

# World Catalog of the Family Carnidae (Diptera, Schizophora)

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## ABSTRACT

A comprehensive catalog of all 95 species of Carnidae (Diptera, Schizophora) including all citations.

## INTRODUCTION

The Carnidae are quite small (1-2 mm) black flies and probably due to their small size, they have not attracted a great degree of study. One notable exception is *Carnus hemapterus* Nitzsch, which is parasitic on birds, and was therefore the centre of several studies. Most species of the Carnidae are saprophagous and are associated with carrion, faeces, or bird's nests. Worldwide there are six genera with 93 extant and two fossil species.

Information on morphology, biology, classification, and distribution of the Carnidae can be found in Hennig (1937), Sabrosky (1987), and Papp (1998a), with some information on morphology present in Brake (2000b) and the European distribution in Ozerov (2010). The Nearctic species of the genus *Meoneura* were revised by Sabrosky (1959), and the genus *Carnus* was revised by Grimaldi (1997). A key to genera was published by Sabrosky (1987), Papp (1998a), and Buck & Marshall (2007).

The phylogeny of the Carnidae was discussed by Hennig (1972), Grimaldi (1997), Buck (2006), and Buck & Marshall (2007). *Meoneura* and *Carnus* are sister groups with the latter probably arising from within *Meoneura*. Sister group to *Meoneura*+*Carnus* is *Enigmocarnus*, and sister group to these three genera is *Hemeromyia*. The sister group to the latter group is a clade consisting of *Neomeoneurites* and the fossil genus *Meoneurites*.

The position of the family within the Schizophora was discussed by Griffiths (1972), J. K. McAlpine (1989) and Buck (2006). According to Buck's phylogenetic analysis Carnidae belong to the superfamily Carnoidea. The only genus of the Australimyziidae, *Australimyza* Harrison, has previously been included in the Carnidae by Colless & D. K. McAlpine (1970, 1974) and Grimaldi (1997). However according to Buck (2006) the Australimyziidae are the sister group to Inbiomyiidae and are therefore not included in the Carnidae. A revision of the genera *Meoneura* Rondani and *Hemeromyia* Coquillett is badly needed as well as a phylogenetic study of the family.

The starting point for this catalog was a compilation of the following catalogs and checklists:

Catalogs: Sabrosky 1965 (Nearctic), 1973 (Neotropical), 1977 (Oriental); Papp 1984 (Palearctic). Checklists: Hackman 1980 (Finland); Nowakowski 1991 (Poland); Canzoneri et al. 1995 (Italy); Roháček 1997 (Czech and Slovak Republics); Chandler 1998a (United Kingdom); Papp 1998b (Switzerland); Brake 1999 (Germany); Chandler et al. 2001 (Denmark), Beuk 2002 (Netherlands); Carles-Tolrá & Báez 2002 (Spain); Freidberg (Israel, pers. comm.).

All data from these summaries were checked against the original literature, and these papers and numerous others were comprehensively screened for nomenclatural and other data. Additional names, published subsequent to the regional catalogs, were entered from the original literature. Literature published before the end of 2009 is included and the 2009 Zoological Record was the last one checked. A few misspellings are included but this is by far not comprehensive. Only the first page on which information about Carnidae occurs has been given for all citations. Bird names were validated using Avibase (<http://avibase.bsc-eoc.org/avibase.jsp>). Collection acronyms and serial abbreviations are given in another chapter of this book. Most of the data in this comprehensive catalog are available online at [www.diptera.myspecies.info](http://www.diptera.myspecies.info), which has species pages for all Carnidae species.

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## TABLE OF GENERA

The following table lists the extant genera of Carnidae in the order found in the catalog, with a summary of the number of extant species known from each zoogeographic region. The number in the total column can be less than the sum of those in individual regions if a species is known from more than one region.

TAXON	DISTRIBUTION						Total
	NE	NT	PA	AF	OR	AU	

<b>Carnus</b> Nitzsch	4		1		1	5
<b>Enigmocarnus</b> Buck	1					1
<b>Hemeromyia</b> Coquillett	2		5	1		8
<b>Meoneura</b> Rondani	13	1	64	5	3	77
<b>Neomeoneurites</b> Hennig		2				2
<b>TOTALS</b>	20	3	70	6	4	93

### KEY TO WORLD GENERA

1. Wing usually broken off, leaving a short stub; if wing complete, crossvein dm-cu absent. Female with abdominal sternites 1-5 absent; membrane with numerous setiferous sclerotized spots ..... *Carnus* Nitzsch
  - Wing complete; posterior crossvein dm-cu present. Female with all abdominal sternites present; membrane usually sparsely bristled ..... 2
2. Frons with 1 medioclinate anterior and 3 reclinate posterior orbital setae; antennae separated across midline by broad, flat, median facial carina. Scutellum with 2-3 pairs of setae, anepisternum bare ..... 5
  - Frons with 2 medioclinate anterior and 2 laterocline posterior orbital setae, antennae separated only by narrow carina. Scutellum with 2 pairs of setae, anepisternum with setulae and one or more setae ..... 3
3. Wing with cell dm long; crossveins r-m and dm-cu widely separated. C extending to M; M distinct; cell cup closed; A1 strong.....*Hemeromyia* Coquillett
  - Wing with cell dm short; crossveins r-m and dm-cu narrowly separated. C ending at R<sub>4+5</sub>; cell cup open; A1 weak, streak-like ..... 4
4. Head setae dark. Thorax not strongly grey microtomentose ..... *Meoneura* Rondani
  - Head setae pale. Thorax strongly grey microtomentose .....*Enigmocarnus* Buck
5. Face with lower margin and vibrissal angle projected well in front of eye; eye oval, long axis inclined anteroventrally. R<sub>4+5</sub> and M converging near apex, costal sector between R<sub>2+3</sub> and R<sub>4+5</sub> longer than sector between R<sub>4+5</sub> and M.....*Neomeoneurites* Hennig
  - Face with lower margin and vibrissal angle not projected in front of eye; eye roundish. R<sub>4+5</sub> and M not converging, costal sector between R<sub>2+3</sub> and R<sub>4+5</sub> shorter than sector between R<sub>4+5</sub> and M ..... *Meoneurites* Hennig (fossil)

## FAMILY CARNIDAE NEWMAN

**CARNITES** Newman, 1834: 379, 396. Type genus: *Carnus* Nitzsch, 1818. Frey 1921a: 149 [family status, morphology of proboscis]; Hennig 1937: 1 [revision of family (diagnosis, morphology, phylogenetic relationships, distribution, biology, keys), Palaearctic genera and species], 1939: 83 [phylogenetic relationships, male terminalia], 1958: 655 [groundplan and phylogenetic relationships], 1971a: 9 [phylogenetic relationships, apomorphic characters], 1971b: 16 [morphology of frons], 1972: 9 [phylogenetic relationships, apomorphic characters, description of spermathecae, key to genera]; Cole 1969: 388 [key to genera]; Speight 1969: 390 [morphology of prothorax, phylogenetic relationships]; Stackelberg 1970: 594 [key to species in European part of Russia]; Griffiths 1972: 235 [description of male terminalia, phylogenetic relationships], 1984: 2 [phylogenetic relationships]; Colless & McAlpine 1970: 727 [*Australimyza* included in Carnidae], 1974: 95 [*Australimyza* included in Carnidae]; Andersson 1977: 22 [phylogenetic relationships]; Papp 1978c: 32 [Hungarian fauna, keys to genera and species, generic diagnoses, biological and faunistic data], 1984: 118 [diagnosis, Palaearctic catalog], 1998a: 211 [diagnosis, biology, classification, distribution, key to Palaearctic genera]; McAlpine, D. K. 1982: 114 [phylogenetic relationships]; Roháček 1982: 7 [fauna of peat-bogs, Czech Republic]; Arnett 1985: 690 [American fauna]; Sabrosky 1987: 909 [diagnosis, biology, classification, distribution, key to Nearctic genera]; McAlpine, J. F. 1989: 1471 [phylogenetic relationships]; Barraclough 1994: 15 [review, Southern African fauna, key to genera, Afrotropical catalog]; Wheeler 1994: 439 [phylogenetic relationships, male terminalia]; Grimaldi 1997: 18 [generic relationships, evolution of host use]; Brake 2000b: 1 [phylogenetic relationships]; Buck & Marshall 2007: 9 [key to genera, phylogenetic relationships, evolution of male protandrium].

### Genus CARNUS Nitzsch

*Carnus* Nitzsch, 1818: 305. Type species: *hemapterus* Nitzsch, by monotypy. Egger 1854: 3 [etymology, generic diagnosis]; Brauer 1880a: 117 [as *Carnus* Egger, descriptive notes on larva]; Collin 1911a: 233 [synonymization of *Cenchrudobia*]; Stobbe 1913: 192 [discussion, history]; Hennig 1937: 72 [diagnosis]; Grimaldi 1997: 1 [diagnosis, revision, phylogenetic relationships].

*Cenchrudobia* Schiner, 1862: 435. Type-species: *eggeri* Schiner, by monotypy [= *hemapterus* Nitzsch]. Brauer 1880b: 40 [larval description, phylogenetic relationships]. Syn. Collin 1911.

*floridensis* Grimaldi. NE: Florida.

*Carnus floridensis* Grimaldi, 1997: 12. USA. Florida: Wakulla Co. (84.3 W, 30.2 N). HT ♂ AMNH. Grimaldi 1997: 12 [on woodpecker nestling, figures of head, male abdomen and terminalia, female abdomen].

**hemapterus** Nitzsch. **PA:** widesp. in Europe; Egypt, Israel, Japan; **NE:** widesp.; **OR:** India.

*Carnus hemapterus* Nitzsch, 1818: 306. Germany. Sachsen. ST 1♂6♀ [no types found in MLUH and NMW]. Nitzsch 1818: 306 [on *Sturnus vulgaris*]; Germar 1822: tab. 24 [citation, figure of habitus]; Egger 1854: 5 [diagnosis, on *Falco tinnunculus*]; Collin 1911b: 138 [history, systematic position, synonymization of *C. eggeri*], 1939: 153 [comparison to *Meoneura*, United Kingdom]; de Meijere 1913: 1 [diagnosis, description of egg and puparium, phylogenetic relationships, history, figures of head, proboscis, rudiment of wing, wing, halter, male terminalia, male and female habitus, egg, and puparium, on *Sturnus vulgaris*, *Sylvia atricapilla*], 1928: 46 [Netherlands], 1946: 18 [Netherlands]; Grandi 1951: 473 [list of hosts]; Stobbe 1913: 192 [discussion, history, on *Aquila imperiale*, *Falco cherrug*]; Engel 1919: 249 [on *Jynx torquilla*, Germany]; Nöller 1920: 149-167 [biology, on *Sturnus vulgaris*, *Tyto alba*]; Frey 1921a: 151 [morphology of proboscis, figure of proboscis], 1921b: 102 [citation], 1941: 30 [checklist, Finland]; Mercier 1928: 529 [wing musculature, sections]; Séguy 1929: 67 [list of hosts, figures of male and female habitus], 1930: 180 [citation], 1934: 631 [list of hosts, figures of male and female habitus]; Wegelin 1933: 105 [on *Passer domesticus*, *Sturnus vulgaris*, *Jynx torquilla*, *Sylvia atricapilla*, *Falco cherrug*, “Ostpreußen“, Romania, Switzerland]; Eichler 1936: 107 [list of hosts, Germany]; Nordberg 1936: 44 [in nest of *Falco peregrinus*, *Corvus cornix*, *Pica pica*, *Fringilla coelebs*, *Regulus regulus*, *Turdus philomelus*, *T. iliacus*, *Haliaeetus albicilla*, *Certhia familiaris*, *Periparus ater*, *Poecile atricapillus*, *Phoenicurus phoenicurus*, *Delichon urbicum*, *Corvus monedula*, *Sturnus vulgaris*, *Dendrocopos major*, *Dryocopus martius*, *Aegolius funereus*, *Columba livia*, *C. oenas*, mainly in nests in caves and above ground, ecology, preferences, Finland]; Hennig 1937: 6 [diagnosis, synonymization of *C. setosus*, figures of head, wing, male and female terminalia, and puparium, Germany], 1952: 282 [citation], 1972: 14 [figure of ovipositor]; Bequaert 1942: 140 [on *Colaptes auratus*, ?*Otus asio*, taxonomy, distribution, list of hosts, bionomics, biology, New York, ?Florida (probably *C. floridensis* acc. to Grimaldi 1997)]; Kloet & Hincks 1945: 403 [checklist, Britain], 1976: 82 [checklist, Britain]; Büttiker 1946: 234 [figure of male habitus, list of hosts, Switzerland]; Balat & Bauer 1955: 103 [on *Falco vespertinus*, *F. tinnunculus*]; Stackelberg 1958: 189 [North European Russia]; Hicks 1962: 254 [citation], 1971: 159 [citation]; Sabrosky

