Annotated checklist of the European species of *Nemophora* (Adelidae)

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Abstract. The checklist, which is an excerpt from the forthcoming world-wide taxonomic revision of the genus *Nemophora* Hoffmannsegg, 1798, includes 20 species so far reported from Europe, along with most important synonymy and comments about the characters useful for identification of the problematic species. *N. albiciliellus* (Staudinger, 1859) is a distinct species, not a junior subjective synonym of *N. barbatellus* (Zeller, 1847). The following synonymies are established: *N. istrianellus* (Heydenreich, 1851) = *N. chlorista* (Meyrick, 1912) **syn. n.**; *N. prodigellus* (Zeller, 1853) = *N. auricellus* (Ragonot, 1874) **syn. n.**; *N. fasciella* (Fabricius, 1775) = *N. annae* (Zeller, 1853) **syn. n.** = *N. purpureus* (Stainton, 1867) **syn. n.**; *N. mollella* (Hübner, [1813]) = *N. glabrata* (Meyrick, 1922) **syn. n.**; *N. albiciliellus* (Staudinger, 1859) = *N. beryllopa* (Meyrick, 1935) **syn. n.** *N. padrejusto* (Agenjo, 1965) (*nomen nudum*) is attributed to *N. barbatellus* (Zeller, 1847). Generic affinity of *N. associatella* (Zeller, 1839), the species sometimes placed into the genus *Adela* Latreille, is confirmed.

Key words. Lepidoptera, Adelidae, *Nemophora*, Europe, nomenclature, new synonymies.

Introduction

In spite of the colourful appearance of fairy moths and general interest to this group, the taxonomy of Adelidae remains surprisingly obscure. Imperfect original descriptions in combination with pronounced variation in external characters caused numerous problems even in the identity of widespread European species, at least half of which had been repeatedly misidentified. These misidentifications, both preserved in historical collections and published by competent researchers, continue to influence the lepidopterological community, leading to the multiplication of errors.

The genus *Nemophora* Hoffmannsegg, 1798 is taxonomically one of the most complicated groups of Adelidae. First, the information provided in all primary descriptions of the European species is insufficient for reliable determination, and in many situations the best what we can do now is just accept the common usage of the names by former authors. The amount of 'historical' problems can easily be seen from the recent debates around the name *N. cupriacella* auct., the current use of which is simply the result of misidentification (Kozlov 2002); however, it has been suggested to conserve this name by selection of the neotype (van Nieukerken 2003). Two further examples concern recent discovery of senior subjective synonyms of *N. associatella* (Zeller) and *N. dumerilella* (Duponchel) that became *nomina oblita* due to identification problems (Kozlov & Kaila 2002; Kozlov 2004). Second, all major recent keys and checklists contain a number of errors and misleading statements; among these the key by Zaguljaev (1978) and the book by Küppers (1980) share the first place. Although these works contain much useful information, I would suggest that researchers without sufficient knowledge of Adelidae refrain from uncritical use of these. Already a number of subsequent publications (e. g. the paper by Kovács & Kovács 1999) caused the multiplication of errors. Third, the genitalia of type specimens of most of European species (had they existed) have never been investigated, which has made

impossible segregation of diagnostic characters from within-species variation in wing pattern and coloration. In this extremely variable group even the 'best' characters of the wing pattern, such as the presence of a forewing fascia, can easily vary, leading to description of aberrant specimens as distinct species. Last but not least, the wide distribution of several species resulted in their repeated description from different parts of the world, as in *N. decisella* (Walker) (Kozlov & Robinson 1996). The European case is *N. bellela* (Walker), which until the last decade was named *N. bellela* in North America only (e. g. Powell 1969), while European populations were determined as *N. esmarkella* (Wocke) (e. g. Zaguljaev 1978; Küppers 1980), and the name *N. hedemanni* (Christoph) was used for the Siberian populations (Meyrick 1912).

Although the taxonomic revision of the genus *Nemophora* was initiated back in 1981, the identity of some European species became clear only in 2003, when I managed to sort out the most confusing complex of uniformly coloured species externally resembling *N. fasciella* (Fabricius). Since I received several requests during the past years to provide taxonomic decisions for checklists and databases, such as the 'Fauna Europaea' project, I decided to publish an annotated checklist of the European species, because the forthcoming revision will not be completed within a couple of years. This checklist is based on an extensive study involving some 700 publications, as well as collections of nearly all leading museums; in particular, I investigated all type specimens of *Nemophora* discovered so far. However, keeping in mind the purpose of this publication, I did not include a detailed bibliography (in particular, references to primary descriptions are omitted, as they can easily be found from Meyrick 1912 and Küppers 1980) or complete morphological descriptions. Only the most important synonyms are included; these were all checked against the type specimens, where available.

