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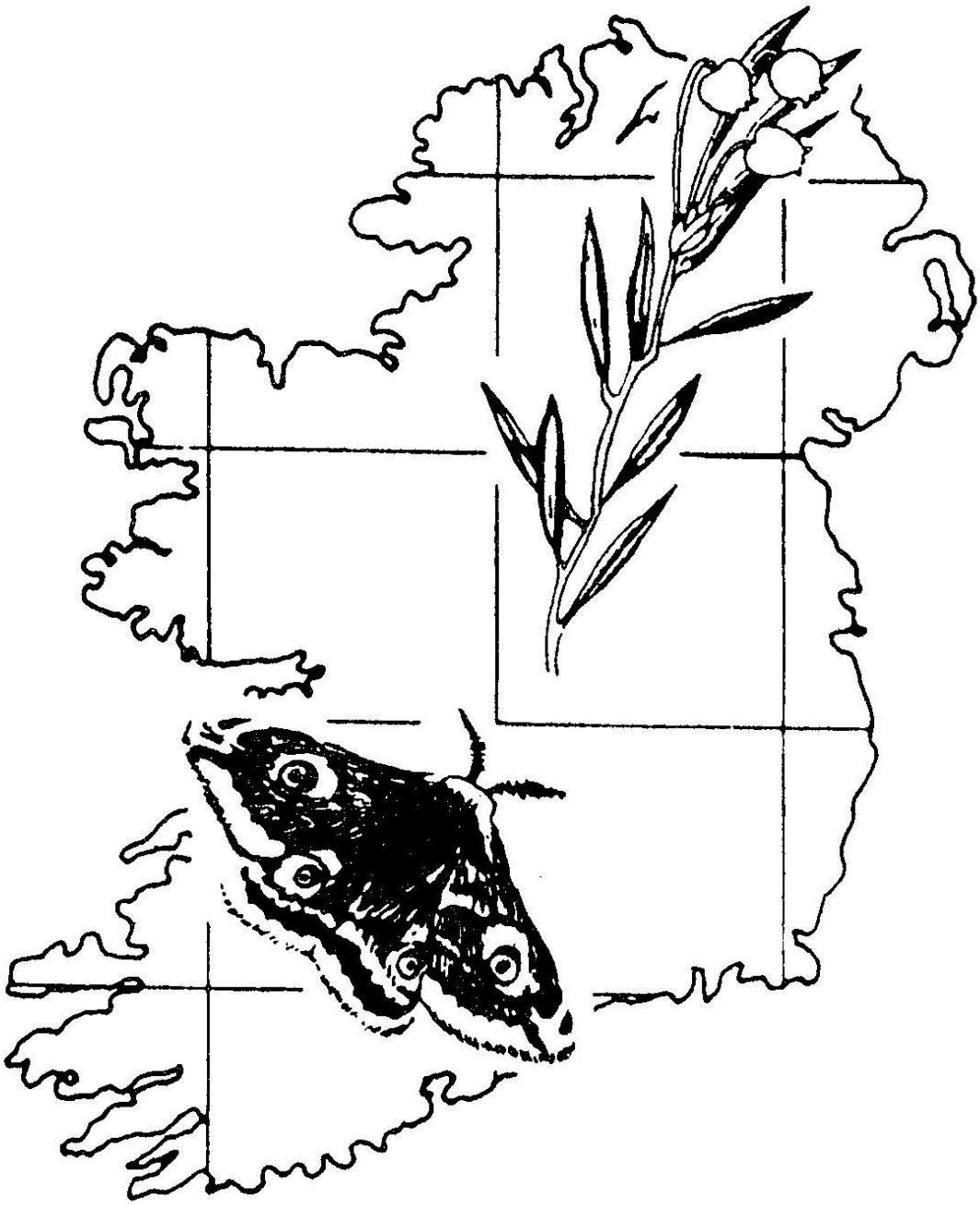

Bulletin No. 47

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DEDICATION

This Bulletin is dedicated to the memory of Dr Christopher Moriarty (14 March 1936 - 13 January 2024). "Christopher Moriarty obituary: Biologist with a rare ability to see nature in a human context" <https://quakers-in-ireland.ie/wp-content/uploads/2024/02/christopher-moriarty-obituary-the-irish-times-feb-2024.pdf>

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BULLETIN OF THE IRISH BIOGEOGRAPHICAL SOCIETY
Number 47

CONTENTS

CONTENTS (continued)

Bulletin of the Irish Biogeographical Society **Number 47** (2024)

Editorial

I have digitalized *Bulletins* **1-46**, the *Macro Series* and *Occasional Publications* **Numbers 6-13** and they are now available for free download as PDFs from edepositIreland <http://edepositireland.ie/>. This site is a new home for Ireland's electronic publications and is run by Trinity College Library, Dublin. The edeposit collections are discoverable alongside those of its sister repository TARA (Trinity's Access to Research Archive). As the largest library in Ireland, Trinity College Library has a comprehensive collection of over six million printed volumes, extensive collections of journals, more than half a million maps and significant collections of manuscripts, reflecting over four hundred years of academic development. The Library have been a print legal deposit library for Ireland and the United Kingdom since 1801 and now aims to develop its digital collections with the new exciting venture of edepositIreland. The Society is very grateful to Patricia Quigley, Accessions Librarian, Niamh Harte, Assistant Librarian (Collection Management) and their staff for providing an account for uploading its publications and for archiving the subsequent submissions. Their encouragement is greatly appreciated.

The remaining *Occasional Publications* will be digitalized over the next few months. All the PDFs will be also made available on our website when it is next updated. Currently, *Bulletins* **31-46** are available there for download along with some other publications.

Details of a new electronic publication *Bibliography of Irish Insects (1802-2020)* was given in *Bulletin* **46** (page 134). This is available for download from <http://www.irishbiogeographicalsociety.com>, <http://edepositireland.ie/> and The National Museum of Ireland – Natural History <https://www.museum.ie/en-IE/Collections-Research/Natural-History-Collections/Collections-List/Insects>. After its publication, Damian McFerran, Records Centre Manager (CEDaR) arranged for a grant for the work to be published as a book. CEDaR is part of the Curatorial Department of National Museums NI. Most of the print run has been sent to museums, scientific institutions and universities in Ireland and abroad but a limited number are now available for sale @ €20 including postage and packaging. Information is provided overleaf.

This year's *Bulletin* is full of interesting articles and the Society is very grateful to the authors for their submissions. I would also like to thank the referees for their reports and our sponsors.

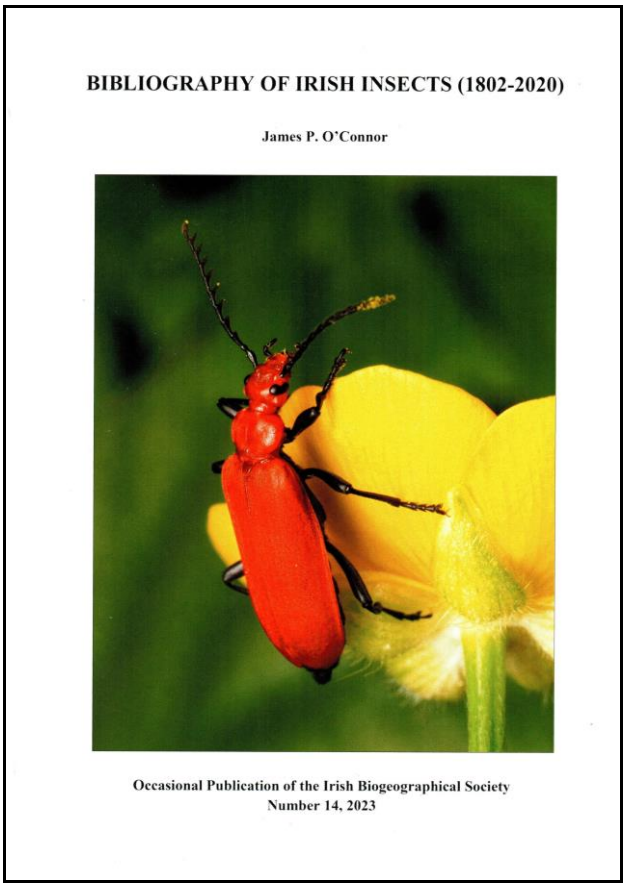
J. P. O'Connor
Editor
1 June 2024

NEW PUBLICATION

Bibliography of Irish insects (1802-2020) by James P. O'Connor
Occasional Publication **Number 14** of the Irish Biogeographical Society.

First published as *Occasional Electronic Publication* **Number 2** on-line on the 28 February 2023, it was then published as a book in association with CEDaR, National Museums NI on 31 August 2023. ISBN 978-1-9164218-3-7. Containing 570 pages, it lists books and papers published on Irish insects from 1802-2020. References are grouped into 20 chapters. The printed edition differs from the electronic edition in minor changes chiefly the removal of the asterisks used in searching the PDF.

After publication, the book has been sent to scientific institutions and libraries in Ireland and abroad. A limited number is now available from the editor Dr James P. O'Connor, 2 Beechpark Crescent, Castleknock, Dublin 15, D15 H6YR, Ireland; price €20 including postage and packaging. Payment should be sent as euro notes or euro cheques payable to James P. O'Connor with the name and address of the purchaser in an envelope. The low price is possible due to the sponsorship and is meant to cover the cost of posting this heavy volume to diverse destinations. The author may be contacted by e-mail: <joconnor@museum.ie>



Bulletin of the Irish Biogeographical Society **Number 47** (2024)

A SURVEY OF IRISH THRIPS (INSECTA: THYSANOPTERA) IN THE COLLECTIONS OF THE NATURAL HISTORY MUSEUM, LONDON, WITH THREE ADDITIONS TO THE IRISH CHECKLIST

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Abstract

The Natural History Museum, London, is confirmed as the largest single depository of slide-mounted, identified, Irish thrips material, containing the great majority of extant specimens. The collection holds material for thirty of the thirty-six species on the current Irish checklist. In addition, examination of the collection revealed specimens of a further three species to be added to the checklist, all collected by Brian Pitkin in the Republic of Ireland in 1968 and 1969: *Aeolothrips ericae* Bagnall (Aeolothripidae; a new familial addition to the Irish fauna), *Odontothrips cytisi* Morison and *O. ignobilis* Bagnall (Thripidae). The absence of voucher specimens in the collection strongly suggests that the current listing of three species for Northern Ireland (*Limothrips denticornis* Haliday, *Odontothrips ulicis* (Haliday) and *Hoplothrips pedicularius* (Haliday)) and two species for the Republic of Ireland (*Aptinothrips stylifer* Trybom and *Thrips discolor* Haliday) is not supported by extant material. Two species are included on the Irish checklist based solely on the finding of a single second-instar larva: *Belothrips acuminatus* Haliday and *Phlaeothrips annulipes* Reuter. Morphometric analysis of the material of *Thrips physapus* L. and *T. trehernei* Priesner indicate all the adult specimens to be confirmed or likely *T. physapus*. This leaves a single second-instar larva collected by Guy Morison in Belfast in 1939 as the only specimen still attributed to *T. trehernei*, an identification that cannot be confirmed or refuted.

Key words: Thysanoptera, thrips, Ireland, Natural History Museum, London, slide-mounted collections, survey, additions, Irish checklist, *Aeolothrips ericae* Bagnall, *Odontothrips cytisi* Morison, *Odontothrips ignobilis* Bagnall.

Introduction

The Irish Thysanoptera fauna is greatly under-recorded, with very little collecting activity ever having been undertaken on the island of Ireland by specialist thysanopterists. The most recently produced checklist of Irish thrips (Mound, Collins and Hamilton, 2018) was primarily a taxonomically corrected version of the list produced by O'Connor (2008) which was, in turn,

based on records compiled from the published literature. It included 36 species in 19 genera from two families, with an additional species recorded as a non-established record of an incursion. This compares with the last published checklist for Great Britain (Collins, 2010) which comprised 157 species in 56 genera from four families, with a further 19 species recorded as non-established incursions. Two species have subsequently been added to the British list (Collins, 2019).

O'Connor's list was annotated with published references to support each species' inclusion. Several of these papers described wider studies of arthropods from which any thrips collected were sent to specialists in Britain for species determination with the species names subsequently listed in the resulting publication: Healy (1975), thus, investigated the invertebrate fauna of a salt marsh on North Bull Island, Dublin, whilst Curry (1976) surveyed the arthropods associated with six grass and weed species on grassland at Glasnevin near Dublin. Similarly, the British dipterist Ken Smith collected thrips at two sites near Dublin and one in County Wicklow during a working visit to Dublin (Smith, 1951). A few records date back to reports of a single species as new to Ireland from the early part of the twentieth century (e.g. Bagnall, 1909; Sherrard, 1911); Richard Bagnall's finding of *Bolothrips dentipes* (Reuter) at Portmarnock salt marsh near Dublin appears to be the only confirmed case of a species of thrips being recorded from Ireland before it was recognised as being present in Great Britain. Most of the given references, however, refer either to papers by Guy Morison or to the Royal Entomological Society Handbook on Thysanoptera (Mound *et al*., 1976). When these were consulted, the original reference was generally found to be limited to a county, or even country, name, within a list of locations across the British Isles. So, for example, county records cited by Mound *et al*. (1976), were largely based on specimens in the collections of the Natural History Museum, London (NHM), but no other details were provided. Consequently, published information on the Irish thrips fauna is both fragmentary and superficial. It precludes any real analysis.

There are only 10 slides of thrips in the collections of the National Museum of Ireland, Natural History, Dublin (NMI), though this includes lectotypes designated for both *Aptinothrips rufus* Haliday and *Sericothrips staphylinus* Haliday. In addition, there are approximately 14 jars containing fluid-preserved specimens, though the contents of entire jars remain unidentified (O'Hanlon, personal communication). There is also a box of Alexander Haliday's card mounted specimens which were examined by the thysanopterist Laurence Mound along with some other miscellaneous card mounted specimens in the general collection. The difficulties associated with Haliday's collection, including assigning positive provenance to specimens, are detailed by O'Connor and Nash (1982). None of Haliday's specimens are slide-mounted or fully-labelled in the modern manner.

As a result, an investigation of the Irish Thysanoptera material held in the collections of the

NHM was carried out as this was considered the likely depositary for most extant slide-mounted, identified, Irish material. The work was intended to provide a baseline of data to support future work on the Irish thrips fauna planned by the author. The NHM collections were searched for Irish specimens during four visits, in 2019 and 2022-2023, and was made both easier and more extensive as a result of recent sorting and cataloguing of the hitherto unorganised "Bagnall and Morison Supplementary Collection" to bring it into line with the main thrips collection. Not all specimens were examined under a microscope, but if deemed necessary for a given species (e.g., to confirm Irish status, or Northern Irish or Republic of Ireland status, or to check specific, difficult or otherwise possibly contentious, identifications), specimens were examined under a GXM-L2800 high-power microscope at magnifications up to 400X. Measurements were made using a GXCAM HiChrome-Met camera (mounted on the microscope) and its integrated software. Species determinations were made using keys by zur Strassen (2003) and Mound, Collins and Hastings (2018).

The Irish thrips in the collections of the NHM proved to be mostly derived from three sources: five (possibly four) visits to Northern Ireland made by Guy Morison to Northern Ireland between 1928 and 1958; two visits to the west and south of the Republic made by Brian Pitkin in 1968 and 1969; identifications made by the then Commonwealth Institute of Entomology (CIE) in London in 1973 from material forwarded by University College, Dublin, that had been collected in 1971-1972 during Curry's survey work on the grassland at Glasnevin. Curry's thrips appear to be the most recently collected from the wild in Ireland; the plant health authorities from both sides of the border will have subsequently recorded thrips from horticultural and other crop production sites, including the two invasive non-native glasshouse pest species introduced since 1987, *Echinothrips americanus* Morgan and *Frankliniella occidentalis* (Pergande).

Guy Morison (1898-1978) was the leading British thysanopterist of the middle part of the twentieth century. He donated over 20,000 microscope slides of British and Northern Irish thrips to the NHM which, together with considerable material acquired earlier from Richard Bagnall (1889-1962) in 1932 (with a few subsequent additions), forms the core of the museum's collection of British thrips. Throughout his professional career Morison was based at the North of Scotland College of Agriculture, Aberdeen, as an advisory entomologist, and analysis of his Northern Irish thrips (largely consisting of common polyphagous species collected from Belfast or adjacent counties) suggests that it was likely collected opportunistically during official visits connected with his work. His material dates to five clusters: 30 July -2 August 1928; 27 June 1939; 26-28 July 1939; 7-10 May 1948; 24 July 1958.

Brian Pitkin (1945-2021) is primarily remembered as a dipterist at the NHM, but he initially joined the museum in 1965 as technical assistant to Laurence Mound and for over a decade he

collected, studied, and published on Thysanoptera from both Britain and overseas. His Irish material was collected from counties in the south and (to a lesser extent) the west of the Republic, and dates to two clusters: 12-23 May 1968 and 13-24 August 1969. Irish county records for a number of species that resulted from these two visits are included in the Royal Entomological Society Handbook, of which Pitkin was a co-author. And yet, the Handbook did not record Irish localities for three species collected by Pitkin, and currently in the NHM collection, that had not previously been recorded from Ireland (or indeed subsequently). As a result, three species (and a new family) are added to the Irish checklist in this paper.

Irish Thysanoptera specimens in the collections of the NHM

Two of the species here added to the Irish checklist, *Aeolothrips ericae* Bagnall and *Odontothrips ignobilis* Bagnall, were both collected from "dwarf furze" by Brian Pitkin at Rosscarbery Bay, County Cork (spelt "Roscaberry" on the slides), on 21 August 1969 (BRP 161). Dwarf furze is a common name that has been used for several species of gorse and in the British Isles may refer to either *Ulex gallii* Planch. or *U. minor* Roth, both hosts of *O. ignobilis*. Botanical atlases (e.g. Preston, Pearman and Dines, 2002) indicate that the plant was almost certainly western gorse, *U. gallii*. Other localities which may have been misspelt are given in italics.

AEOLOTHRIPIDAE – New addition to Irish checklist

***Aeolothrips ericae* Bagnall, 1920 – New addition to Irish checklist** [1 sample; 2 adults]

The first member of the Aeolothripidae to be recorded from Ireland, *Aeolothrips ericae* is presumed to be a facultative predator, feeding on a mixed diet of pollen and the larvae of other thrips. It is restricted to the flowers of heather species and those of various Fabaceae such as *Ulex*, but these are all widespread in Ireland. The thrips was recently recorded from the west Welsh coast for the first time and it was suggested that the absence of records from the western parts of the British Isles is a likely case of recording deficit (Collins, 2021). The same potentially applies to other species of *Aeolothrips* that are common in Britain; collectively they are characterised by a relatively large size, conspicuous wing patterning, and active behaviour on a beating tray, running rather than walking.

REPUBLIC OF IRELAND: 2♀♀, dwarf furze, Rosscarbery Bay, Co. Cork, 21.viii.1969 (BRP 161).

THRIPIDAE-SERICOTHRIPINAE

***Sericothrips staphylinus* Haliday, 1836** [2 samples; 24 adults]

The location of "Leencon" is unknown to the author. Pitkin was in County Mayo on the 12th

May 1968 and in County Kerry on the 17th May.
REPUBLIC OF IRELAND: 8♀♀, 3♂♂, *Ulex*, nr *Leencon*, 13.v.1968 (BRP 96); 10♀♀, 3♂♂, dwarf furze, Rosscarbery Bay, Co. Cork, 21.viii.1969 (BRP 161).

THRIPIDAE-THRIPINAE
***Anaphothrips obscurus* (Müller, 1776)** [4 samples; 27 adults, 15 larvae]
NORTHERN IRELAND: ♀ macr., oats, Belfast, 31.vii.1928 (GDM); 4♀♀ macr., 2♀♀ micr., 11L_2, *Agrostis alba*, Belfast, 26.vii.1939 (GDM); 2♀♀ macr., 4♀♀ micr., 4L_2, grass, Hillsborough, 27.vii.1939 (GDM).
REPUBLIC OF IRELAND: 4♀♀ macr., 10♀♀ micr., *Dactylis*, Glasnevin, Dublin, det. 1973 (CIE A. 6304).

***Aptinothrips rufus* Haliday, 1836** [5 samples; 91 adults, 14 larvae]
NORTHERN IRELAND: 78♀♀, grass, Belfast, 30.vii-02.viii.1928 (GDM); 9♀♀, 1 ♂, 5L_1 9L_2, *Agrostis alba*, Belfast, 26.vii.1939 (GDM).
REPUBLIC OF IRELAND: ♀, gorse, 2ml E of Kenmare, Kerry, 18.viii.1969 (BRP 155); ♀, dwarf furze, Rosscarbery Bay, Co. Cork, 21.viii.1969 (BRP 161); ♀, *Vicia cracca*, nr Clonakilty, Co. Cork, 22.viii.1969 (BRP 166).

***Aptinothrips stylifer* Trybom, 1894** [1 sample; 4 adults]
This apterous grass species, widely recorded from Great Britain, was collected at North Bull Island, Dublin, by Healy (1975). However, with the specimens, identified by the mid twentieth century English thysanopterist Ernest Speyer, not at the NHM, their absence leaves the status of the species in the Republic of Ireland unsupported by a known, extant, voucher specimen.
NORTHERN IRELAND: 4♀♀, grass, Belfast, 30.vii-02.viii.1928 (GDM).

***Baliothrips dispar* (Haliday, 1836)** [7 samples; 19 adults, 6 larvae, 4 pupae]
NORTHERN IRELAND: ♀, grass, Belfast, 30.vii.1928 (GDM); 3♀♀, ♂, 2L_1, 4L_2, 1PP, 3P, *Agrostis*, Belfast, 26.vii.1939 (GDM); 4♀♀, ♂, grass, Hillsborough, Co. Down, 27.vii.1939 (GDM); ♀ hemimacr., grass, Portadown, Co. Armagh, 07.v.1948 (GDM).
REPUBLIC OF IRELAND: 6♀♀, grass, nr Limerick, 15.v.1968 (BRP 98); ♀ hemimacr., *Dactylis*, Glasnevin, Dublin, det. 1973 (CIE A. 6304); ♂, *Lolium*, Glasnevin, Dublin, det. 1973 (CIE A. 6304).

***Belothrips acuminatus* Haliday, 1836** [1 sample; 1 larva] (Plate 1)
A single second-instar larva collected by Morison in Northern Ireland in 1958 is the only

record of this species from the island of Ireland. Elsewhere in the British Isles, it is known only from northern Scotland, almost entirely as a result of Morison's own collecting activity, despite the availability of suitable hosts across the archipelago. The specimen, with orange-red bands ("crimson" in Morison's description), a single pair of pronotal posteroangular setae, and a terminal pair of upturned hooks, matches the description of the second-instar larva provided by Morison himself (1969). The species is found on leaves and flowers of various species of *Galium*, but is not the only thrips species in the British Isles that is found on *Galium verum*; and, the second-instar larva of *Rubiothrips silvarum* (Priesner), a species found in southern England, also has a terminal pair of upturned hooks. However, its body is described by Vierbergen, Kucharczyk and Kirk (2010) as yellow (as per specimens at the NHM) to pale rose. Unfortunately, *Belothrips acuminatus* is a species that is not included in either the key or descriptions provided by this publication.
NORTHERN IRELAND: 1L_2, *Galium verum*, Bushmills, Co. Antrim, 24.vii.1958 (GDM).

***Ceratothrips ericae* (Haliday, 1836)** [5 samples; 24 adults]
NORTHERN IRELAND: 15♀♀, ♂, *Erica cinerea*, Belfast, 30.vii.1928 (GDM); ♂, grass, Belfast, 30.vii-02.viii.1928 (GDM).
REPUBLIC OF IRELAND: ♀, Nephin Mountains, Co. Mayo, 25.viii.1944 (det. DWC)*; 5♀♀, *Erica* sp., 2ml E of Kenmare, Kerry, 18.viii.1969 (BRP 154); ♀, gorse, 2ml E of Kenmare, Kerry, 18.viii.1969 (BRP 155).

*The slide label, an image of which is visible online on the Natural History Museum Data Portal (<https://data.nhm.ac.uk/> specimen number NHMUK014779738), was originally annotated (in pencil) as "*Taeniothrips*", but has the later addition (in darker pencil) of "? *latus* Bg.", made by Speyer. Identification of the female as *Ceratothrips ericae* was made by the current author. There is no Irish specimen of *Mycterothrips latus* (Bagnall) at the NHM, and the species remains unknown from Ireland.

***Chirothrips manicatus* (Haliday, 1836)** [3 samples; 4 adults]
NORTHERN IRELAND: 2♀♀, grass, Portadown, Co. Armagh, 07.v.1948 (GDM).
REPUBLIC OF IRELAND: ♀, *Pinus sylvestris*, *Kenarl* [Mound *et al*. (1976) listed Kerry in their county location list for the species; also, see *Oxythrips ajugae* below], 18.v.1968, det. E. R. Speyer (BRP 105); ♀, *Dactylis*, Glasnevin, Dublin, det. 1973 (CIE A. 6304).

***Limothrips cerealium* Haliday, 1836** [6 samples; 40 adults, 7 larvae, 7 pupae]
NORTHERN IRELAND: 8♂♂, *Avena sativa*, Belfast, 30.vii.1928 (GDM); 4♀♀, 24♂♂, 5PP, 2P, *Avena sativa*, Belfast, 01.viii.1928 (GDM); 1L_1, 6L_2, *Avena sativa*, Stormont, Belfast,

26.vii.1939 (GDM).
REPUBLIC OF IRELAND: ♀, gorse, nr Clonakilty, Cork, 21.viii.1969 (BRP 165); ♀, *Armeria maritima* flowers, Kilmore Quay, Wexford, 24.viii.1969 (BRP 171); 2♀♀, *Lolium*, Glasnevin, Dublin, det. 1973 (CIE A. 6304).

***Limothrips denticornis* Haliday, 1836** [3 samples; 3 adults]

The absence of any material from Northern Ireland leaves the status of the species there unsupported by a known, extant, voucher specimen. However, this grass thrips is common and widespread across the British Isles and very unlikely to be absent from Northern Ireland.
REPUBLIC OF IRELAND: ♀, *Prunus spinosa*, nr Clonakilty, Co. Cork, 21.viii.1969 (BRP 164); ♀, *Armeria maritima* flowers, Kilmore Quay, Co. Wexford, 24.viii.1969 (BRP 171); ♀, *Dactylis*, Glasnevin, Dublin, det. 1973 (CIE A. 6304).

***Odontothrips cytisi* Morison, 1928 – New addition to Irish checklist** [1 sample, 2 adults] (Plates 2-3)

Adult females of *Odontothrips cytisi*, a florivore specialist of broom, are morphologically very similar to those of *O. ulicis*, making the two very difficult to distinguish. Indeed, the *Thrips of the British Isles* website does not attempt to separate the two leaving practical identification to a combination of host and the more distinct males (Mound, Collins and Hastings, 2018), though the text suggests that the number of setae on the forewing second vein in the female is usually above 20 in *O. ulicis* and usually below that number in *O. cytisi*. Continental European authors have attempted to separate the females, suggesting diagnostic characters which, when used, prove indicative of trends but not wholly robust. In the Killarney specimens, the S_1 and S_2 setae on tergites VI and VII are roughly subequal, consistent with *O. ulicis* according to zur Strassen (2003), whilst the lengths of the hind tibiae (223-241 µm) lie within the overlap of the ranges for the two species provided by Priesner (1964). In contrast, however, the tibial claws are noticeably smaller than those of British *O. ulicis* specimens against which they were compared and comparable to Scottish specimens of *O. cytisi*, each of the four forewing second veins bear 15 setae, and the length of antennal segment VI is 61-64 µm, all indicative of *O. cytisi* (Morison, 1928; Priesner, 1964; Mound, Collins and Hamilton, 2018). Furthermore, consideration of these characters shows the Killarney specimens to be clearly different to Pitkin's Roscommon specimens of *O. ulicis* collected on gorse just four days earlier. Pitkin identified both Killarney specimens as *O. cytisi*, and given that they were collected from broom that judgement, on balance, holds in the view of the present author, though collection of males would conclusively confirm the identification. The finding produces a highly disjunct distribution for *O. cytisi* across the British Isles with findings restricted to northern Scotland and

south west Ireland.
REPUBLIC OF IRELAND: 2♀♀, *Cytisus scoparius*, Killarney, Co. Kerry, 16.v.1968 (BRP 101).

***Odontothrips ignobilis* Bagnall, 1919 – New addition to Irish checklist** [1 sample, 7 adults]

Odontothrips phaleratus is a phytophagous florivore specialist of *Ulex gallii* and *U. minor*, both species that flower in mid and late summer. In Britain, the species is commonly collected wherever its hosts are present, so a wider distribution across southern Ireland mirroring the range of western gorse should be expected.
REPUBLIC OF IRELAND: 6♀♀, ♂, dwarf furze, Rosscarbery Bay, Co. Cork, 21.viii.1969 (BRP 161).

***Odontothrips phaleratus* (Haliday, 1836)** [2 samples; 3 adults, 1 larva]
NORTHERN IRELAND: ♀, 2♂♂, *Lathyrus pratensis*, Belfast, 30.vii.1928 (GDM); $1L_2$, grass, Belfast, 30.vii-02.viii.1928 (GDM).

***Odontothrips ulicis* (Haliday, 1836)** [1 sample; 2 adults] (Plates 2-3)

In contrast to *Odontothrips ignobilis*, *O. ulicis* is a specialist of common gorse, *Ulex europaeus* L., which can safely be assumed to be the host for these two adult females, particularly given the spring collection date. The slide label gives the collection information as detailed immediately below. However, Ballymoe is just across the county border from Roscommon, and the county location is listed as Galway by Mound *et al*. (1976). There is no material of *O. ulicis* from Northern Ireland at the NHM. Mound *et al*. (1976) included Down in their county location list for the species and this was the basis for its inclusion as a Northern Irish species by O'Connor (2008). I have been unable to find any mention of any such finding elsewhere in the literature; Morison does not reference Northern Ireland in any of his published references to the species. Thus, the presence of the species north of the border is unsupported by any known voucher specimen, though its host plant is widespread there.
REPUBLIC OF IRELAND: 2♀♀, *Ulex* sp., Roscommon, nr Ballymoe, 12.v.1968 (BRP 92).

***Oxythrips ajugae* Uzel, 1895** [2 samples; 2 adults]

"Kenarl" may be a mis-transcription on the slide label by Speyer who made the identification. The location is thus unknown to the author but Mound *et al*. (1976) listed county records for Galway and Kerry (also, see *Chirothrips manicatus* above),. The Pontoon specimen was initially identified as *Oxythrips ulmifoliorum*, but later corrected to *O. ajugae* (confirmed by the author).
REPUBLIC OF IRELAND: ♀, sedge, Pontoon, Co. Mayo, Ireland, 12.v.1968 (BRP 93); ♀,

Pinus sylvestris, *Kenarl*, 18.v.1968, det. E. R. Speyer (BRP 105).

***Oxythrips halidayi* Bagnall, 1924** [2 samples; 5 adults]

Oxythrips halidayi is one of three morphologically very similar species (together with *O. quercicola* Bagnall and *O. ulmifoliorum* (Haliday)) that are morphologically very similar, and Mound, Collins and Hastings (2018) expressed doubt as to whether there was sufficient biological evidence to support three species. However, wing reduction is reported only for *O. halidayi*, and all the specimens below are both brown and either micropterous or hemimacropterous.

NORTHERN IRELAND: 3♀♀ micr., ♀ hemimacr., *Fraxinus excelsior*, Co. Antrim, 10.v.1948 (GDM).

REPUBLIC OF IRELAND: ♀ hemimacr., ash, nr Sneem, Co. Kerry, 17.v.1968 (BRP 104).

***Oxythrips ulmifoliorum* (Haliday, 1836)** [1 sample; 1 adult]

The slide of the Glasnevin female was originally labelled "*Oxythrips*", with "*Oxy. ulmifoliorum*" added in pencil. The thrips is pale brown, with antennal segment I yellowish-brown and segment II darker than either I or III; antennal segments IV and V are subtly, but clearly paler in the basal half; ocellar setae pair III is shorter than the distance between the posterior ocellae. This makes the specimen consistent with zur Strassen's concept of *ulmifoliorum* (zur Strassen, 2003). The slide of the Northern Irish male was similarly originally marked "*Oxythrips*" in black ink by Morison, but he subsequently added "*ulmifoliorum*" in blue ink. The specimen is generally yellow with some brown mottling; antennal segments I to II are pale; segments IV and V are paler in the basal half; ocellar setae III are short, almost minute, the likely main reason why Morison applied the name *ulmifoliorum* to the specimen. Notably, neither specimen was taken from a host tree.

NORTHERN IRELAND: ♂, herbage, Stormont, Belfast, 26.vii.1939 (GDM).

REPUBLIC OF IRELAND: ♀, *Urtica*, Glasnevin, Dublin, det. 1973 (CIE A. 6304).

***Taeniothrips picipes* (Zetterstedt, 1828)** [2 samples; 10 adults]

The location of "Kichane" is unknown to the author; the name is clearly written on each slide label with no county name attached. Mound *et al*. (1976) listed a county record for Kerry.

NORTHERN IRELAND: 3♀♀, *Teucrium scorodonia*, Rostrevor, Co. Down, 28.vii.1939 (GDM).

REPUBLIC OF IRELAND: 7♀♀, *Euphorbia* flowers, nr *Kichane*, 23.v.1968 (BRP 120).

***Thrips atratus* Haliday, 1836** [13 samples; 50 adults, 2 larvae]
NORTHERN IRELAND: ♀, ♂, *Rubus fruticosus*, Belfast, 01.viii.1928 (GDM); 6♀♀, *Campanula* sp., Belfast, 26.vii.1939 (GDM); 2♂♂, 2L_2, *Dianthus* sp., Belfast, 26.vii.1939 (GDM); 2♀♀, 2♂♂, *Hieracium* sp., Stormont, Belfast, 26.vii.1939 (GDM); 2♀♀, 2♂♂, *Leucanthemum vulgare*, Stormont, Belfast, 26.vii.1939 (GDM); ♀, ♂, *Linum usitatissimum*, Stewartstown, Co. Tyrone, viii.1941 (R. Chamberlain, det. GDM).
REPUBLIC OF IRELAND: 4♀♀, *Lythrum salicaria*, nr Wexford, Co. Wexford, 13.viii.1969 (BRP 150); 2♀♀, *Salix*, Youghal, Wexford, Co. Wexford, 14.viii.1969 (BRP 152); ♀, *Vicia cracca*, 2ml S of Bantry, Co. Cork, 20.viii.1969 (BRP 158); 6♀♀, *Centranthus ruber*, Timoleague, Co. Cork, 21.viii.1969 (BRP 162); ♀, bramble flowers, nr Clonakilty, Co. Cork, 21.viii.1969 (BRP 163); 7♀♀, 8♂♂, *Vicia cracca*, nr Clonakilty, Co. Cork, 22.viii.1969 (BRP 166); ♀, orange iris-type flowers, 5m N of Monkstown, Co. Cork, 23.viii.1969 (BRP 169).

***Thrips brevicornis* Priesner, 1920** [1 sample, 1 adult]

The single slide in the NHM collection apparently contains the only specimen to have been collected in Ireland.
NORTHERN IRELAND: ♀, *Cirsium arvense* and *Senecio vulgaris*, Stormont, Belfast, 26.vii.1939 (GDM).

***Thrips discolor* Haliday, 1836** [1 sample; 1 adult]

The only records of the species from the Republic of Ireland in the literature are the references to adults of both sexes in crucifer flowers at the botanical gardens at Glasnevin, Dublin, made by Haliday (1836; 1852). There are possibly no extant specimens to support the record. The species is a phytophagous specialist of creeping buttercup, *Ranunculus repens* L.
NORTHERN IRELAND: ♀ macr., *Linum usitatissimus*, Stormont, Belfast, 26.vii.1939 (GDM).

***Thrips flavus* Schrank, 1776** [19 samples; 62 adults]
NORTHERN IRELAND: ♂, *Rubus fruticosus* agg., Belfast, 01.viii.1928 (GDM); 2♀♀, *Cirsium arvense* and *Senecio vulgaris*, Stormont, Belfast, 26.vii.1939 (GDM); ♂, Asteraceae, Hillsborough, Co. Down, 27.vii.1939 (GDM); 4♂♂, *Sinapis arvensis*, Dromara, Co. Down, 27.vii.1939 (GDM); 2♀♀, ♂, *Ulex europaeus*, Newcastle, Co. Down, 28.vii.1939 (GDM).
REPUBLIC OF IRELAND: ♀, ♂, *Menyanthes*, Killarney, Co. Kerry, 16.v.1968 (BRP 100); ♀, *Brassica nigra*, nr Cork Airport, Co. Cork, 19.v.1968 (BRP 106); 3♀♀, *Euphorbia*, nr *Kichane*, 23.v.1968 (BRP 120); 4♀♀, ♂, *Lythrum salicaria*, nr Wexford, Co. Wexford, 13.viii.1969 (BRP 150); 5♀♀, *Erica* sp., 2 ml E of Kenmare, Co. Kerry, 18.viii.1969 (BRP

154); 3♀♀, ♂, gorse, 2 ml E of Kenmare, Co. Kerry, 18.viii.1969 (BRP 155); ♀, ♂, *Senecio*, 3 ml S of Killarney, Co. Kerry, 19.viii.1969 (BRP 156); 2♀♀, 2♂♂, *Vicia cracca*, 2 ml S of Bantry, Co. Cork, 20.viii.1969 (BRP 158); ♂, *Trifolium pratense*, 2 ml S of Bantry, Co. Cork, 20.viii.1969 (BRP 159); 3♀♀, *Mentha aquatica*, 4 ml N of Skibbereen, Co. Cork, 20.viii.1969 (BRP 160); 4♀♀, dwarf furze, Rosscarbery Bay, Co. Cork, 21.viii.1969 (BRP 161); ♀, *Rubus fruticosus* agg., nr Clonakilty, Co. Cork, 21.viii.1969 (BRP 163); 4♀♀, 4♂♂, *Cytisus scoparius*, Kinsale, Co. Cork, 28.viii.1969 (BRP 167); 4♀♀, 4♂♂, orange iris-type flowers, 2.5 ml N of Monkstown, Co. Cork, 23.viii.1969 (BRP 169).

***Thrips fuscipennis* Haliday, 1836** [17 samples; 42 adults]
NORTHERN IRELAND: ♀, herbage, Hillsborough, Co. Down, 27.vii.1939 (GDM); ♀, *Linum usitatissimum*, Cookstown, Co. Tyrone, viii.1941 (R. Chamberlain; det. GDM); 5♀♀, 2♂♂, *Solanum tuberosum*, Benburb, Co. Tyrone, 19.vii.1961 (no further collection details: possibly det. E. R. Speyer).
REPUBLIC OF IRELAND: 3♀♀, *Prunus spinosa*, Killarney, Co. Kerry, 23.v.1968 (BRP 108); ♀, ♂, *Lythrum salicaria*, nr Wexford, Co. Wexford, 13.viii.1969 (BRP 150); 2♀♀, *Senecio*, 3 ml S of Killarney, Co. Kerry, 19.viii.1969 (BRP 156); ♀, ♂, *Vicia cracca*, 2 ml S of Bantry, Co. Cork, 20.viii.1969 (BRP 158); ♂, *Trifolium pratense*, 2 ml S of Bantry, Co. Cork, 20.viii.1969 (BRP 159); 10♀♀, *Mentha aquatica*, 4 ml N of Skibbereen, Co. Cork, 20.viii.1969 (BRP 160); ♂, *Centranthus ruber*, Timoleague, Co. Cork, 21.viii.1969 (BRP 162); 2♂♂, *Cytisus scoparius*, Kinsale, Co. Cork, 28.viii.1969 (BRP 167); ♂, *Trifolium pratense*, 2 ml N of Kinsale, Co. Cork, 23.viii.1969 (BRP 168); ♀, orange iris-type flowers, 2.5 ml N of Monkstown, Co. Cork, 23.viii.1969 (BRP 169); ♀, *Dactylus*, Glasnevin, Dublin, det. 1973 (CIE A. 6304); ♀, *Ranunculus*, Glasnevin, Dublin, det. 1973 (CIE A. 6304); 2♀♀, 2♂♂, *Rumex*, Glasnevin, Dublin, det. 1973 (CIE A. 6304); 2♀♀, *Senecio*, Glasnevin, Dublin, det. 1973 (CIE A. 6304).

***Thrips major* Uzel, 1895** [26 samples; 67 adults]
NORTHERN IRELAND: ♂, *Erica cinerea*, Belfast, 30.vii.1928 (GDM); ♀, *Rubus fruticosus* agg., Belfast, 1.viii.1928 (GDM); 2♂♂, Asteraceae, Belfast, 26.vii.1939 (GDM); ♀, *Digitalis purpurea*, Belfast, 26.vii.1939 (GDM); 2♀♀, herbage, Belfast, 26.vii.1939 (GDM); ♀, *Hieracium*, Stormont, Belfast, 26.vii.1939 (GDM); 8♀♀, ♂, *Rubus fruticosus* agg., Stormont, Belfast, 26.vii.1939 (GDM); 3♀♀, 3♂♂, herbage, Hillsborough, Co. Down, 27.vii.1939 (GDM); ♂, *Rubus fruticosus* agg., Rostrevor, Co. Down, 28.vii.1939 (GDM); ♀, *Linum usitatissimum*, Stewartstown, Co. Tyrone, viii.1941 (R. Chamberlain, det. GDM); ♀, herbage, Portadown, Co. Armagh, 7.v.1948 (GDM).

REPUBLIC OF IRELAND: ♂, on pasture land, Portumna, Co. Galway, vi.1963 (R. George; det. GDM); ♀, *Menyanthes*, Killarney, Co. Kerry, 16.v.1968 (BRP 100); ♀, *Brassica nigra*, nr Cork Airport, Co. Cork, 19.v.1968 (BRP 106); ♀, *Fumaria officinalis*, nr Cork Airport, Co. Cork, 19.v.1968 (BRP 107); 2♀♀, *Prunus spinosa*, Killarney, Co. Kerry, 23.v.1968 (BRP 108); 4♀♀, 5♂♂, *Lythrum salicaria*, nr Wexford, Co. Wexford, 13.viii.1969 (BRP 150); ♀ gorse, 2 ml E of Kenmare, Co. Kerry, 18.viii.1969 (BRP 155); 5♀♀, 4♂♂, *Senecio*, 3 ml S of Killarney, Co. Kerry, 19.viii.1969 (BRP 156); ♀, *Mentha aquatica*, 4 ml N of Skibbereen, Co. Cork, 20.viii.1969 (BRP 160); ♀, *Rubus fruticosus* agg., nr Clonakilty, Co. Cork, 21.viii.1969 (BRP 163); ♀, *Vicia cracca*, nr Clonakilty, Co. Cork, 22.viii.1969 (BRP 166); ♂, *Cytisus scoparius*, Kinsale, Co. Cork, 28.viii.1969 (BRP 167); 7♀♀, 2♂♂, orange iris-type flowers, 2.5 ml N of Monkstown, Co. Cork, 23.viii.1969 (BRP 169); ♀ *Rumex*, Glasnevin, Dublin, det. 1973 (CIE A. 6304); 2♂♂, *Senecio*, Glasnevin, Dublin, det. 1973 (CIE A. 6304).

***Thrips physapus* Linnaeus, 1776** [5 samples; 6 adults]

Adult females of *Thrips physapus* and *T. trehernei* Priesner are morphologically very similar, with their separation reliant on morphometric algebraic determinants developed, with slight variations since 1968 (Ward, 1968; Pitkin, 1976; zur Strassen, 2003). These determinants reflect a difference in size with a bimodal curve observed when the determinants are plotted against frequency. *T. physapus* is deemed the smaller species. Males of the two species are more easily separated, with those of *T. physapus* yellow and those of *T. trehernei* brown. However, each determinant for the females allows for an overlap of the two species' ranges so that, for example, Pitkin estimated that about 20% of individuals could not "be recognised with any certainty". This can make identification based on a limited number of adult females problematic. Only three adult females and a single larva catalogued as either *T. physapus* or *T. trehernei* from Northern Ireland were found in the NHM collection. The slide labels for all three females were originally identified as *T. physapus*, but in each case a line has been drawn through "*physapus*" and the name "*hukkineni*" [= *trehernei*] inserted instead, all in ink in Morison's handwriting. However, when the specimens were re-analysed by the author using the algebraic determinants, Ward's principle component (Wpc) indicated one female to be *T. physapus* and the other two to be in the overlap zone. When zur Strassens's slightly different vector (zSv) was applied, all three females were identified as *T. physapus*. Similarly, one of the Republic specimens collected by Pitkin was assigned to *T. trehernei* using Wpc, albeit by just 2µm, but was identified as *T. physapus* if the zSv was applied instead. The other two specimens clearly registered as *T. physapus*.

NORTHERN IRELAND: 2♀♀, *Senecio vulgaris*, Richhill, Co. Armagh, 28.vii.1939 (Wpc 389, 446: zSv 353, 411) (GDM); ♀, *Taraxacum* sp., Rostrevor, Co. Down, 28.vii.1939 (Wpc

434: zSv 394) (GDM).
REPUBLIC OF IRELAND: ♀, *Mentha aquatica*, 4 ml N of Skibereen, Co. Cork, 20.viii.1969 (Wpc 397: zSv 397) (BRP 160); ♀, dwarf furze, Rosscarbery Bay, Co. Cork, 21.viii.1969 (Wpc 410: zSv 382) (BRP 161); ♀, *Centranthus ruber* flowers, Timoleague, Co. Cork, 21.viii.1969 (Wpc 451: zSv 413) (BRP 162).

***Thrips tabaci* Lindeman, 1889** [8 samples; 42 adults]
NORTHERN IRELAND: 12♀♀, *Rubus fruticosus* agg., Belfast, 1.viii.1928 (GDM); 16♂♂, *Campanula*, Belfast, 26.vii.1939 (GDM); 6♀♀, *Digitalis purpurea*, Belfast, 26.vii.1939 (GDM); ♀, *Malus* sp., Belfast, x.1993 (Stephen Jess).
REPUBLIC OF IRELAND: ♀, moss, Glengarriff, Co. Cork, 13.ix.1939 (JL); ♀, *Trifolium pratense*, 2 ml N of Kinsale, Co. Cork, 23.viii.1969 (BRP 168); ♀, *Ranunculus*, Glasnevin, Dublin, det. 1973 (CIE A. 6304); 4♀♀, *Senecio*, Glasnevin, Dublin, det. 1973 (CIE A. 6304).

***Thrips trehernei* Priesner, 1927** [1 sample; 1 larva]

O'Connor's listing of *Thrips trehernei* in his Irish checklist is complicated by the fact that he mistakenly listed it as the unrelated phlaeothripid *Haplothrips hukkineni* Priesner (occasionally found on *Bolboschoenus maritimus* (L.) Palla in south east England). Up to, and including, Mound *et al*. (1976), British literature always referred to *T. trehernei* by its synonym *T. hukkineni* Priesner 1937, wherein the confusion arose. To justify his listing, O'Connor (2008) quoted Pitkin (1976) as describing *Thrips trehernei* as "widely spread and quite common" in Northern Ireland though Pitkin's full phrasing was itself a direct and attributed quote from Morison (1958), "widely spread and quite common in Great Britain and N. Ireland". Morrison's comment, however, predated the development of morphometric algebraic determinants to distinguish adult female *T. trehernei* from *T. physapus* (albeit for only c.80% of specimens), which when applied to the limited material found in the NHM collection confirmed specimens as *T. physapus* and not *T. trehernei* (see above). This leaves a single second-instar larva (originally) labelled "*hukkineni*" by Morison. However, neither Speyer and Parr (1941) nor Vierbergen, Kucharczyk and Kirk (2010) included *T. trehernei* in their analyses of the diagnostics of second-instar larvae of European thripids, making it impossible to provide an opinion either as to the identity of this specimen or to how Morison made the determination (other than by association with adults?). Morison (1947-1949) did not mention *T. trehernei*, so there is no detail provided in the literature to support his 1958 comment. Other Morison specimens may exist, unknown to the present author, that may support the inclusion of *T. trehernei* in the Irish checklist, potentially including adult males, which precludes de-listing the species at this point. In any case, given that the species is common and widespread in Britain,

new and extensive sampling of yellow-flowered Asteraceae across Ireland would likely produce specimens that would confirm its presence on the island.
NORTHERN IRELAND: 1L_2, ?Compositae sp., Stormont, Belfast, 26.vii.1939 (GDM).

***Thrips validus* Uzel, 1895** [4 samples; 6 adults, 13 larvae]
NORTHERN IRELAND: ♂, grass, Belfast, 30.vii.1928 (GDM); ♀, *Rubus fruticosus* agg., Belfast, 01.viii.1928 (GDM); 2♀♀, ♂, 3L_1, 12L_2, *Hieracium* sp., Stormont, Belfast, 26.vii.1939 (GDM); ♀, *Hypochaeris radicata*, Rostrevor, Co. Down, 28.vii.1939 (GDM).

***Thrips vulgatissimus* Haliday, 1836** [14 samples; 74 adults]
NORTHERN IRELAND: 2♀♀, *Hieracleum sphondylium*, Belfast, 30-31.vii.1928 (GDM); 39♀♀, ♂, *Rubus fruticosus* agg., Belfast, 1.viii.1928 (GDM); 3♀♀, *Campanula*, Belfast, 26.vii.1939 (GDM); ♀, *Hieracium*, Stormont, Belfast, 26.vii.1939 (GDM); 2♀♀, *Linum usitatissimum*, Cookstown, Co. Tyrone, viii.1941 (R. Chamberlain, det. GDM).
REPUBLIC OF IRELAND: 4♀♀, on pasture land, Portumna, Co. Galway, vi.1963 (R. George, det. GDM); 4♀♀, *Prunus spinosa*, Pallasgreen, Co. Limerick, 14.v.1968 (BRP 97); 5♀♀, 2♂♂, *Brassica nigra*, nr Cork Airport, Co. Cork, 19.v.1968 (BRP 106); ♀, *Lotus corniculatus*, Youghal, Co. Cork, 14.viii.1969 (BRP 151); 2♀♀, *Senecio*, 3 ml S of Killarney, Co. Kerry, 19.viii.1969 (BRP 156); ♀, *Mentha aquatica*, 4 ml N of Skibbereen, Co. Cork, 20.viii.1969 (BRP 160); ♀, *Rubus fruticosus* agg., nr Clonakilty, Co. Cork, 21.viii.1969 (BRP 163); ♀, *Vicia cracca*, nr Clonakilty, Co. Cork, 22.viii.1969 (BRP 166); 5♀♀, *Cytisus scoparius*, Kinsale, Co. Cork, 28.viii.1969 (BRP 167).

***Thrips* spp.** [1 sample; 10 adults]
REPUBLIC OF IRELAND: (across 3 slides) 7♀♀, 3♂♂, *Euphorbia*, Howth, Co. Dublin, undated (R. S. Bagnall) (almost certainly a mix of *T. fuscipennis*, *T. tabaci* and *T. vulgatissimus*).

Two slides labelled with pre-printed slide labels for Floyd Andre, ♀ *Thrips atratus* and ♀ *Thrips flavus*, both marked only "Ireland, on carnation leaves", are possibly quarantine interceptions by the United States plant health services, or were obtained as part of material exchanges between Andre and other researchers (Mound, 1974).

PHLAEOTHRIPIDAE - PHLAEOTHRIPINAE
***Haplothrips statices* (Haliday, 1836)** [6 samples; 30 adults, 87 larvae]

Adults of *Haplothrips statices* include both macropterous and micropterous forms, the relationship between the two being unclear. Many authors, including Mound *et al*. (1976), have

treated the two morphs as subspecies with the macropterous form designated as *H. statices statices* (Haliday) and the micropterous form as *H. statices morisoni* Priesner. The species has been recorded from coastlines around Great Britain, from the south coast of England to the Orkney Islands, but the microptereous form has only been recorded from northern Scotland and the Scottish islands (Morison, 1974). Adult specimens from Northern Ireland (all dated 1928-1939) are all macropterous. O'Connor (2008) recorded the species from County Dublin based on specimens from North Bull Island that were referenced by Healy (1975). The specimens do not appear to be extant, but Healy recorded that the specimens were all micropterous. O'Connor's placement of the reference under *H. statices statices* was therefore erroneous. Indeed, all the currently known adult specimens from the Republic of Ireland (all from 1968) are micropterous.

NORTHERN IRELAND: $1L_1$, $6L_2$, *Armeria maritima*, Giant's Causeway, Co. Antrim, 02.viii.1928 (GDM); 10♀♀ macr., 10♂♂ macr., $38L_1$, $10L_2$, *Armeria maritima*, Belfast, 26.vii.1939 (GDM); ♀ macr., ♂ macr., $12L_1$, $8L_2$, *Armeria maritima*, Belfast, 27.vii.1939 (GDM).

REPUBLIC OF IRELAND: 3♀♀ micr., 4♂♂ micr., *Armeria maritima*, Sneem, Co. Kerry, 17.v.1968 (BRP 102); ♀ micr., *Fraxinus*, Sneem, Co. Kerry, 17.v.1968 (BRP 104); $12L_2$, *Armeria maritima*, Kilmore Quay, Co. Wexford, 24.viii.1968 (BRP 171).

***Hoplothrips pedicularius* (Haliday, 1836)** [2 samples; 13 adults]

The absence of any material from Northern Ireland leaves the status of the species there, reported by Morison (1947-1949), unsupported by a known, extant, voucher specimen.

REPUBLIC OF IRELAND: 5♀♀, 7♂♂, dead plane logs, 2ml W of Killarney, Co. Kerry, 15.viii.1969 (BRP 153); ♀, dead log, nr Glengariff, Co. Cork, 19.viii.1969 (BRP 157).

***Phlaeothrips annulipes* Reuter, 1880** [1 sample; 1 larva]

Phlaeothrips annulipes is a fungal-feeding species, found on dead branches of trees such as birches or willows. It was recorded as Irish by O'Connor (2008) after Mound *et al*. (1976) included Armagh in their county listings for the species. There is only one Irish slide in the NHM collection, that of a single second-instar phlaeothripid larva, which was presumably identified as *P. annulipes* by a combination of its habitat, habitus and colour. The larvae are described as "bright red" (Mound, Collins and Hastings, 2018) or "crimson" (Morison, 1947-1949) and can sometimes be found in large colonies. By contrast, the larvae of its sole British congener, *P. coriaceus* Haliday are predominantly pale. The treated, slide-mounted, NHM specimen is orange-brown to the eye. Morison was familiar with the larvae, describing in print that it could be easily separated from potentially confusing species such as *Hoplandrothrips*

ellisi (Morison 1947-1949), but it appears that no formally determined adult material currently supports inclusion of this species on the Irish checklist.
NORTHERN IRELAND: $1L_2$, sticks, Portadown, Armagh, 07.v.1948 (GDM).

Discussion

This study confirmed the NHM to be the largest single depository of slide-mounted, identified, Irish thrips specimens. The majority of published references to Irish thrips were found to be based on specimens now held in the NHM collection. The gaps are identified and highlighted in this paper. The current study recorded 674 individual adult thrips (excluding the two Andre Floyd specimens), and a further 148 larval and 11 pupal thrips, collected as 84 separate (host/location) samples, forty from Northern Ireland and forty-four from the Republic of Ireland. This compares with the 12 individuals mounted on 10 slides in the collection of the NMI. Exactly half of the adults (337 individuals) represent just six species, all common and widespread, polyphagous, florivores in Great Britain: *Thrips atratus*, *T. flavus*, *T. fuscipennis*, *T. major*, *T. tabaci* and *T. vulgatissimus*. These are the species that dominate the "catch" from casual or untargeted collecting in Britain and elsewhere in western Europe, not least because, readily carried by winds, they are often found in the flowers of plants on which they do not breed. A further 161 adults represent 6 common, grass-living, thrips (*Aptinothrips rufus*, *A. stylifer*, *Baliothrips dispar*, *Chirothrips manicatus*, *Limothrips cerealium* and *L. denticornis*), though this includes the 78 adult *A. rufus* mounted onto a single slide from 1928.

The addition of *Aeolothrips ericae*, *Odontothrips cytisi* and *O. ignobilis* to the Irish checklist means that it now includes 39 species in 20 genera from 3 families; one further species is recorded as a non-established record of an incursion. The NHM collection contains Irish specimens from 33 species of thrips; thus, only six (*Bolothrips dentipes* (Reuter), *Haplothrips juncorum* Bagnall and *Odontothrips loti* (Haliday), plus the three introduced glasshouse pest species *Echinothrips americanus*, *Frankliniella occidentalis* and *Heliothrips haemorrhoidalis* (Bouché)) are not represented. However, two slides of *F. occidentalis* are amongst the small holding of slide mounted material held by the NMI. It appears that none of Richard Bagnall's Portmarnock specimens of *B. dentipes* were amongst his large collection of thrips slides obtained by the NHM in 1932. Likewise, the males of *O. loti* collected by Ken Smith at Killoughter, County Wicklow, in 1951, and identified by Guy Morison, were seemingly not part of Morison's later donation to the NHM. Specimens of *H. juncorum* collected by Brenda Healy at North Bull Island, Dublin, in the early 1960s were sent to Ernest Speyer for identification. The current author is unaware of any surviving slide mounts made by Speyer beyond the relatively few examples deposited at the NHM; Speyer worked at the horticultural Experimental and Research Station at Cheshunt in Hertfordshire, long-since closed and incorporated into an

evolving chain of successor organisations. It is possible that he did not have a collection as such (Laurence Mound, personal communication).

It is not within the remit of this study, which cannot claim to be a comprehensive accounting of Irish thrips material, to remove any species from the Irish checklist, nor the checklists for either Northern Ireland or the Republic, because of an apparent lack of extant specimens. Nevertheless, it seems unlikely that there are many other specimens, if any, other than possible card-mounted Haliday types, to be found elsewhere to support the published records that underpin the original O'Connor checklist. Hence, it is worth noting that no known specimens currently support the presence of three species in Northern Ireland (*Limothrips denticornis*, *Odontothrips ulicis* and *Hoplothrips pedicularius*) or two species in the Republic of Ireland (*Aptinothrips stylifer* and *Thrips discolor*). Of further note, the inclusion of three species in the Irish checklist (*Belothrips acuminatus*, *T. trehernei* and *Phlaeothrips annulipes*) is based solely, in each case, on a single second-instar larva. This is unusual, given that morphological thrips identification is based on adult material, primarily adult females. The identifications of *B. acuminatus* and *P. annulipes* are not disputed here; it is impossible to confirm or refute the identification of *T. trehernei*. There are no reasons, based either on known biogeography and/or levels of abundance in Great Britain, to presume any of the above records to be unlikely, so it is hoped that this study will spur future collecting to confirm the presence of these species as designated.

Mound, Collins and Hastings (2018) excluded three species mentioned by O'Connor (2008) from their Irish checklist, as their presence in Ireland had never been formally confirmed. No Irish specimens of the three, *Kakothrips pisivorus* Westwood, *Haplothrips setiger* Priesner or *H. senecionis* Bagnall, were found during this study.

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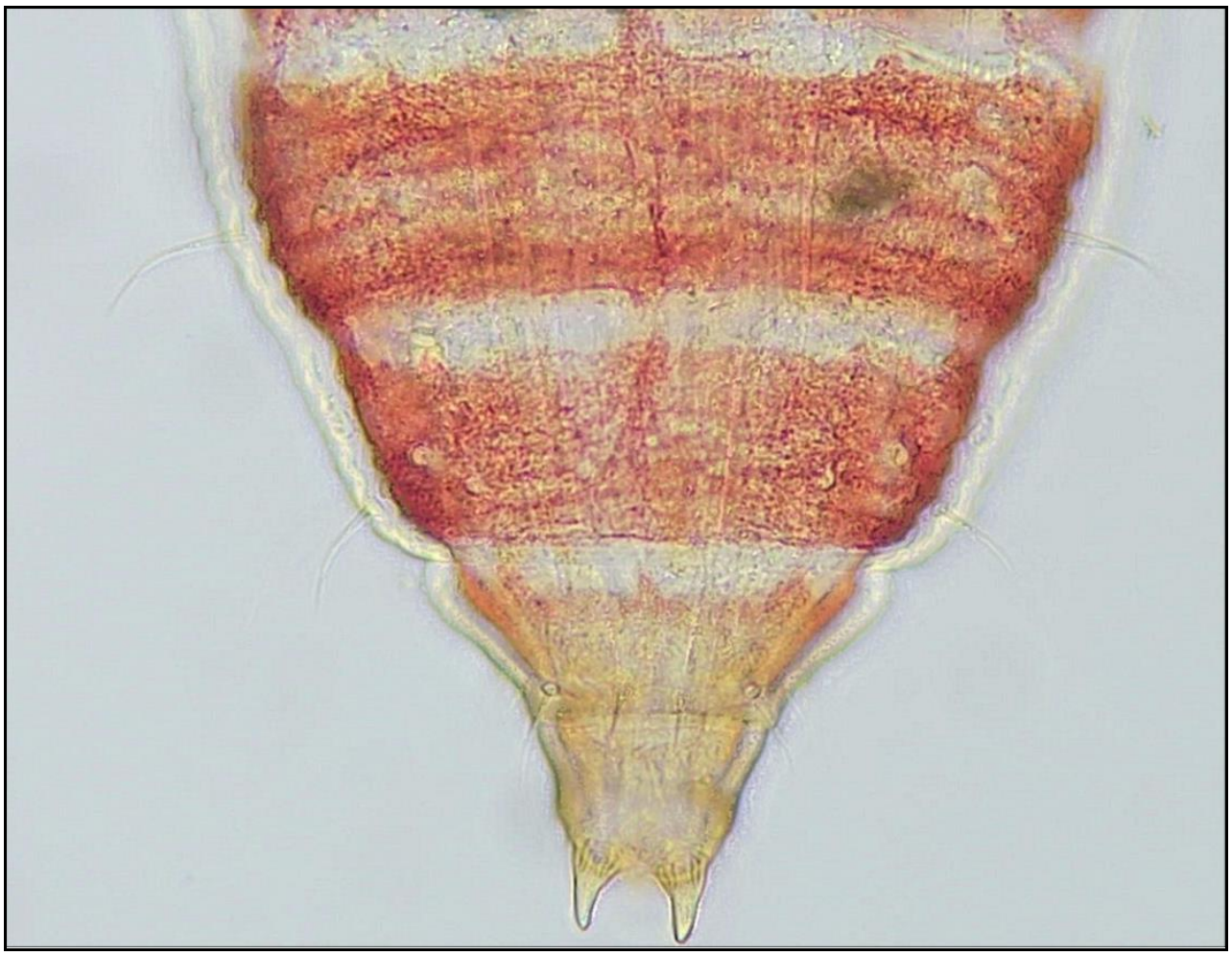

PLATE 1. *Belothrips acuminatus*, second-instar larva, abdominal segments VII-X. Bushmills, County Antrim, 24 July 1958 (identification by Guy Morison).

PLATE 2. Comparison between Irish specimens of *Odontothriops cytisi* and *O. ulicis* collected by Brian Pitkin 1968-69: a) *O. cytisi*, right wing (BRP 101), b) *O. ulicis*, right wing (BRP 92).

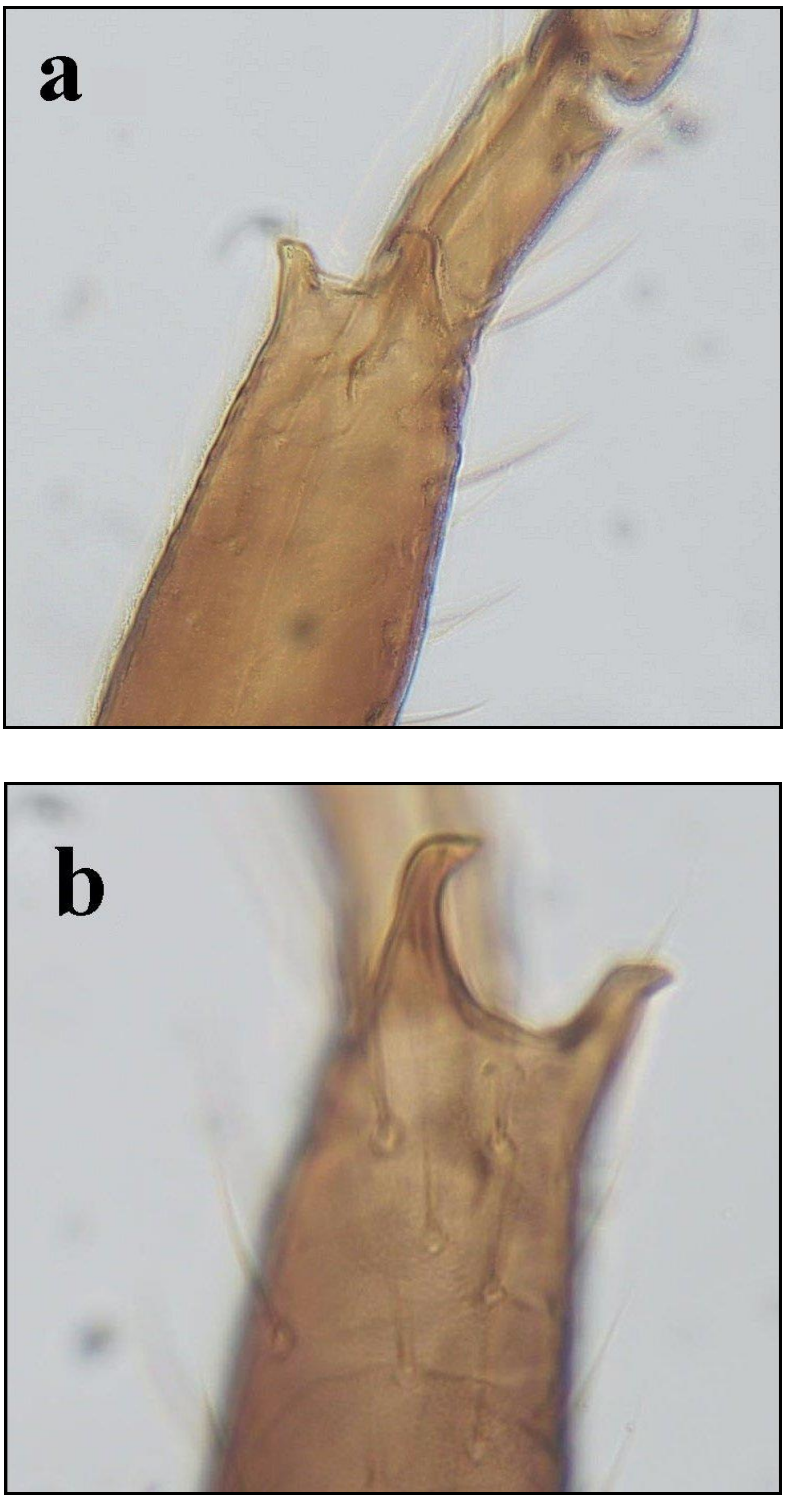

PLATE 3. Comparison between Irish specimens of *Odontothriops cytisi* and *O. ulicis* collected by Brian Pitkin 1968-69 (continued): a) *O. cytisi*, apex of right tibia (BRP 101), b) *O. ulicis*, apex of left tibiae (BRP 92).