1965: 729 [Nearctic catalog, California, Arizona, New York, New Brunswick, Florida, Mexico], 1977: 275 [Oriental catalog, India], 1987: 909 [figure of head, wing, and female habitus]; Lloyd & Philip 1966: 414 [on *Buteo jamaicensis calurus*, *Falco mexicanus*, *F. sparverius*, Utah]; Steyskal 1966: 116 [on *Corvus corax tingitanus*, Egypt]; Maa 1968: 33 [on *Ardea cinerea*, figures of head, proboscis, abdomen and male terminalia, Netherlands]; Wilson 1968: 251 [on *Sturnus vulgaris*, Indiana]; Cole 1969: 388 [Arizona, California]; Capelle & Whitworth 1973: 525 [distribution, list of hosts, figures of female habitus and puparium, North America]; Büttiker & Aeschlimann 1974: 298 [list of hosts, figure of male habitus, Europe]; Büttiker 1975: 311 [list of hosts, figure of female habitus, Switzerland]; Wilson & Bull 1977: 172 [on *Dryocopus pileatus*, Oregon]; Papp 1978c: 36 [Hungary], 1984: 119 [Palaeartic catalog, Italy, Central & South European Russia, Sweden, former Yugoslavia], 1998a: 214 [figures of third instar larva and puparium], 1998b: 296 [checklist, Switzerland]; Hackman 1980: 152 [checklist, Finland]; Guigan et al. 1983: 54 [biology, distribution, France]; Andersson 1985: 117 [Sweden]; Roháček 1985: 198 [on *Pica pica*, Czech Republic, Slovakia], 1997: 79 [checklist, Czech Republic, Slovakia], 1999: 328 [Czech Republic]; Cannings 1986a: 38 [on *Aegolius acadicus*, British Columbia], 1986b: 83 [biology]; Gregor 1986: 184 [catalog, Slovakia], 1987: 261 [checklist, Czech Republic, Slovakia]; Ferrar 1987: 101 [citation]; Walter & Hudde 1987: 251 [list of hosts, biology, Germany]; Freidberg 1988: 290 [Israel]; Kirkpatrick & Colvin 1989: 109 [biology, on *Tyto alba*, New Jersey]; Nowakowski 1991: 219 [checklist, Poland]; Canzoneri et al. 1995: 25 [checklist, Italy]; Carles-Tolrá 1995b: 50 [in Moerike trap, males in pig liver trap, Spain]; Schmidt 1995: 127 [biology, on *Milvus milvus*, *Gypaetus barbatus*, *Aquila pomarina*, list of hosts, Germany]; Krištofik et al. 1996: 559 [biology, on *Merops apiaster*, Slovakia]; Poole 1996: 81 [Nearctic checklist]; Dawson & Bortolotti 1997: 2021 [biology]; Grimaldi 1997: 6 [diagnosis, list of hosts, biology, description of larva, figures of male terminalia, female abdomen, distribution, British Columbia, New Brunswick, Ontario, Colorado, Indiana, Maryland, Massachusetts, New Jersey, New York, Rhode Island, Utah, Hungary, Sweden, Switzerland, Egypt]; Müller 1997: 93 [on *Ciconia ciconia*, Germany]; Chandler 1998a: 144 [checklist, United Kingdom]; Roulin 1998: 265 [biology, on *Tyto alba*, Switzerland], 1999: 205 [biology, on *Tyto alba*, Switzerland]; Brake 1999: 138 [checklist, Germany], 2010b [photos of habitus]; Lacinia 1999: 29 [biology, on *Falco tinnunculus*]; Iwasa et al. 2000: 265 [in external auditory meatus of human, Japan]; Petrescu & Adam 2000: 221 [on *Merops apiaster*, Romania], 2001: 315 [on *Merops apiaster*, photo of female, Romania]; Carles-Tolrá & Blasco-Zumeta 2001: 52 [in *Juniperus thurifera* forest, Spain]; Fargallo

et al. 2001: 236 [biology, on *Falco tinnunculus*, Spain]; Liker et al. 2001: 574 [biology, on *Sturnus vulgaris*, Hungary]; Roulin et al. 2001: 103 [biology, on *Tyto alba*, Switzerland]; Beuk 2002: 278 [checklist, Netherlands]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Roulin et al. 2003: 75 [biology, on *Tyto alba*, *Falco tinnunculus*, Switzerland]; Heddergott 2003: 201 [biology, on *Falco t. tinnunculus*], 2005: 77 [Germany]; Valera et al. 2003: 245 [biology, on *Merops apiaster*, *Petronia petronia*, Spain]; Jánoškova et al. 2005: 84 [Slovakia]; Jánošková & Sobeková 2006: 74 [on *Passer montanus*, Slovakia]; Hansen 2006: 313 [on *Phalacrocorax carbo*, Denmark], 2007: 31 [figures of habitus, ecology, on *Phalacrocorax carbo*, Denmark]; Martín-Vivaldi et al. 2006: 468 [ecology, Spain]; Valera et al. 2006: 247 [ecology, in nest of *Coracias garrulus*, *Athene noctua*, *Upupa epops*, *Merops apiaster*, Spain]; Valera et al. 2006: 179 [biology, Spain]; Bährmann 2007: 8 [collecting methods, Germany]; Jamriska & Meliskova 2007: 143 [on *Strix aluco*, Slovakia]; López-Rull et al. 2007: 131 [ecology, *Sturnus vulgaris*, Spain]; Iwasa et al. 2008: 47 [biology, on *Corvus corone*, *Eurystomus orientalis*, *Dendrocopos major*, Japan]; Calero-Torrallbo & Valera 2008: 1343 [ecology, on *Merops apiaster*, Spain]; Matyukhin & Krivosheina 2008: 124 [on *Corvus frugilegus*, *Corvus cornix*, Central European Russia]; Roulin et al. 2008: 465 [biology, on *Tyto alba*, Switzerland]; Miguel Aviles et al. 2009: 993 [ecology, on *Sturnus unicolor*, Spain]; Stuke 2009: 86 [citation]; Wiebe 2009: 166 [ecology, on *Colaptes auratus*, British Columbia].

*Cenchrudobia eggeri* Schiner, 1862: 436. Austria. ST 1♂ NMW. Schiner 1862: 436 [on *Falco tinnunculus*]; Brake 2009: 74 [information on type material], 2010b [photos of syntype]. Syn. Collin 1911b.

*Carnus setosus* Stobbe, 1913: 193. Austria. ST 2♂ NMW [originally ST 2♂2♀]. Stobbe 1913: 193 [on *Dendrocopos major*]; Brake 2009: 74 [information on type material], 2010b [photos of syntype]. Syn. Hennig 1937.

*Carnus haemapterus*; Newman, 1834: 397 [ae with ligature]. Misspelling.

*Carnus haemapterus*; Egger 1854: pl. I [ae without ligature]. Misspelling. Balat & Bauer 1955: 103; Barraclough 1994: 17; Roulin et al., 2003: 75; de Neve et al. 2007: 765 [ecology, on *Pica pica*, Spain]; Ortega & Espada 2007: 386 [ecology, on *Bubo bubo*, Spain]; Roulin et al. 2007: 704 [ecology, on *Tyto alba*, Switzerland]; Václav et al. 2008: 464 [ecology, on *Coracias garrulus*, Spain].

*Carnus hemapterus*; Roulin et al., 2003: 77. Misspelling.

*Carnus hematerus*; Westneat et al. 2004: 18. Misspelling. Westneat et al. 2004: 18 [on *Passer domesticus*].

*mexicana* Grimaldi. **NE:** Durango.

*Carnus mexicana* Grimaldi, 1997: 13. Mexico. Durango: 10 mi W' Pueblo Nuevo [= El Salto] (105.4 W, 23.7 N). HT ♂ CNC. Grimaldi 1997: 13 [on flicker (?*Colaptes* sp.), figures of head, male terminalia, female abdomen].

*occidentalis* Grimaldi. **NE:** California, Idaho, Utah.

*Carnus occidentalis* Grimaldi, 1997: 11. USA. Utah: Box Elder Co., Mantua, Devil's Gate (111.9 W, 41.4 N). HT ♂ AMNH. Grimaldi 1997: 11 [on flicker (?*Colaptes* sp.), *Falco peregrinus anatum*, *F. sparvarius*, *Tyto alba*, hawk nest; figures of head, male abdomen and terminalia, wing, SEM of female habitus, head, larva, California, Idaho].

*orientalis* Maa. **OR:** Malaysia.

*Carnus orientalis* Maa, 1968: 33. Malaysia. Selangor, "Rantau Panjang". HT ♀ BBM. Maa 1968: 33 [on *Ketupa ketupu*, figures of head, proboscis, abdomen and male terminalia]; Sabrosky 1977: 275 [Oriental catalog]; Grimaldi 1997: 11 [diagnosis].

### unnamed species

*Carnus* sp. n. in De Coninck 1986: 49 [on *Halcyon albiventris*]; Barraclough 1994: 16 [citation, Zaire]; Grimaldi 1997: 13 [citation].

*Carnus* spp. in Grimaldi 1997: 13 [Mexico].

*Carnus* sp. in Séguy 1955: 135 [in nest of falcons, *Dryobates*, eagle, starlings, "mésanges"]; Hicks 1962: 254 [citation].

### Genus ENIGMOCARNUS Buck

*Enigmocarnus* Buck, 2007: 10. Type-species: *chloropiformis* Buck, by original designation.

*chloropiformis* Buck. **NE:** Texas.

*Enigmocarnus chloropiformis* Buck, 2007: 11. USA. Texas: Bastrop Co., Colorado River E Utley at Rd. 969. HT ♂ DEBU. Buck 2007: 10 [figures of habitus, wing, male terminalia].



## Genus HEMEROMYIA Coquillett

*Hemeromyia* Coquillett, 1902: 190. Type-species: *obscura* Coquillett, by original designation. Melander 1913b: 169 [synonymization of *Paramadiza*]; Hendel 1920: 71 [review]; Hennig 1937: 58 [diagnosis]; Papp 1979: 108 [key to Palaearctic species]; Deeming & Báez 1984: 241 [key]; Wheeler 1994: 439 [discussion of male terminalia].

*Paramadiza* Melander, 1913a: 245. Type-species: *washingtona* Melander, by original designation. Syn. Melander 1913b.

*afghanica* Papp. **PA:** Afghanistan.

*Hemeromyia afghanica* Papp, 1979: 108. Afghanistan. Kabul: “Bini Hesar” (69.3 E, 34.5 N). HT ♂ HNHM. Papp 1979: 108 [reared from manure, figure of male surstylus], 1984: 120 [Palaearctic catalog].

*anthracina* Collin. **PA:** Czech Republic to Ukraine, s. to Spain and Egypt; Canary Is.

*Hemeromyia anthracina* Collin, 1949: 222. Egypt. Matruh: Siwah, Wahat [= Siwa Oasis], “Mariout” (25.7 E, 29.2 N). HT ♀ UMO. Papp 1977a: 176 [reared from pigeon faeces, Hungary], 1978c: 36 [Hungary], 1984: 120 [Palaearctic catalog]; Deeming & Báez 1984: 241 [description of male, figures of head and male terminalia, Spain (Canary Islands)]; Roháček & Gregor 1984: 19 [Czech Republic]; Gregor 1987: 261 [checklist, Czech Republic]; Carles-Tolrá 1992c: 346 [on house windows, decaying vegetation, dog faeces, Spain], 1994: 19 [Spain], 1997: 7 [Spain], 2004: 189 [on Apiaceae, Spain]; Pont 1995: 34 [information on type material]; Roháček 1997: 79 [checklist, Czech Republic]; Korneyev 1999: 34 [Ukraine]; Carles-Tolrá & Báez 2002: 150 [catalog, Andorra, Canary Islands, Spain]; Valera et al. 2006: 247 [ecology, in nest of *Upupa epops*, Spain]; pers. note [Greece].

*australis* Barraclough. **AF:** Namibia.

*Hemeromyia australis* Barraclough, 1994: 19. Namibia. “Aar Farm”. HT ♂ BMNH. Barraclough 1994: 19 [figures of head and wing].

*longirostris* Carles-Tolrá. **PA:** Andorra, Hungary, Spain.

*Hemeromyia longirostris* Carles-Tolrá, 1992a: 63. Spain. Madrid: Madrid (3.7 W, 40.4 N). HT ♂ coll. Carles-Tolrá. Carles-Tolrá 1992a: 63 [on *Achillea filipendulina*, figures of head and male terminalia], 2004: 189 [on Apiaceae, Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Andorra, Spain]; Valera et al.

2006: 247 [ecology, in nest of *Upupa epops*, Spain]; Brake 2010a [discussion].

*Hemeromyia longicornis*; Papp 2003: 334. Misspelling. Papp 2003: 334 [Hungary].

*Hemeromyia remotinervis*; Papp 1977a: 175. Correction of identification by Papp 2003.

**obscura** Coquillett. **NE:** California to Texas.

*Hemeromyia obscura* Coquillett, 1902: 190. USA. New Mexico: Las Vegas Hot Springs (105.3 W, 35.7 N). HT ♀ USNM. Aldrich 1905: 649 [catalog, North America]; Malloch 1913: 145 [description of type, New Mexico, Texas]; Sabrosky 1965: 728 [Nearctic catalog, Arizona, California]; Cole 1969: 388 [citation]; Poole 1996: 81 [Nearctic checklist]; Brake 2010b [photos of habitus].

**remotinervis** (Strobl). **PA:** France to Hungary, s. to Greece; ?Egypt.

*Agromyza remotinervis* Strobl, 1902: 504. Croatia. Zadarsko-Kninska: Zadar [= Zara] (15.2 E, 14.1 N). HT ♀ NMBA.

*Agromyza remotinervis* Strobl, 1904: 566. Croatia. Zadarsko-Kninska: Zadar [= Zara] (15.2 E, 14.1 N). HT ♀ NMBA. [German translation of Strobl 1902].

