *Nepticula wollofella* Gustafsson, Gambia: Gambia river between Bathurst and Basse Santa Su., on riverboat M/S Lady Wright in flash light, 5.xii.1970, B. Gustafsson Genitalia slide 5103 (NHRS). Holotype ♂ *Nepticula mandingella* Gustafsson, Gambia: Gambia river between Bathurst and Basse Santa Su., on riverboat M/S Lady Wright in flash light, 5.xii.1970, B. Gustafsson Genitalia slide 4874 (NHRS).

25 *Stigmella rosaefoliella* (Clemens, 1862). The subspecies *S. rosaefoliella pectocatena* Wilkinson & Scoble, 1979 is removed as a synonym to *S. centifoliella*, see there.

26 *Stigmella ogygia* group. Since our studies show that all New Zealand *Stigmella* species – as far as studied - belong to one monophyletic clade, we group them as the *Stigmella ogygia* group, based on the widespread and common *S. ogygia* (Meyrick, 1889), which is readily recognizable on host-plant alone (herbaceous *Senecio*, Asteraceae).

27 *Stigmella epicosma* group. Puplesis and Robinson (2000) placed many Neotropical species in an enlarged *salicis* group because of the similarity in male genitalia. Our phylogeny (Doorenweerd et al. 2016a) gives the two examined Neotropical species of this group (both Asteraceae feeders) as sister to the *salicis* group s.str., whereas the only Neotropical *Salix* feeder *S. molinensis* van Nieukerken & Snyers, 2016 is sister to the remaining Holarctic *salicis* group members. Because of the strong difference in host plant choice, all *salicis* group members but one feed on Salicaceae, whereas the Neotropic species feed on Asteraceae and various other families, and because of the strong apomorphy of the signa band in the female genitalia for the *salicis* group, we separate all Neotropic species (apart from *molinensis*) and place them in their own *epicosma* group.

28 *Stigmella costalimai* (Bourquin, 1962) and *S. guittonae* (Bourquin, 1962) are tentatively moved to the *epicosma* group because their host plants belong to Asteraceae, resp. *Tessaria integrifolia* Ruiz & Pav. and *Senecio bonariensis* Hook. & Arn. (Bourquin 1961) and so far all known Neotropic Asteraceae feeders belong to this group. Puplesis and Robinson (2000) overlooked the original host plant data for *S. costalimai*. The record of *Ludwigia longifolia* (DC.) H.Hara (Onagraceae) as one of the host plants for *S. guittonae* by Bourquin (as *Jussiaea longifolia*) is most likely an error: just after this description he wrote the description of a Momphid, *Psacophora orfilai*, making leafmines on that host. Momphidae frequently feed on Onagraceae.

29 Species described by Klimesch in his paper “Neue *Stigmella*-Arten (Lep., Stigmellidae)” in the “Zeitschrift der Wiener Entomologischen Gesellschaft vol 31(9–12) have been incorrectly cited by us and others as Klimesch, 1946 (van Nieukerken 1986a; 2013; Diškus and Puplesis 2003). However, this issue, 9–12 of volume 31, for the year 1946 was published on 15 March 1948 as can be seen on the first page of that issue, 129 (http://www.zobodat.at/pdf/ZOEV_31_0129.pdf) (“Ausgegeben 15.März 1948”).

30 *Stigmella salicis* (Stainton, 1854) forms a complex of species that requires revision: some synonyms may be one of the constituent species, others have to be described as new (van Nieukerken et al. 2012a).

31 *Stigmella centifoliella* (Zeller, 1848). *Nepticula centifoliella* was first named by Heyden (1843) when describing *Nepticula*. Since this was a short message during a meeting, there is no description, and only a vague indication to unspecified earlier papers ("Von einer Art (der *Centifoliella*) kannten schon de Geer und Goeze die eigenthümlich gebildete Raupe"). We consider this insufficient to make the name available, and thus keep Zeller, 1848, who described the species in detail, as author (see also Wilkinson 1978). We synonymise *Stigmella rosaefoliella pectocatena* Wilkinson & Scoble, 1979 from Canada with *S. centifoliella*. The authors overlooked the fact that this represents in fact the introduced European species, which is rather different from North American *S. rosaefoliella*, that only externally superficially resembles it and has very different genitalia. Details will be published elsewhere.
Material: Holotype ♀ *Stigmella rosaefoliella pectocatena* Wilkinson & Scoble: Canada, Ontario, Ottawa, emerged 24.ix.1962, leafmines on *Rosa* sp., 62-11, Freeman & Lewis, genitalia slide CNC3292 [not found] (Canadian National Collection of Insects, Arachnids, and Nematodes).

32 *Stigmella azaroli* (Klimesch, 1978) is very similar to *S. perpygmaeella*, but the moth is usually much paler. DNA barcodes of *S. perpygmaeella*, *incognitella* and *azaroli* form a tangled cluster, where *S. perpygmaeella* is paraphyletic, and island forms have very different barcodes from continental populations (Fig. 76). In this unclear situation we rather do not synonymise *S. azaroli*, until more reared material and DNA analyses are available (BIN's: *S. perpygmaeella*, most of Europe: BOLD:AAI0008, Greece, Holotype *S. azaroli*: BOLD:ACG8759, *S. azaroli* Cyprus: BOLD:ACU6096, *S. incognitella*: BOLD:AAF3364, "*S. perpygmaeella*" Malta: BOLD:ACG8760, Mallorca: BOLD:ACG8761).
Material: Holotype ♂ *Nepticula azaroli*: Greece, Rodos, Rodini, 22.ix.1972, mines on *Crataegus azarolus*, em. 11.x.1972, J. Klimesch, Genitalia slide EvN4235, DNA barcode RMNH.INS.24235 (Zoologische Staatssammlung München).

33 *Stigmella magdalenae* (Klimesch, 1950). This species was known as *Stigmella nylandriella* or *Nepticula nylandriella* in most literature prior to Borkowski (1975) and in Britain prior to Emmet (1979). See Schoorl et al. (1985).

34 *Stigmella nylandriella* (Tengström, 1848). Before the type of *Lyonetia nylandriella* was re-examined in the 1970's, this species was known as *S. aucupariae* (Frey, 1857) and *Stigmella* or *Nepticula nylandriella* referred to the species now known as *S. magdalenae* (Borkowski 1975; Schoorl et al. 1985).

35 *Stigmella oxyacanthella* (Stainton, 1854). The finding of larvae on *Crataegus*, *Malus* and *Amelanchier* in North America apparently having the same DNA barcode as European *S. oxyacanthella* (BOLD:AAF3421) led EvN to re-examine specimens identified as *S. pomivorella* (Packard, 1870) in CNC and USNM. All show genitalia inseparable from *S. oxyacanthella*, and we thus synonymise *Stigmella pomivorella*. This leafminer apparently was already introduced in the USA during the 19th century. Details will be published elsewhere.