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A FIVE YEAR STUDY (2018-2022) OF THE FLORA AND FAUNA OF BALLYWILLIAM (R909097), BALLYPOREEN, CAHIR, COUNTY TIPPERARY, IRELAND

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Abstract

Plants and animals were listed over a five-year period (2018-2022) within the 100m grid square (Irish grid reference R909097) around the author's home at Ballywilliam, Ballyporeen Cahir, County Tipperary, Ireland (Fig. 1). The area consists of diversely structured countryside in a secluded location in the mountainous foothills of the Knockmealdowns mountains. The habitats consist of old stone walls, hedges with old spruces, old ivy and many hawthorns. It also includes heathy ground, wet meadows, many small streams and swamps. There are numerous deciduous trees including alder, ash, birch, maple, oak and willow. In addition, there are old and more-recently planted forest plantations with fir, larch, pine and spruce.

Key words: fauna, flora, lists, 2018-2022, Ballywilliam, Ballyporeen, Cahir, County Tipperary, Ireland, Irish grid reference (R909097).

Introduction

Several years ago, I decided to list all the plants and animals that could be observed in the 100m grid square surrounding my home at Ballywilliam (R909097), Ballyporeen, Cahir, County Tipperary, Ireland. The house is a stony one in a secluded location in the mountainous foothills of the Knockmealdown mountains. The house has a rich flowering garden which includes plants specially planted for insects. These include trees, shrubs, perennials and other plants flowering throughout the year. There is a small ditch, natural stone walls, large single stones and additional wild areas with thistles, nettles and sorrel.

The area within the 100m grid square consists of diversely structured countryside including old stone walls, hedges with old spruces, old ivy and many hawthorns. It also includes heathy ground, wet meadows, many small streams and swamps. The hedges around the meadows are also diverse with gorse, blueberries and blackberries. There are numerous deciduous trees including alder, ash, birch, maple, oak and willow. In addition, there are old and more-recently planted forest plantations fir, larch, pine and spruce.

I listed and photographed all the plants and animals that I could observe in the area including the garden and on the walls of the stony house, on the roadsides, walls and meadows to the

nearby mountain road and in the hedges and the small water habitats around the house. Specimens (e.g. moths, caddisflies) attracted to light at the house were also noted. Through contacts with specialists (listed in the acknowledgements), my determinations were confirmed or corrected *via* photographs and/or voucher specimens. Unidentified specimens were also determined with their assistance.

The records were sent to the National Biodiversity Data Centre. One species - unfortunately an invasive flatworm species - is new to Ireland (*Marionfyfea adventor* Jones & Sluys, 2016) while most were new to the 1000m grid square. I also wrote a small summary book, profusely illustrated with photographs and detailing the information, *Diverse – rich – beautiful Baile Liam "What lives in my region" foothills of the Knockmealdowns 5-year monitoring: 2018 – 2022*. Sadly, all the printed copies were lost in transit to me from the printers in Germany. This paper is based on the surviving proofs of the book and was prepared by James P. O'Connor to preserve the data in a printed format. Professor Tom Bolger and Margaret Norton kindly reviewed the manuscript to detect any errors made by the Editor.

The nomenclature mainly follows GBIF: The Global Biodiversity Information Facility (2023) with some additions from the National Biodiversity Data Centre (2023), O'Connor (2021), Bond, Nash and O'Connor (2006), O'Connor, Nash and Broad (2009), O'Connor and Nelson (2012) and Seaward (2023). Nomenclature for vascular plants follows Stace (2019).

IRISH GRID R909097: PROVEN OCCURRENCES OF ANIMALS AND PLANTS (SPECIES, GENERA, FAMILIES) FOR THE FIVE YEARS: 2018, 2019, 2020, 2021 AND 2022.

FAUNAL LISTS

Coelenterata

Cnidaria: Hydrozoa - Common Hydra

Hydra vulgaris Pallas, 1766: 2020.

Platyhelminthes

Tricladida - Flatworms

Australoplana sanguinea (Moseley, 1877): 2019, 2020, 2021.
Dendrocoelum lacteum (Müller, 1774): 2021, 2022.
Marionfyfea adventor Jones & Sluys, 2016: 2022.
Microplana terrestris (O.F.Müller, 1773) Linden, 1900: 2022.

Nematomorpha

Gordioida - White Horsehair Worm

Gordioidea sp.: 2020, 2021, 2022.

Nemertea

Argonemertes dendyi (Dakin, 1915): 2019.

Annelida

Clitellata - Earthworms

Allolobophora chlorotica (Savigny, 1826): 2019, 2020, 2021.
Eisenia cf *fetida* (Savigny, 1826): 2021, 2022.
Lumbricus rubellus Hoffmeister, 1843: 2019, 2021.
Lumbricus cf *terrestris* Linnaeus, 1758: 2018, 2019, 2020.
Lumbricus sp.: 2018, 2019, 2020, 2021, 2022.

Arthropoda

Chilopoda - Centipedes

Lithobius cf *borealis* Meinert, 1868: 2020, 2021, 2022.

Diplopoda - Millipedes

Cylindroiulus cf *punctatus* (Leach, 1815): 2021, 2022
Julus cf *scandinavius* (Latzel, 1884): 2019, 2020.
Polydesmus agg cf *angustus* Latzel, 1884: 2019, 2020, 2021.
Tachypodoiulus niger (Leach, 1814): 2019, 2020, 2021, 2022.

Crustacea

Isopoda - Woodlice

Oniscus asellus Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Porcellio scaber Latreille, 1804: 2018, 2019, 2020, 2021, 2022.

Arachnida

Arachnida: Acari - Mites

Damaeus cf *onustus* Koch, 1844: 2020.
Panonychus ulmi (Koch, 1836): 2018, 2019, 2020, 2021.
Gamasina sp.: 2019.
Parasitus cf *fucorum* (De Geer, 1778): 2018, 2019, 2020, 2021, 2022.
Thrombidium holosericeum (Linnaeus, 1758): 2018, 2019, 2020.

Arachnida: Araneae - Spiders

Agelena labyrinthica (Clerck, 1757): 2018, 2019, 2020, 2021, 2022.
Alopecosa pulverulenta (Clerck, 1757): 2019.
Amaurobius cf *fenestralis* (Ström, 1768): 2019.
Amaurobius similis (Blackwall, 1861): 2018, 2019, 2020, 2021, 2022.
Amaurobius ferox (Walckenaer, 1830): 2021.
Araneus diadematus Clerck, 1757: 2018, 2019, 2021.
Araniella agg. cf *inconspicua* (Simon, 1874): 2018, 2019.
Araniella cucurbitina (Clerck, 1757): 2018.
Araniella cucurbitina / *A. opisthographa* (Kulczyński, 1905): 2019, 2020, 2021, 2022.
Araniella sp.: 2020, 2021.
Clubiona cf *brevipes* Blackwall, 1841: 2018.
Clubiona cf *reclusa* O. Pickard-Cambridge, 1863: 2018.
Clubiona sp.: 2019, 2020, 2021.
Cnephalocotes obscurus (Blackwall, 1834): 2018.
Dictyna arundinacea (Linnaeus, 1758): 2019.
Drassodes cupreus (Blackwall, 1834) / *D. lapidosus* (Walckenaer, 1802): 2020, 2021.
Drassodes sp.: 2019, 2020, 2021, 2022.
Enoplognatha ovata (Clerck, 1757) / *E. latimana* Hippa & Oksala, 1982 var. *lineata*: 2018, 2019, 2020, 2021, 2022.
Enoplognatha ovata (Clerck, 1757) / *E. latimana* Hippa & Oksala, 1982 var. *redimida*: 2019, 2020.
Eratigena atrica (C. L. Koch, 1843): 2018, 2019, 2020, 2021, 2022.
Eratigena atrica / *E.* x *saeva* (Blackwall, 1844): 2018, 2020, 2021, 2022.
Erigone sp.: 2020.
Euophrys frontalis (Walckenaer, 1802): 2018.
Gnaphosidae sp.: 2020.
Haplodrassus cf *signifer* (C. L. Koch, 1839): 2018.
Hygrolycosa cf *rubrofasciata* (Ohlert, 1865): 2018.
Larinioides cf *cornutus* (Clerck, 1757): 2020.
Leptyphantes cf *minutus* (Blackwall, 1833): 2018, 2020.
Linyphia hortensis Sundevall, 1830: 2018.
Linyphia triangularis (Clerck, 1757): 2018, 2019, 2021, 2022.
Metellina mengei (Blackwall, 1869): 2018, 2019, 2020, 2021, 2022.
Metellina merianae (Scopoli, 1763): 2018, 2019, 2020, 2021, 2022.
Metellina merianae var. *celata* (Blackwall, 1841): 2020.

Metellina segmentata (Clerck, 1757): 2018, 2019, 2020, 2021, 2022.
Micaria pulicaria (Sundevall, 1831): 2021.
Neottiura bimaculata (Linnaeus, 1767): 2019.
Neriene clathrata (Sundevall, 1830): 2018, 2019, 2020, 2021, 2022.
Neriene montana (Clerck, 1757): 2019, 2020, 2021, 2022.
Neriene peltata (Wider, 1834): 2018, 2019, 2022.
Neriene radiata (Walckenaer, 1841): 2019.
Nuctenea umbratica (Clerck, 1757): 2018, 2019, 2020, 2021, 2022.
Pachygnatha clercki Sundevall, 1823: 2018, 2019, 2020.
Pachygnatha degeeri Sundevall, 1830: 2019, 2021.
Paidiscura pallens (Blackwall, 1834): 2019.
Pardosa agricola (Thorell, 1856): 2018.
Pardosa amentata (Clerck, 1757): 2018, 2019, 2020, 2021, 2022.
Pardosa lugubris (Walckenaer, 1802) s.l.: 2018, 2020.
Pardosa monticola (Clerck, 1757) agg.: 2021, 2022.
Pardosa nigriceps (Thorell, 1856): 2021, 2022.
Pardosa sp.: 2018, 2019, 2020, 2021, 2022.
Philodromus aureolus (Clerck, 1757) agg.: 2019.
Pholcus phalangioides (Fuesslin, 1775): 2018, 2019, 2020, 2021, 2022.
Phylloneta impressa (L. Koch, 1881) / *P. sisyphia* (Clerck, 1757): 2019.
Pirata piraticus (Clerck, 1757): 2019, 2021, 2022.
Pisaura mirabilis (Clerck, 1757): 2018, 2019, 2020, 2021, 2022.
Salticus scenicus (Clerck, 1757): 2019, 2021, 2022.
Scotophaeus blackwalli (Thorell, 1871): 2018, 2019, 2021, 2022.
Segestria senoculata (Linnaeus, 1758): 2018, 2020, 2021, 2022.
Steatoda grossa (C.L. Koch, 1838): 2022.
Steatoda nobilis (Thorell, 1875): 2021, 2022.
Tetragnatha cf *extensa* (Linnaeus, 1758): 2020.
Tetragnatha montana Simon, 1874: 2018, 2020, 2021, 2022.
Tetragnatha cf *obtusa* C.L. Koch, 1837: 2018.
Tetragnatha sp.: 2019.
Theridion melanurum Hahn, 1831 agg.: 2018, 2019, 2021, 2022.
Xysticus cf *cristatus* (Clerck, 1757): 2018, 2019, 2020.
Xysticus cristatus / *X. kochi* Thorell, 1872: 2018, 2019, 2020, 2021, 2022.
Zora spinimana (Sundevall, 1833): 2019.
Zygiella x-notata (Clerck, 1757): 2018, 2019, 2020, 2021, 2022.

Arachnida: Ixodida - Ticks

Ixodes cf *ricinus* Linnaeus, 1758: 2018, 2020, 2022.

Arachnida: Opiliones - Harvestmen

Lacinius ephippiatus (Koch, 1835): 2018.
Leiobunum blackwalli Meade, 1861: 2018, 2019.
Leiobunum rotundum (Latreille, 1798): 2018, 2019, 2020, 2021, 2022.
Leiobunum sp.: 2019, 2020.
Megabunus diadema (Fabricius, 1779): 2018, 2019, 2020, 2021, 2022.
Mitopus morio (Fabricius, 1779): 2018, 2019, 2020, 2021, 2022.
Paroligolophus agrestis (Meade, 1855): 2018, 2019, 2020, 2021, 2022.
Phalangium opilio Linnaeus, 1758: 2019.
Rilaena triangularis (Herbst, 1799): 2018, 2019, 2020, 2021, 2022.

Hexapoda

Collembola - Springtails

Hypogastrura sp.: 2022.
Pogonognathellus longicornis (O.F. Müller, 1776): 2019, 2022,
Tomocerus cf *vulgaris* (Tullberg, 1871): 2019, 2020, 2021, 2022.

Insecta

Coleoptera - Beetles

Adalia decempunctata (Linnaeus, 1758): 2019, 2022.
Agabus bipustulatus (Linnaeus, 1767): 2020, 2021.
Agabus guttatus (Paykull, 1798)/*Agabus biguttatus* (Olivier, 1795): 2020.
Agabus nebulosus (Forster, 1771): 2020.
Agonum muelleri (Herbst, 1784): 2019, 2020, 2021.
Altica sp.: 2019.
Amara aenea (DeGeer, 1774): 2022.
Amara ovata (Fabricius, 1792): 2019, 2020.
Amara sp.: 2022.
Anatis ocellata (Linnaeus, 1758): 2019.
Anchomenus dorsalis (Pontoppidan, 1763): 2020.
Anotylus sp.: 2019.
Aphodius fossor (Linnaeus, 1758): 2021.
Aphodius rufipes (Linnaeus, 1758): 2019, 2020, 2021, 2022.

Aphodius sp.: (+ phoretic mites 2019) 2019, 2021, 2022.
Asemum striatum (Linnaeus, 1758): 2020.
Asiorestia ferruginea (Scopoli, 1763): 2020.
Asiorestia sp.: 2019.
Athous haemorrhoidalis (Fabricius, 1801): 2019 , 2022.
Athous subfuscus (Müller, 1764): 2020.
Barypeithes sp.: 2019, 2020, 2022.
Bembidion sp.: 2021.
Bolitobius cingulatus Mannerheim, 1830: 2019.
Byturus sp.: 2021.
Cantharis sp. : 2021, 2022.
Cantharis cryptica Ashe, 1947: 2020, 2021, 2022.
Cantharis cf *fulvicollis* Fabricius, 1792: 2019.
Cantharis cf *lividus* Linnaeus, 1758: 2022.
Cantharis cf *pellucida* Fabricius, 1792: 2022.
Cantharis lateralis Linnaeus, 1758: 2018.
Cantharis rufa (Linnaeus, 1758): 2019, 2021, 2022.
Cassida flaveola Thunberg, 1794: 2019.
Cassida rubiginosa Müller, 1776: 2019.
Calvia quatuordecimguttata (Linnaeus, 1758): 2018, 2019, 2021, 2022.
Ceutorhynchus obstrictus (T. Marsham, 1802): 2020.
Cicindela campestris Linnaeus, 1758: 2022.
Coccidula rufa (Herbst, 1783): 2019.
Coccinella septempunctata Linnaeus, 1758: 2018, 2019, 2020 , 2021, 2022.
Columbetes fuscus (Linnaeus, 1758): 2022.
Cytilus sericeus (Forster, 1771): 2018.
Deleaster dichrous (Gravenhorst, 1802): 2020, 2022.
Dytiscidae sp.: 2018 , 2019, 2020, 2021, 2022.
Elateridae sp.: 2018, 2022.
Epuraea sp.: 2021, 2022.
Galerucinae sp.: 2020, 2022.
Gastrophysa viridula (De Geer, 1775): 2018, 2019, 2020, 2021, 2022.
Grammoptera sp.: 2020.
Halticinae sp.: 2019.
Harmonia axyridis (Pallas, 1773): 2019.
Helophorus sp.: 2019, 2020.

Hippodamia variegata (Goeze, 1777): 2018.
Hydroporus cf *tesselatus* (Drapiez, 1819): 2020 .
Hylobius abietis (C. Linnaeus, 1758): 2020, 2022.
Hypera zoilus (Scopoli, 1763): 2022.
Ilybius sp.: 2019.
Lagria hirta (Linnaeus, 1758): 2019, 2022.
Latrobium fulvipenne (Gravenhorst, 1806): 2018.
Leiosoma sp.: 2020, 2022.
Leistus sp.: 2019.
Leistus cf *fulvibarbis* Dejean, 1826: 2019.
Lignyodes enucleator (G.W.F. Panzer, 1798): 2018.
Lochmaea caprea (Linnaeus, 1758): 2018.
Lochmaea suturalis (Thomson, 1866): 2019, 2020, 2021, 2022.
Malthinus cf *seriepunctatus* Kiesenwetter, 1851: 2022.
Mononychus cf *punctumalbum* (J.F.W. Herbst, 1784): 2019.
Nedyus quadrimaculatus (C. Linnaeus, 1758): 2019.
Nitidulidae sp.: 2020.
Notiophilus biguttatus (Fabricius, 1779): 2019, 2020, 2021, 2022.
Notiophilus sp.: 2022.
Ocys harpaloides (Audinet-Serville, 1821) / *O. tachysoides* (Antoine, 1933): 2022.
Otiorhynchus sp.: 2018, 2019, 2020, 2021.
Otiorhynchus singularis (Linnaeus, 1767): 2020, 2021.
Otiorhynchus cf s*ingularis*: 2019, 2020, 2022.
Otiorhynchus singularis / *O. veterator* Uyttenboogaart, 1932: 2018, 2019.
Otiorhynchus sulcatus (Fabricius, 1775): 2019.
Philontus sp.: 2019.
Phosphuga atrata (Linnaeus, 1758): 2021.
Phyllobius argentatus Linnaeus, 1758: 2020.
Phyllobius pomaceus Gyllenhal, 1834: 2018, 2019, 2020, 2022.
Prasocuris (*Hydrothassa*) *marginella* (Linnaeus, 1758): 2018, 2019, 2020.
Psylliodes sp.: 2020.
Pterostichus nigrita (Paykull, 1790) / *P. rhaeticus* Heer, 1837: 2020.
Pterostichus strenuus (Panzer, 1796): 2018.
Pterostichus vernalis (Panzer, 1796): 2019.
Pterostichus sp.: 2020, 2021, 2022.
Quedius sp.: 2019, 2022.

Rhagium bifasciatum Fabricius, 1775: 2018, 2019, 2020, 2021, 2022.
Rhagonycha fulva (Scopoli, 1763): 2019, 2020, 2021, 2022.
Rhagonycha lignosa (Müller, 1764): 2020.
Serica brunnea (Linnaeus, 1758): 2019.
Silpha sp.: 2020.
Sitona sp. 2019.
Sitona cf *sulcifrons* (Thunberg, 1798): 2018.
Sitona regensteinensis (Herbst, 1797): 2022.
Sphaeroderma cf *S. rubidum* (Graëlls, 1858) / *S. testaceum* (Fabricius, 1775).
Stenus sp.: 2021.
Strophosoma melanogrammum (Forster, 1771): 2018, 2019, 2020, 2021.
Tachinus sp.: 2020.
Tachinus subterraneus (Linnaeus, 1758): 2021.
Tachyporus sp.: 2019, 2022.
Xantholininae sp.: 2020.

Dermaptera - Earwigs

Forficula auricularis Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.

Diptera: Bibionidae - Fever fly

Dilophus febrilis (Linnaeus, 1758): 2019.
Dilophus cf *febrilis* (Linnaeus, 1758): 2020.

Diptera: Cecidomyiidae - Gall midge

Dasineura urticae (Perris, 1840): 2021, 2022.

Diptera: Ceratopogonidae - Biting midge

Culicoides impunctatus Goetghebuer, 1920: 2018, 2019, 2020, 2021, 2022.

Diptera - Craneflies

Limonia nubeculosa Meigen, 1804: 2019, 2020, 2022.
Limonia sp.: 2018, 2019, 2020, 2021, 2022.
Pedicia rivosa (Linnaeus, 1758): 2019, 2021, 2022.
Ptychoptera albimana (Fabricius, 1787): 2018.
Tipula confusa van der Wulp, 1883: 2021.
Tipula fascipennis Meigen, 1818: 2018.

Tipula fulvipennis De Geer, 1776: 2020, 2021, 2022.
Tipula lateralis Meigen, 1804: 2021.
Tipula luna Westhoff, 1879: 2022.
Tipula maxima Poda, 1761: 2019.
Tipula oleracea Linnaeus, 1758: 2019, 2022.
Tipula pagana Meigen, 1818: 2020.
Tipula paludosa Meigen, 1830: 2019, 2021, 2022.
Tipula paludosa Meigen, 1830 / *T. czizeki* de Jong, 1925: 2019.
Tipula scripta Meigen, 1830: 2022.
Tipula sp.: 2018, 2019, 2020, 2021, 2022.
Tipula submarmorata Schummel, 1833: 2021.
Tipula vittata Meigen, 1804: 2019, 2020, 2021, 2022.

Diptera: Psychodidae - Moth fly

Psychodidae spp.: 2018, 2019, 2020, 2021, 2022.

Diptera: Ptychopteridae - Phantom cranefly

Ptychoptera albimana (Fabricius, 1787): 2018.

Diptera: Syrphidae - Hoverflies

Anasimyia sp.: 2018.
Arctophila superbiens (Müller, 1776): 2020.
Baccha elongata (Fabricius, 1775): 2020.
Cheilosia illustrata (Harris, 1780): 2022.
Cheilosia pagana (Meigen, 1822): 2018.
Cheilosia sp.: 2020.
Chrysogaster solstitialis (Fallén, 1817): 2020, 2021, 2022.
Chrysotoxum bicinctum (Linnaeus, 1758): 2020, 2021, 2022.
Chrysotoxum cf *intermedium* Meigen, 1822: 2018.
Criorhina cf *berberina* (Fabricius, 1805): 2018.
Didea fasciata Macquart, 1834: 2018.
Episyrphus balteatus (De Geer, 1776): 2018, 2019, 2020, 2021, 2022.
Eristalis arbustorum (Linnaeus, 1758) / *E. abusiva* Collin, 1931: 2020, 2021.
Eristalis lineata Wahlberg, 1843: 2021, 2022.
Eristalis cf *rupium* Fabricius, 1805: 2020.
Eristalis intricaria (Linnaeus, 1758): 2020, 2021.

Eristalis nemorum (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Eristalis pertinax (Scopoli, 1763): 2018, 2019, 2020, 2021, 2022.
Eristalis tenax (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Eristalis sp.: 2020, 2021.
Eupeodes corollae (Fabricius, 1794): 2019, 2020, 2021.
Eupeodes luniger (Meigen, 1822): 2019, 2020.
Eupeodes sp.: 2022.
Helophilus hybridus Loew, 1846: 2018, 2021.
Helophilus pendulus (Linnaeus, 1758): 2019, 2020, 2021, 2022.
Helophilus trivittatus (Fabricius, 1805): 2018, 2021.
Leucozona glaucia (Linnaeus, 1758): 2021, 2022.
Leucozona lucorum (Linnaeus, 1758): 2021.
Melangyna barbifrons (Fallén, 1817): 2020.
Melangyna cincta (Fallén, 1817): 2020.
Melangyna umbellatarum (Fabricius, 1794): 2020.
Melanostoma scalare (Fabricius, 1794): 2020, 2021, 2022.
Meliscaeva auricollis (Meigen, 1822): 2018, 2019, 2020, 2021, 2022.
Meliscaeva cinctella (Zetterstedt, 1843): 2019, 2020, 2021, 2022.
Meliscaeva sp.: 2020.
Merodon equestris (Fabricius, 1794): 2020.
Neoascia cf *annexa* (Müller, 1776) / *N. tenur* (Harris, 1780): 2020.
Orthonevra sp.: 2022.
Platycheirus albimanus (Fabricius, 1781) (agg): 2018, 2019, 2020 , 2021, 2022.
Platycheirus cf *granditarsus* (Forster, 1771): 2022.
Platycheirus manicatus (Meigen, 1822): 2020.
Platycheirus peltatus (Meigen, 1822): 2020.
Platycheirus scutatus (Meigen, 1822) (agg): 2019, 2020, 2021, 2022.
Platycheirus sp.: 2020, 2021, 2022.
Rhingia campestris Meigen, 1822: 2018, 2019, 2020, 2021, 2022.
Riponnensia splendens (Meigen, 1822): 2022.
Scaeva pyrastri (Linnaeus, 1758): 2019, 2021, 2022.
Scaeva selenitica (Meigen, 1822): 2018, 2021, 2022.
Sericomyia lappona (Linnaeus, 1758): 2018, 2022.
Sericomyia silentis (Harris, 1778): 2018, 2019, 2020, 2021, 2022.
Sphaerophoria cf *scripta* (Linnaeus, 1758): 2018.
Sphegina elegans Schummel, 1841: 2022.

Sphegina cf *elegans* Schummel, 1841: 2020, 2021.
Sphegina cf *clunipes* (Fallén, 1816): 2021.
Syritta pipiens (Linnaeus, 1758): 2019, 2020, 2021, 2022.
Syrphus cf *ribesii* (Linnaeus, 1758): 2020, 2021, 2022.
Syrphus sp.: 2020, 2021, 2022.
Tropidia cf *scita* (Harris, 1780): 2018.
Volucella bombylans (Linnaeus, 1758): 2022.
Volucella pellucens (Linnaeus, 1758): 2020.
Xylota cf *abiens* Meigen, 1822: 2022.
Xylota segnis (Linnaeus, 1758): 2020, 2022.

Diptera: Tabanidae - Horse-flies

Haematopota pluvialis (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Tabanus sudeticus Zeller, 1842: 2021, 2022.

Diptera: Trichoceridae - Winter gnat

Trichocera annulata Meigen, 1818: 2018, 2019, 2020.
Trichocera sp.: 2018, 2019, 2020, 2021, 2022.

Diptera - other two-winged flies

Anthomyiidae sp.: 2020.
Calliphora vicina Robineau-Desvoidy, 1830: 2020, 2021, 2022.
Calliphora vomitoria (Linnaeus, 1758): 2018.
Chloromyia formosa (Scopoli, 1763): 2020.
Chrysotis sp.: 2021.
Empis sp.: 2020, 2021.
Ephydridae sp.: 2020, 2021.
Graphomya maculata (Scopoli, 1763): 2019, 2020.
Haematobosca stimulans (Meigen, 1824): 2020.
Helina depuncta (Fallén, 1825): 2018.
Helina cf *evecta* (Harris, 1780): 2020.
Hylemya vagans (Panzer, 1797): 2020.
Lucilia sp.: 2019, 2020, 2021.
Meiosimyza decempunctata (Fallén, 1820): 2020.
Mesembrina meridiana (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Morellia sp.: 2021.

Muscidae sp.: 2018, 2019, 2020, 2021, 2022.
Musca domestica Linnaeus, 1758: 2018, 2019, 2020, 2021.
Opomyza germinationis petrei Mesnil, 1934: 2021.
Phaonia angelicae (Scopoli, 1763): 2019, 2020, 2021, 2022.
Phaonia rufiventris (Scopoli, 1763): 2020.
Phaonia tuguriorum (Scopoli, 1763): 2020, 2021.
Pollenia sp.: 2020.
Pollenia cf *rudis* (Fabricius, 1794): 2020.
Protophormia terranovae (Robineau-Desvoidy, 1830): 2018.
Rhagio scolopaceus (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Rhagio sp.: 2020.
Rhamphomyia sp.: 2020, 2021.
Rivellia syngenesiae (Fabricius, 1781): 2019, 2020, 2021.
Sarcophaga sp.: 2020, 2021.
Scathophaga stercoraria (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Scatophaga sp.: 2019, 2020.
Scatopse notata (Linnaeus, 1758): 2021.
Sciara cf *analis* Schiner, 1863: 2020.
Sepsis fulgens Meigen, 1826: 2020.
Sepsis cf *fulgens* Meigen, 1826: 2021, 2022.
Sicus cf *ferrugineus* (Linnaeus, 1761): 2021.
Siphona sp.: 2020, 2021.
Siphona cf *geniculata* (De Geer, 1776): 2020.
Tachina grossa (Linnaeus, 1758): 2020.
Tachinidae sp.: 2020.
Tachydromia sp.: 2020.
Tephritis cf *neesii* (Meigen, 1830): 2020.
Thricops cf *semicinereus* (Wiedemann, 1817): 2020, 2021.
Xyphosia miliaria (Schrank, 1781): 2020, 2021, 2022.

Ephemeroptera - Mayflies

Cloeon dipterum (Linnaeus, 1761): 2020, 2021.
Siphlonurus lacustris Eaton, 1870: 2018.

Hemiptera: Aphidae – Aphids

Acyrthosiphon pisum (Harris, 1776): 2020, 2021, 2022.

Macrosiphum rosae (Linnaeus, 1758): 2020, 2021, 2022.
Uroleucon jaceae (Linnaeus, 1758): 2019.

Hemiptera: Heteroptera - True bugs

Acanthosoma haemorrhoidale (Linnaeus, 1758): 2022.
Anthocoris nemorum (Linnaeus, 1761): 2019, 2020, 2021, 2022.
Capsus cf *ater* (Linnaeus, 1758): 2022.
Closterotomus norvegicus (Gmelin, 1790): 2022.
Coreus marginatus (Linnaeus, 1758): 2022.
Dolycoris baccarum (Linnaeus, 1758): 2020, 2021, 2022.
Elasmostethus interstinctus (Linnaeus, 1758): 2019.
Grypocoris stysi (Wagner, 1968): 2019.
Leptoterna dolabrata (Linnaeus, 1758): 2019, 2022.
Leptoterna sp. (nymph): 2022.
Liocorus tripustulatus (Fabricius, 1781): 2018, 2022.
Lygocoris pabulinus (Linnaeus, 1761): 2020, 2021, 2022.
Lygus cf *wagneri* Remane, 1955 / *L. pratensis* (Linnaeus, 1758): 2022.
Lygus sp.: 2022.
Navis cf *limbatus* Dahlbom, 1851: 2022.
Orthops cf *campestris* (Linnaeus, 1758): 2022.
Palomina prasina (Linnaeus, 1761): 2018, 2019, 2020, 2021, 2022.
Pentatoma rufipes (Linnaeus, 1758): 2020, 2022.
Picromerus bidens (Linnaeus, 1758): 2022.
Piezodorus lituratus (Fabricius, 1794): 2020, 2021, 2022.
Pithanus maerkelii (Herrich-Schaeffer, 1838): 2019.
Saldula cf *saltatoria* (Linnaeus, 1758): 2022.

Hemiptera: Homoptera - Spittlebug, leafhopper, planthopper, cicada

Aphrophora alni (Fallén, 1805): 2020, 2022.
Cicadella viridis (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Cixius nervosus (Linnaeus, 1758): 2019, 2020, 2021, 2022.
Philaenus spumarius (Linnaeus, 1758) (6 diffierent varieties): 2018, 2019, 2020, 2021, 2022.
Javesella dubia (Kirschbaum, 1868) / *J. pellucida* (Fabricius, 1794): 2020.
Tachycixius pilosus (Olivier, 1791): 2019, 2022.

Hemiptera: Gerridae - Common water strider

Gerris lacustris (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.

Hemiptera: Veliidae - Water cricket

Velia caprai Tamanini, 1947: 2018, 2019, 2020, 2021, 2022.

Hymenoptera: Apidae - Bumble bees

Bombus barbutellus (Kirby, 1802) : 2019, 2020, 2021.
Bombus bohemicus Seidl, 1837: 2018, 2019, 2020, 2021.
Bombus hortorum Linnaeus, 1761): 2020, 2021, 2022.
Bombus hypnorum (Linnaeus, 1758): 2019, 2020.
Bombus lapidarius (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Bombus lucorum (Linnaeus, 1761) agg: 2018, 2019, 2020, 2021, 2022.
Bombus pascuorum (Scopoli, 1763): 2018, 2019, 2020, 2021, 2022.
Bombus pratorum (Linnaeus, 1761): 2019, 2020, 2021, 2022.
Bombus sylvestris Lepeletier, 1832: 2019 , 2020.
Bombus terrestris (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.

Hymenoptera: Apidae – Honey bees

Apis mellifera mellifera Buckfast: 2020 & *Apis mellifera mellifera* Linnaeus, 1758 (dark native bee): 2022.

Hymenoptera - Solitary bees

Andrena bicolor Fabricius, 1775: 2020.
Andrena cineraria (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Andrena haemorrhoa (Fabricius, 1781): 2020, 2021, 2022.
Andrena sp.: 2018, 2019, 2020, 2021, 2022.
Halictus rubicundus (Christ, 1791): 2018, 2019, 2020, 2021, 2022.
Halictus sp.: 2018, 2019, 2020, 2021.
Hylaeus cf *confusus* Nylander, 1852: 2020.
Lasioglossum sp.: 2018, 2019, 2020, 2021, 2022.
Megachile cf *cetuncularis* Nylander, 1852: 2020.
Megachile cf *willugbiella* (Kirby, 1802): 2019.
Megachile sp.: 2021, 2022.
Nomada sp.: 2019, 2020, 2021, 2022.
Sphecodes sp.: 2020, 2022.

Hymenoptera: Crabronidae

Ectemnius cf *lapidarius* (Panzer, 1804): 2019.
Ectemnius sp.: 2019, 2020, 2021, 2022.

Hymenoptera: Cynipidae - Gall wasps

Andricus curvator Hartig, 1840 (syn. *A. collaris* Hartig, 1840): 2018, 2019, 2020, 2021, 2022.
Andricus foecundatrix (Hartig, 1840): 2021.
Neuroterus numismalis (Fourcroy, 1785): 2021.

Hymenoptera: Formicidae - Ants

Lasius cf *niger* (Linnaeus, 1758) agg: 2018, 2019, 2020.
Lasius cf *platythorax* Seifert, 1991: 2020 , 2021, 2022.
Myrmica cf *rubra* (Linnaeus, 1758) agg: 2018, 2019, 2020.
Myrmica cf *ruginodis* Nylander, 1846 / *M. scabrinodis* Nylander, 1846: 2018, 2019, 2020, 2021, 2022

Hymenoptera- Parasitic wasps

Gasteruption assectator (Linnaeus, 1758) agg.: 2020.
Ichneumon cf *insidiosus* Wesmael, 1845: 2021.
Ichneumonidae spp.: 2019, 2020, 2021, 2022.
Netelia cf *tarsata* (Brischke, 1880): 2021.
Ophion cf *obscuratus* Fabricius, 1798: 2019, 2020, 2021, 2022.
Ophion scutellaris Thomson, 1888: 2019.
Ophion sp.: 2021, 2022.

Hymenoptera: Sphecidae

Sphex sp.: 2021.

Hymenoptera: Symphyta - Sawflies

Abia candens Konow, 1887: 2020.
Dolerus sp. (larva): 2020.
Rhogogaster viridis (Linnaeus, 1758): 2020.
Selandria serva (Fabricius, 1793): 2019.
Tenthredo cf *arcuata* Forster, 1771: 2021.
Tenthredo cf *notha* Klug, 1817: 2018, 2019, 2020, 2021, 2022.

Hymenoptera: Vespidae – Social wasps

Dolichovespula norvegica (J.C. Fabricius, 1781): 2019, 2020, 2021, 2022.
Dolichovespula sp. (suggest *saxonica* (Fabricius, 1793)): 2020.
Dolichovespula cf *sylvestris* (Scopoli, 1763): 2019, 2021.
Vespula sp. (suggest *germanica* (Fabricius, 1793)): 2019.

Lepidoptera

Rhopalocera - Butterflies

Aglais io (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Aglais urticae (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Anthocaris cardamines (Linnaeus, 1758): 2018, 2019, 2020, 2021 , 2022.
Aphantopus hyperantus (Linnaeus, 1758): 2018, 2019, 2020, 2021 , 2022.
Argynnis paphia (Linnaeus, 1758): 2020, 2021, 2022.
Leptidea juvernica Williams, 1946 agg: 2019.
Lycaena phlaeas (Linnaeus, 1761): 2018, 2019, 2020, 2021, 2022.
Maniola jurtina (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Pararge aegeria (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Pieris napi (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Polygonia c -album (Linnaeus, 1758): 2022.
Polyommatus icarus Tutt, 1910: 2020, 2021, 2022.
Pyronia tithonus (Linnaeus, 1771): 2019.
Vanessa atalanta (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Vanessa cardui (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.

Heterocera - Moths

Abrostola tripartita (Hufnagel, 1766): 2019, 2022.
Acasis viretata (Hübner, 1799): 2019, 2022.
Acleris bergmanniana (Linnaeus, 1758): 2022.
Acleris emergana (Fabricius, 1775): 2022.
Acleris laterana (Fabricius, 1794): 2022.
Acleris sp. (*laterana* (Fabricius, 1794) / *A. comerana* (Lienig & Zeller, 1846)): 2020.
Acronicta rumicis Linnaeus, 1758: 2019, 2020, 2021, 2022.
Aethes cnicana Westwood, 1854: 2019, 2020, 2022.
Agapeta hamana (Linnaeus, 1758): 2019, 2021.
Agonopterix heracliana Linnaeus, 1758: 2019.

Agonopterix heracliana Linnaeus, 1758 versus *A. ciliella* Stainton, 1849: 2022.
Agonopterix nervosa Haworth, 1812: 2021, 2022.
Agriphila straminella (Denis & Schiffermüller) 1775: 2019. 2020, 2021, 2022.
Agriphila cf *straminella* (Denis & Schiffermüller) 1775: 2022.
Agriphila tristella (Denis & Schiffermüller) 1775: 2019, 2020, 2021, 2022.
Agrochola lota Clerck, 1759: 2019, 2021.
Agrotis exclamationis (Linnaeus, 1758): 2019, 2020, 2021, 2022.
Agrotis ipsilon (Hufnagel, 1766): 2021.
Alcis repandata (Linnaeus, 1758): 2019.
Alsophila aescularia (Denis & Schiffermüller) 1775: 2020. 2021.
Alucita hexadactyla Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Amphipyra pyramidea Linnaeus, 1758: 2021, 2022.
Anania (*Eurrhypara*) *hortulata* Linnaeus, 1758: 2019, 2020, 2021, 2022.
Ancylis badiana (Denis & Schiffermüller) 1775: 2019, 2020.
Ancylis geminana (Donovan, 1806): 2019.
Anticlea derivata (Denis & Schiffermüller) 1775: 2019.
Antophila fabriciana (Linnaeus, 1767): 2018, 2020, 2021, 2022.
Apamea crenata (Hufnagel, 1766): 2020, 2022.
Apamea monoglypha (Hufnagel, 1766): 2019, 2020, 2021, 2022.
Apamea remissa (Hübner, [1809]): 2022.
Apamea sp.: 2020.
Aphelia paleana (Hübner, 1793): 2019, 2020.
Aphomia sociella (Linnaeus, 1758): 2022.
Atolmis rubricollis Linnaeus, 1758: 2018, 2019, 2020.
Autographa gamma (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Axylia putris Linnaeus, 1761: 2019, 2022.
Bactra lancealana (Hübner, 1799): 2022.
Biston strataria (Hufnagel, 1767): 2019.
Blastobasis adustella Walsingham, 1894: 2019, 2021, 2022.
Blastobasis lacticolella Rebel, 1939: 2020.
Bryotropha sp.: 2019, 2022.
Bryotropha terella (Denis & Schiffermüller) 1775: 2021.
Cabera exanthemata (Scopoli, 1763): 2019, 2020, 2021, 2022.
Cabera pusaria (Linnaeus, 1758): 2019, 2022.
Callistege mi (Clerck, 1759): 2020.
Calliteara pudibunda Linnaeus, 1758: 2019, 2022.

Campaea margaritata (Linnaeus, 1767): 2019.
Celaena leucostigma (Hübner, 1808): 2022.
Celypha lacunana (Denis & Schiffermüller, 1775): 2018, 2019, 2020, 2022.
Ceramica pisi Linnaeus, 1758: 2019, 2020, 2022.
Cerapteryx graminis Linnaeus, 1758: 2019.
Cerastis rubricosa (Denis & Schiffermüller) 1775: 2019, 2020, 2022.
Chloroclystis v-ata (Haworth, 1809): 2019, 2020, 2022.
Chrysoteuchia culmella Linnaeus, 1758: 2019, 2020.
Chrysoteuchia sp.: 2021.
Coleophora sp.: 2019.
Colocasia coryli (Linnaeus, 1758): 2020,
Colostygia pectinataria Hübner, 1825: 2019, 2020, 2021, 2022.
Colotois pennaria (Linnaeus, 1761): 2020.
Cosmorhoe ocellata (Linnaeus, 1758): 2019, 2021, 2022.
Crambus lathoniellus (Zincken, 1817): 2019, 2020, 2022.
Crambus pascuella Linnaeus, 1758: 2019, 2021.
Cydia ulicetana (Haworth, 1811): 2022.
Deilephila elpenor Linnaeus, 1758: 2019, 2020.
Deileptenia riberata (Clerck, 1759): 2019, 2022.
Deltote pygarga (Hufnagel, 1766): 2019, 2020, 2021, 2022.
Denticucullus pygmina Haworth, 1809: 2019, 2022.
Diachrysia chrysitis (Linnaeus, 1758): 2020, 2021.
Diacrisia sannio (Linnaeus, 1758): 2022.
Diaphora mendica (Clerck, 1759): 2020, 2022.
Diarsia mendica Fabricius, 1775: 2019, 2020, 2021.
Diarsia rubi (Vieweg, 1790): 2019, 2020, 2021, 2022.
Dioryctria abietella (Denis & Schiffermüller) 1775: 2019.
Diurnea fagella (Fabricius, 1787): 2021.
Dysstroma citrata (Linnaeus, 1761): 2022.
Dysstroma truncata (Hufnagel, 1767): 2019, 2020, 2021, 2022.
Ecliptopera silaceata (Denis & Schiffermüller) 1775: 2021, 2022.
Ectropis crepuscularia (Denis & Schiffermüller) 1775: 2019, 2020, 2022.
Eilema depressa Esper, 1786: 2019, 2020, 2021, 2022.
Eilema lurideola Zincken, 1817: 2022.
Elachista argentella Clerck, 1759: 2019, 2021.
Electrophaes corylata (Thunberg, 1792): 2020.

Emmelina cf *monodactyla* (Linnaeus, 1758): 2021.
Endrosis sarcitrella Linnaeus, 1758: 2019, 2020.
Epiblema sp.: 2021, 2022.
Epinotia tedella (Clerck, 1759): 2019.
Epinotia trigonella (Linnaeus, 1758): 2019.
Epione repandaria (Hufnagel, 1767): 2021, 2022.
Epirrhoe alternata (Müller, 1764): 2020, 2021, 2022.
Epirrita agg.: 2019, 2022.
Epirrita dilutata (Denis & Schiffermüller) 1775: 2021.
Esperia sulphurella (Fabricius, 1775): 2020, 2021.
Eucosma campoliliana (Denis & Schiffermüller) 1775: 2021.
Eucosma cana (Haworth, 1811): 2019, 2021, 2022.
Eucosma hohenwartiana (Denis & Schiffermüller) 1775: 2019, 2021.
Eudonia lacustrata Panzer, 1804: 2019, 2020, 2021, 2022.
Eudonia mercurella Linnaeus, 1758: 2019, 2020, 2021, 2022.
Eudonia truncicolella Stainton, 1849: 2019, 2022.
Eulithis populata (Linnaeus, 1758): 2019, 2021, 2022.
Eulithis pyraliata (Denis & Schiffermüller) 1775: 2021.
Euphyia unangulata (Haworth, 1809): 2019, 2020, 2022.
Eupithecia abbreviata Stephens, 1831: 2019, 2021.
Eupithecia cf *abbreviata* Stephens, 1831: 2021.
Eupithecia pulchellata Stephens, 1831: 2019, 2021, 2022.
Eupithecia subfuscata (Haworth, 1809): 2021, 2022.
Eupithecia virgaureata Doubleday, 1861: 2022.
Eupithecia vulgata (Haworth, 1809): 2019, 2020, 2021, 2022.
Evergestis pallidata Hufnagel, 1767: 2019, 2021, 2022.
Falcaria lacertinaria (Linnaeus, 1758): 2022.
Geometra papilionaria (Linnaeus, 1758): 2019.
Glyphipterix sp.: 2020, 2021.
Glyphipterix thrasonella Scopoli, 1763: 2019, 2020, 2021, 2022.
Gymnoscelis rufifasciata (Haworth, 1809): 2019, 2020, 2021, 2022.
Habrosyne pyritoides Hufnagel, 1767: 2022.
Helotropha leucostigma Hübner, 1808: 2019.
Hemithea aestivaria (Hübner, 1799): 2022.
Hepialus humuli (Linnaeus, 1758): 2022.
Hofmannophila pseudospretella Stainton, 1849: 2019, 2020, 2022.

Hoplodrina alsines Brahm, 1791: 2019, 2022.
Hydraecia micacea Esper, 1789: 2018, 2019, 2022.
Hydriomena furcata (Thunberg, 1784): 2020, 2021, 2022.
Hydriomena impluviata (Denis & Schiffermüller) 1775: 2022.
Hydriomena ruberata (Freyer, 1831): 2019.
Hypena crassalis (Fabricius, 1787): 2022.
Hypena proboscidalis (Linnaeus, 1758): 2018, 2019, 2021, 2022.
Idaea aversata (Linnaeus, 1758): 2020, 2022.
Idaea aversata f. *remutata* (Linnaeus, 1758): 2019.
Idaea biselata (Hufnagel, 1767): 2019, 2020, 2021, 2022.
Idaea biselata (Hufnagel, 1767) var *melanotica* Haver: 2022.
Jodis lactearia (Linnaeus, 1758): 2022.
Korscheltellus fusconebulosa De Geer, 1778: 2019, 2020, 2021, 2022.
Lacanobia thalassina Hufnagel, 1766: 2022.
Lampronia luzella (Hübner, 1817): 2022.
Lampropteryx suffumata (Denis & Schiffermüller) 1775: 2019, 2020 , 2021, 2022.
Lasiocampa quercus Linnaeus, 1758: 2022.
Lomaspilis marginata (Linnaeus, 1758): 2019, 2020, 2022.
Lomographa bimaculata (Fabricius, 1775): 2021, 2022.
Lycophotia porphyrea (Denis & Schiffermüller) 1775: 2022.
Macaria liturata (Clerck, 1759): 2022.
Macroglossum stellatarum Linnaeus, 1758: 2019, 2021, 2022.
Mamestra brassicae Linnaeus, 1758: 2022.
Marcrothylacia rubi (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Mesapamea secalis (Linnaeus, 1758) agg.: 2019, 2020, 2021, 2022.
Mesoleuca albicillata (Linnaeus, 1758): 2019, 2020, 2021, 2022.
Micropterix aureatella (Scopoli, 1763): 2018, 2019.
Micropterix calthella (Linnaeus, 1761): 2019, 2020, 2021, 2022.
Mompha lacteella (Stephens, 1834): 2020.
Mompha locupletella (Denis & Schiffermüller) 1775: 2018.
Mompha propinquella (Stainton, 1851): 2020.
Mormo maura (Linnaeus, 1758): 2021.
Mythimna ferrago Fabricius, 1787: 2022.
Mythimna impura Hübner, 1808: 2019, 2020, 2021, 2022.
Nematopogon schwarziellus Zeller, 1839 / *N. swammerdamella* (Linnaeus, 1758): 2019.
Noctua comes Hübner, 1813: 2018, 2019, 2020, 2021, 2022.

Noctua janthe Borkhausen, 1792: 2020, 2022.
Noctua pronuba Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Nola confusalis (Herrich-Schäffer, 1847): 2020.
Notocelia uddmanniana (Linnaeus, 1758): 2022.
Ochropleura plecta Linnaeus, 1761: 2019, 2020, 2021, 2022.
Odontopera bidentata (Clerck, 1759): 2019, 2020, 2021, 2022.
Oligia fasciuncula (Haworth, 1809): 2019, 2020, 2021, 2022.
Oligia strigilis (Linnaeus, 1758) agg.: 2022.
Operophtera brumata (Linnaeus, 1758): 2019, 2020, 2021, 2022.
Opisthograptis luteolata (Linnaeus, 1758): 2019, 2020, 2022.
Orgyia antiqua (Linnaeus, 1758): 2018, 2021.
Orthonama vittata Borkhausen, 1794: 2019, 2020, 2021.
Orthosia cerasi Fabricius, 1775: 2019, 2020, 2021.
Orthosia gothica Linnaeus, 1758: 2020.
Orthosia incerta Hufnagel, 1766: 2020.
Orthosia munda (Denis & Schiffermüller, 1775): 2020.
Orthotaenia undulana (Denis & Schiffermüller) 1775: 2019.
Pasiphila rectangulata (Linnaeus, 1758): 2022.
Peridroma saucia Hübner, 1808: 2019, 2022.
Petrophora chlorosata (Scopoli, 1763): 2019, 2020, 2021, 2022.
Phalera bucephala Linnaeus, 1758: 2018, 2019.
Phigalia pilosaria (Denis & Schiffermüller) 1775: 2020.
Phlogophora meticulosa (Linnaeus, 1758): 2018, 2020, 2021, 2022.
Phragmatobia fuliginosa Linnaeus, 1758: 2019, 2022.
Phymatopus hecta (Linnaeus, 1758): 2022.
Plagodis pulveraria (Linnaeus, 1758): 2022.
Platyptilia isodactylus (Zeller, 1852): 2022.
Pleuroptya ruralis Scopoli, 1763: 2019, 2022.
Plusia festucae (Linnaeus, 1758): 2021.
Plutella xylostella (Linnaeus, 1767): 2019.
Pseudoterpna pruinata (Hufnagel, 1767): 2021, 2022.
Pterophorus pentadactyla (Linnaeus, 1758): 2019, 2022.
Rhigognostis incarnatella (Steudel, 1873): 2019.
Rivula sericealis (Scopoli, 1763): 2019, 2020, 2021, 2022.
Saturnia pavonia Linnaeus, 1758: 2021.
Scoliopteryx libatrix Linnaeus, 1758: 2022.

Scoparia ambigualis Treitschke, 1829: 2019, 2020, 2021, 2022.
Selenia dentaria (Fabricius, 1775): 2021.
Spilosoma lubricipeda Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Spilosoma luteum (Hufnagel, 1766): 2019, 2020, 2021, 2022.
Stigmella aurella (Fabricius, 1775): 2018, 2022.
Syndemis musculana (Hübner, 1799): 2019.
Thera britannica (Turner, 1925): 2019, 2020, 2021, 2022.
Thyatira batis (Linnaeus, 1758): 2019, 2020, 2021.
Trichopteryx carpinata (Borkhausen, 1794): 2022.
Tyria jacobaeae Linnaeus, 1758: 2018.
Udea ferrugalis Hübner, 1796: 2019.
Udea lutealis Hübner, 1809: 2018, 2019, 2021, 2022.
Udea prunalis (Denis & Schiffermüller) 1775: 2020.
Xanthia togata (Esper, 1788): 2021.
Xanthorhoe designata (Hufnagel, 1767): 2019, 2020, 2021, 2022.
Xanthorhoe ferrugata Prout, 1937: 2019, 2020, 2021, 2022.
Xanthorhoe fluctuata (Linnaeus, 1758): 2019, 2020, 2021, 2022.
Xanthorhoe montanata (Denis & Schiffermüller) 1775: 2018, 2019, 2020, 2021, 2022.
Xestia c-nigrum (Linnaeus, 1758): 2019, 2022.
Xestia sexstrigata Haworth, 1809: 2021.
Xestia sp. (caterpillar): 2021.
Xestia xanthographa (Denis & Schiffermüller, 1775): 2019, 2020, 2021, 2022.
Xestia xanthographa / *X. sexstrigata* Haworth, 1809: 2019.
Zeiraphera ratzeburgiana (Saxesen, 1840): 2019.
Zygaena filipendula (Linnaeus, 1758): 2020, 2022.

Neuroptera - Green and brown lacewings

Chrysoperla carnea (Stephens, 1836): 2020, 2022.
Hemerobius cf *lutescens* Fabricius, 1793: 2019.
Hemerobius cf *humulinus* Linnaeus, 1758 (versus *H. stigma* Stephens, 1836): 2021.

Odonata - Damselflies and dragonflies

Libellula cf *quadrimaculata* Linnaeus, 1758: 2019.
Pyrrhosoma nymphula Sulzer, 1776: 2019, 2020, 2021, 2022.
Sympetrum cf *striolatum* Charpentier, 1840: 2021, 2022.

Orthoptera: Acrididae - Grasshoppers

Chorthippus cf *biguttulus* (Linnaeus, 1758): 2018.
Chorthippus brunneus (Thunberg, 1815): 2018, 2019, 2020, 2021 , 2022.
Gomphocerippus rufus (Linnaeus, 1758): 2018.
Myrmeleotettix maculatus (Thunberg, 1815): 2019.

Plecoptera - Stoneflies

Isoperla grammatica (Poda, 1761): 2020.

Psocodea - Barkfly

Chilenocaecilius ornatipennis (Blanchard, 1851): 2020.

Thysanura - Silverfish

Lepisma saccharina Linnaeus, 1758: 2019, 2021.

Trichoptera- Caddisflies

Agrypnia obsoleta (Hagen, 1864): 2019, 2020.
Beraea pullata (Curtis, 1834): 2020.
Chaetopteryx villosa (Fabricius, 1798): 2020, 2021.
Drusus annulatus (Stephens, 1837): 2020, 2022.
Halesus digitatus (Schrank, 1781): 2019, 2020, 2021, 2022.
Halesus radiatus (Curtis, 1834): 2020, 2021, 2022.
Limnephilus auricula Curtis, 1834: 2021.
Limnephilus centralis Curtis, 1834: 2019, 2020, 2022.
Limnephilus incisus Curtis, 1834: 2019.
Limnephilus luridus Curtis, 1834: 2020, 2022.
Limnephilus cf *sparsus* Curtis, 1834: 2019.
Limnephilus sparsus Curtis, 1834: 2020, 2021, 2022.
Lype phaeopa (Stephens, 1836): 2020.
Lype reducta (Hagen, 1868): 2020.
Micropterna lateralis (Stephens, 1837): 2020, 2021, 2022.
Micropterna sequax McLachlan, 1875: 2020, 2022.
Neureclipsis bimaculata (Linnaeus, 1758): 2019.
Phrygaena bipunctata Retzius, 1783 / *P. grandis* Linnaeus, 1758: 2020.
Plectrocnemia conspersa (Curtis, 1834): 2020, 2021, 2022.
Polycentropus irroratus Curtis, 1835: 2019.

Potamophylax cingulatus (Stephens, 1837): 2020, 2021, 2022.
Potamophylax latipennis (Curtis, 1834): 2021, 2022.
Rhyacophila dorsalis (Curtis, 1834): 2021.
Rhyacophila munda McLachlan, 1862: 2022.
Stenophylax permistus McLachlan, 1895: 2019, 2020, 2022.
Stenophylax sp./*Micropterna* sp.: 2020.

Mollusca

Slugs

Arion ater (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Arion ater brown form: 2019.
Arion distinctus Mabille, 1868: 2018, 2021.
Arion fuscus (O.F. Müller, 1774) / *A. subfuscus* (Draparnaud, 1805): 2018.
Arion hortensis A. Férussac, 1819 agg.: 2020, 2022.
Arion cf *silvaticus* Lohmander, 1937: 2021.
Arion subfuscus (Draparnaud, 1805): 2019, 2020, 2021, 2022.
Arion sp.: 2018.
Deroceras invadens Reise, Hutchinson, Schunack & Schlitt, 2011: 2018, 2019, 2022.
Deroceras reticulatum (O F. Müller, 1774): 2018, 2019, 2020, 2021, 2022.
Lehmannia marginata (O.F. Müller, 1774): 2019, 2022.
Lehmannia valentiana (A. Férussac, 1822): 2018, 2019, 2020, 2021, 2022.

Snails

Aegopinella nitidula (Draparnaud, 1805): 2019.
Ashfordia granulata (Alder, 1830): 2019.
Cepea hortensis (O.F. Müller, 1774): 2019, 2020, 2021, 2022.
Clausilia bidentata (Strøm, 1765): 2019, 2020, 2021, 2022.
Cornu aspersum (O.F. Müller, 1774): 2018, 2019, 2020, 2021, 2022.
Discus rotundatus (O.F. Müller, 1774): 2021.
Lymnaeidae sp.: 2020.
Monacha carthusiana (O.F. Müller, 1774): 2020.
Oxychilus alliarius (J.S. Miller, 1822): 2018, 2019.
Oxychilus draparnaudi (H. Beck, 1837): 2019, 2020, 2021, 2022.
Potamopyrgus antipodarum (J.E. Gray, 1843): 2019.
Radix balthica (Linnaeus, 1758): 2019, 2022.
Succinella oblonga (Draparnaud, 1801): 2018.

Trochulus sp.: 2020, 2021.
Trochulus striolatus (C. Pfeiffer, 1828): 2018, 2019, 2021.

Chordata

Amphibia - Amphibians

Lissotriton vulgaris (Linnaeus, 1758): 2021
Rana temporaria Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.

Aves - Birds

Accipiter nisus (Linnaeus, 1758): 2020, 2021, 2022.
Aegithalos caudatus (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Anthus pratensis (Linnaeus, 1758): 2019 , 2020, 2021, 2022.
Ardea cinerea Linnaeus, 1758: 2019, 2020, 2021, 2022.
Buteo buteo (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Carduelis cannabina (Linnaeus, 1758): 2021.
Carduelis carduelis (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Carduelis spinus (Linnaeus, 1758): 2020 , 2021, 2022.
Cinclus cinclus (Linnaeus, 1758): 2018, 2019, 2020.
Circus cyaneus (Linnaeus, 1766): 2018, 2019, 2020, 2021.
Columba palumbus Linnaeus, 1758: 2018, 2019 , 2020, 2021, 2022.
Corvus corax Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Corvus corone cornix Linnaeus, 1758: 2018, 2019, 2020. 2021, 2022.
Corvus frugilegus Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Corvus monedula Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Cuculus canorus Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Cyanistes caeruleus (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Delichon urbicum (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Erithacus rubecula (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Falco subbuteo Linnaeus, 1758: 2022.
Falco tinnunculus Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Fringilla coelebs Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Garrulus glandarius (Linnaeus, 1758): 2019, 2020, 2021, 2022.
Hirundo rustica Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Larus argentatus Pontoppidan, 1763: 2018, 2019, 2020.
Larus fuscus Linnaeus, 1758 s.l.: 2020, 2021, 2022.
Loxia curvirostra Linnaeus, 1758: 2020, 2022.

Motacilla alba Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Motacilla alba yarrellii Gould, 1837: 2018, 2019, 2020.
Parus ater Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Parus major Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Passer domesticus (Linnaeus, 1758): 2022.
Phasianus colchicus Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Phylloscopus collybita (Vieillot, 1817): 2019, 2020, 2021, 2022.
Phylloscopus trochilus (Linnaeus, 1758): 2018, 2019, 2020, 2021 , 2022.
Pica pica (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Prunella modularis (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Pyrrhula pyrrhula (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Regulus regulus (Linnaeus, 1758): 2020, 2022.
Scolopax rusticola Linnaeus, 1758: 2020, 2021, 2022.
Sturnus vulgaris Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Troglodytes troglodytes (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Turdus merula Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Turdus philomelos C. L. Brehm, 1831: 2018, 2019, 2020, 2021, 2022.
Turdus pilaris Linnaeus, 1758: 2018, 2019, 2020, 2021.
Turdus viscivorus Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.
Tyto alba (Scopoli, 1769): 2020.

Mammalia

Chiroptera - Bats

Pipistrellus pipistrellus (Schreber, 1774): 2018, 2019, 2020, 2021, 2022.
*Pipistrellu*s cf *pygmaeus* (Leach, 1825): 2021.

Land mammals

Apodemus sylvaticus: 2018, 2019, 2020, 2021, 2022.
Crocidura russula (Hermann, 1780): 2018, 2019, 2020, 2021, 2022.
Dama dama (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Lepus timidus hibernicus Bell, 1837: 2018, 2019, 2020, 2021, 2022.
Meles meles (Linnaeus, 1758): 2018.
Mustela erminea hibernica (Thomas & Barrett-Hamilton, 1895): 2019, 2021, 2022.
Myodes glareolus (Schreber, 1780): 2020, 2021, 2022.
Oryctolagus cuniculus (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.
Sciurus vulgaris Linnaeus, 1758: 2018, 2019, 2020, 2021, 2022.

Sorex minutus Linnaeus, 1766: 2021.
Vulpes vulpes (Linnaeus, 1758): 2018, 2019, 2020, 2021, 2022.

FLORAL LISTS

Plantae sensu lato

Cyanophyta - Blue-green algae

Nostoc commune Vaucher ex Bornet & Flahault, 2018: 2019, 2020, 2021, 2022.

Eumycota - Funguses

Amanita muscaria (L.) Lam.: 2018, 2019.
Amanita rubescens Pers.: 2022.
Antrodia cf *vaillantii* (DC.) Ryvarden: 2018.
Ascocoryne sarcoides (Jacq.) J.W.Groves & D.E.Wilson: 2021, 2022.
Boletus edulis Bull.: 2018, 2019, 2020, 2021, 2022.
Calvatia gigantea (Batsch) Lloyd: 2019.
Cantharellus cibarius Fr.: 2022.
Claviceps purpurea (Fr.) Tul.: 2021.
Clitocybe flaccida (Sowerby) P.Kumm.: 2018, 2019, 2020, 2021, 2022.
Clitocybe nebularis (Batsch) P.Kumm.: 2018, 2019, 2020, 2021, 2022.
Coprinopsis atramentaria (Bull.) Redhead, Vilgalys & Moncalvo: 2018, 2019.
Coprinus comatus (O.F. Müller) Pers.: 2018, 2019, 2020, 2021, 2022.
Dacrymyces cf *chrysospermus* Berk. & M.A. Curtis: 2018, 2019, 2020.
Helvella lacunosa Afzel.: 2018, 2019, 2020, 2021, 2022.
Hygrophoropsis aurantiaca (Wulfen) Maire: 2018, 2019, 2020.
Hygrophorus pudorinus (Fr.) Fr.: 2018, 2019, 2020.
Hypholoma fasciculare (Huds.) P. Kumm.: 2018, 2019, 2020.
Imleria badia (Fr.) Vizzini: 2018, 2019, 2020, 2021, 2022.
Lactarius deterrimus Gröger: 2019, 2020, 2021, 2022.
Lactarius sp.: 2018, 2019, 2020.
Lepista nuda (Bull.) Cooke: 2020, 2021, 2022.
Lycoperdon molle Pers.: 2018, 2019, 2020.
Lycoperdon nigrescens Pers.: 2018, 2019, 2020, 2021, 2022.
Lycoperdon perlatum Pers.: 2018, 2019, 2020, 2021, 2022.
Macrotyphula fistulosa (Holmsk.) R.H.Petersen: 2021.
Peziza badia Pers.: 2022.
Piptoporus betulina (Bull.) P.Karst.: 2019, 2020, 2021, 2022.

Polyporus squamosus Huds.: 2018.
Ramaria stricta (Pers.) Quél.: 2022.
Russula sanguinaria (Schumach.) Rauschert 2018, 2019, 2020, 2021, 2022.
Russula spp.: 2018, 2019, 2020, 2021, 2022.
Suillus luteus (L.) Roussel: 2019.
Tremella mesenterica Retz. cf: 2019, 2020, 2021, 2022.
Xylaria hypoxylon (L.) Grev.: 2021.

Parasitic Fungi

Entomophthora sp.: 2018, 2019, 2020, 2021, 2022.

Rust and molds

Mucor sp.: 2018, 2019.
Phragmidium violaceum (Schultz) Brockm.: 2018.
Puccinales sp.: 2020, 2021, 2022.
Puccinia urticata (Link) F. Kern: 2019.

Lichens

Anaptychia ciliaris ciliaris Körb. ex A.Massal.: 2018, 2019, 2020.
Cladonia humilis (With.) J.R.Laundon: 2018, 2019, 2020, 2021, 2022.
Crustose Lichen sp.: 2018, 2019, 2020, 2021, 2022.
Graphis scripta (L.) Ach.: 2018, 2019, 2020, 2021, 2022.
Hypogymnia physodes (L.) Nyl.: 2018, 2019, 2020.
Lecanora muralis (Schreb.) Rabenh.: 2020.
Lecanora pulicaris (Pers.) Ach.: 2018.
Parmotrema crinitum (Ach.) M.Choisy: 2018.
Peltigera sp.: 2018, 2019, 2020, 2021, 2022.
Ramalina calicaris (L.) Röhl.: 2018, 2019, 2020.
Xanthoria parietina (L.) Th.Fr.: 2018, 2019, 2020, 2021, 2022.

Bryophyta - Mosses

Atrichum undulatum Palisot de Beauvois, 1805: 2022.
Bryum sp.: 2018, 2019, 2020, 2021, 2022.
Bryum cf *capillare* Hedw.: 2018, 2019, 2020, 2021.
Calliergonella cuspidatus Loeske, 1911: 2018.
Campylopus flexuosus Bridel, 1819: 2019, 2020, 2021.

Campylopus introflexus Bridel, 1819: 2018, 2021, 2022.
Dicranum majus Turner, 1804: 2022.
Enthostodon cf o*btusus* Lindberg, 1865 vs *E. fascicularis* (Hedw.) Müll.Hal.: 2019.
Eurhynchium striatum W.P.Schimper, 1856: 2022.
Hylocomium splendens W.P.Schimper, 1852: 2022.
Hypnum andoi A.J.E.Smith, 1981: 2021.
Hypnum cupressiforme Hedwig, 1801: 2018, 2019, 2020, 2021.
Hypnum jutlandicum Holmen & Warncke, 1969: 2018, 2019, 2020, 2021, 2022.
Isothecium myosuroides Bridel, 1827: 2018, 2022.
Kindbergia praelonga (Hedw.) Ochyra: 2022.
Lophocoela bidentata (L.) Dumort.: 2022.
Orthotrichum cf *affine* Schrader ex Bridel, 1801: 2021.
Oxyrrhynchium hians (Hedw.) Loeske: 2022.
Plagiothecium undulatum (Hedw.) Schimp.: 2022.
Pleurozium schreberi Mitten, 1869: 2018.
Pogonatum aloides Palisot de Beauvois, 1805: 2022.
Polytrichum commune Hedwig, 1801: 2018, 2019, 2020, 2021, 2022.
Polytrichum commune versus *P. formosum* Hedw.: 2019, 2021.
Polytrichum formosum Hedw.: 2018.
Pseudoscleropodium purum Fleischer, 1925: 2018.
Rhytidiadelphus loreus Warnstorf, 1906: 2022.
Rhytidiadelphus squarrosus Warnstorf, 1906: 2018, 2022.
Rhytidiadelphus triquetus Warnstorf, 1906: 2018, 2021.
Sphagnum cf *palustre* L., 1753: 2018.
Sphagnum denticulatum Bridel, 1826: 2018, 2022.
Sphagnum fallax Klinggräff, 1881: 2022.
Sphagnum papillosum Lindberg, 1872 versus *S. palustre*: 2021.
Sphagnum rubellum Wilson, 1855: 2018, 2019, 2020.
Sphagnum sp.: 2018, 2019, 2020, 2021, 2022.
Thuidium tamariscium W.P.Schimper, 1852: 2018, 2019, 2020, 2021 , 2022.
Tortula muralis Hedwig, 1801: 2020, 2021, 2022.

Marchantiophyta - Liverworts

Marchantia polymorpha L.: 2022.
Marchantia polymorpha cf subsp. *ruderalis* Bischl. & Boissel.-Dub.: 2018, 2019, 2020, 2021.

