

RECORDS OF ADULT STONEFLY (PLECOPTERA) FROM IRELAND IN 2021, WITH OBSERVATIONS ON WING LENGTH AND WING CRUMPLING

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Abstract

Adult distribution records for 15 species of stoneflies (Plecoptera) taken randomly on lakes and rivers from March to September 2021, primarily from Counties Dublin, Galway, Kerry, Mayo and Wicklow, but records are also presented from Antrim, Kildare, Kilkenny, Offaly, Roscommon and Sligo. It is notable that the records from Antrim are the first adult records published for Northern Ireland in over 30 years. Records of brachyptery and microptery are also provided, as well as observations on wing crumpling and Entomophthora infection, where relevant.

Key words: Plecoptera, stoneflies, lakes, rivers, Ireland, Northern Ireland, wing length, wing crumpling, Entomophthora infection.

Introduction

During 2021 while in the field the authors took the opportunity to collect adult stoneflies from lake shores, streams and rivers from March to September. Records presented were primarily collected from Counties Dublin, Galway, Kerry, Mayo and Wicklow, but records are also presented from Counties Antrim, Kildare, Kilkenny, Offaly, Roscommon and Sligo. Specimens collected by Bryan Kennedy and Cathal McNaughton were forwarded to Hugh Feeley for identification. This paper presents records for 15 of the 19 extant Irish stoneflies species, and all stonefly families (Capniidae, Chloroperlidae, Leuctridae, Nemouridae, Perlidae, Perlodidae and Taeniopterygidae), confirmed in Ireland. A recent review and update of Irish

records of the nemourid *Protonemura praecox* (Morton, 1894) is available in Feeley (in press) and therefore, the 2021 records are not duplicated here. Three other species *Chloroperla tripunctata* (Scopoli, 1763), *Leuctra nigra* (Olivier, 1811) and *Nemoura avicularis* Morton, 1894 went unrecorded as adults by the authors in 2021. The latter two species are considered to have restricted distributions in Ireland (Feeley *et al.*, 2016). It is notable that records collected in Antrim by Cathal McNaughton are the first published adult stonefly records for Northern Ireland since those reported in the island-wide review by Costello (1988a). Similarly, the adult records of *Capnia atra* Morton, 1896, listed as Vulnerable in the recent IUCN red listing assessment (see Feeley *et al.*, 2020), and *Zwicknia bifrons* (Newman, 1839) are likewise the first published since Costello (1988a). Other notable records are highlighted within the text below.

Brachyptery, and the more severe microptery (i.e. very shortened or vestigial wings), in stoneflies is well known (e.g. Costello, 1988b; Feeley and Baars, 2020). In this paper all adults were fully winged (i.e. macropterous) and all male Perlidae were brachypterous unless otherwise stated. Similarly, Feeley and Macadam (2021) have highlighted the phenomenon of ‘crumpled wings’ in adult stoneflies, best described as an unsuccessful inflation of the wing or wings during the teneral adult stage (Plate 1). All observations in adults collected in 2021 are noted below. Observations of Entomophthora infection are also noted.

All specimens were identified using Hynes (1977). Nomenclature is based on Feeley *et al.* (2020). All records will be forwarded to the National Biodiversity Data Centre to update the dataset “Stoneflies (Plecoptera) of Ireland” (Feeley, 2021).

The records

CAPNIIDAE

***Capnia atra* Morton, 1896**

MAYO: Lough Conn, east shore (Mount Falcon) (G192096), 1♂ 24 April 2021, collected by B. Kennedy, identified by H. B. Feeley.

The individual collected exhibited brachyptery and wing crumpling (Plate 1).

SLIGO: Lough Easkey, lake shore (north) (G448237), 1♀ 16 April 2021, collected by B. Kennedy, identified by H. B. Feeley.

These are the first adult records of *Capnia atra* published in Ireland since Costello (1988a) and despite larval records for County Sligo (Feeley, 2021), this is the first published record of adult material. The individual collected exhibited brachyptery.

