

Corrections and changes to the Diptera Checklist (39) – Editor

It is intended to publish here any corrections to the text of the latest Diptera checklist (publication date was 13 November 1998; the final ‘cut-off’ date for included information was 17 June 1998) and to draw attention to any subsequent changes. All readers are asked to inform me of errors or changes and I thank all those who have already brought these to my attention.

Changes are listed under families; names new to the British Isles list are in bold type. The notes below refer to addition of 18 species, two deletions, loss of one name as a nomen dubium and loss of two names due to synonymy, resulting in a new total of **7171** species (of which 41 are recorded only from Ireland).

An updated version of the checklist, incorporating all corrections and changes that have been reported in *Dipterists Digest*, is available for download from the Dipterists Forum website. It is intended to update this regularly following the appearance of each issue of *Dipterists Digest*.

Mycetophilidae. The following species were added by **P. CHANDLER** (2018. Fungus Gnats Recording Scheme Newsletter 10. Spring 2018. pp 1-10. *Bulletin of the Dipterists Forum* **85**):

Brevicornu arcticum (Lundström, 1913 – *Brachycampta*) + [new to Britain but previously recorded from Ireland]

Phronia longelamellata Strobl, 1898

Trichonta tristis (Strobl, 1898 – *Phronia*)

Sciaridae. K. HELLER, A. KÖHLER, F. MENZEL, K.M. OLSEN and Ø. GAMMELMO (2016. Two formerly unrecognized species of Sciaridae (Diptera) revealed by DNA barcoding. *Norwegian Journal of Entomology* **63**, 96-115) proposed the following changes:

Sciara hemerobioides Scopoli, 1763 = *Rhagio morio* Fabricius, 1794, syn. n.

Trichosia edwardsi (Lengersdorf, 1930) sp. restit., not *T. habilis* (Johannsen, 1912)

Trichosia caudata (Walker, 1848 – *Sciara*) sp. restit. = *morio*: authors, misident., not (Fabricius, 1794)

Cecidomyiidae. It was not previously reported that M. JASCHHOF and C. JASCHHOF (2009. The Wood Midges (Diptera: Cecidomyiidae: Lestremiinae) of Fennoscandia and Denmark. *Studia dipterologica, Supplement* **18**, viii + 333 pp) recognised a subfamily MICROMYINAE to include all tribes formerly in LESTREMIINAE except Lestremiini itself.

The following changes result from R.J. GAGNÉ and M. JASCHHOF (2017. A Catalog of the Cecidomyiidae (Diptera) of the World. Fourth Edition. 762 pp. Digital):

Ametrodiplosis phalaridis (Abbass, 1986 – *Sitodiplosis*) (ex *Sitodiplosis*)

Jaapiella gibsoni (Felt, 1911 – *Dasyneura*) (ex *Dasyneura*: queried if a synonym of *J. cirsiicola*)

LESTODIPLOSIS Kieffer, 1894 = BLASTODIPLOSIS Kieffer, 1912, new synonymy

Lestodiplosis artemisiae (Kieffer, 1901 – *Clinodiplosis*)

STENOSPATHA *eriphori* Kieffer, 1913 [nomen dubium, genus and species ex Lestremiinae incertae sedis]

Numerous reassignments of genera to tribes were indicated by R.J. GAGNÉ (2010. Update for A Catalog of the Cecidomyiidae (Diptera) of the World. 545 pp. Digital Version 1.) and R.J. GAGNÉ and M. JASCHHOF (2014. A Catalog of the Cecidomyiidae (Diptera) of the World. 3rd Edition. 493 pp. Digital version 2; 2017. A Catalog of the Cecidomyiidae (Diptera) of the World. Fourth Edition. 762 pp. Digital.). The arrangement in the updated checklist follows them and these changes are not repeated here.