*Hemeromyia remotinervis*. Hendel 1920: 71 [generic combination, description of type, figures of head and wing]; Hennig 1937: 58 [diagnosis]; Coe 1968a: 125 [Macedonia, former Yugoslavia], 1968b: 140 [Macedonia, former Yugoslavia]; Dainat et al. 1971: 103 [attracted to *Clathrus ruber* (mushroom), France]; Papp 1978c: 36 [Hungary], 1984: 120 [Palaeartic catalog, ?Egypt]; Chvála & Götze 2004: 44 [Strobl species-group name]; Chvála 2008: 224 [information on type material]; Brake 2010a [discussion, photos of habitus, Greece].

**vibrissina** Papp. **PA:** Hungary.

*Hemeromyia vibrissina* Papp, 2003: 334. Hungary. Budapest, Pestszentlőrinc, Péterhalmi-erdő, tölgyes, tisztás. HT ♀ HNHM.

**washingtona** (Melander). **NE:** Washington, s. to California and New Mexico.

*Paramadiza washingtona* Melander, 1913a: 246. USA. Washington: Whitman Co., Wawawai (117.4 W, 46.6 N). HT ♀ USNM.

*Hemeromyia washingtona*. Melander 1913b: 169 [synonymization of *H. nitens*]; Sabrosky 1953: 39 [synonymization of *H. nitida*, reared from pupae collected in nest of *Peromyscus truei*], 1965: 728 [Nearctic catalog, California, Idaho, New

Mexico]; Arnould 1966: 149 [list of Melander names]; Coffey 1966: 215 [on cow dung, Washington]; Cole 1969: 388 [short diagnosis]; Ferrar 1987: 101 [citation]; Poole 1996: 81 [Nearctic checklist].

*Hemeromyia nitida* Malloch, 1913: 146. USA. Colorado: Teller Co., Florissant (105.3 W, 38.9 N). HT ♀ USNM. Malloch 1913: 146 [figure of head]. Syn. Sabrosky 1953.

*Hemeromyia nitens* Melander, 1913b: 169. *Nomen nudum*; attributed to Malloch. Sabrosky 1953: 39 [discussion of name]; Sabrosky 1965: 728 [Nearctic catalog]. Syn. Melander 1913b.

### unnamed species

*Hemeromyia* sp. in Griffiths 1972: fig. 134 [figure of male terminalia].

*Hemeromyia* sp. in Sabrosky 1987: 911 [figure of wing].

*Hemeromyia* sp. in Wheeler 1994: 440 [figure of male terminalia].

*Hemeromyia* sp. in Papp 1998a: 212 [figure of head].

*Hemeromyia* sp. in Brake 2000b: 71 [figure of spermathecae].

### Genus MEONEURA Rondani

***Meoneura*** Rondani, 1856: 128. Type-species: *Agromyza obscurella* Fallén, by monotypy. Lioy 1864: 1314 [generic diagnosis]; Hendel 1903: 251 [systematic position, synonymization of *Psalidotus*], 1911: 34 [list]; Malloch 1913: 144 [synonymization of *Anisonevra*]; Collin 1930: 82 [revision, key]; Seguy 1934: 629 [key to French species]; Hennig 1937: 59 [diagnosis, revision of Palaearctic species, key, synonymy of *Agrobia*]; Sabrosky 1959: 17 [revision of Nearctic species, key]; Gregor 1973: 173 [variation, sister species]; Deeming 1976: 31 [checklist, distribution]; Papp 1976: 385 [key to Mongolian species]; Gregor & Papp 1981: 199 [distribution, seasonal incidence and food preference of Czechoslovak species].

*Anisonevra* Lioy, 1864: 1314. Type-species: *Agromyza lacteipennis* Fallén, by monotypy. Syn. Malloch 1913.

*Agrobia* Lioy, 1864: 1313. Type-species: *Agromyza pectinata* Meigen [= *obscurella* Fallén], by monotypy. Syn. Hennig 1937.

*Psalidotus* Becker, 1903: 191. Type-species: *primus* Becker, by monotypy. Syn. Hendel 1903.

*Anisoneura*; Malloch 1913: 144. Misspelling for *Anisonevra* Lioy. Neave, 1939: 204 [Neave gives the u spelling as the original, has a crossreference under the v spelling].

*Meonura*; Cole 1969: 387. Misspelling. Kloet & Hincks 1976: 82.

***acuticerca*** Gregor. **PA:** Andorra, Czech Republic, Greece, Spain.

*Meoneura acuticerca* Gregor, 1973: 138. Czech Republic. Moravia: “Devín in Pavlovské vrchy-hills, Moravia merid“. HT ♂ MMB. Gregor 1973: 138 [on human faeces, figures of male terminalia], 1987: 261 [checklist, Czech Republic]; Gregor & Papp 1981: 200 [on human faeces, Czech Republic]; Papp 1984: 120 [Palaeartic catalog]; Carles-Tolrá 1992c: 346 [on human faeces, Spain], 1994: 19 [Spain]; Roháček 1997: 79 [checklist, Czech Republic], 1999: 328 [Czech Republic]; Carles-Tolrá & Blasco-Zumeta 2001: 52 [in *Juniperus thurifera* forest, Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Andorra, Spain]; Brake 2010a [photo of habitus, Greece].

***algerica*** Hennig. **PA:** Algeria.

*Meoneura algerica* Hennig, 1937: 61. Algeria. “Algeria centr., Hassi Babah”. HT ♂ NMW. Hennig 1937: 61 [figure of wing tip and male terminalia]; Papp 1984: 120 [Palaeartic catalog]; Brake 2009: 74 [information on type material].

***alphabetica*** Carles-Tolrá & Ventura. **PA:** Spain.

*Meoneura alphabetica* Carles-Tolrá & Ventura, 2002: 289. Spain. Girona: “Queralbs, Núria”. HT ♂ coll. Carles-Tolrá. Carles-Tolrá & Ventura 2002: 289 [in white and blue colour dishes]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain].

***alpina*** Hennig. **PA:** Switzerland to Czech Republic, s. to Slovakia; **NE:** California.

*Meoneura alpina* Hennig, 1948: 138. Austria. Niedere Tauern, 1700-1900 m, Neualm near Predigtstuhl or Putzenalm near Sölkeltal. LT ♂ [designated by Rohlfien & Ewald 1970: 444] DEI. Hennig 1948: 138 [on *Veratrum album*]; Papp 1984: 120 [Palaeartic catalog], 1998b: 296 [checklist, Switzerland]; Roháček 1987: 101 [Slovakia], 1997: 79 [checklist, Czech Republic, Slovakia]; pers. note [Austria, California].

***amurensis*** Ozerov. **PA:** Russia.

*Meoneura amurensis* Ozerov, 1986: 84. Russia. Amur Region: Zeya (127.2 E, 53.8 N). HT ♂ ZMM. Ozerov 1986: 84 [figure of male terminalia], 1999: 578 [key, Russian Far East], 2005: 126 [information on type material].

***anceps*** Frey. **PA:** Finland, North European Russia.

*Meoneura anceps* Frey, 1935: 100. Finland. “Lojo bei Torhola“. HT ♂ [?lost]. Frey 1935: 100 [figure of male terminalia], 1941: 30 [checklist, Finland]; Hennig 1937: 62 [diagnosis, Russia]; Stackelberg 1958: 188 [North European Russia]; Hackman 1980: 152 [checklist, Finland]; Papp 1984: 120 [Palaeartic catalog]; Vilkamaa, pers. comm. [holotype not in UZMH, probably lost].

***arctica*** Ozerov. **PA:** Russia, Sweden.

*Meoneura arctica* Ozerov, 1991: 9. Russia. Yamal peninsula, river Shchuch'ya, mouth of river Khey yakha. HT ♂ ZMM. Ozerov 1991: 9 [figures of male terminalia], 2005: 126 [information on type material]; pers. note [Sweden].

***asiatica*** Papp. **PA:** Mongolia, Tunisia.

*Meoneura asiatica* Papp, 1976: 374. Mongolia. Töv [=Central] aimak: “Zargalant“. HT ♂ HNHM. Papp 1976: 374 [on yak and horse faeces, figures of male terminalia], 1978a: 202 [Tunisia], 1984: 120 [Palaeartic catalog].

***atoma*** Papp. **PA:** Netherlands to Czech Republic, s. to Spain and Greece.

*Meoneura atoma* Papp, 1981: 184. Austria. Tirol: Obergurgl (11.0 E, 46.9 N). HT ♂ HNHM. Papp 1981: 184 [figure of male surstylus], 1984: 120 [Palaeartic catalog], 1998b: 296 [checklist, Switzerland]; Roháček & Gregor 1984: 20 [Czech Republic]; Gregor 1987: 261 [checklist, Czech Republic]; Roháček 1997: 79 [checklist, Czech Republic]; Carles-Tolrá & Báez 2002: 150 [catalog, Andorra, Spain]; Brake 2010a [photo of male terminalia, Greece]; pers. note [Netherlands].

***australis*** Deeming. **AF:** South Africa.

*Meoneura australis* Deeming, 1997: 134. South Africa. Western Cape: 5 km W of Clanwilliam (18.9 E, 32.2 S). HT ♂ NMP. Deeming 1997: 134 [on hyrax faeces, figures of male terminalia].

***baluchistani*** Duda. **OR:** Pakistan, Yemen.

*Meoneura baluchistani* Duda, 1936: 337. Pakistan. Baluchistan: Quetta (67.0 E, 30.2

N). ST 1♂2♀ BMNH. Hennig 1937: 62 [diagnosis]; Deeming 1976: 29 [figure of male terminalia], 1998: 156 [Yemen]; Sabrosky 1977: 275 [Oriental catalog].

**bicuspidata** Collin. **PA:** United Kingdom to Poland.

*Meoneura bicuspidata* Collin, 1930: 88. United Kingdom. Scotland: Sutherland, Skelbo sandhills near Dornoch (4.0 W, 57.9 N); England: Cornwall, St. Merryn (5.0 W, 50.5 N); Essex, Frinton-on-Sea (1.2 E, 51.8 N). ST 3♂2♀ UMO; ST 4♂3♀ CUM. Collin 1930: 88 [figure of male terminalia]; Hennig 1937: 63 [diagnosis]; Kloet & Hincks 1945: 403 [checklist, Britain]; Papp 1984: 120 [Palaeartic catalog]; Nowakowski 1991: 219 [checklist, Poland]; Deeming 1995: 61 [on thistles, United Kingdom]; Pont 1995: 38 [information on type material]; Brake 1997: 202 [Germany], 1999: 138 [checklist, Germany]; Chandler 1998a: 144 [checklist, United Kingdom]; Bährmann 2007: 8 [collecting methods, Germany]; Tschirnhaus 2007: 104 [citation]; Stuke 2009: 86 [citation].

*Meonura bicuspidata*; Kloet & Hincks 1976: 82 [checklist, Britain].

**biseta** Deeming. **AF:** Nigeria, Yemen (Socotra).

*Meoneura biseta* Deeming, 1976: 30. Nigeria. Zaria, Samaru. HT ♂ BMNH. Deeming 1976: 30 [figure of male terminalia]; Brake 2010b [photos of holotype]; pers. note [on carrion, Socotra].

**californica** Sabrosky. **NE:** California.

*Meoneura californica* Sabrosky, 1961: 229. USA. California: San Diego Co., Borrego Valley (116.3 W, 33.3 N). HT ♂ USNM. Sabrosky 1961: 229 [in rotten egg trap, figure of male terminalia], 1965: 729 [Nearctic catalog]; Poole 1996: 81 [Nearctic checklist].

**carpathica** Papp. **PA:** Czech Republic, s. to Spain and Romania.

*Meoneura carpathica* Papp, 1977a: 176. Romania. “Homoród-fürdő”. HT ♂ HNHM. Papp 1977a: 176 [figures of male terminalia], 1978c: 46 [Hungary], 1984: 120 [Palaeartic catalog, Austria], 1993a: 89 [on human faeces, Hungary], 1997: 152 [figure of male surstylus]; Gregor & Papp 1981: 200 [on human faeces, Czech Republic, Slovakia]; Roháček 1985: 198 [habitat, Czech Republic, Slovakia], 1997: 79 [checklist, Czech Republic, Slovakia]; Gregor 1986: 183 [catalog, Slovakia], 1987: 261 [checklist, Czech Republic, Slovakia]; Carles-Tolrá 1992c: 347 [on rubbish bag, Spain], 1994: 19 [Spain]; Carles-Tolrá, Isern-Vallverdu &

Pedrocchi-Renault 1993: 36 [Spain]; Roháček & Barták 2001: 386 [Czech Republic]; Carles-Tolrá & Báez 2002: 150 [catalog, Andorra, Spain]; pers. note [Austria].

***caucasica*** Ozerov. **PA:** Russia.

*Meoneura caucasica* Ozerov, 1991: 10. Russia. North Ossetia: Alania, environs of Alagir. HT ♂ ZMM. Ozerov 1991: 10 [figures of male terminalia], 2005: 126 [information on type material].

***compacta*** Gregor. **OR:** ?Afghanistan, Pakistan.

*Meoneura compacta* Gregor, 1971: 55. Pakistan. Hindu Kush, Shekhniyak, Tirich-valley. HT ♂ MMB. Gregor 1971: 55 [on faeces, figures of male terminalia]; Gregor & Daniel 1971: 352 [Pakistan]; Sabrosky 1977: 276 [Oriental catalog]; Papp 1984: 121 [Palaeartic catalog, ?Afghanistan].

***digitata*** Sabrosky. **NE:** Nebraska.

*Meoneura digitata* Sabrosky, 1959: 19. USA. Nebraska: Thomas Co., Halsey (100.3 W, 41.9 N). HT ♂ USNM. Sabrosky 1959: 19 [figure of male terminalia], 1965: 729 [Nearctic catalog]; Poole 1996: 81 [Nearctic checklist]; Grimaldi 1997: 20 [figure of female abdomen].