The genus *Nemophora* includes to date about 350 species world-wide, among which some 150 species remain to be described in the forthcoming revision. The species of *Nemophora* more or less naturally split into a number of species groups which, however, could not be combined at the subgeneric level. Since the analysis of the phylogeny of the genus has not been completed yet, the order of species in the present checklist follows Wojtusiak (1996). All species names are given in their original spelling, i.e. the highly debatable (Sommerer 2002) requirement of ICZN (1999) about the gender agreement is not followed.

Last but not least, this publication indicates some shortcomings in our knowledge about fairy moths in order to focus current studies on the problems that have not been solved yet. Any criticism, as well as information on material or publications which have not been accounted for, will be accepted with gratitude.

Abbreviations

MINGA – Museul de Istorie Naturala 'Grigore Antipa', Bucharest, Romania.
MNHN – Muséum National d'Histoire Naturelle, Paris, France.
NHM – The Natural History Museum, London, UK.
ZIN – Zoological Institute, St. Petersburg, Russia.
MNB – Museum für Naturkunde, Berlin, Germany.

Nemophora Hoffmannsegg, 1798

Type species: *Phalaena (Tinea) degeerella* Linnaeus, 1758 by subsequent designation by Hampson (1918: 388); for the authorship of the generic name, see Nye & Fletcher (1991).

N. degeerella (Linnaeus, 1758)

Determination. This is the best known species of the genus, and its identity has only occasionally caused problems. It can be confused with *N. amatella*, from which differs in particular by the narrower forewings; for other diagnostic characters, including male genitalia, consult Kyrki (1981), Razowski (1978) for *N. degeerella*, and Kozlov (1997) for *N. amatella*. The records of *N. degeerella* from Siberia, Far East Russia and Japan should most likely be attributed to *N. amatella*; the record from India represents an unidentified species. The eastern distributional limit remains to be clarified.

Nomenclature. No synonyms are listed for this species, because its synonymy requires detailed investigation that had not been completed yet.

N. amatella (Staudinger, 1892)

Adela degeerella var. *amurensis* Alpheraky, 1897.
Adela kukunorensis Sauber, 1899.
Adela badioumbratella Sauber, 1899.
Adela coreana Matsumura, 1931.
Nemotois degeerella f. *ogasawarai* Matsumura, 1932.

Determination. Transpalaearctic species, widely distributed in Asia (Siberia, Korea and Japan); in Northern Europe *N. amatella* has been collected for a long time, but was misidentified as *N. degeerella* until its true identity was revealed two decades ago (Kyrki 1981). The species is very variable both in external characters (head colour, width of fascia, length of apical yellow strips) and in the male genitalia (shape of valva, tegumen, and base of aedeagus); for diagnostic traits consult Kyrki (1981) and Kozlov (1997).

Nomenclature. The syntypes of *N. amatella* (deposited in MNB) include two specimens of *N. amatella* and two specimens of *N. degeerella*.

N. bellela (Walker, 1863)

Adela esmarkella Wocke, 1864.
Adela hedemanni Christoph, 1888.
Adela bellella Walsingham, 1890, incorrect subsequent spelling.
Nemotois belleta Anderson, 1915, lapsus calami.
Nemophora belella Wojtusiak, 1996, incorrect subsequent spelling.

Determination. This is the only circumpolar species of *Nemophora*, and the only representative of this genus in North America. It is easily distinguishable from *N. degeerella*, *N. amatella* and *N. congruella* by the short male antennae (not exceeding the doubled forewing length); for male genitalia and other diagnostic traits consult Kyrki (1981; referred to as *N. esmarkella*) and Kozlov (1997).

Nomenclature. Note the correct spelling of this name – the number of errors is exceptionally high; Wojtusiak (1996) introduced one more version of an incorrect subsequent spelling. The synonymy was established on the basis of investigation of the type specimens deposited in NHM, ZIN and MINGA.