Pterphyta - Ferns

Asplenium scolopendrium L.: 2018, 2019, 2020, 2021, 2022.
Blechnum spicant (L.) Roth: 2018, 2019, 2020, 2021, 2022.
Dryopteris affinis agg.: 2018, 2019, 2020, 2021, 2022.
Polypodium vulgare agg.: 2018, 2019, 2020, 2021, 2022.

Tracheophyta - Flowering plants (Angiosperms)

Abies procera Rehder: 2018, 2019, 2020, 2021, 2022.
Acer pseudoplatanus L.: 2018, 2019, 2020, 2021, 2022.
Achillea millefolium L.: 2018, 2019, 2020, 2021, 2022.
Ajuga reptans L.: 2018, 2019, 2020, 2021, 2022.
Alnus glutinosa (L.) Gaertn.: 2018, 2019, 2020, 2021, 2022.
Anagallis arvensis L.:2018, 2019, 2020, 2021.
Angelica sylvestris L.: 2018, 2019, 2020, 2021, 2022.
Anthriscus sylvestris (L.) Hoffm.: 2018, 2019, 2020, 2021, 2022.
Atriplex patula L.: 2018, 2019, 2020, 2021.
Barbarea intermedia Boreau: 2021.
Bellis perennis L.: 2018, 2019, 2020, 2021, 2022.
Betula pendula Roth: 2018, 2019, 2020, 2021, 2022.
Brassica rapa L.: 2019, 2021.
Callitriche stagnalis Scop.: 2018, 2019, 2020, 2021, 2022.
Calluna vulgaris (L.) Hull: 2018, 2019, 2020, 2021, 2022.
Cardamine hirsuta L.: 2018, 2019, 2020, 2021, 2022.
Cardamine pratensis L.: 2018, 2019, 2020, 2021, 2022.
Centaurea nigra L.: 2018, 2019, 2020, 2021, 2022.
Centaurium erythraea Rafn: 2022.
Cerastium fontanum Baumg.: 2019, 2020, 2021.
Chamaenerion angustifolium (L.) Scop.: 2018, 2019, 2020, 2021, 2022.
Cirsium arvense (L.) Scop.: 2018, 2019, 2020, 2021, 2022.
Cirsium palustre (L.) Scop.: 2018, 2019, 2020, 2021, 2022.
Cirsium vulgare (Savi) Ten.: 2018, 2019, 2020, 2021, 2022.
Crataegus monogyna Jacq.: 2018, 2019, 2020, 2021, 2022.
Crepis capillaris (L.) Wallr.: 2022.
Crocosmia x crocosmiiflora (Lemoine) N.E. Br.: 2020, 2021, 2022.
Cymbalaria muralis P. Gaertn., B. Mey. & Scherb.: 2019: 2021.
Cytisus scoparius (L.) Link: 2018, 2019, 2020, 2021, 2022.

Dactylorhiza maculata (L.) Soó: 2021.
Digitalis purpurea L.: 2018, 2019, 2020, 2021, 2022.
Epilobium hirsutum L.: 2021, 2022.
Epilobium obscurum Schreb.: 2021.
Epilobium parviflorum Schreb.: 2018, 2019, 2020, 2021, 2022.
Erica cinerea L.: 2018, 2019, 2020, 2021, 2022.
Euphrasia nemorosa (Pers.) Wallr.: 2018, 2019, 2020, 2021, 2022.
Fagus sylvatica L.: 2018, 2019, 2020, 2021, 2022.
Ficaria verna Huds.: 2018, 2019, 2020, 2021, 2022.
Filipendula ulmaria (L.) Maxim.: 2022.
Fraxinus excelsior L.: 2018, 2019, 2020, 2021, 2022.
Fumaria muralis Sond. ex W.D.J. Koch: 2019.
Fuchsia magellanica Lam.: 2018, 2019, 2020, 2021, 2022.
Galium aparine L.: 2021, 2022.
Galium palustre L.: 2018, 2019, 2020, 2021.
Galium saxatile L.: 2022.
Geranium robertianum L.: 2018, 2019, 2020, 2022.
Gnaphalium uliginosum L.: 2022.
Hedera hibernica (G. Kirch.) Bean: 2018, 2019, 2020, 2021, 2022.
Heracleum sphondylium L.: 2018, 2019, 2020, 2021, 2022.
Hyacinthoides x *massartiana* Geerinck: 2018, 2019, 2020, 2021, 2022.
Hypericum tetrapterum Fr.: 2019, 2020, 2021, 2022.
Hypericum elodes L.: 2018.
Hypericum perforatum L.: 2018, 2019, 2020, 2021, 2022.
Hypochaeris radicata L.: 2021.
Ilex aquifolium L.: 2018, 2019, 2020, 2021, 2022.
Jacobaea aquatica (Hill) P. Gaertn., B. Mey. & Scherb.: 2021.
Jacobaea vulgaris Gaertn.: 2018, 2019, 2020, 2021, 2022.
Larix sp.: 2018, 2019, 2020, 2021, 2022.
Leontodon autumnalis (L.) Moench: 2018, 2019, 2020, 2021, 2022.
Leontodon saxatilis Lam.: 2021, 2022.
Leucanthemum vulgare Lam.: 2022.
Ligustrum vulgare L.: 2018, 2019, 2020, 2021, 2022.
Linum catharticum L.: 2018, 2019, 2020, 2021, 2022.
Lotus corniculatus L.: 2018, 2019, 2020, 2021, 2022.
Lotus pedunculatus Cav.: 2018, 2019, 2020, 2021.

Matricaria discoidea DC.: 2018, 2019, 2020, 2021, 2022.
Mentha aquatica L.: 2018, 2019, 2020, 2021, 2022.
Myosotis laxa Lehm.: 2018, 2019, 2020, 2021, 2022.
Narcissus pseudonarcissus L. agg.: 2018, 2019, 2020, 2021, 2022.
Odontites vernus (Bellardi) Dumort.: 2021.
Pedicularis sylvatica L.: 2021.
Persicaria maculosa Gray: 2018, 2019, 2020, 2021, 2022.
Picea sitchensis (Bong.) Carrière: 2018, 2019, 2020, 2021, 2022.
Pilosella officinarum F.W. Schultz & Sch. Bip.: 2022.
Pinus sylvestris L.: 2018, 2019, 2020, 2021, 2022.
Plantago lanceolata L.: 2018, 2019, 2020, 2021, 2022.
Plantago major L.: 2018, 2019, 2020, 2021, 2022.
Potentilla anglica Laichard.: 2018, 2019, 2020, 2021, 2022.
Potentilla erecta (L.) Raeusch.: 2018, 2019, 2020, 2021, 2022.
Prunella vulgaris L.: 2018, 2019, 2020, 2021, 2022.
Prunus laurocerasus L.: 2018, 2019, 2020, 2021, 2022.
Quercus robur L.: 2018, 2019, 2020, 2021, 2022.
Ranunculus flammula L.: 2018, 2019, 2020, 2021, 2022.
Ranunculus omiophyllus Ten.: 2018, 2019, 2020, 2021, 2022.
Ranunculus repens L.: 2018, 2019, 2020, 2021, 2022.
Rhododendron ponticum L.: 2018, 2019, 2020, 2021, 2022.
Rubus spp.: 2018, 2019, 2020, 2021, 2022.
Rumex acetosa L.: 2018, 2019, 2020, 2021, 2022.
Rumex acetosella L.: 2022.
Rumex crispus L.: 2018, 2019, 2020, 2021, 2022.
Rumex obtusifolius L.: 2018, 2019, 2020, 2021, 2022.
Sagina procumbens L.: 2018, 2019, 2020, 2021, 2022.
Salix sp.: 2018, 2019, 2020, 2021, 2022.
Scrophularia auriculata L.: 2021, 2022.
Scrophularia nodosa L.: 2021, 2022.
Senecio squalidus L.: 2021.
Senecio vulgaris L.: 2022.
Solidago virgaurea L.: 2018, 2019, 2020, 2021, 2022.
Sonchus asper (L.) Hill: 2018, 2019, 2020, 2021, 2022.
Sonchus oleraceus L.: 2018, 2019, 2020, 2021.
Sorbus aucuparia L.: 2018, 2019, 2020, 2021, 2022.

Stachys palustris L.: 2018, 2019, 2020, 2021, 2022.
Stachys sylvatica L.: 2018, 2019, 2020, 2021, 2022.
Stellaria graminea L.: 2018, 2019, 2020, 2021, 2022.
Stellaria media (L.) Vill.: 2018, 2019, 2020, 2021.
Succisa pratensis Moench: 2018, 2019, 2020, 2021, 2022.
Taraxacum officinale agg.: 2018, 2019, 2020, 2021, 2022.
Trifolium dubium Sibth.: 2018, 2019, 2020, 2021, 2022.
Trifolium pratense L.: 2018, 2019, 2020, 2021, 2022.
Trifolium repens L.: 2018, 2019, 2020, 2021, 2022.
Tussilago farfara L.: 2018, 2019, 2020, 2021, 2022.
Ulex europaeus L.: 2018, 2019, 2020, 2021, 2022.
Umbilicus rupestris (Salisb.) Dandy: 2018, 2019, 2020, 2021, 2022.
Urtica dioica L.: 2018, 2019, 2020, 2021, 2022.
Vaccinium myrtillus L.: 2018, 2019, 2020, 2021, 2022.
Veronica arvensis L.: 2018, 2019, 2020, 2021, 2022.
Veronica beccabunga L.: 2021.
Veronica chamaedrys L.: 2019, 2020, 2021, 2022.
Veronica officinalis L.: 2022.
Veronica persica Poir.: 2018, 2019, 2020, 2021.
Veronica serpyllifolia L.: 2018, 2019, 2020, 2021.
Vicia cracca L.: 2018, 2019, 2020, 2021, 2022.
Vicia sepium L.: 2018, 2019, 2020, 2021, 2022.
Viola riviniana Rchb.: 2018, 2019, 2020, 2021, 2022.

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FIGURE 1. The location of the study site.

PLATE 1. One of the small streams, Ballywilliam. Photograph: Sylvia Voss.

PLATE 2. Left: *Micropterix aureatella*, Ballywilliam. Right: *Dolycoris baccarum*, Ballywilliam. Photographs: Sylvia Voss.

PLATE 3. Left: *Xylaria hypoxylon* Candlesnuff fungus, Ballywilliam. Right: *Argonemertes dendyi* egg clutch, Ballywilliam. Photographs: Sylvia Voss.

PLATE 4. *Cicadella viridis*, Ballywilliam. Photograph: Sylvia Voss.

PLATE 5. Left: *Sphagnum rubellum* + *Pleurozium schreberi*, Ballywilliam. Right: *Centaurium erythraea*, Ballywilliam. Photographs: Sylvia Voss.

PLATE 6. *Regulus regulus*, Ballywilliam. Photograph: Sylvia Voss.

PLATE 7. *Leucozona glaucia*, Ballywilliam. Photograph: Sylvia Voss.

PLATE 8. *Enoplognatha ovata/E. latimana* var. *redimida*, Ballywilliam. Photograph: Sylvia Voss.

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NEW RECORDS OF IRISH CADDISFLIES (TRICHOPTERA) IN 2014, 2021, 2022 & 2023

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Abstract

Recent records of Irish caddisflies (Trichoptera) are reported including new monad, hectad and county ones.

Key words: *Apatania muliebris*, *Leptocerus tineiformis*, *Setodes argentipunctellus*, Trichoptera, caddisflies, Ireland, new records, distribution.

Introduction

The year 2023 had a poor Summer for sweeping or running light traps for caddisflies in Ireland. Rainfall was above average everywhere, wettest in July, driest in June. It began very dry with widespread climatological dry periods up to mid-June, before breaking down with eight consecutive days of intense thunderstorm activity. Atlantic westerlies took hold towards the end of June. July saw Atlantic low pressure systems dominating in a mostly westerly or cyclonic airflow. Numerous active weather fronts crossed the country along with periods of intense, sometimes thundery, convective rainfall. August was again dominated by Atlantic low pressure systems. Two named storms brought spells of very heavy rain and strong winds (Anon., 2023).

Nevertheless new data have been discovered since O'Connor, O'Connor and Feeley (2023). While that paper was in press, a population of the caddisfly *Setodes argentipunctellus* McLachlan, was reported from the West of Ireland at Ross Lake, County Galway. The species was previously known only from two lakes in the Killarney district in the south-west of the island (Little, Feeley and O'Connor, 2023). New records contained in the present paper include monad (1km^2), hectad (10km^2) and county ones. Four figure (1km^2) Irish grid references are given for each record with the exception of the Phoenix Park, County Dublin. Previous records in O'Connor (2015) from the square O1036 relate to the Quarry Lake (O103362) while a separate water body, the Machine Pond, is indicated in this paper by (O104364). The more important discoveries are shown (Figs 1-5). Unless otherwise stated, specimens were identified by the senior author using Malicky (2004),

Barnard and Ross (2012) and Salokannel and Mattila (2018). Other records were confirmed by JPOC.

Methods

The extensive collection of HBF were made with a combination of methods e.g. using a beating tray on bankside vegetation and over-hanging bushes and branches, and by sweeping a net through marginal grasses. The O'Connors used nets and light-traps.

Addendum 7 and Addendum 8

Addendum 7 to the dataset "Caddisflies (Trichoptera) of Ireland", was uploaded by the National Biodiversity Data Centre on the 8 August 2023 <https://maps.biodiversityireland.ie/Dataset/250> (O'Connor, 2023). There are presently 17973 records for 156 species from 930 sites. The records in this paper will be sent to the National Biodiversity Data Centre as Addendum 8 for incorporation into the above dataset.

The new records

RHYACOPHILIDAE

***Rhyacophila dorsalis* (Curtis, 1834)**

KILDARE: Cloncumber Stream, Old River Bridge (N7420), 1♂ 23 August 2023, H. Feeley.
LAOIS: River Barrow, Tankardstown Bridge (S7088), 1♀ 13 September 2023, H. Feeley. River Stradbally, bridge north-west of Ballintlea (S5389), 1♂2♀♀ 11 September 2023, H. Feeley. Timahoe River, Bauteoge Bridge (S5593), 1♂ 2♀♀ 11 September 2023, H. Feeley.
OFFALY: River Cushina, bridge east of Monavane House (N5316), 1♂ 6 September 2023, H. Feeley.
WICKLOW: River Avonbeg, ford at Barravore (T0694), 1♀ 2 May 2023, H. Feeley. River Glendasan, bridge upstream of Glenealo confluence (T1296), 1♂ 21 April 2023, H. Feeley. River Ow, Ballymanus Bridge (T0981), 1♂ 2 May 2023, bridge upstream of Aghavannagh Bridge (T0586), 2♂♂ 2 May 2023, both H. Feeley.

GLOSSOSOMATIDAE

***Agapetus fuscipes* Curtis, 1834**

CLARE: Moyree Bridge upstream of River Fergus (R3688), 3♀♀ 25 May 2023, H. Feeley. River Caher, bridge 2km downstream of Formoyle (M1608), 1♂ 23 May 2023, H. Feeley. Millbrook River, Ballyline Bridge (R3886), 1♂1♀ 25 May 2023, H. Feeley. River Fergus, Addroon Bridge (R3587), 3♂♂ 25 May 2023, River Fergus, Poplar Bridge (R2791), 1♂1♀ 24 May 2023, both H. Feeley.

KILDARE: River Greese (S7995), 1♂ 28 August 2023, H. Feeley. River Lerr, east of the bridge at Castledermot (S7885), 1♂1♀ 14 September 2023, H. Feeley. Tully Stream, Bridge west of Cherrymill House (N6804), 1♂1♀ 31 August 2023, Soomeragh Bridge (N7006), 2♂♂ 31 August 2023, both H. Feeley.
LAOIS: River Douglas, Gale's Bridge (S6585), 1♂ 13 September 2023, H. Feeley.
***Agapetus ochripes* Curtis, 1834**
CARLOW: River Lerr, Lerr Bridge (S7181), 1♀ 14 September 2023, H. Feeley.
***Glossosoma boltoni* Curtis, 1834**
KERRY: River Finnihy, Kenmare (V9071), 2♂♂1♀ 16 August 2023, H. Feeley.
MAYO: River Srahnalong, bridge on R300 (M0061), 1♀ 5 April 2023, H. Feeley.
WICKLOW: River Grangecon, bridge south-east of of Ballynure (S8396), 1♂ 28 August 2023, H. Feeley.

HYDROPTILIDAE

***Agraylea multipunctata* Curtis, 1834**
CAVAN: Lough Oughter, south-east of Derries Upper (H3304), 1♂ 10 July 2023, H. Feeley.
CLARE: Lough Derg, Annacarriga (R6877), 1♂ 4 August 2023, H. Feeley.
LEITRIM: Derrycassan Lough, west shore (H2211), 1♂ 17 July 2023, H. Feeley.
***Hydroptila forcipata* (Eaton, 1873) New to County Laois**
LAOIS: River Douglas, Gale's Bridge (S6585), 1♀ 13 September 2023, H. Feeley.
MAYO: River Finny, bridge in Finny (M0158), 1♂ 22 Mayo 2023, H. Feeley.
***Hydroptila tineoides* Dalman, 1819**
MAYO: River Finny, bridge in Finny (M0158), 1♀ 22 May 2023, H. Feeley.
***Oxyethira frici* Klapálek, 1891**
MAYO: River Finny, bridge in Finny (M0158), 1♂ 22 May 2023, H. Feeley.

PHILOPOTAMIDAE

***Chimarra marginata* (Linnaeus, 1761)**
CLARE: Millbrook River, Ballyline Bridge (R3886), 2♂♂ 25 May 2023, H. Feeley. Moyree Bridge upstream of River Fergus (R3688), 1♀ 25 May 2023, H. Feeley.
MAYO: River Finny, bridge in Finny (M0158), 1♂2♀♀ 22 May 2023, H. Feeley.
***Philopotamus montanus* (Donovan, 1813) New to Counties Laois and Sligo**
DONEGAL: Cronaniv Burn, Poisoned Glen (B9318), 1♂ 30 March 2023, H. Feeley.
LAOIS: River Glenlahan, Clarahill Bridge (N3410), 1♂ 4 September 2023, H. Feeley.
MAYO: River Glensaul, confluence at waterfall (M0867), 1♂ 5 April 2023, H. Feeley.
SLIGO: Lenyvee Stream (G4117), 1♀ 25 March 2023, B. Kennedy.

WICKLOW: Cock Brook, bridge north-west of Kilmore (O0208), 1♂ 18 April 2023, H. Feeley. River Ow, Ballymanus Bridge (T0981), 1♂ 2 Mayo 2023, H. Feeley.

***Wormaldia subnigra* McLachlan, 1865**

KILDARE: Cloncumber Stream, Old River Bridge (N7420), 1♂2♀♀ 23 August 2023, H. Feeley.

POLYCENTROPOPIDAE

***Cyrnus flavidus* McLachlan, 1864**

CAVAN: Lough Bawn, south shore (H3006), 1♂ 6 July 2023, H. Feeley.

***Cyrnus trimaculatus* (Curtis, 1834)**

CAVAN: Lough Bunerky, angling platform (H1918), 3♂♂ 17 July 2023, H. Feeley.

***Holocentropus picicornis* (Stephens, 1836)**

CAVAN: Corglass Lough, North Shore (H3408), 1♂ 11 July 2023, H. Feeley. Derrybrick Lough, south basin (H3411), 2♀♀ 11 July 2023 , H. Feeley.

CLARE: Lough Derg, Moys Bay, just south of Killaloe/Ballina (R7071), 1♂ 1 August 2023, H. Feeley.

DUBLIN: Royal Canal, Ashtown (O1237), 1♂ 18 May 2021, J. T. Brophy.

WESTMEATH: Lough Ree, shore west of Coosan (N0445), 1♂ 4 July 2023, H. Feeley.

***Neureclipsis bimaculata* (Linnaeus, 1758)**

ROSCOMMON: Lough Ree, Hodson's Bay (N0046), light-trap 1♀ 22 September 2023, J. P. O'Connor & M. A. O'Connor.

***Polycentropus flavomaculatus* (Pictet, 1834)**

CAVAN: Glasshouse Lough, north shore (H2706), 1♀ 29 June 2023, H. Feeley.

CLARE: River Caher, bridge 2km downstream of Formoyle (M1608), 1♀ 23 May 2023, H. Feeley.

KILDARE: River Slate opposite the church in Rathangan (N6719), 2♂♂1♀ 24 August 2023, H. Feeley. Tully Stream, Cloney Bridge (N6501), 3♂♂ 31 August 2023, bridge west of Cherrymill House (N6804), 1♀ 31 August 2023, both H. Feeley.

LAOIS: River Blackwater, Blackwater Bridge (N4305), 1♂ 5 September 2023, H. Feeley. River Stradbally Bridge, west north west of Ballykilcavan House (S5997), 1♀ 11 September 2023, H. Feeley.

OFFALY: Enaghan Stream (N5316), 1♂ 6 September 2023, H. Feeley. Esker Stream, Esker Bridge (N5527), 1♂1♀ 22 August 2023, H. Feeley. Silver River, Cadamstown (N2307), 1♂ 26 July 2022, J. T. Brophy.

WICKLOW: River Slaney, Knockanarrigan (S9793), 1♀ 13 June 2021, J. T. Brophy.

***Polycentropus irroratus* (Curtis, 1835)**

DUBLIN: River Dodder, Dartry (O1529), 1♀ 10 June 2021, J. T. Brophy.

PSYCHOMYIIDAE

***Lype phaeopa* (Stephens, 1836) New to County Laois**

KILDARE: Tully Stream, Soomeragh Bridge (N7006), 1♂ 31 August 2023, H. Feeley.

LAOIS: River Blackwater, Blackwater Bridge (N4305), 1♂1♀ 5 September 2023, H. Feeley.

***Lype reducta* (Hagen, 1868) New to Counties Clare and Laois (Fig. 1)**

CLARE: River Caher, bridge 2km downstream of Formoyle (M1608), 1♂1♀ 23 May 2023, H. Feeley.

LAOIS: River Owenass, ford north of Bakmill (N4105), 1♀ 5 September 2023, H. Feeley. River Stradbally, bridge west-north-west of Ballykilcavan House (S5997), 1♀ 11 September 2023, H. Feeley.

***Psychomyia pusilla* (Fabricius, 1781)**

ROSCOMMON: Lough Ree, Rinnagan (N0056), 1♀ 7 August 2021, collected and determined J. T. Brophy.

***Tinodes maculicornis* (Pictet, 1834)**

ROSCOMMON: Lough Ree, Hodson's Bay (N0046), light-trap 1♂ 22 September 2023 & 1♀ 23 September 2023, J. P. O'Connor & M. A. O'Connor.

WESTMEATH: Lough Ree, shore west of Coosan (N0445), 2♂♂ 4 July 2023, H. Feeley.

***Tinodes waeneri* (Linnaeus, 1758)**

CAVAN: Lough Ardan, north shore (H3512), 1♂ 13 July 2023, H. Feeley. Lough Bawn, south shore (H3006), 2♂♂ 6 July 2023, H. Feeley. Lough Oughter, shoreline near Rinn (H3408), 1♂ 10 July 2023, Killyleen (H3507), 4♂♂ 10 July 2023, both H. Feeley.

FERMANAGH: Lough Melvin, Garrison Angling Club (G9353), 3♂♂ 26 July 2023, H. Feeley.

LEITRIM: Lough Melvin, south west shore (G9151), 1♀ 25 July 2023, H. Feeley.

ROSCOMMON: Hodson's Bay, Lough Ree (N0046), light-trap 1♀ 22 September 2023 & 5♂♂4♀♀ 23 September 2023, (N0146), 1♀ 22 September 2023, J. P. O'Connor & M. A. O'Connor. Lecarrow River (M9655), 1♀ 23 September 2023, J. P. O'Connor & M. A. O'Connor.

HYDROPSYCHIDAE

***Hydropsyche siltalai* Döhler, 1963**

GALWAY: River Beagh, downstream of Lough Cultra (M4600), 1♀ 23 May 2023, H. Feeley.

MAYO: River Moy, Foxford Bridge (G2604), 2♂♂1♀ 29 May 2023, B. Kennedy.

OFFALY: Esker Stream, Esker Bridge (N5527), 1♀ 22 August 2023, H. Feeley.

PHRYGANEIDAE

***Agrypnia pagetana* Curtis, 1835**

FERMANAGH: Lough Melvin, Garrison Angling Club (G9353), 1♂ 26 July 2023, H. Feeley.

***Phryganea grandis* Linnaeus, 1758**

CAVAN: River Belcoo, Blacklion Bridge (H0838), 1♀ 21 May 2023, H. Feeley.

GOERIDAE

***Goera pilosa* (Fabricius, 1775)**

CAVAN: Glasshouse Lough, north shore (H2706), 2♂♂ 29 June 2023, H. Feeley.

WESTMEATH: Lough Ree, shore west of Coosan (N0445), 1♀ 4 July 2023, H. Feeley.

***Silo nigricornis* (Pictet, 1834)**

CLARE: River Caher, bridge 2km downstream of Formoyle (M1608), 2♂♂2♀♀ 23 May 2023, H. Feeley.

***Silo pallipes* (Fabricius, 1781)**

CLARE: River Fergus, Poplar Bridge (R2791), 1♂ 24 May 2023, H. Feeley.

LEPIDOSTOMATIDAE

***Lepidostoma basale* (Kolenati, 1848)**

CLARE: River Caher, bridge 2km downstream of Formoyle (M1608), ♂♂2♀♀ 23 May 2023, H. Feeley.

***Lepidostoma hirtum* (Fabricius, 1775)**

KILDARE: Tully Stream, Cloney Bridge (N6501), 1♀ 31 August 2023, H. Feeley.

APATANIDAE

***Apatania muliebris* McLachlan, 1866**

CLARE: River Fergus, Poplar Bridge (R2791), 1♀ 24 May 2023, H. Feeley.

Apatania muliebris is a rare Irish species living in spring fed streams with a stony substratum, also trickles and ditches fed by ground water (O'Connor, 2021).

***Apatania wallengreni* McLachlan, 1871**

MAYO: Lough Conn, Brackwanshagh (G1909), 2♀♀ 6 April 2023, H. Feeley. Lough Mask, near Churchfield Lower (M0865), 2♀♀ 5 April 2023, H. Feeley.

LIMNEPHILIDAE

***Drusus annulatus* (Stephens, 1837) New to County Kildare (Fig. 2)**

CARLOW: River Lerr, Lerr Bridge (S7181), 1♂ 14 September 2023, H. Feeley.

KILDARE: River Greese (S7995), 1♂ 28 August 2023, H. Feeley. River Graney, Graney

Bridge (S8183), 1♀ 14 September 2023, H. Feeley. River Lerr, east of bridge, Castledermot (S7885), 1♂ 14 September 2023, H. Feeley.
WICKLOW: Sraghoe Brook (O0208), 1♂ 17 April 2023, H. Feeley. Upper Lough Bray inflow (O1415), 1♂1♀ 3 May 2023, H. Feeley.

***Ecclisopteryx dalecarlica* Kolenati, 1848 New to County Westmeath**

WESTMEATH: Gageborough east of Bunanagh (N299431), larva 21 May 2014, Environmental Protection Agency.

***Glyphotaelius pellucidus* (Retzius, 1783)**

DUBLIN: Phoenix Park, Machine Pond (O104364), 1♂ 25 July 2023, J.P.O'Connor.
LAOIS: River Owenass, Cathole Falls (N3704), 1♀ 5 September 2023, H. Feeley.

***Limnephilus affinis* Curtis, 1834**

DUBLIN: Phoenix Park, Machine Pond (O104364), 1♂ 19 June 2023, J. P. O'Connor.
ROSCOMMON: Lough Ree, Hodson's Bay (N0046), 1♂2♀♀ 22 September 2023, J. P. O'Connor & M. A. O'Connor.

***Limnephilus auricula* Curtis, 1834**

DUBLIN: Phoenix Park, Machine Pond (O104364), 2♂♂1♀ 19 June 2023, J.P.O'Connor.

***Limnephilus decipiens* (Kolenati, 1848) New to County Roscommon (Fig. 3) (Plate 1)**

ROSCOMMON: Lough Ree, Hodson's Bay (N0046), 1♂ 23 September 2023, dead in a spider's webs on a boat house, J. P. O'Connor & M. A. O'Connor.

***Limnephilus flavicorn*is (Fabricius, 1787)**

DUBLIN: Phoenix Park, Machine Pond (O104364), 1♂ 25 July 2023, J.P.O'Connor.
ROSCOMMON: Lough Ree, Hodson's Bay (N0046), 2♂♂1♀ 22 September 2023, J. P. O'Connor & M. A. O'Connor.

***Limnephilus lunatus* Curtis, 1834**

ROSCOMMON: Lecarrow Canal (M9655), 1♀ 23 September 2023, J. P. O'Connor & M. A. O'Connor. Lough Ree, Hodson's Bay (N0046), light-trap 1♂2♀♀ 22 September 2023, J. P. O'Connor & M. A. O'Connor.

***Limnephilus marmoratus* Curtis, 1834**

KILDARE: Cloncumber Stream, Old River Bridge (N7420), 1♂2♀♀ 23 August 2023, H. Feeley. River Slate opposite the church in Rathangan (N6719), 1♀ 24 August 2023, H. Feeley.
ROSCOMMON: Lough Ree, Hodson's Bay (N0046), 5♀♀ 22 September 2023, (N0146), 1♂1♀ 22 September 2023, J. P. O'Connor & M. A. O'Connor.

***Limnephilus nigriceps* (Zetterstedt, 1840) New to County Roscommon (Fig. 4) (Plate 1)**

ROSCOMMON: Lough Ree, Hodson's Bay (N0046), 1♂ 22 September 2023, (N0146), 1♂ 22 September 2023, J. P. O'Connor & M. A. O'Connor. Lough Ree, Portrunny Bay (M9660), 1♂ 23 September 2023, J. P. O'Connor.

***Limnephilus sparsus* Curtis, 1834**
DUBLIN: Phoenix Park, Machine Pond (O104364), 1♀ 26 June 2023, J. P. O'Connor.
GALWAY: Illauneeragh (L8426), 1♂1♀ 7 June 2021, J. T. Brophy.
***Limnephilus vittatus* (Fabricius, 1798)**
ROSCOMMON: Lough Ree, Hodson's Bay (N0046), 5♀♀ 22 September 2023, (N0146), 1♀ 22 September 2023, J. P. O'Connor & M. A. O'Connor.
***Halesus radiatus* (Curtis, 1834)**
KILDARE: River Graney, Graney Bridge (S8183), 1♂1♀ 14 September 2023, H. Feeley.
LAOIS: River Barrow, Tinnahinch Bridge (N3510), 1♂ 4 September 2023, H. Feeley. River Douglas, Coolanagh (S6883), 1♂ 13 September 2023, H. Feeley. River Owenass, bridge north of Irishtown (N4507), 1♂1♀ 5 September 2023, H. Feeley.
***Potamophylax cingulatus* (Stephens, 1837) New to Counties Laois and Roscommon**
LAOIS: Crooked Stream, bridge west of Luggacurren (S5888), 1♀ 11 September 2023, H. Feeley.
ROSCOMMON: Lecarrow River (M9655), 1♀ 23 September 2023, J. P. O'Connor & M. A. O'Connor (Plate 2).
WICKLOW: River Grangecon, bridge south-east of Ballynure (S8396), 1♂ 28 August 2023, H. Feeley.
***Potamophylax latipennis* (Curtis, 1834) New to County Laois**
KILDARE: Tully Stream, Cloney Bridge (N6501), 1♂ 31 August 2023, H. Feeley.
LAOIS: River Barrow, Tankardstown Bridge (S7088), 1♀ 13 September 2023, H. Feeley.
***Stenophylax permistus* McLachlan, 1895**
SLIGO: River Unshin, south-east of Riverstown (G7518), 1♂ 17 March 2023, B. Kennedy.

SERICOSTOMATIDAE

***Sericostoma personatum* (Spence, 1826)**
GALWAY: Lough Cutra, boat launch (R4898), 1♀ 23 May 2023, H. Feeley.
KILDARE: Cloncumber Stream, Old River Bridge (N7420), 1♂ 23 August 2023, H. Feeley. River Slate, Quigley's Bridge (N7826), 1♂ 24 August 2023, H. Feeley. Tully Stream, downstream of the bridge near Tully House (N7310), 1♀ 31 August 2023, H. Feeley.
WESTMEATH: Lough Ree, shore west of Coosan (N0445), 1♀ 4 July 2023, H. Feeley.
WICKLOW: River Bothoge, Rathtoole Bridge (S8292), 1♀ 29 August 2023, H. Feeley.

BERAEIDAE

***Beraea pullata* (Curtis, 1834) New to County Galway**
GALWAY: River Beagh, downstream of Lough Cultra (M4600), 1♀ 23 May 2023, H. Feeley.

ODONTOCERIDAE

***Odontocerum albicorne* (Scopoli, 1763) New to County Kildare**

KILDARE: River Greese (S7995), 1♀ 28 August 2023, Spratstown (S8298), 7♂♂5♀♀ 28 August 2023, both H. Feeley.

WICKLOW: River Grangecon, Ardsillish Bridge (S8695), 2♀♀ 28 August 2023, River Grangecon, bridge south-east of Ballynure (S8396), 1♀ 28 August 2023, both H. Feeley.

MOLANNIDAE

***Molanna albicans* (Zetterstedt, 1840)**

CLARE: Lough Derg, Cribby Island (R7285), 1♂ 1 August 2023, H. Feeley.

FERMANAGH: Lough Melvin, Garrison Angling Club (G9353), 2♀♀ 26 July 2023, H. Feeley.

LEPTOCERIDAE

***Athripsodes albifrons* (Linnaeus, 1758)**

KILDARE: River Slate opposite the church in Rathangan (N6719), 3♂♂ 24 August 2023, H. Feeley.

***Athripsodes aterrimus* (Stephens, 1836)**

CAVAN: Annagh Lough, angling club launch (H3912), 2♂♂ 3 July 2023, H. Feeley. Lough Ardan, north shore (H3512), 2♂♂ 13 July 2023, H. Feeley. Mill Lough, north shore (H3106), 1♀ 12 July 2023, H. Feeley.

DUBLIN: Gollierstown (O1331), 1♂ 5 June 2022, J. T. Brophy. Phoenix Park, Machine Pond (O104364), 1♀ 17 June 2023, J. P. O'Connor.

ROSCOMMON: Lough Ree, Hodson's Bay quay (N0046), 1♀ 22 September 2023, dead in a spider's web, J. P. O'Connor & M. A. O'Connor.

***Athripsodes cinereus* (Curtis, 1834)**

ROSCOMMON: Lough Ree, Hodson's Bay quay (N0046), 1♂ 22 September 2023, dead in a spider's web, J. P. O'Connor & M. A. O'Connor.

***Leptocerus tineiformis* Curtis, 1834**

LIMERICK: Lough Gur (R6441), 12 larvae 22 April 2021, collected and determined R. Little.

Leptocerus tineiformis is a species which is spreading in Ireland. It inhabits fens, lakes and ponds (O'Connor, 2021).

***Mystacides azurea* (Linnaeus, 1761)**

CLARE: Millbrook River, Ballyline Bridge (R3886), 1♂ 25 May 2023, H. Feeley.

DUBLIN: Templeogue (O1128), 1♂ 11 July 2021, collected and determined J. T. Brophy.

OFFALY: Esker Stream, Esker Bridge (N5527), 1♀ 22 August 2023, H. Feeley.

ROSCOMMON: Lough Ree, Rinnagan (N0056), adult 7 August 2021, collected and determined J. T. Brophy.

***Mystacides longicornis* (Linnaeus, 1758)**

CAVAN: Lough Ardan, north shore (H3512), 1♂ 13 July 2023, H. Feeley.

KILDARE: Royal Canal, Sallins (N8922), 1♀ 11 June 2021, collected and determined J. T. Brophy.

***Oecetis lacustris* (Pictet, 1834)**

CAVAN: Glasshouse Lough, north shore (H2706), 1♂ 29 June 2023, H. Feeley. Lough Gowna, north basin (N2890), 1♂ 27 June 2023, H. Feeley.

CLARE: Lough Derg, Moys Bay, just south of Killaloe/Ballina (R7071), 1♀ 1 August 2023, H. Feeley.

ROSCOMMON: Lough Ree, Hodson's Bay (N0046), 1♀ 23 September 2023, dead in a spider's webs on a boat house, J. P. O'Connor & M. A. O'Connor.

***Setodes argentipunctellus* McLachlan, 1877 (Fig. 5)**

Ruth Little collected the larvae of *Setodes argentipunctellus* at two different sites in the littoral of Ross Lake, County Galway (M192364, M204366) in the west of Ireland in 2010 and 2022. The waterbody is situated in the Corrib catchment, in a chain of lakes entering Lough Corrib at Moycullen Bay. Since *S. argentipunctellus* may be under threat in the Killarney lakes, County Kerry, it is important that the Ross Lake population has been discovered within a SAC (Little, Feeley and O'Connor, 2023).

***Triaenodes bicolor* (Curtis, 1834)**

CAVAN: Derrybrick Lough, south basin (H3411), 1♂ 11 July 2023, H. Feeley. Lough Ardan, north shore (H3512), 4♂♂2♀♀ 13 July 2023, H. Feeley. Lough Bunerky, angling platform (H1918), 1♂ 17 July 2023, H. Feeley.

FERMANAGH: Lough Melvin, Garrison Angling Club (G9353), 2♂♂ 26 July 2023, H. Feeley.

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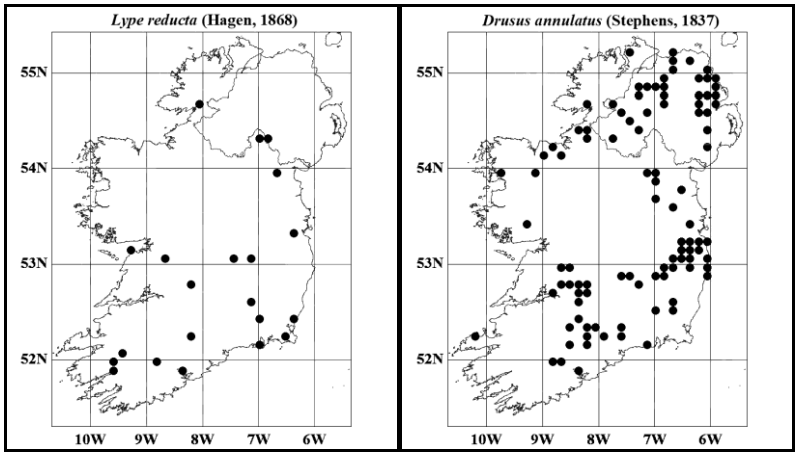
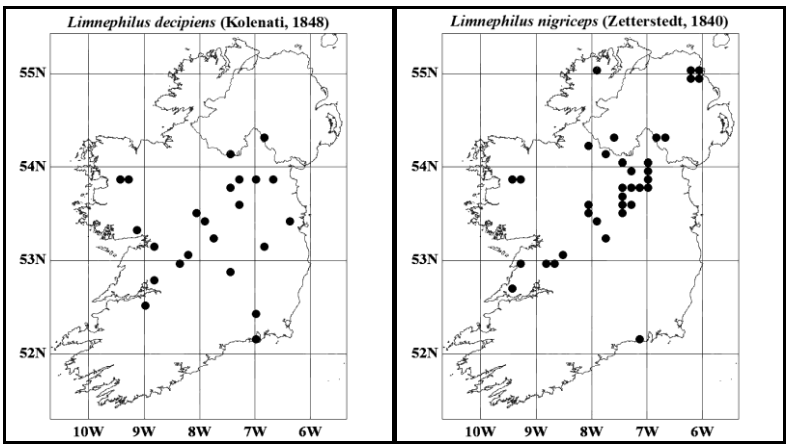


FIGURES 1-2. The known Irish distributions of *Lype reducta* and *Drusus annulatus*.



FIGURES 3-4. The known Irish distributions of *Limnephilus decipiens* and *L. nigriceps.*

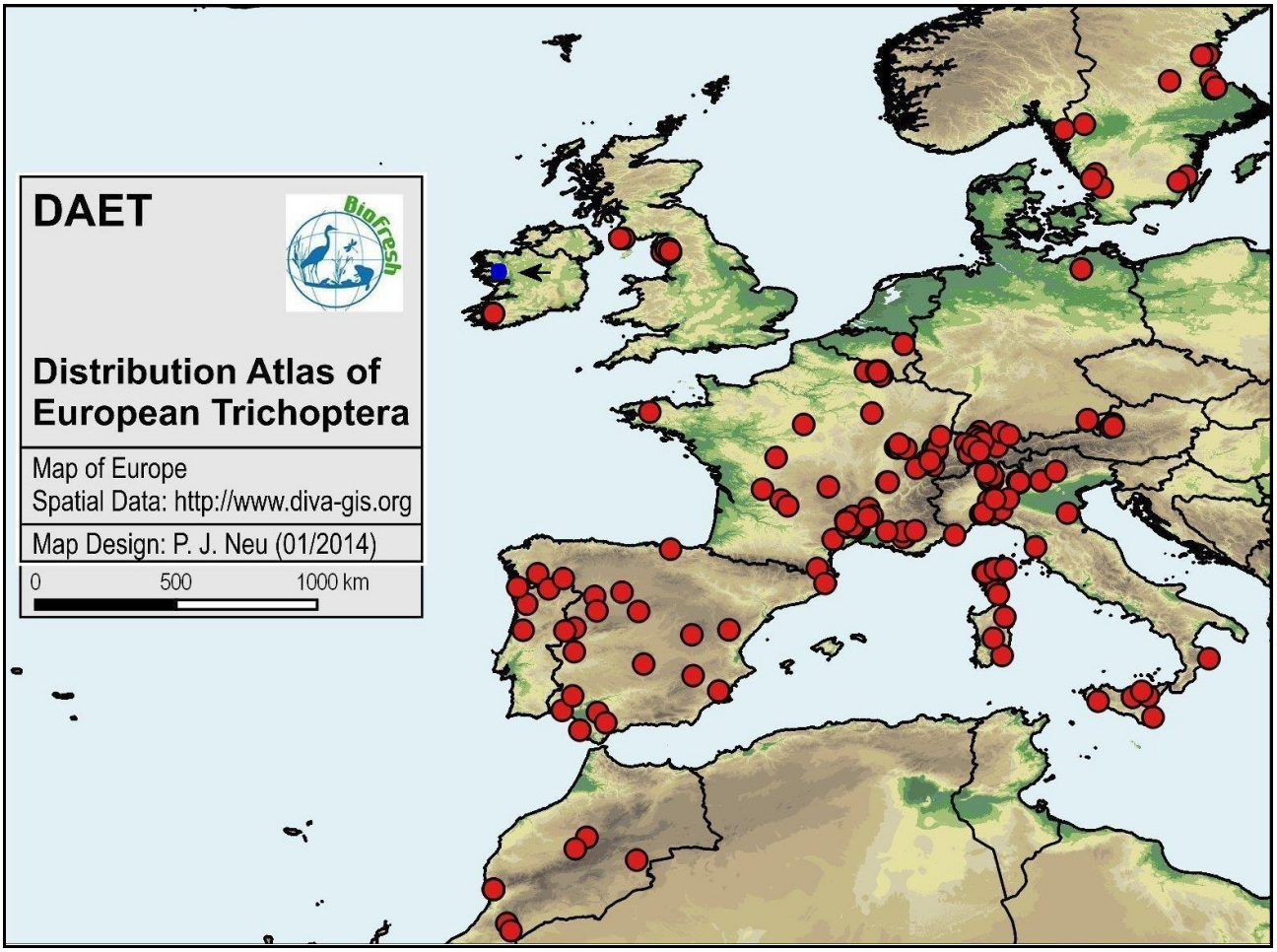


FIGURE 5. The European distribution of *Setodes argentipunctellus* (based on Neu *et al.,* 2018). The new Irish record is shown in blue (indicated by an arrow).

PLATE 1. Hodson's Bay, Lough Ree, Roscommon, 22 September 2023. Photograph: M. A. O'Connor. *Limnephilus decipiens* and *L. nigriceps* were new to Roscommon from this site.

PLATE 2. Lecarrow River entering Lecarrow Canal, Roscommon, 23 September 2023. Photograph: M. A. O'Connor. *Potamophylax cingulatus* was new to Roscommon from this site.

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A STUDY OF THE PRESENT STATE OF AN IRISH COLONY OF THE SLOW WORM (*ANGUIS FRAGILIS* LINNAEUS, 1758) (SQUAMATA: ANGUIDAE) IN THE BURREN, COUNTIES CLARE AND GALWAY. ADDENDUM 2020 – 2023

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Abstract

In the glacial karst landscaped Burren region of Counties Clare and Galway in the west of Ireland there is a colony of slow worms, the legless lizard, *Anguis fragilis* Linnaeus, 1758 (Squamata: Anguidae). This is a continuation from the 2015 to 2019 report and covers the period 2020 to 2023. Data includes sex ratios, refugia preference, pertinent temperatures, female gravidity, observation of juveniles, optimum conditions, terrain preference, repeat sightings.

Key words: *Anguis fragilis*, slow worm, Ireland, Burren, distribution, sex ratio, gravidity, birth, habits, age, terrain, refugia.

Introduction

Parry (2020) reviewed the history and ecology of the slow worm (*Anguis fragilis* Linnaeus, 1758) in Ireland. The author reported on a five-year investigation (2015 to 2019) into the lifestyle, habits, age and sexual dimorphism, and terrain inhabited by the current population in the glacial karst landscaped Burren region of Counties Clare and Galway in the west of Ireland. From the total encounters of 743, the ratio of male, female and juvenile slow worms was monitored as was the possibility of a home range and repeated individual refugia preference by adult females compared to the transient habit of males. The variation of preferred habitat, the refugia employed and pertinent temperatures were also recorded. The present paper deals with a continuation of this research for the period 2020 – 2023. for further information on the Burren, see Anon. (2023a).

Methods

Recommencing the study in 2020 the number of covers employed and the distances travelled were reduced due to Covid-19, my age and health. The Covid restrictions also limited the meeting of new landowners to access their properties, therefore the use of the previously accessible sites was continued with many covers retained from previous years but with some additions. The covers were of a variety of materials mainly of dimensions 0.5m² and positioned

without considered orientation.

Locations

The divisons are townlands. These are small geographical divisions of land, historically and currently used in Ireland (Anon., 2023a).

2020. County Clare

Fahee North: corrugated tin and corrugated bitumen retained from previous year. Sundry items – traffic cone on road verge.

Keelhilla: steel sheet placed in 2015 remained. A corrugated tin 50cm² was added.

Quakerstown: retained from previous years corrugated tin, steel sheet, tin sheet and one bitumen mat plus various debris rubbish on site.

Rockvale: retained were corrugated bitumen and corrugated tin.

2020. County Galway

Cahererillan: steel sheet 2.5m x 1.5m and corrugated tin retained from previous years plus various debris items.

Cappacasheen 1: tin sheet retained since 2016 and one corrugated tin added.

Cappacasheen 2: corrugated tin x 4, one bitumen mat retained from previous years.

Cappacasheen JCs: retained were two of corrugated bitumen and one plywood.

Funshin More: corrugated bitumen and corrugated tin were retained.

Roo: with access previously granted a corrugated tin (Roo north side) and corrugated bitumen (Roo South side) were placed.

2021. County Clare

Keelhilla: two covers retained, steel sheet, corrugated tin.

Quakerstown: three covers retained from previous year, tin sheet, corrugated tin, steel sheet plus debris felt etc.

Rockvale: two covers retained corrugated bitumen and corrugated tin.

NEW. *Derreenatloghtan*: corrugated tin placed on roadside verge.

2021. County Galway

Cahererillan: one cover of corrugated tin retained plus various debris items.

Cappacasheen 1: retained one cover and one added. Tin sheet and corrugated tin.

Cappacasheen 2: retained 5 covers, one bitumen mat and 4 of corrugated tin.

Cappacasheen JCs: as for 2020, three covers, two corrugated bitumen and one plywood.

Roo South: one cover corrugated tin replaced corrugated bitumen.

NEW. *Ballybuck South*: corrugated tin placed on roadside verge.

Gortnaglogh: two covers placed corrugated bitumen and bitumen mat.

2022. County Clare

Quakerstown: three covers retained, corrugated tin, tin sheet, steel sheet, added corrugated tin

plus felt mat.
Quakerstown LR: two covers both corrugated bitumen.
Quakerstown OTR: steel sheet placed.
Rockvale: one corrugated bitumen cover abutting drystone wall.
Derreenatloghtan: roadside verge, corrugated tin retained.
Keelhilla RS: steel tin as previous years.
South Commons: two covers, one corrugated tin one corrugated bitumen.

2022. County Galway

Cappacasheen 1: two covers retained, tin sheet and corrugated tin. Further cover a large plywood sheet added.
Cappacasheen 2: five covers, four corrugated tin and one bitumen mat.
Cappacasheen JCs: three covers retained two corrugated bitumen and one of plywood. Plywood sheet added.
NEW: *Normangrove*: corrugated tin placed on roadside verge.

2023. County Clare

Derreenatloghtan: one cover, corrugated tin retained.
Keelhilla RS: steel sheet retained.
Quakerstown: four covers retained, two corrugated tin, tin sheet, steel sheet, plus bitumen felt amongst debris on site.
Quakerstown LR: two covers as before but now corrugated bitumen and one bitumen mat.
Quakerstown OTR: steel sheet retained, plywood sheet added.
Rockvale: one bitumen mat.
South Commons: two covers retained, corrugated tin and corrugated bitumen.
NEW: *Cloonselherny*: two covers introduced corrugated bitumen and bitumen mat.

2023. County Galway

Cappacasheen 1: three covers retained, plywood, tin sheet, and corrugated tin.
Cappacasheen 2: four covers, three corrugated tin and one bitumen mat. JCs: four covers retained being two plywood and two corrugated bitumen. Plywood cover added.

Procedure

The checking of the sites during 2020 began from the first week in March to the end of October. In 2021, checking began in late January and concluded during the last week of October. During 2022, sites were checked from mid-February until mid-September when illness caused a premature conclusion. In 2023, it was late February when site checks commenced and concluded on 28 October when hibernation was assumed.

The dates of the appearance of the slow worms in Spring and the last sightings in Autumn were noted along with the relevant meteorological details (Table 1). Recording weather

conditions and then attempting to relate encounter numbers of slow worms under refugia to any condition was considered important.

Each site visit followed the same principal whether a slow worm was encountered or not. The date and time would always be noted along with the air temperature, the minimum temperature of the previous night and the daily maximum temperature. Also recorded were the temperature of each cover surface and the weather conditions with particular emphasis on cloud levels.

Also noted were the sex and age class of the animal, length if measurable and any interesting features such as sloughing, mating marks or damage, and if it was a previously recorded animal. The behaviour of gravid females and appearance dates and growth rates of juveniles were also recorded. Young slow worms were allocated either adult or juvenile status dependant on their size, markings and colour, thus sub-adult classification was not implemented. Two townlands that have been surveyed over some years are Cappacasheen in County Galway and Quakerstown in County Clare. While both are within the limestone area of the Burren, visibly they are very different. A comparison of the two sites was made of which 2023 is a perfect example. Did the frequency of visits, at least twice, preferably three times weekly cause a noticeable disturbance? Times of visits to check covers were usually *ad hoc* but during one specific month in 2023 checks were restricted to those times and conditions my data suggested as optimum. Checks were not made during storms or seriously inclement weather.

Unusual behavioural occurrences were noted and analysed. As with previous years all manner of debris and miscellanea at sites and *en route* was investigated. Photographs were taken, when possible, with a Samsung Galaxy S7.

Results

2020

Cahererillan: two covers plus debris produced 130 encounters between 7 May and 21 September. Steel sheet 25, corrugated tin 37 with debris items, felt 23, plastic 5, slate 35, scrap tin 4, plus one openly basking animal.

Cappacasheen 1: one cover 25 encounters between 22 March and 21 September. Tin sheet 25.

Cappacasheen 2: five covers produced 156 encounters between 19 March and 5 October. Four corrugated tin 111, bitumen mat 44, plus 1 openly basking animal.

Cappacasheen JCs: three covers for 31 encounters between 19 March and 7 September. Corrugated bitumen 26, plywood 5.

Keelhilla: two covers produced 30 sightings from 25 May to 28 September. Steel sheet 5, corrugated tin 25.

Quakerstown: four covers plus various debris produced 158 encounters from 15 March to 18 October. Corrugated tin 107, tin sheet 27, steel sheet 10, bitumen mat 4, various debris concrete

and felt 10.
Roo: two covers for 5 encounters from 10 August to 14 September. Corrugated tin none, corrugated bitumen 5.
Sundry sightings: traffic cone, 3 encounters.
No slow worms were found at Rockvale, Funshin More and Fahee North.

2020: total 538. Females 213, Males 71 = ratio 3/1. Juveniles 254 being 47.2% of total. Covers were checked on 87 occasions for a total of 6.1 encounters per trip.

2021

Ballybuck South: one cover produced one encounter on 7 April. Corrugated tin 1.
Cahererillan: one corrugated tin plus debris produced 26 encounters from 18 May to 10 August. Corrugated tin 1, debris of tin/felt 25.
Cappacasheen 1: two covers housed 16 encounters between 19 March and 31 August. Tin sheet 15, corrugated tin 1.
Cappacasheen 2: five covers produced 36 sightings plus one openly basking animal between 19 March and 31 August. Four corrugated tin 30 encounters, bitumen mat 6.
Cappacasheen JCs: three covers produced 15 encounters between 30 March and 26 August. Two corrugated bitumen 8 and plywood 7.
Derreenatloghtan: one cover produced 17 encounters from 28 May until 8 October. Corrugated tin 17.
Keelhilla: two covers, for one slow worm on 31 May. Corrugated tin none, steel sheet one.
Quakerstown: three covers plus debris produced 156 encounters from 16 March to 22 October. Corrugated tin 116, tin sheet 30, steel sheet 7, debris felt 2, debris cardboard 1.
Roo South: one cover revealed one slow worm on 2 September. Corrugated tin one.
No slow worms were encountered at Gortnaglogh, Normangrove or Rockvale.

2021 total 269. Females 85, Males 53 = ratio 1.6/1. Juveniles 131 being 48.6% of total. Covers were checked on 74 occasions giving 3.6 encounters per trip.

2022

Cappacasheen 1: three covers produced 50 encounters. Tin sheet 16, corrugated tin 2, plywood 32. From 19 March to 15 September.
Cappacasheen 2: four corrugated tin 29 encounters, bitumen mat 18 encounters. From 14 April to 9 September.
Derreenatloghtan: one corrugated tin 34 encounters from 24 March to 2 September.
Cappacasheen JCs: two corrugated bitumen 5 encounters, two plywood 13 encounters. From 21 March to 31 August.
Keelhilla RS: one steel sheet. One encounter 29 June.
Quakertown: five covers plus debris item produced 133 encounters from 19 March to 15

September Corrugated tin x two 86, tin sheet 17, steel sheet 15, felt 15. Openly basking animal 1.
Quakerstown LR: two corrugated bitumen 10 encounters from 23 June to 15 September.
Quakerstown OTR: one steel sheet 14 encounters from 13 March to 16 August.
Sundry sightings: *Leitra*: 1 on concrete. *Cappacasheen*: traffic cone 4. *Fahee North*: paving stone, 1. *Under council signs lying on road verge*: 2. *Normangrove*: dead body on roadway.
No slow worms were found at Rockvale or South Commons.

2022 total 317. Females 145, Males 105 = ratio 1.38 /1. Juveniles 67 being 21.1% of total. Covers were checked on 77 occasions for 4.11 encounters per trip. Survey prematurely concluded on 15 September.

2023

Cappacasheen 1: 59 Encounters. Plywood 44, tin sheet 8, corrugated tin 7. From 25 March to 3 October.
Cappacasheen 2: total 138 encounters, three corrugated tin 96 encounters, bitumen mat 42. From 20 March to 16 October.
Cappacasheen JCs: three plywood 5 encounters, two corrugated bitumen produced 7 encounters from 29 June until 31 August.
Cloonselherny: one encounter on 25 July.
Derreenatloghtan: one corrugated tin produced 49 encounters from 16 March to 8 October.
Keelhilla RS: steel sheet 9 encounters. From 17 April to 17 August.
Quakerstown: 148 encounters. Two corrugated tin 77, tin sheet 4 encounters. Steel sheet 18 encounters. Debris felt mat 49. From 16 March to 19 October.
Quakerstown LR.: 53 encounters being corrugated bitumen 29, bitumen mat 24 encounters. From 1 April to 24 October.
Quakerstown OTR: 8 encounters. Steel sheet 3, plywood 5 encounters. From 1 May to 25 August.
Rockvale: one encounter, bitumen mat on 23 August.
No slow worms were found at South Commons.

2023 total 482. Females 267, males 137, Juveniles 78. Ratio Female/male 1.95/1. Juvenile 78 being 16.18% of total. There were 92 cover checks producing an average of 5.3 encounters per trip until assumed hibernation.

Gravid females and growth of juveniles

In contrast to 2021 and 2022 when few female slow worms appeared to have been mated, 2020 saw at least one gravid female at each of the sites and similarly during 2023 many of the adult females encountered under refugia appeared to be gravid.

In both 2020 and 2023, it was noticeable in what appears to be normal behaviour, that those females remained in the usual refugia until just prior to birthing. Most returned later, obviously postnatal. While various refugia placed near the birth site may house one or two juveniles, it was fortuitous that in 2020 up to seven juveniles remained under a single corrugated tin, their recognizable head markings enabling me to follow their growth from first appearance and into subsequent years.

Most newborns at this site were of a size according to the accepted age/length scales. Beebee and Griffiths (2000) state that newborn slow worms measure between 70 and 100mm long. By the end of their first one year of age, immature slow worms have approximately doubled in length and by two years measure up to 230mm. Smith (1951) notes that at birth the young measure from 65 to 90mm. in length. At one year old, they are between 152 and 180mm. in length; at two years old between 219 and 230mm in length". Inns (2009) gives the size of hatchlings at 80mm, Frazer (1983) records that at birth the slow-worm is 65-90mm long and there are 4-28 in the litter (usually 6-12).

With a rigid piece of tape measure laid alongside and photographed from above, I was able to obtain fairly accurate lengths over time. Initially they were in the 80 to 90mm range, by October they were in the mid 90mm. The following spring, March into April 2021, they ranged between 103 to 115mm. At the end of year one they were 145 to 160mm and the single remaining animal after the tin was vandalized, measured, with tail partially in an ant tunnel, at more than 190mm on 18 August 2022, nearly two years old. At the same site, a steel sheet just 50m away also held newborns.

In late September 2020, an individual was measured at 73mm. On 9 October, another measured 78mm, one on 9 October at 78mm and a third on 18 October was 82mm. This seemed to be a clutch of smaller individuals than appeared under the corrugated tin. In late April 2021 that same steel sheet housed a juvenile at just 75mm, while a bitumen mat lying alongside contained a juvenile of 67mm, near the accepted minimum length of a newborn. These measurements perhaps lent some merit to the suggestion by Street (1979) that the young are normally born at the end of August or beginning of September, although they may appear as early as mid-July or after an unfavourable summer as late as October, November, or even the following spring. Both Frazer (1983) and Smith (1951) refer to Knight's report (1949) of a slow worm discovered hibernating near Deal in Kent on 29 February which, when killed, was found to contain fully developed embryos 75 to 80mm in length. Bebee (2013) states that "There's also some suggestion that slow-worms may retain their young and give birth the following spring. Does this really happen?" Gender and age ratios 2015 – 2023 are shown (Fig. 1).

Hibernation

From 2020 to 2023, the dates of initial sightings on emergence from hibernation, and those of the final sightings presuming that hibernation had occurred have been noted. It is reasonable to assume that being ectotherms, slow worms are temperature driven, or is it day length that affects their behaviour? A further likely factor is that their major food sources become inactive and or unavailable during cooler weather. The temperature has been noted for each of the five days prior to my first sighting of the year and the five days prior to my final sighting and presumed hibernation of each year (Table 1).

Roadside verges

If access to an unsurveyed townland was unavailable, a cover placed on a suitable stretch of nearby roadside verge often proved effective. Carefully positioned and concealed in the foliage, most were removed as soon as they produced or after a short trial period if they had not. These temporary placings, along with various discarded debris items were particularly productive for roaming males during March and April. At Derreenatloghtan townland, a corrugated tin cover was placed in a roadside verge in late August 2019 until October as a trial. One damaged slow worm was found in that period despite the site appearing unsuitable for slow worm habitation. That single encounter piqued my interest, and the cover was replaced in May 2021. With vehicles passing just two meters away on a busy 'L' road, the results were significant.

Through 2021 the cover was checked on 57 occasions with a single slow worms present 17 times, nine of which were a particular mature male (MM1). Remaining in place over winter the cover was checked on 79 occasions during 2022. On 32 occasions it was inhabited by a single animal and twice with two. MM1 was present on 29 visits.

From the first of 33 visits in 2023 beginning on 16 March to the last on 8 October MM1 was found with one other on four occasions, and at another time was one of six. (Plate 1). Over the three years, the cover was checked on 228 occasions. On 80 checks a single slow worm was present, on seven occasions there were two and once the six were present. MM1 was encountered 71 times.

Repeat sightings and disturbance effect

Female #58 was initially seen in August 2016 and each subsequent year. In 2020 she was present on 22 March and occasionally during the summer. On 13 July it was noted she had lost tail length. In 2021 she appeared initially on 19 March and again in March and April. She was last seen that year on 8 July. In 2022 for the seventh successive year female #58 was again present under the tin sheet, coincidentally again on 19 March. However, in 2023 she was not encountered.

Repeat sightings of individual slow worms over periods of three and four years became accepted as normal behaviour rather than noteworthy. Many of those individuals demonstrated personal characteristics to such an extent that I would know the response to expect when lifting particular covers. Some slow worms were very calm and took little notice when their roof was lifted, even in warm conditions, which enabled leisurely photography and measurement. Others, despite being exposed on numerous occasions rarely enabled a clear photograph with the best perhaps a blurred tail-end. My overall impression is that mature males were the least responsive to disturbance.

Among the slow worms which remained on site throughout the summer were those that were occasionally present over two or three years but with some years missed out completely. A casual passers-by was also seen once. A repeat sighting of interest occurred on 29 July 2016. This was male #52 at KY, the longest slow worm yet discovered and found under corrugated tin in the company of a female. The tin was removed at the end of that year but replaced on 20 March 2020 in the original position. On 14 September 2020, male #52 was discovered under the tin. Previously 43cm long ,it was now showing a severely reduced tail and a length of just 31cm. According to Smith (1951) the tail is 55 per cent. of the total length of the adult male. Beebee and Griffiths (2000) state that the tail is between one and one and one-and-a-half times the body length but is proportionately longer in males than females. Accordingly, this male had lost at least 50% of its tail. Slow worms are able to shed a length of tail should they be in danger. This ability, autotomy, is effective when under attack from predators.

Cloud effect

My data offered a recurring factor present on days that resulted in multi-encounters, cloud. Cloud is frequently reported with the encountering of slow worms. (Fish, 2016) notes that slow worms and common lizards both appeared to be recorded in greater numbers during overcast or wet weather. Simms (1970) states that this is the reptile likely to be most active on cloudy but mild days or those days of alternating sun and shower so typical of an English spring.

Daily levels of cloud density can be measured using the Okta system, whereby cloud is measured at eight grades with 0 being clear sky and 8 being completely overcast (Anon., 2023c). Figure 2 shows the contrasting results of two occasions when covers were checked at the same time of day and with similar air temperatures of 18-20°C. The third data is a day at random and the fourth an example from August 2023.

The three extra covers on 10 August 2020 were serial non-producers but as they were checked, they were included. The air pressure and humidity levels in the chart were added as perhaps they play some part in slow worm activity and possibly a major part.

During August 2023, a month generally regarded as poor for encounters, rather than time my

trips for occasions when it was convenient or at those times recommended in the literature as preferable. Instead, I visited my sites in those conditions and times of day which I considered, *via* my data, as most likely to prove productive which were the presence of heavy cloud cover coupled with a temperature of around 20°C and in late afternoon. Luckily those conditions prevailed. The average monthly encounter numbers for 2023 were March, 1 per trip, April 6, May 5.4, during June 4.16, July 5.33, August 11 per trip, September 3.6, and October 4.18 per trip (Fig. 2).

Site comparison

As can be seen in the results, two townlands that have been surveyed regularly are Cappacasheen in County Galway and Quakerstown in County Clare. While both areas are within the limestone of the Burren area, visibly they are very different, and a curious pattern of encounters has occurred in the last few years of which 2023 is a perfect example (Fig. 3).

Cappacasheen is highly vegetated, much of it impenetrable with thick, long grasses and flora including, ling or common heather (*Calluna vulgaris*), common juniper (*Juniperus communis*), brambles (*Rubus fructicosus*) and common ivy (*Hedera helix*), and dense shrubbery of mainly blackthorn (*Prunus spinosa*), whitethorn or hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*), ivy, and hazel (*Corylus avellana*) along with ash (*Fraxinus excelsior*) trees. Flanked by a roadside hedgerow obscuring a dry-stone wall, there are occasional areas open to the sun, intimate and sheltered from wind. The area has not been grazed for some years and the path to access my covers requires regular pruning.

Quakerstown is open, flat, windswept limestone pavement with some low, stunted scrub, sparse grass and ground foliage which is regularly grazed by cattle. There are occasional bushed areas, mainly whitethorn often swathed in brambles. The main structure available are dry stone walls ivy covered and vegetated at the base. Loose, flat limestone rocks abound creating limitless natural refugia for slow worms.

Both sites contain similar cover numbers and material types. It is peculiar that initially in the year the encounters in an open, cool windswept Quakerstown far outnumber those in the sheltered, highly vegetated Cappacasheen. In June and July, the encounters for both sites were comparable but during August and September Cappacasheen exceeded those of Quakerstown considerably. Subsequently, in October, a complete reversal of numbers of sightings is recorded. The final annual totals are not dissimilar.

Q. Mar 4. Apr 36. May 28. June 23. July 29. Aug 35. Sept 17. Oct 33

C. Mar 2. Apr 18. May 18. June 23. July 29. Aug 65. Sept 25. Oct 12

Discussion

After eight years of surveying the Burren slow worm colony, some thousands of data have been accumulated with the major goal to make some reasonable sense of the lifestyle and movement of slow worms. Their commonly used descriptive adjectives, enigmatic and cryptic are appropriate. There appear to be three categories of encounters, those regular inhabitants of a particular refugia often over years but also females during a summer, occasional inhabitants with perhaps a year or longer in between attendance, and those occasional visitors. The behaviour of slow worms is impossible to predict or comprehend and while each year brings more fascination, 2023 ranked highly with occasions of inexplicable behaviour. The finding of six slow worms, all adult, under a single cover was even more unusual as over a three-year period there were often none to be found, infrequently a single individual and rarely there maybe two. Gonzalo *et al*. (2004) states that *Anguis* being semi fossorial and spending much time subsurface or in dense undergrowth, use scent to locate prey and other slow worms. Having seen several gravid females together before during August and while these were healthy specimens (see plate 1), the females were not obviously gravid as one would expect in mid-August. Is it scent that for some reason impelled the hexad to assemble, and for what purpose? Were they a group or an aggregation?