Trichoceridae. The following species were added by **A. GRAYSON** (2018. Additions and corrections to the Yorkshire Diptera list (part 7): including two species of *Trichocera* [Diptera: Trichoceridae] new to the British list. *The Naturalist* **143**, 23-31):

Trichocera (*Saltrichocera*) **brevis** Krzemińska, 2002

Trichocera (*Saltrichocera*) **implicata** Dahl, 1976

Psychodidae. It has been accepted in recent literature that a name synonymised with *Psychoda surcoufi* by P. WITHERS (1988. Revisionary notes on British species of *Psychoda* Latreille (Diptera, Psychodidae) including new synonyms and a species new to science. *British Journal of Entomology & Natural History* **1**, 69-76), has priority:

Psychoda sigma Kincaid, 1899 = *P. surcoufi* Tonnoir, 1922

The following changes are due to G.M. KVIFTE (2014. Nomenclature and taxonomy of *Telmatoscopus* Eaton and *Seoda* Enderlein; with a discussion of parameral evolution in Paramormiini and Pericomaini (Diptera: Psychodidae, Psychodinae). *Zootaxa* **3878**(4), 390-400): *Telmatoscopus advena* (Eaton, 1893), not *advenus* (as *advena* is considered a noun in apposition) *Telmatoscopus morulus* (Eaton, 1893 - *Pericoma*) = *vaillantii* Withers, 1986, new synonym [The latter species is in this work placed in SEODA Enderlein, 1935 also including of British species *labeculosa* (Eaton, 1893), *ambigua* (Eaton, 1893), *britteni* (Tonnoir, 1940), *morula* (Eaton, 1893) and *similis* (Tonnoir, 1922); only *laurencei* Freeman, 1953 remains in *Telmatoscopus* with *advena*, other species having earlier been assigned to other genera]

Chironomidae. The following species are added in the present issue:

Metricnemus (*M.*) **alisonae** Langton, 2013 + [previously known only from Ireland]

Nanocladius (*Nanocladius*) **distinctus** (Malloch, 1915 – *Orthocladius*) +

The following changes result from E. STUR and T. EKREM (2006. A revision of West Palaearctic species of the *Micropsectra atrofasciata* species group (Diptera: Chironomidae). *Zoological Journal of the Linnean Society* **146**, 165-225):

Micropsectra atrofasciata (Kieffer, 1911) = *M. bidentata* (Goetghebuer, 1921), new synonym

Micropsectra logani (Johannsen, 1928 – *Tanytarsus*) = *M. groenlandica* Andersen, 1937

Micropsectra pallidula (Meigen, 1830 – *Chironomus*) = *M. bidentata* of authors, not Goetghebuer, 1921

The following synonymies follow O. SÆTHER and M. SPIES (2013. Fauna Europaea: Chironomidae. In P. BEUK and T. PAPE (Eds). Fauna Europaea: Diptera Nematocera. Fauna Europaea version 2.6. Internet database (<http://www.faunaeur.org/>):

Micropsectra apposita (Walker, 1856) = *M. contracta* Reiss, 1965

Parachironomus gracilior (Kieffer, 1918 – *Chironomus*) = *P. arcuatus* (Goetghebuer, 1919), a junior primary homonym

The following species, recorded within the British Isles only in Ireland, was deleted from the list by D.A. MURRAY, J.P. O'CONNOR and P.J. ASHE (2016. A contribution to the Fauna Europaea [sic] database – additions and amendments to the inventory of Irish Chironomidae (Diptera: Insecta) from the Republic of Ireland and Northern Ireland. *Bulletin of the Irish Biogeographical Society* **40**, 131-141):

Parachironomus swammerdami (Kruseman, 1933)

The following previously overlooked changes (the rest of those cited here for this family) were apparent from Murray *et al.* (2018: see Changes to Irish Diptera List (26) below) and Peter Langton was helpful in advising on these:

The following species was added by D.A. MURRAY and W.A. MURRAY (2003. A reassessment of Chironomidae (Diptera) of Clare Island, Co. Mayo, with first records of *Acamptocladius reissi* Cranston and Sæther and *Limmophyes angelicae* Sæther (Orthoclaadiinae) for the Irish faunal checklist. *Bulletin of the Irish Biogeographical Society* **27**, 255-269) (without indication that it was new to Ireland or the British Isles):

Eukiefferiella cyanea Thienemann, 1936 ++

The following species was added by D.A. MURRAY, P.H. LANGTON, J.P. O'CONNOR and P.J. ASHE (2014. Distribution records of Irish Chironomidae (Diptera): Part 2 Orthoclaadiinae. *Bulletin of the Irish Biogeographical Society* **38**, 61-246):

Cricotopus (Cricotopus) algarum (Kieffer, 1911 – *Trichocladius*) ++

The following species was added by D.A. MURRAY, P.H. LANGTON, J.P. O'CONNOR and P.J. ASHE (2015. Distribution records of Irish Chironomidae (Diptera): Part 3 Chironominae. *Bulletin of the Irish Biogeographical Society* **39**, 7-190):