***elongella*** (Zetterstedt). **PA:** Norway to Finland, s. to Switzerland.

*Agromyza elongella* Zetterstedt, 1838: 790. Sweden. Vasterbottens Lan: Lycksele (18.7 E, 64.6 N). HT ♀ ZIL. Danielsson 2005 [information on type material].

*Meoneura elongella*. Collin 1911a: 233 [generic combination]; Hennig 1937: 63 [diagnosis]; Deeming 1976: 29 [Norway]; Hackman 1980: 152 [checklist, Finland]; Papp 1984: 121 [Palaeartic catalog], 1998b: 296 [checklist, Switzerland].

*Agromyza elongula*; Becker 1905: 243 [Palaeartic catalog]. Misspelling.

***exigua*** Collin. **PA:** Denmark to Slovakia, s. to Spain and Greece.

*Meoneura exigua* Collin, 1930: 84. France. Midi-Pyrénées: Toulouse (1.4 E, 43.6 N). ST 2♂2♀ and a third male terminalia mount BMNH [originally ST 3♂4♀]. Collin 1930: 84 [bred from damaged puparium of *Sarcophaga*, figure of male terminalia]; Hennig 1937: 63 [diagnosis], 1950: 53 [attracted to carrion, Germany]; Papp 1984: 121 [Palaeartic catalog, ?former Czechoslovakia], 2001:

286 [Hungary]; Ferrar 1987: 101 [citation]; Roháček 1987: 101 [Slovakia], 1997: 79 [checklist, Czech Republic, Slovakia]; Carles-Tolrá 1992c: 347 [on carrion and dog faeces, Spain], 1994: 19 [Spain]; Pont 1995: 67 [information on type material]; Chandler et al. 2001: 189 [checklist, Denmark]; Carles-Tolrá & Blasco-Zumeta 2001: 52 [in *Juniperus thurifera* forest, Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Brake 2010a [photos of habitus and male terminalia, Greece].

*falcata* Papp. **PA:** Austria, Switzerland.

*Meoneura falcata* Papp, 1997: 152. Austria. Pillersee. HT ♂ HNHM. Papp 1997: 152 [figure of male terminalia, in larch forest], 1998b: 296 [checklist, Switzerland]; Stuke 2010 [photo of male terminalia].

*flabella* Carles-Tolrá. **PA:** Spain.

*Meoneura flabella* Carles-Tolrá, 1992b: 193. Spain. Zaragoza: Pina de Ebro. HT ♂ coll. Carles-Tolrá. Carles-Tolrá 1992b: 193 [figure of male terminalia]; Carles-Tolrá & Blasco-Zumeta 2001: 52 [in *Juniperus thurifera* forest, Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain].

*flavifacies* Collin. **PA:** widesp. in Europe; Mongolia, Russian Far East; **NE:** Alaska and Northwest Territories to Labrador, s. to Oregon, Utah & Michigan.

*Meoneura flavifacies* Collin, 1930: 85. United Kingdom. England: Cornwall, Devon, Hampshire, Essex, Suffolk, Cambridgeshire. ST 10♂8♀1? UMO; ST 2♂ CUM; ST 3♂2♀ BMNH. Collin 1930: 85 [on *Crataegus monogyna*, figure of male terminalia]; Karl 1936: 324 [Poland]; Hennig 1937: 63 [diagnosis, Germany, Poland]; Kloet & Hincks 1945: 403 [checklist, Britain]; de Meijere 1946: 18 [Netherlands]; Stackelberg 1958: 188 [North European Russia]; Sabrosky 1959: 24 [diagnosis, Alaska, British Columbia, Alberta, Manitoba, Ontario, Quebec, Labrador, Colorado, Idaho, North Dakota, Michigan, Oregon, Utah, Washington], 1965: 729 [Nearctic catalog, Alaska and Northwest Territories to Labrador, s. to Oregon, Utah, and Michigan]; Buhl 1961: [colour dish studies, biology, Germany]; Cole 1969: 389 [citation]; Andersson 1971: 235 [Norway, Sweden]; Papp 1976: 375 [Mongolia], 1978b: 202 [in cave, France], 1978c: 45 [Hungary], 1984: 121 [Palaeartic catalog, Austria, Finland, Romania], 1985a: 378 [on sheep faeces, Hungary], 1992: 84 [developing in pasture dung, Hungary], 1993a: 89 [on human faeces, Hungary], 1993b: 110 [in cattle farm, on sheep dung, Hungary], 1995: 159 [on sheep faeces, Hungary], 1998a: 211 [figure of male habitus], 1998b: 296 [checklist, Switzerland], 2007: 128 [on cow faeces,



Hungary]; Hackman 1980: 152 [checklist, Finland]; Gregor & Papp 1981: 200 [on human and cow faeces, Czech Republic, Slovakia]; Nibaruta 1982: 204 [reared from cow faeces, Belgium]; Roháček & Gregor 1984: 19 [on faeces, Czech Republic, Slovakia], Deeming 1985: 143 [United Kingdom]; Gregor 1986: 183 [catalog, Slovakia], 1987: 261 [checklist, Czech Republic, Slovakia]; Ozerov 1986: 85 [Russian Far East], 1999: 579 [key, Russian Far East]; Roháček 1986: 4 [Czech Republic], 1987: 101 [Slovakia], 1997: 79 [checklist, Czech Republic, Slovakia]; De Bruyn 1991: 156 [checklist, Belgium]; Nowakowski 1991: 219 [checklist, Poland]; Carles-Tolrá 1992c: 347 [Spain], 1994: 19 [Spain]; Carles-Tolrá, Isern-Vallverdu & Pedrocchi-Renault 1993: 36 [Spain]; Pont 1995: 72 [information on type material]; Brake 1996: 42 [Netherlands], 1997: 201 [ecology, faunistics, Germany], 1999: 138 [checklist, Germany], 2010a [photos of habitus and male terminalia, Greece]; Poole 1996: 81 [Nearctic checklist]; Chandler 1998a: 144 [checklist, United Kingdom]; Chandler et al. 2001: 189 [checklist, Denmark]; Roháček & Barták 2001: 386 [Czech Republic]; Beuk 2002: 278 [checklist, Netherlands]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Withers 2002: 118 [Ireland]; Bährmann 2007: 7 [collecting methods, Germany]; Stuke 2009: 86 [habitat, Germany]; pers. note [Austria, Germany, Italy, Norway, Poland, Spain, Sweden, California].

*Meonura flavifacies*; Kloet & Hincks 1976: 82 [checklist, Britain].

*Agromyza lacteipennis*; Coquillett 1900: 464. Misidentification. Coquillett 1900: 464 [Alaska]. Correction of identification Sabrosky 1959.

*Meoneura lacteipennis*; Malloch 1913: 144. Misidentification. Malloch 1913: 144 [descriptive notes, figures of wing and forefemur, Alaska, British Columbia]. Correction of identification Sabrosky 1959.

*flavifrons* Papp. **PA:** Spain to Austria, United Kingdom.

*Meoneura flavifrons* Papp, 1981: 185. Austria. Tirol: Obergurgl. HT ♂ IZUI. Papp 1981: 185 [figure of male terminalia], 1984: 121 [Palearctic catalog], 1998b: 296 [checklist, Switzerland]; Carles-Tolrá 1992c: 347 [Spain], 1994: 19 [Spain]; Carles-Tolrá, Isern-Vallverdu & Pedrocchi-Renault 1993: 36 [Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Grayson 2009: 36 [United Kingdom]; Stuke 2010 [photo of male terminalia].

*forcipata* Sabrosky. **PA:** Mongolia; **NE:** Canada (British Columbia).

*Meoneura forcipata* Sabrosky, 1959: 24. Canada. British Columbia: Mt. Revelstoke. HT ♂ CNC. Sabrosky 1959: 24 [figure of male terminalia], 1965: 729 [Nearctic

catalog]; Papp 1976: 375 [discussion of male terminalia, Mongolia], 1984: 121 [Palaeartic catalog]; Poole 1996: 81 [Nearctic checklist]; Cooper & Cumming 2000: 48 [information on type material].

**freta** Collin. **PA:** United Kingdom to Poland, s. to Spain and Hungary; Russian Far East.

*Meoneura freta* Collin, 1937: 251. United Kingdom. Norfolk: Blakeney Point. ST 4♂2♀ UMO. Kloet & Hincks 1945: 403 [checklist, Britain]; Lyneborg 1969: 42 [figures of male terminalia, Spain]; Papp 1978c: 41 [Hungary], 1984: 121 [Palaeartic catalog], 1992: 84 [developing in pasture dung, Hungary], 1995: 159 [on sheep faeces, Hungary], 1998b: 296 [checklist, Switzerland], 2007: 128 [on cow faeces, Hungary]; Gregor & Papp 1981: 200 [on human faeces and decaying fish, Czech Republic, Slovakia]; Gregor 1986: 183 [catalog, Slovakia], 1987: 261 [checklist, Czech Republic, Slovakia]; Roháček 1987: 102 [Slovakia], 1997: 79 [checklist, Czech Republic, Slovakia], 1999: 328 [Czech Republic]; Carles-Tolrá 1992c: 347 [on carrion and dog and cow faeces, Spain], 1994: 19 [Spain]; Pont 1995: 74 [information on type material]; Brake 1997: 201 [ecology, faunistics, on carrion, Germany], 1999: 138 [checklist, Germany]; Chandler 1998a: 144 [checklist, United Kingdom]; Ozerov 1999: 578 [key, Russian Far East]; Chandler et al. 2001: 189 [checklist, Denmark]; Carles-Tolrá & Blasco-Zumeta 2001: 52 [in *Juniperus thurifera* forest, Spain]; Roháček & Barták 2001: 386 [Czech Republic]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Stuke 2009: 86 [citation]; pers. note [Poland].

*Meonura freta*; Kloet & Hincks 1976: 82 [checklist, Britain].

**furcata** Hennig. **PA:** Algeria, Spain.

*Meoneura furcata* Hennig, 1937: 64. Algeria. “Algeria centr., Hassi Babah”. HT ♂ NMW. Hennig 1937: 64 [figure of male terminalia]; Papp 1984: 121 [Palaeartic catalog]; Carles-Tolrá 1995b: 50 [in colour dishes and pitfall with beer, Spain]; Carles-Tolrá & Blasco-Zumeta 2001: 52 [in *Juniperus thurifera* forest, Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Brake 2009: 74 [information on type material].

**glaberrima** Becker. **PA:** widesp. in Europe; Afghanistan, Tunisia.

*Meoneura glaberrima* Becker, 1907c: 548. France. Corsica. LT ♂ [designated by Papp 1977b: 185] ZMHU. Kröber 1935: 77 [Germany]; Hennig 1937: 64 [description of types, figure of male terminalia, probably corsican subspecies of *M. lacteipennis*]; Beshovski 1972: 12 [Bulgaria]; Papp 1977b: 185 [lectotype

designation and description, not subspecies of *M. lacteipennis*], 1978a: 202 [Tunisia], 1979: 106 [Afghanistan], 1984: 121 [Palaeartic catalog]; Ozerov 1994: 140 [notes, synonymization of *M. neglecta*]; Roháček & Barták 2001: 386 [Czech Republic]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Carles-Tolrá 2004: 189 [on Apiaceae, on *Thapsia villosa*, Spain]; pers. note [Germany].

*Meoneura glaberrima* Becker, 1910: 664. France: Corsica. LT ♂ ZMHU.

*Meoneura neglecta* Collin, 1930: 88. United Kingdom. England: Suffolk, Moulton. LT ♂ [designated by Ozerov 1994: 140] UMO. Hennig 1937: 67 [diagnosis, figure of male terminalia, Germany]; Kloet & Hincks 1945: 403 [checklist, Britain]; Stackelberg 1958: 189 [North European Russia]; Papp 1978c: 47 [Hungary], 1984: 121 [Palaeartic catalog], 1985a: 378 [on sheep faeces, Hungary], 1992: 84 [developing in pasture dung, Hungary], 1993b: 113 [on sheep dung, Hungary], 1995: 159 [on sheep faeces, Hungary], 1998b: 296 [checklist, Switzerland]; Hackman 1980: 152 [checklist, Finland]; Gregor & Papp 1981: 201 [in Skufin trap, Czech Republic]; Roháček & Gregor 1984: 19 [Slovakia]; Gregor 1986: 183 [catalog, Slovakia], 1987: 261 [checklist, Czech Republic, Slovakia]; Pont 1995: 114 [information on type material]; Roháček 1997: 79 [checklist, Czech Republic, Slovakia]; Chandler 1998a: 144 [checklist, United Kingdom]; Brake 1999: 138 [checklist, Germany]; Chandler et al. 2001: 189 [checklist, Denmark]; Bährmann 2007: 8 [collecting methods, Germany]. Syn. Ozerov 1994.

*Meonura neglecta*; Kloet & Hincks 1976: 82 [checklist, Britain].

***graeca*** Hennig. **PA:** Greece.

*Meoneura graeca* Hennig, 1972: 8. Greece. Grevená (21.4 E, 40.1 N). HT ♂ SMNS. Hennig 1972: 8 [figures of male and female terminalia, and spermathecae]; Papp 1984: 121 [Palaeartic catalog].

***granadensis*** Lyneborg. **PA:** Spain.

*Meoneura granadensis* Lyneborg, 1969: 42. Spain. Granada. HT ♂ CNC. Lyneborg 1969: 42 [figures of male terminalia]; Papp 1984: 121 [Palaeartic catalog]; Cooper & Cumming 2000: 48 [information on type material]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain].