N. congruella (Zeller, 1839)

Determination. This infrequent transpalaearctic species, belonging to the degeerella species group, is clearly distinguished by its light-coloured forewing: in *N. congruella* the dominant forewing colour is yellow, whereas in both *N. degeerella* and *N. amatella* the dominant wing colour is dark (black, brown and silver-grey). Also the forewing fascia in *N. congruella* is situated closer to the forewing base than in both *N. degeerella* and *N. amatella*.

Nomenclature. For a long time Fischer von Röslerstamm was considered as the author of this species (e. g. Meyrick 1912; Zaguljaev 1978; Küppers 1980); however, the pages of his book (Fischer von Röslerstamm 1834–[1843]) with descriptions of Adelidae were published in 1840, and they contain reference to Zeller (1839), who is the author. Duponchel [1839] published the description of *N. congruella* the same year but later than Zeller (see Joannis 1922 for the publication dates). No synonyms were discovered so far.

N. ochsenheimerella (Hübner, [1813])

Nemotois chibiana Matsumura, 1931.
Nemophora japanalpina Yasuda, 1957.

Determination. In Europe this transpalaearctic species is difficult to confuse with any other due to its characteristic V-shaped yellow spot in the distal part of the forewing. However, this spot is often split into two spots (along the fascia and along termen), and the proximal part of it (along the fascia) sometimes disappears. Melanistic specimens have often been misidentified as *N. degeerella*, although *N. ochsenheimerella* is much smaller than *N. degeerella* (wing expanse 10–14 and 16–22 mm, respectively).

N. basella (Eversmann, 1844)

Adela basiradiella Christoph, 1888.

Determination. *N. basella* is easily distinguished from all other European species by two elongate yellow spots in the basal half of the forewing (see figures in Reiprich 1978) and by a horn-like protuberance at the middle of the internal valvar margin in the male genitalia (Kozlov 1997). The mass occurrence of this species in a single locality of Central Europe (Reiprich 1978) is intriguing, since it had not be found so far in any other European locality, except for the South-Eastern part of Western Europe (the type locality); sparsely distributed from Ural to Amur region; infrequent.

N. raddaella (Hübner, 1793)

Tinea raddella Hübner, [1796], lapsus calami.
Alucita latreillella Fabricius, 1798.
Nemotois raddaëllus Wocke, 1871, unjustified emendation.
Nematois algeriensis Walsingham, 1907.

Determination. The species is easily recognisable by the combination of its large size, the prominent glossy bronze forewing colour, and an incomplete light yellow fascia consisting of a larger costal spot and a smaller dorsal spot.

Nomenclature. The modification of the original spelling by Hübner [1796] should be considered a *lapsus calami*, because it was subsequently corrected (Hübner 1816: 416). Unfortunately, both Heydenreich (1851) and Herrich-Schäffer [1855] have used the incorrect subsequent spelling; as result, the original spelling (*N. raddaella*) was followed only by about half of the authors mentioning this species. Zaguljaev (1978) was probably the last to use the correct spelling, and during the past decade the incorrect subsequent spelling became commoner (e. g. Wojtusiak 1996; Leraut 1997). Note that if these changes are considered unjustified emendations, the use of the original spelling should be maintained, because the correct spelling had been used frequently and conditions of article 33.3.1 of the ICZN (1999) are not met.

Some authors (e. g. Küppers 1980; Vives Moreno 1991; Leraut 1997) consider *N. latreillella* as a subspecies; however, the differences between populations from Central and Southern Europe do not exceed the 'normal' range of geographical variation within the genus *Nemophora*.

N. metallica (Poda, 1761)

Phalaena scabiosella Scopoli, 1763.
Nemotois aerosellus Zeller, 1850.
Nemotois rebelellus Turati, 1924.

Determination. Large unicoloured species, whose identity had not been questioned for a long time; however, small females (poor quality specimens) have sometimes been misidentified as *N. pfeifferella*.

Nomenclature. Since the description by Poda (1761) does not allow a reliable identification, a neotype will be selected to assure the stability of the current use of this name.

N. pfeifferella (Hübner, [1813])

Adela chrysochraon Razowski, 1978, unnecessary replacement name.
Adela huebneri Koçak, 1980, unnecessary replacement name.

Determination. Due to characteristic wing pattern, this species is only rarely misidentified; however large females (poor quality specimens) can be mixed with *N. metallica*.

Nomenclature. For the history of the replacement names, see Nielsen (1985).