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

MAYO: Lough Conn, east shore (Mount Falcon), 1♀ 24 April 2021, collected by B. Kennedy, identified by H. B. Feeley.

This is the first adult record of *Zwicknia bifrons* published in Ireland since Costello (1988a).

CHLOROPERLIDAE

Siphonoperla torrentium (Pictet, 1841)

DUBLIN: Owendoher River, Cruagh Road Bridge (O137227), 2♂♂ 25 April 2021 and 3♂♂ 11 May 2021, all H. B. Feeley.

KERRY: Galway's River, east of Incheens (V913790), 1♀ 20 July 2021. Galway's River, upstream of Cummeenshaun Lough (V925774), 1♀ 22 July 2021, all J-R. Baars.

KILKENNY: Tributary of Dinin River, Burn's Bridge (S595711), 2♂♂6♀♀ (2♀♀ crumpled wings) 15 May 2021, J-R. Baars.

MAYO: Beltra Lough, west shore (M086985), 2♀♀ 17 June 2021. Lough Carrowmore, lake shore at a slipway (near Knocknascollop) (F830283), 1♂1♀ 23 June 2021. Muingnahalloona Stream, bridge on N59 (F850193), 4♀♀ 23 June 2021. Lough Conn, east shore (Mount Falcon) (G192096), 1♀ 29 June 2021. Lough Mask, Inishowenlackboy (shore) (M128620), 1♀ 14 July 2021, all H. B. Feeley.

WICKLOW: River Liffey, Ballyward Bridge (O021160), 1♂3♀♀ 7 June 2021, J-R. Baars.

LEUCTRIDAE

Leuctra fusca (Linnaeus, 1758)

GALWAY: Knock River (Abhainn an Chnoic), bridge at Derryoughter (M186241), 1♀ 3 August 2021. Loughinch River (Abhainn Loch Inse), second bridge upstream of the Knock River (M189239), 10♂♂6♀♀ 3 August 2021. Owenboliska River, bridge in An Spidéal (M127222), 2♂♂ 3 August 2021. Gowlabeg River (Abhainn Ghabhla Beag), bridge south-west of Gowla (L815391), 2♂♂1♀ 4 August 2021. Cashla River, Cashla Bridge (L978264), 1♂1♀ 9 August 2021. Cashla River, bridge upstream of Loch an Doirin (M031332), 2♂♂4♀♀ 9 August 2021. Crumlin River (Abhainn Chromghlinne), Droichead na Chromghlinne (M039221), 8♂♂9♀♀ (1♀ crumpled wings) 9 August 2021. Knockadoagh River, bridge north of Knockadoagh (M010297), 6♂♂2♀♀ 9 August 2021. Owenriff (South Galway), bridge north-east of Knock South (M089225), 6♂♂2♀♀ 9 August 2021. Bunowen River, Glengowla Bridge (near Oughterard) (M083423), 4♂♂2♀♀ (1♀ crumpled wings) 10 August 2021. Glengawbeg, bridge upstream of Agraffard Lough (M067416), 13♂♂13♀♀ 10 August 2021. Owenriff River, 1km downstream of Agraffard Lough (M072420), 3♂♂1♀ 10 August 2021. Owenwee (Corrib), 200m downstream of Tawnaghbeg Lough (M014467), 4♂♂1♀ 10 August 2021. Owenboliska River, inflow of Seecon Lough (Galway Wind Park) (M080350), 8♂♂2♀♀ 11 August 2021. Owenboliska River, downstream of Seecon Lough (Galway Wind Park) (M108342), 8♂♂5♀♀ 11 August 2021. Owenboliska River, upstream of Lough Boliska (M121286), 8♂♂5♀♀ 6

September 2021. Cregg River, bridge near Drumgriffin (at the old Mill House) (M353378), 1♂1♀ 7 September 2021, all H. B. Feeley.