***helvetica*** Papp. **PA:** Spain, Switzerland.

*Meoneura helvetica* Papp, 1997: 154. Switzerland. “Ftan/Clünas”. HT ♂ Coll.

Bächli. Papp 1997: 154 [figures of male terminalia]; Papp 1998b: 296 [checklist, Switzerland]; Carles-Tolrá & Ventura 2001: 123 [Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Stuke 2010 [photo of male terminalia].

***hennigi*** Gregor. **PA:** Afghanistan, Tajikistan; **OR:** Pakistan.

*Meoneura hennigi* Gregor, 1971: 54. Pakistan. Hindu Kush, Shekhniyak, Tirich-valley. HT ♂ MMB. Gregor 1971: 54 [on faeces and decaying meat, figures of male terminalia]; Gregor & Daniel 1971: 352 [Afghanistan, Pakistan]; Sabrosky 1977: 275 [Oriental catalog]; Papp 1979: 106 [on donkey faeces, montane species, Afghanistan], 1984: 121 [Palaeartic catalog, Tajikistan].

***hungarica*** Papp. **PA:** Spain to Czech Republic, s. to Tunisia and Slovakia.

*Meoneura hungarica* Papp, 1977a: 177. Hungary. Hortobágy N.P., Tiszacsege, Kiskecskés. HT ♂ HNHM. Papp 1977a: 177 [on faeces, figure of male terminalia], 1978a: 202 [Tunisia], 1978c: 44 [Hungary], 1984: 121 [Palaeartic catalog], 1992: 84 [developing in pasture dung, Hungary], 1995: 159 [on sheep faeces, Hungary]; Gregor & Papp 1981: 201 [on human faeces, decaying fish, and carrion, Czech Republic, Slovakia]; Gregor 1986: 183 [catalog, Slovakia], 1987: 261 [checklist, Czech Republic, Slovakia]; Carles-Tolrá 1992c: 347 [on dog and cow faeces, Spain], 1994: 19 [Spain]; Roháček 1997: 79 [checklist, Czech Republic, Slovakia], 1999: 328 [Czech Republic]; Carles-Tolrá & Blasco-Zumeta 2001: 52 [in *Juniperus thurifera* forest, Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Andorra, Spain].

***inversa*** Papp. **PA:** Mongolia.

*Meoneura inversa* Papp, 1976: 375. Mongolia. Bayan-Ölgiy: “im Tal des Flusses Chavcalyn gol“. HT ♂ HNHM. Papp 1976: 375 [figures of male terminalia], 1984: 121 [Palaeartic catalog].

***kaszabi*** Papp. **PA:** Mongolia.

*Meoneura kaszabi* Papp, 1976: 376. Mongolia. Dundgovi [= Mittelgobi]: “Choot bulag, zwischen Chuld und Somon Delgerchangaj“. HT ♂ HNHM. Papp 1976: 376 [in soil traps, figure of male terminalia], 1984: 121 [Palaeartic catalog].

***krivosheinae*** Ozerov. **PA:** Tajikistan.

*Meoneura krivosheinae* Ozerov, 1991: 11. Tajikistan, environs Dzilikulya, reserve “Tigrovaya Balka“. HT ♂ ZMM. Ozerov 1991: 11 [figures of male terminalia],

1994: 140 [comparison with *M. stepposa*], 2005: 127 [information on type material].

*lacteipennis* (Fallén). **PA:** widesp. in Europe; Tunisia.

*Agromyza lacteipennis* Fallén, 1823: 4. Sweden. ST 1? ZIL, ST 5? NRS. Meigen 1830: 183 [diagnosis]; Curtis 1831: 240 [United Kingdom]; Macquart 1835: 612 [Sweden]; Zetterstedt 1838: 789 [diagnosis, Finland, Sweden], 1848: 2768 [diagnosis, on Apiaceae, Asteraceae, and *Carduus*, Finland, Sweden]; Rossi 1848: 81 [Austria]; Schiner 1864: 300 [diagnosis]; Kowarz 1894: 29 [Czech Republic]; Van der Wulp & de Meijere 1898: 136 [Netherlands]; Strobl 1900a: 640 [Bosnia-Herzegovina], 1900b: 61 [Spain], 1902: 504 [Bosnia-Herzegovina], 1904: 566 [German translation of Strobl 1902], 1906: 376 [Spain], 1910: 215 [up to 1800m, Austria]; Verrall 1901: 35 [list, Britain]; Becker 1902: 342 [Meigen specimens]; Aldrich 1905: 648 [catalog, North America]; Czerny & Strobl 1909: 262 [Spain]; Kröber 1910: 103 [Germany]; Kuntze 1913: 551 [France (Corse)]; Kramer 1917: 349 [Germany], 1921: 96 [Germany]; Frey 1918: 27 [North European Russia]; Danielsson 2005 [information on type material]; Pape, pers. comm. [information on type material].

*Meoneura lacteipennis*. Collin 1911a: 233 [generic combination, United Kingdom], 1930: 86 [diagnosis]; Alfken 1924: 457 [Germany]; Wahlgren 1927: 384 [Sweden]; Frey 1935: 101 [Finland], 1941: 30 [checklist, Finland]; Seguy 1934: 631 [France, Tunisia]; Kröber 1935: 77 [Germany]; Karl 1936: 324 [Poland]; Hennig 1937: 65 [diagnosis, figure of male terminalia, Austria, France, Germany, Russia]; Ardö 1957: 140 [in marine dune shore ecosystem, Norway]; Stackelberg 1958: 188 [North European Russia, on *Anthriscus*, *Aegopodium*, *Heracleum*, *Filipendula*, *Sorbaria*]; Buhl 1961: 4 [citation]; Nuorteva & Järvinen 1961: 202 [in nest of *Riparia riparia*, Finland]; Hicks 1971: 159 [citation]; Papp 1977a: 179 [figure of male terminalia], 1978a: 202 [Tunisia], 1978c: 45 [Hungary], 1984: 122 [Palaeartic catalog], 1998b: 296 [checklist, Switzerland]; Hackman 1980: 152 [checklist, Finland]; Ferrar 1987: 101 [citation]; Gregor 1987: 261 [checklist, Czech Republic]; Roháček 1987: 102 [Czech Republic]; De Bruyn 1991: 156 [checklist, Belgium]; Nowakowski 1991: 219 [checklist, Poland]; Bröring et al. 1993: 133 [Germany]; Roháček 1997: 79 [checklist, Czech Republic, Slovakia]; Chandler 1998a: 144 [checklist, United Kingdom]; Brake 1999: 138 [checklist, Germany], 2000a: 161 [Germany], 2000b: 26 [SEM-photo of head, figures of proboscis and female reproductive system], 2010b [photos of habitus and male terminalia]; Chandler et al. 2001: 189 [checklist, Denmark]; Roháček & Barták 2001: 386 [Czech Republic]; Beuk

2002: 278 [checklist, Netherlands]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Carles-Tolrá 2004: 189 [on Apiaceae, Spain]; Pakalniškis et al. 2006: 107 [Lithuania]; Bährmann 2007: 8 [collecting methods, Germany]; Stuke 2009: 87 [citation]; pers. note [on *Anthriscus sylvestris*, Germany]

*Mesoneura lacteipennis*; Alfken 1930: 55 [Germany].

*Meoneura lactipennis*; Kröber 1938: 91 [Germany]. Misspelling.

*Meoneura laeteipennis*; Kloet & Hincks 1945: 403 [checklist, Britain].

*Meonura lacteipennis*; Kloet & Hincks 1976: 82 [checklist, Britain].

***lamellata*** Collin. **PA:** Iceland to North European Russia, s. to France and Hungary; Algeria, Russian Far East; **NE:** Alaska.

*Meoneura lamellata* Collin, 1930: 86. United Kingdom. England: Dorset, Suffolk, Norfolk. ST 18♂5♀ UMO; ST 7♂4♀ BMNH. Collin 1930: 86 [near openings of *Riparia riparia* burrows]; Seguy 1934: 631 [Algeria]; Frey 1935: 101 [Finland], 1941: 30 [checklist, Finland]; Nordberg 1936: 44 [in nest of *Corvus cornix*, *Pica pica*, *Fringilla coelebs*, *Turdus merula*, *Parus major*, *Delichon urbicum*, *Sturnus vulgaris*, Finland]; Karl 1936: 324 [Poland]; Hennig 1937: 66 [diagnosis, figure of male terminalia, Germany, Russia]; Kloet & Hincks 1945: 403 [checklist, Britain]; Brauns 1949: 159 [in *Honckenya*-Zone, Germany]; Ardö 1957: 140 [in marine dune shore ecosystem, Norway, Sweden]; Stackelberg 1958: 188 [North European Russia]; Sabrosky 1959: 23 [diagnosis, in nest of *Riparia riparia*, Alaska], 1965: 729 [Nearctic catalog]; Buhl 1961: 4 [citation]; Nuorteva & Järvinen 1961: 201 [in nest of *Riparia riparia*, Finland]; Hicks 1962: 254 [citation], 1971: 159 [citation]; Andersson 1967: 115 [Iceland]; Pridantseva 1967: 492 [on camel dung, Russia]; Büttiker 1969: 216 [in nest of *Riparia riparia*, Switzerland]; Cole 1969: 389 [citation]; Papp 1978c: 50 [Hungary], 1984: 122 [Palaeartic catalog, Austria, former Czechoslovakia], 1998b: 296 [checklist, Switzerland]; Hackman 1980: 152 [checklist, Finland]; Andersson 1985: 117 [Sweden]; Deeming 1985: 143 [on beach, United Kingdom], 1995: 61 [on thistles, United Kingdom]; Ferrar 1987: 101 [citation]; Nowakowski 1991: 219 [checklist, Poland]; Ólafsson 1991: 52 [checklist, Iceland]; Carles-Tolrá, Isern-Vallverdu & Pedrocchi-Renault 1993: 36 [Spain]; Pont 1995: 95 [information on type material]; Poole 1996: 81 [Nearctic checklist]; Brake 1997: 201 [ecology, faunistics, figure of male habitus, on carrion, reared from faeces and pellets of *Larus argentatus*, Germany], 1999: 138 [checklist, Germany], 2010b [photos of habitus, male terminalia and puparium]; Chandler 1998a: 144 [checklist, United

Kingdom]; Ozerov 1999: 579 [key, Russian Far East]; Chandler et al. 2001: 189 [checklist, Denmark]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Carles-Tolrá 2004: 189 [on Apiaceae, on *Thapsia villosa*, Spain]; Stuke 2009: 87 [Germany]; pers. note [France, Poland].

*Meonura lamellata*; Kloet & Hincks 1976: 82 [checklist, Britain].

***longifurca*** Papp. **PA:** Switzerland.

*Meoneura longifurca* Papp, 1997: 154. Switzerland. Graubünden: Zuoz-Nüd. HT ♂  
Coll. Bächli. Papp 1997: 154 [figure of male terminalia], 1998b: 296 [checklist, Switzerland].

***maritima*** Ozerov. **PA:** Russian Far East.

*Meoneura maritima* Ozerov, 1991: 11. Russia. Far East, Primorskiy Kray, Lazovskiy region, environs of Lazo. HT ♂ ZMM. Ozerov 1991: 11 [figures of male terminalia], 1999: 579 [key, Russian Far East], 2005: 127 [information on type material].

***milleri*** Gregor. **PA:** Czech Republic, Slovakia, Spain.

*Meoneura milleri* Gregor, 1973: 137. Czech Republic. Moravia: “Devín in Pavlovské vrchy-hills, Moravia merid“. HT ♂ MMB. Gregor 1973: 137 [on human faeces, rocky steppe, figures of male terminalia], 1986: 183 [catalog, Slovakia], 1987: 261 [checklist, Czech Republic, Slovakia]; Gregor & Papp 1981: 201 [on human and *Capra aegagrus* faeces, Czech Republic, Slovakia]; Papp 1984: 122 [Palaeartic catalog]; Roháček 1997: 79 [checklist, Czech Republic, Slovakia], 1999: 328 [Czech Republic]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain].

***minuscula*** Papp. **PA:** Hungary.

*Meoneura minuscula* Papp, 1977a: 178. Hungary. Bakony-hg.: Fenyőfő. HT ♂ HNHM. Papp 1977a: 178 [on human faeces, figures of male terminalia], 1978c: 43 [Hungary], 1984: 122 [Palaeartic catalog].

***minutissima*** (Zetterstedt). **PA:** United Kingdom to Finland and North European Russia, s. to Hungary.

*Agromyza minutissima* Zetterstedt, 1860: 6459. Sweden. Skåne: “Kungsmarken“ near Lund. HT ♀ ZIL. Strobl 1893: 134 [dwarf form of *Meoneura vagans* var. *obscurilla*], 1894: 137 [Austria], 1910: 215 [probably var. of *M. lacteipennis*]; Danielsson 2005 [information on type material].

*Agromyza vagans* var. *minutissima*. Strobl 1898a: 270 [Austria], 1901: 244 [Austria].