N. istrianellus (Heydenreich, 1851)

Adela beyruthella Bruand, 1858.
Nemotois cupriacellus var. *dalmatinellus* Zeller, 1853.
Nemotois chlorista Meyrick, 1912, **syn. n.**

Determination. *N. istrianellus* does not possess an epiphysis, and by this character can easily be distinguished from other species of the *fasciella* species group (listed below) except for *N. prodigellus* and *N. cupriacella* auct. From *N. prodigellus* it differs in the following characters: forewing without distinct spot at the base of R stem; forewing background dark brown to dark coppery brown; hindwing uniformly brown to dark brown; base of male antenna usually with dense row of semi-erect scales. In the male genitalia, *N. istrianellus* differs from *N. prodigellus* by the shape of the valvae, which are widely rounded to almost rectangular apically, with parallel distal halves of their inner borders (consult fig. 85b in Küppers 1980). Females of *N. istrianellus* differ from females of *N. cupriacella* auct. in the following characters: fore tibia dorsally bronze to brown, ventrally and sometimes ventrolaterally yellowish white to yellow, with strict border between these two colours; forewing fascia usually distinct; forewing bronze to dark coppery brown.

The species is reported from South Europe and Asia Minor, but due to numerous misidentifications is with certainty known from a few localities only. There is an urgent need for reliable information about the distribution and biology of *N. istrianellus*.

Nomenclature. Herrich-Schäffer ([1851], plate 33, fig. 232) illustrated a male moth under the name '*istrianella*'. Herrich-Schäffer's plates carry only specific names, which are not binominal and therefore not available; the descriptive text (on p. 98) did not appear until 1854 (see Hemming 1937: 588 for the publication dates of vol. 5 of Herrich-Schäffer's work). The name was made available by reference to Herrich-Schäffer's illustration by Heydenreich (1851: 81, published in combination *Nematois* [sic!] *istrianellus*). The type specimen has not been discovered yet, and therefore a neotype will be selected from the NHM collection in accordance with the current use of this name.

The junior subjective synonym, *N. dalmatinellus*, is traditionally ascribed to Mann, with the date 1869 (e. g. Meyrick 1912). However, already Heydenreich (1851) published this name (as '*Nematois dalmatinellus* Mn.') without description; this name is therefore nomen nudum. Zeller (1853) described '*cupriacellus* Var. b', indicating on p. 60 that he received the described males from Mann who identified them as *N. dalmatinellus*. This name should be considered as subspecific according to article 45.6.4 of ICZN (1999) and attributed to Zeller.

N. cupriacella auctorum

Determination. This is the only parthenogenetic species of *Nemophora* (Suomalainen 1978). There exist however a possibility that males of *N. cupriacella* auct. can occasionally be found, as it happened in several other parthenogenetic moths (van

Nieukerken 2003); therefore any reliable information about this species, especially results of the rearing from larvae, would be extremely important to clarify the situation.

Descriptions of males of *N. cupriacella* published so far clearly belong to other species, and the identity this species caused much doubt and confusion until very recently (Kozlov 2002). Females of *N. cupriacella* differ from females of its closest relative, *N. istrianellus*, by uniformly coloured, light bronze to brown, fore tibia, and light bronze to bronze forewing without distinct fascia, and from females of *N. violella* by absence of epiphysis and longer labial palpi covered predominantly by yellow hairs (for head photos, see van Nieukerken 2003).

Nomenclature. The figure of *Tinea cupriacella* by Hübner ([1819], f. 445), to my opinion, depicts a male specimen of *N. violellus*, and therefore the current use of this name for the parthenogenetic species is most likely the result of misidentification (Kozlov 2002). The case is under consideration by the International Commission on Zoological Nomenclature (Kozlov 2002; van Nieukerken 2003). If ICZN rules as proposed by Kozlov (2002), then the parthenogenetic species will require formal description, because no available name exists for it. An alternative suggestion is to conserve the existing usage of the name *N. cupriacella* (van Nieukerken 2003).

N. violellus (Herrich-Schäffer in Stainton, 1851)

Adela violaria Razowski, 1978, unnecessary replacement name.

Determination. This species has a characteristic external appearance, with an oily (not metallic) tint of uniformly dark brown forewings. Poor quality specimens can be confused with *N. fasciella*, from which *N. violella* differs by the absence of a forewing fascia, longer male antennae (2.5–3.0× forewing length) and shorter labial palpi (0.95–1.05× vertical eye diameter in males). Females of *N. violella* differ from females of *N. cupriacella* auct. by presence of an epiphysis and shorter labial palpi covered almost exclusively by black hairs (for head photos, see van Nieukerken 2003).