KERRY: Tributary of Galway's River, west of Ullauns (V914792), 1♂ 20 July 2021, J-R. Baars. Galway River's, east of Incheens (V913790), 25♂♂12♀♀ 20 July 2021, J-R. Baars. Tributary of Galway's River, downstream of Glas Lough (V905791), 27♂♂6♀♀ 21 July 2021, J-R. Baars. Coomeelan Stream, Drehidroughteragh Bridge (V973632), 2♀♀ 25 August 2021, H. B. Feeley. Coomeelan Stream, ford near Gearlan (V955644), 2♂♂3♀♀ 25 August 2021, H. B. Feeley. Cummeenshrule Stream, Priest's Leap (V984612), 2♂♂3♀♀ 25 August 2021, H. B. Feeley. Tributary of Galway's River, north of N71 on Kerry Way (V909806), 1♂9♀♀ 1 September 2021, J-R. Baars.

KILDARE: Rye Water River, downstream of Kellystown Lane (N985375), 1♀ 21 September 2021. Hartwell Stream, near Rathmore village (N973200), 2♀♀ 25 September. Hartwell Stream, near North of Johnstown (N925219), 1♀ 25 September 2021. Morell River, adjacent to Palmerstown Golf Course (N914222), 1♂1♀ 25 September 2021. Morell River, Tipper Road (N917188), 1♀ 25 September 2021, all J-R. Baars.

MAYO: River Robe, upstream of second bridge downstream of Castlemacgarrett (M345709), 3♂♂2♀♀ 7 September 2021. Scardaun Stream, bridge at Scardaun (M333680) 6♂♂3♀♀ 7 September 2021, all H. B. Feeley.

***Leuctra hippopus* Kempny, 1899**

DUBLIN: Glencullen River, Brockley Lane (O191194), 4♂♂5♀♀ 15 April 2021. Glencullen River, Boranaraltry Bridge (O168206), 1♂ 25 April 2021. Owendoher River, Cruagh Road Bridge (O137227), 1♂ 25 April 2021, all H. B. Feeley.

KERRY: Galway's River, east of Incheens (V913790), 4♀♀ 20 July 2021. Tributary of Galway's River, downstream of Glas Lough (V905791), 16♀♀ 21 July 2021, all J-R. Baars.

MAYO: Cong Canal, east bank near the monks fishing hut (Ashford Castle Estate) (M146550), 1♀ 10 June 2021, H. B. Feeley.

WICKLOW: Cloghoge Brook, bridge upstream of the Annamoe (Cloghoge) River confluence (O158060), 1♂ 13 April 2021. Avonmore River, south-east of the Sally Gap (O143099), 2♂♂2♀♀ 14 April 2021, all H. B. Feeley.

***Leuctra inermis* Kempny, 1899**

DUBLIN: Glencullen River, Boranaraltry Bridge (O168206), 2♂♂1♀ 25 April 2021. Owendoher River, Cruagh Road Bridge (O137227), 1♂2♀♀ 25 April 2021, all H. B. Feeley.

MAYO: Lough Carrowmore, lake shore at a slipway (near Knocknascollop) (F830283), 1♂1♀ 23 June 2021, H. B. Feeley.

WICKLOW: Avonmore River, south-east of the Sally Gap (O143099), 1♂2♀♀ 14 April 2021. River Liffey, 2km north-west of the Sally Gap (O109127), 3♂♂5♀♀ (1♂ crumpled wing and

1♀ with Entomophthora infection) 14 April 2021. Ballinagee River, Ballinagee Bridge (O036023), 5♂♂4♀♀ 15 April 2021. Ballydonnell Brook, Ballylow Bridge (O059130), 1♂ 15 April 2021. Ballylow Brook, bridge upstream of the Ballydonnell Brook confluence (O067133), 9♂♂4♀♀ (2♀♀ crumpled wings) 15 April 2021. Cock Brook, bridge north-west of Kilmore (O021088), 11♂♂7♀♀ 15 April 2021. Kings River (Liffey), bridge 100m upstream of the Ballinagee River confluence (O033020), 2♂♂2♀♀ 15 April 2021. Annalecka Brook, Annalecka Bridge (O055018), 1♂1♀ 16 April 2021. River Ow, Ballymanus Bridge (T092815), 1♂ 22 April 2021. River Ow, bridge near Aghavannagh Barracks (T055861), 2♂♂2♀♀ 22 April 2021, all H. B. Feeley.