36 *Stigmella micromelis* Puplesis, 1985. After the finding that Siberian larvae on *Crataegus* share the barcode with Korean and Japanese larvae found on *Aria alnifolia*

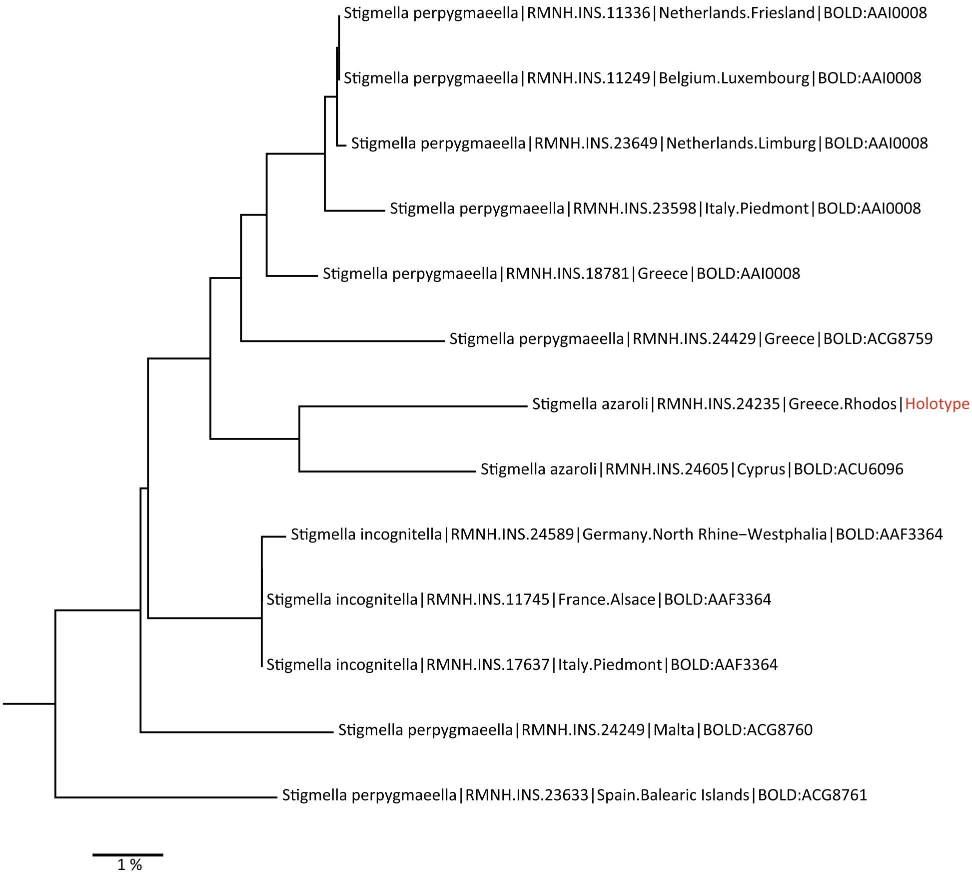


Figure 76. Neighbor Joining tree of DNA Barcodes of the *Stigmella incognitella* group, showing the paraphyly with regards to *S. azaroli* and *S. incognitella* and large distances for specimens identified as *Stigmella perpygmaeella* from Malta and Mallorca. Specimens from Cyprus are identified as *S. azaroli*, of which the holotype from Rhodos was also barcoded.

(= *Sorbus alnifolia* or *Micromelis alnifolia*) (BOLD:ACK9547), and the fact that genitalia of *S. micromelis* and *S. crataegivora* Puplesis, 1985 are indistinguishable, we synonymise both species here. Since both species were named in the same publication, we here determine as First Reviser (ICZN art 24.2) that *S. micromelis* has priority over *crataegivora*. Photos of the genitalia of the types were given by Stonis and Rocienė (2013). A paper with more details is in preparation.

37 *Stigmella amelanchierella* (Clemens, 1862), **stat. rev**. *Stigmella amelanchierella* was described on the basis of leafmines only. Subsequent authors have been unable to rear or to identify the species and Newton and Wilkinson (1982) were even uncertain about its generic status. We found several times leafmines with green larvae on *Amelanchier*, that fit Clemens' description well. DNA barcodes of these showed two different clusters, both closely related to other members of the *oxyacanthella* group, such as *S. crataegifoliella*, one occurring more west in Colorado and Canada (BOLD:ACG5879), another east in Tennessee, Virginia and Massachusetts (BOLD:ACG8835). We consider it likely that the last group represents the real *S. amelanchierella*, since Clemens described it from Pennsylvania. Even though we have not yet studied a single adult, we consider it likely to be a separate species in the *S. oxyacanthella* group, of which the identity is based on the DNA barcode.

38 *Stigmella purpuratella* (Braun, 1917). After study of the holotype slides we synonymise *S. scinanella* Wilkinson & Scoble, 1979 with *S. purpuratella*. Already Newton and Wilkinson (1982) suggested both species cannot be distinguished, except by the paler and less iridescent forewings of *S. purpuratella*. This difference can easily be explained by the much older age of the *purpuratella* specimens, but this text did not seem to be supported by the very different drawings of the genitalia of both species in the same paper. After checking the slides it can be concluded that the valvae of *S. scinanella* were drawn incorrectly, and the drawing of the phallus of *S. purpuratella*, which is a reconstruction of a broken phallus, is turned upside down, making the characteristic longer cornuti pointing posteriorly rather than anteriorly, and the phallus tube is an incorrect reconstruction. The species makes leafmines on *Crataegus* that are inseparable from those of *S. crataegifoliella*. Figures will be published elsewhere.

Material: Holotype ♂ *Nepticula purpuratella*: (United States), Pennsylvania, Pittsburgh, 30.v.1906, Engel, Genitalia slide CNC3467 P. Newton (USNM).

Holotype ♂ *Stigmella scinanella*: [Canada], Ontario, Normandale, mines 26.vii.1956 on *Malus*, 56-154, Freeman & Lewis, Genitalia slide MIC7102 (=CNC2972) (Canadian National Collection of Insects, Arachnids, and Nematodes).