Nomenclature. For nomenclature and authorship of this species consult Karsholt (1996) and Kozlov (2002).

N. prodigellus (Zeller, 1853), sp. rev.

Nemotois auricellus Ragonot, 1874, **syn. n.**
Nemotois splendidus Staudinger, 1880.

Determination. *N. prodigellus* possesses no epiphysis, and by this character can easily be distinguished from other species of the *fasciella* species group (listed below) except for *N. istrianellus* and *N. cupriacella*. From both these species it differs by the presence of a distinct dark brown spot at the base of the R stem; additionally, from *N. istrianellus* it differs by bronze to dark bronze forewing background colour and by the base of the male antenna, which is not thickened by semi-erect scales. In the male genitalia *N. prodigellus* differs from *N. istrianellus* by the shape of the valvae, which are almost triangular with narrow tips.

Nomenclature. There has been a long-lasting confusion about the identity of *N. prodigellus*, the species has sometimes been attributed to Heinemann (1870), or considered *sensu* Heinemann. In fact, both Zeller (1853) and Heinemann (1870) provided descriptions of the same species, and Zeller is thus the author of this name. Direct comparison of lectotypes of all three taxa involved showed that they are conspecific. Since all three names have been used until recently, the principle of priority is applicable, and the senior subjective synonym, *N. prodigellus* (Zeller, 1853), is to be used as the valid name.

Another confusing story concerns the suggested synonymy between *N. prodigellus* and *N. inauratella* that has been repeated by several authors. It is based on misidentification of the latter species by Peyerimhoff (1872) and as such has no influence on the synonymy. The syntypes of *N. inauratella* (MNHN) are conspecific with *N. dumerilella*.

N. fasciella (Fabricius, 1775)

Tinea schiffermillerella [Denis et Schifermüller], 1775.
Nemotois annae Zeller, 1853, **syn. n.**
Nemotois purpureus Stainton, 1867, **syn. n.**

Determination. The species is variable in forewing colour and in development of the fascia; in particular, southern populations are darker, with more expressed metallic tint of the forewing. The dark brown spot at the base of the R stem is also variable in size and can easily be overlooked in some specimens. The following species are most similar to *N. fasciella*:

- *albiciliellus*, from which *N. fasciella* differs by the brown colour of the hindwing cilia, shorter labial palpi (palpus length 1.2–1.4× vertical eye diameter in males) and uniformly brown piliform scales covering the labial palpi;
- *violellus*, from which *N. fasciella* differs by the presence of a fascia and by a metallic tint of the forewing;
- *barbatellus* and *N. mollella*, from which *N. fasciella* differs by presence of a diffuse but distinct dark brown spot (diameter approximately equal to the width of fascia) near the tornal margin of forewing, and the slightly larger size (forewing length 5.4–7.2 mm).

Nomenclature. The synonymization of *N. purpurea* and *N. annae* with *N. fasciella* is based on investigation of the type specimens of all three taxa (all deposited in NHM).

N. barbatellus (Zeller, 1847)

Nemotois chalcochrysellus Mann, 1855.
Nemotois constantinella Baker, 1888.
Nemotois demaisoni Ragonot, 1889.
Nemotois padrejusto Agenjo, 1965, nomen nudum.

Determination. Closest to *N. mollella*, from which it differs by the presence of a horizontal row of long (reaching beyond the lateral margin of compound eyes) piliform scales above antennal sockets. The labial palpi are longer than in *N. mollella* (1.2–1.7× vertical eye diameter in males) and densely covered with long piliform scales, which are dark brown to black, at least on the external face of the palp.

Nomenclature. *N. barbatellus* has for a long time erroneously been considered as a senior subjective synonym of *N. albiciliellus* (see below for details). The name *N. padrejusto* is *nomen nudum*; the specimens to which Agenjo (1965) applied this name were later on misidentified by Vives Moreno (1991) as *N. minimella* ([Denis & Schiffermüller]).