*Meoneura minutissima*. Collin 1911a: 233 [generic combination], 1930: 85 [type information, diagnosis, figure of male terminalia, United Kingdom]; Hennig 1937: 66 [diagnosis], 1948: 138 [comparison with *M. alpina*]; Frey 1941: 30 [checklist, Finland]; Kloet & Hincks 1945: 403 [checklist, Britain]; Ardö 1957: 140 [in marine dune shore ecosystem, Sweden]; Stackelberg 1958: 188 [North European Russia]; Papp 1978c: 42 [Hungary], 1984: 122 [Palaeartic catalog], 1992: 84 [developing in pasture dung, Hungary], 1998b: 296 [checklist, Switzerland]; Gregor & Papp 1981: 201 [on human faeces, Czech Republic]; Roháček & Gregor 1984: 19 [on faeces, Slovakia]; Gregor 1986: 183 [catalog, Slovakia], 1987: 261 [checklist, Czech Republic, Slovakia]; Roháček 1987: 102 [Slovakia], 1997: 79 [checklist, Czech Republic, Slovakia], 1999: 328 [Czech Republic]; Ozerov 1991: 9 [comparison with *M. arctica*]; Chandler 1998a: 144 [checklist, United Kingdom]; Chandler et al. 2001: 189 [checklist, Denmark]; Bährmann 2007: 8 [collecting methods, Germany].

*Meonura minutissima*; Kloet & Hincks 1976: 82 [checklist, Britain].

*Meoneura minutissima*; Hennig, 1948: 138. Misspelling.

***mongolica*** Papp. **PA:** Mongolia.

*Meoneura mongolica* Papp, 1976: 378. Mongolia. Töv [=Central] aimak: “12 km S von Somon Bajanbaraat“. HT ♂ HNHM. Papp, 1976: 378 [figures of male terminalia], 1984: 122 [Palaeartic catalog].

***moravica*** Gregor & Papp. **PA:** Czech Republic, Greece, Portugal, Spain.

*Meoneura moravica* Gregor & Papp, 1981: 205. Czech Republic. Moravia, Podhradí, Vranov nad Dyji. HT ♂ MMB. Papp 1984: 122 [Palaeartic catalog]; Gregor 1987: 261 [checklist, Czech Republic]; Carles-Tolrá 1992c: 348 [on dog faeces, Spain], 1994: 19 [Spain], 2004: 189 [on Apiaceae, Spain]; Roháček 1997: 79 [checklist, Czech Republic]; Carles-Tolrá & Báez 2002: 150 [catalog, Portugal, Spain]; Brake 2010a [photos of habitus, Greece].

***neottiophila*** Collin. **PA:** widesp. in Europe.

*Meoneura neottiophila* Collin, 1930: 87. United Kingdom. England: Suffolk, Newmarket (0.4 E, 52.3 N); Oxfordshire, Oxford (1.3 W, 51.8 N); Reading (1.0 W, 51.5 N); Hertfordshire, Weston (0.2 W, 52.0 N); Cambridgeshire, Chippenham (0.4 E, 52.3 N). ST 9♂8♀1 (sex ?) UMO, ST 20♂6♀ CUM, ST 2♀ BMNH, ST



4(sex ?) MM. Collin 1930: 87 [bred from old nests of birds, on carrion]; Frey 1935: 101 [Finland], 1941: 30 [checklist, Finland]; Nordberg 1936: 44 [in nest of *Haliaeetus albicilla*, *Accipiter gentilis*, *A. nisus*, *Poecile atricapillus*, *Phoenicurus phoenicurus*, *Corvus monedula*, *Dendrocopos major*, *Aegolius funereus*, *Falco tinnunculus*, *Columba oenas*, Finland]; Hennig 1937: 67 [diagnosis, figure of male terminalia, Germany]; Kloet & Hincks 1945: 403 [checklist, Britain]; Stackelberg 1958: 189 [North European Russia]; Buhl 1961: 4 [citation, reared from humus layer below colony of *Corvus frugilegus*, Germany]; Hicks 1962: 254 [citation]; Papp 1978c: 49 [Hungary], 1984: 122 [Palaeartic catalog, Sweden], 1998a: 214 [figure of puparium], 1998b: 296 [checklist, Switzerland]; Hackman & Meinander 1979: 75 [reared from macrofungus *Leccinum scabrum*, Finland]; Hackman 1980: 152 [checklist, Finland]; Gregor & Papp 1981: 201 [on dead blindworm and decaying fish or meat, Czech Republic]; Andersson 1985: 117 [Sweden]; Ferrar 1987: 101 [citation]; Gregor 1987: 261 [checklist, Czech Republic]; Roháček 1987: 102 [Czech Republic, Slovakia], 1997: 79 [checklist, Czech Republic, Slovakia], 1999: 328 [Czech Republic]; Nowakowski 1991: 219 [checklist, Poland]; Carles-Tolrá 1992c: 348 [on carrion, fungi, decaying fat and pigeon faeces, Spain], 1994: 19 [Spain], 1997: 7 [Spain]; Pont 1995: 114 [information on type material]; Chandler 1998a: 144 [checklist, United Kingdom], 1998b: 29 [on fungus *Pleurotus*], 2002: 158 [on fungus *Polyporus squamosus*]; Brake 1999: 138 [checklist, Germany], 2010b [photos of male terminalia]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Pakalniškis et al. 2006: 107 [Lithuania]; Bährmann 2007: 8 [collecting methods, Germany]; pers. note [on carrion, Germany].

*Meonura neottiophila*; Kloet & Hincks 1976: 82 [checklist, Britain].

*Meoneura* near *neottiophila*. Brake 2010a [photos of habitus and male terminalia, Greece].

***nevadensis*** Lyneborg. **PA:** Spain.

*Meoneura nevadensis* Lyneborg, 1969: 41. Spain. Granada: Sierra Nevada, N. slope Veleta. HT ♂ CNC. Lyneborg 1969: 41 [figures of male terminalia]; Papp 1984: 122 [Palaeartic catalog]; Cooper & Cumming 2000: 48 [information on type material]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain].

***nigeriensis*** Deeming. **AF:** Nigeria.

*Meoneura nigeriensis* Deeming, 1976: 30. Nigeria. Zaria, Samaru. HT ♂ BMNH. Deeming 1976: 30 [figure of male terminalia]; Brake 2010b [photos of

holotype].

***nigrifrons*** Malloch. **NE:** Illinois, Nebraska, Ontario.

*Meoneura nigrifrons* Malloch, 1915: 47. USA. Illinois: Champaign Co., Urbana (88.2 W, 40.1 N). HT ♂ INHS. Frison 1927: 196 [type information]; Sabrosky 1959: 25 [diagnosis, Illinois, Ontario], 1965: 729 [Nearctic catalog, Nebraska]; Poole 1996: 81 [Nearctic checklist].

***nitidiuscula*** Collin. **PA:** Cape Verde Is, Egypt, Oman, Saudi Arabia, Yemen.

*Meoneura nitidiuscula* Collin, 1949: 224. Egypt. Matruh: Siwah, Wahat [=Siwa Oasis] (25.7 E, 29.2 N). ST 10♂♀ BMNH. Steyskal 1966: 118 [citation]; Deeming 1976: 29 [condition of type material, figure of male terminalia], 1998: 156 [pollinating *Caralluma* sp. (Asclepiadaceae), on *Saccharum griffithii* in wadi bed, dunes, cow byre, Oman, Saudi Arabia, Yemen]; Barraclough 1994: [Cape Verde Islands]; Pont 1995: 117 [information on type material]; Brake 2010b [photos of syntype].

***obscura*** (Fallén). **PA:** widesp. (Iceland to China); **NE:** Massachusetts, Minnesota, New York, Ontario.

*Agromyza obscura* Fallén, 1823: 6. Sweden. Skåne [=Scania]. ST 1♂ ZIL, ST 6(sex ?) NRS. Meigen 1830: 184 [diagnosis]; Curtis 1831: 240 [United Kingdom]; Macquart 1835: 612 [France, ?Germany]; Rossi 1848: 81 [Austria]; Zetterstedt 1848: 2770 [diagnosis, Denmark, Sweden], 1855: 4815 [Sweden], 1860: 6459 [Sweden]; Schiner 1864: 300 [diagnosis]; Van der Wulp 1871: 205 [Netherlands]; Kowarz 1873: 463 [Romania], 1894: 29 [Czech Republic]; Siebke 1877: 180 [Norway]; Strobl 1880: 36 [Austria]; Mik 1881: 599 [France]; Gobert 1887: 50 [catalog, France]; Pokorny 1887: 412 [Italy]; Bezzi 1894: 346 [Italy]; Wulp & de Meijere 1898: 137 [Netherlands]; Thalhammer 1899: 68 [Hungary]; Verrall 1901: 35 [list, Britain]; Becker 1902: 342 [Meigen specimens], 1905: 239 [Palearctic catalog], 1907b: 59 [China]; Grimshaw 1905: 35 [United Kingdom]; Malloch 1913: 143 [as a questionable synonym of *Meoneura vagans*]; Danielsson 2005 [information on type material]; Pape, pers. comm. [information on type material].

*Agromyza vagans* var. *obscura*. Strobl 1893: 134 [?Austria], 1894: 137 [Austria], 1900a: 640 [Bosnia-Herzegovina, Italy, Croatia], 1900b: 61 [Spain], 1902: 504 [Croatia], 1904: 566 [German translation of Strobl 1902], 1906: 376 [Spain], 1910: 215 [Austria]; Funk 1901: 40 [Germany].

*Meoneura obscurella*. Becker 1907a: 407 [Tunisia]; Collin 1911a: 233 [United Kingdom], 1930: 87 [diagnosis, in caves and in cellar]; Malloch 1913: 143 [as a synonym of *M. vagans*]; Dalla Torre 1918: 162 [Austria]; Bezzi 1921: 437 [Libya]; Frey 1921a: 149 [morphology of proboscis, figures of proboscis], 1935: 101 [Finland], 1941: 30 [checklist, Finland], 1945: 97 [Portugal (Azores)]; Wahlgren 1927: 384 [Sweden]; Engel 1930: [description of larva and puparium, reared from snuff]; Lindroth 1931: 317 [on salt-fish, Iceland]; Edwards & Collin 1932: 266 [United Kingdom (St. Kilda)]; Seguy 1934: 631 [France]; Kröber 1935: 77 [Germany], 1938: 91 [Germany]; Karl 1936: 324 [Poland]; Hennig 1937: 68 [diagnosis, discussion of synonyms, figures of head, wing, and male terminalia, Austria, Germany, Greece], 1950: 53 [attracted to carrion, Germany], 1952: 281 [citation], 1971b: 57 [figure of head], 1972: 13 [figure of proboscis and ovipositor]; Kloet & Hincks 1945: 403 [checklist, Britain]; Ringdahl 1954: 106 [citation]; Stackelberg 1958: 189 [North European Russia]; Sabrosky 1959: 22 [diagnosis, in feed and seed company, Canada, Minnesota], 1965: 729 [Nearctic catalog, Ontario, Massachusetts, New York], 1987: 911 [figures of ovipositor and male terminalia]; Buhl 1961: 4 [citation]; Coe 1962: 142 [former Yugoslavia (Dalmatia)]; Schumann 1963: 320 [Germany]; Lyneborg 1968: 35 [on *Angelica*-flowers, Denmark (Faroes Is.)], 1969: 43 [Spain]; Papp 1978c: 48 [Hungary], 1984: 122 [Palaeartic catalog]; Hackman 1980: 152 [checklist, Finland]; Andersson 1985: 117 [Sweden]; Ferrar 1987: 101 [citation]; Gregor 1987: 261 [checklist, Czech Republic]; De Bruyn 1991: 156 [checklist, Belgium]; Nowakowski 1991: 219 [checklist, Poland]; Ólafsson 1991: 52 [checklist, Iceland]; Bröring et al. 1993: 133 [Germany]; Canzoneri et al. 1995: 25 [checklist, Italy]; Poole 1996: 81 [Nearctic checklist]; Roháček 1997: 79 [checklist, Czech Republic]; Chandler 1998a: 144 [checklist, United Kingdom]; Brake 1999: 138 [checklist, Germany], 2000a: 161 [Germany], 2010b [photo of habitus]; Ozerov 1999: 579 [key, Russian Far East]; Chandler et al. 2001: 189 [checklist, Denmark]; Beuk 2002: 278 [checklist, Netherlands]; Carles-Tolrá & Báez 2002: 150 [catalog, Portugal (Azores, Madeira), Spain]; Bährmann 2007: 8 [collecting methods, Germany]; Stuke 2009: 87 [citation].

*Meonura obscurella*; Kloet & Hincks 1976: 82 [checklist, Britain].

*Agromyza pectinata* Meigen, 1830: 179. Not given (?Austria). ST 3♀1 (sex ?) NMW. Gimmerthal 1847: 205 [Latvia]; Rossi 1848: 81 [Austria]; Beuthin 1887: 29 [Germany]; Verrall 1888: 12 [?United Kingdom]; Kröber 1910: 103 [Germany]; Malloch 1913: 143 [as a questionable synonym of *Meoneura vagans*]; Kramer 1917: 349 [description of male terminalia, Germany]; Brake 2009: 74 [information on type material], 2010b [photos of syntype].

*Meoneura pectinata*. Collin 1911a: 233 [generic combination]; Hennig 1937: 68 [information on type material]. Syn. Hennig 1937.

*Agromyza infuscata* Meigen, 1830: 184. Not given (?Austria). ST 1 (sex ?) NMW. Zetterstedt 1848: 2771 [diagnosis, Sweden], 1860: 6459 [Sweden]; Van der Wulp 1871: 206 [discussion whether var. of *Meoneura obscurella*]; Malloch 1913: 143 [as a questionable synonym of *M. vagans*]; Brake 2009: 74 [information on type material], 2010b [photos of syntype].

*Meoneura infuscata*. Collin 1911a: 233 [generic combination], 1930: 85 [synonymy]; Hennig 1937: 68 [information on type material]. Syn. Hennig 1937.