39 *Stigmella aurella/ruficapitella* cluster. The remaining *Stigmella* species form a well supported clade in our multi-gene molecular analyses (Doorenweerd et al. 2016a; Doorenweerd et al. 2016b), that is also relatively well recognisable by genitalia characters, such as the presence of a manica (phallocrypt) in the male genitalia and a large accessory sac in the female genitalia. However, within this cluster the relationships are confusing and many unsupported clades appear in various analyses, often at different places. Some supported groups stand out, including the complete *aurella* group (including *S. lediella*), the *S. floslactella* group and the core *S. ruficapitella* group s.s. Also part of the *lemniscella* group (formerly *marginicolella* group) is well supported: viz. *S. continuella, S. lemniscella* + *S. zelkoviella*, usually with poorer support linked to *S.apicialbella* and an unnamed *Betula* feeding North American species, but always never with *S. gimmonella* included (only one specimen sequenced). The other Fagaceae mining species, including the North American *S. procrastinella* and *S. alba* almost always form a poorly supported clade together with the core *ruficapitella* group, which we therefore together classify as the *S. ruficapitella* group s.l., that is here restricted to Fagaceae feeding species only. *Stigmella speciosa*, *lonicerarum* and relatives, previously placed with the *ruficapitella* group, always group outside. A *Stigmella sorbi* group is never recognised in molecular analyses and even the morphologically similar *S. sorbi* and *S. plagicolella* are never placed close to each other. On the other hand, *S. amygdali*, previously placed in a monotypic species group, always groups with moderate support together with *S. plagicolella*, forming a *Prunus* feeding clade. This situation can currently not be easily translated into monophyletic species groups, and apart from the well supported ones, we recognise tentatively a *S. speciosa* group for the non-Fagaceae miners previously placed in the *ruficapitella* group (or the *hemargyrella* group) and an enlarged *sorbi* group, at the moment a kind of waste bin for mainly Rosaceae feeding species, but also including *S. hamamelella* on *Hamamelis*. We leave *S. zagulaevi* from the Caucasus and *S. talassica* from the Tyan Shan in the *lemniscella* group, although we are not convinced that this is the correct placement.

40 *Stigmella monticulella* Puplesis, 1984. We synonymise here *Stigmella gracilipae* Hirano, 2014 from Japan. Both taxa make linear leafmines on *Lonicera*¸ occur in East Asia and have inseparable genitalia (Stonis and Rocienė 2013; Hirano 2014). The species is also close to *S. lonicerarum* (Frey, 1857) from Europe.

41 *Stigmella filipendulae* (Wocke, 1871). After *S. ulmariae* (Wocke, 1879) had earlier been synonymized (van Nieukerken et al. 2012a), we also synonymise *S. palmatae* Puplesis, 1984 from Russia: Primorye, feeding on *Filipendula palmatae*, on the basis of the similar genitalia (Stonis and Rocienė 2013). *S. filipendulae* is apparently a widespread Palearctic *Filipendula* feeding species.

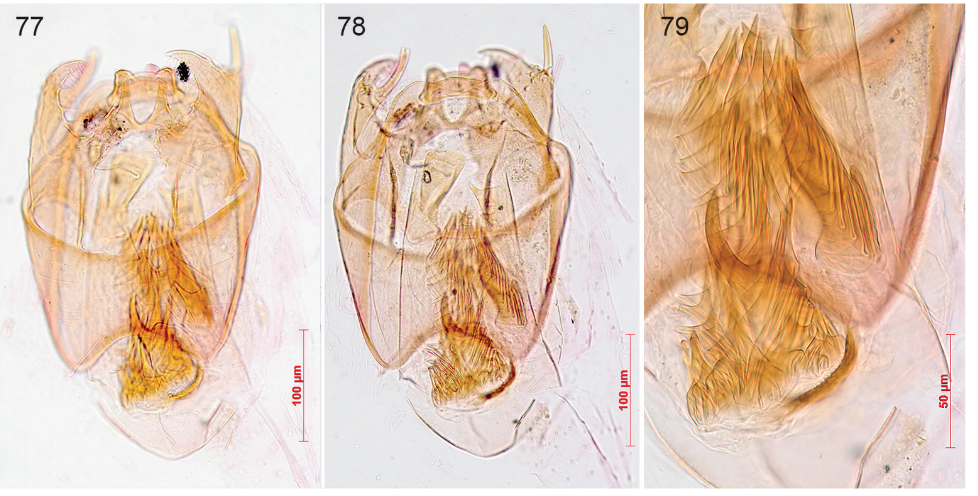
42 *Stigmella lediella* (Schleich, 1867). Puplesis (1994) already synonymized the two *Rhododendron* feeding species from Russia: Primorye, and here we also add the Japanese *Rhododendron* feeder to the synonymy: *Stigmella sesplicata* Kemperman & Wilkinson, 1985. The original description only dealt with females, but meanwhile male genitalia have been described (Hirano 2013) and are identical to *S. lediella.* We have no DNA barcodes yet from Japan, but those from Korea are almost identical to those from Europe and have the same BIN (BOLD:AAL6954). *Stigmella rhododendrifolia* Dovnar-Zapolski & Tomilova, 1978 is an unavailable name, based on leafmines from Siberia. Considering the fact that all *Rhododendron* leafmines belonging to *Stigmella* from eastern Europe to Japan apparently are all *S. lediella*, we conclude that this name also belongs here.

43 *Stigmella longispina* Puplesis, 1994 is here moved to the *aurella* group on the basis of similarity in its male genitalia as shown in a single studied specimen from Tajikistan (RMNH.INS.15381) (Figs 77–79).

44 *Stigmella spiculifera* Kemperman & Wilkinson, 1985. *Stigmella oa* Kemperman & Wilkinson, 1985 was described on the basis of a single female from Japan. After carefully comparing descriptions and figures, we can only conclude that it is indistinguishable from the *Rubus* feeding *S. spiculifera* and hence synonymize it here.

45 *Stigmella lurida* Puplesis, 1994. On the basis of DNA analysis of one female from Altai, that consistently groups with *Stigmella sorbi*, we place *S. lurida* in the *S. sorbi* group (RMNH.INS.24818).

46 *Stigmella humboldti* Remeikis & Stonis, 2015 was described from a single female reared from *Quercus humboldti* in Colombia. The authors could not place this species in a known group, due to the spiny signa on the female bursa. Since we see some resemblance with the spiny signa of *S. procrastinella* and *S. alba*, both shown



Figures 77–79. *Stigmella longispina* Puplesis, 1994, male genitalia, Tajikistan, 30 km N Dushanbe, Kondara, 20.viii.1989, R. Puplesis, slide JCK8318, RMNH.INS.15381.

to be *Quercus* feeders as well (DNA barcode data), we place *S. humboldti* close to these species.

47 *Stigmella samiatella* (Zeller, 1839). We list here two previously overlooked Herrich-Schäffer names: *Nepticula quercella* Herrich-Schäffer, 1863a was merely published as a name in a checklist (abbreviated as *Nepticula querc.*: Herrich-Schäffer followed the rule of fixed endings, -ella for Tineina, so that everybody knew this to be written as *quercella*). This unavailable nomen nudum was synonymised by Segerer (1997). *Nepticula chaoniella* Herrich-Schäffer, 1863b was described in a paper on the Lepidoptera of Engadin, in comparison with another new species, *N. alpinella* (see note 67). Herrich-Schäffer wrote: "Durch letzteres Merkmal unterscheidet sie sich auf den ersten Blick von der eichenbewohnenden *chaoniella* m. (früher unter *samiatella*, aber ohne verdickte Schuppen der männlichen Hfl.)" [By the last character it is separated on first sight from the oak feeding *chaoniella* m[ihi] (earlier under *samiatella*, but without thicker scales in the male hindwing)]. Like many early authors Herrich-Schäffer mixed several oak mining *Stigmella* species and separates his *chaoniella* from male *atricapitella* or *ruficapitella* [named by him *samiatella*], that both show these thicker (androconial) scales. From this it is clear that *chaoniella* can only be a synonym of *S. samiatella*. Further the name *N. chaoniella* can be considered a nomen oblitum, we are not aware of any later use of this name.