N. mollella (Hübner, [1813])

Nemotois molellus Hartmann, 1880, incorrect subsequent spelling.
Nemotois glabrata Meyrick, 1922, **syn. n.**

Determination. Although this species seems difficult to misidentify, confusions with other species are surprisingly frequent (Küppers 1980); therefore only little reliable information about *N. mollella* is available. This species is closest to *N. barbatellus*, from which it differs by the less hairy male head (a tuft of piliform scales never reaches the lateral margin of the compound eyes) and the shorter labial palpi (1.1–1.3× vertical eye diameter in males), which are sparsely covered with short brown piliform scales. From *N. prodigellus*, with which it is most frequently confused, it differs by the presence of an epiphysis, and from *N. minimella* by the absence of a brown spot at the base of the R stem in the forewing.

Nomenclature. The spelling of this name was nearly consistent during almost two centuries; unfortunately Wojtusiak (1996) used the incorrect subsequent spelling. The new synonymy is established on the basis of the investigation of the type of *N. glabrata* (deposited in NHM). Note that the description of *N. glabrata* by Küppers (1980) is misleading as it is probably based on misidentified specimens of *N. istrianellus*.

N. minimella ([Denis & Schiffermüller], 1775)

Nemotois schiffermillerellus var. *lenellus* (Zeller, 1853).

Determination. The species is easy to recognise by its small size (forewing length 4.5–5.7 mm) and by the long (>0.15× forewing length) brown spot at the base of the R stem in the forewing.

Nomenclature. Heydenreich (1851) published the name '*Nematois lenellus* Mn.' without description; I therefore regard it as a nomen nudum. Investigation of the lectotype of *N. lenellus* (deposited in NHM) confirmed the synonymy, which was established by Küppers (1980).

N. dumerilella (Duponchel, [1839])

Adela inauratella Duponchel, 1844.
Tinea basochesella Hübner, [1824], nomen oblitum.

Determination. This species can easily be recognised by the presence of bright yellow scales at least on the internal part of the dark brown forewing fascia and by the very short labial palpi (not exceeding 0.7× vertical eye diameter in males).

Nomenclature. The study of the types of *N. inauratella* (deposited in MNHN) confirmed that they are conspecific with *N. dumerilella*.

The name *Nemotois fervidellus* Z. was included in the catalogue by Heydenreich (1851) whthout description; it is thus a nomen nudum. Zeller (1853: 83) provided some morphological and distributional details for two undescribed taxa in his description of *N. dumerilella*; these were referred to as '*fervidellus* Mann in lit.' and '*zelleriellus* Dahlbom in lit.'. However, since Zeller mentioned that these forms do not even deserve infrasubspecific status, these names remain unavailable.

N. albiciliellus (Staudinger, 1859), sp. rev.

Nemotois beryllopa Meyrick, 1935, **syn. n.**

Determination. *N. albiciliellus* can be easily distinguished from *N. barbatellus* by the snow-white scales which dorsally cover the labial palpi, and by the white piliform scales on the inner face of the palpus. From *N. fasciella* it differs by the white cilia of the hindwing, the longer labial palpi (1.4–1.6× vertical eye diameter in males), and the colour of the piliform scales, covering the labial palpi: in *N. albiciliellus* they are usually white on the inner face and brown on the outer face of the palpus.

Nomenclature. *N. albiciliellus* was erroneously synonymized with *N. barbatellus* long ago (Wocke 1871), and subsequent authors uncritically followed this synonymy. However, investigation of the type specimens of both species (deposited in MNB and NHM) demonstrated that this synonimization was incorrect.

N. associatella (Zeller, 1839)

Tinea megerlella Hübner, [1810], nomen oblitum.

Determination. Differs from other European *Nemophora* by the medial position of the wide forewing fascia, and by the absence of a distinct pattern in both basal and apical halves of the forewing; its identity in Europe seems to cause no problems so far.

Nomenclature. This species was erroneously placed into the genus *Adela* Latreille by several authors including Wojtusiak (1996), and this generic placement was uncritically followed by many researchers, including myself (Kozlov & Kaila 2002). However, investigation of the male antennal structures surprisingly revealed that the antennal pegs of *N. associatella* are of the *Nemophora* type, not of the *Adela* type (see Nielsen 1980). Therefore *N. associatella* is herewith transferred to the genus *Nemophora*. For identity of *N. megerlella*, see Kozlov & Kaila (2002).

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References

Agenjo, R. 1965. Catálogo ordenador de los lepidópteros de España. Familias: Micropterygidae, Eriocraniidae, Hepialidae, Adelidae, Lithocolletidae, Argyresthiidae, Plutellidae, Epermeniidae, Coleophoridae (= Eupistidae), Elachistidae y Douglasidae. – Graellsia **21**: [168]–[193].