*Agromyza tritici* Fitch, 1856: 535. USA. New York. ST 3♂1♀ USNM. Fitch 1856: 535 [reared from wheat, “Wheat Mow Fly“, description and figure of puparium, description of parasitic hymenoptera]; Osten Sacken 1858: 85 [catalog, North America], 1878: 211 [catalog, North America]; Smith 1890: 404 [New Jersey]; Aldrich 1905: 649 [catalog, North America]; Malloch 1913: 143 [as a synonym of *Meoneura vagans*]; Hennig 1937: 68 [maybe synonym of *M. obscurella*]; Sabrosky 1959: 22 [information on type material]; Cole 1969: 389 [citation]. Syn. Sabrosky 1959.

*Agromyza vagans* var. *geniculata* Strobl, 1898b: 585. Bosnia and Herzegovina. Mostar & Trebinje. ST 2♂7♀ NMBA. Strobl 1902: 504 [Croatia], 1904: 566 [German translation of Strobl 1902]; Hendel 1911: 35 [generic combination]; Chvála & Götze 2004: 44 [Strobl name]; Chvála 2008: 133 [information on type material]. Syn. Hennig 1937.

*Agromyza vagans* var. *geniculata* Strobl, 1900a: 640. Bosnia and Herzegovina. Mostar & Trebinje. ST 2♂7♀ NMBA. [German translation of Strobl 1898b].

***palaestinensis*** Hennig. **PA:** Israel, Jordania, Tunisia.

*Meoneura palaestinensis* Hennig, 1937: 70. Israel. HaDarom: Rehovot near Yafo. HT ♂ SMNS. Hennig 1937: 70 [figure of male terminalia]; Papp 1978a: 202 [Tunisia], 1984: 122 [Palaeartic catalog]; Brake 2010b [photos of habitus and male terminalia]; Tschorsnig, pers. comm. [information on type material, 8 specimens but none of these labeled as type, 2 specimens dissected]; pers. note [Jordania].

***pamphylica*** Ozerov. **PA:** Turkey.

*Meoneura pamphylica* Ozerov, 2008: 491. Turkey. Antalya: ruins of Seleukeia near Siseler (36.871752°N, 31.475023°E). HT ♂ ZMM. Ozerov 2008: 491 [on decaying meat].

***paralacteipennis* Papp. PA:** Hungary.

*Meoneura paralacteipennis* Papp, 1977a: 179. Hungary. Borsod-Abaúj-Zemplén: Tiszatarján. HT ♂ HNHM. Papp 1977a: 179 [figure of male terminalia], 1978c: 47 [Hungary], 1984: 122 [Palaeartic catalog].

***paraseducta* Papp. PA:** Mongolia.

*Meoneura paraseducta* Papp, 1976: 379. Mongolia. Arhangaj [= Archangaj] aimak: “Koschoo zaidam am Chogschin-Orchon“. HT ♂ HNHM. Papp 1976: 379 [in nest of *Milvus*, in soil trap, figures of male terminalia], 1984: 123 [Palaeartic catalog].

***parva* Papp. PA:** Mongolia.

*Meoneura parva* Papp, 1976: 380. Mongolia. Hentiy [= Chentej] aimak: “7 km NO von Somon Mörön“. HT ♂ HNHM. Papp 1976: 380 [figures of male terminalia], 1984: 123 [Palaeartic catalog].

***perlamellata* Hennig. PA:** Andorra, Israel, Spain.

*Meoneura perlamellata* Hennig, 1937: 71. Israel. Jerusalem (35.2 E, 31.8 N). HT ♂ SMNS. Hennig 1937: 71 [figure of male terminalia]; Papp 1984: 123 [Palaeartic catalog]; Carles-Tolrá 1992c: 348 [on decaying fat, Spain], 1994: 19 [Spain]; Carles-Tolrá, Garanto & Checa 1993: 85 [Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Andorra, Spain]; Tschorsnig, pers. comm. [information on type material].

***polita* Sabrosky. NE:** Washington and Idaho, s. to California, Mexico, and Texas.

*Meoneura polita* Sabrosky, 1959: 20. USA. Texas: Pecos Co., Fort Stockton (102.9 W, 30.9 N). HT ♂ USNM. Sabrosky 1959: 20 [on *Erigonum*, figure of male terminalia, Arizona, California, Mexico, New Mexico, Washington], 1961: 230 [comparison with *M. californica*], 1965: 729 [Nearctic catalog, Washington and Idaho, s. to California, Mexico, and Texas], 1973: 1 [Neotropical catalog]; Poorbaugh et al. 1968: 21 [reared from cattle faeces, California]; Legner 1969: 125 [attracted to rotten egg baits, California]; Ferrar 1987: 101 [citation]; Poole 1996: 81 [Nearctic checklist].

*prima* (Becker). **PA**: widesp. in PA, e. to Afghanistan; **AF**: Namibia, South Africa, Sudan; **NE**: Washington and Idaho, s. to California, Mexico, and Texas.

*Psalidotus primus* Becker, 1903: 192. Egypt. Cairo (31.3 E, 30.1 N). LT ♂ [designated by Papp 1977b: 186] ZMHU.

*Meoneura prima*. Becker 1905: 239 [Palaeartic catalog, as a synonym of *M. obscurella*]; Bezzi 1908: 194 [as a synonym of *M. obscurella*, Egypt]; Hennig 1937: 68 [probably synonym to *M. obscurella*]; Steyskal 1966: 118 [citation]; Papp 1977b: 186 [lectotype designation and diagnosis, valid species, synonymization to *M. seducta*], 1978a: 202 [Tunisia], 1979: 107 [Afghanistan], 1984: 123 [Palaeartic catalog, Finland, Greece, Jordania, United Kingdom], 1992: 84 [developing in pasture dung, Hungary], 1998b: 296 [checklist, Switzerland], 2001: 286 [Hungary]; Gregor & Papp 1981: 201 [on human faeces, pig manure, decaying fish and meat, in slaughter house, Czech Republic]; Roháček & Gregor 1984: 20 [Czech Republic]; Roháček 1985: 199 [Czech Republic], 1987: 103 [Czech Republic]; Gregor 1987: 261 [checklist, Czech Republic, Slovakia]; Ozerov 1991: 11 [comparison with *M. maritima*]; Barraclough 1994: 21 [probably associated with faeces of rock hyrax *Procavia capensis*, figures of head and wing, South Africa]; Carles-Tolrá 1992c: 348 [on carrion, fungi, and pigeon faeces, Spain], 1994: 19 [Spain], 1995a: 72 [Spain]; Deeming 1997: 133 [Sudan]; Roháček 1997: 79 [checklist, Czech Republic, Slovakia], 1999: 328 [Czech Republic]; Chandler 1998a: 144 [checklist, United Kingdom]; Chandler et al. 2001: 189 [checklist, Denmark]; Carles-Tolrá & Blasco-Zumeta 2001: 52 [in *Juniperus thurifera* forest, Spain]; Kirk-Spriggs 2001: 251 [behaviour, on faeces of namaqua rock mouse *Aethomys namaquensis*, Namibia]; Roháček & Barták 2001: 386 [Czech Republic]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Brake 2010b [photos on habitus and male terminalia]; pers. note [Canary Is, Germany, Greece, Jordania, Morocco].

*Meoneura seducta* Collin, 1937: 250. United Kingdom. England: Pembrokeshire, Grassholme Is. (5.4 W, 51.7 N). ST 2♂2♀ UMO, ST 2♂2♀ BMNH. Collin 1937: 250 [may have some association with nests of gannets]; Kloet & Hincks 1945: 403 [checklist, Britain]; Sabrosky 1959: 22 [diagnosis, reared from or collected on faeces of pig, mink, cow, and chicken, California, Greece, Idaho, Jordan, Maryland, Michigan, Ontario, Texas, Washington], 1965: 729 [Nearctic catalog]; Timon-David 1961: 233 [in nest of *Larus michahellis*, France]; Coffey 1966: 215 [collected and reared from chicken and swine faeces, on mink, cow, horse, human, and dog faeces; Washington]; Cole 1969: 389 [citation]; Lyneborg 1969: 44 [figures of male terminalia, Spain]; Hicks 1971: 159 [citation];

Hackman 1980: 152 [checklist, Finland]; Ferrar 1987: 101 [citation]; Pont 1995: 146 [information on type material]; Poole 1996: 81 [Nearctic checklist]; Brake 2010b [photos of syntype]. Syn. Papp 1977.

*Meonura seducta*; Kloet & Hincks 1976: 82 [checklist, Britain].

***pseudoflavifacies*** Papp. **PA:** Austria, Czech Republic, Switzerland.

*Meoneura carpathica pseudoflavifacies* Papp, 1997: 152. Austria. Pillersee. HT ♂ HNHM. Papp 1997: 152 [figure of male terminalia], 1998b: 296 [checklist, Switzerland].

*Meoneura pseudoflavifacies*. Roháček 1999: 326 [species status, Czech Republic].

***pseudoseducta*** Papp. **PA:** Mongolia.

*Meoneura pseudoseducta* Papp, 1976: 381. Mongolia. Bayan-Ölgiy: “im Tal des Flusses Chavcalyn gol, 25 km O von Somon Cagaannuur“. HT ♂ HNHM. Papp 1976: 381 [figures of male terminalia], 1984: 123 [Palaeartic catalog].

***pseudotriangularis*** Papp. **PA:** Mongolia.

*Meoneura pseudotriangularis* Papp, 1976: 382. Mongolia. Töv [= Central] aimak: Ulaanbaatar, “Nucht im Bogdo ul“. HT ♂ HNHM. Papp 1976: 382 [in soil trap, figures of male terminalia], 1984: 123 [Palaeartic catalog].

***pteropleuralis*** Sabrosky. **NE:** Nebraska.

*Meoneura pteropleuralis* Sabrosky, 1959: 19. USA. Nebraska: Thomas Co., Halsey (100.3 W, 41.9 N). HT ♂ USNM. Sabrosky 1959: 19 [on sand hills, figure of male terminalia], 1965: 729 [Nearctic catalog]; Poole 1996: 81 [Nearctic checklist].

***quadrisetosa*** Papp. **PA:** Mongolia, Russian Far East.

*Meoneura quadrisetosa* Papp, 1976: 382. Mongolia. Töv [= Central] aimak: “12 km S von Somon Bajanbaraat“. HT ♂ HNHM. Papp 1984: 123 [Palaeartic catalog]; Ozerov 1999: 578 [key, Russian Far East].

***sabroskyi*** Papp. **PA:** Hungary.

*Meoneura sabroskyi* Papp, 2006: 224. Hungary. “Kiskunsági N.P., Kerekegyháza, Kondor-tó“. HT ♂ HNHM. Papp 2006: 224 [on flowers, figures of male terminalia].

*scutellata* Deeming. **AF:** Nigeria.

*Meoneura scutellata* Deeming, 1976: 30. Nigeria. Zaria, Samaru. HT ♂ BMNH.  
Deeming 1976: 30 [figure of male terminalia]; Brake 2010b [photos of holo- and paratypes].

*setipyga* Papp. **PA:** Mongolia.

*Meoneura setipyga* Papp, 1976: 384. Mongolia. Töv [= Central] aimak: “Zargalant”.  
HT ♂ HNHM. Papp 1976: 384 [on yak and horse faeces, figures of male terminalia], 1984: 123 [Palaeartic catalog], 1992: 87 [on horse/donkey dung, Mongolia].

*sinclairi* Wheeler. **NT:** Ecuador (Galapagos Is.).

*Meoneura sinclairi* Wheeler, 2000: 116. Ecuador. Galapagos Is.: San Cristóbal, Puerto Baquerizo (89.6 W, 0.9 S). HT ♂ CNC. Wheeler 2000: 116 [on marine iguana nesting sites, in yellow colour dishes, carrion and dung traps, seal dung trap, in littoral zone and adjacent arid zone, on flowers of PaloSanto (*Lignum vitae*); phylogenetic relationships, zoogeography, figures of male and female terminalia].

*stepposa* Ozerov. **PA:** Kazakhstan.

*Meoneura stepposa* Ozerov, 1994: 140. Kazakhstan. Akmola: “Mt. Kokshetau nr. river Torsakkan Akmol”. HT ♂ ZISP. Ozerov 1994: 140 [figures of male terminalia].

*subfreta* Papp. **PA:** Afghanistan, Spain.

*Meoneura subfreta* Papp, 1979: 107. Afghanistan. Kandahar (65.7 E, 31.6 N). HT ♂ HNHM. Papp 1979: 107 [figures of male terminalia], 1984: 123 [Palaeartic catalog]; Carles-Tolrá 1992c: 348 [Spain], 1994: 19 [Spain]; Carles-Tolrá & Blasco-Zumeta 2001: 53 [in *Juniperus thurifera* forest, Spain]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain].

*sublongisetosa* Carles-Tolrá. **PA:** Spain.

*Meoneura sublongisetosa* Carles-Tolrá, 2008: 127. Spain. Salamanca: Villar de Ciervo, Puente Quebrada. HT ♂ coll. Carles-Tolrá. Carles-Tolrá 2008: 127 [on Apiaceae, on *Thapsia villosa*].

*subnivalis* Gregor. **PA:** Afghanistan.



*Meoneura subnivalis* Gregor, 1971: 56. Afghanistan. Hindu Kush: Ishmurkh-valley. HT ♂ MMB. Gregor 1971: 56 [figures of male terminalia]; Gregor & Daniel 1971: 352 [Afghanistan]; Papp 1984: 123 [Palaeartic catalog].