NEMOURIDAE

Amphinemura sulcicollis (Stephens, 1836)

KERRY: Tributary of Galway's River, west of Ullauns (V914792), 9♂♂8♀♀ 20 July 2021. Galway's River, east of Incheens (V913790), 6♂♂6♀♀ 20 July 2021. Tributary of Galway's River, downstream of Glas Lough (V905791), 7♂♂20♀♀ 21 July 2021, all J-R. Baars.

MAYO: Lough Carrowmore, lake shore at a slipway (near Knocknascollop) (F830283), 3♂♂4♀♀ 23 June 2021, H. B. Feeley.

Nemoura cinerea (Retzius, 1783)

ANTRIM: Lough Natrosk, western reedbed (D272198), 3♂♂1♀ 2 April 2021 and 2♂♂1♀ 12 May 2021, collected by C. McNaughton, identified by H. B. Feeley.

MAYO: Lough Conn, east shore (Mount Falcon) (G192096), 1♂ 24 April 2021, collected by B. Kennedy, identified by H. B. Feeley. Lough Mask, Saints Island (shore) (M102586), 1♂ 14 July 2021, H. B. Feeley.

WICKLOW: Lough Bray Lower, lake shore opposite the main house (Lough Bray Lodge Estate) (O136163), 2♂♂ 14 April 2021, H. B. Feeley.

Nemurella pictetii Klapálek, 1900

ROSCOMMON: Cloonfad River, Blackford Bridge (M492710), 1♂ 2 June 2021, H. B. Feeley.

Previously only two larval records are available for *Nemurella pictetii* in County Roscommon reported by Callanan (2009) and listed in Feeley (2021). This is the first record of adult material for the county.

Protonemura meyeri (Pictet, 1841)

ANTRIM: Lough Natrosk, western reedbed (D272198), 1♀ 1 March 2021. Lough Garve, lake shore (D210176), 1♀ 25 April 2021, all collected by C. McNaughton, identified by H. B. Feeley.

DUBLIN: Glencullen River, Brockley Lane (O191194), 2♂♂1♀ 15 April 2021. Glencullen River, Boranaraltry Bridge (O168206), 1♂1♀ 25 April 2021, all H. B. Feeley.

GALWAY: Sinking River, bridge at Dunmore Castle (M500639), 2♀♀ 3 June 2021, all H. B. Feeley.

WICKLOW: Cloghoge Brook, bridge upstream of the Annamoe (Cloghoge) River confluence (O158060), 1♀ 13 April 2021. Avonmore River, southeast of the Sally Gap (O143099), 1♀ 14 April 2021. River Liffey, 2km northwest of the Sally Gap (O109127), 1♂1♀ 14 April 2021. Ballinagee River, Ballinagee Bridge (O036023), 1♀ 15 April 2021. Ballydonnell Brook, Ballylow Bridge (O059130), 1♂1♀ 15 April 2021. Ballylow Brook, bridge upstream of the Ballydonnell Brook confluence (O067133), 1♀ 15 April 2021. Cock Brook, bridge northwest of Kilmore (O021088), 3♂♂ 15 April 2021. Kings River (Liffey), bridge 100m upstream of the Ballinagee River confluence (O033020), 1♂3♀♀ 15 April 2021. Annalecka Brook, Annalecka Bridge (O055018), 1♂ 16 April 2021. Douglas River (Liffey), Granamore Bridge upstream of the Kings River confluence (N977030), 1♀ 16 April 2021. Glashaboy Brook, Glashaboy Brook Bridge east (O066016), 1♀ 16 April 2021. River Ow, bridge near Aghavannagh Barracks (T055861), 1♂1♀ (♂ with Entomophthora infection) 22 April 2021, all H. B. Feeley.