Occasionally what appeared to be random behaviour has occurred. A site containing three covers in 2020 produced 31 encounters. That site produced 15 encounters in 2021. The same site with an added cover produced 18 encounters in 2022, but in 2023 with yet a further cover added, it was not until trip 46 on 29 June before the first encounter. No further encounters were made until 14 August when until 31 August eleven slow worms were found. There were no further sightings thereafter. In addition to the curiously brief appearance period the general attendance figures over the years hint at a decreasing population. Or was it disturbance?
At JCs two identical corrugated bitumen mats are positioned up against a dry-stone wall. They face the same direction, are in the same vegetation, their cover surface temperatures vary by one degree at most and are 25 metres apart. Over three years JCL has produced 35 encounters, JCR just 4.

After a poor return of encounters during September 2023, on 1 October with sun and passing cloud and a temperature of 16°C rising to 17°C, I checked my circuit from mid-day until 13.30hrs. The result was just two covers inhabited, one with a single, the other with two. A partial re-run three hours later of fifteen covers produced a further six encounters including the single still present from the first trip. Five further slow worms had emerged in the interim period from covers that were initially vacant. With the air temperature up by one degree the surface differences of the newly inhabited covers were, with single occupancy, up 2°C from 21°C, up 5°C from 21°C and exact same at 22°C. A cover now with two inhabitants had

decreased by 8°C to 20°C from the initial circuit. The movement of the sun had affected the cover temperatures as those covers in shade/semi-shade became open and those that had been open to the sun become less so. From initially recording three slow worms I was able to record eight for the day. This raised the question of why two slow worms had appeared under a cover that had dropped in temperature so radically?

When I first noticed from data collected over many years that cloud cover may have a positive effect on slow worm numbers encountered under refugia, I assumed it was because of some element within those conditions, that it may be humidity levels or perhaps barometric pressure. I used the Okta system of cloud levels (Anon., 2023c) as did Raye (2021) athough he appeared unconvinced commenting, "Since cloud cover does not seem to affect slow worms much, could a different weather variable be monitored?"

Comparing productive days with average results I have concluded that the reason is far simpler than any meteorological or other possible cause. The covers were roughly positioned but they would all receive at least some direct solar rays during the day, which could either enable or disable their suitability for habitation. At any one time some covers may be too hot while others are too cool so only a limited number of covers would be at an acceptable temperature. This situation changes with heavy cloud cover. The dense low cloud limiting direct rays hitting the ground is, in effect, causing all covers to be shaded whatever their position. Should the air temperature be sufficiently warm i.e 18°C or more then the covers are affected by convection rather than direct radiation. Consequently, rather than direct sunshine affecting some covers but not all which would cause a temperature range of too cold to too warm, the entire cover range then become low to mid-twenties, a perfect temperature for habitation. If the air temperature is low, no amount of cloud will be effective.

What impels an ectotherm into and out of hibernation is broadly assumed to be temperature influenced, but that is debatable. Beebee and Griffiths (2000) note that emergence from hibernation usually occurs in March in (southern England) but may be later in the north. Speybroeck *et al*. (2016) state that active between March and October in most of range, but this may be considerably shorter in N of range and longer in S. That slow worms are temperature driven does not accord with my data in the four-year chart (Fig. 2) showing the five days prior to emergence (my first sighting) each year and the five days prior to assumed hibernation (my last sighting) during those years. The air temperatures do not imply the need for immediate action. Perhaps it is the instinctual nature of their body clock or rhythm that they are impelled by rather than external factors such as meteorological, thermal or another possible factor. The Mean 10cm Soil Temperature data for September and October 2023 (Met Eireann, 2023) make interesting reading, the drop in soil temperature being steadier than the corresponding fluctuating air temperature and may affect a semi-fossorial animal. Presumably they hibernate

before it gets too cold, while there is still sufficient food available.

Most Citizen Science slow worm sighting in Ireland reported to the National Biodiversity Data Centre (2023) emanate from the Burren National Park where access is freely available. The major portion of the Burren remains unexplored as much of the land is privately owned and inaccessible to ramblers. According to Burrenbeo Trust (2023), the Burren stretches across roughly 560 km² of north Clare and south Galway. Of which, according to National Parks of Ireland (2023), the Burren National Park covers 1800 hectares (18km²).

Sightings reported from outside the National Park are often on public roadways, green roads or other tourist walks. The increase in reported sightings is due to a greater public interest and awareness of the animal coupled with the simplicity of reporting with personal technology *via* the National Biodiversity Data Centre app. Should a planned programme be implemented across the entirety of the Burren a greater area of occupancy would undoubtedly be revealed. During my study period conducted with an amateur though enthusiastic approach I met slow worms in seventeen townlands in both Clare and Galway for a total number of 2349 encounters and each one was as thrilling as the first.

Slowly but surely as slow worms gain publicity and interest, increased numbers will be recorded across the country. I am convinced that they are far more widespread than is currently known but then they are as enigmatic as they are cryptic. It is unfortunate that the slow worm in Ireland is largely ignored when the presence of these fascinating and beautiful animals should be cherished.

Acknowledgements

Grateful thanks to the many landowners who allowed me access and to Ciaran Kelly at Met Eireann.

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TABLE 1. The temperature was noted for each of the five days prior to the first sighting of the year and the five days prior to the final sighting and presumed hibernation of each year. Some data used from Timeanddate (2023)

	First sighting - previous 5 days high/low °C
2020 15 March	12/6, 10/3, 9/3, 9/5, 13/6.
2021 16 March	13/8, 10/4, 9/4, 8/3, 11/6.
2022 19 March	11/4, 10/3, 11/0, 13/4, 16/4.
2023 16 March	12/3, 9/1, 13/8, 13/7, 12/1.
	Final sighting - previous 5 days high/low °C
2020 18 October	13/9, 14/5, 13/3, 13/4, 13/7.
2021 22 October	17/14, 19/15, 19/11, 13/9, 12/5.
2022 15 September	Illness prevented further checks.
2023 24 October	11/7, 12/8, 14/6, 12/11, 12/8.

PLATE 1. Six slow worms under the same cover, Derreenatloghtan townland, County Clare, 17 August 2023. Photograph: Nicholas Parry.

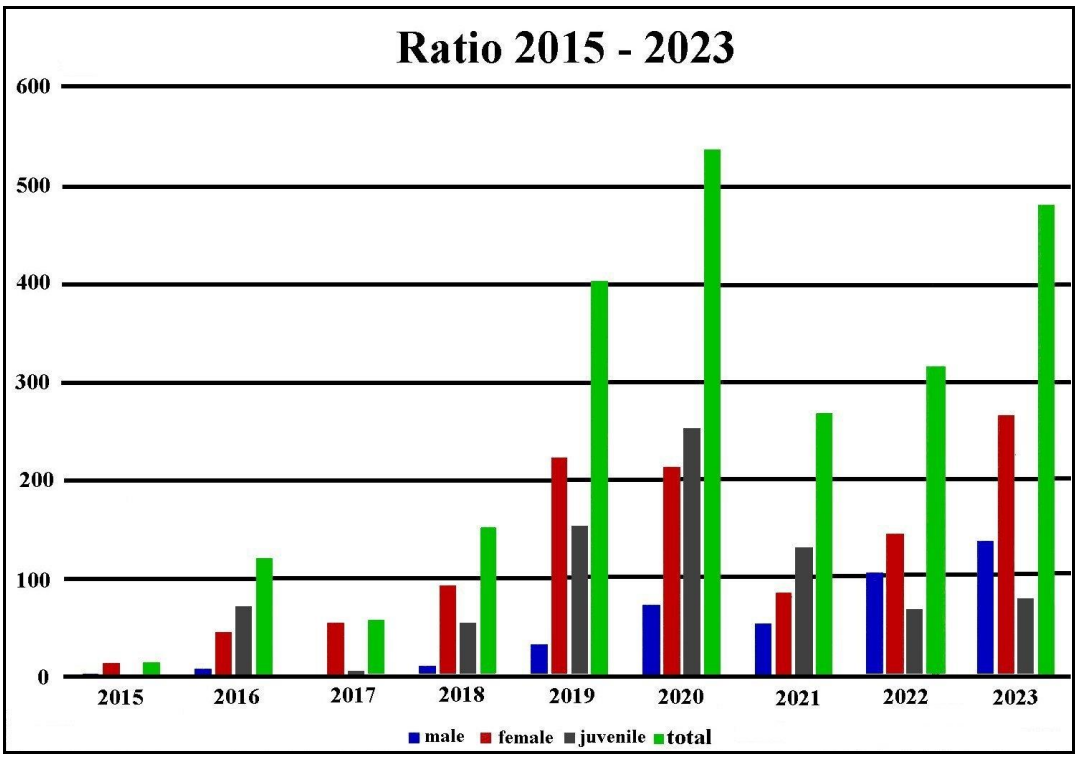

FIGURE 1. Gender and age ratios 2015 – 2023.

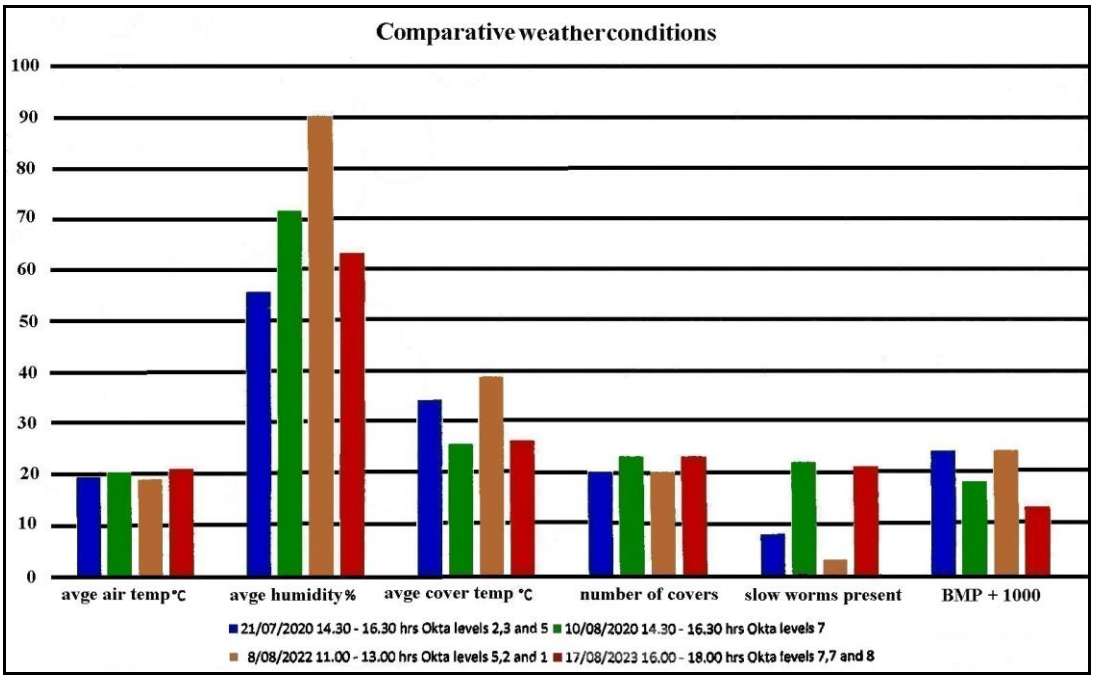

FIGURE 2. Comparative weather conditions.

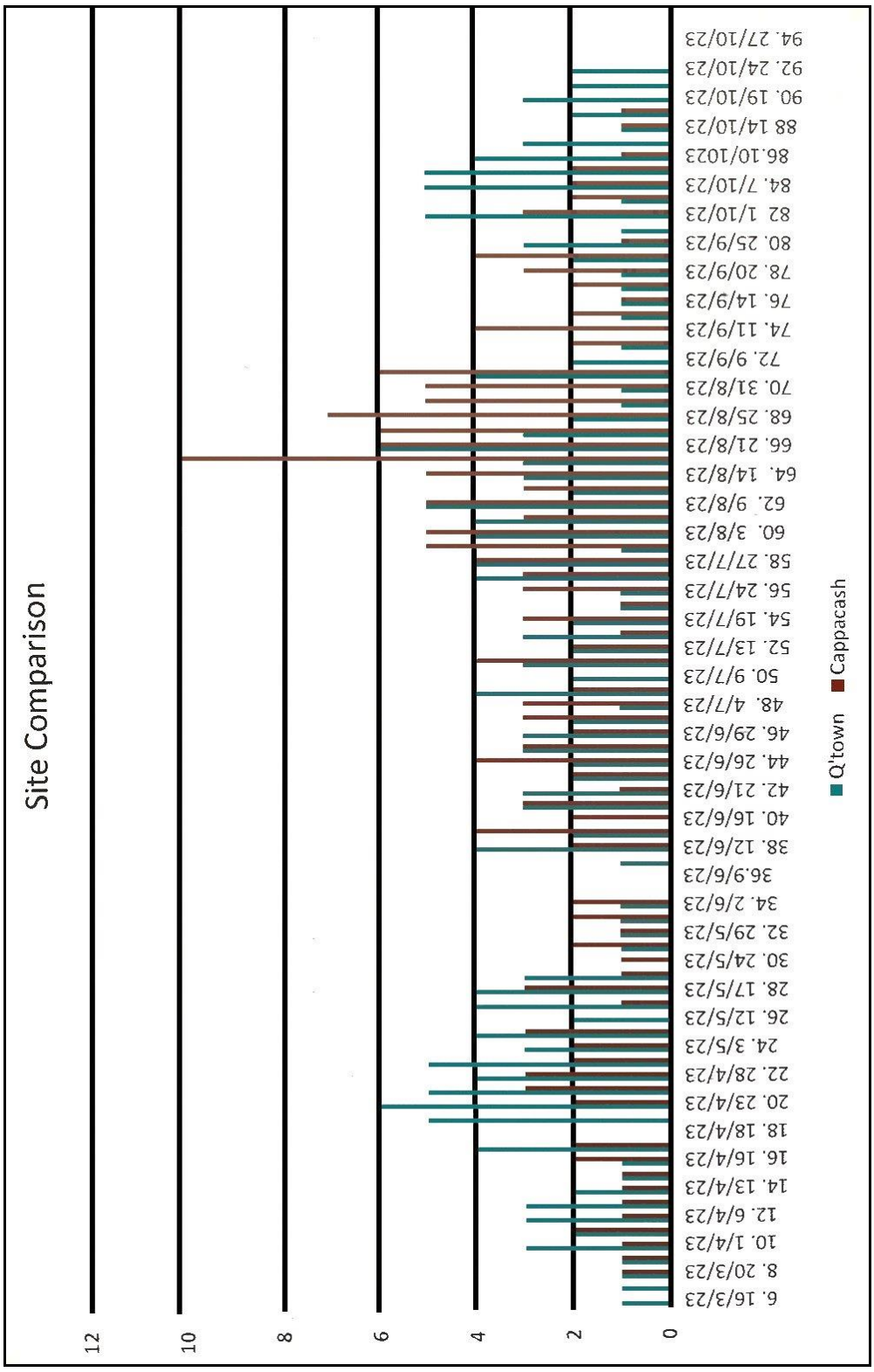

FIGURE 3. Comparison of the number of slow worms in Cappacasheen, County Galway and Quakerstown, County Clare, respectively.

Bulletin of the Irish Biogeographical Society **Number 47** (2024)

AN AID FOR IDENTIFYING ADULTS OF *LIMNEPHILUS PATI* O'CONNOR (TRICHOPTERA: LIMNEPHILIDAE)

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Abstract

Photographs and drawings are provided as an aid towards identifying adults of *Limnephilus pati* O'Connor. They also show intraspecific variability within the species.
Key words: *Limnephilus pati* O'Connor, Trichoptera, caddisfly, adults, identification aid, intraspecific variability, photographs, drawings.

Introduction

Limnephilus pati O'Connor was described in 1980 from England, Ireland and the Isle of Man (O'Connor, 1980). It is a rare European caddisfly known from only 20 sites in Denmark, France, Germany, Great Britain, Ireland, the Isle of Man and Poland (Fig. 1). It is mainly associated with raised bogs and calcareous fens. Slow-flowing, shallow, well-vegetated streams with a reasonable calcium carbonate content are its principal breeding habitat at Market Weston Fen, England (Sutton, Wallace and O'Connor, 2023). The streams arise within the fen from the coalescence of highly calcareous spring oozes. Such specialised habitats are not widespread and populations of *L. pati* were probably always isolated, made even more so nowadays by habitat destruction through drainage and water abstraction. As a result, the genitalia may differ from site to site especially in the degree and form of the prolongation of the ninth segment and the shape of the male lateral appendage. Records of adults date from the mid May to the end of July. The flight period therefore is short. Many *Limnephilus* species go into summer diapause during the warmest and driest part of the summer and re-appear afterwards to mate and deposit their eggs. This diapause does not seem to be present in *L. pati* (Lock, 2023) or at most it is of short duration (Wallace, 2023). Light trapping has been the easiest way to find this species. RDS discovered a population of *L. pati* in Scotland (Sutton, Wallace and O'Connor, 2021,

2023). Since he was was able to take high resolution photographs of live specimens (male and female), it was thought useful to use these along with other photographs and drawings as an aid towards identifying the species and also to indicate intraspecific variability.

PLATE 1. Live adults of *Limnephilus pati*: (a) ♂, light-trap, Eochar, South Uist, 21 July 2020; (b) ♀, light-trap, Eochar, South Uist, 27 June 2023. Photographs: Robin D. Sutton.

PLATE 2. Right forewing of *Limnephilus pati* (showing the freckling in this species), peat bogs along the river Semois in the nature reserve Marais de Heinsch in Arlon, Belgium, 20 July 2020. Photograph: Koen Lock.

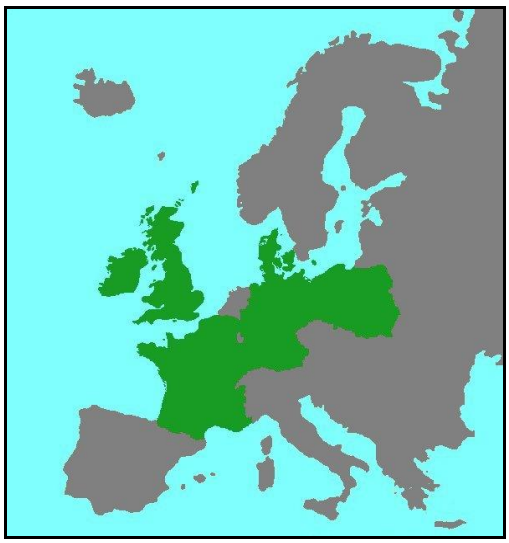

FIGURE 1. The European countries where *Limnephilus pati* has been recorded (marked in green).

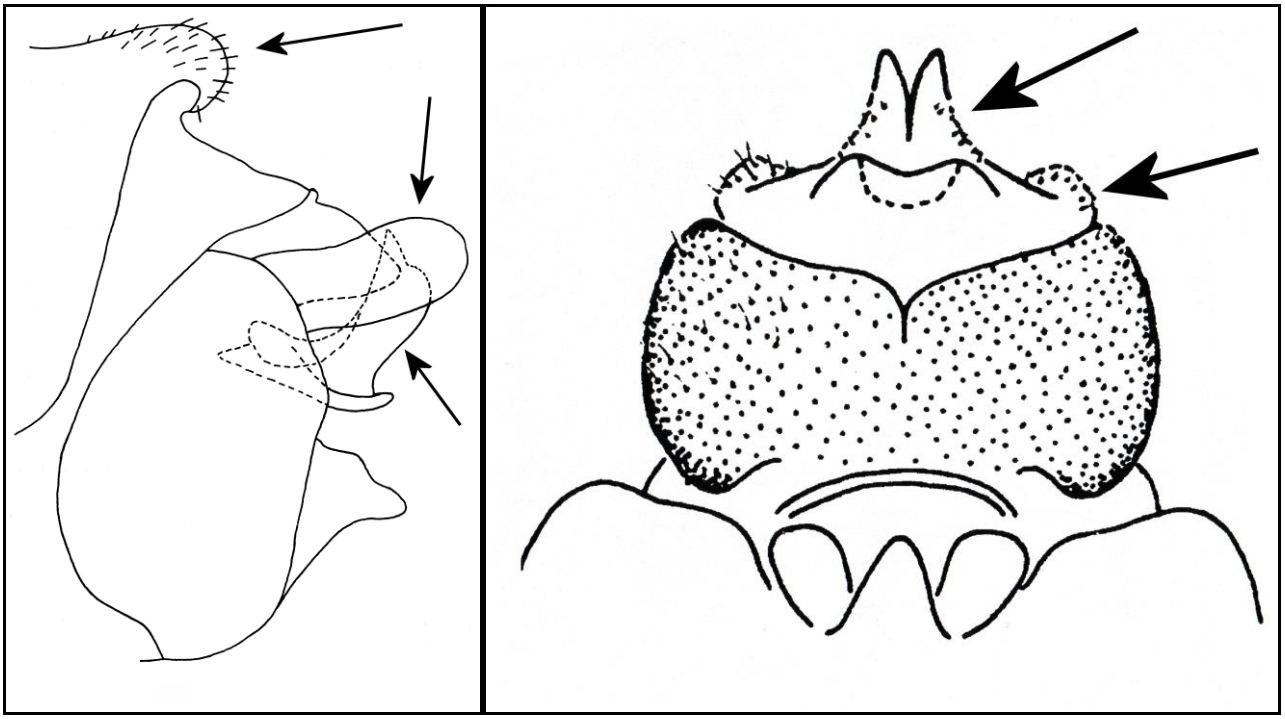

FIGURE 2. Left: ♂, lateral view, Coxtown, Donegal, July 1894, W. F. Johnson. Drawn by J. P. O'Connor with the assistance of Hans Malicky (see O'Connor, 1980). Right: ♀, ventral view, Curragh Ballaugh, Isle of Man, R. Cassal. Drawn by P. C. Barnard (see O'Connor and Barnard, 1981; Malicky, 2004). Diagnostic features are indicated by arrows.

Variation in males

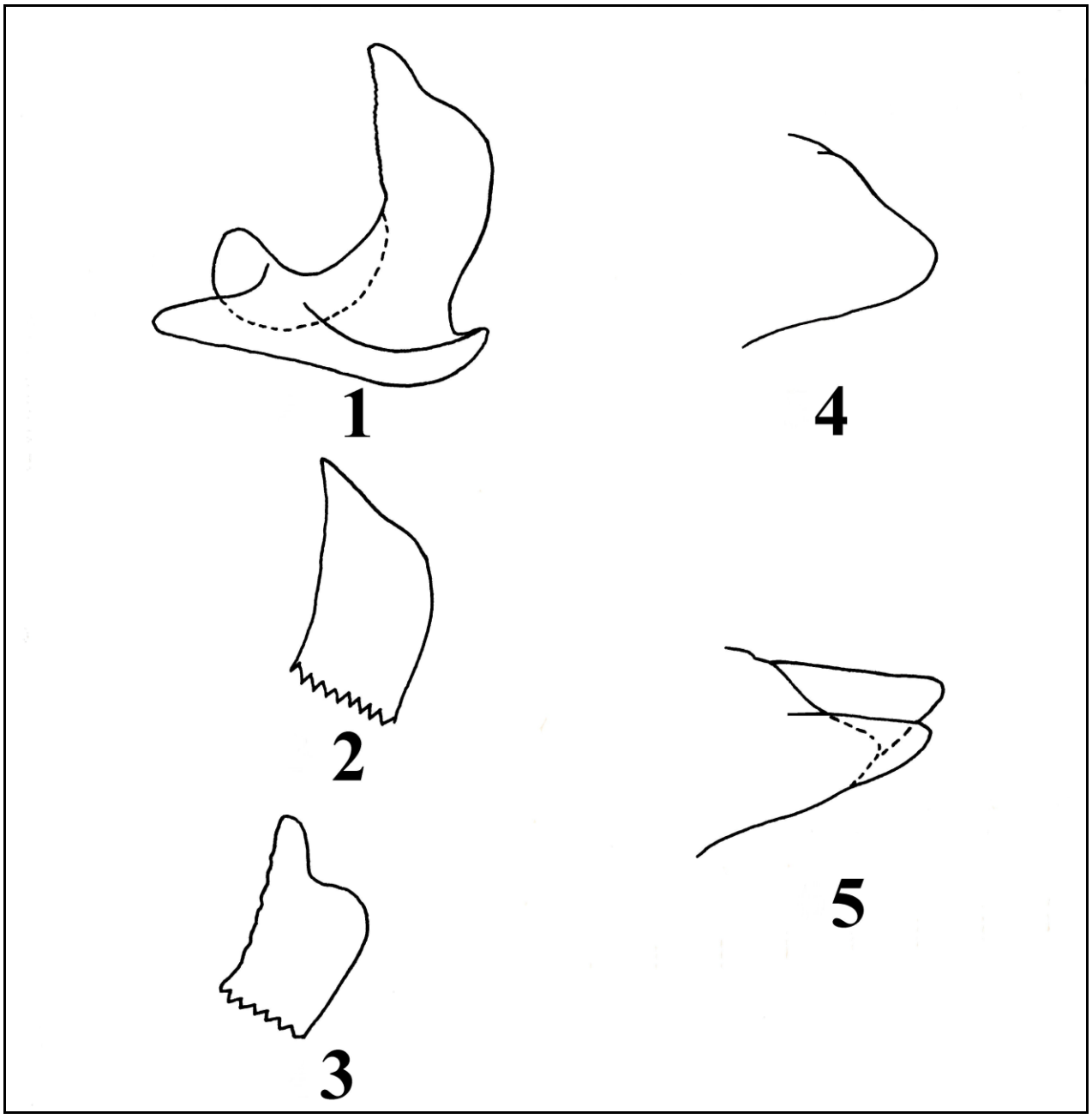

FIGURE 3. ♂♂ showing variation in the lateral (intermediate or mid) appendage (1-3) and the prolongation of the ninth segment under the tenth segment (dorsum), which is often bifid (4-5). This structure is missing in some individuals. Drawn by J. P. O'Connor with the assistance of Hans Malicky based on twelve individuals from England, Ireland and the Isle of Man (see O'Connor, 1980).

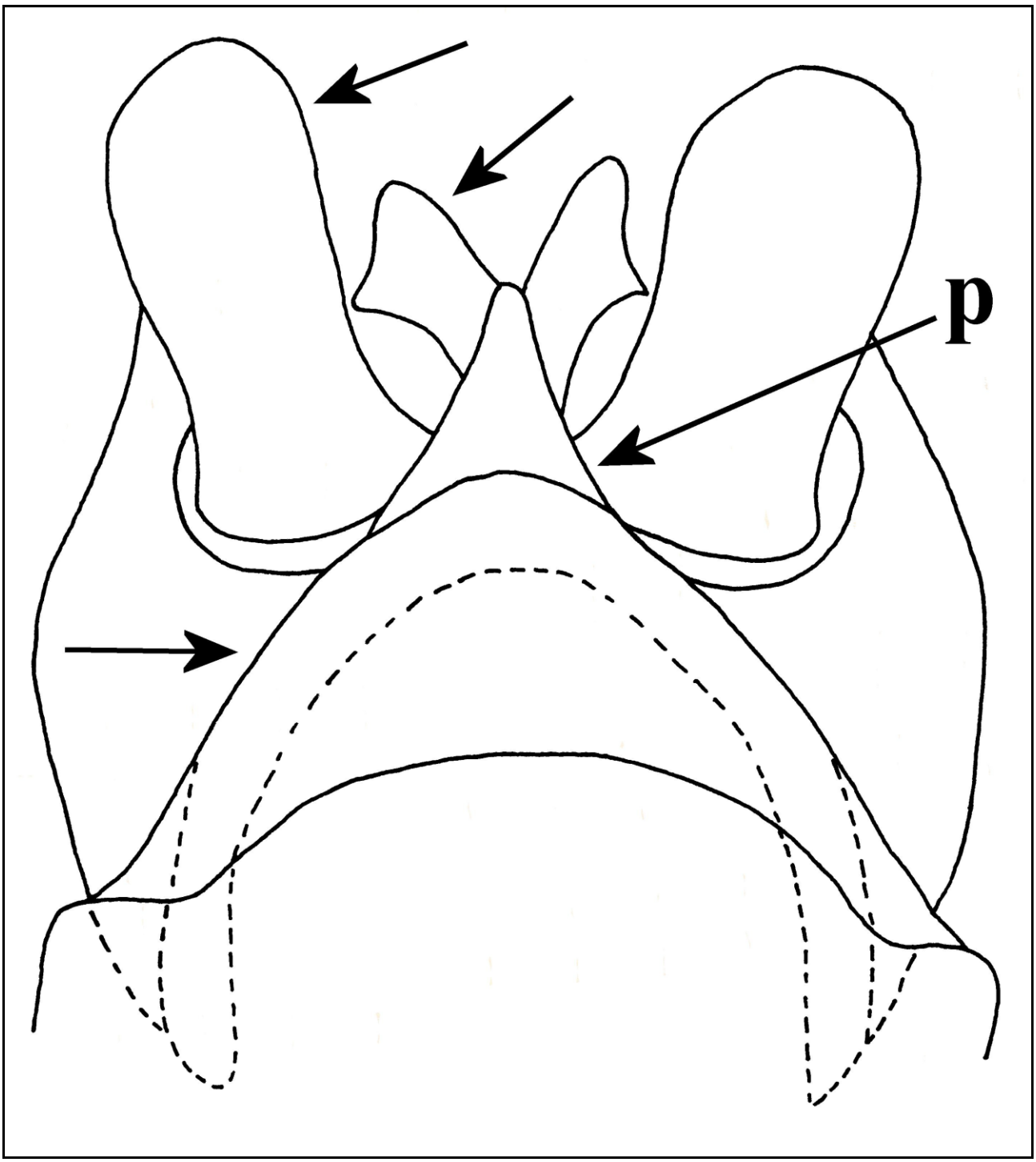

FIGURE 4. ♂, Coxtown, Donegal, July 1894, W. F. Johnson. Drawn by J. P. O'Connor with the assistance of Hans Malicky (see O'Connor, 1980). The prolongation of the ninth segment under the tenth segment (dorsum) is indicated (p). This structure is missing in some individuals. Diagnostic features are indicated by unlabelled arrows.

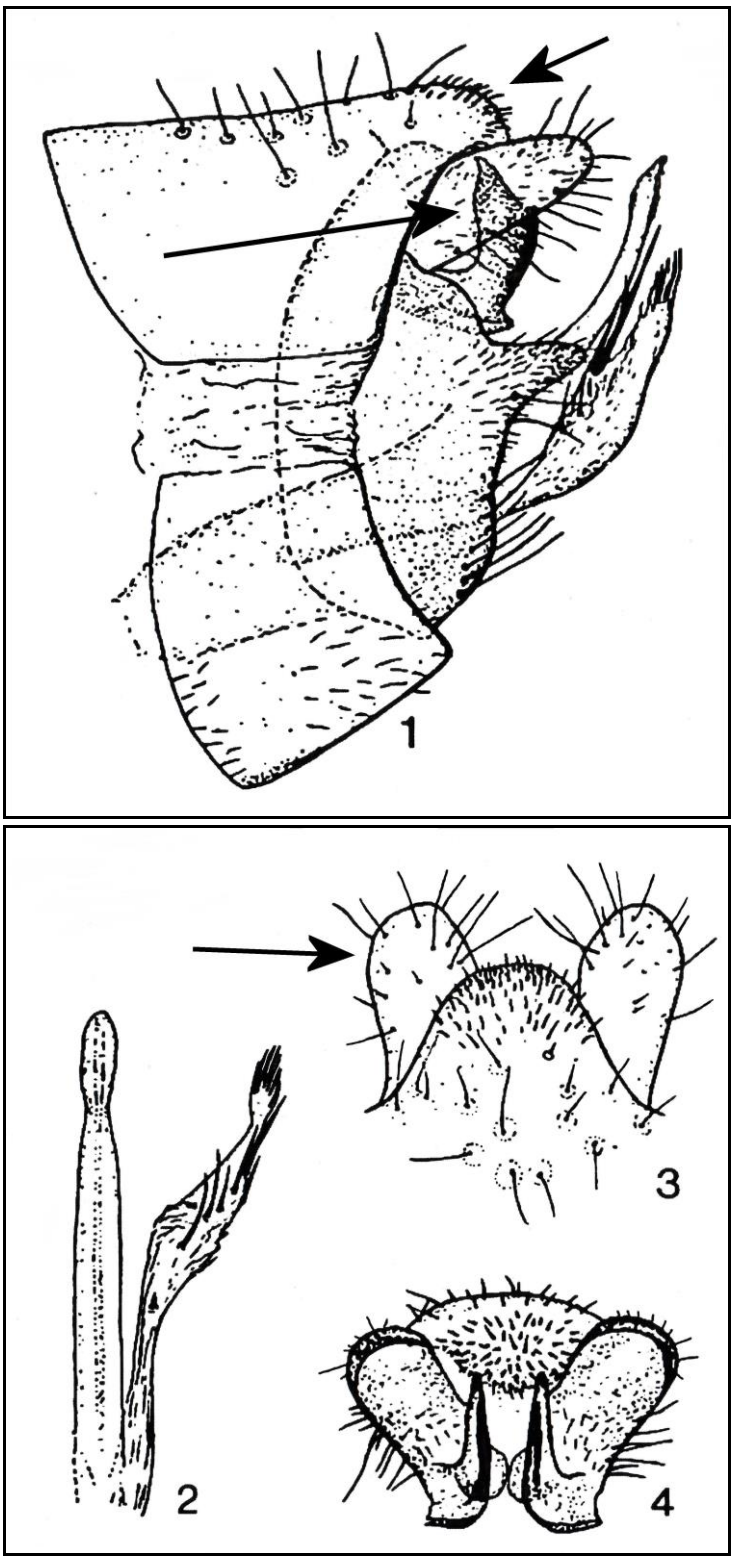

FIGURE 5. ♂, Mindelsee, Lake Constance area, Germany, 2 June 1966, W. Eidel. Figure adapted from Tobias (1981). Diagnostic features are indicated by arrows.

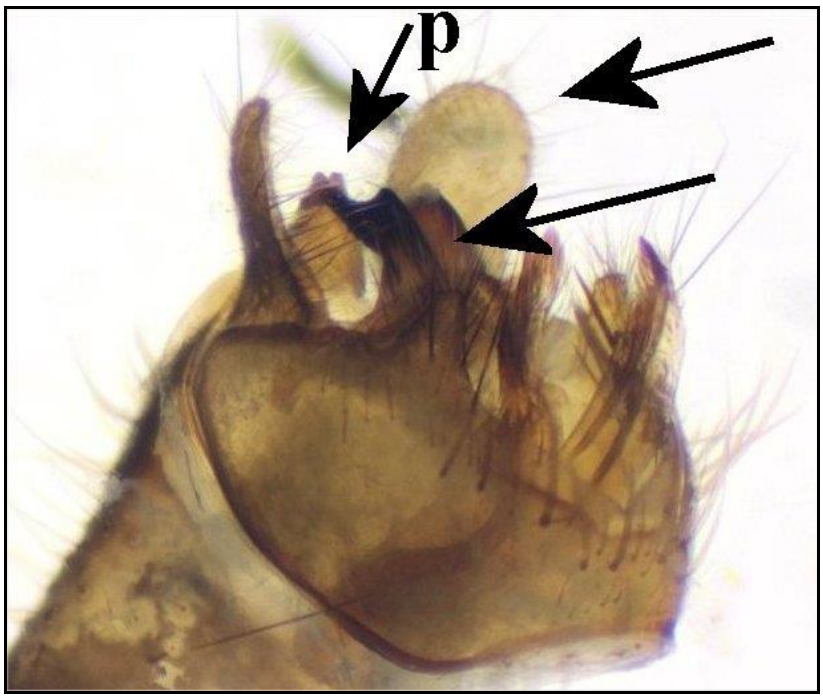

PLATE 3. ♂, light-trap, Eochar, South Uist, 21 July 2020. Photograph Robin D. Sutton. The ninth segment bifid prolongation (p) is evident. Diagnostic features are indicated by unlabelled arrows.

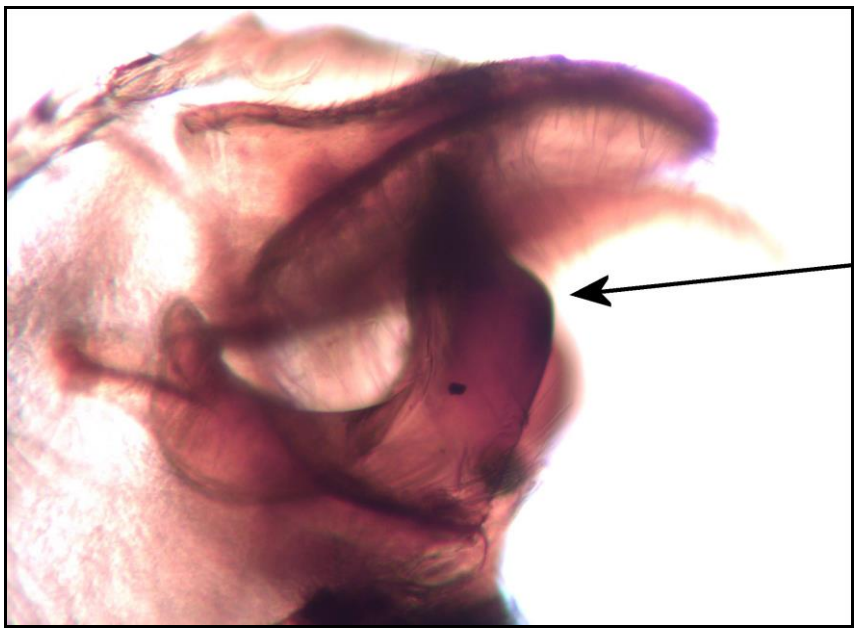

PLATE 4. ♂, Malaise trap, Doubs department, Franche-Comté (Eastern France), 27 June 2014. Photograph: Gennaro Coppa. A diagnostic feature is indicated by an arrow.

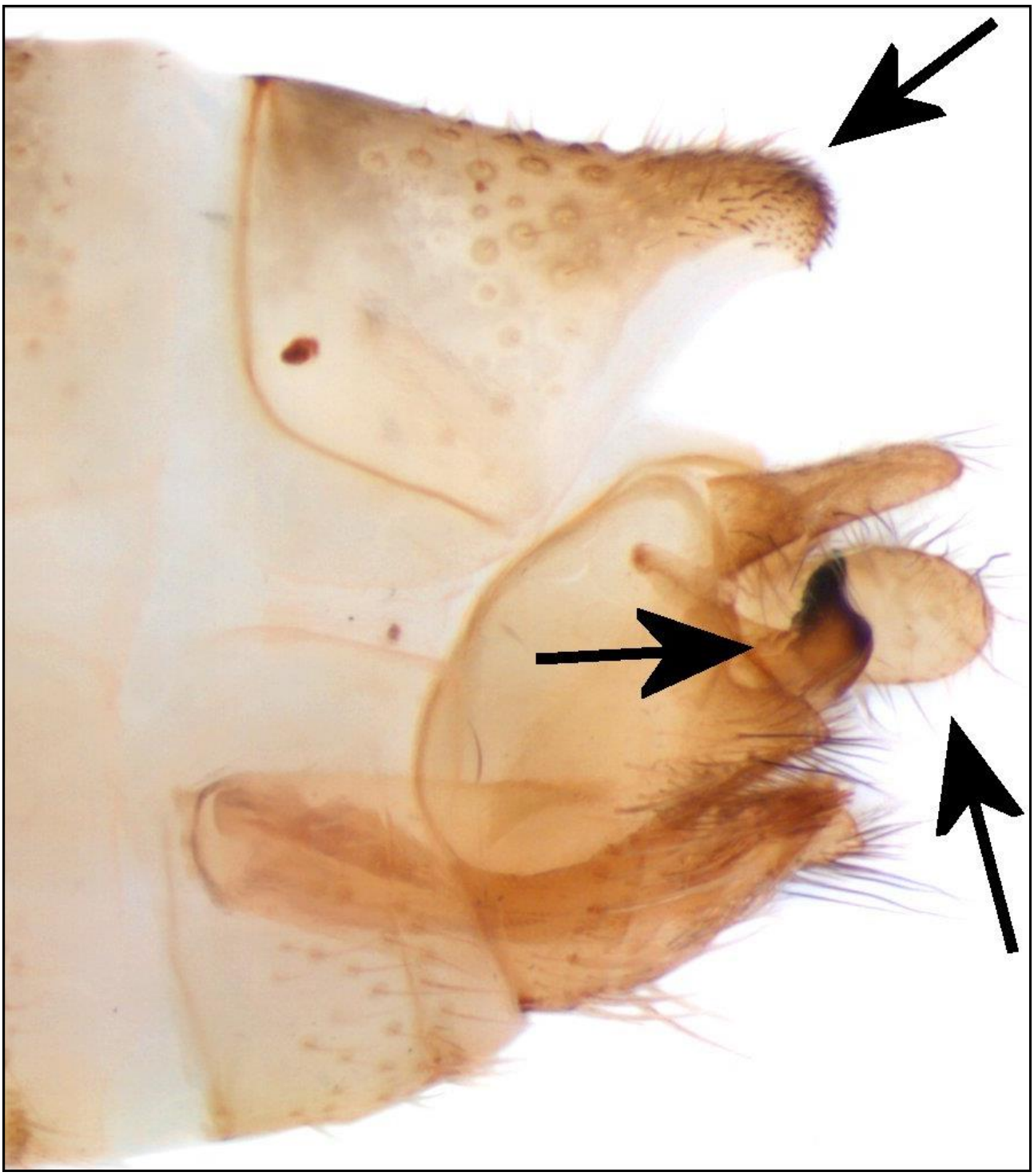

PLATE 5. ♂, Luboń in northwest Poland, 6 July 2011. Photograph: David Tempelman. Diagnostic features are indicated by arrows.

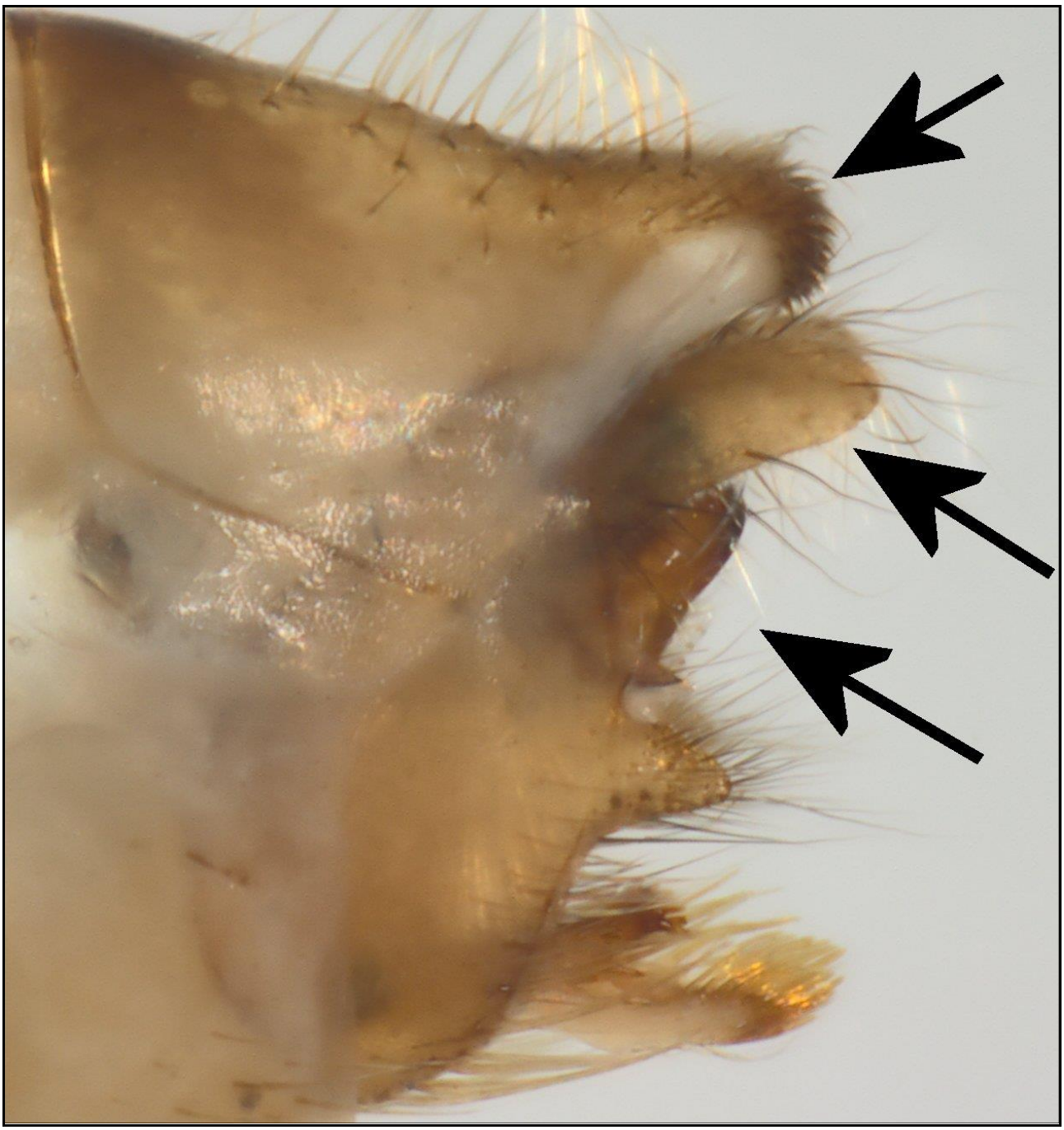

PLATE 6. ♂, peat bogs along the river Semois in the nature reserve Marais de Heinsch in Arlon, Belgium, 20 July 2020. Photograph: Koen Lock. Diagnostic features are indicated by arrows.

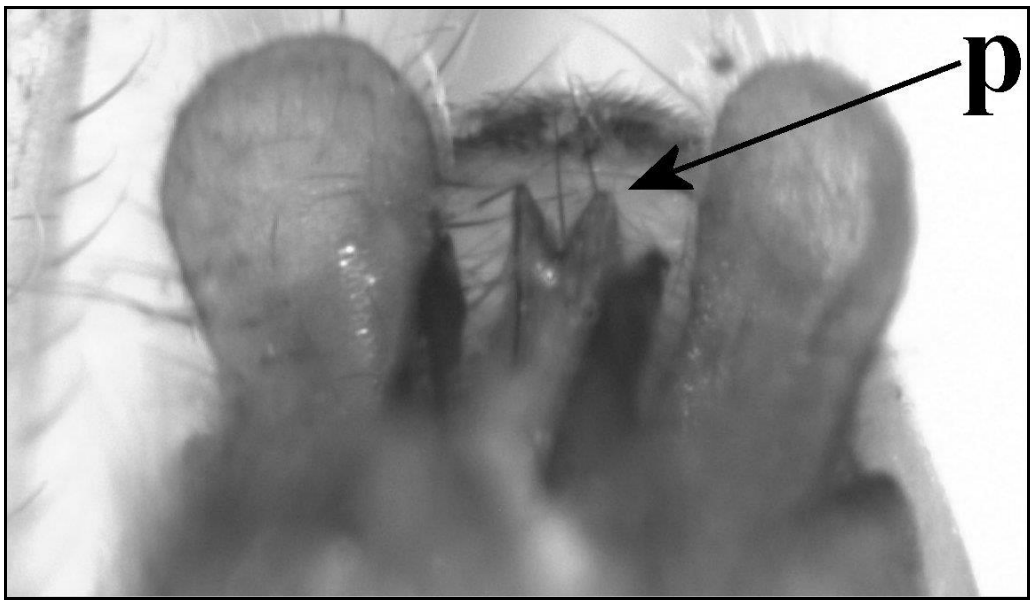

PLATE 7. ♂, Cabragh Bog, Tipperary, Ireland, 28 June 1994, K. G. M. Bond. Photograph: Tatyana S. Vshivkova. See O'Connor (2015). The prolongation of the ninth segment is indicated by an arrow (p).

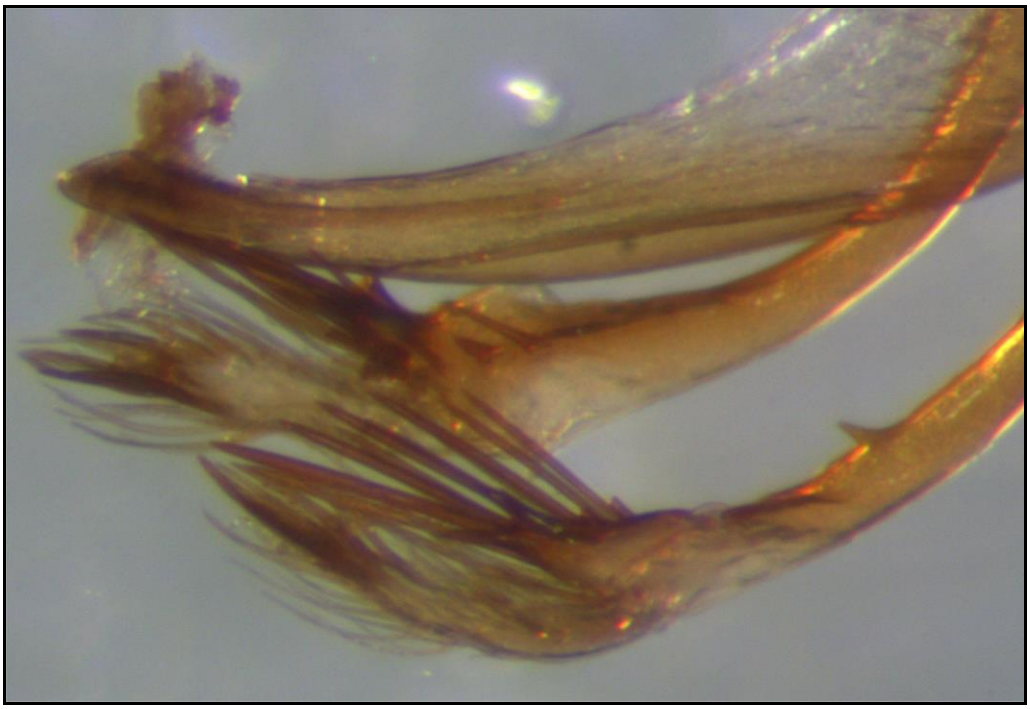

PLATE 8. ♂, aedeagus and parameres, Doubs department, Franche-Comté (Eastern France), 27 June 2014. Photograph: Gennaro Coppa.

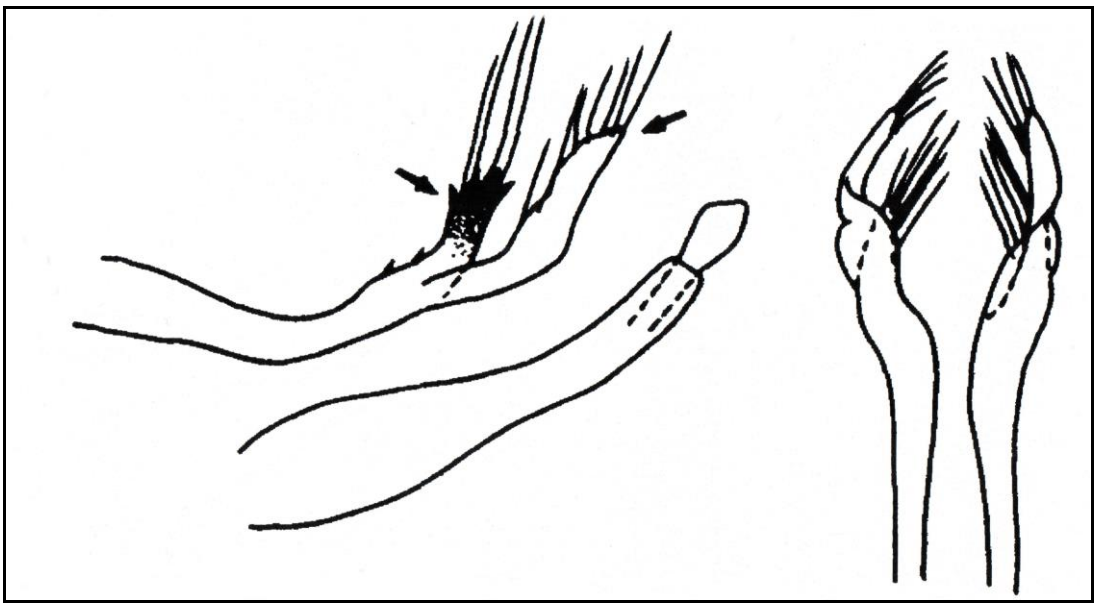

FIGURE 6. ♂, aedaegus and parameres from Malicky (2004). Diagnostic features are indicated by arrows.

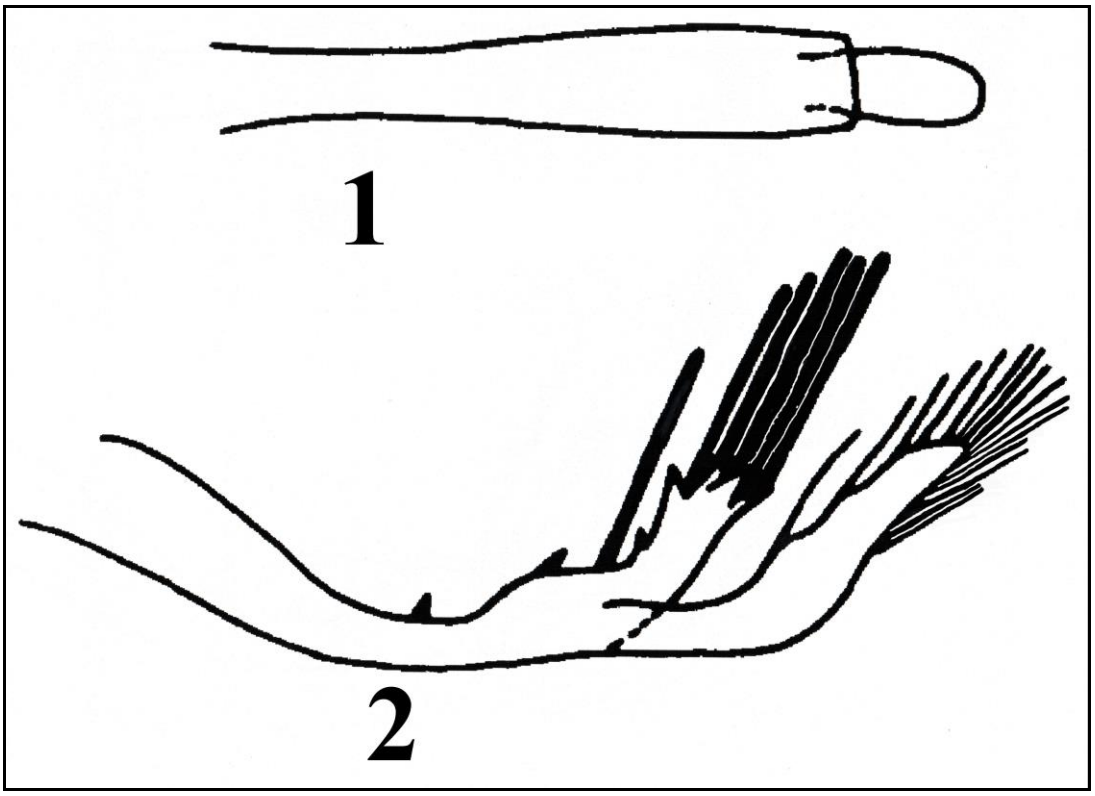

FIGURE 7. ♂, aedaegus and parameres based on O'Connor (1980).

PLATE 9. ♂, aedaegus and parameres, Luboń in northwest Poland, 6 July 2011. Photograph: David Tempelman. A diagnostic feature is indicated by the arrow.

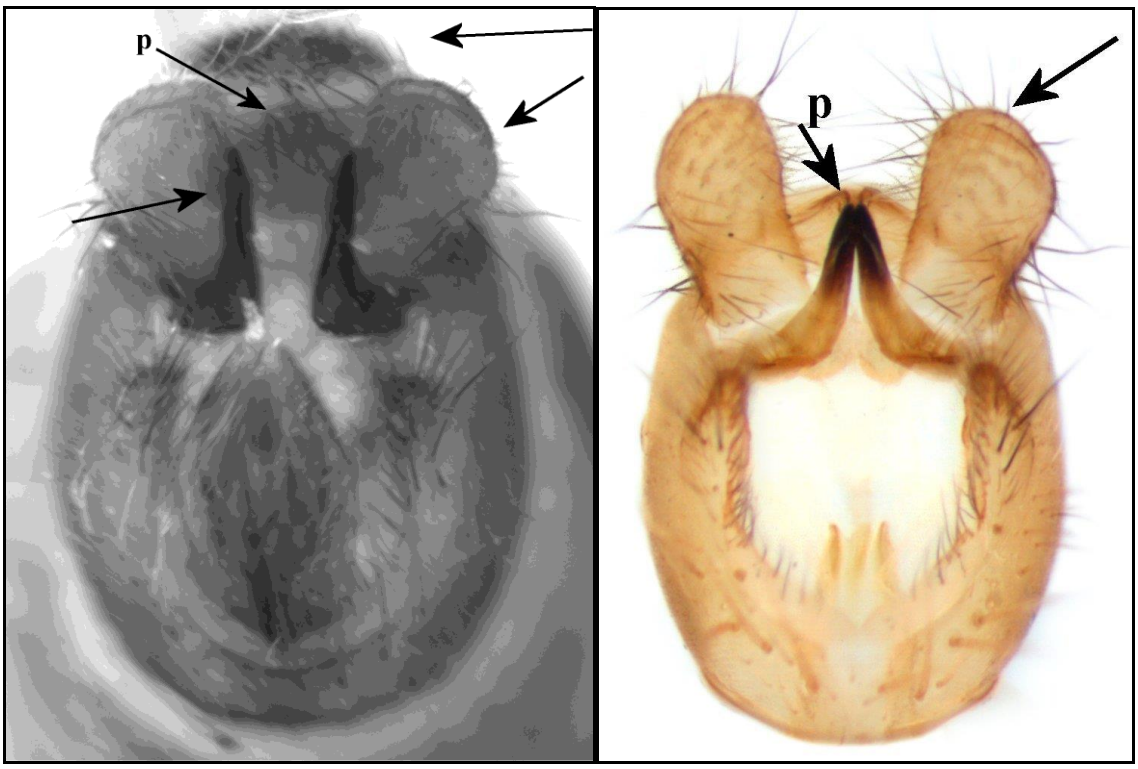

PLATE 10. Left: ♂, Cabragh Bog, Tipperary, Ireland, 28 June 1994, K. G. M. Bond. Photograph: Tatyana S. Vshivkova. See O'Connor (2015). Right: ♂, Luboń in northwest Poland, 6 July 2011. Photograph: David Tempelman. The prolongation of the ninth segment is indicated by an arrow (p) and diagnostic features by unlabelled arrows.

PLATE 11. ♂, Luboń in northwest Poland, 6 July 2011 showing the diagnostic lateral appendage. Photograph: David Tempelman.

PLATE 12. ♂, peat bogs along the river Semois in the nature reserve Marais de Heinsch in Arlon, Belgium, 20 July 2020. Photograph: Koen Lock.

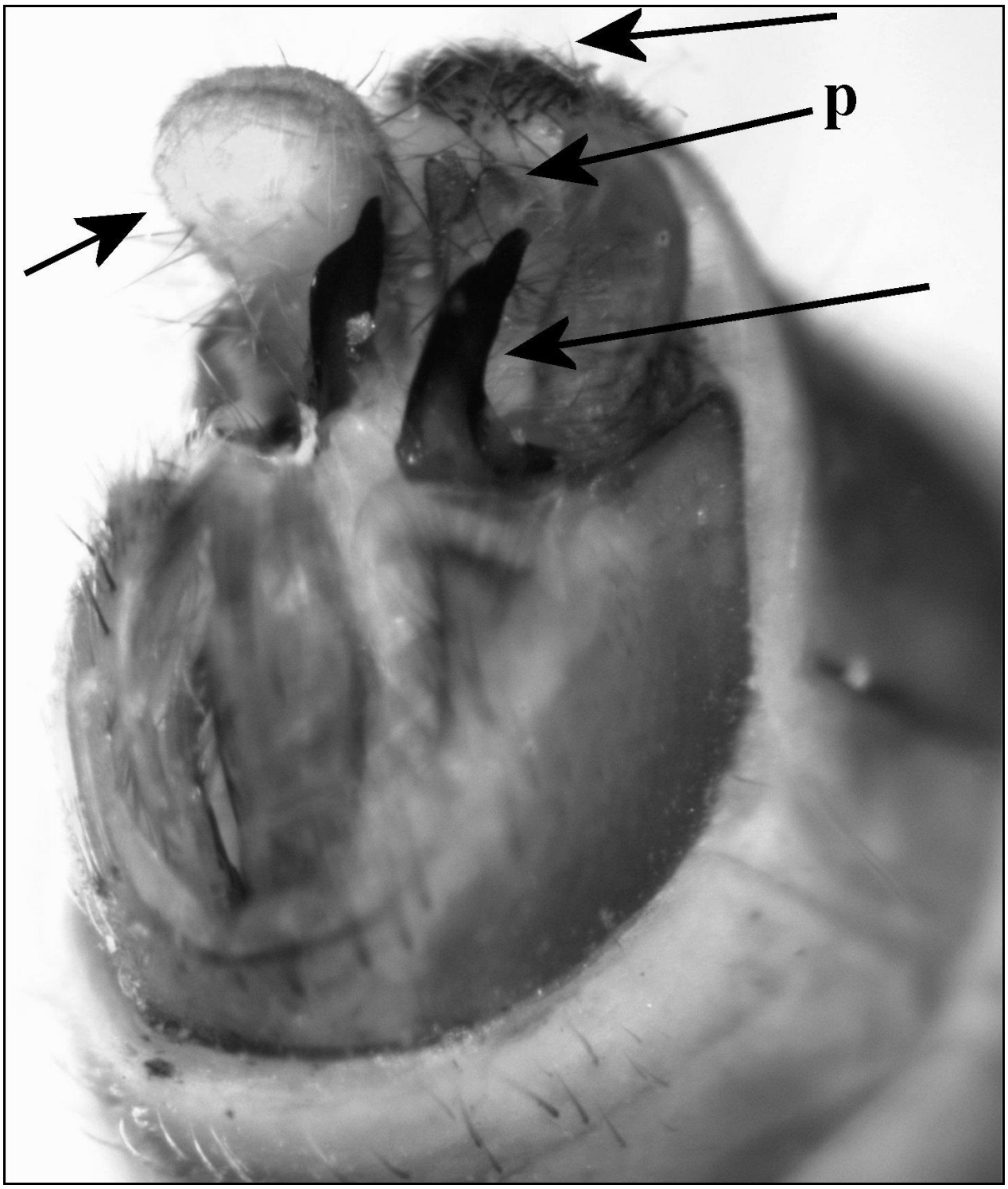

PLATE 13. ♂, Cabragh Bog, Tipperary, Ireland, 28 June 1994, K. G. M. Bond. Photograph: Tatyana S. Vshivkova. See O'Connor (2015). Prolongation of the ninth segment indicated by an arrow (p) and diagnostic features by unlabelled arrows.

Variation in females

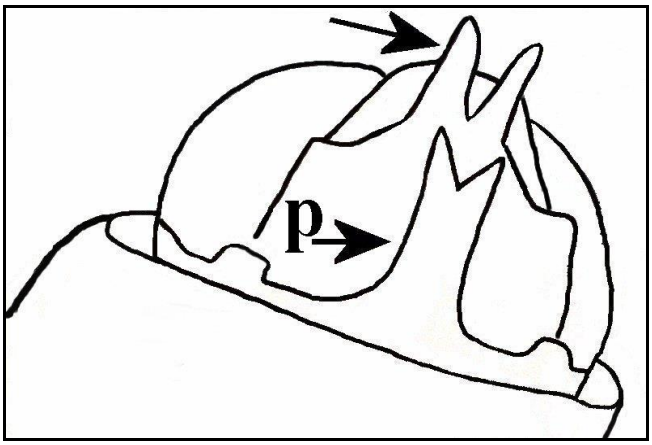

FIGURE 8. ♀, dorsal view, Eochar, South Uist, 27 June 2023. Based on the photograph by Robin Sutton (Plate 15). Drawn by J. P. O'Connor. A prolongation of the ninth segment over the tenth segment is indicated (p) and a diagnostic feature by the other arrow.

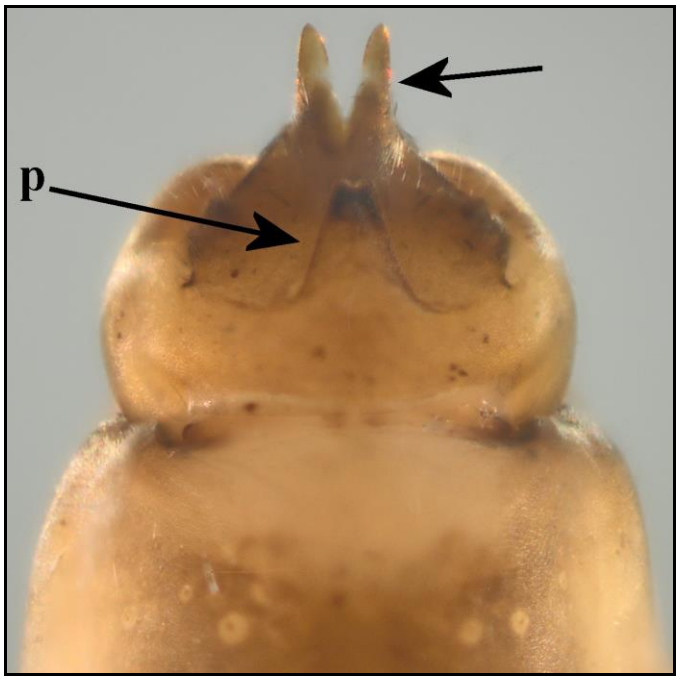

PLATE 14. ♀, dorsal view, peat bogs along the river Semois in the nature reserve Marais de Heinsch in Arlon, Belgium, 20 July 2020. Photograph: Koen Lock. A prolongation of the ninth segment over the tenth segment is indicated (p) and a diagnostic feature by the unlabelled arrow.