Stempellinella reissi Casas & Vilchez-Quero, 1991 ++

According to P. ASHE and J.P. O'CONNOR (2012. A World Catalogue of Chironomidae (Diptera). Part 2. Orthoclaadiinae (Sections A and B). 968 pp; note on p. 748), *Brillia longifurca* Kieffer, 1921 is no longer regarded as a synonym of *B. flavifrons* (Johannsen, 1905), but western Palaearctic specimens named as *flavifrons* are likely to be *longifurca*. Murray *et al.* (2018) thus use the name *B. longifurca* for the British Isles species.

The following change results from P.S. CRANSTON and J.H. EPLER (2013. The larvae of Tanypodinae (Diptera: Chironomidae) of the Holarctic Region – keys and diagnoses. pp 39-136.

In T. ANDERSEN, P.S. CRANSTON and J.H. EPLER (Eds) The larvae of Chironomidae of the Holarctic Region – keys and diagnoses. *Insect Systematics & Evolution Supplement* **66**: HAYESOMYIA Murray & Fittkau, 1985 becomes a subgenus of THIENEMANNIMYIA Fittkau, 1957

The following change results from F.L. SILVA and T. EKREM (2016. Phylogenetic relationships of nonbiting midges in the subfamily Tanypodinae (Diptera: Chironomidae) inferred from morphology. *Systematic Entomology* **41**, 73-92):

PARAMERINA Fittkau, 1962 becomes a subgenus of ZAVRELIMYIA Fittkau, 1962

The following change results from P.S. CRANSTON and M.N. KROSCHE (2015. DNA sequences and austral taxa indicate generic synonymy of *Paratrachocladus* Santos-Abreu with *Cricotopus* Wulp. *Systematic Entomology* **40**, 719-732):

PARATRACHOCLADIUS Santos Abreu, 1918 becomes a subgenus of CRICOTOPUS van der Wulp, 1874

The following change results from T. EKREM, E. WILLASSEN and E. STUR (2010. Phylogenetic utility of five genes for dipteran phylogeny: a test case in the Chironomidae leads to generic synonymies. *Molecular Phylogenetics and Evolution* **57**, 561-571):

PARAPSECTRA Reiss, 1969 = junior synonym of MICROPSECTRA Kieffer, 1909

Empidoidea. E. WAHLBERG and K.A. JOHANSON (2018. Molecular phylogenetics reveals novel relationships within Empidoidea (Diptera). *Systematic Entomology* DOI: 10.1111/syen.12297, 1-18) propose a revised classification of Empidoidea, including sinking of Brachystomatidae within Empididae and recognition of a family Ragadidae, to include the genera *Ragas* and *Iteaphila* of the British fauna, as well as a number of changes to suprageneric taxa. These conclusions are yet to be tested by other workers on Empidoidea, so are not adopted here.

The subfamily RAGADINAE had previously been proposed by B.J. SINCLAIR (2016. Revision of the Australian species of *Hydropeza* Sinclair (Diptera: Empididae: Ragadinae subfam. nov.). *Records of the Australian Museum* **68**(1), 1-22) for several genera, including *Hormopeza* Zetterstedt and *Ragas* Walker in the British Isles fauna.

Hybotidae. The current usage of *Ocydromia* Meigen, 1820 was conserved ([ICZN, 2014](#). OPINION 2349 (Case 3595) *Ocydromia* Meigen, 1820 (Insecta, Diptera, HYBOTIDAE): usage conserved. [Bulletin of zoological nomenclature](#) **71**(4), 65-266) by setting aside all type species fixations for *Ocydromia* Meigen, 1820 prior to that of *Empis glabricula* Fallén, 1816 by Westwood (1840).

Empididae. The current usage of *Hemerodromia* Meigen, 1822 was conserved ([ICZN, 2014](#). Opinion 2347 (Case 3589): *Hemerodromia* Meigen, 1822 and HEMERODROMIINAE Schiner, 1862 (Insecta, Diptera, EMPIDIDAE): genus-group and family-group names conserved. [Bulletin of zoological nomenclature](#) **71**(4), 265–266), by setting aside all type species fixations prior to that of *Tachydromia oratoria* Fallén, 1815 by Rondani (1856).