*triangularis* Collin. **PA:** widesp. in Europe; Mongolia, Russian Far East; **NE:** Alaska to Manitoba, s. to Oregon and Colorado.

*Meoneura triangularis* Collin, 1930: 88. United Kingdom. England: Sussex, Newmarket (0.4 E, 52.3 N). ST 1♂1♀ UMO. Collin 1930: 88 [figure of male terminalia]; Hennig 1937: 71 [diagnosis, Germany, Russia]; Kröber 1938: 91 [Germany]; Kloet & Hincks 1945: 403 [checklist, Britain]; Stackelberg 1958: 189 [North European Russia]; Sabrosky 1959: 24 [diagnosis, Alaska, Manitoba, Oregon, Washington], 1965: 729 [Nearctic catalog, Colorado]; Cole 1969: 389 [British Columbia, Oregon, Washington]; Andersson 1971: 236 [North European Russia, Sweden]; Papp 1976: 385 [in soil traps, Mongolia], 1978c: 44 [Hungary], 1984: 123 [Palaeartic catalog, Austria, Finland], 1992: 90 [on human faeces, Hungary], 1995: 159 [on sheep faeces, Hungary], 1998b: 296 [checklist, Switzerland]; Hackman 1980: 152 [checklist, Finland]; Gregor & Papp 1981: 202 [on human faeces and decaying meat, Czech Republic]; Ozerov 1986: 85 [Russian Far East], 1999: 579 [key, Russian Far East]; Nowakowski 1991: 219 [checklist, Poland]; Carles-Tolrá 1992c: 348 [on dog faeces, Spain], 1994: 19 [Spain], 2004: 189 [on Apiaceae, Spain]; Pont 1995: 165 [information on type material]; Gregor 1987: 261 [checklist, Czech Republic]; Poole 1996: 81 [Nearctic checklist]; Roháček 1997: 79 [checklist, Czech Republic], 1999: 328 [Czech Republic]; Chandler 1998a: 144 [checklist, United Kingdom]; Brake 1999: 138 [checklist, Germany], 2010a [photos of habitus, Greece]; Carles-Tolrá & Blasco-Zumeta 2001: 53 [in *Juniperus thurifera* forest, Spain]; Roháček & Barták 2001: 386 [Czech Republic]; Carles-Tolrá & Báez 2002: 150 [catalog, Andorra, Spain]; Bährmann 2007: 8 [collecting methods, Germany]; pers. note [on fox faeces, Germany, Morocco, Netherlands].

*Meonura triangularis*; Kloet & Hincks 1976: 82 [checklist, Britain].

*tschorsnigi* Carles-Tolrá. **PA:** Spain.

*Meoneura tschorsnigi* Carles-Tolrá, 2008: 128. Spain. Salamanca: Villar de Ciervo (environs). HT ♂ coll. Carles-Tolrá. Carles-Tolrá 2008: 128 [on Apiaceae, on *Foeniculum*].

*tunisica* Papp. **PA:** Tunisia.

*Meoneura tunisica* Papp, 1978a: 202. Tunisia. “La Hencha”. HT ♂ HNHM. Papp

1978a: 202 [on *Ferula* flowers, on mimosa shrubs near dung heap, figure of male terminalia], 1984: 123 [Palearctic catalog].

***ungulata*** Carles-Tolrá & Ventura. **PA:** Spain.

*Meoneura ungulata* Carles-Tolrá & Ventura, 2002: 290. Spain. Girona: “Queralbs, Núria”. HT ♂ coll. Carles-Tolrá. Carles-Tolrá & Ventura 2002: 290 [collected in white water trap]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; pers. note [doubtful species, probably synonym of *Meoneura alpina* Hennig].

***vagans*** (Fallén). **PA:** widesp. in Europe; Russian Far East; **NE:** Idaho to Pennsylvania, n. to Quebec.

*Agromyza vagans* Fallén, 1823: 5. Sweden. ST 1♂1 (sex ?) ZIL, ST 3 (sex ?) NRS. Meigen 1830: 183 [diagnosis]; Curtis 1831: 240 [United Kingdom]; Zetterstedt 1848: 2767 [diagnosis, Sweden], 1855: 4815 [Sweden], 1860: 6458 [Sweden]; Schiner 1864: 300 [diagnosis]; Siebke 1877: 180 [Norway]; Strobl 1880: 36 [on *Primula*, Austria], 1900a: 640 [Croatia], 1902: 504 [Greece; acc. to Hennig 1937 probably *Meoneura obscurella*], 1904: 566 [German translation of Strobl 1902], 1906: 376 [Spain], 1910: 215 [Austria]; Gobert 1887: 50 [catalog, France]; Pokorny 1887: 412 [Italy]; Bezzi 1894: 345 [Italy]; Van der Wulp & de Meijere 1898: 137 [Netherlands]; Funk 1901: 40 [on meadows, Germany]; Verrall 1901: 35 [list, Britain]; Becker 1902: 342 [Meigen specimen]; Czerny & Strobl 1909: 262 [Spain]; Kröber 1910: 103 [Germany]; Kramer 1917: 349 [Germany], 1921: 96 [Germany]; Dalla Torre 1918: 162 [Austria]; Lyneborg 1968: 35 [citation, Denmark (Faroes Is.)]; Danielsson 2005 [information on type material]; Pape, pers. comm. [information on type material].

*Meoneura vagans*. Collin 1911a: 233 [generic combination, United Kingdom]; Hendel 1911: 34 [Idaho]; Malloch 1913: 143 [diagnosis, figures of head and forefemur; acc. to Hennig 1937 maybe *M. obscurella*]; Melander 1913a: 246 [Alaska, Idaho, Washington]; Johnson 1925: 288 [Maine, Massachusetts]; Hendel 1928: 104 [figures of head and wing]; Leonard 1928: 865 [New York]; Collin 1930: 84 [diagnosis, figure of male terminalia, on carrion]; Seguy 1934: 630 [figures of head and wing]; Frey 1935: 101 [Finland], 1941: 30 [checklist, Finland]; Karl 1936: 324 [Poland]; Hennig 1937: 72 [diagnosis, Austria, Russia]; Procter 1927: 225 [Maine], 1938: 347 [citation], 1946: 402 [citation]; Kloet & Hincks 1945: 403 [checklist, Britain]; Ardö 1957: 140 [in marine dune shore ecosystem, Denmark, Norway, Sweden]; Stackelberg 1958: 189 [North European Russia]; Sabrosky 1959: 23 [diagnosis, Michigan], 1965: 729 [Nearctic catalog; *M. vagans* of American authors equals several spp.]; Buhl 1961: 4 [citation];

Nuorteva & Järvinen 1961: 202 [in nest of *Riparia riparia*, Finland]; Gregor & Povolný 1961: 26 [on meat, Slovakia]; Schumann 1963: 320 [Germany]; Coe 1968b: 140 [flying over manure heap, Macedonia, Slovenia]; Cole 1969: 388 [discussion of presence in Northwestern America]; Hicks 1971: 159 [citation]; Beshovski 1972: 13 [Bulgaria]; Valley 1977: 125 [on carrion, Pennsylvania, New York]; Hackman 1980: 152 [checklist, Finland]; Gregor & Papp 1981: 202 [on human faeces and decaying meat, in slaughter house, Czech Republic]; Papp 1984: 123 [Palaeartic catalog, Hungary, Romania, ?Greece], 1985b: 507 [Switzerland], 1998b: 296 [checklist, Switzerland]; Roháček & Gregor 1984: 20 [Czech Republic]; Gregor 1986: 184 [catalog, Slovakia], 1987: 261 [checklist, Czech Republic, Slovakia]; Ozerov 1986: 85 [Russian Far East], 1999: 578 [key, Russian Far East]; Roháček 1987: 103 [Czech Republic, Slovakia], 1997: 79 [checklist, Czech Republic, Slovakia], 1999: 328 [Czech Republic]; Nowakowski 1991: 219 [checklist, Poland]; Brake 1996: 42 [Netherlands], 1997: 204 [Germany], 1999: 138 [checklist, Germany], 2010b [photos of habitus]; Poole 1996: 81 [Nearctic checklist]; Chandler 1998a: 144 [checklist, United Kingdom]; Roháček & Barták 2001: 386 [Czech Republic]; Beuk 2002: 278 [checklist, Netherlands]; Carles-Tolrá & Báez 2002: 150 [catalog, Spain]; Abd Al-Halim et al. 2004: 461 [Egypt] {pers. note: species identity questionable}; Abd Al-Halim et al. 2005: 354 [Egypt] {pers. note: species identity questionable}; Bährmann 2007: 7 [collecting methods, Germany]; Stuke 2009: 87 [Germany]; pers. note [on dog and fox faeces, on *Heracleum*, Germany, Norway, Quebec].

*Meonura vagans*; Kloet & Hincks 1976: 82 [checklist, Britain].

**vieja** Grimaldi. **NT**: Dominican Republic amber.

*Meoneura vieja* Grimaldi, 1997: 16. Dominican Republic amber. HT ♂ AMNH. Grimaldi 1997: 16 [phylogenetic relationships, figures of head, male terminalia, female abdomen and habitus, wing, photo of male and female habitus].

**wirthi** Sabrosky. **NE**: California, Washington.

*Meoneura wirthi* Sabrosky, 1959: 25. USA. California: Modoc Co., Willow Creek, Fandango Pass. HT ♂ USNM. Sabrosky 1959: 25 [figure of male terminalia]; Sabrosky 1965: 729 [Nearctic catalog, Washington]; Poole 1996: 81 [Nearctic checklist].

#### unnamed species

*Meoneura* sp. in Frey 1921b: 103.

*Meoneura* sp. n. in Oldroyd, 1958: 79 [Penguin rookery in small cave, Gough Island]; Hicks 1962: 254 [citation]; Barraclough 1994: 22 [maybe *M. prima*]; Deeming 1997: 133 [discussion].

*Meoneura* sp. in Gregor & Povolný 1959: 382 [Bulgaria].

*Meoneura* sp. in Gregor & Povolný 1960: [on meat and faeces, Hungary].

*Meoneura* sp. in Gregor & Povolný 1961: 31 [figure of male terminalia, Slovakia].

*Meoneura* sp. in Pridantseva 1967: 492 [on camel dung, Russia].

*Meoneura* spp. in Poorbaugh et al. 1968: 21 [attracted to cattle faeces, California].

*Meoneura* sp. in Legner 1969: 124 [attracted to rotten egg baits, Uruguay].

*Meoneura* sp. n. in Deeming, 1976: 31 [from stomach of ruff (*Philomachus pugnax* (Scolopacidae)), Nigeria]. Sabrosky 1980: 690 [Afrotropical catalog].

*Meoneura* sp. in Sabrosky 1989: 559 [Australasian/Oceanian catalog, New Zealand].

*Meoneura* sp. in Fain & Grootaert 1994: 167+170 [with parasitic Acari, Papua New Guinea].

*Meoneura* spp. n. in Deeming 1997: 134 [on elephant dung, Nigeria].

*Meoneura* spec. in Bährmann 2007: 8 [collecting methods, Germany].

### **Genus MEONEURITES Hennig**

***Meoneurites*** Hennig, 1965: 185. Type-species: *enigmatica* Hennig, by monotypy.

*Meonurites*; Evenhuis 1994: 428. Misspelling.

***enigmatica*** Hennig. **PA:** Baltic amber.

*Meoneurites enigmatica* Hennig, 1965: 185. Baltic amber (?Germany). HT ♀ PMHU. Hennig 1965: 185 [figures of head, thorax, ovipositor, habitus, wing, legs]; Keilbach 1982: 388 [citation, information about type]; Tschirnhaus & Hoffeins 2009: 201 [key to species in amber].

*Meonurites enigmatica*. Evenhuis 1994: 428 [fossil catalog].

### unnamed species

*Meoneurites* sp. in Tschirnhaus & Hoffeins 2009: 199 [key to species in amber].

### Genus NEOMEONEURITES Hennig

*Neomeoneurites* Hennig, 1972: 1. Type-species: *chilensis* Hennig, by original designation. Wheeler 1994: 436 [diagnosis, description of male terminalia, discussion].

*chilensis* Hennig. NT: Chile.

*Neomeoneurites chilensis* Hennig, 1972: 1. Chile. "Farellones". HT ♂ SMNS. Hennig 1972: 1 [on *Azorella*, figures of head, proboscis mesonotum, wing, female sternites, ovipositor, spermathecae, male terminalia]; Sabrosky 1973: 2 [Neotropical catalog]; Wheeler 1994: 438 [discussion].

*dissitus* Wheeler. NT: Argentina.

*Neomeoneurites dissitus* Wheeler, 1994: 436. Argentina. Neuquén: "Lolog". HT ♂ CNC. Wheeler 1994: 436 [figures of male terminalia]; Cooper & Cumming 2000: 48 [information on type material].

### unnamed genus and species

Carnidae in Tschirnhaus 2007: 103 [citation], 2008: 374 [citation]; Ontiveros et al. 2008: 257 [on *Hieraetus fasciatus*, Spain].

sp.n. 67, ?Carnidae in Tschirnhaus & Hoffeins 2009: 198 [key to species in amber].

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## **TAXA FORMERLY INCLUDED IN CARNIDAE**

*Rhodesiella* = Chloropidae

*Agromyza lonicerae* Kaltenbach 1872 = Agromyzidae

*Agromyza geniculata* Fallén, 1823 = Agromyzidae

*Agromyza geniculata* Meig. excl. Fallén = Agromyzidae?