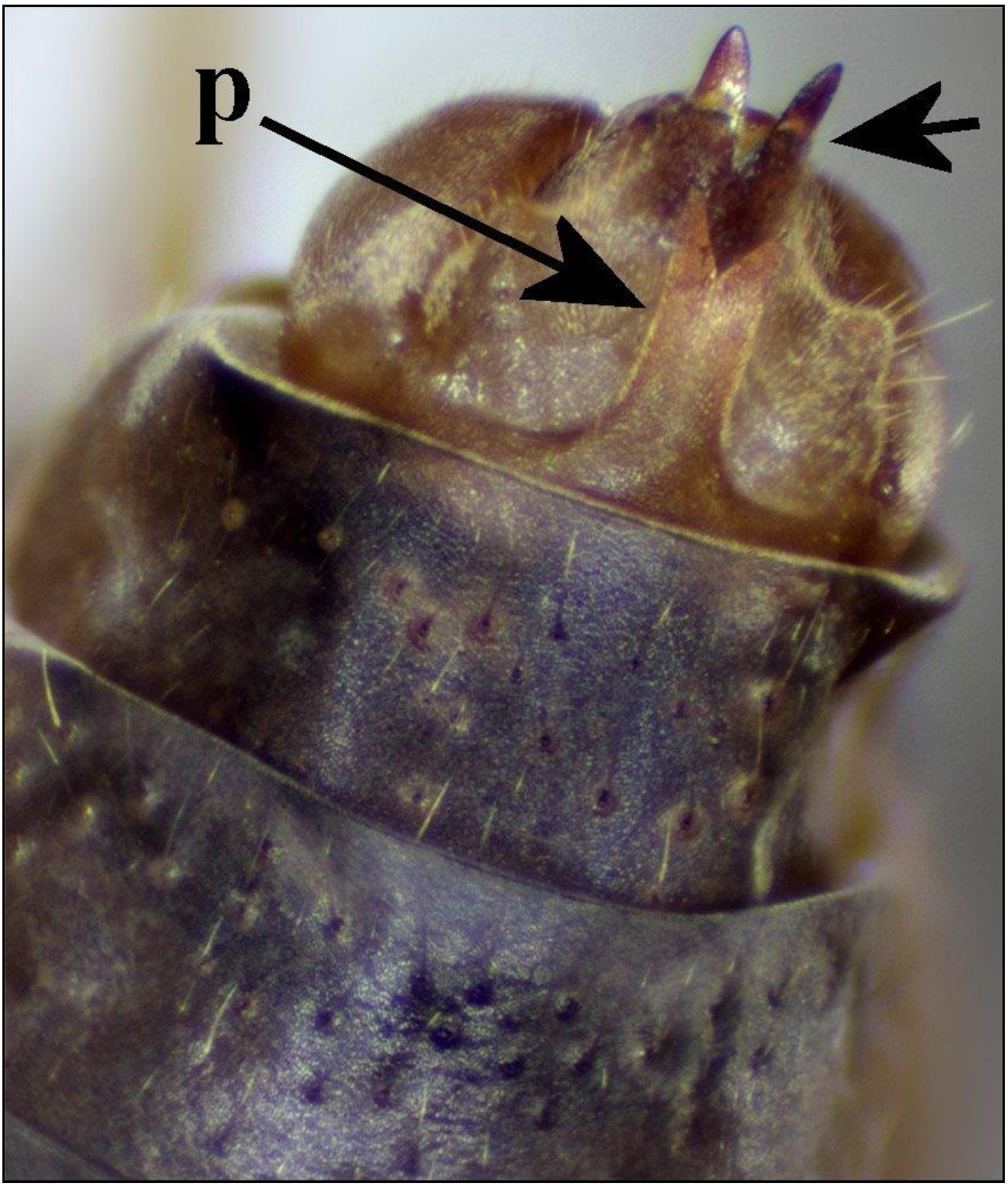

PLATE 15. ♀, dorsal view, Eochar, South Uist, 27 June 2023. Photograph: Robin D. Sutton. A prolongation of the ninth segment over the tenth segment is indicated (p) and a diagnostic feature by the unlabelled arrow.

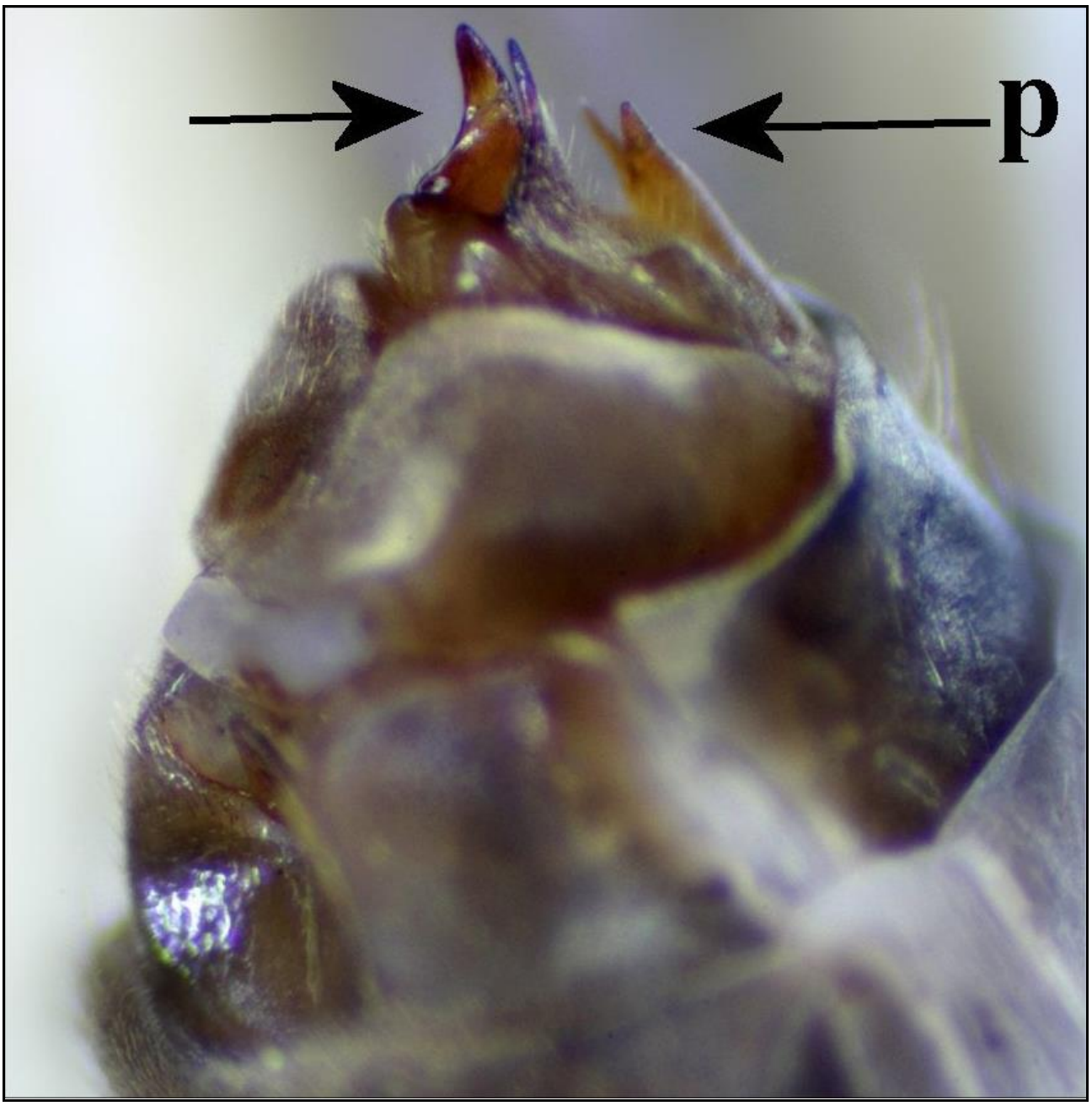

PLATE 16. ♀, lateral view, Eochar, South Uist, 27 June 2023. Photograph: Robin D. Sutton. A prolongation of the ninth segment over the tenth segment is indicated (p) and a diagnostic feature by the unlabelled arrow.

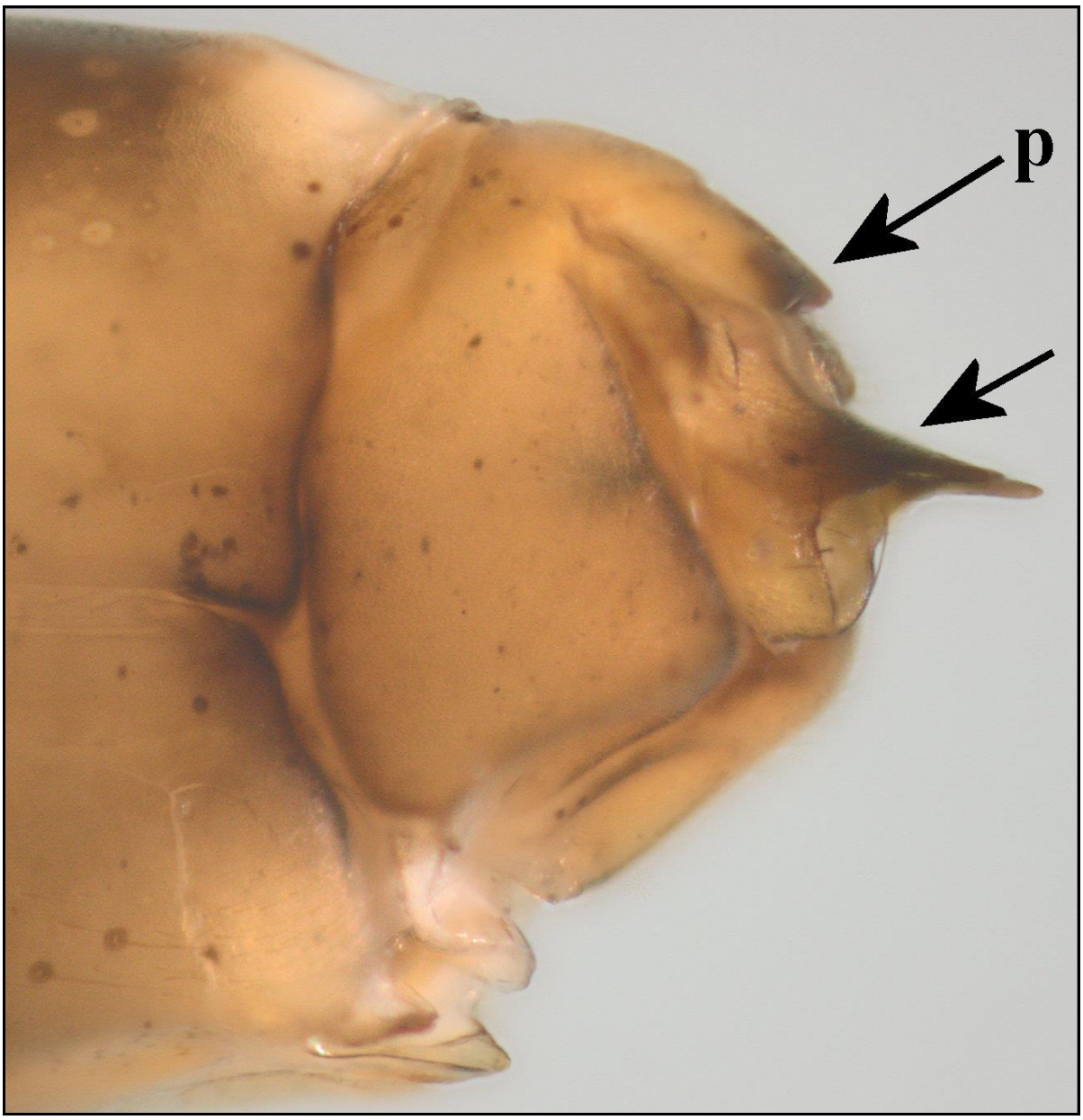

PLATE 17. ♀, lateral view, peat bogs along the river Semois in the nature reserve Marais de Heinsch in Arlon, Belgium, 20 July 2020. Photograph: Koen Lock. A prolongation of the ninth segment over the tenth segment is indicated (p) and a diagnostic feature by the unlabelled arrow.

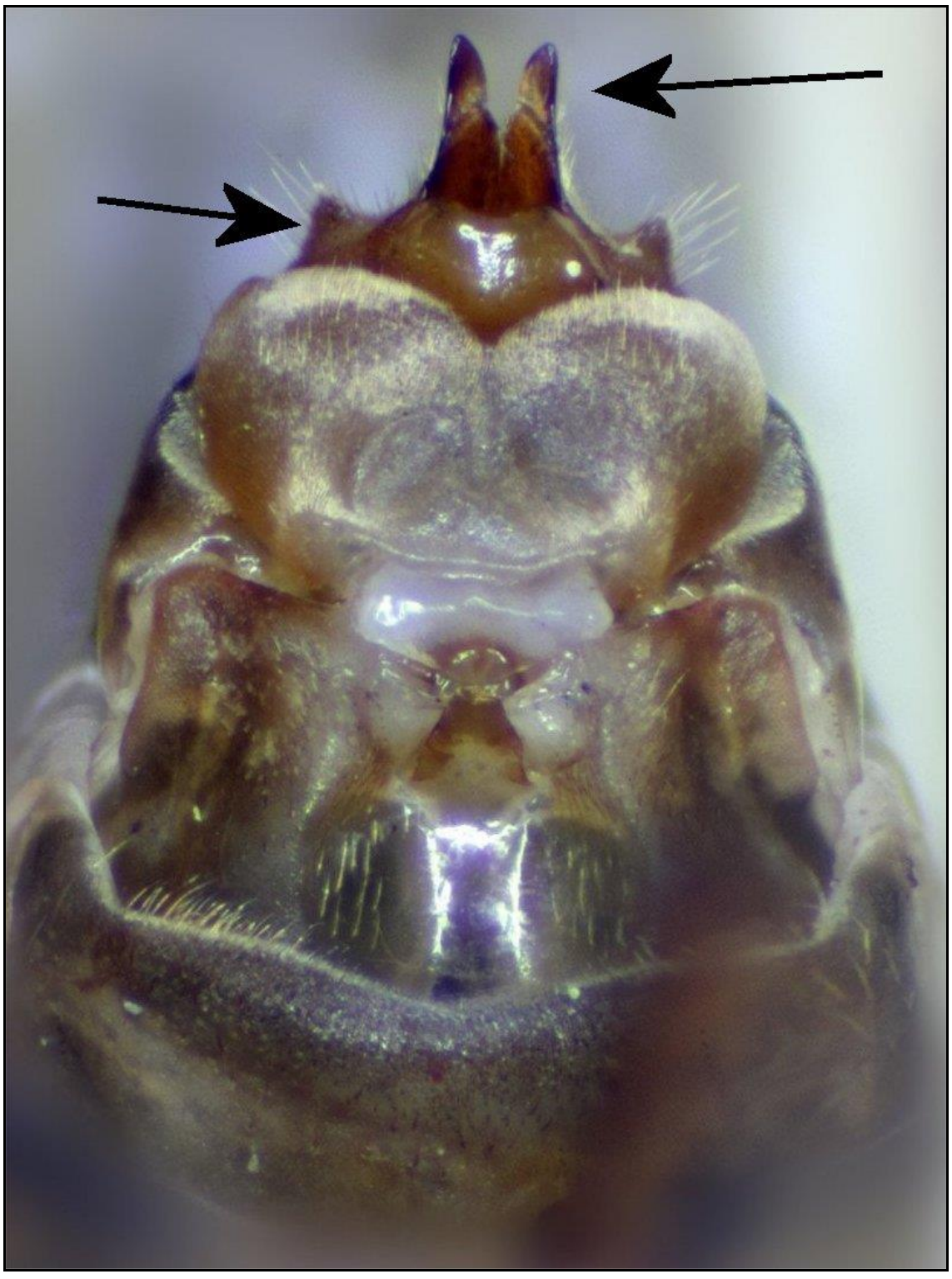

PLATE 18. ♀, ventral view, Eochar, South Uist, 27 June 2023. Photograph: Robin D. Sutton. Diagnostic features are indicated by arrows.

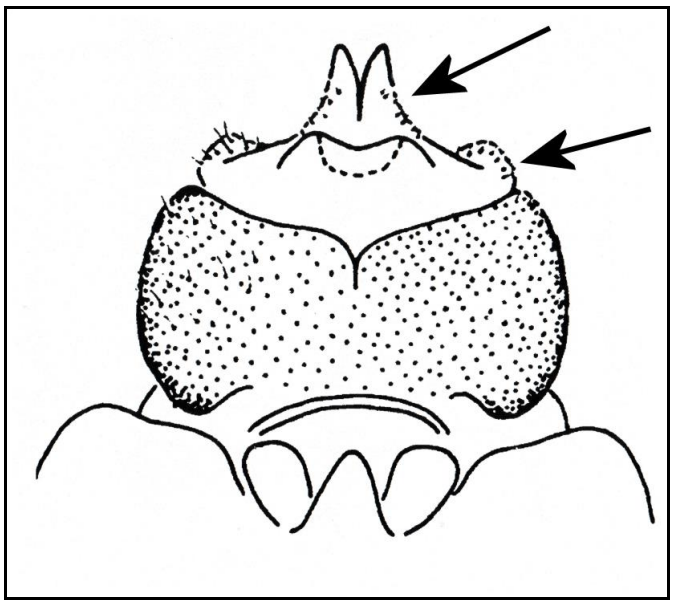

FIGURE 9. ♀, ventral view, Curragh Ballaugh, Isle of Man, R. Cassal. Drawn by P. C. Barnard (see O'Connor and Barnard, 1981; Malicky, 2004). The diagnostic features are indicated by arrows.

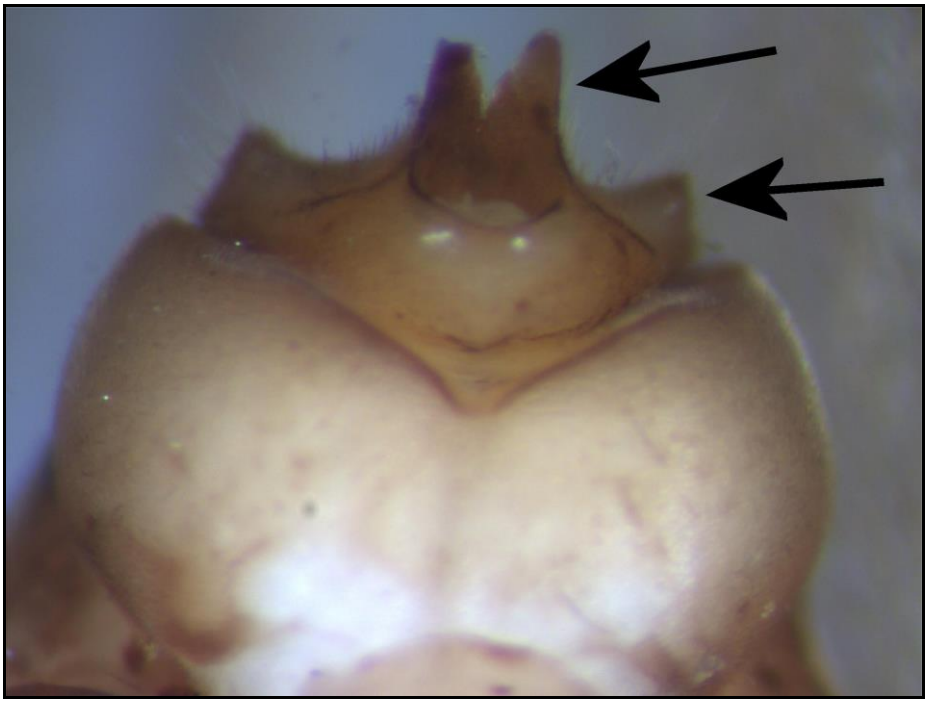

PLATE 19. ♀, ventral view, Doubs department, Franche-Comté (Eastern France), 27 June 2014. Photograph: Gennaro Coppa. Diagnostic features are indicated by arrows.

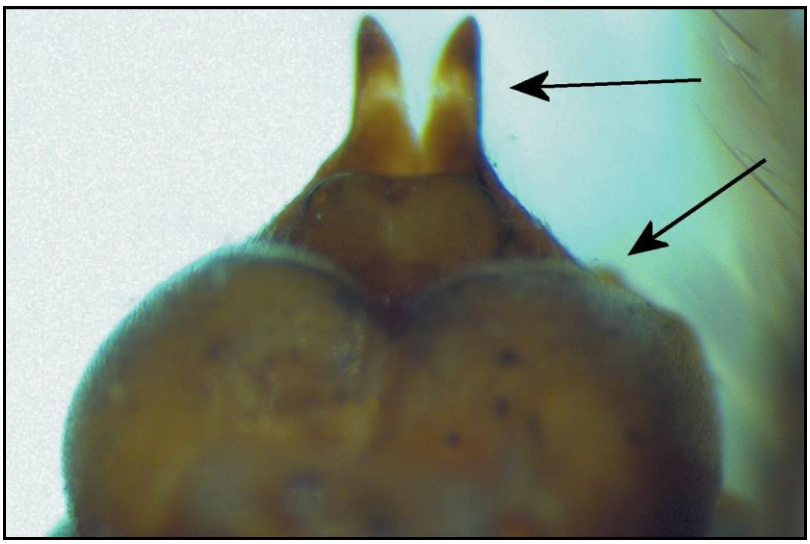

PLATE 20. ♀, ventral view, Cabragh Bog, Tipperary, Ireland, 28 June 1994, K. G. M. Bond. Photograph: Tatyana S. Vshivkova. See O'Connor (2015). Diagnostic features are indicated by arrows.

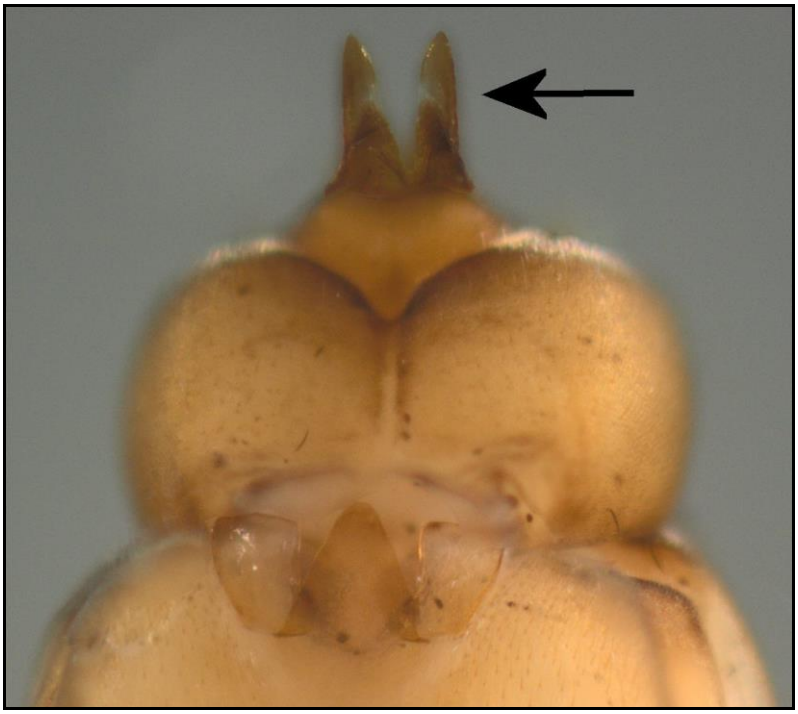

PLATE 21. ♀, ventral view, peat bogs along the river Semois in the nature reserve Marais de Heinsch in Arlon, Belgium, 20 July 2020. Photograph: Koen Lock. A diagnostic feature is indicated by the arrow.

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FIRST RECORDS OF TROPICAL ALMOND *TERMINALIA CATAPPA* L. (MYRTALES: COMBRETACEA: TERMINALIINAE) DRIFT MESOCARPS FROM IRISH MARITIME SHORES AND A REVIEW OF NW EUROPEAN RECORDS

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Abstract

The first confirmed records of Topical Almond *Terminalia catappa* L. drift mesocarps stranded on Irish maritime shores are reported. Previously published and unpublished records from UK and Dutch waters are included in a review of all known NW European records. *T. catappa* drift mesocarps are considered to be true peregrine disseminules most likely originating from populations introduced into the tropical and sub-tropical Western Atlantic.
Key words: Tropical Almond, *Terminalia catappa,* drift mesocarps, standings on Irish and NW European maritime shores.

Introduction

Terminalia is a monophyletic genus often cited as containing *circa* 150-200 species of trees and more rarely shrubs with a pantropical distribution encompassing both seasonally dry and wet biomes in America, Africa, Madagascar, Asia, Australia and the Pacific region. The systematic identification of *Terminalia* species has long been problematic because inter-species differentiation is unclear and there is considerable variation in morphotypes, anatomy and karyotypes. However, the increasing application of genetic techniques over the last two decades has helped to clarify some of the previous taxonomic confusion (Tan *et al*., 2002; Maurin *et al*., 2010, 2017, 2023; Nithaniyal and Parani, 2016; Mishra *et al*., 2017).

A total of 284 species of *Terminalia* are currently accepted worldwide (Anon., 2022), 75 (*circa* 26%) of which occur in tropical and sub-tropical regions of the New World, generally ranging from Mexico and the Caribbean Islands southwards to Argentina. At least 46 (61%) of these Neo-tropical species occur in wet tropical biomes and hydrometric catchments draining into the Caribbean and Western Tropical Atlantic.

Terminalia species display a wide range of different seed dispersal mechanisms, involving either water (hydrochory), animals (zoochory), and/or wind (anemochory) (Maurin *et al*., 2023).

Several species of *Terminalia* are economically important, particularly as a source of timber, food (nuts), ethno-medicinal and veterinary uses, and in the tanning industry (Little *et al*., 1974; Little and Skolmen, 1989; Walter and Sam, 1993; Evans, 1999; Yow, 2001; Chakrabarty and Balarkishnan, 2003; Chitmanat *et al.,* 2005; Cock, 2015; Intharuksa *et al*., 2016; Lusiastuti *et al*., 2017; Zhang *et al*., 2019; Das *et al.*, 2020).

***Terminalia catappa* L.**

Terminalia catappa is a large tree reaching up to 25m in height, naturally found near coastal sandy beaches and mangroves throughout its native range within the Indo-West Pacific region (Plate 1). The fruit is an oval flattened drupe measuring up to 75mm in width with rather sharp edges (Plate 2). Although the fruits, which contain a hard sclerenchymatous endocarp, are locally dispersed by birds and mammals, the mesocarp is composed of an outer spongy layer of aeriferous parenchyma tissue which provides natural buoyancy in sea water for up to two years, thus facilitating more widespread oceanic dispersal (Guppy, 1917; Ridley, 1930).

T. catappa has been widely introduced by man outside of its native range into many parts of South and Central America as well as Africa (Anon., 2022). The fruits, mesocarps, and eroded endocarps are commonly found stranded on beaches throughout the Gulf of Mexico and Caribbean, occasionally as far north as Cape Hatteras in North Carolina, U.S.A. (Perry and Dennis, 2010).

Irish and NW European records of stranded *Terminalia catappa* drift mesocarps

Although there are two undated mesocarps of *Terminalia catappa* in the collections of the National Herbarium in Dublin (Plate 3), donated by Henry Brougham Guppy during May 1915, and listed as having been collected from ‘Salcombe Beach, S Devon’, it would appear that both of these specimens were most likely collected by Guppy in the West Indies rather than the U.K. Guppy (1917) remarked ‘I may add that with the object of directing interest to this matter I sent in May 1915 to the National Museum, Dublin (DBN), a collection of West Indian drift seeds most likely to be found on the Irish coasts’. In preparing his account of ‘Tropical Drift Seeds on the Irish Atlantic Coasts’, Colgan (1919) corresponded with Guppy and acknowledged his help and encouragement, noting ‘that the field of enquiry was untrodden, and might well repay exploration’, and that Guppy’s ‘expectation of a rich yield of tropical seeds from our Atlantic shores is justified’. Nelson (2000) made no reference to Guppy’s DBN *Terminalia* specimens, and considered their U.K. origin as doubtful (Nelson, pers. comm.). Although Guppy (1917) was residing at “Rosario”, Salcombe during 1915, and personally collected various species of drift seeds from Devon between 1909 and 1916, he did not specifically mention having collected any *Terminalia*, which at that time would have represented the first known records of

this drift seed from NW European waters. Nelson (2000) remarked that Guppy 'noted many seeds washed ashore in Britain and Ireland but did not seem to have made a concerted attempt to keep documented specimens from British beaches'.

Since 1978, a total of 25 stranded *T. catappa* drift mesocarps have been confirmed from NW European maritime shores, including 9 U.K., 9 Irish, and 7 Dutch (Table 1). The database includes details on 17 unpublished records, including the first 9 Irish specimens, 5 U.K. and 3 Dutch. Apart from one specimen reported from the Orkneys (Scotland) (Plate 4a), all of the U.K. specimens were recorded from Cornwall (Plate 4b). All of the Irish specimens were recorded from the west coast, including County Clare (7) (Plate 4c, 4d, 4e & Plate 5), County Kerry (1) (Plate 6a) and County Sligo (1) (Plate 6b). Although isolated specimens were recorded along the Dutch coast, almost 43% were collected off the NW coast on the island of Texel (Plates 7 and 8). Almost 55% of the NW European specimens were recorded during January and February (Fig. 1)

On two occasions *T. catappa* specimens were found simultaneously along with two other sub-tropical Western Atlantic disseminules in Irish waters: Sea Heart *Entada gigas* (L.) Fawc. & Rendle and Sea Purse *Macropsychanthus comosus* (G. Mey.) L.P. Queiroz & Snak (Record Numbers 19-23). On another occasion, a stranded specimen of *T. catappa* was found along with a Peach *Prunus persica* (L.) endocarp which may have been of local origin (Record Number 18). An unidentified stalked barnacle (*Lepas* sp.) was attached to a stranded specimen of *T. capatta* from Irish waters (Record Number 17).

The average total length, width, depth and dry weight of the NW European mesocarps were 41.7 (range 31.0-55.5; N=24), 29.3 (range 19.0-43.0; N=24), 19.9 (range 15.0-29.5; N=23), and 4.6 (range 1.6-10.0; N=9) respectively. The average total length/width ratio was 1.5 (range 1.1-2.2; N=24).

Discussion

Considering their abundance in tropical and sub-tropical regions of the Western Atlantic, along with their known flotation capacity in sea water of 24 months, it likely that the *T. catappa* mesocarps stranded on NW European shores originated from this area and floated *via* the Antilles Current, Gulf Stream and North Atlantic Drift to NW Europe within the estimated minimum passive trans-Atlantic flotation time interval of 14 to 18 months (Quigley *et al*., 2016; Minchin and Quigley, 2023), supporting Nelson's (2000) opinion that the NW European mesocarps of *T. catappa* are true peregrine drifters. The occasional co-occurrence of other tropical and sub-tropical Western Atlantic disseminules such as *Entada gigas* and *Macropsychanthus comosus* along with *T. catappa* in Irish waters (Records 19-23) lends further support to this conclusion.

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PLATE 1. *Terminalia catappa* tree, Bucerias, Nayarit, Bay of Banderas, Pacific Mexico, 25 January 2024. Photograph: Declan Quigley.

PLATE 2. *Terminalia catappa* foliage, fruits, mesocarps and endocarps, Bucerias, Mexico, 25 January 2024. Photograph: Declan Quigley.

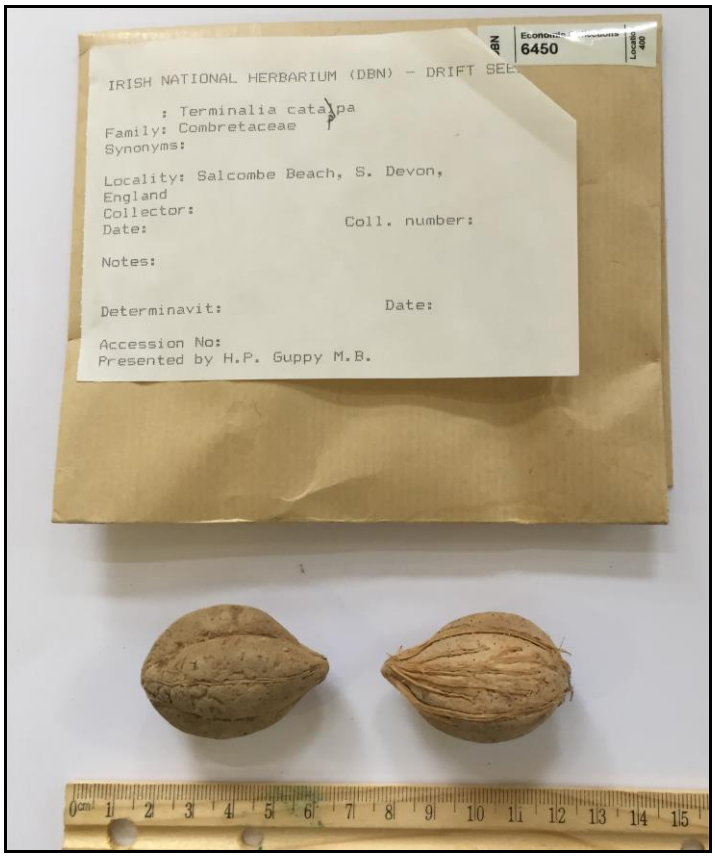

PLATE 3. *Terminala catappa* mesocarps donated by H. B. Guppy to the National Herbarium, Dublin, May 1915 (DBN 6450). Photograph: Declan Quigley.

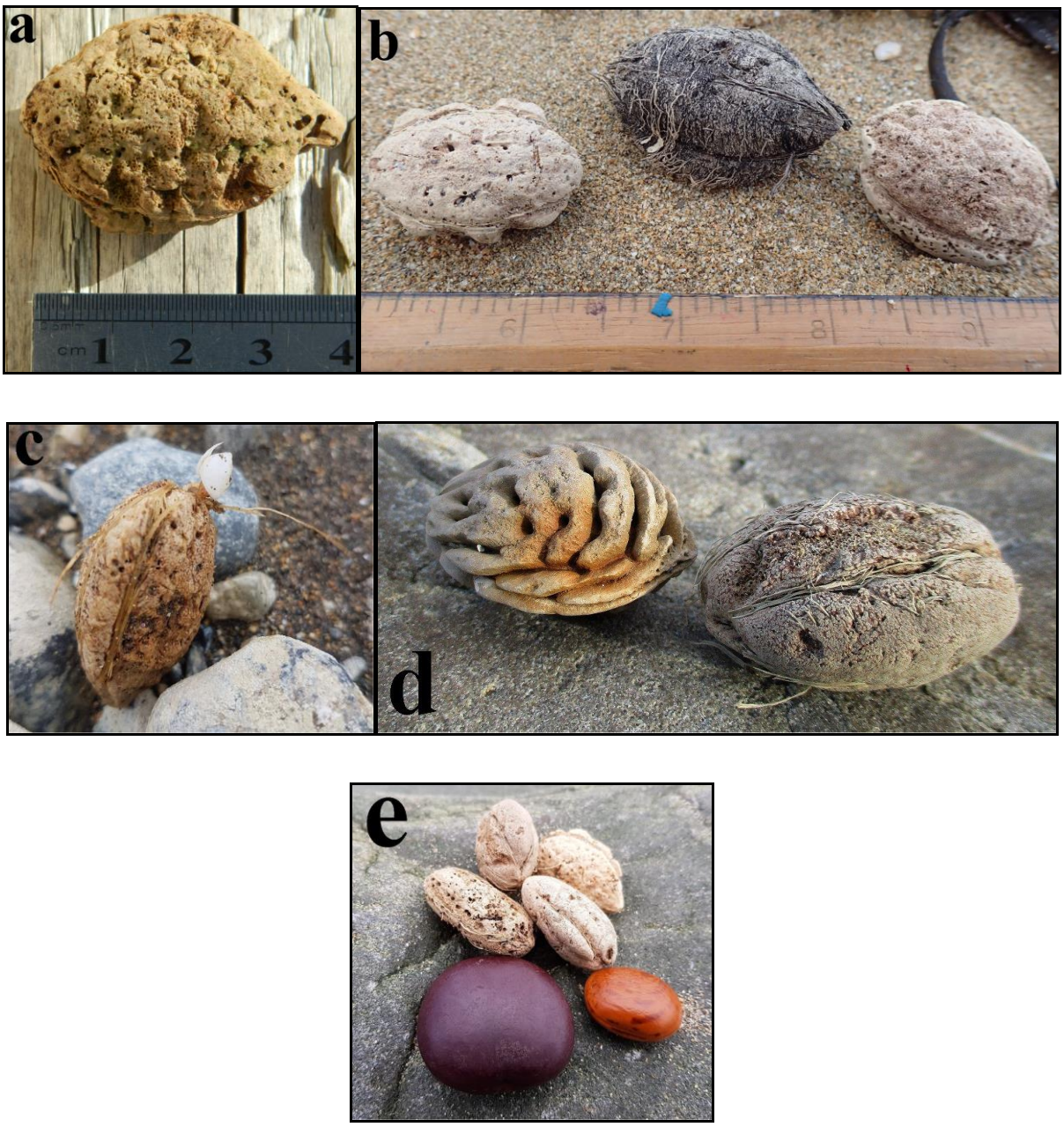

PLATE 4. a - *Terminalia catappa* mesocarp from the Billia Croo, Orkney Islands. 13 September 2019. Photograph: Martin Gray; **b** - *Terminalia catappa* mesocarps from north Cornwall, U.K. Photograph: Paul Gainey; **c** - *Terminalia catappa* mesocarp with *attached Lepas* sp., Fanore Beach, Fanore Mor, County Clare, 7 September 2017. Photograph: Liam McNamara; **d** - *Terminalia catappa* mesocarp along with *Prunus persica* endocarp, Seafield, Quilty, County Clare, 13 January 2018. Photograph: Liam McNamara; **e**- *Terminalia catappa* mesocarp along with *Entada gigas* and *Macropsychanthus comosus*, Goilin, Carrowtedaun, Lahinch, County Clare, 5 January 2019. Photograph: Liam McNamara.

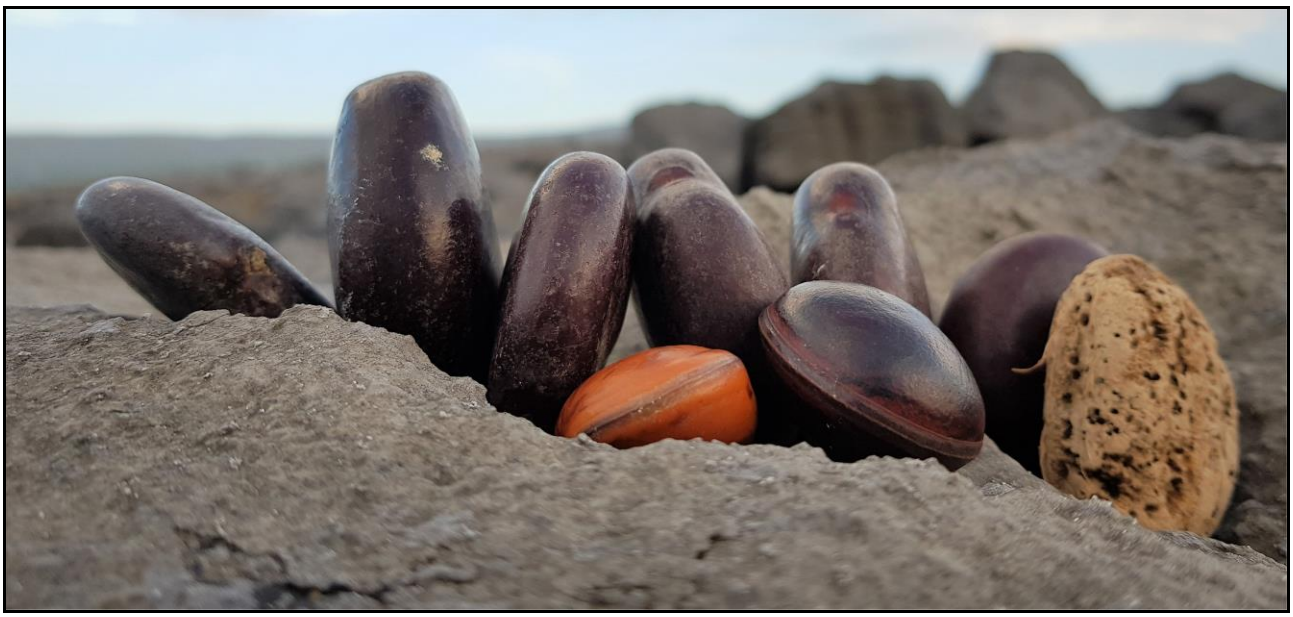

PLATE 5. *Terminalia catappa* mesocarp along with *Entada gigas* and *Macropsychanthus comosus*,Tawee Beach, Craggagh, Fanore, County Clare, 26 February 2019. Photograph: Liam McNamara.

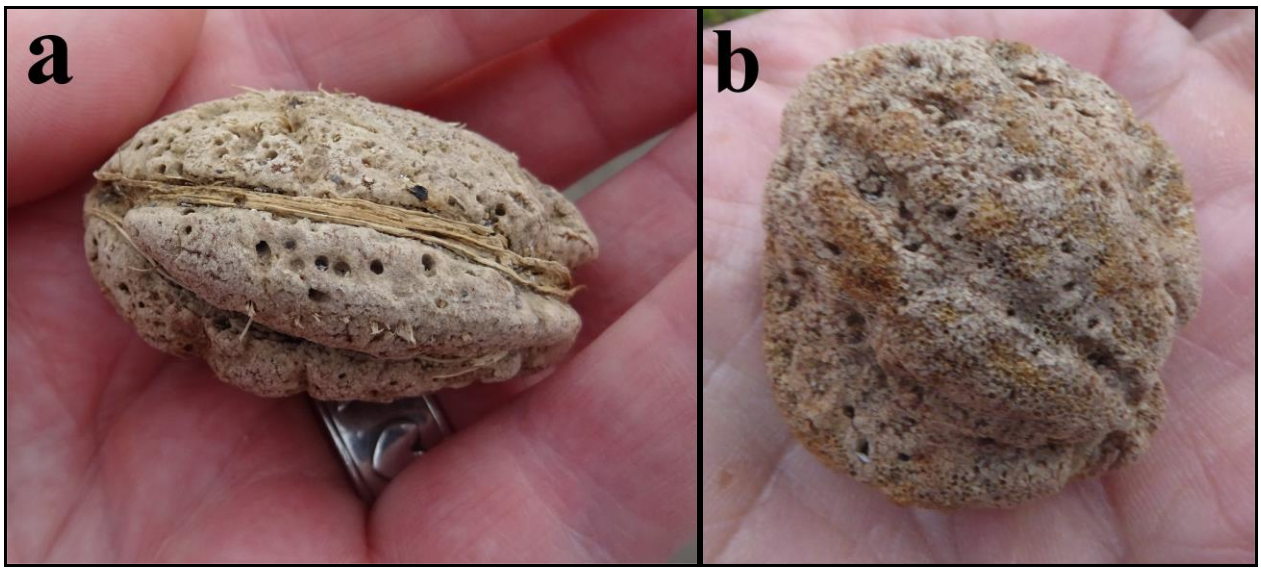

PLATE 6. a - *Terminalia catappa* mesocarp from St Finian's Bay, County Kerry, 15 June 2021. Photograph: Rosemary Hill; **b** - *Terminalia catappa* mesocarp from Dunmoran Strand, County Sligo, 1 October 2022. Photograph: John Mark Dick.

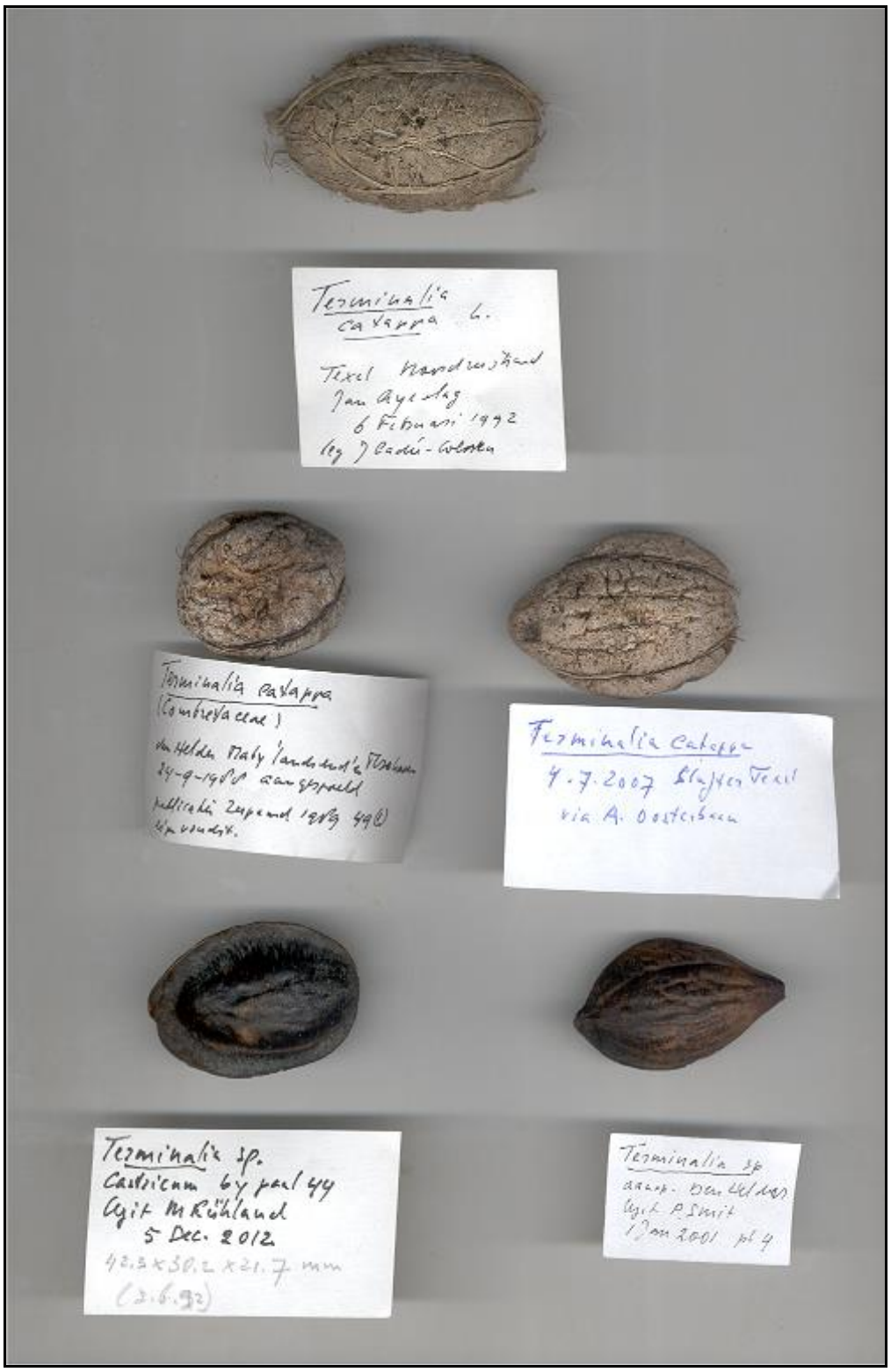

PLATE 7. *Terminalia catappa* mesocarps and endocarps from the Dutch coast. Photograph: Gerhard Cadee.

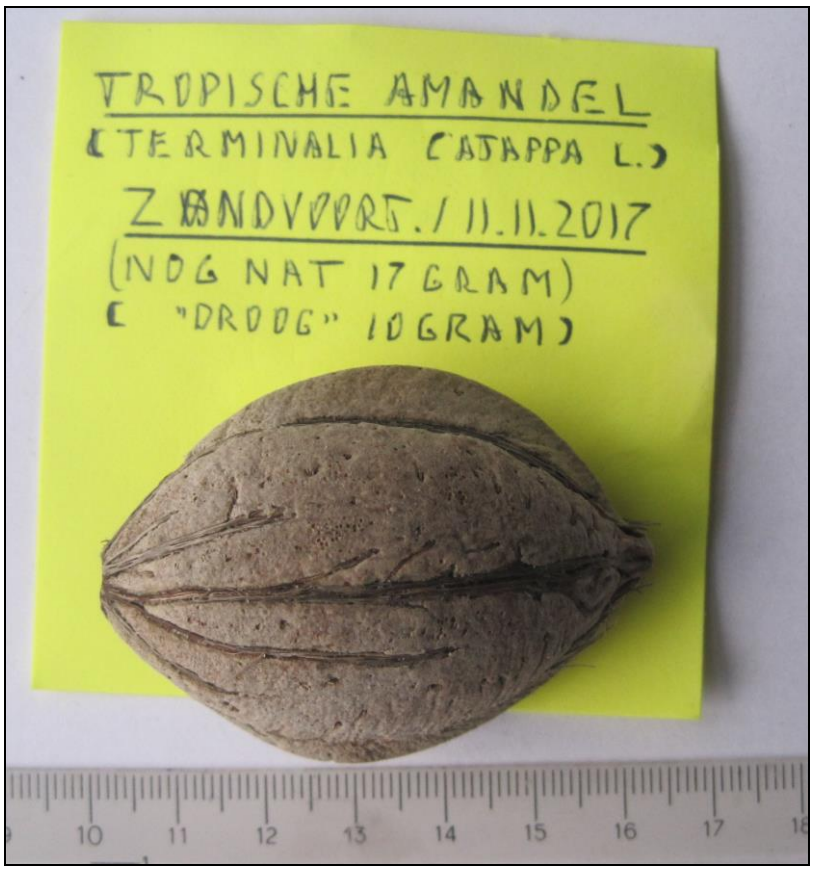

PLATE 8. *Terminalia catappa* mesocarp, Zandvoort, The Netherlands, 1 November 2017. Photograph: Wim Kruiswijk.

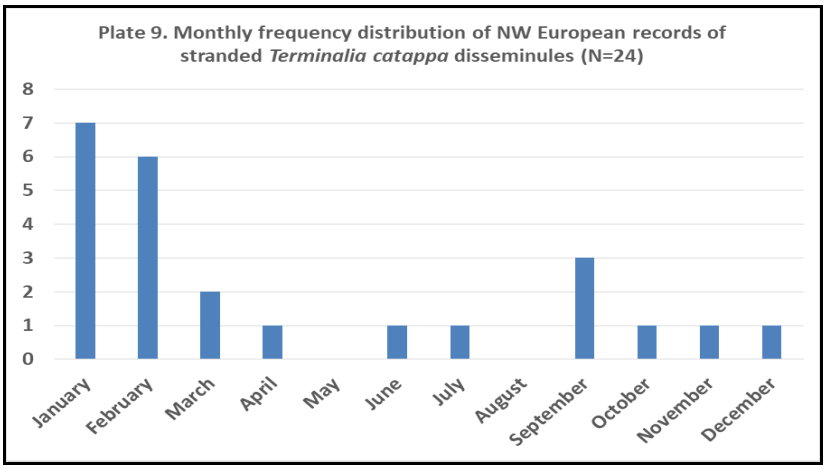

FIGURE 1. Monthly frequency distribution of NW European records of stranded *Terminalia catappa* drift mesocarps and endocarps (N = 24).

TABLE 1. NW European records of *Terminalia catappa* drift mesocarps.

Record Number	Figure Number	Date	Location	Latitude (N)	Longitude	Total Length (mm)	Maximum Width (mm)	Maximum Depth (mm)
1		c.1978	near St. Mary's, Isles of Scilly (SV91), SW Cornwall, UK	49.925	-6.2987			
2	Fig. 10	24.09.1988	Den Helder, Netherlands	52.9563	4.7608	34.9	29.1	17.1
3		06.02.1992	Texel, Netherlands	53.0548	4.7977	50.8	31.8	24.7
4		01.01.2001	Den Helder, Netherlands	52.9563	4.7608	40	25	20
5		12.04.2006	Hors Texel, Netherlands	52.9922	4.7324	51.3	30.3	18.3
6	Fig. 10	04.07.2007	Texel, Netherlands	53.0548	4.7977	45.5	31.9	20
7		13.01.2009	Treyarnon Bay (SW8673), near St. Merryn, N Cornwall, UK	50.5264	-5.025	43	29	21
8	Fig. 3	17.02.2010	Hayle Towans Beach (SW552384), N Cornwall, UK	50.2088	-5.4125	36	26	19
9		03.02.2012	Perranporth (SW7554), N Cornwall, UK	50.3444	-5.1544	35	25	19
10	Fig. 10	05.12.2012	Castricum, Netherlands	52.5453	4.6727	42.3	30.2	21.7
11		24.03.2013	Treyarnon Bay (SW8673), near St. Merryn, N Cornwall, UK	50.5264	-5.025	35	27	21
12	Fig. 3	11.02.2014	Perranporth (SW7554), N Cornwall, UK	50.3444	-5.1544	48	43	18
13		28.03.2014	Gwithian/Upton, Towans Beach, N Cornwall, UK	50.2299	-5.3915	39	30	20
14		Feb-16	Porthcothan (SW8672), N Cornwall, UK	50.5094	-5.0212	42	19	16
15	Fig. 2	13.09.2017	Billia Croo, SW Orkney Mainland Island, N Scotland	59.9723	-3.3512	40	27.5	18.3
16	Figs. 11	01.11.2017	Zandvoort, Holland	52.3711	4.5334	55.5	40.5	29.5
17	Fig. 4	07.09.2017	Fanore Beach, Fanore Mor, Co Clare, W Ireland	53.1199	-9.2881	45.5	34	21
18	Fig. 5	13.01.2018	Seafield, Quilty, Co Clare, W Ireland	52.8041	-9.4881	37	27.5	21
19	Fig. 6	05.01. 2019	Goilin, Carrowntedaun, Lahinch, Co Clare, W Ireland	52.9051	-9.3689	45	31.5	17
20						40	26.5	19
21						35.5	28	20
22						31	21.5	18
23	Fig. 7	26.02.2019	Trawee Beach, Craggagh, Fanore, Co Clare, W Ireland	53.0929	-9.31	42	19	15
24	Fig. 8	15.06.2021	St. Finian's Bay, The Glen, Ballinskelligs, Co Kerry, SW Ireland	51.5	-10.2	48	37	
25	Figs. 9	01.10.2022	Dunmoran Strand (G542353), Co Sligo, NW Ireland	54.2628	-8.724	38	34	22

TABLE 1 (Continued).

Record Number	Length/ Width Ratio	Dry Weight (g)	Collector	Reference	Notes
1			H. Wakefield	Nelson (1990, 2000);Gainey (2014)	mesocarp
2	1.2	2.9	Gerhard Cadee	Cadee (1989)	mesocarp
3	1.6	7.1	Hans Cadee	Cadee (1992a,b,1995,1996,1997)	mesocarp
4	1.6	1.6	Pieter Smit	Brochard & Cadee (2005)	endocarp
5	1.7	3.3	Wim Kruiswijk	This paper	mesocarp
6	1.4	3.1	Arthur Oosterbaan	Cadee (2007)	mesocarp
7	1.5		Jane Darke	Gainey (2014, 2020)	mesocarp
8	1.4		Paul Gainey	This paper	mesocarp
9	1.4		Chris Eaton	Gainey (2014, 2020)	mesocarp
10	1.4	3.6	Michel Ruehland	This paper	endocarp
11	1.3		Jane Darke	Gainey (2014, 2020)	mesocarp
12	1.1		Paul Gainey	Gainey (2014, 2020)	mesocarp
13	1.3		Paul Gainey	This paper	mesocarp
14	2.2		Jane Darke	Gainey (2014, 2020)	mesocarp
15	1.5	5.1	Martin Gray	This paper	mesocarp
16	1.4	10	Wim Kruiswijk	This paper	mesocarp
17	1.3		Liam McNamara	This paper	mesocarp along with attached *Lepas sp.*
18	1.3		Liam McNamara	This paper	mesocarp along with *Prunus persica* endocarp
19	1.4				
20	1.5		Liam McNamara	This paper	mesocarp along with 1 *E. gigas* & 1 *M. comosus*
21	1.3				
22	1.4				
23	2.2		Liam McNamara	This paper	mesocarp along with 6 *E. gigas* & 2 *M. comosus*
24	1.3		Rosemary Hill	This paper	mesocarp
25	1.1	5	John Mark Dick	This paper	mesocarp

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RECORDS OF TRICHOPTERA COLLECTED FOR THE BIOMONITORING OF IRELAND'S LAKE NETWORK 2013-2018 AND 2019-2021

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Abstract

Records of Trichoptera are reported from Irish lakes collected as part of the EU Water Framework Directive monitoring programme. Larval material was collected during 2013-2018 and 2019-2021. Only new monad, hectad and county records are noted.
Key words: Trichoptera, caddisflies, larvae, Ireland, new records, distribution, lakes.

Introduction

The Environmental Protection Agency conducts the national Water Framework Directive monitoring programme in Ireland (e.g. EPA 2021, 2023) by which river and lake water quality and trends are assessed with respect to ecological criteria and to physico-chemical water quality standards. This work includes the sampling of aquatic invertebrates in 117 lakes under the Acid Lakes and Surveillance Lake Monitoring Programme. Fourteen acid lakes are sampled annually and the remaining lakes are sampled once every three years.

Two lakes which encompass the major lake types in Ireland are shown (Plates 1-2): soft acid lakes (e.g. Upper Lake in Killarney, County Kerry) and hard limestone lakes (e.g. Lough Bunny in the Burren, County Clare). The former is situated in the south-west of Ireland, the latter in the west.

The Trichoptera data, reported here, are from 2013-2018 and 2019-2021. Only new monad ($1km^2$), hectad ($10km^2$) and county records from these data are noted in this paper. Four figure ($1km^2$) Irish grid references are given for each new record.

Ruth Little identified the larvae using Edington and Hildrew (1995) and Wallace *et al*. (2003). Identifications to species level are only included. It was often not possible to identify many immature larval stages as they were very small and the key characteristics had not yet developed. In addition, only *Tinodes waeneri* is included as the larval key for the other species of *Tinodes* is unreliable. *Polycentropus* was also not speciated due to problems with the claw angle and other characteristics.

Addendum 7, Addendum 8 and Addendum 9

Addendum 7 to the dataset "Caddisflies (Trichoptera) of Ireland", was uploaded by the National Biodiversity Data Centre on the 8 August 2023 <https://maps.biodiversityireland.ie/Dataset/250> (O'Connor, 2023). There are presently 17973 records for 156 species from 930 sites. Records from Connor, O'Connor and Feeley (2024) in this *Bulletin* will be be included in Addendum 8 and sent to the National Biodiversity Data Centre for incorporation into the dataset. The records in this paper will be include in a subsequent Addendum 9. Only one record will be sent if there are multiple ones from the same site.

Methods

At each lake, specimens were collected using a two-minute littoral invertebrate kick-sample collected from the shoreline using a pond net (230×225mm frame with 1mm mesh). The operator shuffled over the substrate disturbing it with the foot to dislodge all benthic organisms which were subsequently retrieved in the pond net by filtering the disturbed material using a sweeping S-type movement. Collected invertebrates were then transferred to a 1-litre sample container and preserved in 70% Industrial Methylated Spirits (IMS). On return to the laboratory, the sample was washed through a 500µm sieve and sorted. All the macroinvertebrates were removed and preserved in 70% IMS for subsequent identification.

Records

RHYACOPHILIDAE

***Rhyacophila dorsalis* (Curtis, 1834)**

GALWAY: Lough Nahasleam (L9744), 1 larva 5 April 2016.

WICKLOW: Upper Lake (T1096), Glendalough, 1 larva 8 April 2019.

GLOSSOSOMATIDAE

***Agapetus fuscipes* Curtis, 1834**

DONEGAL: Lough Akibbon (C0718), 1 larva 14 April 2021. Lough Derg (H0973), 29 larvae 14 April 2021. Lough Fern (C1824), 1 larva 25 April 2018. Lough Kindrum (C1943), 13 larvae 25 April 2018 & 3 larvae 22 April 2021. Lough Sessiagh (Loch an tSeisigh) (C0436), 1 larva 31 March 2015, 3 larvae 25 April 2018 & 3 larvae 22 April 2021.

GALWAY: Lough Aughrusbeg (L5558), 5 larvae 3 April 2013 & 7 larvae 6 April 2016. Lough Ballynakill (L6457), 14 larvae 6 April 2016 & 2 larvae 3 April 2013. Lough Corrib Lower (M2734), 1 larva 12 April 2016, (M0648), 14 larvae 12 April 2016, (M1349), 23 larvae 12 April 2016, (M1650), 2 larvae 12 April 2016. Lough Corrib Upper (M1353), 6 larvae 15 April 2019, (M1049), 7 larvae 9 April 2013, (M1349), 2 larvae 9 April 2013. Lough Kylemore

(L7658), 3 larvae 3 April 2013 & 1 larva 7 April 2016.
LEITRIM: Lough Gill (G7835), 1 larva 15 April 2014. Lough Glenade (G8345), 7 larvae 9 April 2014.
MAYO: Carrowmore Lake (F8328), 14 larvae 14 April 2014.
ROSCOMMON: Lough O'Flynn (M5879), 2 larvae 10 April 2014.
***Glossosoma boltoni* Curtis, 1834**
GALWAY: Lough Ballynakill (L6457), 1 larva 3 April 2013.

HYDROPTILIDAE

***Agraylea multipunctata* Curtis, 1834**
GALWAY: Loughaunwillan (L9325), 1 larva 5 April 2016.
***Agraylea sexmaculata* Curtis, 1834 New to County Galway (Fig. 1)**
GALWAY: Ross Lake (M1936), 1 larva 11 April 2013.
***Tricholeiochiton fagesii* (Guinard, 1879) (Fig. 2)**
GALWAY: Lough Fadda (L6646), 47 larvae 2 April 2013, 1 larva 2 April 2019 & 1 larva 15 April 2021. Lough Maumwee (L9748), 1 larva, 4 April 2016 & 1 larva 19 April 2021.

ECNOMIDAE

***Ecnomus tenellus* (Rambur, 1842) New to County Tipperary**
CAVAN: Lough Sheelin (N4785), 1 larva 15 April 2013. Lough Skeagh Upper (H6500), 1 larva 15 April 2013.
CLARE: Lough Doo (R1172), 7 larvae 19 April 2021.
GALWAY: Lough Ballynakill (L6457), 1 larva 3 April 2013. Lough Beaghcauneen (L6847), 4 larvae 2 April 2013 & 1 larva 2 April 2019. Lough Enask (L6646), 2 larvae 2 April 2013. Lough Fadda (L6646), 4 larvae 2 April 2013, 10 larvae 29 April 2020 & 1 larva 15 April 2021. Lough Maumwee (L9748), 2 larvae 1 May 2020 & 1 larva 19 April 2021. Lough Nahasleam (L9744), 1 larva 1 May 2020 & 1 larva 19 April 2021. Loughanillaun (L9746), 4 larvae 17April 2019, (L9847), 1 larva 11 April 2013. Ross Lake (M1936), 1 larva 11 April 2013.
KERRY: Lough Brin (V7877), 2 larvae 24 April 2020. Lough Caragh (V7290), 9 larvae 27 April 2020. Upper Lake (V9282), 1 larva 8 April 2021.
LEITRIM: Lough Macnean Lower (H0238), 1 larva 23 March 2016.
MAYO: Carrowmore Lake (F8328), 1 larva 13 April 2017. Lough Aille (M0780), 2 larvae 1 May 2020. Lough Urlaur (M5089), 1 larva 7 April 2017.
TIPPERARY: Lough Derg (R7186), 2 larvae 12 April 2018.

POLYCENTROPODIDAE

***Cyrnus flavidus* McLachlan, 1864 New to County Cork**

CAVAN: Lough Mushlin (H6201), 6 larvae 21 March 2016.

CORK: Lough Allua (W1865), 8 larvae 24 April 2020.

DONEGAL: Lough Anure (B8116), 3 larvae 13 May 2015.

FERMANAGH Lough Macnean Lower (H0938), 1 larva 25 April 2019.

GALWAY: Lough Fadda (L6646), 2 larvae 29 April 2020 & 1 larva 15 April 2021. Lough Lettercraffroe (M0536), 5 larvae 17 April 2019.

LEITRIM: Lough Glenade (G8345), 1 larva 24 April 2020. Lough Macnean Upper (H0238), 1 larva 23 March 2016.

MAYO: Lough Beltra (M0899), 4 larvae 27 April 2020.

ROSCOMMON: Lough O'Flynn (M5879), 10 larvae 28 April 2020.

SLIGO: Lough Gill (G7132), 1 larva 28 April 2020.

TIPPERARY: Lough Derg (M8401), 3 larvae 21 April 2021.

***Cyrnus trimaculatus* (Curtis, 1834)**

CAVAN: Lough Skeagh Upper (H6500), 7 larvae 15 April 2013.

CLARE: Lough Lickeen (R1690), 4 larvae 19 April 2021.

CORK: Lough Allua (W1865), 10 larvae 12 April 2017.

DONEGAL: Lough Fern (C1824), 1 larva 25 April 2018. Lough Kiltooris (G6797), 1 larva 23 April 2021. Lough Nasnanida (B8507), 2 larvae 23 April 2021.

GALWAY: Lough Ardderry (L9746), 2 larvae 11 April 2019. Lough Aughrusbeg (L5558), 1 larva 6 April 2016. Lough Beaghcauneen (L6847), 59 larvae 2 April 2013 & 1 larva 2 April 2019. Lough Enask (L6646), 3 larvae 6 April 2016. Lough Fadda (L6646), 2 larvae 29 April 2020 & 8 larvae 15 April 2021. Lough Seecon (M0835), 4 larvae 13 April 2016. Lough Shindilla (L9545), 1 larva 9 April 2013. Ross Lake (M1936), 5 larvae 11 April 2013.

KERRY: Lough Cam (Q5907), 12 larvae 9 April 2014, 16 larvae 11 April 2017, 3 larvae 2 April 2019, 2 larvae 2020 & 15 larvae 13 April 2021. Lough Caragh (V7290), 1 larva 27 April 2020. Upper Lake (V9282), 2 larvae 8 April 2021.

LEITRIM: Lough Gill (G7835), 4 larvae 13 April 2017. Lough Glenade (G8345), 1 larva 24 April 2020. Lough Macnean Upper (H0238), 1 larva 26 April 2019.

MAYO: Lough Acorrymore (F5705), 1 larva 9 April 2014 & 4 larvae 29 April 2020. Lough Beltra (M0899), 1 larva 27 April 2017. Lough Carra (M1673), 10 larvae 10 April 2017.

MONAGHAN: Lough Muckno (H8319), 2 larvae 16 April 2013 & 33 larvae 22 March 2016.

SLIGO: Lough Talt (G4014), 2 larvae 9 April 2014.

TIPPERARY: Lough Derg (M8401), 12 larvae 21 April 2021, (R7186), 1 larva 12 April 2018.

WICKLOW: Lough Bray Lower (O1316), 1 larva 11 April 2018 & 8 larvae 14 April 2021.