Dolichopodidae. The following species is deleted in the present issue:
Diaphorus winthemi Meigen, 1824

The following change results from M. POLLET and A. STARK (2018. The quest for the identity of *Orthoceratium lacustre* (Scopoli, 1763) reveals centuries of misidentifications (Diptera, Dolichopodidae). *ZooKeys* **782**, 49–79):

Orthoceratium sabulosum (Becker, 1907 – *Alloeoneurus*) = *O. lacustre*: authors, misident., not (Scopoli, 1763)

Note 1 in the 1998 list indicated that *Argyra* Macquart, 1834 was a junior synonym of *Porphyrops* Meigen, 1824 but *Argyra* was retained because of prevailing usage. This was resolved by [ICZN](#) (2014. Opinion 2348 (Case 3591): *Argyra* Macquart, 1834 (Insecta, Diptera, DOLICHOPODIDAE): the name conserved. [Bulletin of zoological nomenclature](#) **71**(4), 267-268), which conserved *Argyra* by suppressing *Porphyrops*.

Phoridae. The following species was added by R.H.L. DISNEY and S. HÄGGQVIST (2018. Morphological recognition of the species of the *Megaselia lucifrons* (Schmitz) group (Diptera: Phoridae). *Entomologist's Monthly Magazine* **154**, 1-7), having previously been raised from synonymy with *M. lucifrons* by S. HÄGGQVIST, S.O. ULEFORS and F. RONQUIST (2015. A new species group in *Megaselia*, the *lucifrons* group, with description of a new species (Diptera, Phoridae). *Zookeys* **512**, 88-108):
Megaselia subnitida (Lundbeck, 1920 – *Aphiochaeta*)

Syrphidae. The following species is added in the present issue:
Dasyssyrphus neovenustus Soszyński, Mielczarek & Tofilski, 2013 +

Attention was drawn by N.L. EVENHUIS (2018. Nomenclatural studies toward a World List of Diptera Genus-Group Names. Part VI: Daniel William Coquillett. *Zootaxa* **4381**, 95 pp) to *Xanthogramma* Schiner, 1860 being a junior synonym of *Philhelius* Stephens, 1841 (type species by monotypy, *Syrphus ornatus* Meigen, 1822 = *Xanthogramma pedissequum* (Harris, 1776)). This was on the grounds that *Philhelius* fulfilled the ICZN requirement of having been used as a valid name later than 1899, i.e. by D.W. COQUILLET (1910. Corrections to my paper on type species of the North American genera of Diptera. *The Canadian Entomologist* **42**, 375-378). *Philhelius* was not described by Stephens and had been considered a nomen nudum, or merely a catalogue name as suggested by G.H. VERRALL (1901. *British Flies*. 8. *Platypezidae, Pipunculidae and Syrphidae*. 691 pp. Gurney & Jackson, London), but it is apparently valid because the identity of the only included species “*ornatus*” was clear. As *Philhelius* has never been adopted by subsequent workers on Syrphidae and *Xanthogramma* has been used in many hundreds of publications, acceptance of this change is not supported by syrphid workers consulted. Martin Speight (*pers. comm.*) will continue to use the name *Xanthogramma* in the StN database, explaining that replacing the well-established generic name *Xanthogramma* by *Philhelius* Stephens serves no useful scientific purpose and simply introduces confusion.

Pipunculidae. The following species are added in the present issue:

Chalarus immanis Kehlmaier in Kehlmaier & Assmann, 2008

Chalarus elegantulus Jervis, 1992

Chalarus proprius Jervis, 1992

Agromyzidae. The following species are added in the present issue:

Agromyza abdita Papp, 2015

Cerodontha (Dizygomyza) palustris Nowakowski, 1973

Phytomyza phillyreae Hering in Buhr, 1930

Stenomicridae. The following species is added in the present issue:

Podocera soniae (Merz & Roháček, 2005 – *Stenomicra*)

Chloropidae. The current usage of *Oscinella* Becker, 1909 was conserved (ICZN. 2014. Opinion 2336 (Case 3576): *Oscinella* Becker, 1909 (Insecta, Diptera, Chloropidae): precedence reversed with *Melanochaeta* Bezzi, 1906 and *Pachychaetina* Hendel, 1907. *Bulletin of zoological nomenclature* **71**(2), 141-143) by giving it precedence over *Melanochaeta* Bezzi, 1906 and its objective synonym *Pachychaetina* Hendel, 1907 whenever these names are considered to be synonyms.