Duponchel, P. A. J. [1839] 1838. Nocturnes. – *In*: J. B. Godart & P. A. J. Duponchel, Histoire naturelle des Lépidoptères ou Papillons de France **8**. – Crevot, Paris. 720 pp.

Fischer von Röslerstamm, J. E. 1834–[1843]. Abbildungen zur Berichtigung und Ergänzung der Schmetterlingkunde, besonders der Microlepidopterologie, als Supplement zu Treitschke's und Hübner's europaeischen Schmetterlingen, mit erläuterndem Text. – J. C. Hinrichs'schen Buchhandlung, Leipzig. 308 pp., 100 pls.

Hampson, G. F. 1918. Some small families of the Lepidoptera which are not included in the key to the families in the Catalogue of Lepidoptera Phalaenae, a list of the families and subfamilies of the Lepidoptera with their types and key to the families. – Novitates Zoologicae **25**: 366–394.

Heinemann, H. 1870. Die Schmetterlinge Deutschlands und der Schweiz. Abt. 2. Kleinschmetterlinge. Bd. 2. Die Motten und Federmotten. – C. A. Schwetschke u. Sohn, Braunschweig. 825 pp.

Hemming, F. 1937. Hübner: A bibliographical and systematic account of the entomological works of Jacob Hübner, and of the supplements thereto by Carl Geyer, Gottfried Franz von Frölich and Gottlieb August Wilhelm Herrich-Schäffer. – Royal Entomological Society of London, London. Vol. 1, xxxiv + 605 pp.; Vol. 2, xi + 274 pp.

Herrich-Schäffer, G. A. W. [1847]–1855. Systematische Bearbeitung der Schmetterlinge von Europa **5**. Die Schaben und Federmotten. – G. J. Manz, Regensburg. 394 pp., 124 pls.

Heydenreich, G. H. 1851. Lepidopterorum Europæorum catalogus methodicus. Systematisches Verzeichniss der Europaeischen Schmetterlinge. – J. Klinkhardt, Leipzig. [2] + 131 + [2] pp.

Hübner, J. 1796–[1836]. Sammlung europäischer Schmetterlinge. VIII. Tineidae – Schaben. – Auf Rosten der Liebhaber, Augsburg. 78 pp., 71 pls.

ICZN. 1999. International code of zoological nomenclature, adopted by the International Union of Biological Sciences. 4th edn. – International Trust for Zoological Nomenclature, London. xxix + 306 pp.

Joannis, J. d., 1922. Duponchel ou Zeller? note complémentaire. – Bulletin de la Société Entomologique de France **17**: 277–280.

Karsholt, O. 1996. Note 350. P. 301. – *In:* O. Karsholt & J. Razowski (eds.), The Lepidoptera of Europe: A distributional checklist. – Apollo Books, Stenstrup.

Kovács, Z. & S. Kovács. 1999. Familia Adelidae (Lepidoptera) în România. – Buletin de Informare al Societatea Lepidopterologica Romania **10**: 9–66.

Kozlov, M. V. 1997. Family Adelidae. Pp. 274–289. – *In:* V. S. Kononenko (ed.), Key to the Insects of Russian Far East. Vol. V. Trichoptera and Lepidoptera, pt. 1. – Dalnauka, Vladivostok (in Russian).

Kozlov, M. V. 2002. *Nemotois violellus* Herrich-Schaeffer in Stainton, 1851 (currently *Nemophora violella*; Insecta, Lepidoptera): proposed conservation of the specific name. – Bulletin of Zoological Nomenclature **59**: 32–35.

Kozlov, M. V. & L. Kaija. 2002. The identity of *Tinea megerlella* Hübner, [1810] – a long-lasting confusion between *Elachista* (Elachistidae) and Adela (*Adelidae*). – Nota lepidopterologica **24**: 3–10.

Kozlov, M. V. & G. S. Robinson. 1996. Identity and distribution of two dimorphic oriental fairy moths – *Nemophora decisella* (Walker, 1863) and *Nemophora cantharites* (Meyrick, 1928) (Lepidoptera, Adelidae). – Nota lepidopterologica **18**: 39–56.