***Holocentropus dubius* (Rambur, 1842)**
GALWAY: Lough Enask (L6646), 3 larvae 6 April 2016.
SLIGO: Lough Gill (G7132), 3 larvae 15 April 2014.
***Holocentropus picicornis* (Stephens, 1836)**
GALWAY: Lough Ardderry (L9746), 5 larvae 11 April 2019. Lough Ballynakill (L6457), 6 larvae 3 April 2013. Lough Fadda (L6646), 5 larvae 15 April 2021. Lough Nahasleam (L9744), 2 larvae 19 April 2021.
KERRY: Lough Cam (Q5907), 8 larvae 13 April 2021. Muckross Lake (V9485), 2 larvae 30 April 2020.
MAYO: Lough Glencullin (L8169), 5 larvae 20 April 2021. Lough Urlaur (M5089), 1 larva 7 April 2017.
SLIGO: Templehouse Lake (G6118), 31 larvae 16 April 2014.
***Neureclipsis bimaculata* (Linnaeus, 1758)**
GALWAY: Lough Fadda (L6646), 5 larvae 15 April 2021.
***Plectrocnemia conspersa* (Curtis, 1834)**
CAVAN: Lough Derrybrick (H3510), 5 larvae 23 March 2016, (H3412), 2 larvae 23 March 2016. Lough Mushlin (H6201), 5 larvae 15 April 2013 & 27 larvae 21 March 2016.
CLARE: Lough Doo (R1172), 1 larva 19 April 2018 & 9 larvae 29 April 2020. Lough Naminna (R1871), 16 larvae 19 April 2018 & 3 larvae 19 April 2021.
CORK: Lough Glenbeg (V7053), 1 larva 10 April 2017.
DONEGAL: Lough Barra (B9212), 1 larva 24 April 2018, 1 larva 5 May 2020 & 4 larvae 23 April 2021. Lough Fern (C1824), 1 larva 25 April 2018. Lough Kindrum (C1943), 5 larvae 25 April 2018. Lough Sessiagh (Loch an tSeisigh) (C0436), 1 larva 31 March 2015.
FERMANAGH: Lough Macnean Lower (H1038), 1 larva 21 April 2013, (H0938), 6 larvae 23 March 2016.
GALWAY: Lough Ardderry (L9746), 1 larva 11 April 2019, (L9845), 9 larvae 9 April 2013. Lough Aughrusbeg (L5558), 12 larvae 3 April 2013, 3 larvae 6 April 2016 & 4 larvae 4 April 2019. Lough Ballynakill (L6457), 5 larvae 6 April 2016 & 1 larva 3 April 2019. Lough Beaghcauneen (L6847), 27 larvae 2 April 2019. Lough Bofin (M0343), 1 larva 11 April 2019 & 10 larvae 29 April 2020. Lough Corrib Lower (M2531), 5 larvae 12 April 2016, (M2734), 1 larva 22 April 2013 & 33 larvae 12 April 2016, (M2837), 5 larvae 16 April 2019, (M2737), 3 larvae 22 April 2013 & 5 larvae 12 April 2016. Lough Corrib Upper (M1049), 1 larva 15 April 2019, (M1749), 1 larva 15 April 2019, (M1349), 6 larvae 12 April 2016, (M1650), 17 larvae 12 April 2016, (M0648), 2 larvae 12 April 2016. Lough Derryclare (L8449), 3 larvae 3 April 2019. Lough Enask (L6646), 14 larvae 2 April 2013, 33 larvae 6 April 2016 & 4 larvae 2 April 2019. Lough Fadda (L6646), 51 larvae 2 April 2013, 16 larvae 6 April 2016, 12 larvae 2 April 2019,

39 larvae 29 April 2020 & 13 larvae 15 April 2021. Lough Illauntrasna (L8825), 1 larva 5 April 2016. Lough Kylemore (L7658), 1 larva 3 April 2013. Lough Lettercraffroe (M0537), 3 larvae 28 April 2016. Lough Maumwee (L9748), 1 larva 10 April 2019 & 6 larvae 19 April 2021. Lough Nahasleam (L9744), 1 larva 5 April 2016, 25 larvae 1 May 2020 & 4 larvae 19 April 2021. Lough Nambrackmore (L7145), 3 larvae 5 April 2016. Lough Rea (M6214), 1 larva 1 April 2013. Lough Seecon (M0835), 2 larvae 13 April 2016 & 3 larvae 10 April 2019. Lough Shindilla (L9545), 1 larva 9 April 2013 & 1 larva 10 April 2019. Loughaunwillan (L9325), 1 larva 8 April 2013, 2 larvae 5 April 2016 & 15 larvae 9 April 2019. Ross Lake (M1936), 2 larvae 11 April 2013 & 4 larvae 13 April 2016.

KERRY: Lough Acoose (V75851), 4 larvae 4 April 2014. Lough Brin (V7877), 2 larvae 9 April 2014 & 2 larvae 11 April 2017. Lough Cam (Q5907), 23 larvae 9 April 2014, 18 larvae 11 April 2017, 6 larvae 2 April 2019, 5 larvae 2020 & 28 larvae 13 April 2021. Lough Caragh (V7290), 3 larvae 11 April 2017 & 1 larva 27 April 2020. Lough Cloonaghlin (V6070), 1 larva 27 April 2020. Lough Leane (V9488), 8 larvae 12 April 2017, (V9090), 4 larvae 12 April 2017. Upper Lake (V9282), 2 larvae 30 April 2020 & 2 larvae 8 April 2021.

LEITRIM: Lough Gill (G7835), 3 larvae 15 April 2014 & 18 larvae 13 April 2017. Lough Glencar (G7543), 1 larva 14 April 2014 & 2 larvae 24 April 2020. Lough Melvin (G8853), 1 larva 24 April 2020.

MAYO: Carrowmore Lake (F8328), 4 larvae 13 April 2017. Lough Acorrymore (F5705), 7 larvae 9 April 2014, 6 larvae 13 April 2017 & 7 larvae 29 April 2020. Lough Beltra (M0899), 1 larva 10 April 2014. Lough Carra (M1673), 1 larva 11 April 2014 & 8 larvae 10 April 2017. Lough Cullin (G2301), 4 larvae 10 April 2014 & 25 larvae 21 April 2017. Lough Glencullin (L8169), 4 larvae 12 April 2017, 2 larvae 4 April 2019 & 16 larvae 1 May 2020. Lough Urlaur (M5089), 4 larvae 9 April 2014.

MONAGHAN: Lough Muckno (H8319), 1 larva 16 April 2013 & 10 larvae 22 March 2016.

ROSCOMMON: Lough Cavetown (M8317), 1 larva 10 April 2014. Lough O'Flynn (M5879), 1 larva 10 April 2014.

SLIGO: Lough Arrow (G7913), 2 larvae 15 April 2014. Lough Easky (G4423), 1 larva 15 April 2014, 3 larvae 12 April 2017, 1 larva 5 April 2019 & 1 larva 29 April 2020. Lough Gill (G7132), 1 larva 15 April 2014. Lough Talt (G4014), 3 larvae 9 April 2014. Templehouse Lake (G6118), 3 larvae 16 April 2014.

TIPPERARY: Lough Derg (R7186), 3 larvae 12 April 2018, (M8401), 2 larvae 12 April 2018.

WESTMEATH: Lough Owel (N4256), 1 larva 14 April 2013. Lough Sheelin (N4482), 6 larvae 15 April 2013.

WICKLOW: Lough Bray Lower (O1316), 3 larvae 11 April 2018 & 33 larvae 14 April 2021. Upper Lake (T1096), Glendalough, 4 larvae 27 April 2020 & 1 larva 15 April 2021.

PSYCHOMYIIDAE

***Lype phaeopa* (Stephens, 1836)**

CAVAN: Lough Derrybrick (H3412), 1 larva 22 April 2013. Lough Sheelin (N4785), 1 larva 15 April 2013. Lough Skeagh Upper (H6500) 1 larva 9 April 2019.

CLARE: Lough Alewnaghta (R7691), 3 larvae 17 April 2018.

GALWAY: Lough Shindilla (L9545), 1 larva 9 April 2013.

TIPPERARY: Lough Derg (R7186), 1 larva 12 April 2018.

***Lype reducta* (Hagen, 1868) New to County Cavan (Fig. 3)**

CAVAN: Lough Sheelin (N4785), 1 larva 15 April 2013.

***Psychomyia fragilis* (Pictet, 1834) New to County Leitrim**

GALWAY: Lough Corrib Lower (M2734), 5 larvae 22 April 2013 & 22 larvae 12 April 2016. Lough Corrib Upper (M1349), 5 larvae 9 April 2013, (M1650), 7 larvae 12 April 2016.

LEITRIM: Lough Gill (G7835), 1 larva 13 April 2017.

MAYO: Lough Carra (M1673), 2 larvae 11 April 2014. Lough Cullin (G2301), 1 larva 21 April 2017. Lough Urlaur (M5089), 13 larvae 9 April 2014 & 4 larvae 7 April 2017.

ROSCOMMON: Lough O'Flynn (M5879), 2 larvae 10 April 2014.

SLIGO: Lough Arrow (G7811), 1 larva 15 April 2014.

***Psychomyia pusilla* (Fabricius, 1781)**

GALWAY: Lough Corrib Lower (M2837), 8 larvae 16 April 2019, (M2534), 6 larvae 16 April 2019. Lough Corrib Upper (M1749), 25 larvae 15 April 2019. Lough Rea (M6214), 28 larvae 1 April 2013.

MAYO: Lough Carra (M1673), 16 larvae 23 April 2020. Lough Cullin (G2304), 4 larvae 23 April 2020, (G2301), 7 larvae 24 April 2020. Lough Urlaur (M5089), 21 larvae 28 April 2020.

***Tinodes waeneri* (Linnaeus, 1758)**

CAVAN: Lough Corglass (H3409), 5 larvae 22 March 2016. Lough Derrybrick (H3510), 32 larvae 22 April 2013, 33 larvae 23 March 2016 & 7 larvae 18 April 2019, (H3412), 3 larvae 22 April 2013 & 9 larvae 23 March 2016. Lough Macnean Upper (H0637), 15 larvae 26 April 2019. Lough Mushlin (H6201), 7 larvae 15 April 2013, 1 larva 21 March 2016 & 4 larvae 9 April 2019. Lough Sheelin (N4785), 1 larva 2019. Lough Skeagh (H6500), 2 larvae 21 March 2016.

CLARE: Lough Alewnaghta (R7691), 35 larvae 29 April 2015, 7 larvae 17 April 2018 & 12 larvae 22 April 2021. Lough Bunny (R3796), 4 larvae 20 April 2021. Lough Cullaun (R3190), 2 larvae 20 April 2021. Lough Dromore (R3485), 1 larva 21 April 2021. Lough Gortglass (R2259), 4 larvae 16 April 2018 & 3 larvae 19 April 2021. Lough Inchicronan (R3986), 1 larva 19 April 2018 & 2 larvae 21 April 2021. Lough Lickeen (R1690), 8 larvae 19 April 2021. Lough Muckanagh (R3692), 2 larvae 17 April 2018 & 5 larvae 20 April 2021. Lough Naminna

(R1871), 3 larvae 29 April 2020.
CORK: Lough Allua (W1865), 28 larvae 2 April 2014. Lough Glenbeg (V7053), 2 larvae 3 April 2014 & 15 larvae 24 April 2020.
DONEGAL: Lough Anure (B8116), 6 larvae 21 April 2021. Lough Dunglow (B7811), 1 larva 21 April 2021. Lough Fern (C1822), 6 larvae 25 April 2018 & 9 larvae 22 April 2021. Lough Glen (C0928), 2 larvae 2021. Lough Kiltooris (G6797), 1 larva 23 April 2021. Lough Kindrum (C1943), 2 larvae 22 April 2021. Lough Sessiagh (Loch an tSeisigh) (C0436), 4 larvae 31 March 2015, 37 larvae 25 April 2018 & 40 larvae 22 April 2021. Lough Unshin (G9463), 1 larva 14 April 2021.
FERMANAGH: Lough Macnean Lower (H1038), 24 larvae 21 April 2013, (H0938), 20 larvae 23 March 2016 & 8 larvae 25 April 2019. Lough Melvin (G9353), 1 larva 10 April 2014 & 2 larvae 24 April 2020.
GALWAY: Lough Aughrusbeg (L5558), 8 larvae 3 April 2013 & 39 larvae 6 April 2016. Lough Ballynakill (L6457), 4 larvae 6 April 2016. Lough Beaghcauneen (L6847), 7 larvae 2 April 2013, 6 larvae 6 April 2016 & 1 larva 2 April 2019. Lough Corrib Lower (M2531), 1 larva 12 April 2016 & 8 larvae 16 April 2019, (M2737), 2 larvae 22 April 2013 & 28 larvae 12 April 2016, (M2534), 9 larvae 16 April 2019. Lough Corrib Upper (M1049), 1 larva 9 April 2013, (M1650), 7 larvae 12 April 2016. Lough Enask (L6646), 2 larvae 2 April 2019. Lough Fadda (L6646), 1 larva 6 April 2016 & 6 larvae 29 April 2020. Lough Lettercraffroe (M0536), 2 larvae 17 April 2019. Lough Maumwee (L9748), 1 larva 10 April 2019, 8 larvae 1 May 2020 & 3 larvae 19 April 2021. Lough Nahasleam (L9744), 1 larva 1 May 2020 & 2 larvae 19 April 2021. Lough Nambrackmore (L7145), 1 larva 5 April 2016. Ross Lake (M2036), 29 larvae 16 April 2019. Lough Rea (M6214), 55 larvae 1 April 2013, 29 larvae 4 April 2016 & 17 larvae 1 April 2019. Lough Seecon (M0835), 1 larva 11 April 2013, 2 larvae 13 April 2016 & 7 larvae 10 April 2019. Loughanillaun (L9746), Maam Cross, 15 larvae 17 April 2019. Loughaunwillan (L9325), 13 larvae 8 April 2013, 6 larvae 5 April 2016 & 2 larvae 9 April 2019. Ross Lake (M1936), 8 larvae 13 April 2016.
KERRY: Lough Acoose (V7585), 11 larvae 27 April 2020 & 1 larva 4 April 2014. Lough Allua (W1865), 46 larvae 24 April 2020. Lough Brin (V7877), 13 larvae 9 April 2014, 4 larvae 11 April 2017 & 24 larvae 24 April 2020. Lough Cam (Q5907), 35 larvae 9 April 2014, 23 larvae 11 April 2017, 4 larvae 2 April 2019, 9 larvae 2020 & 33 larvae 13 April 2021. Lough Caragh (V7290), 2 larvae 11 April 2017 & 2 larvae 27 April 2020. Lough Cloonaghlin (V6070), 1 larva 4 April 2014. Lough Leane (V9090), 2 larvae 27 April 2020. Muckross Lake (V9485), 2 larvae 30 April 2020.
LEITRIM: Lough Gill (G7835), 11 larvae 15 April 2014, 26 larvae 13 April 2017 & 2 larvae 28 April 2020. Lough Glenade (G8345), 167 larvae 9 April 2014 & 9 larvae 24 April 2020.

Lough Glencar (G7543), 2 larvae 14 April 2014 & 3 larvae 24 April 2020. Lough Macnean Upper (H0238), 3 larvae 21 April 2013. Lough Melvin (G8853), 1 larva 10 April 2014 & 5 larvae 24 April 2020, (G8255), 1 larva 24 April 2020.
LIMERICK: Lough Gur (R6441), 52 larvae 22 April 2021.
MAYO: Carrowmore Lake (F8328), 2 larvae 14 April 2014, 3 larvae 13 April 2017 & 23 larvae 27 April 2020. Lough Acorrymore (F5705), 7 larvae 9 April 2014, 40 larvae 13 April 2017 & 65 larvae 29 April 2020. Lough Aille (M0780), 11 larvae 1 May 2020. Lough Beltra (M0899), 6 larvae 27 April 2020. Lough Carra (M1970), 1 larva 11 April 2014 & 22 larvae 23 April 2020, (M1673), 12 larvae 11 April 2014, 1 larva 10 April 2017 & 33 larvae 23 April 2020. Lough Cullin (G2304), 2 larvae 10 April 2014, 1 larvae 21 April 2017 & 7 larvae 23 April 2020, (G2301), 1 larvae 10 April 2014 & 24 larvae 21 April 2017. Lough Glencullin (L8169), 1 larva 1 May 2020 & 2 larvae 20 April 2021. Lough Moher (L9777), 14 larvae 30 April 2020. Lough Urlaur (M5089), 119 larvae 9 April 2014, 32 larvae 7 April 2017 & 40 larvae 28 April 2020.
MEATH: Lough Bane (N5571), 15 larvae 14 April 2016.
MONAGHAN: Lough Egish (H7814), 10 larvae 16 April 2013 & 1 larva 12 April 2019. Lough Muckno (H8319), 1 larva 16 April 2013 & 35 larvae 22 March 2016.
ROSCOMMON: Lough Annaghmore (M9083), 4 larvae 5 April 2017. Lough Cavetown (M8397), 1 larva 10 April 2014. Lough Meelagh (G9011), 13 larvae 10 April 2014 & 4 larvae 23 April 2020. Lough O'Flynn (M5879), 101 larvae 10 April 2014 & 526 larvae 28 April 2020.
SLIGO: Lough Arrow (G7811), 1 larva 28 April 2020, (G7913), 2 larvae 15 April 2014 & 5 larvae 28 April 2020. Lough Easky (G4423), 1 larva 15 April 2014 & 12 larvae 29 April 2020. Lough Gill (G7132), 8 larvae 15 April 2014 & 7 larvae 28 April 2020. Lough Talt (G4014), 1 larva 9 April 2014. Templehouse Lake (G6118), 2 larvae 16 April 2014 & 1 larva 30 April 2020.
TIPPERARY: Lough Derg (M8401), 9 larvae 12 April 2018 & 67 larvae 21 April 2021, (R7186), 40 larvae 12 April 2018 & 22 larvae 21 April 2021.
WESTMEATH: Lough Owel (N4256), 2 larvae 14 April 2016. Lough Sheelin (N4482), 15 larvae 15 April 2013.
WICKLOW: Lough Bray Lower (O1316), 6 larvae 11 April 2018.

HYDROPSYCHIDAE

***Hydropsyche siltalai* Döhler, 1963 New to County Roscommon**
ROSCOMMON: Lough Annaghmore (M9083), 1 larva 23 April 2020.

The specimen was probably washed into the turlough from a feeder stream.

PHRYGANEIDAE

***Agrypnia obsoleta* (Hagen, 1864)**
MAYO: Lough Carra (M1673), 1 larva 11 April 2014.
***Agrypnia varia* (Fabricius, 1793)**
MAYO: Lough Carra (M1673), 1 larva 23 April 2020.
***Phryganea grandis* Linnaeus, 1758**
CLARE: Lough Bunny (R3796), 1 larva 17 April 2018.

GOERIDAE

***Goera pilosa* (Fabricius, 1775)**
CAVAN: Lough Corglass (H3409), 1 larva 22 March 2016. Lough Derrybrick (H3510), 1 larva 23 March 2016, (H3412), 8 larvae 23 March 2016.
CLARE: Lough Lickeen (R1690), 1 larva 18 April 2018.
DONEGAL: Lough Akibbon (C0718), 1 larva 25 April 2018.
FERMANAGH: Lough Melvin (G9353), 1 larva 24 April 2020.
GALWAY: Lough Bofin (M0343), 1 larva 29 April 2020. Loughaunwillan (L9325), 1 larva 8 April 2013.
LEITRIM: Lough Glenade (G8345), 2 larvae 9 April 2014.
MAYO: Lough Beltra (M0899), 3 larvae 27 April 2020.
TIPPERARY: Lough Derg (M8401), 2 larvae 21 April 2021.
WESTMEATH: Lough Lene (N5368), 1 larva 14 April 2016.

LEPIDOSTOMATIDAE

***Lepidostoma hirtum* (Fabricius, 1775)**
CAVAN: Lough Corglass (H3409), 3 larvae 22 March 2016. Lough Derrybrick (H3510), 1 larva 22 April 2013.
CLARE: Lough Alewnaghta (R7691), 1 larva 17 April 2018 & 1 larva 22 April 2021. Lough Gortglass (R2259), 1 larva 16 April 2018 & 1 larva 19 April 2021. Lough Naminna (R1871), 3 larvae 2019.
DONEGAL: Lough Akibbon (C0718), 3 larvae14 April 2021. Lough Anure (B8116), 5 larvae 21 April 2021. Lough Barra (B9212), 6 larvae 24 April 2018 & 1 larva 23 April 2021. Lough Beagh (Veagh) (C0221), 1 larva 25 April 2018. Lough Derg (H0973), 13 larvae 14 April 2021. Lough Gartan (C0616), 14 larvae 14 April 2021. Lough Glen (C0928), 2 larvae 2021. Lough Kiltooris (G6797), 6 larvae 23 April 2021. Lough Kindrum (C1943), 2 larvae 25 April 2018 & 1 larva 22 April 2021. Lough Sessiagh (Loch an tSeisigh) (C0436), 3 larvae 25 April 2018 & 3 larvae 22 April 2021. Lough Unshin (G9463), 8 larvae 14 April 2021.

FERMANAGH: Lough Macnean Lower (H0938), 1 larva 23 March 2016. Lough Melvin (G9353), 2 larvae 24 April 2020.
GALWAY: Ballynahinch Lake (L7847), 8 larvae 2 April 2013, 3 larvae 5 April 2016 & 8 larvae 3 April 2019. Lough Ardderry (L9845), 7 larvae 9 April 2013 & 3 larvae 4 April 2016. Lough Aughrusbeg (L5558), 1 larva 3 April 2013 & 4 larvae 6 April 2016. Lough Ballynakill (L6457), 24 larvae 3 April 2013, 24 larvae 6 April 2016 & 13 larvae 3 April 2019. Lough Beaghcauneen (L6847), 4 larvae 2 April 2013 & 1 larva 6 April 2016. Lough Bofin (M0343), 3 larvae 9 April 2013. Lough Corrib Lower (M2734), 8 larvae 22 April 2013 & 14 larvae 12 April 2016, (M2837), 41 larvae 16 April 2019, (M2737), 3 larvae 22 April 2013 & 7 larvae 12 April 2016, (M2534), 3 larvae 16 April 2019, (M2531), 2 larvae 12 April 2016. Lough Corrib Upper (M1049), 1 larva 9 April 2013 & 6 larvae 15 April 2019, (M0648), 2 larvae 12 April 2016, (M1349), 2 larvae 9 April 2013, (M1749), 1 larva 15 April 2019. Lough Derryclare (L8449), 19 larvae 3 April 2019 & 8 larvae 2 April 2013, (M0649), 9 larvae 22 April 2016. Lough Enask (L6646), 1 larva 6 April 2016 & 1 larva 2 April 2019. Lough Fadda (L6646), 4 larvae 2 April 2013, 20 larvae 6 April 2016, 5 larvae 2 April 2019 & 13 larvae 15 April 2021. Lough Fern (C1822), 5 larvae 22 April 2021. Lough Kylemore (L7658), 1 larva 4 April 2016 & 2 larvae 3 April 2019. Lough Lettercraffroe (M0537), 7 larvae 11 April 2013 & 17 larvae 28 April 2016. Lough Maumwee (L9748), 2 larvae 9 April 2013 & 5 larvae 4 April 2016. Lough Nahasleam (L9744), 10 larvae 8 April 2013 & 7 larvae 5 April 2016. Lough Nambrackmore (L7145), 20 larvae 5 April 2016 & 6 larvae 2 April 2019. Lough Pollacappul (L7558), 3 larvae 3 April 2013 & 5 larvae 7 April 2016. Lough Rea (M6214), 4 larvae 1 April 2013 & 6 larvae 4 April 2016. Lough Seecon (M0835), 4 larvae 13 April 2016. Lough Shindilla (L9545), 2 larvae 5 April 2016 & 1 larva 10 April 2019. Loughanillaun (L9847), 6 larvae 11 April 2013, (L9746), 4 larvae 17 April 2019, (L9847), 54 larvae 13 April 2016. Loughaunwillan (L9325), 8 larvae 8 April 2013, 6 larvae 5 April 2016 & 7 larvae 9 April 2019. Ross Lake (M2036), 5 larvae 16 April 2019, (M1936), 5 larvae 13 April 2016.
KERRY: Lough Acoose (V7585), 2 larvae 4 April 2014, 5 larvae 10 April 2017 & 3 larvae 27 April 2020. Lough Cam (Q5907), 1 larva 11 April 2017 & 5 larvae 2 April 2019. Lough Caragh (V7290), 11 larvae 11 April 2017 & 6 larvae 27 April 2020. Lough Caum (Q5907), 1 larva 13 April 2021. Lough Leane (V9090), 1 larva 10 April 2014.
LEITRIM: Lough Glenade (G8345), 7 larvae 9 April 2014. Lough Glencar (G7543), 19 larvae 14 April 2014. Lough Gill (G7835), 5 larvae 15 April 2014, 26 larvae 13 April 2017 & 1 larva 28 April 2020. Lough Melvin (G8853), 1 larva 10 April 2014.
MAYO: Carrowmore Lake (F8328), 50 larvae 14 April 2014 & 6 larvae 27 April 2020. Lough Aille (M0780), 1 larva 1 May 2020. Lough Beltra (M0899), 6 larvae 10 April 2014, 9 larvae 27 April 2017 & 9 larvae 27 April 2020. Lough Bofin (M0343), 1 larva 29 April 2020 & 8 larvae

19 April 2021. Lough Carra (M1970), 1 larva 11 April 2014, (M1673), 1 larva 11 April 2014 & 10 larvae 10 April 2017. Lough Cullin (G2304), 4 larvae 10 April 2014, (G2301), 52 larvae 10 April 2014 & 3 larvae 21 April 2017. Lough Doo (L8368), 2 larvae 11 April 2014, 3 larvae 12 April 2017 & 4 larvae 1 May 2020. Lough Glencullin (L8169), 24 larvae 4 April 2014 & 246 larvae 12 April 2017.
MEATH: Lough Bane (N5571), 1 larva 14 April 2016.
MONAGHAN: Lough Egish (H7814), 1 larva 16 April 2013 & 1 larva 22 March 2016.
ROSCOMMON: Lough Cavetown (M8397), 1 larva 10 April 2014. Lough Meelagh (G9011), 2 larvae 10 April 2014. Lough O'Flynn (M5879), 5 larvae 28 April 2020.
SLIGO: Lough Arrow (G7913), 3 larvae 15 April 2014. Lough Easky (G4423), 45 larvae 12 April 2017, 6 larvae 5 April 2019, 25 larvae 29 April 2020 & 28 larvae 16 April 2021. Lough Gill (G7132), 1 larva 15 April 2014.
TIPPERARY: Lough Derg (R7186), 7 larvae 12 April 2018, (M8401), 1 larva 21 April 2021.
WESTMEATH: Lough Sheelin (N4482), 1 larva 15 April 2013.
WICKLOW: Lough Bray Lower (O1316), 12 larvae 11 April 2018 & 74 larvae 14 April 2021. Lough Tay (O1607), 178 larvae 13 April 2021. Upper Lake (T1096), Glendalough, 1 larva 12 April 2018 & 1 larva 27 April 2020.

APATANIIDAE

***Apatania auricula* (Forsslund, 1930)**
KERRY: Lough Acoose (V7585), 2 larvae 10 April 2017 & 4 larvae 11 April 2017. Lough Brin (V7877), 2 larvae 9 April 2014.
***Apatania wallengreni* McLachlan, 1871 New to County Cavan (Fig. 4)**
CAVAN: Lough Derrybrick (H3412), 3 larvae 23 March 2016.

LIMNEPHILIDAE

***Drusus annulatus* (Stephens, 1837)**
GALWAY: Lough Corrib Upper (M1353), 2 larvae 15 April 2019, (M1749), 9 larvae 15 April 2019, (M1049), 1 larva 9 April 2013, (M1349), 3 larvae 9 April 2013.
LEITRIM: Lough Gill (G7835), 1 larva 13 April 2017.
***Chaetopteryx villosa* (Fabricius, 1798)**
KERRY: Lough Caragh (V7088), 1 larva 4 April 2014.
***Anabolia nervosa* (Curtis, 1834)**
CAVAN: Lough Derrybrick (H3510), 2 larvae 22 April 2013 & 8 larvae 23 March 2016, (H3412), 11 larvae 23 March 2016. Lough Mushlin (H6201), 1 larva 9 April 2019.
CLARE: Lough Cullaun (R3190), 1 larva 20 April 2021. Lough Muckanagh (R3692), 2 larvae

17 April 2018.
DONEGAL: Lough Akibbon (C0718), 2 larvae 30 March 2015. Lough Derg (H0973), 56 larvae 14 April 2021. Lough Fern (C1822), 2 larvae 22 April 2021.
FERMANAGH: Lough Macnean Lower (H0938), 2 larvae 23 March 2016 & 1 larva 25 April 2019, (H1038), 1 larva 21 April 2013. Lough Melvin (G9353), 14 larvae 10 April 2014.
GALWAY: Lough Bofin (M0343), 16 larvae 19 April 2021. Lough Corrib Lower (M2734), 9 larvae 12 April 2016.
LEITRIM: Lough Glenade (G8345), 3 larvae 9 April 2014. Lough Macnean Upper (H0238), 1 larva 21 April 2013, 3 larvae 23 March 2016 & 4 larvae 26 April 2019. Lough Melvin (G8255), 3 larvae 24 April 2020, (G8853), 1 larva 10 April 2014.
LIMERICK: Lough Gur (R6441), 14 larvae 22 April 2021.
MAYO: Lough Aille (M0780), 11 larvae 11 April 2014 & 1 larva 1 May 2020. Lough Carra (M1673), 1 larva 10 April 2017. Lough Cullin (G2304), 15 larvae 10 April 2014, 1 larva 21 April 2017 & 1 larva 23 April 2020, (G2301), larvae 21 April 2017. Lough Moher (L9777), 1 larva 30 April 2020. Lough Urlaur (M5089), 2 larvae 9 April 2014 & 1 larva 28 April 2020.
MEATH: Annagh (White) Lake (N5172), 1 larva 18 April 2019. Lough Bane (N5571), 1 larva 14 April 2016 & 4 larvae 10 April 2019.
MONAGHAN: Lough Egish (H7814), 11 larvae 16 April 2013 & 15 larvae 22 March 2016. Lough Muckno (H8319), 31 larvae 22 March 2016.
ROSCOMMON: Lough Annaghmore (M9083), 1 larva 5 April 2017. Lough Meelagh (G9011), 5 larvae 10 April 2014.
SLIGO: Lough Arrow (G7811), 2 larvae 15 April 2014 & 6 larvae 28 April 2020, (G7913), 1 larva 15 April 2014. Lough Gill (G7132), 1 larva 28 April 2020. Templehouse Lake (G6118), 3 larvae 16 April 2014.
WESTMEATH: Lough Lene (N5368), 2 larvae 14 April 2016 & 4 larvae 10 April 2019. Lough Sheelin (N4482), 9 larvae 15 April 2013.

***Glyphotaelius pellucidus* (Retzius, 1783)**

GALWAY: Lough Ballynakill (L6457), 1 larva 3 April 2013.

***Limnephilus decipiens* (Kolenati, 1848)**

MAYO: Lough Cullin (G2301), 3 larvae 10 April 2014.

***Limnephilus flavicornis* (Fabricius, 1787)**

FERMANAGH: Lough Macnean Lower (H1038), 2 larvae 21 April 2013. Lough Melvin (G9353), 1 larva 24 April 2020.
GALWAY: Lough Nahasleam (L9744), 1 larva 8 April 2013.
MAYO: Lough Carra (M1673), 1 larva 11 April 2014.
MEATH: Lough Bane (N5571), 2 larvae 10 April 2019.

MONAGHAN: Lough Muckno (H8319), 1 larva 12 April 2019.
ROSCOMMON: Lough Annaghmore (M9083), 1 larva 23 April 2020.

***Limnephilus lunatus* Curtis, 1834**

CAVAN: Lough Derrybrick (H3510), 3 larvae 22 April 2013 & 4 larvae 23 March 2016, (H3412), 8 larvae 23 March 2016.
CLARE: Lough Alewnaghta (R7691), 4 larvae 29 April 2015 & 1 larva 17 April 2018. Lough Dromore (R3485), 2 larvae 21 April 2021. Lough Gortglass (R2259), 2 larvae 19 April 2021. Lough Lickeen (R1690), 1 larva 19 April 2021.
DONEGAL: Lough Akibbon (C0718), 4 larvae 30 March 2015, 1 larva 25 April 2018 & 10 larvae 14 April 2021. Lough Fern (C1822), 1 larva 22 April 2021.
FERMANAGH: Lough Macnean Lower (H0938), 26 larvae 23 March 2016 & 1 larva 25 April 2019, (H1038), 2 larvae 21 April 2013. Lough Melvin (G9353), 2 larvae 10 April 2014.
GALWAY: Lough Bofin (M0343), 2 larvae 4 April 2016, 1 larva 11 April 2019 & 1 larva 19 April 2021. Lough Corglass (H3409), 1 larva 22 March 2016. Lough Corrib Lower (M2837), 1 larva 16 April 2019, (M2734), 42 larvae 12 April 2016, (M2534), 4 larvae16 April 2019. Lough Corrib Upper (M1349), 2 larvae 12 April 2016, (M1650), 7 larvae 12 April 2016, (M1049), 4 larvae 9 April 2013 & 3 larvae 15 April 2019, (M0648), 10 larvae 12 April 2016. Lough Derryclare (L8449), 1 larva 2 April 2013 & 2 larvae 22 April 2016. Lough Enask (L6646), 3 larvae 2 April 2013, 3 larvae 6 April 2016 & 1 larva 2 April 2019. Lough Fadda (L6645), 1 larva 6 April 2016. Lough Illauntrasna (L8825), 1 larva 5 April 2016. Lough Lettercraffroe (M0536), 1 larva 17 April 2019. Lough Pollacappul (L7558), 1 larva 7 April 2016 & 1 larva 3 April 2019. Lough Seecon (M0835), 2 larvae 13 April 2016 & 2 larvae 10 April 2019. Loughanillaun (L9746), 3 larvae 17 April 2019, (L9847), 7 larvae 13 April 2016. Loughaunwillan (L9325), 1 larva 5 April 2016. Ross Lake (M2036), 3 larvae 16 April 2019, (M1936), 4 larvae 13 April 2016.
KERRY: Lough Cam (Q5907), 2 larvae 2 April 2019. Lough Caragh (V7290), west shore, 6 larvae 11 April 2017 & 2 larvae 27 April 2020. Muckross Lake (V9585), 4 larvae 30 April 2020. Upper Lake (V9282), 1 larva 30 April 2020.
LEITRIM: Lough Gill (G7835), 2 larvae 15 April 2014 & 9 larvae 13 April 2017. Lough Glenade (G8345), 9 larvae 9 April 2014. Lough Glencar (G7543), 15 larvae 14 April 2014 & 2 larvae 24 April 2020. Lough Macnean Upper (H0238), 2 larvae 23 March 2016.
MAYO: Lough Aille (M0780), 12 larvae 1 May 2020. Lough Carra (M1970), 8 larvae 11 April 2014 & 2 larvae 23 April 2020, (M1673), 6 larvae 10 April 2017. Lough Cullin (G2301), 1 larva 10 April 2014, 5 larvae 21 April 2017 & 4 larvae 24 April 2020, (G2304), 31 larvae 10 April 2014. Lough Moher (L9777), 2 larvae 30 April 2020. Lough Urlaur (M5089), 2 larvae 9 April 2014 & 1 larva 28 April 2020.

MEATH: Lough Bane (N5571), 5 larvae 14 April 2016 & 1 larva 10 April 2019.
MONAGHAN: Lough Egish (H7814), 1 larva 16 April 2013. White Lough (H6719), 2 larvae 22 March 2016 & 1 larva 12 April 2019.
ROSCOMMON: Lough Meelagh (G9011), 8 larvae 10 April 2014.
SLIGO: Lough Arrow (G7811), 5 larvae 15 April 2014. Lough Gill (G7132), 1 larva 15 April 2014. Templehouse Lake (G6118), 32 larvae 16 April 2014.
TIPPERARY: Lough Derg (R7186), 4 larvae 12 April 2018, (M8401), 2 larvae 21 April 2021.
WESTMEATH: Lough Sheelin (N4482), 1 larva 15 April 2013 & 5 larvae 24 March 2016.

***Limnephilus marmoratus* Curtis, 1834**

CAVAN: Lough Corglass (H3409), 1 larva 22 March 2016. Lough Derrybrick (H3510), 4 larvae 22 April 2013 & 13 larvae 23 March 2016, (H3412), 10 larvae 23 March 2016. Lough Mushlin (H6201), 1 larva 15 April 2013.
CLARE: Lough Cullaun (R3190), 2 larvae 20 April 2021. Lough Doo (R1172), 1 larva 8 April 2019, 3 larvae 29 April 2020 & 1 larva 19 April 2021. Lough Dromore (R3485), 8 larvae 21 April 2021. Lough Inchicronan (R3986), 3 larvae 21 April 2021. Lough Muckanagh (R3692), 2 larvae 17 April 2018.
DONEGAL: Lough Kiltooris (G6797), 2 larvae 23 April 2021.
FERMANAGH: Lough Macnean Lower (H0938), 29 larvae 23 March 2016.
GALWAY: Lough Corrib Lower (M2534), 2 larvae 16 April 2019. Lough Lettercraffroe (M0536), 4 larvae 17 April 2019. Lough Seecon (M0835), 3 larvae 13 April 2016. Ross Lake (M1936), 1 larva 13 April 2016.
KERRY: Upper Lake (V9282), 1 larva 8 April 2021.
LEITRIM: Lough Melvin (G8255), 8 larvae 24 April 2020.
LIMERICK: Lough Gur (R6441), 3 larvae 22 April 2021.
MAYO: Lough Aille (M0780), 2 larvae 1 May 2020. Lough Carra (M1970), 1 larva 23 April 2020. Lough Cullin (G2304), 33 larvae 10 April 2014, (G2301), 1 larva 21 April 2017.
MEATH: Lough Bane (N5571), 1 larva 14 April 2013, 4 larvae 14 April 2016 & 4 larvae 10 April 2019.
MONAGHAN: Lough Egish (H7814), 3 larvae 16 April 2013 & 5 larvae 22 March 2016. Lough Muckno (H8319), 7 larvae 22 March 2016. White Lough (H6719), 2 larvae 12 April 2019.
ROSCOMMON: Lough Annaghmore (M9083), 1 larva 9 April 2014 & 2 larvae 23 April 2020. Lough Meelagh (G9011), 1 larva 10 April 2014.
SLIGO: Templehouse Lake (G6118), 2 larvae 30 April 2020.

***Limnephilus nigriceps* (Zetterstedt, 1840)**

CAVAN: Lough Derrybrick (H3412), 1 larva 22 April 2013.

MEATH: Lough Annagh (White) (N5172), 1 larva 18 April 2019. Lough Bane (N5571), 2 larvae 10 April 2019.

***Limnephilus rhombicus* (Linnaeus, 1758) New to County Meath**

LEITRIM: Lough Macnean Upper (H0238), 1 larva 23 March 2016.

MEATH: Lough Bane (N5571), 4 larvae 10 April 2019.

***Limnephilus sparsus* Curtis, 1834**

GALWAY: Lough Ardderry (L9845), 1 larva 4 April 2016.

***Limnephilus vittatus* (Fabricius, 1798) New to County Leitrim**

CAVAN: Lough Derrybrick (H3510), 8 larvae 22 April 2013 & 119 larvae 23 March 2016, (H3412), 1 larva 22 April 2013.

FERMANAGH: Lower Lough Macnean (H0938), 1 larva 23 March 2016.

LEITRIM: Lough Melvin (G8255), 1 larva 24 April 2020.

MONAGHAN: Lough Egish (H7814), 4 larvae 22 March 2016.

ROSCOMMON: Lough Meelagh (G9011), 15 larvae 10 April 2014. Lough O'Flynn (M5879), 1 larva 28 April 2020.

***Halesus digitatus* (Schrank, 1781)**

SLIGO: Lough Arrow (G7811), 2 larvae 28 April 2020.

***Halesus radiatus* (Curtis, 1834)**

CAVAN: Lough Corglass (H3409), 1 larva 22 March 2016. Lough Derrybrick (H3510), 1 larva 22 April 2013 & 3 larvae 23 March 2016. Lough Skeagh Upper (H6500), 1 larva 15 April 2013 & 2 larvae 9 April 2019.

CLARE: Lough Alewnaghta (R7691), 1 larva 29 April 2015. Lough Naminna (R1871), 2 larvae 19 April 2021.

DONEGAL: Lough Akibbon (C0718), 3 larvae 30 March 2015 & 8 larvae 25 April 2018.

GALWAY: Lough Corrib Lower (M2837), 1 larva 16 April 2019, (M2734), 2 larvae 12 April 2016. Lough Corrib Upper (M1049), 2 larvae 9 April 2013, (M1650), 1 larva 12 April 2016, (M0648), 11 larvae 12 April 2016. Lough Illauntrasna (L8825), 1 larva 9 April 2019. Lough Maumwee (L9748), 1 larva 19 April 2021. Lough Nambrackmore (L7145), 1 larva 5 April 2016. Lough Rea (M6214), 1 larva 1 April 2013. Loughanillaun (L9847), 1 larva 11 April 2013.

KERRY: Lough Brin (V7877), 1 larva 24 April 2020. Lough Cam (Q5907), 3 larvae 9 April 2014.

LEITRIM: Lough Gill (G7835), 1 larva 15 April 2014 & 5 larvae 13 April 2017. Lough Macnean Upper (H0238), 1 larva 21 April 2013.

MAYO: Lough Acorrymore (F5705), 1 larva 9 April 2014. Lough Carra (M1970), 2 larvae 11 April 2014, (M1673), 6 larvae 11 April 2014. Lough Cullin (G2304), 1 larva 10 April 2014.

MEATH: Lough Bane (N5571), 1 larva 14 April 2013.

SLIGO: Lough Arrow (G7811), 1 larva 15 April 2014 & 2 larvae 28 April 2020.
TIPPERARY: Lough Derg (R7186), 1 larva 12 April 2018.
WESTMEATH: Lough Sheelin (N4482), 4 larvae 15 April 2013.
WICKLOW: Lough Bray Lower (O1316), 7 larvae 14 April 2021.
***Potamophylax cingulatus* (Stephens, 1837)**
DONEGAL: Lough Akibbon (C0718), 11 larvae 14 April 2021.
MAYO: Lough Cullin (G2304), 2 larvae 21 April 2017.
***Potamophylax latipennis* (Curtis, 1834)**
MAYO: Lough Cullin (G2304), 1 larva 23 April 2020, (G2301), 1 larva 24 April 2020. Lough Urlaur (M5089), 1 larva 28 April 2020.
WESTMEATH: Lough Lene (N5368), 1 larva 14 April 2016.

SERICOSTOMATIDAE

***Sericostoma personatum* (Spence, 1826)**
CAVAN: Lough Corglass (H3409), 2 larvae 18 April 2019. Lough Derrybrick (H3510), 2 larvae 22 April 2013, 3 larvae 23 March 2016 & 1 larva 18 April 2019, (H3412), 3 larvae 23 March 2016. Lough Macnean Upper (H0637), 3 larvae 26 April 2019.
CLARE: Lough Alewnaghta (R7691), 1 larva 29 April 2015. Lough Dromore (R3485), 1 larva 21 April 2021. Lough Inchicronan (R3986), 1 larva 21 April 2021.
DONEGAL: Lough Akibbon (C0718), 1 larva 25 April 2018. Lough Anure (B8116), 1 larva 21 April 2021. Lough Barra (B9212), 1 larva 24 April 2018. Lough Derg (H0973), 5 larvae 14 April 2021. Lough Fern (C1822), 2 larvae 22 April 2021. Lough Gartan (C0616), 1 larva 14 April 2021. Lough Kindrum (C1943), 3 larvae 25 April 2018. Lough Nasnanida (B8507), 1 larva 21 April 2021. Lough Sessiagh (Loch an tSeisigh) (C0436), 4 larvae 31 March 2015 & 3 larvae 25 April 2018. Lough Unshin (G9463), 2 larvae 14 April 2021.
FERMANAGH: Lough Macnean Lower (H0938), 1 larva 23 March 2016.
GALWAY: Lough Aughrusbeg (L5558), 3 larvae 3 April 2013. Lough Ballynakill (L6457), 3 larvae 3 April 2013. Lough Bofin (M0343), 1 larva 4 April 2016, 1 larva 11 April 2019, 1 larva 29 April 2020 & 1 larva 19 April 2021. Lough Corrib Lower (M2837), 1 larva 16 April 2019, (M2737), 2 larvae 22 April 2013 & 3 larvae 12 April 2016. Lough Corrib Upper (M1650), 48 larvae 12 April 2016, (M0648), 11 larvae 12 April 2016, (M1049), 1 larva 9 April 2013 & 14 larvae 15 April 2019, (M1749), 1 larva 15 April 2019, (M1353), 6 larvae 15 April 2019, (M1349), 8 larvae 9 April 2013 & 22 larvae 12 April 2016. Lough Derryclare (L8449), 1 larva 2 April 2013 & 1 larva 22 April 2016. Lough Nambrackmore (L7145), 12 larvae 5 April 2016. Lough Rea (M6214), 2 larvae 1 April 2013 & 1 larva 4 April 2016. Lough Seecon (M0835), 1 larva 10 April 2019. Lough Shindilla (L9545), 1 larva 5 April 2016. Loughanillaun (L9847), 2

larvae 13 April 2016. Loughaunwillan (L9325), 3 larvae 8 April 2013.
KERRY: Lough Acoose (V7585), 1 larva 4 April 2014. Lough Cam (Q5907), 1 larva 11 April 2017 & 3 larvae 2020.
LEITRIM: Lough Gill (G7835), 5 larvae 15 April 2014, 8 larvae 13 April 2017 & 1 larva 28 April 2020. Lough Glenade (G8345), 2 larvae 9 April 2014. Lough Macnean Upper (H0238), 5 larvae 26 April 2019. Lough Melvin (G8853), 1 larva 10 April 2014.
MAYO: Lough Beltra (M0899), 5 larvae 27 April 2020. Lough Carra (M1970), 1 larva 11 April 2014 & 1 larva 23 April 2020. Lough Cullin (G2304), 9 larvae 10 April 2014, 11 larvae 21 April 2017 & 22 larvae 23 April 2020, (G2301), 19 larvae 10 April 2014, 23 larvae 21 April 2017 & 5 larvae 24 April 2020. Lough Doo (L8368), 1 larva 12 April 2017.
MEATH: Lough Bane (N5571), 1 larva 14 April 2013 & 1 larva 10 April 2019.
SLIGO: Lough Arrow (G7913), 2 larvae 28 April 2020, (G7811), 1 larva 15 April 2014. Lough Easky (G4423), 4 larvae 12 April 2017 & 48 larvae 16 April 2021.
TIPPERARY: Lough Derg (M8401), 10 larvae 12 April 2018 & 1 larva 21 April 2021.
WICKLOW: Lough Tay (O1607), 16 larvae 13 April 2021.

BERAEIDAE

***Beraea pullata* (Curtis, 1834)**
LEITRIM: Lough Gill (G7835), 1 larva 13 April 2017.

ODONTOCERIDAE

***Odontocerum albicorne* (Scopoli, 1763)**
MAYO: Lough Beltra (M0899), 1 larva 27 April 2017.

MOLANNIDAE

***Molanna albicans* (Zetterstedt, 1840)**
MAYO: Lough Cullin (G2301), 1 larva 21 April 2017. Lough Urlaur (M5089), 1 larva 7 April 2017.

LEPTOCERIDAE

***Adicella reducta* (McLachlan, 1865) New to County Fermanagh & County Monaghan**
CLARE: Lough Gortglass (R2259), 1 larva 16 April 2018. Lough Naminna (R1871), 1 larva 19 April 2018.
DONEGAL: Lough Barra (B9212), 1 larva 24 April 2018.
FERMANAGH: Lough Melvin (G9353), 3 larvae 10 April 2014.
MONAGHAN: White Lough (H6719), 1 larva 22 April 2013.

TIPPERARY: Lough Derg (R7186), 2 larvae 12 April 2018.

***Athripsodes albifrons* (Linnaeus, 1758)**

MAYO: Lough Moher (L9777), 8 larvae 30 April 2020.

***Athripsodes aterrimus* (Stephens, 1836)**

CLARE: Lough Alewnaghta (R7691), 6 larvae 29 April 2015.

GALWAY: Lough Corrib Lower (M2531), 4 larvae 12 April 2016.

MAYO: Lough Aille (M0780), 3 larvae 1 May 2020. Lough Carra (M1673), 3 larvae 10 April 2017

SLIGO: Lough Arrow (G7913), 2 larvae 28 April 2020. Lough Gill (G7132), 3 larvae 28 April 2020.

***Athripsodes cinereus* (Curtis, 1834)**

CAVAN: Lough Corglass (H3409), 1 larva 22 March 2016. Lough Derrybrick (H3412), 1 larva 22 April 2013. Lough Garfiny (H3510), 1 larva 22 April 2013. Lough Mushlin (H6201), 1 larva 15 April 2013. Lough Skeagh Upper (H6500), 3 larvae 21 March 2016.

CLARE: Lough Alewnaghta (R7691), 7 larvae 29 April 2015.

DONEGAL: Lough Anure (B8116), 10 larvae 13 May 2015. Lough Glen (C0928), 1 larva 2021.

FERMANAGH: Lough Macnean Lower (H0938), 3 larvae 23 March 2016.

GALWAY: Lough Ballynakill (L6457), 1 larva 3 April 2013 & 2 larvae 6 April 2016. Lough Corrib Lower (M2737), 1 larva 12 April 2016. Lough Corrib Upper (M1650), 1 larva 12 April 2016. Lough Illauntrasna (L8825), 2 larvae 5 April 2016. Lough Pollacappul (L7558), 2 larvae 3 April 2013 & 1 larva 7 April 2016. Lough Seecon (M0835), 1 larva 13 April 2016 & 1 larva 10 April 2019. Lough Shindilla (L9545), 1 larva 5 April 2016. Loughaunwillan (L9325), 15 larvae 8 April 2013 & 2 larvae 5 April 2016. Ross Lake (M1936), 1 larva 11 April 2013.

KERRY: Lough Acoose (V7585) 1 larva 10 April 2017.

LEITRIM: Lough Gill (G7835), 1 larva 28 April 2020. Lough Glenade (G8345), 5 larvae 24 April 2020. Lough Glencar (G7543), 5 larvae, 24 April 2020. Lough Melvin (G8853), 15 larvae 24 April 2020.

MAYO: Lough Carra (M1970), 2 larvae 11 April 2014. Lough Cullin (G2301), 7 larvae 10 April 2014. Lough Doo (L8368), 1 larva 11 April 2014. Lough Glencullin (L8169), 7 larvae 4 April 2014. Lough Urlaur (M5089), 9 larvae 28 April 2020.

MEATH: Lough Bane (N5571), 1 larva 14 April 2016.

ROSCOMMON: Lough Cavetown (M8397), 1 larva 10 April 2014. Lough Meelagh (G9011), 2 larvae 10 April 2014 & 9 larvae 23 April 2020. Lough O'Flynn (M5879), 4 larvae 10 April 2014.

SLIGO: Lough Arrow (G7811), 2 larvae 15 April 2014 & 2 larvae 28 April 2020. Lough Gill

(G7132), 16 larvae 15 April 2014 & 2 larvae 28 April 2020. Templehouse Lake (G6118), 2 larvae 30 April 2020.
TIPPERARY: Lough Derg (R7186), 4 larvae 12 April 2018.
***Ceraclea albimacula* (Rambur, 1842)**
MAYO: Lough Moher (L9777), 2 larvae 30 April 2020.
***Ceraclea dissimilis* (Stephens, 1836)**
GALWAY: Lough Nahasleam (L9744), 1 larva 1 May 2020.
MAYO: Lough Carra (M1970), 1 larva 23 April 2020.
***Ceraclea fulva* (Rambur, 1842)**
GALWAY: Lough Fadda (L6646), 3 larvae 15 April 2021.
***Ceraclea nigronervosa* (Retzius, 1783)**
MAYO: Lough Moher (L9777), 1 larva 30 April 2020.
***Ceraclea senilis* (Burmeister, 1839)**
MAYO: Lough Cullin (G2301), 1 larva 21 April 2017.
***Mystacides azurea* (Linnaeus, 1761)**
CAVAN: Lough Corglass (H3409), 1 larva 18 April 2019. Lough Macnean Upper (H0637), 1 larva 26 April 2019. Lough Skeagh Upper (H6500), 1 larva 15 April 2013 & 1 larva 21 March 2016.
CLARE: Lough Alewnaghta (R7691), 2 larvae 22 April 2021. Lough Bunny (R3796), 1 larva 20 April 2021. Lough Doo (R1172), 1 larva 29 April 2020.
CORK: Lough Glenbeg (V7053), 2 larvae 24 April 2020.
DONEGAL: Lough Anure (B8116), 1 larva 21 April 2021. Lough Barra (B9212), 1 larva 23 April 2021. Lough Beagh (Veagh) (C0221), 1 larva 5 May 2020. Lough Glen (C0928), 6 larvae, 2021. Lough Nasnanida (B8507), 2 larvae 23 April 2021.
GALWAY: Ballynahinch Lake (L7847), 1 larva 2 April 2013. Lough Derryclare (L8449), 1 larva 2 April 2013. Lough Illauntrasna (L8825), 6 larvae 9 April 2019. Lough Lettercraffroe (M0537), 7 larvae 11 April 2013. Lough Maumwee (L9748), 2 larvae 19 April 2021. Ross Lake (M2036), 5 larvae 16 April 2019.
KERRY: Lough Brin (V7877), 2 larvae 24 April 2020. Lough Cam (Q5907), 1 larva 9 April 2014, 2 larvae 11 April 2017, 7 larvae 2020 & 3 larvae 13 April 2021. Lough Caragh (V7088), 2 larvae 4 April 2014, (V7290), 4 larvae 11 April 2017 & 1 larva 27 April 2020. Upper Lake (V9282), 3 larvae 8 April 2021.
MAYO: Lough Acorrymore (F5705), 8 larvae 9 April 2014 & 4 larvae 29 April 2020. Lough Aille (M0780), 5 larvae 1 May 2020. Lough Cullin (G2301), 3 larvae 21 April 2017.
MONAGHAN: Lough Egish (H7814), 1 larva 22 March 2016.
ROSCOMMON: Lough Annaghmore (M9083), 5 larvae 5 April 2017.

***Mystacides longicornis* (Linnaeus, 1758)**
CAVAN: Lough Corglass (H3409), 1 larva 22 April 2013. Lough Derrybrick (H3412), 1 larva 23 March 2016.
DONEGAL: Lough Akibbon (C0718), 1 larva 14 April 2021.
FERMANAGH: Lough Melvin (G9353), 1 larva 10 April 2014.
GALWAY: Ballynahinch Lake (L7847), 3 larvae 2 April 2013 & 1 larva 3 April 2019. Lough Corrib Lower (M2737), 2 larvae 22 April 2013 & 1 larva 12 April 2016, (M2734), 1 larva 22 April 2013. Lough Derryclare (L8449), 1 larva 22 April 2016. Lough Fadda (L6646), 2 larvae 29 April 2020 & 2 larvae 15 April 2021. Lough Nahasleam (L9744), 23 larvae 8 April 2013, 2 larvae 9 April 2019, 3 larvae 1 May 2020 & 2 larvae 19 April 2021. Loughanillaun (L9847), 2 larvae 11 April 2013 & 2 larvae 13 April 2016.
KERRY: Lough Caragh (V7088), 4 larvae 4 April 2014. Upper Lake (V9282), 6 larvae 2 April 2019, 4 larvae 30 April 2020 & 7 larvae 8 April 2021.
LEITRIM: Lough Melvin (G8255), 3 larvae 24 April 2020.
LIMERICK: Lough Gur (R6441), 18 larvae 22 April 2021.
MAYO: Lough Aille (M0780), 11 larvae 1 May 2020. Lough Cullin (G2301), 13 larvae 10 April 2014 & 1 larva 21 April 2017. Lough Glencullin (L8169), 1 larva 4 April 2019. Lough Moher (L9777), 1 larva 30 April 2020.
MONAGHAN: White Lough (H6719), 2 larvae 12 April 2019.
SLIGO: Lough Arrow (G7913), 1 larva 28 April 2020. Lough Gill (G7132), 3 larvae 15 April 2014 & 4 larvae 28 April 2020.
TIPPERARY: Lough Derg (R7186), 3 larvae 12 April 2018.
WICKLOW: Lough Dan (O1502), 12 larvae 2019 & 1 larvae 27 April 2020. Upper Lake (T1096), Glendalough, 2 larvae 8 April 2019 & 4 larvae 15 April 2021.
***Oecetis furva* (Rambur, 1842) New to County Sligo**
CLARE: Lough Inchicronan (R3986), 4 larvae 19 April 2018.
GALWAY: Lough Bofin (M0343), 1 larva 19 April 2021.
KERRY: Lough Caragh (V7290), 2 larvae 11 April 2017.
SLIGO: Lough Gill (G7132) 1 larva 15 April 2014.
WESTMEATH: Lough Lene (N5368), 1 larva 14 April 2016.
***Oecetis lacustris* (Pictet, 1834)**
KERRY: Lough Acoose (V7585), 3 larvae 10 April 2017.
***Oecetis ochracea* (Curtis, 1825)**
CLARE: Lough Muckanagh (R3692), 1 larva 17 April 2018 & 1 larva 20 April 2021.
CORK: Lough Allua (W1865), 1 larva 2 April 2014.
DONEGAL: Lough Barra (B9212), 1 larva 24 April 2018.

GALWAY: Lough Nahasleam (L9744), 1 larva 5 April 2016.
KERRY: Lough Acoose (V7585), 2 larvae 10 April 2017.
MAYO: Lough Carra (M1673), 1 larva 10 April 2017.
***Oecetis testacea* (Curtis, 1834) New to County Leitrim**
CAVAN: Lough Skeagh Upper (H6500), 2 larvae 15 April 2013.
CLARE: Lough Alewnaghta (R7691), 1 larva 17 April 2018. Lough Carra (M1970), 1 larva 11 April 2014.
DONEGAL: Lough Beagh (Veagh) (C0221), 2 larvae 5 May 2020. Lough Derg (H0923), 1 larva 14 April 2021. Lough Gartan (C0616), 1 larva 14 April 2021. Lough Glen (C0928), 11 larvae 2021. Lough Kiltooris (G6797), 2 larvae 23 April 2021.
GALWAY: Lough Bofin (M0343), 2 larvae 29 April 2020 & 3 larvae 19 April 2021. Lough Kylemore (L7658), 1 larva 3 April 2019. Lough Pollacappul (L7558), 1 larva 3 April 2013, 8 larvae 7 April 2016 & 3 larvae 3 April 2019. Lough Shindilla (L9545), 2 larvae 10 April 2019. Ross Lake (M2036), 1 larva 16 April 2019.
KERRY: Lough Leane (V9090), 2 larvae 12 April 2017 & 1 larva 27 April 2020. Upper Lake (V9282), 15 larvae 30 April 2020 & 1 larva 8 April 2021.
LEITRIM: Lough Gill (G7835), 1 larva 13 April 2017. Lough Macnean Upper (H0238), 2 larvae 26 April 2019. Lough Melvin (G8853), 1 larva 24 April 2020.
MAYO: Lough Doo (L8368), 1 larva 1 May 2020.
WICKLOW: Lough Dan (O1502), 3 larvae 27 April 2020 & 1 larva 14 April 2021.

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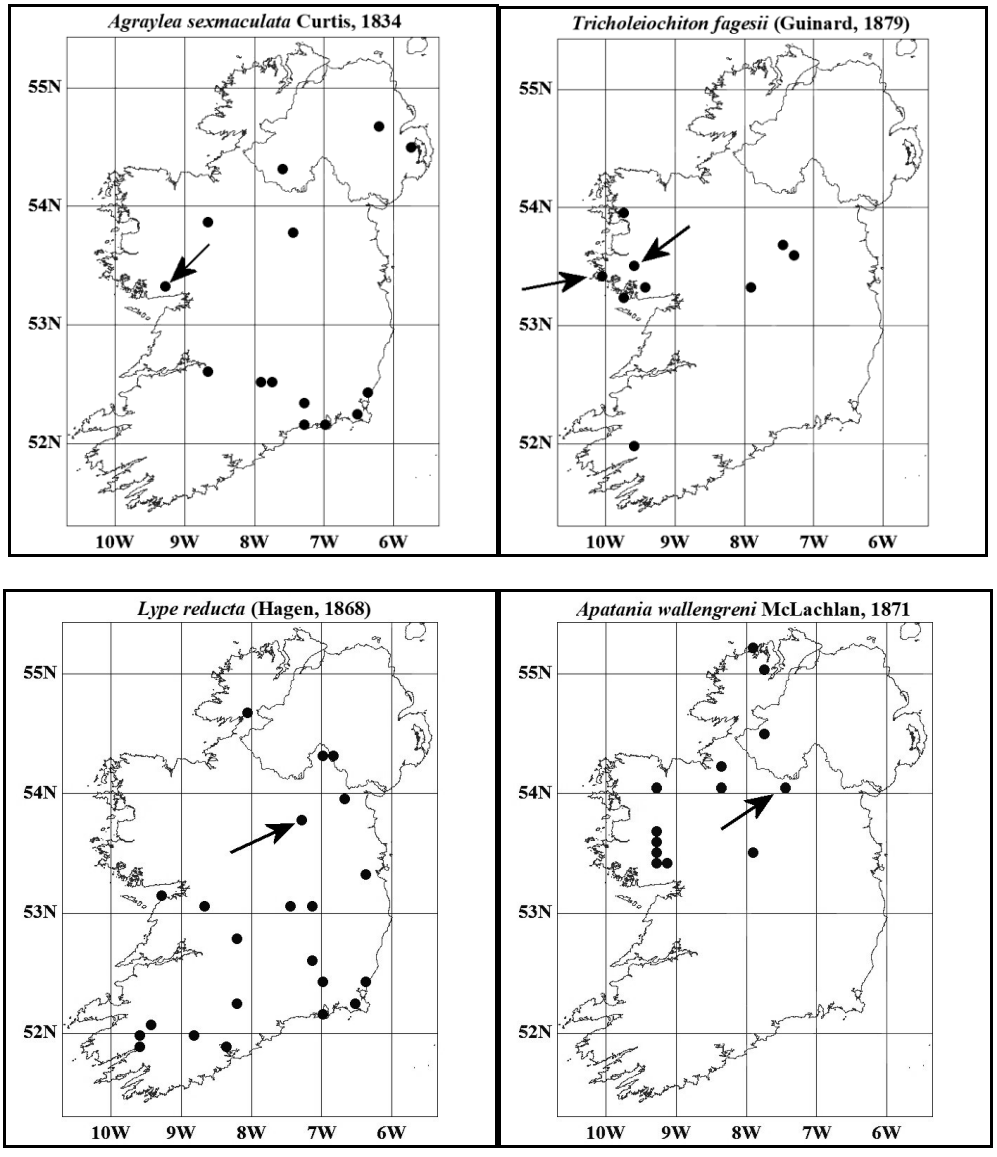

FIGURES 1-4. The known Irish distributions of *Agraylea sexmaculata* Curtis, 1834, *Tricholeiochiton fagesii* (Guinard, 1879), *Lype reducta* (Hagen, 1868) and *Apatania wallengreni* McLachlan, 1871. The notable records are indicated by an arrow.

PLATE 1. An acid lake. The Upper Lake, Killarney, County Kerry. Photograph: Ruth Little.

PLATE 2. A hard limestone lake. Lough Bunny, County Clare. Photograph: Ruth Little.

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FIRST IRISH RECORDS OF *THERIDION PICTUM* (WALCKENAER, 1802) (ARANEAE, THERIDIIDAE) FROM COUNTIES ARMAGH AND ANTRIM

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Abstract

The first observation of *Theridion pictum* (Walckenaer, 1802) in Ireland was made in 2013 by Stephen Foster at Craigavon, County Armagh, and was evidenced by photographs. Voucher specimens were not collected however and because a critical identification had not been made, a note was not prepared. In May 2023, Myles Nolan visited the location at which the species had been observed and collected a number of specimens primarily from *Ulex* scrub confirming them as *T. pictum*. The species' ecology and distribution is briefly characterised.

Key words: Araneae, Theridiidae, *Theridion pictum*, first Irish records, Northern Ireland, Armagh, Antrim, Gorse, *Ulex*, waterside, lakeshore.

Introduction

In October 2013, Stephen Foster (SF) was beating *Ulex* shrubs on an embankment in the area of the Craigavon Lakes, County Armagh, when he collected a submature spider with a clear, dentate, dorsal pattern (Plate 1a). He felt, on the basis of examination of a range of photographs on the internet, that the species involved was most likely *Theridion pictum* (Walckenaer, 1802) although an unusually marked *T. varians* Hahn, 1831 seemed another possibility. Finding that the former species appeared not to be listed for Ireland he contacted Martin Cawley and then Myles Nolan (MN) for their opinion. MN agreed the photograph very strongly indicated *T. pictum* but suggested that in order to be absolutely certain it would be necessary to collect some adult specimens.

On 31 May 2014, SF collected spiders from *Ulex* at the same location, gathering some 10 specimens, a number of which he retained. He sent a photograph of a female's epigyne to MN in February 2015 (Plate 1b) which again strongly indicated that *T. pictum* was the species involved. However in 2013, MN had collected and published the first Irish records of the closely related *Theridion hemerobius* Simon, 1914 (Nolan, 2013) and given the similarities between the two species he was reluctant to commit to an identification until voucher specimens from Craigavon had been critically identified.

On the 26 May 2023, MN made a visit to the Craigavon Lakes in order to try and collect some specimens of the species. Having located a stand of *Ulex* on the southern side of a railway embankment separating the southern and northern lakes a typical retreat was quickly spotted which was occupied by a female spider (Plate 2). A number of additional specimens were collected from *Ulex* and *Crataegus* along the causeway and others observed. Critical examination, using Bosmans *et al*. (1994) to distinguish the specimens from *T. hemerobium*, confirmed *T. pictum* was the species involved.

RECORDS

Theridion pictum (Walckenaer, 1802) New Irish Record

COUNTY ARMAGH: Craigavon Lakes, Craigavon (ITM 705622 858154) (Irish grid reference J 05680 58140), 21 October 2013, ♂ submature, beaten from *Ulex* on an embankment close to the Eastway road, collected and photographed by Stephen Foster (specimen released); 31 May 2014, *circa* 10♂♂♀♀ collected from *Ulex* at the same area, most returned, collected and determined Stephen Foster; 26 May 2023, Craigavon Lakes, Craigavon (ITM 705361 857977) (Irish grid reference J 05419 57963), 2♂♂ 5♀♀ (one recently moulted) collected from *Ulex* at the eastern end of a railway embankment separating the northern and southern lakes, 1♀ (recently moulted) 1 small immature (♀?) collected from *Crataegus* at about midpoint along the causeway (ITM 705296 857969) (Irish grid reference J 05354 57955), 1♂ collected from *Ulex* at western end of the causeway (ITM 704821 857702) (Irish grid reference J 04879 57688); additional specimens seen and returned alive; specimens observed, collected and identified Myles Nolan.

COUNTY ANTRIM: Rea's Wood, Lough Neagh shores (J1485), 14 May 2021, Rodney Monteith. This record appears on the NBN Atlas for Northern Ireland (NBN, 2024) and is included here for completeness. We are not certain if a specimen was retained or if the identification was confirmed by a third party.

Preferred habitat, appearance, behaviour and distribution of *Theridion pictum*

The spider is found in a wide variety of habitat types but usually on scrubby marginal/ecotonal habitat – thus in the majority of cases it occurs on *Ulex* scrub, other scrub vegetation and in marginal situations such as ditches and verges. It occurs generally in somewhat damp areas and can also occasionally be found at ground level amongst litter and mosses (Spider Recording Scheme, 2023). A preference for damp habitats is observed also in the Czech Republic where the spider is scarce and found at pond margins and in wet meadows on shrubs and herbaceous vegetation (Buchar and Růžička, 2002).

The spider has a strongly developed pale stripe down the midline of the abdomen which is

produced laterally into a series of points – in some specimens this can resemble a series of triangles joined broadly apex to base (Plate 3a). The opisthosoma has a dark midline stripe that broadens to fully occupy the ocular area, and broadly to narrowly darkened margins; two large pale areas are sandwiched between these bands and behind the ocular area. Legs are strongly annulated and the sternum has a large pale triangle occupying much and sometimes nearly all of its area – this is clearer in females than males. The epigyne is strongly sclerotised and protrudes into a sharp lip posteriorly, the copulatory pore is small and sub-circular with a raised lip immediately anterior and slightly overhanging it (Plates 1b, 3c). The epigastric region in the males is very strongly swollen and elongate.