48 *Bohemannia pulverosella* (Stainton, 1849). We synonymise *Bohemannia piotra* Puplesis, 1984 from Russia: Primorye, because it is indistinguishable in genitalia from *pulverosella*, and makes similar mines on *Malus* as European *pulverosella*. We expect that the species has a continuous distribution throughout Siberia. In Europe most populations of *B. pulverosella* seem to be parthenogenetic without any males, and only a few males are known (van Nieukerken and Johansson 1990).

49 *Bohemannia quadrimaculella* (Boheman, 1853). The publication year for the original paper has been cited as 1851, 1852 or 1853. Boheman's paper was published in the volume for the year 1851 that according to the title page was published in 1853. On the title page of the article is printed: "Inlemnad den 6 Mars 1852 [submitted on March 6, 1852], probably causing the incorrect references to 1852. The synonymy of *Bucculatrix antispilella* Meess, 1907 established by van Nieukerken and Johansson (1990), who incorrectly cited 1910 as year of description, in fact was already spotted shortly after its description by Disqué (1912) (see Hausenblas 2009).

50 *Bohemannia manschurella* Puplesis, 1984. We synonymize here *Bohemannia nipponicella* Hirano, 2010 from Japan with *B. manschurella* from Russia: Primorye. Hirano (2010) described *B. nipponicella* as different in the cornuti, comparing it to the original description of *B. manschurella*, but by comparing the photos of the types of both species (Hirano 2010; Stonis and Rocienė 2013) and the study of material from Russia and Japan, no difference can be seen at all.

51 *Glaucolepis oishiella* (Matsumura, 1931), **comb. n.** The female holotype of *Trifurcula oishiella* Matsumura 1931 was examined, and compared to the description of *Sinopticula sinica* Yang 1989; both species were described as gall maker on *Prunus*. Further, material collected in China and Japan helped to establish that this concerns a single species, with gall making larvae on *Prunus*. Further details will be published elsewhere.

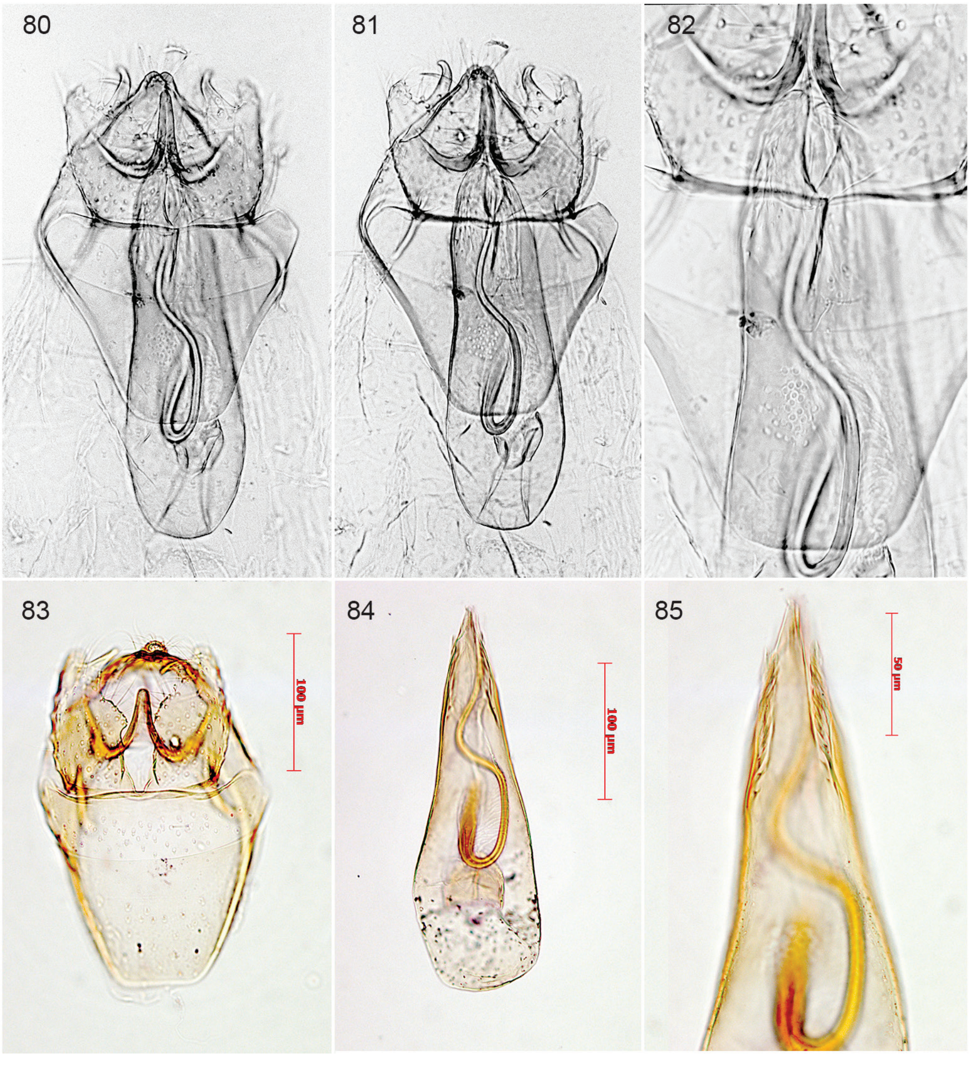
Translation of the original description in Japanese by Matsumura:

"Head orange yellow, setae on both sides grey-white. Antenna grey, base of several segments with dark rings. Body and forewing dark brown with a little purple colour ribbon and also with reflection. Scales large, tip of wing spoon-like with long hairscales. Hindwing dark. Legs brown. Hindtibia dorsally with half erect setae. Larvae on *Prunus*, boring into branches, making a gall. In mid-June to late-June in Japan, Honshu". [*Translated by Liu Youqiao, August 1996*]

Material: Holotype *Trifurcula oishiella* ♀, Japan, Honshu, reared from galls on *Prunus*, T. Oishi, Genitalia slide EvN2916 (Entomological Institute, Hokkaido University).