Küppers, P. V., 1980. Untersuchungen zur Taxonomie und Phylogenie der westpaläarktischen Adelinae (Lepidoptera: Adelidae). – M. Wahl, Karlsruhe. 497 pp.

Kyrki, J. 1981. *Nemophora amurensis* Itä-Fennoskandissa (Lepidoptera, Incurvariidae). – Notulae Entomologicae **61**: 125–129.

Leraut, P. 1997. Liste systématique et synonymique des Lépidoptères de France, Belgique et Corse (deuxième édition). – Universa, Wetten. 526 pp.

Meyrick, E. 1912. Lepidoptera Heterocera (Tineae). Fam. Adelidae. – P. Wytsman (ed.), Genera Insectorum. Fasc. 133. – V. Verteneuil & L. Desmet, Bruxelles. 12 pp., 1 pl.

Nielsen, E. S. 1980. A cladistic analysis of the Holarctic genera of adelid moths (Lepidoptera: Incurvaroidea). – Entomologica Scandinavica **11**: 161–178.

Nielsen, E. S. 1985. The nomenclature of the two species named *Tinea pfeifferella* by J. Hübner (1813) (Lepidoptera: Heliozelidae, Adelidae). – Entomologist's Gazette **36**: 23–27.

Nieukerken, E. J. van. 2003. Comment on the proposed conservation of the specific name of *Nemotois violellus* Herrich-Schaeffer in Stainton, 1851 (currently *Nemophora violella*; Insecta, Lepidoptera). – Bulletin of Zoological Nomenclature **60**: 54–57.

Nye, I. W. B. & Fletcher, D. S. 1991. The generic names of moths of the world. Vol. 6. Microlepidoptera. – Natural History Museum, London. xxix + 368 pp.

Peyerimhoff, H. de. 1872. Description de quelques Lépidoptères nouveaux ou peu connus. – Annales de la Société Entomologique de France (ser. 5) **2**: 7–17.

Poda, N. 1761. Insecta musei Græcensis, quæ in ordines, genera et species juxta Systema Naturae Caroli Linnaei. – Hæredum Widmanstadii, Græcii. 18 + 127 pp., 2 pls.

Powell, G. A. 1969. A synopsis of Nearctic Adelid moths, with descriptions of new species (Incurvariidae). – Journal of Lepidopterists' Society **23**: 211–240.

Razowski, J. 1978. Heteroneura, Adeloidea. Motyle (Lepidoptera) Polski, Cz. III. Monografie fauny Polski **8**. – Panstwowe Wydawnictwo Naukowe, Warszawa & Kraków. 137 pp., 11 pls.

Reiprich, A. 1978. *Adela basella* Eversman – eine neue Schmetterlingsart für Mitteleuropa aus Slovensky Ray in der Slowakei (Lep. Incurvariidae). – Biologia (Bratislava) **33**: 423–430.

Sommerer, M. D. 2002. To agree or not to agree: The question of gender agreement in the International Code of Zoological Nomenclature. – Nota lepidopterologica **25**: 191–204.

Suomalainen, E. 1978. Two new cases of parthenogenesis in moths. – Nota lepidopterologica **1**: 65–68.

Vives Moreno, A. 1991. Catálogo sistemático y sinonimico de los Lepidopteros de la Peninsula Iberica y Baleares (Insecta: Lepidoptera). – Ministerio de Agricultura, Madrid. 378 p.

Wocke, M. F. 1871. Microlepidoptera. Pp. 201–346. – *In:* O. Staudinger & M. F. Wocke, Catalogue ou Enumération Méthodique des Lépidoptères qui habitent le territoire de la Faune Européenne. – Dresden.

Wojtusiak, J. 1996. Adelidae. Pp. 28–29. – *In:* O. Karsholt & J. Razowski (eds.). The Lepidoptera of Europe: A distributional checklist. – Apollo Books, Stenstrup.

Zaguljaev, A. K. 1978. Fam. Adelidae – long-horn moths. Pp. 92–112. – *In:* G. S. Medvedev (ed.), Key for determination of Insects of the European Part of the USSR. Vol. IV, Lepidoptera, pt. 1. – Nauka, Leningrad. [in Russian]

Zeller, P. C. 1839. Versuch einer naturgemäßen Einteilung der Schaben. – Isis von Oken **23**: 167–219.

Zeller, P. C. 1853. Sieben Tineaceen-Gattungen. – Linnaea Entomologica **8**: 1–87.