The webs that MN observed at Craigavon were very similar to those of some other Theridiidae species found in Ireland e.g. *Phylloneta sisyphia* (Clerck, 1757) and *P. impressa* (L. Koch, 1881). These consist of a shallow bell-shaped retreat set underneath a 'branch' of *Ulex* (Plate 2a) or other foliage, the spider resting within the bell. This situation is used by the female to set her egg-sac. The retreat is surrounded by a complex tangled scaffold of silk, which can be quite extensive and easily spotted. The retreat is often disguised/decorated with the remnants of its prey or fragments of vegetation. The female produces a greyish brown egg-sac (Nentwig *et al*., 2023).

In Ireland, *Theridion pictum* almost certainly has an annual life-cycle: mating in early summer, setting eggs soon after, grown hatchlings over-wintering most probably as late instar immatures or possibly subadults and maturation occurring in the following spring/early summer with mating following soon after. This pattern is evidenced to some extent by the above records since two of the females collected at Craigavon in May 2023 were recently moulted. MN did not see any egg-sacs at this time, but three of the females collected had a relatively swollen abdomen suggesting the egg-mass was developing/developed. Males of this species mature earlier than females and none of the males seen had the appearance of having recently moulted. The presence of an immature specimen in May suggests it hatched late in 2022 and overwintered as a very young instar. Whether it would have matured in time to mate in 2023 is a moot point, but if not then it would possibly go through a second winter before mating, as either an adult or a late instar immature. This suggests that a small cohort of specimens might have a two-year life-cycle.

It is of interest to note that no female had the epigyne plugged, a process whereby a secretion produced by both the females and males at the end of the mating process blocks the copulatory pore, a strategy which prevents further mating but which is not always successful. Plug formation is expected in *Theridion* species of the '*varians*' group (Knoflach, 1998) which includes *T. pictum*, and in this species the plug is easily seen as it fills the entire atrium of the epigyne (the darkened 'triangular' area posterior to the copulatory pore in Plate 3c). Mate-

guarding is commonly observed in this group of species, whereby a mature male will locate a submature female and remain close to her, mating soon after she goes through her final moult (a behaviour observed in many other spider species). The absence of females with plugs at Craigavon suggests they had not yet mated and mate-guarding was not observed.

Across Europe males of *T. pictum* occur primarily from May to July but can be found in April and August while females occur from April to September most commonly but can persist to December (Spider Recording Scheme, 2023; Nentwig *et al*., 2023). In Britain, the spider is locally common and widely distributed through England but much less common in the west, north and extreme south of the island. The species has a Palaearctic distribution, occurring from Ireland to China and Japan.

Comment

It is intriguing that *Theridion pictum* has not been previously recorded from Ireland. While a wide distribution in England is by no means a guarantee that a spider occurs in Ireland, its preferred environment of scrubby vegetation in dampish situations is available in Ireland in great abundance. The species has long been known from most European countries, and while it is not amongst the commonest of the *Theridion* group of species (*sensu* Roberts, 1993), it does not seem to be especially rare wherever it occurs in Europe. It does not have status other than Least Concern in European national Red Lists (Milano *et al.*, 2020).

There is little reason to think this species is a recent arrival in Ireland and and it would seem to have been missed thus far by collectors. Examination of *Ulex* scrub, especially in damp habitats or the vicinity of water should turn up additional records of the spider.

Acknowledgement

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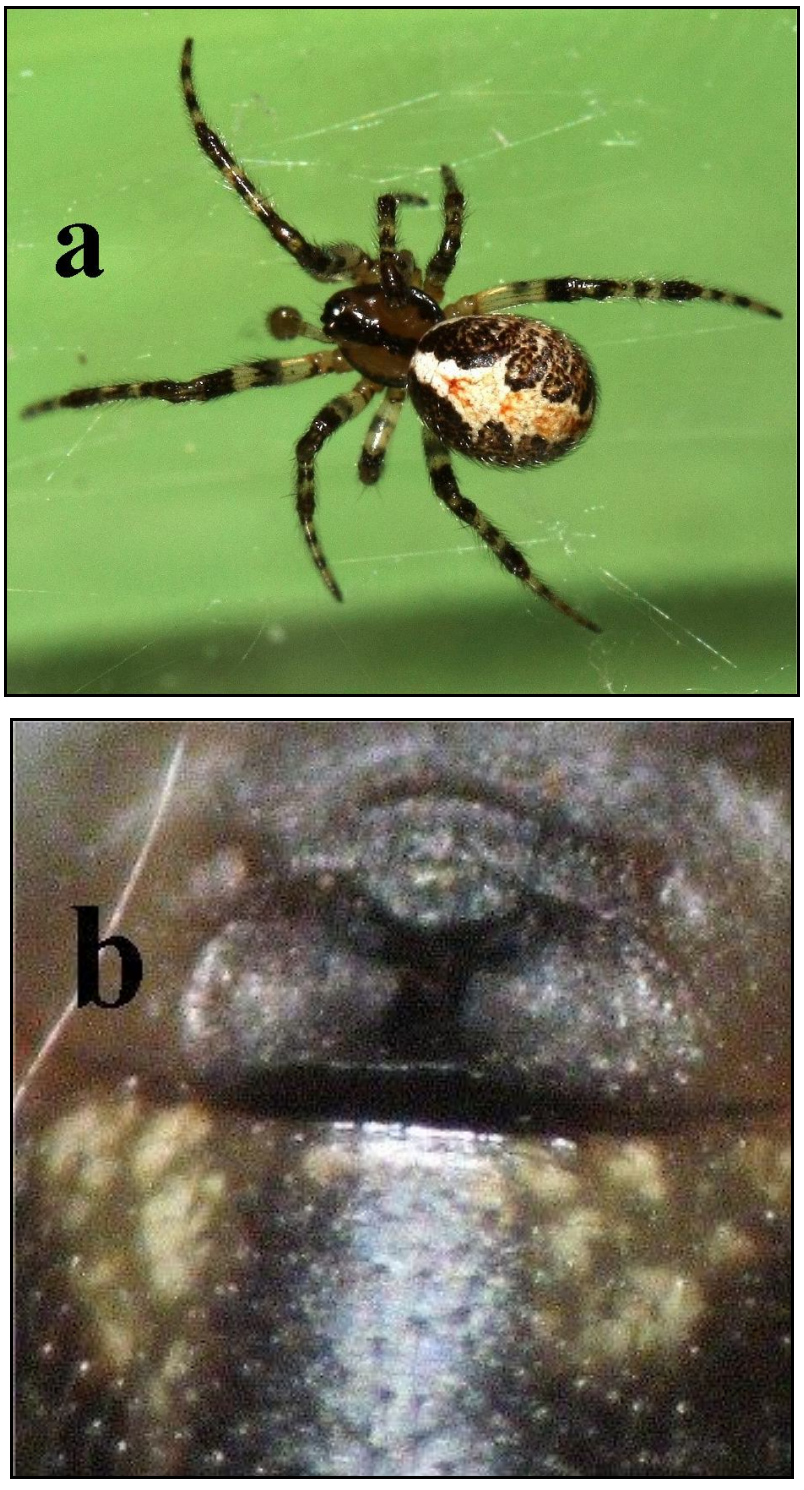

PLATE 1. a: submature male *Theridion pictum* collected at Craigavon Lakes, County Armagh, 21 October 2013; b: epigyne of a female *Theridion pictum* specimen collected at Craigavon Lakes, County Armagh, 31 May 2014. Photographs: Stephen Foster.

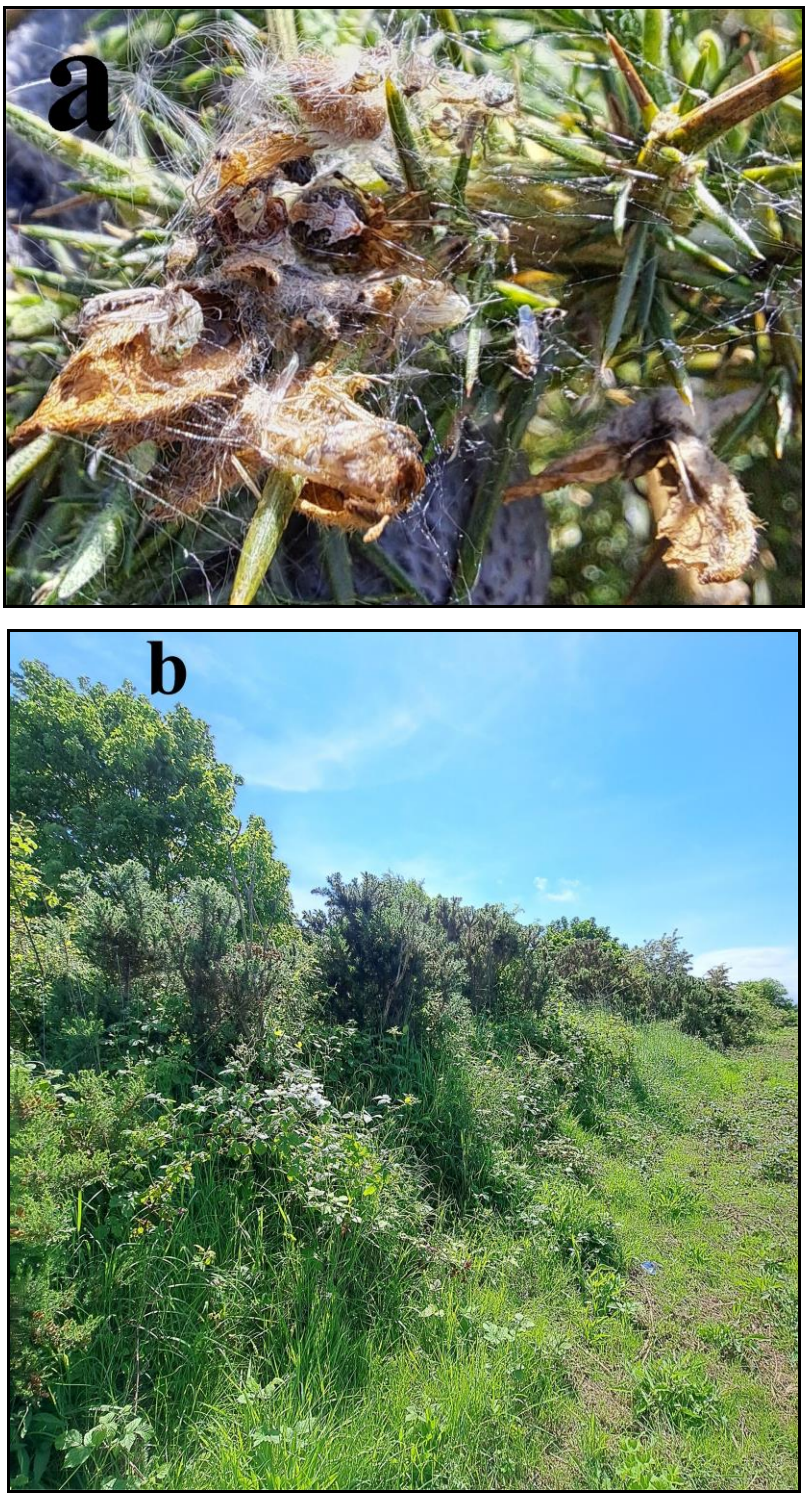

PLATE 2. a: female *Theridion pictum* in her retreat on *Ulex* at Craigavon Lakes, County Armagh, 26 May 2023; b: *Ulex* scrub habitat characteristic of *T. pictum* at the same location, 26 May 2023. Photographs: Myles Nolan.

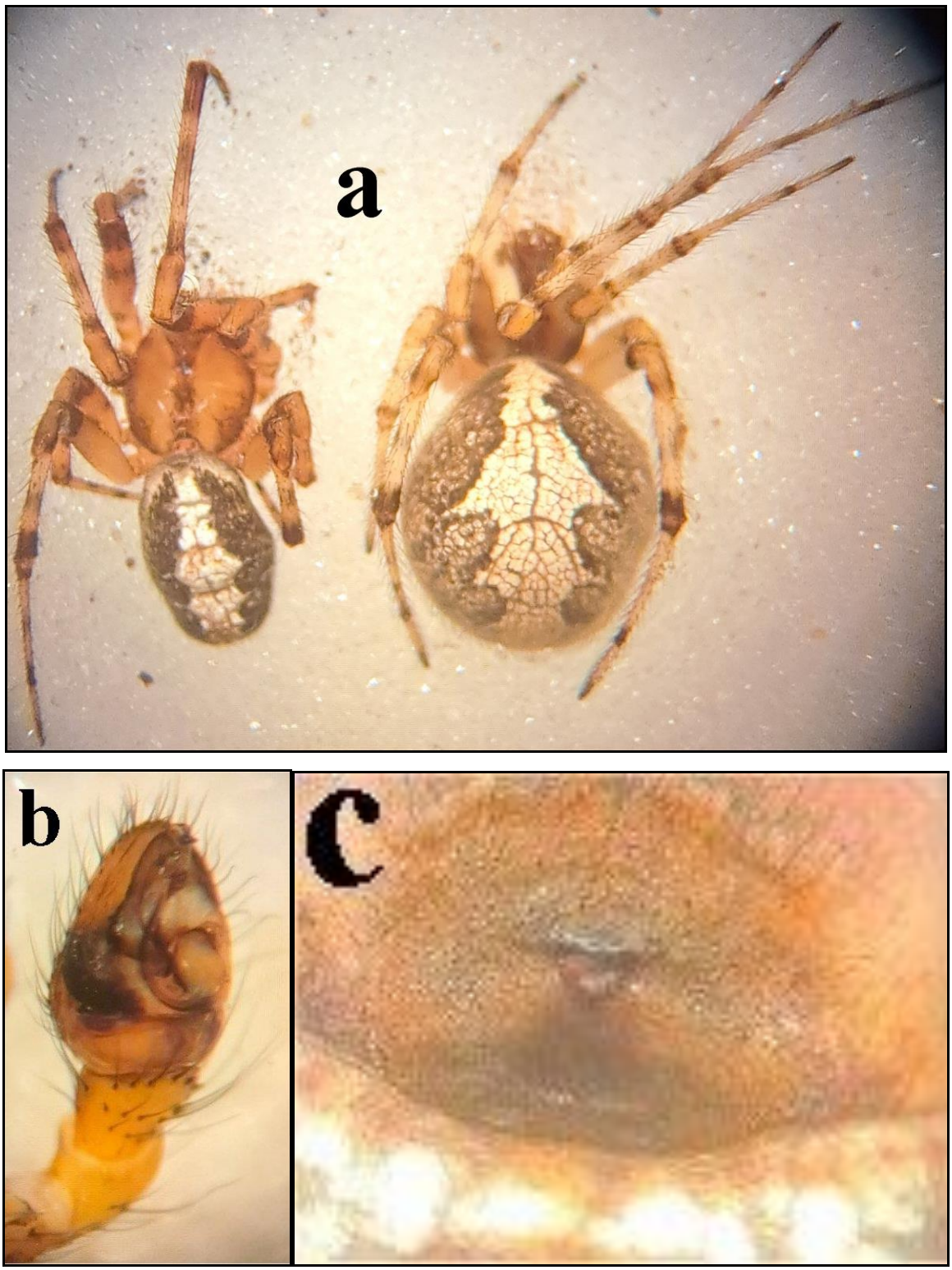

PLATE 3. *Theridion pictum*. a: habitus male (left) and female (right); b: male palp; c: female epigyne, with the copulatory pore (upside down triangle) near the midpoint. All specimens collected at Craigavon Lakes, County Armagh, 26 May 2023. Photographs: Myles Nolan.

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STONEFLY (PLECOPTERA) RECORDS FROM IRELAND IN 2023, WITH ADDITIONAL RECORDS FROM 2009 TO 2022

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Abstract

Almost 450 stonefly records from 22 counties collected primarily in 2023 and 2022, with a single record from 2009 and two records each from 2020 and 2021 are included, covering all 19 extant species found on the island. Several new locations are listed for the rare and restricted species *Capnia atra*, *Leuctra nigra*, *Nemoura avicularis* and *Zwicknia bifrons*. A significant number of records are listed for Northern Ireland, a first in over 30 years. Of worthy attention here is also the reinstatement of the species name *Perla carlukiana* for *Perla* specimens in Ireland after a review of the *Perla bipunctata* species complex in Europe. *Perla carlukiana* is considered an endemic species to Ireland (and Britain). This paper also notes variations in wing length across populations where observed.

Key words: Brachyptery**,** *Capnia atra*, *Leuctra nigra*, *L. nigra* f. *hibernica,* microptery, *Nemoura avicularis*, new records, Northern Ireland, *Perla carlukiana*, *Zwicknia bifrons*.

Introduction

The authors took the opportunity to collect stoneflies from lake shores, streams and rivers across the island. Four hundred and forty-two records presented were collected primary from February to November 2023, but additional records collected in 2022, a single record from 2009 and two records each from 2020 and 2021 are also included. All 19 extant species were recorded as adults by the authors in 2023. Larval records of 14 species are presented. Specimens

were collected or recorded from 22 counties: Antrim, Carlow, Clare, Cork, Derry (Londonderry), Donegal, Down, Dublin, Fermanagh, Galway, Kerry, Kildare, Laois, Mayo, Monaghan, Offaly, Sligo, Tipperary, Tyrone, Waterford, Wexford and Wicklow.

Several new locations for *Capnia atra*, *Leuctra nigra* and *Nemoura avicularis* are listed below. Similarly, there are a significant number of records included within this paper from across Northern Ireland which, excluding minor additions by Feeley *et al.* (2021), are the first significant species records from the region since the early 1990s (see Bradley and Kelly-Quinn (2005) for more details).

It is worth noting here that recent research by Reding (2023) has resulted in the species name *Perla carlukiana* Klapálek, 1907 being re-instated for *Perla* specimens from the British-Irish Isles. Illies (1966) synonymised this species incorrectly with *Perla bipunctata* Pictet, 1833; however, *P. carlukiana* is clearly different owing to the consistent brachypterous nature of the males, amongst other traits. See Reding (2023) for full details. This species is considered an endemic species to Britain and Ireland and is henceforth referred to only with its reinstated nomenclature. The only other endemic stonefly to both Britain and Ireland is *Perlodes mortoni* (Klapálek, 1906). Unfortunately it is considered regionally extinct in Ireland (Feeley *et al.*, 2020), despite being relatively widespread on the island of Britain. Britain has three endemic species/subspecies not found in Ireland: *Capnia vidua anglica* Aubert, 1950, *Brachyptera putata* (Newman, 1838) and *Taeniopteryx nebulosa britannica* Hynes, 1957 (Macadam, 2015).

Recently, Feeley, Mitchell and Macadam (2024) described the infrasubspecific form *Leuctra nigra* f. *hibernica* from Ireland (Plate 3), which based on records to date is the dominant form of *L. nigra* in Ireland. Although this form is likely to only be considered a synonym given that it is genetically identical to British *L. nigra* (R. Edward DeWalt, pers. comm.) it is nonetheless an important observation and describes characteristics not presently included in identification keys for the species. All records of *L. nigra* listed below indicate if the form *hibernica* was recorded.

This paper also notes variation in wing length across species and populations where observed, i.e. macroptery, brachyptery and microptery (e.g. Costello, 1988a) but all adults were fully winged (i.e. macropterous) and all male Perlidae were brachypterous unless otherwise stated. Similarly, the phenomenon of 'crumpled wings' (Feeley and Macadam, 2021; Feeley *et al*., 2021) where observed are noted, while one observation of Entomophthora, or fungal infection, is also noted.

Specimens collected by Ciaran Byrne, Bryan Kennedy, David McGrath, Ryan Mitchell, Caroline Plant and Marcin Penk were determined or confirmed by Hugh B. Feeley. Specimens collected by Helen M. Barber-James were identified by Andrew Kenny, Georgia Miles and Helen M. Barber-James, with a subset confirmed by Craig Macadam, Hugh B. Feeley or Jan-Robert Baars. Also included are 39 records submitted to the National Biodiversity Data Centre

(NBDC) by members of the public in 2022 and 2023. Records submitted, accompanied by a photograph, were confirmed, or amended by Hugh B. Feeley and covered the period 2009 to 2023. These records may not have sex denoted and records are identified by NBDC in parenthesis after the collector.

All specimens were identified using Hynes (1977) and Macadam, Feeley and Doe (2022). Larval records were only included where no corresponding adult records are listed below or listed previously in Feeley *et al*. (2023). All records will be forwarded to the National Biodiversity Data Centre to update the dataset "Stoneflies (Plecoptera) of Ireland" (Feeley, 2023). Records are also forwarded to the Centre for Environmental Data and Recording (CEDaR) in Northern Ireland.

The records

CAPNIIDAE

***Capnia atra* Morton, 1896**

CORK: Glenbeg Lough, north shore (V701537), 1♀ 18 April 2023, Caroline Plant.

DONEGAL: Lough Veagh, shoreline (at steps) (C022212), 13♂♂13♀♀ 29 March 2023, H. B. Feeley. Lough Barra, shoreline at slipway off the R254 (B929123), 1♂2♀♀ 29 March 2023, H. B. Feeley.

MAYO: Lough Mask, Paddys Bar Shore, Cappaghduff West (M087658), 1♀ 5 April 2023, H. B. Feeley. Lough Conn, shore at Brackwanshagh (G191098), 10♂♂16♀♀ (1♀ with crumpled wings) 6 April 2023, H. B. Feeley and Bryan Kennedy. Lough Beltra, east shore (off the R312) (M072981), 1♂1♀ 17 April 2023, Bryan Kennedy.

These are the first confirmed adult records of this species in County Cork and at Lough Beltra in County Mayo. Previous records from Glenbeg Lough and Lough Beltra were based on larval material (Feeley, Baars and Kelly-Quinn, 2016). Lough Barra is a new record for this species in Ireland. *Capnia atra* is very rare in Ireland, found in a selection of lakes along the western Atlantic coast and is considered vulnerable to extinction because of climate change (Feeley *et al.*, 2016; Feeley *et al*., 2020).

This species showed variation in wing length depending on location. Individuals of both sexes collected from Lough Veagh, County Donegal and Lough Mask, County Mayo were brachypterous (Plate 1a), but specimens of both sexes collected at Lough Barra, County Donegal and Lough Conn, County Mayo were macropterous (Plate 1b). This would suggest that wing length within populations can vary across small geographical areas. Costello (1988a) also noted variation in wing length from population to population, although numbers assessed were small. It seems, however, that wing length is consistent regardless of sex within a given population.

***Zwicknia bifrons* (Newman, 1839)**

MAYO: Lough Mask, Paddys Bar Shore, Cappaghduff West (M087658), 7♂♂ 5 April 2023, H. B. Feeley. Lough Conn, shore at Brackwanshagh (G191098), 4♂♂ 6 April 2023, H. B. Feeley and Bryan Kennedy.

TYRONE: Gortin Water, Oritor (Ballinderry Rivers Trust HQ) (H774796), 7♂♂2♀♀ 28 March 2023, H. B. Feeley, H. M. Barber-James and Craig Macadam.

All males were micropterous (Plate 2), while all females were fully winged or macropterous. Costello (1988a) previously noted this phenomenon for other populations of *Z. bifrons* in Ireland.

CHLOROPERLIDAE

***Chloroperla tripunctata* (Scopoli, 1763)**

DERRY: Carndaisy Glen, tributary of the Ballinderry River (H828857), 1 larva 2 October 2022, H. M. Barber-James and 2 larvae 27 March 2023, H. M. Barber-James and Craig Macadam.

DOWN: Bloody Bridge River, Bloody Bridge (J386269), 1 larva 19 March 2023, H. B. Feeley and H. M. Barber-James.

DUBLIN: Owendoher River, Cruagh (bridge on the R116) (O137227), 1♂ 3 May 2023, H. B. Feeley.

KERRY: River Owenreagh, bridge upstream of the Upper Lake (V884821), 1♂1♀ 27 May 2023, J-R. Baars.

LAOIS: Clodaigh River, bridge on the L6002 (N296095), 5 larvae 2 April 2023, J-R. Baars. Owenass River, Cathole Falls (N377049), 2 larvae 2 April 2023, J-R. Baars.

TYRONE: Lissan Water, Harry's Bridge (Lissan House) (H797823), 1 larva 31 August 2022, H. M. Barber-James.

***Siphonoperla torrentium* (Pictet, 1841)**

ANTRIM: Glenarm River, Glenarm Forest (D301117) ,1♀ 10 May 2022, H. M. Barber-James. Forth River, Crow Glen (J289768), 1♂2♀♀ 2 June 2023, H. M. Barber-James.

CLARE: River Caher, 150m upstream of Caher Bridge (M163081), 8♂♂3♀♀ (1♀ with crumpled wings) 23 May 2023, H. B. Feeley. River Fergus, Poplar Bridge (R271911), 1♂1♀ 24 May 2023 and Addroon Bridge (R359878), 3♂♂ 25 May 2023, both H. B. Feeley.

DERRY: Carndaisy Glen, tributary of the Ballinderry River (H828857), 4 larvae 27 March 2023, H. M. Barber-James and Craig Macadam.

DOWN: Bloody Bridge River, Bloody Bridge (J386269), 1 larva 19 March 2023, H. B. Feeley and H. M. Barber-James.

DUBLIN: Owendoher River, Cruagh (bridge on the R116) (O137227), 5♂♂4♀♀ 3 May 2023

and Kilakee Mountain (O125222), 1♂ 3 May 2023, both H. B. Feeley.
KERRY: Tomies Wood River, below O'Sullivan's Falls (V915885), 1♂ 20 April 2023 and 5♂♂4♀♀ 29 May 2023, off a small road (V912878), 1♂1♀ 29 May 2023, 500m upstream of a small road (V913873), 11♂♂11♀♀ 29 May 2023, 850m upstream of a small road (V911870), 5♂♂10♀♀ 29 May 2023 and 1.4km upstream of a small road (west tributary, Coomclochan) (V907867), 1♂2♀♀ 29 May 2023, all J-R. Baars. Owengarriff River, near lake edge Mucross House (V962850), 1♂3♀♀ 22 April 2023, J-R. Baars.
LAOIS: Clodaigh River, bridge on L6002 (N296095), 3 larvae 2 April 2023, J-R. Baars.
MAYO: Finny River, bridge south of church in Finny (M010586), 2♀♀ 22 May 2023, H. B. Feeley.
MONAGHAN: Avaghon Lake stream, 2nd bridge downstream of Lough Avaghon (H678142), 1 larva 28 June 2022, H. B. Feeley.
TYRONE: Gortin Water, Oritor (Ballinderry Rivers Trust HQ) (H774796), 13 larvae 28 March 2023, H. B. Feeley, H. M. Barber-James and Craig Macadam and 7 larvae 18 May 2023, H. M. Barber-James. Ballinderry River tributary, Teebane Bridge (H671802), 1 larva 17 May 2023, H. M. Barber-James. Ballinderry River, Wellbrook Mill Seep (H749791), 3♂♂2♀♀ 19 May 2023, H. M. Barber-James.
WICKLOW: River Avonbeg, ford at Barravore (T065941), 4♂♂1♀ 2 May 2023, Drumgoff Bridge (T105907), 3♂♂ 2 May 2023 and Greenan Bridge (T146873), 5♂♂2♀♀ 2 May 2023, all H. B. Feeley. River Ow, bridge near Aghavannagh Barracks (T055861), 4♂♂1♀ 2 May 2023 and Roddenagh Bridge (T117790), 1♂ 2 May 2023, both H. B. Feeley. Glencullen River, Knocksink Wood (O214181), 1♂ 7 May 2023, Ryan Mitchell.

LEUCTRIDAE

***Leuctra fusca* (Linnaeus, 1758)**
ANTRIM: Glenarm River, Glenarm Estate (above a weir) (D301116), 1♀ 22 July 2022, H. M. Barber-James. Linford Water, tributary of Glenarm River (D312060), 4♂♂6♀♀ 22 July 2022, H. M, Barber-James. River Maine, Randalstown Forest (J094877), 1 larva 30 July 2022, H. M. Barber-James. Shillanavogy (Tributary of Shilanavogy Water) (D252014), 1 adult (sex indeterminate) 4 August 2023, David Craig (NBDC).
CARLOW: River Lerr, Lerr Bridge (S718815), 3♂♂1♀ 14 September 2023, H. B. Feeley. Aghalona River, bridge near Moatalusha House (S809728), 1♂1♀ 19 September 2023, H. B. Feeley.
CLARE: Lissycasey Stream, bridge on the N68 north east of Lissycasey (R225670), 4 larvae 6 July 2023 and Lissycasey Stream, bridge on the N68 south west of Lissycasey (R209660), 3 larvae 21 July 2023, both David McGrath. Mill spring, mountain above Aliwee Cave

(M244042), 1 larva 18 August 2023, H. M. Barber-James. Unnamed spring, Berneens (M226027), 1 larva 18 August 2023, H. M. Barber-James. River Caher, Caher Bridge (M163082), 1♂ 21 August 2023, H. M. Barber-James and 2 larvae 21 August 2023, David McGrath.

CORK: Cork City, Quays (River Lee south channel) (W678717), 1 adult (sex indeterminate) 21 August 2009, John O'Sullivan (NBDC). River Sullane, Macroom (W329734), 1 adult (sex indeterminate) 22 November 2020, Judith Vonhof (NBDC). Canrooska River, Glengarriff Nature Reserve (V918569), 2♂♂2♀♀ 16 August 2023, H. B. Feeley.

DERRY: Ballinderry River tributary, Reubens Glen (H857887), 1 larva 2 October 2022, H. M. Barber-James.

KERRY: River Owenreagh, bridge upstream of the Upper Lake (V884821). 1♂ 27 May 2023, J-R. Baars. Tomies Wood River, below O'Sullivan's Falls (V915885), 1♀ 29 May 2023, off a small road (V912878), 5♂♂4♀♀ 29 May 2023, 500m upstream of a small road (V913873), 18♂♂4♀♀ 29 May 2023, 850m upstream of a small road (V911870), 1♂ 29 May 2023, and 1.4km upstream of a small road (west tributary, Coomclochan) (V907867), 2♂♂ 29 May 2023, all J-R. Baars.

KILDARE: River Greese, Levitstown Bridge (S729849), 4♂♂ 13 September 2023, H. B. Feeley. Graney River, bridge in Graney (S817839), 1♂3♀♀ 14 September 2023, H. B. Feeley.

LAOIS: Glenlahan River, Clarahill Bridge (N345107), 1♂ 1♀ 4 September 202, H. B. Feeley. River Barrow, Tinnahinch Bridge (N351104), 3♂♂3♀♀ 4 September 2023, ford south of Rearyvalley (N360129), 6♂♂ 4 September 2023, Twomile Bridge (N422118), 7♂♂3♀♀ 4 September 2023, Barranagh's Bridge (N463092), 1♂ 3♀♀ 4 September 2023, Kilnahown Bridge (N513107), 1♂2♀♀ 5 September 2023, Portarlington Spa Bridge (N542128), 1♂ 7 September 2023 and Bert Bridge (S659969), 1♂ 12 September 2023, all H. B. Feeley. River Owenass, Cathole Falls (N376048), 3♂♂ 5 September 2023, ford north of Barkmill (N416051), 2♂♂3♀♀ 5 September 2023, bridge north of Irishtown House on the N80 (N450072), 5♂♂ 5 September 2023, all H. B. Feeley. Enaghan Stream, bridge upstream of the Coolagillagh stream confluence (N530167), 3♂♂2♀♀ 6 September 2023, H. B. Feeley. Stradbally River, bridge west northwest of Ballykilcavan House (S596971), 3♂♂1♀ 11 September 2023 and Derrybrock Bridge (S613990), 3♂♂1♀ 11 September 2023, both H. B. Feeley. Crooked Stream, bridge west of Luggacurren (S585887), 4♂♂ ♀ 11 September 2023, H. B. Feeley. Dunrally Stream, bridge upstream of the River Barrow (N629026), 4♂♂♀ 12 September 2023, H. B. Feeley. River Douglas, Gales Bridge (S657859), 2♂♂ 13 September 2023, bridge downstream of Gale's Bridge (S688838), 3♂♂2♀♀ 13 September 2023 and Shanragh Bridge (S608846), 3♂♂2♀♀ 13 September 2023, all H. B. Feeley. River Fushoge, bridge northeast of Strand House (S654804), 3♂♂ 19 September 2023 and bridge south of Crockaun (S691756), 2♀♀ 19

September 2023, both H. B. Feeley.
OFFALY: River Barrow, Garryhinch (N497105), 1 adult (sex indeterminate) 29 September 2022, Rachel Mc Kenna (NBDC). River Camcor, Kinnitty Demesne (N201061), 1 adult (sex indeterminate) 6 November 2022, Rachel Mc Kenna (NBDC). Esker Stream, Esker Bridge (N558272), 6♀♀ 22 August 2023, H. B. Feeley.
SLIGO: Crowagh River headwaters, Easkey Bog (G469283), 6♂♂14♀♀ 23 July 2022, Ryan Mitchell.
TYRONE: Glenelly River, bridge southwest of the B47 (H681939), 16 larvae 3 August 2022, and bridge to farmyard on the B47 (H679941), 7 larvae 3 August 2022, both H. M. Barber-James. Owenkillew River, bridge over Owenkillew River on B48 (H493866), 1 larva 3 August 2022, H. M. Barber-James. Tributary of Drumquin River, Dooish (H311711), 1 adult (sex indeterminate) 17 August 2022, David Craig (NBDC). Ballinderry River tributary, Ballynagilly Bridge (H740839), 1 larva 31 August 2022, H. M. Barber-James. Killymoon River tributary, Slate Quarry Bridge (H727726), 2 larvae 2 October 2022, H. M. Barber-James. Gortin Water, Oritor (Ballinderry Rivers Trust HQ) (H774796), 4 larvae 18 May 2023, H. M. Barber-James.
WEXFORD: Camolin, tributary of Bann River (T069569), 1 adult (sex indeterminate) 11 August 2022, 1 adult (sex indeterminate) 30 October 2022, 1 adult (sex indeterminate) 19 December 2022, and 1 adult (sex indeterminate) 19 November 2023, all Hilary Rimbi (NDBC).
WICKLOW: Grangecon Stream, bridge southeast of Ballynure (S836967), 1♂ 28 August 2023, H. B. Feeley.

It is worth noting that the record from Cork in 2009 is the first published record of any stonefly species within the urbanised city of Cork.

***Leuctra hippopus* Kempny, 1899**

ANTRIM: Forth River, Crow Glen (J289768), 1♀ 2 June 2023, H. M. Barber-James.
CLARE: Millbrook River, Ballyline Bridge (R383861), 1♀ 25 May 2023, H. B. Feeley.
DERRY: Carndaisy Glen, tributary of the Ballinderry River (H828857), 1♂ 27 March 2023, H. M. Barber-James and Craig Macadam.
DONEGAL: Owenveagh River, Glenveagh Cottage (B993182), 1♂3♀♀ 29 March 2023, H. B. Feeley. Lough Barra, shoreline at a slipway off the R254 (B929123), 1♀ 29 March 2023, H. B. Feeley. Gweebarra River, Pollglass Bridge (R254) (B948139), 1♂ 29 March 2023, H. B. Feeley. Bullaba River, 500m upstream of the Owenwee River (R254) (C011137), 1♀ 29 March 2023, H. B. Feeley. Cronaniv Burn, Poisoned Glen, Dunlewy (B930186), 1♀ 30 March 2023, H. B. Feeley. Sruhannameel Stream, upstream of Lough Nacung (B901188), 1♂3♀♀ 30 March 2023, H. B. Feeley. Glentornan River, upstream of Lough Nacung (B895191), 5♂♂7♀♀ 30 March 2023, H. B. Feeley. Lough Eske, Ardnamona Wood (G964847), 1♀ 16 April 2023 and 1♀ 13 May 2023, both Ryan Mitchell.

DOWN: Bloody Bridge River, Bloody Bridge (J386269), 1♀ 19 March 2023, H. B. Feeley and H. M. Barber-James. Small stream 1, Carrick Little, Head Road, Annalong (J340229), 1♀ 19 March 2023, H. B. Feeley and H. M. Barber-James. National Museums NI Cultra (J426801), 1♀ 30 March 2023, Craig Macadam.
DUBLIN: Owendoher River, Cruagh (bridge on the R116) (O137227), 2♀♀ 4 February 2023, and Kilakee Mountain (O125222), 2♀♀ 3 May 2023, both H. B. Feeley. Cot Brook, near O'Rourkes Lane (O108199), 2♂♂3♀♀ 27 March 2023, J-R. Baars.
GALWAY: Clonbur River, Clonbur Woods (Roshill) (M097566), 1♂1♀ 5 April 2023, H. B. Feeley.
KERRY: Tomies Wood River, below O'Sullivan's Falls (V915885), 1♀ 20 April 2023, 500m upstream of a small road (V913873), 6♂♂8♀♀ 21 April 2023, 850m upstream of a small road (V911870), 10♂♂6♀♀ 21 April 2023, and 1.4km upstream of a small road (west tributary, Coomclochan) (V907867), 1♂ 21 April 2023, all J-R. Baars.
LAOIS: Owenass River, Cathole Falls (N376048), 2♀♀ 2 April 2023, J-R. Baars. Upper Murglash River, tributary of Owenass River, off the L2018 (N377053), 2♂♂4♀♀ 2 April 2023, J-R. Baars.
MAYO: Finny River, bridge south of the church in Finny (M010586), 6♂♂8♀♀ 5 April 2023, and 3♂♂ 1♀ 22 May 2023, both H. B. Feeley. Glensaul River, confluence at the waterfall, Tourmakeady Woods (M082676), 1♀ 5 April 2023 and at the car park at Tourmakeady Woods (M091678), 1♂1♀ 5 April 2023, both H. B. Feeley.
SLIGO: Union Wood stream, Collooney (G680281), 5♂♂2♀♀ 26 March 2023 and 1♀ 2 April 2023, Ryan Mitchell.
TYRONE: Gortin Water, Oritor (Ballinderry Rivers Trust HQ) (H774796), 1♀ 28 March 2023, H. B. Feeley, H. M. Barber-James and Craig Macadam.
WICKLOW: Lough Dan, Scout Centre Shore (O157025), 5♀♀ 3 March 2023, J-R. Baars. Avonmore River, 1st Bridge south-east of the Sally Gap (O143099), 2♂♂1♀ 6 April 2023, J-R. Baars. Glencree River, off the R115 (O141185), 2♂♂4♀♀ 6 April 2023, J-R. Baars. Avonmore River tributaries, Sheepsbank Bridge (O153095), 4♂♂4♀♀ 17 April 2023 and 2nd bridge southeast of the Sally Gap (O148097), 8♂♂3♀♀ 17 April 2023, both H. B. Feeley. River Liffey, 2km northwest of the Sally Gap (O109127), 8♂♂1♀ (3♂♂ and 1♀ with crumpled wings) 17 April 2023, H. B. Feeley. Avonmore River, 1st Bridge southeast of the Sally Gap (O143099), 4♀♀ 17 April 2023, H. B. Feeley. Lugduff Stream, upstream of the Upper Lake, Glendalough (T110961), 1♀ 21 April 2023, H. B. Feeley. Glendasan River, old mining works (R756) (T099981), 3♂♂ 27 April 2023, H. B. Feeley. River Ow, bridge near Aghavannagh Barracks (T055861), 1♀ 2 May 2023, H. B. Feeley. Glencullen River, Knocksink Wood (O214181), 1♂1♀ 7 May 2023, Ryan Mitchell.

All the specimens collected above the small road in Tomies Wood River, County Kerry, were brachypterous. Costello (1988a) previously reported brachypterous *L. hippopus* from several locations in County Kerry and one location in County Mayo.

***Leuctra inermis* Kempny, 1899**

ANTRIM: Glenarm River, Glenarm Forest (D301117), 1♀ 10 May 2022, H. M. Barber-James. Forth River, Crow Glen (J289768), 1♂5♀♀ 2 June 2023, H. M. Barber-James.

DERRY: Carndaisy Glen, tributary of the Ballinderry River (H828857), 1♀ 27 March 2023, H. M. Barber-James and Craig Macadam.

DONEGAL: Mullangore Stream, bridge upstream of Lough Veagh (C007192), 1♂ 29 March 2023, H. B. Feeley. Sruhannameel Stream, upstream of Lough Nacung (B901188), 8♂♂ 30 March 2023, H. B. Feeley. Glentornan River, upstream of Lough Nacung (B895191), 1♂3♀♀ 30 March 2023, H. B. Feeley. Lough Eske, Ardnamona Wood (G964847), 4♂♂ 16 April 2023, Ryan Mitchell.

DOWN: Bloody Bridge River, Bloody Bridge (J386269), 9 larvae 19 March 2023, H. B. Feeley and H. M. Barber-James. Small stream 1, Carrick Little, Head Road, Annalong (J340229), 2 larvae 19 March 2023, H. B. Feeley and H. M. Barber-James.

DUBLIN: Owendoher River, Cruagh (bridge on the R116) (O137227), 5♂♂2♀♀ 3 May 2023 and Kilakee Mountain (O125222), 1♂1♀ 3 May 2023, both H. B. Feeley.

KERRY: Tomies Wood River, below O'Sullivan's Falls (V915885), 2♂♂3♀♀ 20 April 2023 and 1♀ 29 May 2023, off a small road (V912878), 3♂♂ 1♀ 20 April 2023 and 1♂1♀ 29 May 2023, 500m upstream of a small road (V913873), 1♂ 21 April 2023 and 1♂1♀ 29 May 2023, 850m upstream of a small road (V911870), 5♂♂3♀♀ 21 April 2023 and 1♂ 4♀♀ 29 May 2023 and 1.4km upstream of a small road (west tributary, Coomclochan) (V907867), 4♂♂♀♀ 21 April 2023 and 5♂♂3♀♀ 29 May 2023, all J-R. Baars.

LAOIS: Glenlahan River, Clarahill Bridge (N345107), 1♂ 2 April 2023, J.-R Baars. Upper Murglash River, tributary of the Owenass River, off the L2018 (N377053), 1♂2♀♀ 2 April 2023, J-R. Baars.

MAYO: Glensaul River, confluence at waterfall, Tourmakeady Woods (M082676), 1♂ 5 April 2023, H. B. Feeley.

TYRONE: Gortin Water, Oritor (Ballinderry Rivers Trust HQ) (H774796), 69 larvae 28 March 2023, H. B. Feeley, H. M. Barber-James and Craig Macadam.

WICKLOW: Avonmore River tributary, small drain, at Old Bridge (O159018), 1♀ 31 March 2023, J-R. Baars and 2nd bridge southeast of the Sally Gap (O148097), 1♂1♀ 17 April 2023, H. B. Feeley. River Liffey tributary, bridge on the R759 (O115124), 2♂♂ 17 April 2023, H. B. Feeley. River Liffey, bridge east of Ballysmuttan (O056148), 1♀ 17 April 2023 and 2km northwest of the Sally Gap (O109127), 8♂♂1♀ 17 April 2023, both H. B. Feeley. Ballylow

Brook, bridge upstream of the Ballydonnell River confluence (O067133), 1♀ 17 April 2023, H. B. Feeley. Lugnalee Brook, just upstream of the River Liffey confluence (O094131), 1♂1♀ 17 April 2023, H. B. Feeley. Sraghoe Brook, bridge on the R759 (O097135), 3♀♀ 17 April 2023, H. B. Feeley. Cock Brook, northwest of Kilmore (O021088), 6♂♂3♀♀ 18 April 2023, H. B. Feeley. Kings River, bridge 100m upstream of the Ballinagee River confluence (O033020), 1♂1♀18 April 2023, H. B. Feeley. Annalecka Brook, Annalecka Bridge (O056018), 5♂♂12♀♀ 18 April 2023, H. B. Feeley. Glashaboy Brook tributary, Glashaboy Bridge (O066016), 1♂ 18 April 2023, H. B. Feeley. Lugduff stream, upstream of Upper Lake, Glendalough (T110961), 1♂ 21 April 2023, H. B. Feeley. Glendasan River, old mining works (R756) (T099981), 1♂5♀♀ 27 April 2023, H. B. Feeley. Glenmacnass River, 500m downstream of Mall Brook (O122007), 1♂ 27 April 2023, H. B. Feeley. River Ow, bridge near Aghavannagh Barracks (T055861), 2♂♂4♀♀ 2 May 2023, H. B. Feeley. River Avonbeg, ford at Barravore (T065941), 2♂♂1♀ 2 May 2023, H. B. Feeley. Lough Bray Upper inflow (off Military Road) (O141151), 3♂♂4♀♀ 3 May 2023, H. B. Feeley. Avonmore River, Old Bridge (O160018), 1♀ 17 April 2023 and 1st bridge southeast of the Sally Gap (O143099), 4♂♂1♀ 17 April 2023, both H. B. Feeley. Glencullen River, Knocksink Wood (O214181), 2♀♀ 7 May 2023, Ryan Mitchell.

***Leuctra nigra* (Olivier, 1811) (Plate 3)**

DERRY: Carndaisy Glen, tributary of the Ballinderry River (H828857), 1♂ (form not recorded) 27 March 2023, H. M. Barber-James and Craig Macadam.

DONEGAL: Mullangore Stream, bridge upstream of Lough Veagh (C007192), 1♂ (1 f. *hibernica*) 29 March 2023, H. B. Feeley. Lough Eske, Ardnamona Wood (G964847), 10♂♂ (9 f. *hibernica*) 2♀♀ 16 April 2023 and 4♂♂ (3 f. *hibernica*) 19♀♀ 13 May 2023, Ryan Mitchell.

KERRY: Owengarriff River, near lake shore Mucross House (V962850), 1♂ (1 f. *hibernica*) 2♀♀ 22 April 2023, J-R. Baars.

LAOIS: Clodaigh River, bridge on L6002 (N296095), 2 larvae 2 April 2023, J-R. Baars.

MAYO: Lough Beltra, east shore (off R312) (M080986), 1♂ (1 f. *hibernica*) 17 April 2023, Bryan Kennedy.

SLIGO: Union Wood stream, Collooney (G680281), 6♂♂ (6 f. *hibernica*) 8♀♀ 26 March 2023 and 1♂ (1 f. *hibernica*) 2♀♀ 2 April 2023, Ryan Mitchell.

The records from Mullangore Stream, County Donegal and Lough Beltra, County Mayo are also included in Feeley *et al.* (2024). The record from Carndaisy Glen is a new county record for County Derry, while Mullangore Stream, Lough Eske and Lough Beltra are new locations for this uncommon and locally restricted species in Ireland (Feeley *et al.*, 2016).

Feeley *et al*. (2024) highlighted how 72% of male *L. nigra* examined to date in Ireland were of the form *hibernica*. Excluding the two individual male records included in that study, 20 of 23 males examined, or 87%, were confirmed of the form *hibernica*.

NEMOURIDAE

***Amphinemura sulcicollis* (Stephens, 1836)**

ANTRIM: Glenarm River, Glenarm Forest (D301117), 1♀ 10 May 2022, H. M. Barber-James. Forth River, Crow Glen (J289768), 1♀ 2 June 2023, H. M. Barber-James.

CLARE: River Caher, 150m upstream of Caher Bridge (M163081), 4♂♂2♀♀ (1♀ with crumpled wings) 23 May 2023, H. B. Feeley.

DERRY: Carndaisy Glen, tributary of the Ballinderry River (H828857), 1 larva 27 March 2023, H. M. Barber-James and Craig Macadam.

DOWN: Bloody Bridge River, Bloody Bridge (J386269), 3 larvae 19 March 2023, H. B. Feeley and H. M. Barber-James. Small stream 1, Carrick Little, Head Road, Annalong (J340229), 4 larvae 19 March 2023, H. B. Feeley and H. M. Barber-James.

KERRY: Tomies Wood River, below O'Sullivan's Falls (V915885), 4♀♀ 29 May 2023, off a small road (V912878), 2♀♀ 29 May 2023, 500m upstream of a small road (V913873), 3♀♀ 29 May 2023, 850m upstream off a small road (V911870), 2♂♂2♀♀ 29 May 2023, 1.2km upstream of a small road (south east tributary, Shehy Mountain) (V913867), 1♀ 29 May 2023 and 1.4km upstream of a small road (west tributary, Coomclochan) (V907867), 4♂♂4♀♀ 29 May 2023, all J-R. Baars.

LAOIS: Clodaigh River, bridge on L6002 (N296095), 4 larvae 2 April 2023, J.-R Baars. Glenlahan River, Clarahill Bridge (N345107), 3 larvae 2 April 2023, J.-R Baars.

MAYO: Glennamong River, bridge upstream of Lough Feeagh (F947024), 1♂ 18 April 2023, Bryan Kennedy.

WICKLOW: Glencullen River, Knocksink Wood (O214181), 1♂ 7 May 2023, Ryan Mitchell.

***Nemoura avicularis* Morton, 1894**

CAVAN: Maudabawn River, bridge upstream of the River Annalee (H645098), 3 larvae 22 August 2022, H. B. Feeley.

DONEGAL: Lough Veagh, shoreline (at steps) (C022212), 1♂ 29 March 2023, H. B. Feeley. Cronaniv Burn, Poisoned Glen, Dunlewy (B930186), 1♂ 30 March 2023, H. B. Feeley. Lough Eske, Ardnamona Wood (G964847), 1♂4♀♀ 16 April 2023, Ryan Mitchell.

GALWAY: Clonbur River, Clonbur Woods (Roshill) (M097566), 1♂ 5 April 2023, H. B. Feeley. Lough Mask, Ferry Bridge (R300) (M064582), 2♂♂ (1 individual had a fungal growth on its genitalia) 5 April 2023, H. B. Feeley.

KERRY: Owengarriff River, near the lake edge, Mucross House (V962850), 1♂ 3♀♀ 22 April 2023, J-R. Baars.

LAOIS: Owenass River, Cathole Falls (N377049), 1♂ 2 April 2023, J-R. Baars.

TYRONE: Ballinderry River, Wellbrook Bridge (H749791), 5 larvae 14 October 2022, H. M. Barber-James.

WICKLOW: Lough Dan, Scout Centre Shore (O157025), 26♂♂11♀♀ 31 March 2023, J-R. Baars and 1♂3♀♀ (1♀ with crumpled wings) 17 April 2023, H. B. Feeley.

The records from counties Cavan, Donegal, Galway and Tyrone above are new locations for this restricted species in Ireland, with the record from County Tyrone only the second record for that county and the first since 1990 (Feeley *et al*., 2016).

***Nemoura cinerea* (Retzius, 1783)**

ANTRIM: Linford Water, tributary of Glenarm River (D312060), 1 larva 22 July 2022, H. M, Barber-James.

DONEGAL: Lough Eske, Ardnamona Wood (G964847), 1♂3♀♀ 13 May 2023, Ryan Mitchell.

DOWN: Small stream 1, Carrick Little, Head Road, Annalong (J340229), 8 larvae 19 March 2023 and small stream 2, Carrick Little, Head Road, Annalong (J336237), 27 larvae 19 March 2023, both H. B. Feeley and H. M. Barber-James.

GALWAY: Clonbur River, Clonbur Woods (Roshill) (M097566), 1♀ 5 April 2023, H. B. Feeley.

KERRY: Tomies Wood River, off a small road (V912878), 1♂1♀ 29 May 2023, J-R. Baars.

MAYO: Finny River, bridge south of the church in Finny (M010586), 2♀♀ 5 April 2023, H. B. Feeley. Lough Conn, shore at Brackwanshagh (G191098), 1♂ 6♀♀ 6 April 2023, H. B. Feeley and Bryan Kennedy. Lough Cullen, shore on the R318 (G239043), 1♀ 13 May 2023, Bryan Kennedy.

***Nemurella pictetii* Klapálek, 1900**

ANTRIM: Linford Water, tributary of Glenarm River (D312060), 1 larva 22 July 2022, H. M. Barber-James. Forth River, Crow Glen (J289768), 1 larva 2 June 2023, H. M. Barber-James.

CLARE: small stream from a holy well, Tobar Oireachta, Dysert (R289838), 17 larva (1♂16♀♀) 13 August 2023, David McGrath.

Mature *N. pictetii* larvae can be sexed successfully (Macadam *et al.*, 2022).

DERRY: Carndaisy Glen, tributary of the Ballinderry River (H828857), 15 larvae 2 October 2022, H. M. Barber-James.

DOWN: Small stream 1, Carrick Little, Head Road, Annalong (J340229), 1 larva 19 March 2023 and small stream 2, Carrick Little, Head Road, Annalong (J336237), 3 larvae 19 March 2023, both H. B. Feeley and H. M. Barber-James.

KERRY: Knockasartnett (Glanooragh River) (V956945), 1♀ 9 May 2022, Noreen O'Reilly (NBDC). Owengarriff River, near lake edge Mucross House (V962850), 1♂ 22 April 2023, J-R. Baars.

SLIGO: Bunduff Lough, south shore off the L7109 (G715552), 1♂1♀ 13 April 2023, Ryan Mitchell.

TYRONE: Ballinderry River tributary, Keragh Bridge (H680824), 3 larvae 2 October 2023, H. M. Barber-James.
WICKLOW: Annalecka Brook, Annalecka Bridge (O056018), 1♀ 18 April 2023, H. B. Feeley. Glashaboy Brook tributary, Glashaboy Bridge (O066016), 1♀ 18 April 2023, H. B. Feeley.

***Protonemura meyeri* (Pictet, 1841)**

ANTRIM: Glenarm River, Glenarm Forest (D301117), 1♀ 10 May 2022, H. M. Barber-James.
CARLOW: River Slaney, Kilcarry Bridge (S892625), 1 adult (sex indeterminate) 3 April 2022, Ciaran Byrne.
CLARE: Shallee River (Ballygriffy River), Rinerrinagh (R308809), 4 larvae 14 December 2022, David McGrath. River Caher, upstream of Caher Bridge (M163081), 1♀ 23 May 2023, H. B. Feeley.
DERRY: Carndaisy Glen, tributary of the Ballinderry River (H828857), 1♂ 27 March 2023, H. M. Barber-James and Craig Macadam.
DONEGAL: Owenveagh River, Glenveagh Cottage (B993182), 1♂2♀♀ 29 March 2023, H. B. Feeley. Gweebarra River, Pollglass Bridge (R254) (B948139), 2♀♀ 29 March 2023, H. B. Feeley. Bullaba River, 500m upstream of Owenwee River (R254) (C011137), 1♀ 29 March 2023, H. B. Feeley. Cronaniv Burn, Poisoned Glen, Dunlewy (B930186), 7♂♂5♀♀ 30 March 2023, H. B. Feeley. Glentornan River, upstream of Lough Nacung (B895191), 1♂3♀♀ 30 March 2023, H. B. Feeley. Killybegs (tributary of Lough Aderry) (G698813), 1 adult (sex indeterminate) 30 March 2023, Marie Muirhead (NBDC). Sruhannameel Stream, upstream of Lough Nacung (B901188), 3♂♂2♀♀ 30 March 2023, H. B. Feeley. Lough Eske, Ardnamona Wood (G964847), 1♀ 13 May 2023, Ryan Mitchell.
DOWN: Bloody Bridge River, Bloody Bridge (J386269), 1♂1♀ 19 March 2023, H. B. Feeley.
DUBLIN: River Dodder, bridge on the Castlekelly Road (O108202), 1♂ 15 March 2022, Marcin Penk. Owendoher River, near Cruagh, off the R116 (O139226), 4♂♂4♀♀ 27 March 2023, J-R. Baars and Kilakee Mountain (O125222), 2♀♀ 3 May 2023, H. B. Feeley. Cot Brook, near O'Rourkes Lane (O108199), 4♂♂5♀♀ 27 March 2023, J-R. Baars.
KERRY: Tomies Wood River, below O'Sullivan's Falls (V915885), 2♀♀ 20 April 2023 and 3♂♂ 29 May 2023 and off a small road (V912878), 1♀ 20 April 2023 and 1♀ 29 May 2023, 500m upstream of a small road (V913873), 1♀ 21 April 2023 and 1♂ 29 May 2023, 850m upstream of a small road (V911870), 1♂ 2♀♀ 21 April 2023, 1.2km upstream of a small road (south east tributary, Shehy Mountain) (V913867), 2♂♂4♀♀ 21 April 2023 and 1.4km upstream of a small road (west tributary, Coomclochan) (V907867), 1♂2♀♀ 21 April 2023, all J-R. Baars.
MAYO: River Robe, Crossboyne Bridge (M337709), 1♀ 26 March 2023, H. B. Feeley. Finny

River, bridge south of church in Finny (M010586), 4♂♂5♀♀ 5 April 2023, H. B. Feeley. Glensaul River, confluence at Waterfall, Tourmakeady Woods (M082676), 1♀ 5 April 2023, H. B. Feeley. Shanwar (flying in domestic garden), Foxford (G297037), 1♀ 12 April 2023, Bryan Kennedy.

OFFALY: Near Birr (N144076), 1 adult 26 March 2022 and 1 adult 13 April 2022, Rachel Mc Kenna (NBDC).

SLIGO: Union Wood stream, Collooney (G680281), 1♀ 26 March 2023, Ryan Mitchell. River Unshin, off the L1402, southeast of Riverstown (G756186), 1♂2♀♀ 17 March 2023, Bryan Kennedy. Lenyvee Stream, bridge upstream of Owenaher River (G418172), 1♂1♀ 25 March 2023, Bryan Kennedy.

TYRONE: Ballinderry River, Wellbrook Bridge (H749791), 50 larvae 14 October 2022, H. M. Barber-James. Gortin Water, Oritor (Ballinderry Rivers Trust HQ) (H774796), 5♂♂1♀ 28 March 2023, H. B. Feeley, H. M. Barber-James and Craig Macadam.

TIPPERARY: Cashel (S069339), 1 adult (sex unknown) 2 March 2022, Larry Doherty (NBDC).

WEXFORD: Camolin, tributary of Bann River (T067569), 1 adult (sex indeterminate) 11 March 2023, Hilary Rimbi (NDBC).

WICKLOW: Avonmore River, 1st Bridge south-east of the Sally Gap (O143099), 2♂♂ 6 April 2023, J-R. Baars and 2♀♀ 17 April 2023, H. B. Feeley. River Liffey tributary, south of bridge on the R759 (O114124), 1♂2♀♀ 6 April 2023, J-R. Baars and at a bridge on the R759 (O115124), 2♀♀ 17 April 2023, H. B. Feeley. River Liffey, 2km northwest of the Sally Gap (O109127), 1♂ 6 April 2023, J-R. Baars and 11♂♂9♀♀ 17 April 2023 and bridge east of Ballysmuttan (O056148), 2♂♂ 17 April 2023, both H. B. Feeley. Glencree River, off the R115 (O141185), 8♂♂2♀♀ 6 April 2023, J-R. Baars. Avonmore River tributaries, Sheepsbank Bridge (O153095), 14♂♂12♀♀ 17 April 2023 and 2nd bridge southeast of the Sally Gap (O148097), 4♂♂1♀ 17 April 2023, both H. B. Feeley. Ballylow Brook, bridge upstream of Ballydonnell River confluence (O067133), 1♂ 17 April 2023, H. B. Feeley. Ballydonnell River, Ballylow Bridge (O060129), 2♂♂2♀♀ (1♂ and 1♀ with crumpled wings) 17 April 2023, H. B. Feeley. Lugnalee Brook, just upstream of the River Liffey confluence (O094131), 1♂ 17 April 2023, H. B. Feeley. Sraghoe Brook, bridge on the R759 (O097135), 1♂1♀ 17 April 2023, H. B. Feeley. Ballinagee River, Ballinagee Bridge (O036023), 1♀ 18 April 2023, H. B. Feeley. Cock Brook, northwest of Kilmore (O021088), 3♂♂3♀♀ 18 April 2023, H. B. Feeley. Kings River, bridge 100m upstream of the Ballinagee River confluence (O033020), 18 April 2023, H. B. Feeley. Annalecka Brook, Annalecka Bridge (O056018), 3♂♂ 18 April 2023, H. B. Feeley. Glendasan River, bridge upstream of the Glenealo River confluence (T123969), 5♂♂1♀ 21 April 2023 and old mining works, (R756) (T099981), 1♂ 27 April 2023, both H. B. Feeley.

Glenealo River, Mining Road (T089961), 1♂1♀ 21 April 2023, H. B. Feeley. Lugduff Stream, upstream of Upper Lake, Glendalough (T110961), 1♂ 21 April 2023, H. B. Feeley. Cloghoge Brook, downstream of Lough Tay (Luggala Estate) (O158060), 1♂ 27 April 2023, H. B. Feeley. River Ow, bridge near Aghavannagh Barracks (T055861), 2♂♂1♀ 2 May 2023 and Ballymanus Bridge (T093815), 2♀♀ 2 May 2023, both H. B. Feeely. Avonbeg River, Greenan Bridge (T146873), 1♀ 2 May 2023, H. B. Feeley. Lough Bray Upper inflow (off Military Road) (O141151), 1♂1♀ 3 May 2023, H. B. Feeley.

***Protonemura praecox* (Morton, 1894)**

DUBLIN: Owendoher River, Cruagh (bridge on R116) (O137227), 2♂♂ 4 February 2023, H. B. Feeley and near Cruagh, off the R116 (O139226), 4♂♂5♀♀ 27 March 2023, J-R. Baars. Cot Brook, near O'Rourkes Lane (O108199), 3♂♂6♀♀ 27 March 2023, J-R. Baars.

PERLIDAE

***Dinocras cephalotes* (Curtis, 1827)**

ANTRIM: Linford Water, tributary of Glenarm River (D312060), 1 larva 22 July 2022, H. M, Barber-James.

CLARE: River Caher, 150m upstream of Caher Bridge (M163081), 7♂♂7♀♀ 23 May 2023, H. B. Feeley, just upstream of Caher Bridge (M163082), 1 larva 21 August 2023, H. M. Barber-James. Derrynavahagh (M173067), 4 larvae 25 November 2023 and just off the L5047 (500m east junction with R477) (M151090), 1 larva 26 November 2023, both David McGrath.

TIPPERARY: Glengarra Woods (Burncourt River) (R923202), 1 larva 27 September 2021, Jonathan Boyle (NBDC) and 1 larva 8 February 2022, Michael Griffin (NBDC).

WATERFORD: Glenary (Glenary River) (S219190), 1 larva 24 March 2022, Niamh Birch (NBDC).

***Perla carlukiana* Klapálek, 1907**

CORK: Coolnagearagh (W431738), 1♀ 26 May 2020 and 1♀ 16 May 2023, Mike O'Sullivan (NBDC).

DONEGAL: Owenveagh River, Glenveagh Cottage (B993182), 2 larvae 29 March 2023, H. B. Feeley.

KERRY: Ullauns River, Killarney National Park (V915794), 1♀ 6 June 2023, Katy Steele (NBDC).

LAOIS: Clodaigh River, bridge on the L6002 (N296095), 3 larvae 2 April 2023, J-R. Baars. Glenlahan River, Clarahill Bridge (N345107), 2 larvae 2 April 2023, J-R. Baars.

MAYO: Finny River, bridge south of the church in Finny (M010586), 5♂♂2♀♀ 22 May 2023, H. B. Feeley.

OFFALY: Camcor River, Birr Town (N064048), 1 larva 6 July 2022, Rachel Mc Kenna

(NBDC).

PERLODIDAE

***Diura bicaudata* (Linnaeus, 1758)**

MAYO: Lough Conn, shore at Brackwanshagh (G191098), 1♀ 6 April 2023, H. B. Feeley and Bryan Kennedy. Lough Beltra, east shore (off the R312) (M080986), 1♂ 17 April 2023, Bryan Kennedy.

WICKLOW: River Liffey, Liffey Head Bog (south of the R115) (O138135), 1♂ 14 June 2021, Liffey Head Bog (north of the R115) (O134138), 1 larva 15 April 2022, both K. Finch (NBDC) and 2km northwest of the Sally Gap (O109127), 1♂ 6 April 2023, J-R. Baars. Avonmore River, 1st bridge southeast of the Sally Gap (O143099), 2♂♂ 6 April 2023, J-R. Baars and 1♀ 17 April 2023, H. B. Feeley.

The female collected in County Mayo was brachypterous and the male micropterous, while the females collected in County Wicklow were fully winged and the males were brachypterous.

***Isoperla grammatica* (Poda, 1761)**

ANTRIM: Glenarm River, Glenarm Forest (D301117), 4 larvae 10 May 2022, H. M. Barber-James. Braid River, Broughshane (D147066), 1 adult (sex indeterminate) 16 May 2023, David Craig (NBDC). Forth River, Crow Glen (J289768), 1♀ 2 June 2023, H. M. Barber-James.

CLARE: River Caher, 150m upstream of Caher Bridge (M163081), 8♂♂2♀♀ (1♂ with crumpled wings) 23 May 2023, H. B. Feeley and just off the L5047 (500m east junction with the R477) (M151090), 1 larva 26 November 2023, David McGrath. River Fergus, Poplar Bridge (R271911), 1♂ 24 May 2023 and Addroon Bridge (R359878), 1♂ 25 May 2023, both H. B. Feeley. Millbrook River, Ballyline Bridge (R383861), 2♂♂2♀♀ 25 May 2023, H. B. Feeley. Lissycasey Stream, Bridge on the N68 south west of Lissycasey (R209660), 1 larva 21 July 2023, David McGrath.

CORK: Glashagarriff River, Coolnagearagh (R618) (W431738), 1 adult (sex indeterminate) 17 May 2023, Mike O'Sullivan (NBDC).

DERRY: Carndaisy Glen, tributary of the Ballinderry River (H828857), 3 larvae 27 March 2023, H. M. Barber-James and Craig Macadam.

DOWN: Small stream 1, Carrick Little, Head Road, Annalong (J340229), 1 larva 19 March 2023, H. B. Feeley and H. M. Barber-James. Bloody Bridge River, Bloody Bridge (J386269), 1 larva 19 March 2023, H. B. Feeley and H. M. Barber-James.

DUBLIN: Whitechurch, Rathfarnham (Whitechurch Stream) (O145259), 1 adult (sex indeterminate) 20 June 2022, Vraja Leader (NBDC).

GALWAY: Beagh River, 1.5km upstream of Lough Cutra (M466004), 1♂2♀♀ 23 May 2023, H. B. Feeley.

KERRY: Tomies Wood River, below O'Sullivan's Falls (V915885), 1♂ 20 April 2023 and off a small road (V912878), 1♂ 20 April 2023 and 1♂ 29 May 2023, 500m upstream of a small road (V913873), 11♂1♀ 29 May 2023 and 1.4km upstream of a small road (west tributary, Coomclochan) (V907867), 5♀♀ 29 May 2023, all J-R. Baars. Glanagenty Kielbawn (Glangeenty River) (Q949142), 1 adult (sex indeterminate) 18 June 2023, Anneke O'Connor (NBDC).
LAOIS: Clodaigh River, bridge on the L6002 (N296095), 2 larvae 2 April 2023, J.-R. Baars. Owenass River, Cathole Falls (N377049), 1 larvae 2 April 2023, J-R. Baars.
OFFALY: Camcor River, Birr Town (N064048), 1 larva 6 July 2022, Rachel Mc Kenna (NBDC).
TIPPERARY: Cahir (R994232), 1♀ 27 May 2022, Niall Halligan (NBDC).
TYRONE: Gortin Water, Oritor (Ballinderry Rivers Trust HQ) (H774796), 4 larvae 28 March 2023, H. B. Feeley, H. M. Barber-James and Craig Macadam. Ballinderry River tributary, Teebane Bridge (H671802), 1 larva 17 May 2023, H. M. Barber-James.
WATERFORD: Knockaunbrandaun (Tributary of Glounmore Stream) (S229112), 1 adult (sex indeterminate) 18 June 2023, Adrian Allen (NBDC).
WICKLOW: Ballydonnell Brook, Ballylow Bridge (O058130), 1 larva 5 May 2023 and 1 adult (sex indeterminate) 12 May 2023, both Paula White (NBDC). Tinahely Railway Walk (Derry River) (T042721), 1 adult (sex indeterminate) 4 June 2023, David Cullen (NBDC).