Heleomyzidae. A.Ö. KOÇAK and M. KEMAL (2013. A nomenclatural note in the family Heleomyzidae (Diptera). *Cesa News* **85**, 11) pointed out that *Chaetomus* Czerny, 1924 is preoccupied by *Chaetomus* McClelland, 1843 (Pisces) and proposed a replacement name:

LEANDERIA Koçak & Kemal, 2013 = **CHAETOMUS** Czerny, 1924, preocc.

The following change is proposed by J. ROHÁČEK (2018. European Chiropteromyzidae (Diptera): taxonomic revision, nomenclature, classification and preimaginal stages. *Annales Zoologici* **68**(2), 281-316 [true *N. nidicola* (Frey, 1930) is known only from Finland], who also suggested that this family should be returned to Heleomyzidae as a subfamily **CHIROPTEROMYZINAE**):

Neossos broersii (de Meijere, 1946 – *Leptometopa*) +

= *N. nidicola*: Collin, 1939 and subsequent British authors, misident.

Drosophilidae. An application to conserve the current usage of *Drosophila* Fallén, 1823 by the designation of *Drosophila melanogaster* Meigen, 1830 (currently the type species of the subgenus *Sophophora* Sturtevant, 1939) as the type species of *Drosophila*, was rejected (ICZN 2010. OPINION 2245 (Case 3407) *Drosophila* Fallén, 1823 (Insecta, Diptera): *Drosophila funebris* Fabricius, 1787 is maintained as the type species. *Bulletin of zoological nomenclature* **67**(1), 106-115).

Scathophagidae. A.L. OZEROV (2016. A review of the genus *Pogonota* Zetterstedt, 1860 (Diptera: Scathophagidae) in Russia. *Russian Entomological Journal* **25**(2), 185-207) proposed the following generic synonymy:

POGONOTA Zetterstedt, 1860 = OKENIELLA Hendel, 1907

Pogonota caudata (Zetterstedt, 1838 – *Cordylura*)

A.L. OZEROV and M.G. KRIVOSHEINA (2016. To taxonomy of the genus *Cleigastra* Macquart, 1835 (Diptera: Scatophagidae) with description of two new species. *Russian Entomological Journal* **25**(1), 97-102) proposed the synonymy of several genera with *Cleigastra* Macquart, 1835, of which two (*Gonatherus* and *Nanna*) are represented in the British Isles [new combinations of specific names were not indicated except for the type species of each name]:

GONATHERUS Rondani, 1856 becomes a subgenus of CLEIGASTRA Macquart, 1835

Cleigastra (Gonatherus) planiceps (Fallén, 1826 – *Cordilura*)

NANNA Strobl, 1894 is sunk within a subgenus CLEIGASTRA

Rhiniidae. *Stomorhina lunata*, which has been placed in the Calliphoridae in the checklist is now generally considered to belong to this separate family (Olga Sivell *pers. comm.*). This follows S.N. KUTTY, T. PAPE, B.M. WIEGMANN and R. MEIER (2010. Molecular phylogeny of the Calyptratae (Diptera: Cyclorrhapha) with an emphasis on the superfamily Oestroidea and the position of Mystacinobiidae and McAlpine's fly. *Systematic Entomology* **35**, 614-635).

Sarcophagidae. The following changes result in the present issue:

Macronychia dolini Verves and Khrokalo, 2006 = *striginervis*: authors, not (Zetterstedt, 1838)

Macronychia striginervis (Zetterstedt, 1838 – *Xysta*) new to list

Changes to the Irish Diptera List (26) – Editor

This section appears as necessary to keep up to date the initial update of the Irish list in Vol. **10**, 135-146 and the latest checklist of Irish Diptera (Chandler *et al.* 2008). Species are listed under families, but with references listed separately (unless within the present issue). The net gain of 20 species cited here brings the total Irish list to 3429.