PERLIDAE

Dinocras cephalotes (Curtis, 1827)

OFFALY: Camcor River, ford 1.5km north of Kinnitty (N189066), 5♂♂3♀♀ (1♀ and 1♂ with crumpled wings) 27 May 2021, J-R. Baars.

Perla bipunctata Pictet, 1833

KILKENNY: Tributary of Dinin River, Burn's Bridge (S595711), 2♂♂2♀♀ 15 May 202 and 25♂♂18♀♀ (3♀♀ with crumpled wings) 26 May 2021. all J-R. Baars.

MAYO: Finny River, bridge south of the church in Finny (M010586), 2♂♂2♀♀ 30 May 2021, H. B. Feeley.

OFFALY: Camcor River, ford 1.5km north of Kinnitty (N189066), 19♂♂13♀♀ 27 May 2021, J-R. Baars.

WICKLOW: River Liffey, Ballyward Bridge (O021160), 14♂♂4♀♀ 7 June 2021, J-R. Baars.

PERLODIDAE

Diura bicaudata (Linnaeus, 1758)

MAYO: Lough Conn, east shore (Mount Falcon) (G192096), 7♂♂11♀♀ 29 June 2021. Lough Mask, Tourmakeady (shore north of Glensaul River inflow) (M107679), 1♀ 12 July 2021. Lough Mask, Tourmakeady (southwest shore) (M078637), 1♂1♀ 15 July 2021, all H. B. Feeley.

All females collected on these lake shores exhibited brachyptery, while males exhibited microptery (Plate 2). This contrasts with the macroptery in females and brachyptery in males recorded in lotic habitats in County Wicklow (Feeley and Baars, 2020).

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

DUBLIN: Owendoher River, Cruagh Road Bridge (O137227), 1♂ 11 May 2021, H. B. Feeley.

GALWAY: Grange River, Grange Bridge (M480499), 2♂♂2♀♀ 1 June 2021. Abbert River, bridge at Ballan (M436407), 2♂♂4♀♀ 8 June 2021. Glennamucka Stream, bridge downstream of the tributary from Lough Doo (M605348), 2♂♂ 8 June 2021. Headford River, bridge at Lisheennageha (M261431), 4♂♂6♀♀ 10 June 2021, all H. B. Feeley.

MAYO: Cong Canal, east bank near the monks fishing hut (Ashford Castle Estate) (M146550), 1♂4♀♀ 10 June 2021. Lough Carrowmore, lake shore at a slipway (near Knocknascollop) (F830283), 1♀ 23 June 2021, all H. B. Feeley.

ROSCOMMON: Cloonfad River, Blackford Bridge (M492710), 2♂♂ 2 June 2021, H. B. Feeley.

WICKLOW: River Liffey, Ballyward Bridge (O021160), 2♀♀ 7 June 2021, J-R. Baars.

TAENIOPTERYGIDAE

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

DUBLIN: Glencullen River, Brockley Lane (O191194), 2♂♂1♀ 15 April 2021. Owendoher River, Cruagh Road Bridge (O137227), 1♂2♀♀ 25 April 2021. Owendoher River, Cruagh Mountain (O140217), 1♀ 25 April 2021, all H. B. Feeley.