52 *Glaucolepis hamirella* (Chrétien) and *G. saturejae* (Parenti). The holotype of *G. hamirella* is very similar to male *G. saturejae* (Figs 80–85), and a synonymy was considered. However, DNA barcodes of Italian populations are very different from those from Morocco, Cyprus and Turkey together, and both clusters show again a lot of variation. A detailed morphological and molecular study is required to solve the status of this complex and until then we keep the species separate. Since the type of *G. hamirella* is from North Africa and *saturejae* from northern Italy, we consider the Turkish/Moroccan cluster as *G. hamirella*, the others as *G. saturejae*. Some specimens of *G. saturejae* studied by EvN earlier may carry labels with the name *Trifurcula hamirella*.

Material: Holotype *Nepticula hamirella*: ♂, Algeria: Biskra, v.1909, Chrétien, Genitalia slide KL0718 (MNHN).



Figures 80–85. *Glaucolepis* species, male genitalia. 80–82 *G. hamirella* (Chrétien, 1915), lectotype, slide KL0718 **83–85** *G. saturejae* (Parenti), Italy (Asti) fraz. Valmanera, Oasi WWF, 13.vii.2006, G. Baldizzone, slide EvN3749.

53 *Glaucolepis magna* (A. Laštůvka & Z. Laštůvka, 1997). The recently described *Trifurcula collinella* Nel, 2012 from France is here synonymised with *G. magna*. The holotype was examined (Figs 86–89), and the relatively large moth shows clearly the typical dorsal spot of this species and the genitalia are similar (e.g. Laštůvka and Laštůvka 1997; van Nieukerken et al. 2006). The long processes of the tegumen, as described by Nel (2012), are in fact the arms of the uncus, that is broken in the middle (Fig. 87). Material: Holotype *Trifurcula collinella* ♂, France, Var, Tourves, D64, Rte de Mazaugues, Malausse, 25.iv.2011, Jacques Nel, Genitalia slide JN25662 (J. Nel, personal collection, later to be deposited in the Tiroler Landesmuseum Ferdinandeum).

Figures 86–89. *Glaucolepis magna* (Laštuvka, A. & Z., 1997), holotype of *Trifurcula collinella* Nel, 2012, adult, labels and male genitalia.

54 *Glaucolepis*: "unassigned to group". The two Neotropical species placed in *Glaucolepis* (Puplesis and Robinson 2000) almost certainly do not belong there. The male genitalia show some resemblance to species in the *Glaucolepis raikhonae* group. However, we examined three males of *G. argentosa* Puplesis & Robinson, 2000, which show none of the apomorphies of *Glaucolepis* + *Trifurcula* (van Nieukerken 1986b), the trifurculate hindwing (Fig. 90), "velvet patch on underside hindwing" or the three pairs of abdominal tufts. The hindwing does show two remarkable groups of special scales on the humeral lobe (Fig. 90). It is possible that this species forms yet another Neotropical generic group. Unfortunately we have only fragments of the DNA barcode, that do not provide enough information on its taxonomic place. *Glaucolepis aerifica* again has very different genitalia and may belong to an entirely different clade.

55 *Trifurcula bicolorella* (Chrétien, 1915), **comb. n.** This species was described as *Bucculatrix* and not recognized as nepticulid, until Zdeno Tókar (Slovakia) identified it as a *Trifurcula* when studying sketches of Western Palearctic *Bucculatrix* genitalia made by Gerfried Deschka. Unfortunately the holotype (Figs 91, 92) is a

Figure 90. *Glaucolepis argentosa* Puplesis & Robinson, 2000, paratype, venation of right wings, slide 4502, RMNH.INS. 24502. Note the absence of Cu in forewing, absence of trifurculate Rs+M in hindwing and presence of two groups of special scales on humeral lobe.

female, and female genitalia are not very diagnostic in this group, and no males are available. The wing markings resemble *T. aurella* Rebel, 1933, that feeds on *Spartium junceum*, and one unnamed species from Spain that feeds on *Retama* species. On the type locality most likely only *Retama* species occur, more North African material is needed to establish the identity of this species firmly.

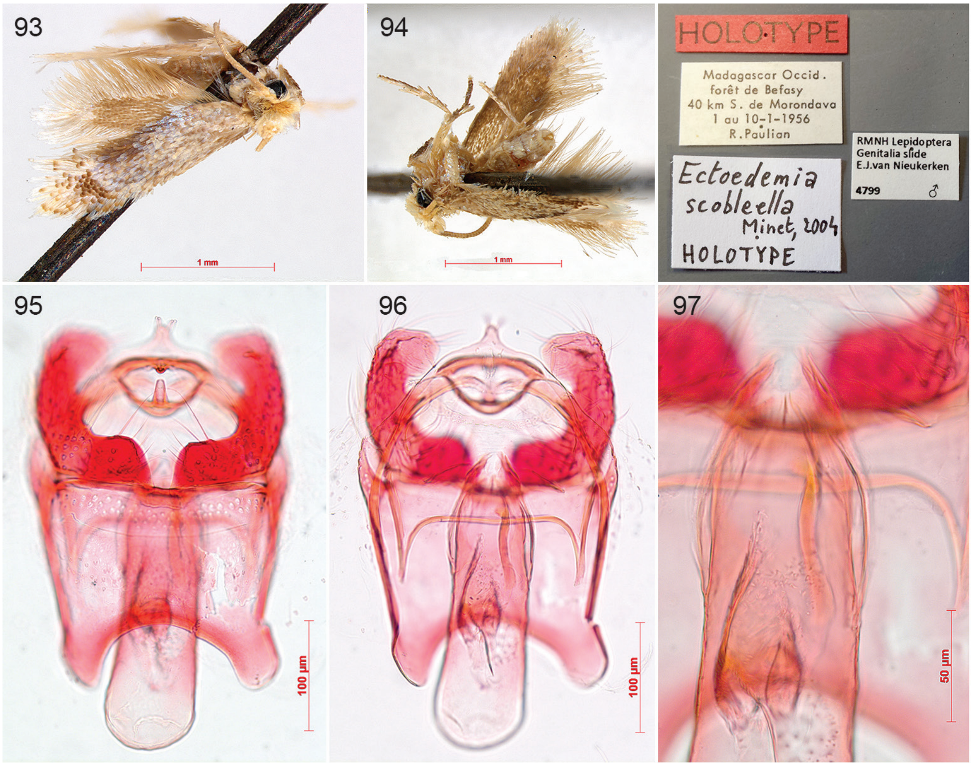
Material: Holotype ♀, [Tunisia, Gafsa, Mai 1907–1912], "169", "Type", "Eukitt-Präp. Nr. 1219 G. Deschka, "Bucculatrix bicolorella" (Muséum National d'Histoire Naturella, Paris).

56 *Ectoedemia scobleella* Minet, 2004 (replacement name for the junior homonym *E. scoblei* Minet, 1990) is here recombined with *Fomoria* on the basis of examination of the type series (Figs 93–97).