There is some doubt over the identity of *Isoperla* in Ireland. British and Irish specimens were originally described as a separate subspecies, *Chloroperla grammatica subarmata* Despax, 1936 (Despax, 1936), but Illies (1952) subsequently synonymised it with *Isoperla grammatica*. However, it is suggested that *I. subarmata* is a valid species based on the shape of the penal armature (Jean-Paul Reding, pers. comm.). Therefore, further work is required to determine the taxonomic status of *Isoperla* in Ireland (and Britain) and whether both *Isoperla grammatica* and *I. subarmata* are present here.

TAENIOPTERYGIDAE

***Brachyptera risi* (Morton, 1896)**

ANTRIM: Glenarm River, Glenarm Forest (D301117), 1 larva 10 May 2022, H. M. Barber-James. Forth River, Crow Glen (J289768), 1♂ 2 June 2023, H. M. Barber-James.
DERRY: Ballinderry River tributary, Reubens Glen (H857887), 1 larva 2 October 2022, H. M. Barber-James. Carndaisy Glen, tributary of the Ballinderry River (H828857), 2♂♂2♀♀ 27 March 2023, H. M. Barber-James and Craig Macadam and 1♀ 18 May 2023, H. M. Barber-James.
DONEGAL: Owenveagh River, Glenveagh Cottage (B993182), 1♀ 29 March 2023, H. B.

Feeley. Lough Eske, Ardnamona Wood (G964847), 2♂♂ 16 April 2023, Ryan Mitchell.
DOWN: Small stream 1, Carrick Little, Head Road, Annalong (J340229), 1 larva 19 March 2023, H. B. Feeley and H. M. Barber-James.
DUBLIN: Owendoher River, near Cruagh, off the R116 (O139226), 2♂♂ 27 March 2023, J-R. Baars, Cruagh (bridge on the R116) (O137227), 2♀♀ 3 May 2023 and Kilakee Mountain (O125222), 1♀ 3 May 2023, both H. B. Feeley. Cot Brook, near O'Rourkes Lane (O108199), 2♀♀ 27 March 2023, J-R. Baars.
FERMANAGH: Crocknagrally (Colebrooke River) (H482428), 17 April 2022, Sam Clawson (NBDC).
KERRY: Tomies Wood River, below O'Sullivan's Falls (V915885), 2♂♂ 20 April 2023, off a small road (V912878), 6♂♂2♀♀ 20 April 2023, 500m upstream of a small road (V913873), 1♂ 21 April 2023, 850m upstream of a small road (V911870), 2♂♂4♀♀ 21 April 2023 and 1.4km upstream of a small road (west tributary, Coomclochan) (V907867), 2♂♂1♀ 21 April 2023, all J-R. Baars.
LAOIS: Clodaigh River, bridge on the L6002 (N296095), 2 larvae 2 April 2023, Owenass River, Cathole Falls (N377049), 2♂♂2♀♀ 2 April 2023, J-R. Baars. Glenlahan River, Clarahill Bridge (N345107), 1♀ 2 April 2023, J-R. Baars. Upper Murglash River, tributary of Owenass River, off the L2018 (N377053), 1♂4♀♀ 2 April 2023, J-R. Baars.
MAYO: Srahnalong River, bridge on the R300 (M008614), 1♂ 5 April 2023, H. B. Feeley. Glensaul River, confluence at the waterfall, Tourmakeady Woods (M082676), 1♂ 5 April 2023 and car park at Tourmakeady Woods (M091678), 1♂ 5 April 2023, both H. B. Feeley.
TYRONE: Gortin Water, Oritor (Ballinderry Rivers Trust HQ) (H774796), 4♂♂3♀♀ 28 March 2023, H. B. Feeley, H. M. Barber-James and Craig Macadam.
WICKLOW: Avonmore River, 1st bridge south-east of the Sally Gap (O143099), 1♂ 6 April 2023, J-R. Baars. Glencree River, off the R115 (O141185), 2♀♀ 6 April 2023, J-R. Baars. Avonmore River tributary, Sheepsbank Bridge (O153095), 1♂ 17 April 2023, H. B. Feeley. River Liffey, bridge east of Ballysmuttan (O056148), 1♀ 17 April 2023 and 2km northwest of the Sally Gap (O109127), 1♂1♀ 17 April 2023, both H. B. Feeley. Ballylow Brook, bridge upstream of the Ballydonnell River confluence (O0677338), 3♂♂2♀♀ (1♂ with crumpled wings) 17 April 2023, H. B. Feeley. Ballydonnell River, Ballylow Bridge (O060129), 2♂♂2♀♀ 17 April 2023, H. B. Feeley. Lugnalee Brook, just upstream of the River Liffey confluence (O094131), 2♂♂ 17 April 2023, H. B. Feeley. Sraghoe Brook, Bridge on the R759 (O097135), 1♂ 17 April 2023, H. B. Feeley. Ballinagee River, Ballinagee Bridge (O036023), 2♀♀ 18 April 2023, H. B. Feeley. Cock Brook, northwest of Kilmore (O021088), 1♂ 18 April 2023, H. B. Feeley. Kings River, bridge 100m upstream of the Ballinagee River confluence (O033020), 2♂♂ 18 April 2023, H. B. Feeley. Annalecka Brook, Annalecka Bridge (O056018), 1♂4♀♀ 18

April 2023, H. B. Feeley. Glashaboy Brook tributary, Glashaboy Bridge (O066016), 1♂ 18 April 2023, H. B. Feeley. Glendasan River, bridge upstream of the Glenealo River confluence (T123969), 1♀ 21 April 2023, H. B. Feeley. Glenmacnass River, just upstream of the Avonmore River (T145964), 1♀ 27 April 2023, H. B. Feeley. River Ow, Ballymanus Bridge (T093815), 1♂2♀♀ 2 May 2023, H. B. Feeley. Lough Bray Upper inflow (off the Military Road) (O141151), 2♀♀ 3 May 2023, H. B. Feeley. Glencullen River, Knocksink Wood (O214181), 1♂ 7 May 2023, Ryan Mitchell.

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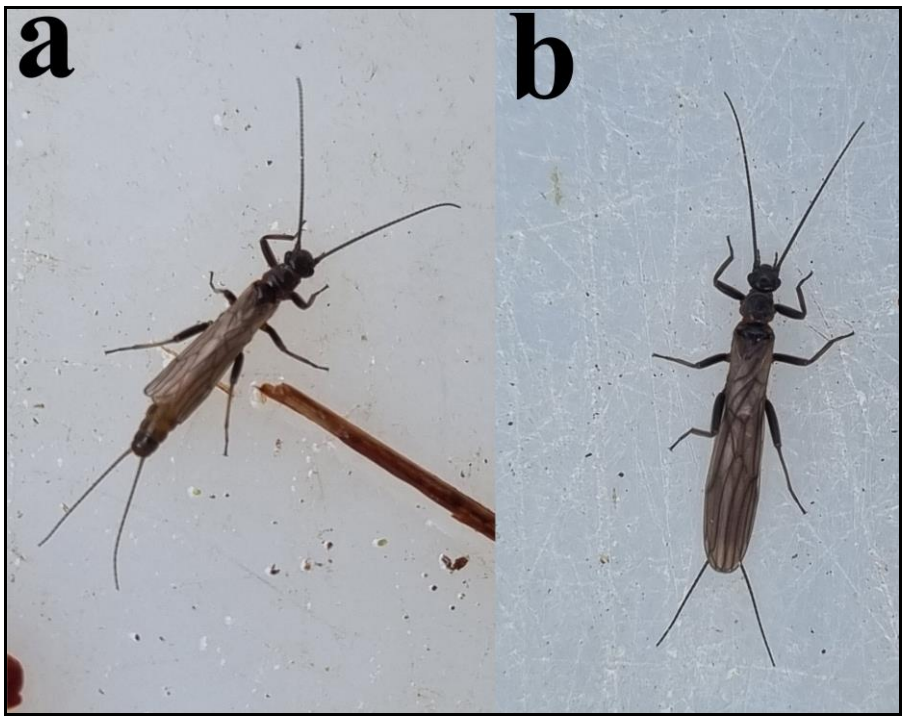

PLATE 1. Wing length variation in *Capnia atra* populations. **a**: brachypterous female collected from Lough Veagh, County Donegal; **b**: macropterous individual collected from Lough Conn, County Mayo. Photographs: Hugh B. Feeley.

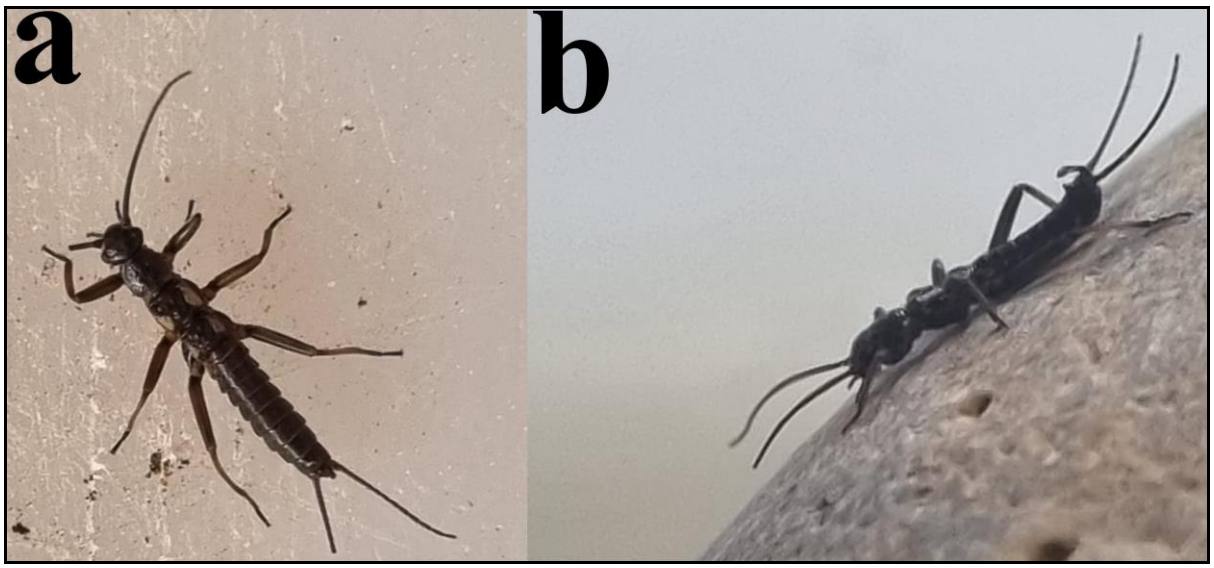

PLATE 2. Microptery in male *Zwicknia bifrons* collected from Lough Mask, County Mayo. All male *Z. bifrons* collected exhibited this extreme reduction in wing size, with adults resembling larvae. **a**: dorsal view. **b**: lateral view. Photographs: Hugh B. Feeley.

PLATE 3. Lateral view of additional upstanding processes on tergite VII characteristic of a male *Leuctra nigra* f. *hibernica* after Feeley *et al*. (2024), the dominant form of adult males in Ireland. Adult male *L. nigra* sensu stricto only have upstanding processes on tergites VI and VIII. Photograph: Hugh B. Feeley.

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MISCELLANEOUS IRISH CADDISFLY (TRICHOPTERA) RECORDS

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Abstract

Records are provided from the National Biodiversity Data Centre and collections made by Anthony Bryant in County Waterford and Rodney Monteith in County Antrim. All are new monad (1km^2) and hectad (10km^2) ones for Ireland with the exception of *Hagenella clathrata* (Kolenati, 1848). Seven new county records are noted.

Key words: Trichoptera, caddisflies, *Hagenella clathrata*, Ireland, new records, distribution.

Introduction

Oisín Duffy, Surveys and Records Officer with the National Biodiversity Data Centre kindly provided a data set containing Irish Trichoptera records (sent to the Centre by the public in 2023) for validation by the senior author. These ranged in quality. Some were supported by photographs and were named. Others were unnamed. The specimens were mainly adults but some larvae were included. The confirmed records are given below. They are indicated by (NBDC, 2024).

In addition, AB sent JPOC a large collection of adults from Tramore and its environs in County Waterford in south-east Ireland.This was followed by a large collection from several sites in County Antrim, Northern Ireland. It included swept and light-trapped adults taken by RM. The main site, Springfarm, is near Lough Neagh, the Six Mile Water River, several ponds and streams.

Only new monad (1km^2) and hectad (10km^2) records are presented with the exception of *Hagenella clathrata* (Kolenati, 1848). This species is noted in Ireland for its rarity and conservation importance. Nolan (2021) reported two adults from Killaun Bog, County Offaly, remarking that it will be of interest to consider whether the bog will maintain populations of *Hagenella clathrata* into the future, in view of the extent to which the site has been managed for peat-harvesting. The greater area of the bog would currently almost certainly not facilitate the species as most of its surface consists of bare peat, the consequence of industrial harvesting.

The remaining areas of revegetating bog were hand-harvested for peat up to c. 50 years ago and a 1.5-2m high face-bank marks the point at which cutting ceased. The area that Nolan surveyed in 2020 and 2021 lies at the southern end of the bog and is a mosaic of wet woodland, *Ulex* and *Calluna* scrub and swampy *Molinia*. It is interesting therefore that Rachel Mc Kenna photographed an adult in 2022 on the bog near where Nolan found his specimens in 2021 (Plate 1).

Specimens were identified by the senior author using Malicky (2004), Barnard and Ross (2012), Salokannel and Mattila (2018) and Wallace, Flint and Flint (2022). An adult shown in a photograph and labelled *Athripsodes albifrons* (Linnaeus, 1758) from Clonmel, County Tipperary appeared to be a possible specimen of *A. bilineatus* (Linnaeus, 1758). Dr Ian Wallace examined the photograph and decided that the adult was an aberrant *Athripsodes albifrons*.

Seven new county records are noted.

Addendum 10

The records in this paper will be sent as Addendum 10 to the dataset "Caddisflies (Trichoptera) of Ireland" of the National Biodiversity Data Centre <https://maps.biodiversityireland.ie/Dataset/250> (O'Connor, 2024). The data will be also supplied to CEDaR.

The new records

RHYACOPHILIDAE

***Rhyacophila dorsalis* (Curtis, 1834)**

ANTRIM: Holywell (J1588), 1♂ 1 October 2023, swept, Rodney Monteith. Millrace Trail (J1585), 1♂ 29 May 2023, swept, Rodney Monteith.

***Rhyacophila munda* McLachlan, 1862**

CORK: Camus Bridge (S0443), 1 larva 2 August 2023, Aideen Kane, determined J. P. O'Connor from a photograph (NBDC, 2024).

GLOSSOSOMATIDAE

***Agapetus fuscipes* Curtis, 1834**

ANTRIM: Tardree Forest (J1893), 1♂ 21 August 2023, swept, Rodney Monteith.

***Agapetus ochripes* Curtis, 1834**

ANTRIM: Springfarm (J1488), 1♀ 13 June 2023, 1♀ 14 August 2023 and 1♂ 6 September 2023, light-trap, Rodney Monteith.

***Glossosoma boltoni* Curtis, 1834**
WATERFORD: Lough Ballyscanlan (S5302), 1♀ 20 May 2023, daytime observation, Anthony Bryant.

HYDROPTILIDAE

***Agraylea multipunctata* Curtis, 1834**
ANTRIM: Springfarm (J1488), 1♂2♀♀ 13 June 2023, light-trap, Rodney Monteith.
***Agraylea sexmaculata* Curtis, 1834**
ANTRIM: Springfarm (J1488), 3♂♂2♀♀ 13 June 2023, light-trap, Rodney Monteith.
WATERFORD: Lough Ballyscanlan (S5302), 1♀ 11 June 2023, light-trap, Anthony Bryant. Tramore (S5701), 1♂ 6 September 2023, light-trap, Anthony Bryant.
***Allotrichia pallicornis* (Eaton, 1873)**
ANTRIM: Springfarm (J1488), 12♂♂10♀♀ 13 June 2023 and 1♀ 3 July 2023, light-trap, Rodney Monteith.
***Hydroptila angulata* Mosely, 1922 New to County Antrim**
ANTRIM: Springfarm (J1488), 5♂♂1♀ 13 June 2023 , light-trap, Rodney Monteith.
***Hydroptila cornuta* Mosley, 1922 New to County Antrim**
ANTRIM: Springfarm (J1488), 2♀♀ 13 June 2023, light-trap, Rodney Monteith.
***Hydroptila sparsa* Curtis, 1834**
ANTRIM: Springfarm (J1488), 5♂♂ 13 June 2023, light-trap, Rodney Monteith.
***Hydroptila tineoides* Dalman, 1819 New to County Antrim**
ANTRIM: Springfarm (J1488), 1♀ 13 June 2023, light-trap, Rodney Monteith.
***Ithytrichia lamellaris* Eaton, 1873 New to County Antrim**
ANTRIM: Springfarm (J1488), 1♂ 13 June 2023, light-trap, Rodney Monteith.

PHILOPOTAMIDAE

***Philopotamus montanus* (Donovan, 1813)**
SLIGO: Sessuegilroy (G4415), adult 25 March 2023, single specimen observed flying in early afternoon in a river channel, Bryan Kennedy, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

POLYCENTROPODIDAE

***Cyrnus trimaculatus* (Curtis, 1834)**
ANTRIM: Springfarm (J1488), 1♂ 13 June 2023, light-trap, Rodney Monteith.
***Polycentropus flavomaculatus* (Pictet, 1834)**
ANTRIM: Millrace Trail (J1585), ♀ 29 May 2023, swept, Rodney Monteith. Springfarm

(J14883), 1♀ 30 June 2023, 3♂♂1♀ 13 June 2023, 1♀ 3 July 2023 and 1♂ 22 August 2023, light-trap, Rodney Monteith.
WATERFORD: Lough Ballyscanlan (S5302), 2♀♀ 11 June 2023, light-trap, Anthony Bryant.

PSYCHOMYIIDAE

***Psychomyia pusilla* (Fabricius, 1781)**
ANTRIM: Springfarm (J1488), ♀ 11 June 2023, 13♂♂6♀♀ 13 June 2023, 1♂1♀ 3July2023 and 2♀♀ 6 September 2023, light-trap, Rodney Monteith.
***Tinodes waeneri* (Linnaeus, 1758)**
ANTRIM: Springfarm (J1488), 1♂ 13 June 2023, light-trap, Rodney Monteith.

HYDROPSYCHIDAE

***Hydropsyche pellucidula* (Curtis, 1834)**
ANTRIM: Springfarm (J1488), 1♂ 13 June 2023, light-trap, Rodney Monteith.
***Hydropsyche siltalai* Döhler, 1963**
ANTRIM: Millrace Trail (J1585), 1♀ 29 May 2023, swept, Rodney Monteith. Springfarm (J1488), 1♀ 11 June 2023, 1♀ 13 June 2023, 1♀ 3 July 2023 and 1♀ 28 July 2023, light-trap, Rodney Monteith.

PHRYGANEIDAE

***Agrypnia varia* (Fabricius, 1793)**
OFFALY: near Clonmacnoise (M9929), adult 19 July 2023 and adult 27 July 2023, Martin Schroeder, determined J. P. O'Connor from a photograph (NBDC, 2024).
***Hagenella clathrata* (Kolenati, 1848) (Plate 1)**
OFFALY: Killaun Bog (N1005), adult 15 May 2022, Rachel Mc Kenna, confirmed by Cathal McNaughton from a photograph. This record (N108051) is close to the record (N108050) from the same bog by Nolan (2021).
***Phryganea bipunctata* Retzius, 1783**
ANTRIM: Springfarm (J1488), 1♂ 13 June 2023, light-trap, Rodney Monteith.

GOERIDAE

***Goera pilosa* (Fabricius, 1775)**
ANTRIM: Springfarm (J1488), 1♂1♀ 11 June 2023 and 1♂1♀ 13 June 2023, light-trap, Rodney Monteith.

LEPIDOSTOMATIDAE

***Lepidostoma hirtum* (Fabricius, 1775)**

ANTRIM: Springfarm (J1488), 1♀ 13 June 2023, light-trap, Rodney Monteith.

WATERFORD: Glen Road, Tramore (S5803), 1♀ 15 May, 2023, day observation, Anthony Bryant. Lough Ballyscanlan (S5302), 2♀♀ 11 June 2023, light-trap, Anthony Bryant.

LIMNEPHILIDAE

***Anabolia nervosa* (Curtis, 1834)**

DUBLIN: Glenasmole (O0921), ♂ 1 October 2023, David Cullen, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

WICKLOW: Baltinglass (S8887), adult 9 September 2023, Bernadette Alcock-Earley, determined J. P. O'Connor from a photograph (NBDC, 2024).

***Glyphotaelius pellucidus* (Retzius, 1783)**

KILDARE: Ardenode (N9009), ♂ 5 May 2023, light-trap Chris Mc Kenna, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

MEATH: Hill of Down (N6849), adult 6 May 2023, Ryan Wilson-Parr (NBDC, 2024).

***Grammotaulius nigropunctatus* (Retzius, 1783)**

OFFALY: Clonmacnoise (M9929), adult 21 May 2023, adult 22 May 2023 and adult 16 August 2023, a garden on an esker, Martin Schroeder, determined J. P. O'Connor from a photograph (NBDC, 2024). Rathgibbon South near Birr (N1407), 1♀ 21 July 2023, Rachel Mc Kenna (NBDC, 2024).

***Limnephilus auricula* Curtis, 1834**

WATERFORD: Lough Ballyscanlan (S5302), 1♂ 31 May 2023, daytime observation, Anthony Bryant.

***Limnephilus binotatus* Curtis, 1834**

CLARE: Tullycommon (R2896), adults 18 May 2023, light-trap, confirmed Cathal McNaughton from a photograph (NBDC, 2024).

***Limnephilus decipiens* (Kolenati, 1848)**

WATERFORD: Tramore (S5701), 1♀ 15 August 2023, light-trap, Anthony Bryant.

***Limnephilus flavicornis* (Fabricius, 1787)**

ANTRIM: Lagan meadows (J3369), adult 3 February 2023, found dried up in a greenhouse, David Craig, determined J. P. O'Connor from a photograph (NBDC, 2024).

***Limnephilus lunatus* Curtis, 1834**

CLARE: Attyslany (R3998), adult 7 October 2023, Rachel Mc Kenna, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

DONEGAL: Carrickmagrath, Ballybofey (H1392), adult 7 October 2023, light-trap, John Cromie, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

***Limnephilus marmoratus* Curtis, 1834**

MAYO: Moore Hall (M1874), adult 11 June 2023, Geraldine Nee, determined J. P. O'Connor from a photograph (NBDC, 2024).

WEXFORD: Portersgate (S7500), adult 5 July 2023, Hubert Gallagher, determined J. P. O'Connor from a photograph (NBDC, 2024).

***Limnephilus sparsus* Curtis, 1834 New to County Down (Fig. 1)**

DOWN: Balloo wetland (J5079), adult 2 September 2023, Sam Clawson, determined J. P. O'Connor from a photograph (NBDC, 2024).

MAYO: Belcarra (M1984), adult 22 May 2023, Geraldine Nee, determined J. P. O'Connor from a photograph (NBDC, 2024).

***Halesus radiatus* (Curtis, 1834)**

DONEGAL: Carrickmagrath, Ballybofey (H1392), adult 3 September 2023, light-trap, John Cromie, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

LAOIS: Kellystown (S5984), adult 17 April 2023, light-trap, Hugh Shepherd (NBDC, 2024).

TIPPERARY: Ballybeg (S1316), adult 7 September 2023 and adult 23 September 2023, light-trap, Louise Garcia, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

***Micropterna lateralis* (Stephens, 1837)**

WATERFORD: Tramore (S5701), 1♂ 22 April 2023, 1♂ 20 May 2023, 1♂ 23 May 2023 and 1♂ 13 September 2023, light-trap, Anthony Bryant.

***Stenophylax permistus* McLachlan, 1895 New to County Offaly**

OFFALY: near Clonmacnoise (M9929), adult 8 April 2023 and 3 adults 27 April 2023, attracted to a lighted window at night in a garden on an esker, Martin Schroeder, determined J. P. O'Connor from a photograph (NBDC, 2024).

WATERFORD: Tramore sandhills (S6100), 1♂ 9 June 2023, light-trap, Anthony Bryant.

SERICOSTOMATIDAE

***Sericostoma personatum* (Spence, 1826)**

ANTRIM: Reas Wood (J1385), 2♂♂ 26 May 2023, swept, Rodney Monteith. Skilgnaban (J3191) 1♀ 16 June 2023, David Craig, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

MAYO: Rosserk (G2525), 1♂ 22 June 2023, Ellen O Hora, determined J. P. O'Connor from a photograph (NBDC, 2024).

LEPTOCERIDAE

***Athripsodes albifrons* (Linnaeus, 1758)**

CORK: Glanmire (W7374), adult 13 August 2023, Alan Brown, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

MEATH: Roughgrange (O0171), (given as Donore), adult 6 July 2023, William Clarke, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

TIPPERARY: Clonmel (S2022), 19 August 2023, Louise Garcia confirmed by I. D. Wallace from a photograph. Grove, Fethard (S2234), adult 16 July 2023, Louise Garcia, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

***Ceraclea dissimilis* (Stephens, 1836)**

ANTRIM: Springfarm (J1488), 2♂♂ 13 June 2023, light-trap, Rodney Monteith.

***Ceraclea fulva* (Rambur, 1842)**

ANTRIM: Springfarm (J1488), 2♀♀ 13 June 2023, light-trap, Rodney Monteith.

WATERFORD: Lough Ballyscanlan (S5302), 1♂ 11 June 2023, light-trap, Anthony Bryant.

***Leptocerus tineiformis* Curtis, 1834**

ANTRIM: Springfarm (J1488), 2♀♀ 13 June 2023, light-trap, Rodney Monteith.

WATERFORD: Tramore saltmarsh (S6000), 1♀ 12 June 2023, light-trap, Anthony Bryant.

***Mystacides azurea* (Linnaeus, 1761)**

ANTRIM: Lagan meadows (J3369), adult 2 August, 2023, David Craig, determined J. P. O'Connor from a photograph (NBDC, 2024). Springfarm (J1488), 1♀ 14 August 2023, light-trap, Rodney Monteith.

The Lagan specimen belonged to a form with pure white unbanded antennae.

CORK: Lough Derreenadarodia, Glengarriff (V8655), adult 10 June, 2023, Cindy Kingston, confirmed J. P. O'Connor from a photograph (NBDC, 2024). Skibbereen (W1233), adult 10 June 2023, Ann Haigh, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

DONEGAL: Lough Gartan (C0516), adult 10 June 2023, light-trap, John Cromie, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

OFFALY: Clooneen Bog (N0712), adult 28 July 2023, Rachel Mc Kenna, confirmed J. P. O'Connor from a photograph (NBDC, 2024).

***Mystacides longicornis* (Linnaeus, 1758)**

ANTRIM: Springfarm (J1488), 3♀♀ 13 June 2023, light-trap, Rodney Monteith.

***Oecetis lacustris* (Pictet, 1834)**

ANTRIM: Springfarm (J1488), 1♂ 22 August 2023, light-trap, Rodney Monteith.

***Oecetis ochracea* (Curtis, 1825)**

ANTRIM: Springfarm (J1488), 2♀♀ 3 July 2023 and 1♂1♀ 20 July 2023, light-trap, Rodney Monteith.

***Oecetis testacea* (Curtis, 1834) New to County Waterford (Fig. 2)**
WATERFORD: Tramore (S5701), 1♀ 24 May 2023, light-trap, Anthony Bryant.

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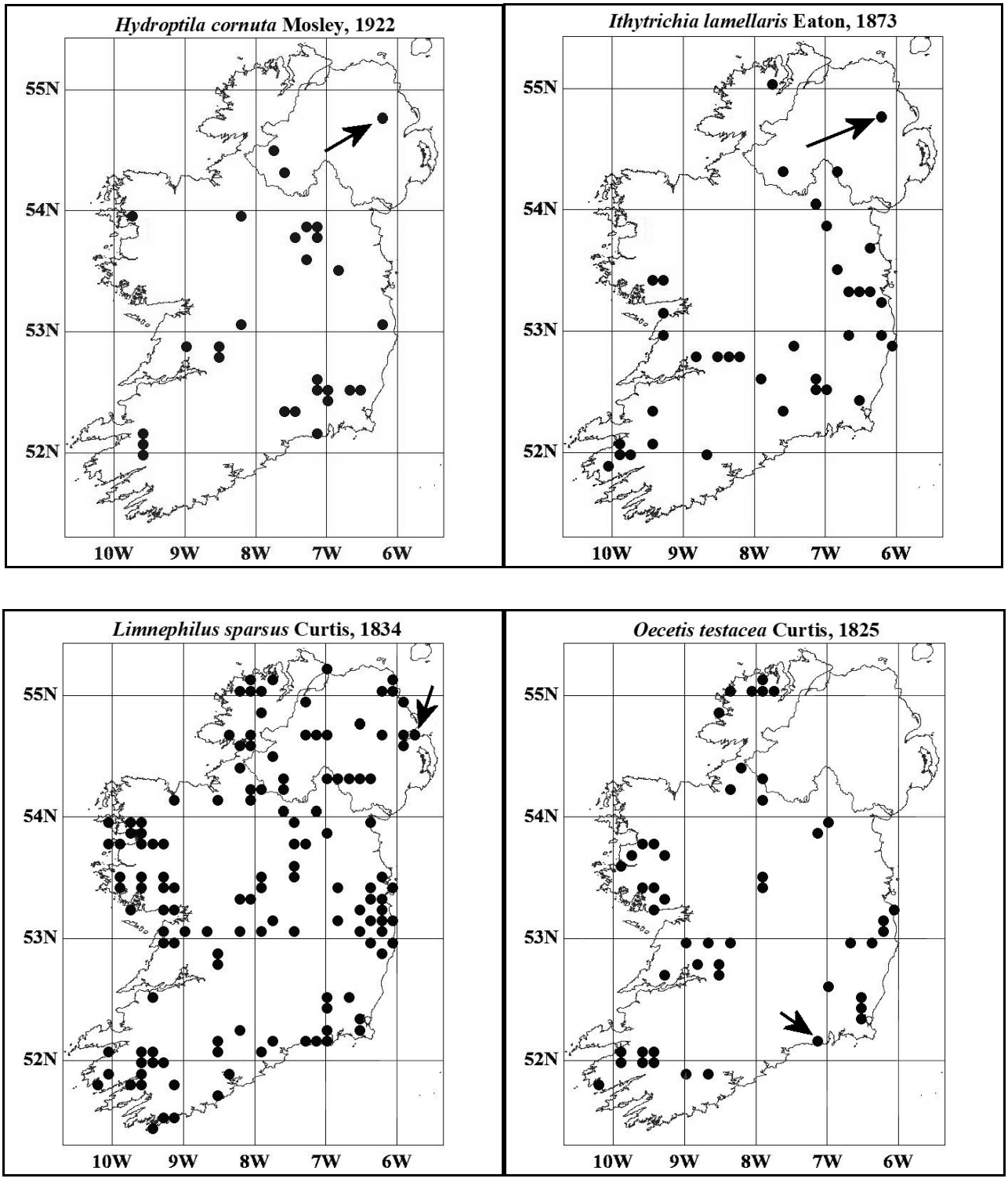

FIGURES 1-2. The known Irish distributions of *Hydroptila cornuta*, *Ithytrichia lamellaris*, *Limnephilus sparsus* and *Oecetis testacea*. The new county records are indicated by arrows.

PLATE 1. *Hagenella clathrata*, Killaun Bog, County Offaly, 15 May 2022. Photograph: Rachel Mc Kenna.

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FURTHER RECORDS OF CHIRONOMIDAE (INSECTA: DIPTERA) IN IRELAND FROM RECENT AND PAST COLLECTIONS

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Abstract

Records are given for 31 species of Chironomidae (Diptera, Insecta) from Counties Armagh, Clare, Dublin, Louth, Meath and Mayo in Hydrometric Areas (HAs) 6, 7, 8, 9, 27 and 30. First records for *Metriocnemus* (*Inermipupa*) *carmencitabertarum*, Langton & Cobo, 1997 are given for Counties Armagh and Louth in HA6 and for *Tanytarsus brundini* Lindeberg, 1963 in County Dublin. *Paralauterborniella nigrohalteralis* (Malloch, 1915), already known from County Mayo, is reported as new for HA30 and a second record of *Rheotanytarsus reissi* Lehmann, 1970 is given in HA 7 in County Meath.
Key words: Chironomidae, Diptera, County, Hydrometric Area, distribution, Ireland.

Introduction

Examination of chironomid pupal exuviae and adult male Chironomidae in collections taken during 2023 up to March 2024 as well as determinations from photographs and of specimens in a single alcohol preserved bulk sample collected in 1974 and on some undetermined slide preparations from collections in 1966 and 1973, have yielded new data additional to species distribution records given in Murray *et al.* (2018) and Murray (2020, 2021, 2023). This paper gives a brief account of these findings with information on 31 species.

Abbreviations

Abbreviations used: HA(s) – Hydrometric Area(s); Loc. – Location; leg. – collector; Pe♂/♀ – male/female pupal exuviae; Im♂/♀ – adult male/female; E-JM – Elle-J Murray; SM – Savannah Murray; DM – D. Murray; OM – Orlagh Murray; FP – Fionn Power.

Methods

Records are reported from ten locations, by County and Hydrometric Area (see <www.epa.ie> for details of hydrometric areas), along with information on location, six figure Irish Grid Reference, date of collection and collector. Unless otherwise stated collections were

made by the author (DM). To foster an interest in invertebrate biodiversity of aquatic habitats in the younger generation, the author encouraged granddaughters Elle-J Murray (E-JM) and Savannah Murray (SM) and one of their friends, Fionn Power (FP), to obtain skim net collections of pupal exuviae at one location (Loc 5) while adult specimens were captured by Orlagh Murray at another (Loc 7) or removed from a cobweb (DM). Pupal exuviae were also hand picked from the surface of outdoor rainwater filled containers. Identifications of adults are based on Langton and Pinder (2007) and of pupal exuviae on Langton and Visser (2003).

Records from collections in 2023 and 2024 at seven locations are reported from Counties Armagh, Louth and Meath in HAs 6, 7 and 8. Examination of alcohol preserved material, and some slide preparations from former collections at three locations yielded new records from 1966 in County Dublin in HA9, in 1973 from County Clare in HA27 and in 1974 from County Mayo in HA30.

The ten locations (Loc.), with details of County, Hydrometric Area, Grid Reference, habitat date(s) of collection, collector (by the author unless stated otherwise) from which records are reported are:

Loc. 1 - County Armagh, HA6, Portadown, IGR J300575, rainwater container, 3 November 2023, B. Nelson.

Loc. 2 - County Louth, HA6, Dundalk, IGR J005000, rainwater container, 10 September 2023, C. Daly.

Loc. 3 - County Meath, HA7, Ardsallagh, IGR N896635, cobweb, 5 June and 10 July 2023.

Loc. 4 - County Meath, HA7, Mullaghaboy, Navan, IGR N853668, rainwater container, 29 December 2023.

Loc. 5 - County Meath, HA7, River Skane, Balgeeth, IGR N887594, skim net collections, 5 June 2023 DM and 15 June 2023, E-JM, SM and FP.

Loc. 6 - County Meath, HA7: Feeder stream to River Hurley, Rathfeigh, IGR N994611, skim net collection, June 2023.

Loc. 7 - County Meath, HA8, Meadesbrook, Ashbourne IGR O040594. June to November 2023 and January to April 2024, rainwater container and aerial net sweep, DM and OM.

Loc. 8 - County Dublin HA9, River Dodder, Bohernabreena, IGR O009242, 27 July 1966.

Loc. 9 - County Clare, HA27, Lough Raha, Corofin, IGR R266866, 26 May 1973, leg. N. Hackett.

Loc. 10 - County Mayo, HA30, Lough Carra, Ballinrobe, IGR M165680, 5 April 1974.

Results

Distribution data is given for 31 species (Table 1), six in the subfamily Tanypodinae, one Diamesinae, nine Orthocladiinae and fifteen Chironominae, (eight in the Tribe Chironomini,

one in the Pseudochironomini and six Tanytarsini). The material examined in recent collections yielded records for 21 species, with new County and Hydrometric Area records for *Metriocnemus* (*Inermipupa*) *carmencitabertarum* Langton & Cobo, 1997 and a second record in Ireland of *Rheotanytarsus reissi* Lehmann, 1970. Examination of specimens in past collections between 1966 and 1974 yielded records for 11 species (one of which was also obtained in recent collections) with a first county record for *Tanytarsus brundini* Lindeberg, 1963 and a new Hydrometric Area record for *Paralauterborniella nigrohalteralis* (Malloch, 1915).

The records

Subfamily TANYPODINAE

***Ablabesmyia* (*Ablabesmyia*) *longistyla* Fittkau, 1962**

MEATH: HA7 - Loc 5, 15 June 2023, Pe♂, leg. E-JM and SM.

Ablabesmyia longistyla is widely distributed in Ireland currently with records from 187 locations. This is a second record of the species at this location but details of the previous record (leg. DM) from 13 August 2016 were inadvertently unpublished. However the record was included in tabulations given in Murray *et al*. (2018).

***Ablabesmyia* (*Ablabesmyia*) *monilis* (Linnaeus, 1758)**

MEATH: HA7 - Loc 5, 5 June 2023, Pe♂.

This is the first record of the species from the River Skane. It is already recorded at 12 other locations in HA7, five in County Cavan and seven in County Meath. *Ablabesmyia longistyla* has a widespread distribution in Ireland and is now documented from 285 locations – an increase of thirteen since records were given in Murray *et al*. (2018).

***Arctopelopia griseipennis* (van der Wulp, 1859)**

MAYO: HA30 - Loc 10, 5 April 1974, Pe♂.

This record from 1974 is the earliest account of the species at Lough Carra from where it was also collected on two previous occasions, in 1996 and 2008 (Murray *et al*., 2013). *Arctopelopia greisipennis* is documented from 67 locations in Ireland - six in County Mayo of which two are in HA30, one each in HA32 and HA33 and two in HA34.

***Procladius* (*Holotanypus*) *crassinervis* (Zetterstedt, 1838)**

MAYO: HA30 - Loc 10, 5 April 1974, Pe♂.

This is the only record of the species to date from Lough Carra although it is already known in HA30 from collections in 2007 from Loughs Beaghcauneen and Corrib and in 2008 from Lough Mask (Murray *et al.*, 2013).

***Procladius* (*Holotanypus*) *simplicistilus* Freeman, 1948**

MAYO: HA30 - Loc 10, 5 April 1974, Pe♂.

There are previous records of this species at this location, from April and June 2008 (Murray

et al., 2013). However, the record from 1974 reported here predates published information by 34 years and is thus is the earliest record of the species from Lough Carra.

***Zavrelimyia* (*Zavrelimyia*) *nubila* (Meigen, 1830)**

MEATH: HA7 - Loc 3, 10 July 2023, Im♂, specimen removed from a cobweb.

The cobweb from which the adult male removed was at a distance of approximately 100m from an animal drinking trough from which there are two previous records of the species, as pupal exuviae, in May 1986 and March 2000 (Murray *et al*., 2013). Larvae of *Zavrelimyia* (*Zavrelimyia*) *nubila* typically inhabit small standing water bodies. The species is thus far only known from five locations in Ireland in the east of the country in Counties, Kildare, Meath and Wicklow (Murray, 2023).

Subfamily DIAMESINAE

***Potthastia gaedii* (Meigen, 1838)**

MEATH: HA7 - Loc 5, 15 June 2023, Pe♂, leg. EJM and SM.

Potthastia gaedii is widely distributed in Ireland and, including this record at Loc. 5, it is now known from 197 locations in Ireland, 18 in County Meath and 16 in HA7.

Subfamily ORTHOCLADIINAE

***Brillia longifurca* Kieffer, 1921**

MEATH: HA7 - Loc 5, 15 June 2023, Pe♂, leg. E-JM and SM. - **Loc. 6**, 18 June 2023, Pe♂.

With the addition of the two new records from the River Skane and at Rathfeigh, both lying in HA7, there are records of *Brillia longifurca* from 70 locations in Ireland, nine in County Meath with six in HA7 and three in the adjacent HA8.

***Eukiefferiella claripennis* (Lundbeck, 1898)**

MEATH: HA7 - Loc 5, 15 June 2023, Pe♂, leg. EJM and SM.

Eukiefferiella claripennis is now known from 115 locations in Ireland including 13 locations in County Meath - one in HA6, two in HA8 and ten in HA7, one of which is at Dalgan Park, approximately 5km downstream of Loc 5 on the River Skane (Murray, 2015).

***Metriocnemus* (*Inermipupa*) *carmencitabertarum* Langton and Cobo, 1997 New for Counties Armagh, Louth and HA6**

ARMAGH: HA6 - Loc 1, 3 November 2023, emerging Im♀ and Pe♀, leg. Brian Nelson.
LOUTH: HA6 - Loc 2, 10 September 2023, larvae in rainwater-filled container, C. Darby.
MEATH: HA8 - Loc 7, 10 September and 14 November 2023, 18 March 2024. larvae, Pe and Im♂.

The record from County Armagh comes from an initial posting of a photograph by Brian Nelson on the *Facebook* Group "Insects and Invertebrates of Ireland", of an adult female semi emerged from it's characteristic readily identifiable pupal exuviae (Plate 1). Following

subsequent communication, BN provided an alcohol-preserved specimen to the author for confirmation of identification. The record from County Louth is similarily based on a *Facebook* posting, by C. Darby, of a video sequence of larvae exhibiting the characteristic movement pattern described in Murray (2013).

The species was first reported from Ireland in 2012 (Murray, 2012) and there have been annual records of this species at Location 7 in HA8 in County Meath since June 2012. Including the two new county records in HA6 reported here, the species is now known from 16 locations in Ireland in seven HA's: 3, 6, 7, 8, 9, 10 and 14 from eight Counties: Armagh, Derry, Dublin, Kildare, Laois, Louth, Meath and Wicklow.

***Orthocladius* (*Orthocladius*) *oblidens* (Walker, 1856)**

MEATH: HA7 - Loc 5, 15 June 2023, Pe♂, leg. E-JM and SM.

This is the first record of *Orthocladius oblidens* from the River Skane and it is now known from 142 locations in Ireland - 12 in County Meath, one each in HA6 and HA8 and now ten in HA7.

***Psectrocladius* (*Psectrocladius*) *limbatellus* (Holmgren, 1869)**

MEATH: HA7 - Loc 3, 5 June 2023, Im♂ removed from house door cobweb.

Psectrocladius limbatellus is known from 51 locations in Ireland with five previous records at this location during the last 24 years (Murray, 2023). It was first recorded in April 2000 in a collection of pupal exuviae from the permanent animal drinking trough located about 100m from the present collection site.

***Rheocricotopus* (*Rheocricotopus*) *fuscipes* (Kieffer, 1909)**

DUBLIN: HA9 - Loc 8, 17 July 1966, Pe♂.

This record comes from examination of a previously unidentified slide mount discovered during a review of personal slide preparations. It is a second record of the species at this site at which it was first observed 20 years earlier, on 2 April 1946, by A. Fitzgerald (1947 - unpublished M.Sc thesis). That record was included in the listing by Murray *et al.* (2014). It is a third record of the species for HA9. **MEATH: HA7 - Loc 5**, 5 June 2023 Pe♂, leg. DM and 15 June 2023, Pe♂, leg. EJM and SM. **Loc 6**, 18 June 2023 Pe♂.

There are records of this species from 110 locations in Ireland with two previous records in HA7 (Murray *et al*., 2014; Murray, 2015). It is now known from six locations in County Meath, four in HA7.

***Smittia aterrima* (Meigen, 1818)**

MEATH: HA8 - Loc 7, 17 March 2024, Im♂♀, leg. OM.

Larvae of *Smittia aterrima* are predominantly terrestrial and are abundant in damp soil and compost (Andersen *et al*., 2013). There are records of the species from nine locations in Ireland based on adult male specimens. It was first recorded at the present location (Meadesbrook) in

1996 and has been documented there on a further six occasions (Murray *et al*., 2014, 2018).

***Tvetenia discoloripes* (Goetghebuer & Thienemann, 1936)**

MEATH: HA7 - Loc 5, 15 June 2023, Pe ♂, leg. E-JM and SM.

There are records of *Tvetenia discoloripes* from 66 different locations in collections from lotic water habitats in Ireland. It is known from 23 locations in County Meath, with three previous records of the species in HA7 from three sites on the River Boyne (Murray *et al*., 2014).

Subfamiy CHIRONOMINAE

Tribe Chironomini

***Chironomus* (*Chironomus*) *anthracinus* Zetterstedt, 1860**

MAYO: HA30 - Loc 10, 5 April 1974, Im♂

This common species is known from 57 locations in Ireland, however this record from 1974 is the first documented record of the species in the section of HA30 in County Mayo. *Chironomus* (*Chironomus*) *anthracinus* is known from other locations in HA30 - at Lough Corrib in County Galway and in County Mayo in the adjoining HA32 catchment at Lough Knappabeg (Murray *et al*., 2015).

***Chironomus* (*Chironomus*) *luridus* Strenzke, 1959**

MEATH: HA8 - Loc 7, 13 and 22 June 2023 and 17 March 2024, Im♂, Pe ♂.

Chironomus (*Chironomus*) *luridus* is a common species of ephemeral static and stagnant waters and has been regularly observed in water barrels, garden tanks etc. at this location since 1986 (Murray *et al.*, 2015). The species is currently known from 29 locations in Ireland (Murray, 2023).

***Chironomus* (*Chironomus*) *tentans* Fabricius, 1805**

MAYO: HA30 - Loc 10, 5 April 1974, Im♂.

There is one earlier record of *Chironomus* (*Chironomus*) *tentans* from this location that was based on collections made for the author by Noel Hackett (Inland Fisheries Trust) on 25 August 1964 and reported in Murray (1972). *C. tentans* is known from 53 locations in Ireland (Murray *et al*., 2018).

***Dicrotendipes pulsus* (Walker, 1856)**

MAYO: HA30 - Loc 10, 5 April 1974, Im♂.

Dicrotendipes pulsus is known from 96 locations in Ireland, including seven locations in HA30 and three in County Mayo, with one record at Lough Carra from July 2008 (Murray *et al.*, 2015). The record reported here, from a collection in 1974, predates existing published information (Murray *et al.,* loc.cit) by 34 years and is the earliest documented record of the species at L. Carra.

***Endochironomus albipennis* (Meigen, 1830)**

CLARE: HA27 - Loc 9, 26 May 1973, Im♂, leg. N. Hackett

Endochironopmus albipennis has been documented from 160 locations in Ireland (Murray, 2023) and has been recorded at eight locations in HA27, ten in County Clare (Murray *et al*., 2015, 2018). However, this record in May 1973 is the earliest known record of the species in County Clare and in HA27.

***Microtendipes pedellus* (De Geer, 1776)**

MEATH: HA7 - Loc. 3, 10 July 2023, Im♂ in cobweb.

With the addition of this record at Loc. 3 *Microtendipes pedellus* is now known from 65 Locations in Ireland, including eight in County Meath, six of which lie in HA7 and two in HA8. The species is already known from collections in the vicinity of the present location in April 1984 (Murray *et al*., 2015).

***Paralauterborniella nigrohalteralis* (Malloch, 1915) New for HA30**

MAYO: HA30 - Loc. 10, 5 April 1974, Im♂.

This record of *Paralauterborniells nigrohalteralis* from a sample collected 1974 from Lough Carra, is the first record of the species in HA30 and is also the earliest record of the species in County Mayo where it is also documented at Lough Lannagh, Castlebar in collections made in August 2008 (Murray *et al*., 2015). The species is now known from 28 locations in Ireland, one additional location to the total given in Murray *et al.* (2018).

***Phaenopsectra flavipes* (Meigen, 1818)**

MEATH: HA7 - Loc 5, 5 June 2023, Pe♂.

There are existing records of *Phaenopsectra flavipes* from four locations in HA7 in County Meath (Murray, 2016). The finding of the species at Loc 5, the first record for the River Skane, provides an additional record for HA7 and County Meath and. The species is now known from 72 locations in Ireland.

Tribe Pseudochironomini

***Pseudochironomus prasinatus* (Stæger, 1839)**

MAYO: HA30 - Loc 10, 5 April 1974, Im♂.

There are records of *Pseudochironomus prasinatus* from 126 locations in Ireland, including a published record from a collection at the present site taken in June 2008 (Murray *et al*., 2015), nine in HA30 of which two are in County Mayo and seven in County Galway. The earliest records of *P. prasinatus* in Ireland are from July 1911 as reported by Grimshaw (1912) from collections in County Mayo from "a lough near Westport" and from Lough Keel, Achill in HA32.

Tribe Tanytarsini

***Micropsectra apposita* (Walker, 1856)**

MEATH: HA7 - Loc 5, 15 June 2023, Pe♂, leg. E-JM and SM.

Micropsectra apposita is known from 59 locations in Ireland, four in HA7 and six in County Meath including two in HA8 (Murray *et al*., 2015; Murray, 2016) and was previously reported at this site in June 2018 (Murray and O'Connor, 2018)

***Micropsectra atrofasciata* (Kieffer, 1911)**

MEATH: HA7 - Loc 4, 29 December 2023, Im♂, Pe♂; **Loc 6,** 18 June 2023, Pe♂; **HA8 - Loc 7,** 10 January 2022 Pe♂ and 3 April 2024 Pe♂, Im♂.

This is a widespread species in Ireland and with the addition of the records from two new locations in HA7 it is now known from148 locations, 16 in HA7 and 18 in County Meath.

***Micropsectra junci* (Meigen, 1818)**

MEATH: HA8 - Loc 7, 13 December 2023 Im♂, Pe♂.

Micropsectra junci is known 33 locations in Ireland with eight previous records at this location, six during the summer months May, June and July and two in November (Murray *et al*., 2015). The species is known from one nearby location in HA8 and from four other locations in County Meath in HA7.

***Rheotanytarsus reissi* Lehmann, 1970**

MEATH: HA7 - Loc 5, 15 June 2023, Pe♂, leg. Fionn Power.

This is the second record of *Rheotanytarsus reissi* in Ireland. It was first documented from County Meath in HA7 from collections on the River Skane, at Dalgan Park (N901626), approximately 5km downstream of the present location (Murray, 2015). *R. reissi* is known from Great Britain and west European countries only (Murray *et al*., 2018).

***Tanytarsus brundini* Lindeberg, 1963 New for County Dublin**

DUBLIN: HA9 - Loc 8, 17 July 1966, Pe♂.

Records of *Tanytarsus brundini* were given from 152 locations by Murray, *et al*. (2015, 2018). With the additions of this new record for County Dublin from a recently discovered slide preparation from 1966, and with the record reported from County Louth (Murray, 2019), *T. brundini* is now known from 154 locations in Ireland. It was already reported from HA9 in collections in June 2000 at Blessington, County Wicklow (Murray *et al*., 2015).

***Virgatanytarsus arduennensis* (Goetghebuer, 1922)**

MEATH: HA7 - Loc 3, 12 July 2023, Im♂, in cobweb.

There are sporadic records in Ireland of this species that is currently known from 16 locations in Ireland, seven in County Meath in HA7, including an adjacent site at St Briget's Well (N897635) beside the River Boyne - a distance of approximately 200m away (Murray *et al*., 2015).

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TABLE 1. Distribution data.

Taxon	Location	County	HA
Tanypodinae			
Ablabesmyia (*Ablabesmyia*) *longistyla* Fittkau, 1962	5	Meath	7
Ablabesmyia (*Ablabesmyia*) *monilis* (Linnaeus, 1758)	5	Meath	7
Arctopelopia griseipennis (van der Wulp, 1859)	10	Mayo	30
Procladius (*Holotanypus*) *crassinervis* (Zetterstedt)	10	Mayo	30
Procladius (*Holotanypus*) *simplicistilus* Freeman, 1948	10	Mayo	30
Zavrelimyia (*Zavrelimyia*) *nubila* (Meigen, 1830)	3	Meath	7
Diamesinae			
Potthastia gaedii (Meigen, 1838)	5	Meath	7
Orthocladiinae			
Brillia longifurca Kieffer, 1921	5	Meath	7
"	6	Meath	7
Eukiefferiella claripennis (Lundbeck, 1898)	5	Meath	7
Metriocnemus (*Inermipupa*) *carmencitabertarum* Langton and Cobo, 1997	1	Armagh*	6*
"	2	Louth*	6*
"	7	Meath	8
Orthocladius (*Orthocladius*) *oblidens* (Walker, 1856)	5	Meath	7
Paraphaenocladius impensus (Walker, 1856)	7	Meath	8
Psectrocladius (*Psectrocladius*) *limbatellus* (Holmgren, 1869)	3	Meath	7
Rheocricotopus (*Rheocricotopus*) *fuscipes* (Kieffer, 1909)	5	Meath	7
"	6	Meath	7
"	8	Dublin	9
Smittia aterrima Meigen 1818	7	Meath	8
Tvetenia discoloripes (Goetghebuer & Thienemann, 1936)	5	Meath	7
Chironominae - Chironomini			
Chironomus (*Chironomus*) *anthracinus* Zetterstedt, 1860	10	Mayo	30
Chironomus (*Chironomus*) *luridus* Strenzke, 1959	7	Meath	8
Chironomus (*Chironomus*) *tentans* Fabricius, 1805	10	Mayo	30
Dicrotendipes pulsus (Walker, 1856)	10	Mayo	30
Endochironomus albipennis (Meigen, 1830)	9	Clare	27
Microtendipes pedellus (De Geer, 1776)	3	Meath	7
Paralauterborniella nigrohalteralis (Malloch, 1915)	10	Mayo	30*
Phaenopsectra flavipes (Meigen, 1818)	5	Meath	7
Chironominae - Pseudochironomini			
Pseudochironomus prasinatus (Stæger, 1839)	10	Mayo	30
Chironominae - Tanytarsini			
Micropsectra apposita (Walker, 1856)	5	Meath	7
Micropsectra atrofasciata (Kieffer, 1911)	4	Meath	7
"	6	Meath	7
"	7	Meath	8
Micropsectra junci (Meigen, 1818)	7	Meath	8
Rheotanytarsus reissi Lehmann, 1970	5	Meath	7
Tanytarsus brundini Lindeberg, 1963	8	Dublin	9*
Virgatanytarsus arduennensis (Goetghebuer, 1922)	3	Meath	7

* = New County or Hydrometric Area record

PLATE 1. Adult female of *Metriocnemus* (*I.*) *carmencitabertarum*, overturned and partially emerged from its pupal exuviae, floating on the water surface of an outdoor water butt, Portadown, County Armagh, 3 November 2023, B. Nelson. Photograph: Brian Nelson.

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CORYNONEURA COLLARIS MAKARCHENKO & MAKARCHENKO, 2010 (DIPTERA: CHIRONOMIDAE: ORTHOCLADIINAE) NEW FOR IRELAND

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Abstract

Corynoneura collaris Makarchenko & Makarchenko, 2010 is added to the checklist of Irish Chironomidae based on distribution records of the morphotype *Corynoneura* Pe2a, sensu Langton, that is now associated with the species. Records are documented from 28 locations in Counties Cork, Donegal, Galway, Kerry, Leitrim, Mayo, Meath, Roscommon, Sligo, Tipperary and Wicklow and in Hydrometric Areas (HAs) 7, 10, 18, 20, 21, 22, 26, 32, 34, 35, 37, 38 and 39.

Key words: *Corynoneurea collaris*, Pe2a, Chironomidae, County, Hydrometric Area, distribution, Ireland.

Introduction

Pupal exuviae of the distinct morphotype *Corynoneura* Pe2a (sensu Langton) have occurred in occasional drift net and other collections of exuviae in Ireland for many years. The morphotype was designated "Pe2a" by P. H. Langton and included in his key to pupal exuviae of British Chironomidae (Langton, 1984) and in the updated and comprehensively revised key to pupal exuviae of West Palaearctic Chironomidae (Langton, 1991; Langton and Visser, 2003). The earliest record in Ireland of the morphotype was by Patrick Ashe from drift net collections in 1978 in which pupal exuviae were found, slide mounts prepared, labelled as "*Corynoneura* sp, indet", deposited in a reference collection and later identified as *Corynoneura* Pe2a from Langton (1984). The morphotype was occasionally found in collections by the author and/or his students in the following years but, while noted, the records were not published. The first published record of the morphotype in Ireland was by Langton (2002) from two sites in County Donegal and those records, along with distribution data from nine other locations, were included in Murray *et al*. (2014). A record from one other location was given in Murray (2018) and a summary of its distribution at those twelve locations in Ireland was given in Murray *et al*. (2018).

Recently Dr Peter Langton (pers. comm.) kindly notified the author that a Finnish colleague, Janne Raunio, had alerted him to the fact that the morphotype, *Corynoneura* Pe2a sensu Langton, has been associated with the species *Corynoneura collaris* Makarchenko & Makarchenko, 2010. Based on the known records of *Corynoneura* Pe2a in Ireland, the species *Corynoneura collaris* may now be added to the checklist of Irish Chironomidae, thereby replacing the taxon entry of *Corynoneura* Pe2a in Murray *et al*. (2018, p. 27).

***Corynoneura collaris* Makarchenko & Makarchenko, 2010.**

Distribution data of *Corynoneura collaris,* in Ireland is presented here based on records of its pupal morphotype *Corynoneura* Pe2a in Murray (2018, 2022), Murray *et al*. (2014, 2018) and in post-graduate theses at University College Dublin (Hayes, 1991; Heneghan, 1986). Records are given from 28 locations that are documented by County and Hydrometric Area (HA), location data, six-figure Irish Grid Reference, date of collection and collector. Abbreviations used for names of collectors are: BH - B. Hayes, CD - C. Duigan, DM - D. Murray, EPA - Environmental Protection Agency (field officers), LH - L. Heneghan, J-RB - J-R Baars, PA - P. Ashe, PHL - P. H. Langton, WM - W. Murray.

Records of *Corynoneura collaris* in Ireland

The records are arranged by county in alphabetic sequence. New, previously unpublished records are marked with the asterisk symbol *.

CORK: HA20 - *River Ilen, Hollybrook (W117363), 24 August 1983 (BH); *River Ovane, Pierson's Bridge (W023544), 24 August 1983 (BH).

DONEGAL: HA37 - Carn Lough, Blue Stack Mountain (G871886), 10 May 2005 (J-RB); *River Eanymore, Letterbara Bridge (G883825), 10 August 1983 (BH) and *Drumagraa Bridge (G863822), 10 August 1982 (BH); *River Oily, Claggen (G751803), 8 August 1982 (BH); *River Stragar, Duninkeely (G727792), 10 August 1982 (BH): **HA38 -** River Devlin, Dunlewy (B927190), 19 July 2000 (PHL) (Langton, 2002); Lough Waskel, The Rosses (B729165), 25 October 1985 (CD); *River Owenveagh, above Lough Veagh, Glenveagh National Park (B990170), 20 July 1985 (LH): **HA39** - River Swilly, Newmills, Letterkenny (C125092), 18 July 2000 (PHL) (Langton, 2002); *River Leannan, Claragh (C197210), 13 August 1982 (LH).

GALWAY: HA32 - *River Dawros, Tullywee Bridge, Letterfrack (L730586), 18 August 1981 (BH).

KERRY: HA21 - Lough Brin, Derreeny (V780775), 10 September 2008 (EPA); *River Inny, Scarriff Bridge (V504696), 24 August 1983 (BH): **HA22 -** River Loo, Aughnanus Bridge, Crohane (W045790), 23 July 1978 (PA).

LEITRIM: HA35 - Lough Lakagh, Boleybrak (G920320), 3 August 2005 (J-RB).

MAYO: HA32 - River Bunowen, Louisburg (L807807), 7 May 2004, (DM, WM); River Owenwee, Westport, Aughamore Bridge (L972817), 5 August 2004 (DM, WM); Stream, Murrisk, Westport (L908824), 7 May 2004 (DM, WM): **HA34 -** Castlebar Lough, Castlebar (M106879), 7 May 2004 (DM, WM).
MEATH: HA7 - River Boyne, New Bridge, Navan (N873679), 18 August 1988 (DM).
ROSCOMMON: HA26 - *River Suck, Athleague (M825758), 14 August 1981 (BPH).
SLIGO: HA35 - *River Easky, Easky (G377378), 19 August 1983 (BH).
TIPPERARY: HA18 - Lough Curra, Galtymore (R867242), 10 August 2005 (J-RB).
WICKLOW: HA10 - *River Glenealo, Glendalough (T090962), 5 October 1996 (DM); *River Avonbeg, Drumgoft Bridge, Glenmalure (T105905), 4 August 1983 (BH); *River Avonmore, Castlehoward (T190833), 4 August 1983 (BH).

Summary

Records of *Corynoneura collaris* in Ireland, based on identification from pupal exuviae, are given from 28 locations in eleven counties (with number of locations per county in brackets): Cork (3), Donegal (10), Galway (1), Kerry (3), Leitrim (1), Mayo (4), Meath (1), Roscommon (1), Sligo (1), Tipperary (1), Wicklow (3). These locations are situated in thirteen Hydrometric areas (HAs): (with number of locations per HA in brackets): HA7 (1), HA10 (3), HA18 (1), HA20 (2), HA21 (2), HA22(1), HA26 (1), HA32 (4), HA34(1), HA35 (2), HA37 (5), HA38 (3), HA39 (2).

Acknowledgement

Sincere thanks to Peter Langton for drawing the author's attention to the association between the pupal morphotype *Corynoneura* Pe2a with the named species *Corynoneura collaris.*

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FRESHWATER PARASITIC WASPS (HYMENOPTERA: MYMARIDAE & TRICHOGRAMMATIDAE) FROM THE RIVER INNY, COUNTY CAVAN, IRELAND

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Abstract

Three species of freshwater parasitic wasps were reared from the eggs of water beetles (*Agabus* and *Ilybius* spp.) collected in the River Inny below the bridge in the village of Finnea, County Cavan, Ireland. These were *Anaphes longicornis* Walker, 1846, *Caraphractus cinctus* Walker, 1846 (both Mymaridae) and *Prestwichia aquatica* Lubbock, 1864 (Trichogrammatidae). *P. aquatica* is new to Ireland.

Key words: Ireland, Hymenoptera, Chalcidoidea, Mymaridae, Trichogrammatidae, freshwater, *Anaphes longicornis*, *Caraphractus cinctus*, *Prestwichia aquatica*.

Introduction

From 5-12 September 1995, Dr Victor Fursov of the Institute of Zoology of the National Ukrainian Academy of Sciences, Kiev, Ukraine, stayed with the author at his home in Castleknock, Dublin, Ireland. During this period, they made several joint collecting trips for chalcidoid egg-parasitoids and other microhymenoptera in different localities in eastern Ireland. The eggs of aquatic insect hosts were collected in the leaves and leaf stalks of various aquatic plants with different positions in the water and on the bottom. The plants were either submerged partially or completely under the water (*Sagittaria*), growing over the water surface (*Alisma*) or floating on the water (*Nuphar*). Parasitized eggs inserted in plant tissue were kept in small glass tubes with a part of the leaf stalk and water. The eggs of aquatic beetles were separated using pins from the plant tissue and submerged under the water in the tube. One of the sites visited yielded a species new to Ireland and a definite Irish locality for two others.

The site

The River Inny spans a large catchment area, rising near Oldcastle in County Meath and flowing for 88km *via* Lough Sheelin to its confluence with the River Shannon at Lough Ree. Much of the Inny runs over limestone, making it a productive river. On the 9 September 1995, samples of submerged *Alisma* and *Sagittaria* stems were taken from the river where it is only a few metres wide below the bridge in the village of Finnea, County Cavan (N4081) (Plate 1).

The river was shallow at the time of the visit.

Results

Three species of aquatic parasitoids were reared from the eggs of water beetles (*Agabus* and *Ilybius* spp.) collected inside the submerged stems of Common Water-plantain (*Alisma plantago-aquatica*) at Finnea. These were *Anaphes longicornis* Walker, 1846, *Caraphractus cinctus* Walker, 1846 (both Mymaridae) and *Prestwichia aquatica* Lubbock, 1864 (Trichogrammatidae). Adults of all three species were found to have emerged on the 25 September 1995. A total of some 100 specimens of *A. longicornis* along with 50 specimens of *C. cinctus* and 300 specimens *of P. aquatica* were reared. The males of *P. aquatica* are wingless but the females occur in two forms i.e. fully-winged (macropterous) and short winged (brachypterous). Only the macropterous form occurred amongst the Irish specimens.

The specimens were identified by Dr Fursov and, at present, voucher material is in his collection but he has promised to send a representative sample to the National Museum of Ireland.

Discussion

One of the species was named by Dr Fursov as *Patasson leptoceras* (Debauche, 1948). This species is now recognised as a synonym of *Anaphes longicornis* Walker, 1846 by Huber and Thuróczy (2018) who give the type locality as England, almost certainly Southgate vicinity. However in the Checklist of British and Irish Hymenoptera - Chalcidoidea and Mymarommatoidea (Dale-Skey *et al.*, 2016), only Ireland is mentioned. In addition, O'Connor, Nash and Bouček (2000) noted that there is a male paralectotype with a green ticket denoting Irish origin in the Oxford University Museum according to Graham (1982). The Inny record is the first definite Irish locality for the species.

Caraphractus cinctus is reclassified as *Eustochus* (*Caraphractus*) *cinctus* (Walker, 1846), comb. nov. in Triapitsyn *et al* (2020) who record the species from Palaearctic (Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Ireland, Russia, Sweden, Ukraine, United Kingdom) and Nearctic (Canada, U.S.A.) regions. No details are given for the Irish occurrence. The Inny record appears to be the first definite Irish locality for the species.

Prestwichia aquatica is new to Ireland (cf O'Connor, Nash and Broad, 2009). In the checklist of British and Irish Hymenoptera - Chalcidoidea and Mymarommatoidea (Dale-Skey *et al.*, 2016), England is only given for the species.

Fursov (1995) gives a comprehensive review of the European Chalcidoidea parasitizing the eggs of aquatic insects including information on the above three species.

Acknowledgements

The author is very grateful to Dr Victor Fursov for identifying the chalcids. I also wish to thank Dr Hugh Feeley of the Environmental Protection Agency for his kindness in providing the photograph of the River Inny site and Dr Wayne Trodd of the Environmental Protection Agency for his permission to use it.

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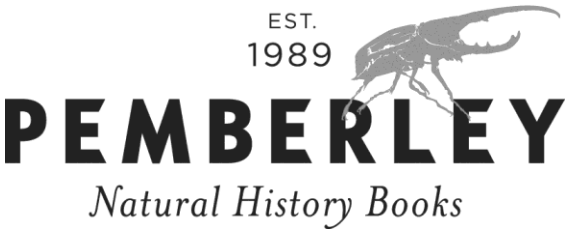
PLATE 1. The collection site on the River Inny below the bridge in the village of Finnea, County Cavan. Photograph: Wayne Trodd. On the 9 September 1995, the water level was lower.

NOTICES



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