WICKLOW: Avonmore River, bridge downstream of Lough Tay (Luggala Estate), (O161061), 1♀ 13 April 2021. River Liffey, bridge east of Ballysmuttan (O056148), 1♀ 14 April 2021. Ballinagee River, Ballinagee Bridge (O036023), 3♂♂ (1♂ crumpled wing) 15 April 2021. Ballydonnell Brook, Ballylow Bridge (O059130), 1♂ 15 April 2021. Ballylow Brook, bridge upstream of the Ballydonnell Brook confluence (O067133), 1♂1♀ 15 April 2021. Cock Brook, bridge northwest of Kilmore (O021088), 1♂ 15 April 2021. Kings River (Liffey), bridge 100m upstream of the Ballinagee River confluence (O033020), 1♂2♀♀ (1♀ crumpled wing) 15 April 2021. Annalecka Brook, Annalecka Bridge (O055018), 2♂♂ 16 April 2021. Glashaboy Brook, Glashaboy Brook Bridge east (O066016), 4♂♂3♀♀ 16 April 2021. Kings River (Liffey), Lockstown Bridge (N978034), 1♀ 16 April 2021. River Ow, bridge near Aghavannagh Barracks (T055861), 1♂2♀♀ 22 April 2021. River Ow, Ballymanus Bridge (T092815), 1♀ 22 April 2021, all H. B. Feeley.

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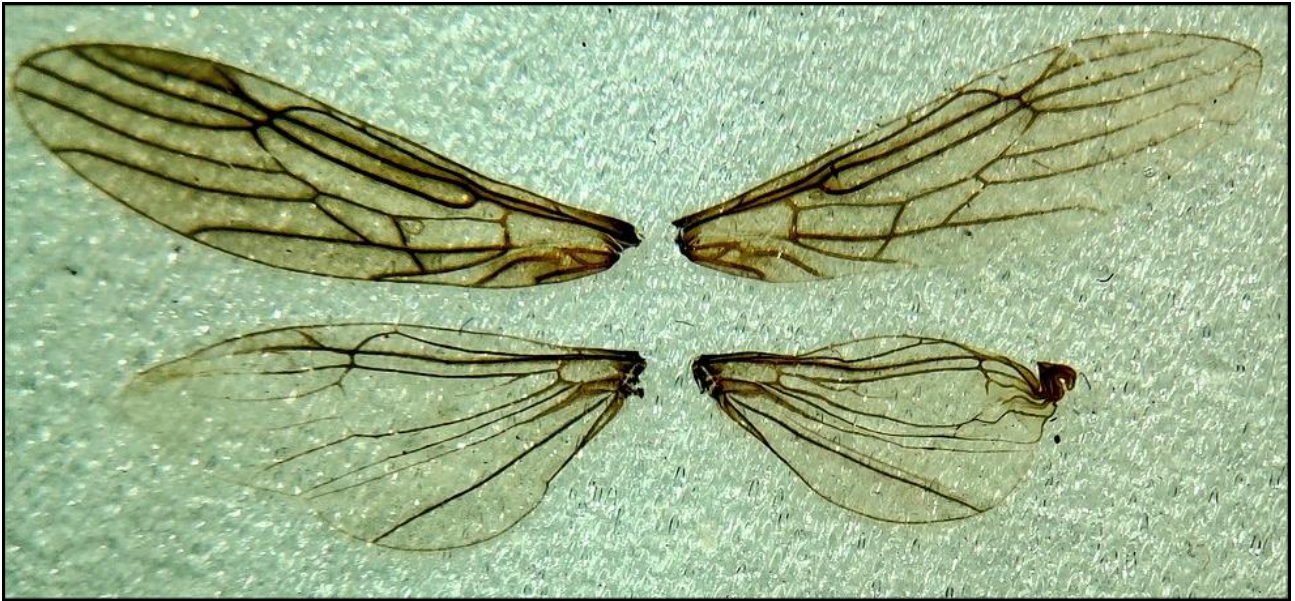


PLATE 1. Wing crumpling in *Capnia atra* Morton. Lough Conn, County Mayo, ♂ 24 April 2021. Photograph: Hugh B. Feeley.



PLATE 2. Adult male (top) and female (bottom) of *Diura bicaudata* (Linnaeus) exhibiting microptery and brachyptery, respectively. Lough Conn, 26 June 2021. Photograph: Hugh B. Feeley.