Material: Holotype ♂, Madagascar, Forêt de Befasy, 40 km S. de Morondava, 1–10.i.1956, R. Paulian, Genitalia slide EvN4799 (Muséum National d'Histoire Naturelle, Paris).

57 *Fomoria argyraspis* (Puplesis & Diškus, 1995), **comb. n.** We here tentatively move this species from *Acalyptris* to *Fomoria* on the basis of the genitalia and externals that are very similar to a number of *Fomoria* species and not to any other *Acalyptris* species.

Figures 91–92. *Trifurcula bicolorella* (Chrétien, 1915), holotype female, labels and genitalia, slide Deschka 1219.



Figures 93–97. *Fomoria scobleella* (Minet, 2004), holotype male, labels and male genitalia.

58 *Fomoria sporadopa* (Meyrick, 1911), **comb. n.** This species from Sri Lanka is very difficult to place. EvN studied the holotype, the only known specimen, in 1986 (Figs 98–101). The venation, studied in the intact specimen shows a curved main trunk of R+Rs+M but further details were hardly visible; the abdomen has a triangular S2a (van Nieukerken 1986b), both speaking against placement in *Acalyptris* where Diškus and Puplesis (2003) placed it. The genitalia are rather peculiar, without transtilla, and elaborate carinal processes. For the time being we place this in *Fomoria*, that comes closest, but it may well belong to a separate clade.
Material: Holotype ♂, [Sri Lanka, Eastern Province] Ceylon, Trincomali, 8.vi.1907, BF [T. Bainbrigge Fletcher], Genitalia slide BM24103 (Natural History Museum, London).

59 *Etainia trifasciata* (Matsumura, 1931). Although the holotype of *Nepticula trifasciata* Matsumura is badly damaged, the forewing pattern is clearly identical to that of *Obrussa tigrinella* Puplesis, 1985. Since this species is common in Japan, and no other species with the same colour pattern occur there, we can safely conclude there is only one trifasciate *Etainia* in Japan, hence we synonymise *O. tigrinella* here.

Figures 98–101. *Fomoria sporadopa* (Meyrick, 1911), holotype male, labels and male genitalia.

Translation of the original description in Japanese by Matsumura:

"Body and wing with grey-yellow and white with reflection. Head orange yellow, both sides silvery white. Antenna grey white. Forewing darker with three bands. One near wing base, one in middle and a little one outwards. Third fascia at the apex. Terminal and dorsal cilia grey-yellow white. Costal fringe darker. Hindwing darker. Legs dark grey. Seems to be the smallest moth in Japan. Early September. Hokkaido." [*Translated by Liu Youqiao, August 1996*]

60 *Acalyptris falkovitshi* (Puplesis, 1984). We synonymize here *Microcalyptris arenosus* Falkovitsh, 1986 and *M. vittatus* Puplesis, 1984, after earlier *M. turanicus* Puplesis, 1984 was synonymized with *A. falkovitshi* (van Nieukerken 2010). We act as First Reviser (ICZN article 24.2) to identify *M. falkovitshi* as having priority to the other species that were published in the same paper (*vittatus* and *turanicus*). The slight differences given earlier (Puplesis 1990; 1994) do not hold when a larger sample is studied: the sclerotization of the T-shaped sclerites on segments 4–8 may vary, probably depending on age. This is the larger species in this group, usually with a longitudinally brown stripe on forewings, a pointed gnathos and conspicuous tufts on tergites 4–8.

61 Unplaced *Acalyptris*. Several of these are morphologically rather different from other *Acalyptris* species. *Acalyptris distaleus* almost certainly does not belong in this genus, it is part of a group of species, occurring all in southern California and Arizona.

62 *Zimmermannia*. The North American species of *Zimmermannia*, previously recognised as the *Ectoedemia castaneae* group, were revised within the revision of *Ectoedemia* (Wilkinson 1981; Wilkinson and Newton 1981). They recognised in all 12 species, but failed to provide sufficient diagnostic characters or keys to separate all these often extremely similar species, several of which were based on a single specimen only. Whereas some lectotypes were selected, a major shortcoming was that the types of the oldest name in this group, *Trifurcula obrutella* Zeller, had not been examined, and the synonymy of *Nepticula bosquella* Chambers with *obrutella*, earlier suggested by Busck (1903) was simply accepted. Comparing the descriptions it is clear that Zeller described the pale headed species ("Kopf bleich lehmgelblich"= Head pale loam yellowish), whereas Chambers described the black headed species. Examination of the *obrutella* types confirms this and leads to a change of the interpretation of *obrutella* as the species currently known as *Ectoedemia piperella* Wilkinson & Newton, 1981, thus reviving *obrutella's* former synonym *bosquella* as the valid name for the black headed species. Also the identity of the Lectotype of *Nepticula grandisella* Chambers, 1880 (indicated as Holotype by Wilkinson 1981) lead to a re-interpretation of this name, here synonymised with *E. chloranthis* Meyrick, 1928 and *E. acanthella* Wilkinson & Newton, 1981.

To establish the identities of these old names firmly, we designate lectotypes below for *Trifurcula obrutella* and *Nepticula grandisella*. As a result of our revision we reduce the number of valid species in Eastern North America to five, synonymising eight names, and reviving two old names. We will more extensively diagnose and illustrate these species in a forthcoming publication. There are more North American species in this genus, particularly in the West and South, but these are all unnamed species.

Material: *Nepticula grandisella* Chambers: Lectotype ♂ (designated here), MCZ-ENT00001302, [United States], Texas, [Bosque Co., Norse, Gustav W. Belfrage], Chambers, Type 1302, Genitalia slide CNC 3495 (Museum of Comparative Zoology, Harvard University).

Trifurcula obrutella Zeller: Lectotype ♂ (designated here), MCZ-ENT00014248, [United States], Texas, Dallas, Boll, Type 14248, Genitalia slide DRD 2936 (Museum of Comparative Zoology, Harvard University). For the data of the other types in this group see Wilkinson and Newton (1981).

63 *Ectoedemia insularis* Puplesis, 1985 was described from two specimens from Sakhalin. We transfer the species here to the *populella* group. In the male genitalia it resembles *E. intimella* (Zeller, 1848) closely, a species also recorded from east Asia, and even Sakhalin. We compared genitalia of specimens reared from *intimella*-like leafmines on *Salix* in South Korea, and also examined light collected adults from Korea and an earlier reported female from Japan (van Nieukerken et al. 2012b). The male genitalia of these are identical to those of the *E. insularis* holotype, illustrated by Stonis and Rocienė (2013), and show a slight, but constant difference to European populations: European *E. intimella* has a wider gnathos and the ventral carinae are wider apart than in *insularis*. Adult externals, larva and biology of East Asian and European populations are identical, but there is a large DNA barcoding gap (more than 5%). On the base of these findings we consider all East Asian "*intimella*" as *E. insularis* and keep both tentatively as separate species. Study of populations and their phylogeography between East Asia and Europe is needed to establish the status of these populations more firmly. BIN's: *E. insularis*: BOLD:AAD0468, *E. intimella*: BOLD:AAD0467.