Mycetophilidae

Leia bilineata (Winnertz, 1863) (added by Chandler in the present issue)

Mycomya affinis (Staeger, 1840) (added by Chandler in the present issue)

Mycomya insignis (Winnertz, 1863) (added by Chandler in the present issue)

Brachypeza bisignata Winnertz, 1863 (added by Chandler in the present issue)

Mycetophila confluens Dziedzicki, 1884 (added by Chandler in the present issue)

Mycetophila eppingensis Chandler, 2001 (added by Chandler in the present issue)

Mycetophila immaculata (Dziedzicki, 1884) (added by Chandler in the present issue)

Mycetophila sumavica (Laštovka, 1963) (added by Chandler in the present issue)

Phrontia sudetica Dziedzicki, 1889 (added by Chandler in the present issue)

Trichonta nigritula Edwards, 1925 (added by Chandler in the present issue)

Cecidomyiidae

Dasineura harrisoni (Bagnall, 1922) (added by Henry 2017)

Chironomidae

Cricotopus (Cricotopus) algarum (Kieffer, 1911) (added by Murray *et al.* 2014, see checklist changes above)

Cricotopus (Cricotopus) tibialis (Meigen, 1804) (added by Murray 1972, assumed in the 1998 list to refer to misidentification of *C. reversus* Hirvenoja, 1973, when true *C. tibialis* was said to be new to the British list and was later confirmed from Scotland by Langton and Ruse 2005)

Eukiefferiella cyanea Thienemann, 1936 (added by Murray & Murray 2003, see checklist changes above)

Nanocladius (Nanocladius) distinctus (Malloch, 1915) (added by Langton and Ruse in the present issue)

Stempellinella reissi Casas & Vilchez-Quero, 1991 (added by Murray *et al.* 2015, see checklist changes above)

Tanytarsus lugens (Kieffer, 1916) (? as Irish in the checklist; accepted in Murray *et al.* 2018)

Cricotopus vierriensis Goetghebuer, 1935 (deleted by Murray *et al.* 2016)

Micropsectra recurvata Goetghebuer, 1928 (deleted by Murray *et al.* 2016)

Parachironomus swammerdami (Kruseman, 1933) (deleted by Murray *et al.* 2016)

Pseudodiamesa nivosa (Goetghebuer, 1928) (deleted by Murray *et al.* 2016)

[*Chironomus striatus* Strenzke, 1959 deleted by Murray *et al.* 2018, was already omitted from the checklist, where it is noted that it was a misidentification of species A sensu Pinder, 1978]

Syrphidae

Dasysyrphus neovenustus Soszyński, Mielczarek & Tofilski, 2013 (added in the present issue)

Pipunculidae

Dorylomorpha anderssoni Albrecht, 1979 (added by Carey and Gormally 2017)

Lonchaeidae

Lonchaea fugax Becker, 1895 (added by Chandler in the present issue)

Lonchaea ultima Collin, 1953 (added by Chandler in the present issue)

Sepsidae

Themira gracilis (Zetterstedt, 1847) (added by Mitchell in the present issue)

Chiropteromyzidae

Neossos broersii (de Meijere, 1946) (added by Roháček 2018, see checklist changes above)

Drosophilidae

Drosophila suzukii (Matsumura, 1931) (Gaffney 2017 indicates that this species has been established in Ireland since 2015 and is now present in six eastern counties)

References

- Carey, J.G.J. and Gormally, M.J. 2017. A record of *Dorylomorpha anderssoni* Albrecht, a species of big-headed fly (Diptera: Pipunculidae) new to Ireland. *Irish Naturalists' Journal* **35**, 128-129.
- Gaffney, M. 2017. Spotted wing *Drosophila* in Ireland: an increasing threat to the Irish soft fruit sector. Teagasc Agriculture & Food Development Authority [powerpoint presentation available on line at www.teagasc.ie/media/website/crops/horticulture/fruit]

- Henry, C. 2017. First Irish record of the cecidomyid gall midge *Dasineura harrisoni* (Bagnall) (Diptera: Cecidomyiidae). *Irish Naturalists' Journal* **35**, 130-131.
- Murray, D.A. 1972. A list of the Chironomidae (Diptera) known to occur in Ireland with notes on their distribution. *Proceedings of the Royal Irish Academy* **72B**, 275-293.
- Murray, D.A., O'Connor, J.P. and Ashe, P.J. 2016 [see checklist changes above]
- Murray, D.A., O'Connor, J.P. and Ashe, P.J. 2018. Chironomidae (Diptera) of Ireland – a review, checklist and their distribution in Europe. *Occasional Publication of the Irish Biogeographical Society* Number **12**, 404 pp.