64 *Ectoedemia sinevi* Puplesis, 1985. This species is placed in the *populella* group on the basis of its male genitalia, and DNA barcodes of material that we consider conspecific. This species will be redescribed in a forthcoming paper on Japanese *Ectoedemia* (Hirano et al. in prep.).

65 *Ectoedemia turbidella* (Zeller, 1848). *Ectoedemia similigena* Puplesis, 1994 was described from a single series from Yalta on the Crimea. Earlier we found the slight differences in genitalia just sufficient to keep it tentatively as a separate species (van Nieukerken et al. 2010). Meanwhile, we have been able to obtain a partial DNA barcode of the dissected and illustrated paratype male (RMNH.INS.23924, genitalia slide EvN3924). The 420 basepairs are almost the same as in Western European specimens of *E. turbidella*, with just 2 basepairs difference, and BOLD classifies the barcode in the same BIN (BOLD:AAD4374). This small difference over a large geographic gap, together with the weak differences observed earlier, prompt us to reverse our earlier opinion, and synonymize *E. similigena* with *E. turbidella*.

66 *Ectoedemia spiraeae* Gregor & Povolný *& jacutica* Puplesis, 1988. Recently, Stonis et al. (2015b) reinstated *Ectoedemia jacutica* Puplesis, 1988 as valid species, after we had synonymised it earlier with *E. spiraeae* (van Nieukerken et al. 2010). In China and Japan we (and Japanese collectors) collected a species on *Spiraea* and *Aruncus* that we hitherto identified as *E. spiraeae*, although it has a large barcode gap with European specimens (van Nieukerken et al. 2012b). Considering the distribution being rather close to the type locality Yakutsk and some morphological similarities, we consider it likely that the Japanese and NE Chinese populations belong to *E. jacutica* (with BIN BOLD:AAI9354). The situation is comparable to that of *E. insularis* and *E. intimella* (above) and thus studies of populations between these are needed for more final conclusions. For now we consider specimens from the much more western Altai (van Nieukerken et al. 2010) to belong to *E. spiraeae*.

67 *Ectoedemia minimella* (Zetterstedt, 1839). The North American *Ectoedemia canadensis* (Braun, 1917) is here synonymised with *E. minimella*. Details will be published elsewhere.

68 *Ectoedemia occultella* (Linnaeus, 1767). This is one of the most widespread Nepticulidae, occurring from westernmost Europe to Japan and throughout northern North America, extending south in the mountain ranges to Colorado and Tennessee. The north American form was described as *Ectoedemia lindquisti* (Freeman, 1962), but we see no reason to treat North American populations differently from Palearctic ones. DNA barcodes: Europe to Mongolia: BOLD:AAD0469; Japan: BOLD:ACU6927; North America: BOLD:AAH4532, distance 2.73%.

69 *Ectoedemia ulmella* (Braun, 1912). We synonymize *E. andrella* Wilkinson, 1981 on the basis of the description and illustrations of the holotype. The genitalia are indistinguishable, and also the characteristic androconial scales on the hindwing are identical.

70 *Nepticula alpinella* Herrich-Schäffer, 1863b, *N. alticolella* Herrich-Schäffer, 1863c and *N. reuttiella* Herrich-Schäffer, 1863c. These three names were described in a paper dealing with a collecting trip to Engadin, in the Swiss Alps, and are available names. However, they have never appeared again in the literature, apart from Snellen (1873), who listed the names as missing from the Staudinger & Wocke catalogue (Wocke 1871), and these names can thus easily be considered Nomina Oblita (ICZN art. 23.9) whenever they are threatening stability of any junior synonyms. Only the name *reuttiella* was picked up in the cardindex of the London Natural History Museum (Beccaloni et al. 2005), and as a consequence appears on some websites that are copying these names uncritically. Looking at the descriptions and localities, *N. alpinella* may refer to *Stigmella thuringiaca*, *N. alticolella* could be *S. stelviana* or *dryadella* and *N. reuttiella* an abberant *S. prunetorum*.

71 *Nepticula oritis* Meyrick, 1910. This species was described from a single specimen from India, Himachal Pradesh, Simla Hills. It is probably a fasciate *Stigmella* species, of which there are many, that can only be identified with genitalia. Meyrick (1910) stated in the introduction that the material was from the Indian Museum (in Kolkota), but we failed to get any information on the whereabouts of the holotype, and therefore this species is better treated as a *Nomen oblitum*, until a type turns up.

72 *Nepticula xuthomitra* Meyrick, 1921. Meyrick described this species on the basis of one specimen from Pretoria, that unfortunately is no longer present in TM or BMNH. The description is too vague to identify the species with any certainty, and since it is very well possible that *N. xuthomitra* is in fact a senior synonym of one of the currently recognized valid species, it is best regarded as a *Nomen oblitum*. Once a synonymy is established, it is best to follow up with an action as described in ICZN 23.9, if this name threatens the stability of nomenclature of another species.

73 *Nepticula anguinella* Clemens, 1861 and *N. platea* Clemens, 1861. These names were given to larvae in incomplete leafmines on oaks. We think that the description can be best interpreted as *Stigmella* species, even though Wilkinson (1981) recombined them with *Ectoedemia*. He did this on the base of the larva having "ten square brown or blackish spots", indeed a character of several *Ectoedemia* species. However, we do not know of any oak feeding *Ectoedemia* in North America with this character, certainly the common *E. similella* Braun does not have such plates. *Stigmella* larvae that feed with the venter upwards, such as those in the *saginella* group, also show dots: the often conspicuous ganglia. Since North American *Stigmella* oak mines are all very similar, there is no way to identify these species on the basis of the very short descriptions, and by absence of any reared adults or other type material we think it is better to leave these names as *Nomina oblita*. If at any time, a synonymy of these species can be established, these names almost certainly have priority to the currently valid names; we therefore strongly advise taxonomists then to reverse priority according to ICZN 23.9, declare these names as *Nomen oblitum*, and declare the junior synonym as *Nomen protectum.*

74 *Unplaced unavailable names*. These names are partly copied from van Nieukerken (1986a) and we add a whole series of names by Dovnar-Zapol'skij from Russia and Central Asia, based on leafmines only, in two poorly known publications (Dovnar-Zapolski 1969; Dovnar-Zapolski and Tomilova 1978). Several of these almost certainly belong to known species, but *Stigmella atraphaxidella* refers to an interesting new host association (*Atraphaxis*, Polygonaceae). The few names that we could identify have been listed under the respective valid names (*S. acerna, S. turbatrix, S. lediella*, see notes 4, 12 and 39).

75 *Opostegoides.* We recombine four South African species, now in *Opostega*, with this genus after study of genitalia slides of type material, prepared by L. Vári: *Opostegoides granifera* (Meyrick, 1913), **comb. n.** (Fig. 102), *O. melitardis* (Meyrick, 1918), **comb. n.** (Fig. 103), *O. pelocrossa* (Meyrick, 1928), **comb. n.** (Fig. 104), *O. praefusca* (Meyrick, 1913), **comb. n.** (Fig. 105).

76 *Opostega cretatella* Chrétien, 1915. Unfortunately no type material of this species could be found. The species has been described from Algeria, Biskra, in April, on the northern edge of the Sahara. It is a very large species, with a wingspan of 14.5 mm. When comparing the description with that of *O. rezniki* Kozlov, 1985, the similar large size (16–17 mm) and uniform colour pattern with a single dorsal dot is striking. Also *O. rezniki* is described from a desert/steppe habitat, in Kazakhstan, 150 km NNE of Almaty, Sarytaukum, flying in mid-May. We consider it very likely that they represent the same species, with a similar distribution as many desert dwelling species, such as *Acalyptris psammophricta* (see van Nieukerken 2010) and thus synonymise them here. Obviously a confirmation from new material collected in North Africa would be welcome.

77 *"Opostega".* Until the eighties of the last century all Opostegids were placed in the single genus *Opostega* Zeller. After the generic revision (Davis 1989) most species have been moved to *Pseudopostega* or *Opostegoides*, but a revision of the African and Australian species has not yet taken place. Since *Opostega* s.str. is really a rather small Palearctic genus, and probably most Australian and African belong to *Pseudopostega* or *Opostegoides*, we prefer to place the species that have not yet been examined in detail tentatively in a separate "*Opostega*". We have been able to place several South African species correctly, since Lajos Vári had already dissected many types, present in the Ditsong Museum of Natural History in Pretoria (former Transvaal Museum).

78 *Pseudopostega chalcopepla* (Walsingham, 1908). We synonymize *Pseudopostega cyrneochalcopepla* Nel & Varenne, 2012 on the basis of virtual identical genitalia (Figs 113, 114) and external characters. We examined and barcoded the paratype. The

Figures 102–105. South African *Opostegoides* species, male genitalia. **102** *O. granifera* (Meyrick, 1913), holotype, slide TM4044 **103** *O. melitardis* (Meyrick, 1918), holotype, slide TM4037 **104** *O. pelocrossa* (Meyrick, 1928), holotype, slide TM4042 **105** *O. praefusca* (Meyrick, 1913), holotype, slide TM4043.

barcodes of the two specimens from Mediterranean islands (Corsica and Cyprus: RMNH.INS.24603) show large barcode distances to the mainland populations, but otherwise we find no differences. For now we prefer to keep these all in one

Figures 106–114. *Pseudopostega* species, female (106–108) and male genitalia. **106, 107** *P. idiocoma* (Meyrick, 1918), syntype, slide TM4036 **108** *P. orophoxantha* (Meyrick, 1921), holotype, slide TM4034 **109** *P. amphimitra* (Meyrick, 1913), syntype, slide TM4039 **110** *P. phaeosoma* (Meyrick, 1928)**,** holotype, slide TM4046 **111** *P. symbolica* (Meyrick, 1914), holotype, slide TM4038 **112** *P. tincta* (Meyrick, 1918), holotype, slide TM4035 **113, 114** *Pseudopostega chalcopepla* (Walsingham, 1908): **113** paratype of *Pseudopostega cyrneochalcopepla* Nel & Varenne, 2012, slide J Nel 24980 **114** France, Var, Mazaugues, slide EvN4279.

variable species, until more is known of these and other island populations. Island populations often have large barcoding gaps to mainland populations, which taken alone is in our opinion not sufficient for species status.

Material: *Pseudopostega cyrneochalcopepla*: 1♂ paratype, [France, Corsica] Pertusato, Bonifacio, 24.v.2011, P. Varenne, DNA extracted from 1 leg, RMNH.INS.550071, collection J. Nel (later to be deposited in the Tiroler Landesmuseum Ferdinandeum).

79 *Pseudopostega* (African species). We recombine six South African species, now in *Opostega*, with this genus after studying genitalia slides of type material, prepared by L. Vári: *Pseudopostega amphimitra* (Meyrick, 1913), **comb. n.** (Fig. 109), *P. idiocoma* (Meyrick, 1918), **comb. n.** (Fig. 106, 107), *P. orophoxantha* (Meyrick, 1921), **comb. n.** (Fig. 108), *P. phaeosoma* (Meyrick, 1928), **comb. n.** (Fig. 109), *P. symbolica* (Meyrick, 1914), **comb. n.** and *P. tincta* (Meyrick, 1918), **comb. n.**

80 *Nepticula belfrageella* Chambers, 1875a. The slide labelled "Type" is not a nepticulid, but belongs to an unidentified Gelechiidae (personal communication J.F. Landry, D. Adamski). Also the description most likely does not refer to a nepticulid species, so we exclude it here.

Material: Genitalia slide ♂ examined, CNC3496, *Nepticula belfrageella* Cham, #99, #1555, no specimen [note in pencil], TYPE, G.L.[ewis], remounted by PJN.[ewton] (USNM).

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Note added in proof

Just before publication, another new species of Nepticulidae was published, and two more described, but not named (Stonis et al. 2016c). The following species should be added to page 115, the *Stigmella epicosma* group. The species has also been added to the online databases.

Stigmella polylepiella Diškus & Stonis in Stonis et al., 2016c: 86 NEO

Stonis JR, Diškus A, Remeikis A, Karsholt O (2016c) Do leaf-mining Nepticulidae occur in the natural but so threatened Andean *Polylepis* forests? Biologija 62: 83–97. doi: 10.6001/biologija.v62i2.3334.

Supplementary material 1

Specimen data for Catalogue of Nepticuloidea with BOLD data

Authors: Erik J. van Nieukerken, Camiel Doorenweerd, Robert J. B. Hoare, Donald R. Davis

Data type: Microsoft Excel (xls).

Explanation note: The 213 records comprise specimens that have either been cited briefly or completely in the Notes, or have been used more implicitly for the texts and figures. Records are listed alphabetically by species, country, stateProvince, AdminDivision2, AdminDivision3, Locality.

Supplementary material 2

BOLD TaxonID Tree of the dataset Lepidoptera - Nepticuloidea of the World 2016 [DS-NEPCAT]

Authors: Erik J. van Nieukerken, Camiel Doorenweerd, Robert J. B. Hoare, Donald R. Davis

Data type: PDF file

Explanation note: A Neighbor joining tree of COI sequences, with Kimura 2 Parameter as distance model for sequences linger than 200 bp, 3203 records.