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NAIS COMMUNIS PIGUET, 1906 (OLIGOCHAETA: NAIDIDAE), MICROHABITAT AND OCCURRENCE IN SOUTHERN IRELAND

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Abstract

For many years, there has been some confusion concerning the identification and status of *Nais communis* Piguet, 1906 (Oligochaeta: Naididae) in Ireland, where there was only one verifiable record of this small oligochaete worm until the chance discovery in 2023 of 26 specimens within the structure of the case of a larva of *Limnephilus marmoratus* Curtis 1834 (Trichoptera: Limnephilidae). Further investigations were undertaken into its occurrence in this microhabitat. A total of 219 *Limnephilus flavicornis/marmoratus* cases from 47 sampling sites in Munster and South Leinster was examined. *N. communis* was recorded at 21 sites, across ten counties and its occurrence suggests a commensal, rather than an accidental relationship with *Limnephilus flavicornis* (Fabricius, 1787) and *L. marmoratus* larvae.
Key words: *Nais communis,* Oligochaeta, Naididae, *Limnephilus flavicornis*, *Limnephilus marmoratus*, Trichoptera, microhabitat, commensal, occurrence, larval cases.

Introduction

Of the one hundred aquatic oligochaete species whose presence in Ireland has been confirmed, fifteen belong to the genus *Nais* (Naididae) (Sweeney, 2016). Among these, some confusion has occurred in the identifications of two similar congeners *N. communis* Piguet, 1906 and *N. christinae* Kasprzak, 1973. The main obvious external difference between preserved specimens of these two small worms (length 1.5mm-12mm) is the angle between the teeth of the anterior ventral crotchets (Timm and Veldhuijzen van Zanten, 2002). Because the first description of *N. christinae* was not until 1973, it was not included in the commonly used identification guide to aquatic oligochaetes by Brinkhurst (1971). *N. communis* was first recorded on Clare Island, County Mayo, by Southern (1913). This record seems to have led to an erroneous statement in the Freshwater Biological Association identification guide to aquatic oligochaetes (Brinkhurst, 1971), that *N. communis* had been recorded in County Clare, which is the only mention in this guide to an Irish location for any of the five species of this genus with bifid dorsal crotchets. This, combined with the absence of *N. christinae* from the guide, led to many misidentifications. A specimen, collected in 1978 in Lough Leane, Killarney, County Kerry, by the author and initially identified as *N. communis*, was corrected to *N. christinae* in 2002 by Tarmo Timm (Estonian University of Life Sciences) and deposited in NMINH. Specimens on a

microscope slide, described as *N. communis* by O'Grady *et al.* (1979) were available for examination and were found to be *Dero digitata* (Müller, 1774) with the hind ends missing and therefore without the diagnostic posterior gills of the latter species. On recent examination, a specimen labelled "*Nais communis*" in the possession of NMINH, which had been prepared by Roland Southern, was found to be *N. elinguis* Müller, 1774, casting doubt on his Clare Island *N. communis* record. On 22 April, 2002, a single specimen of *N. communis* was collected in the River Barrow at Carlow Town (Sweeney, 2016) and was verified by Tarmo Timm. Until 2023, this remained the only verifiable record of *N. communis* in Ireland, despite checking for its presence at other sites along the River Barrow.

On 7 March, 2023, an invertebrate sample was taken from a drain running from a constructed wetland to the River Barrow upstream of Goresbridge, County Carlow. While identifying a single larval specimen of the cased caddis *Limnephilus marmoratus* Curtis, 1834 from the sample, it was noticed that a very small oligochaete was protruding from between the plant fragments of which the case was constructed. This was identified as *N. communis*. On dismantling the case, a further 25 specimens of *N. communis* were found within the interstices of the case wall. This discovery of the presence of *N. communis* living within the wall of a limnephilid case added to the intrigue associated with the status and distribution of this species in Ireland, warranting a further examination of caddis cases to check for the species.

Methods

From March 2023 to February 2025, at 47 sites in Munster and South Leinster, larval cases of several caddis species from still water and slow-flowing aquatic habitats were examined, with particular focus on the congeners *Limnephilus flavicornis* (Fabricius, 1787) and *L. marmoratus*, which have very loose case structures, with pieces of plant material arranged tangentially, resulting in many very small spaces within the case wall (Plate 1). To accurately separate these two caddis species at larval stage, ratios of measurements taken from the head and prosternite, as described by Wallace *et al*. (2003), are required. Furthermore, many of the caddis larvae collected in the study left their cases on being placed in alcohol, making it impossible, in a vial of cases and larvae, to determine the species in which case an oligochaete specimen was found. Therefore, only in a small sample where *N. communis* had been found in an occupied case, was species level identification of these caddis done, and others were recorded as *L. flavicornis/marmoratus*. On occasions where none or few *L. flavicornis/marmoratus* larvae were found, particularly during the summer months, when *L. flavicornis* and *L. marmoratus* are at adult stage of their life cycles (O'Connor, 2020), the cases of four other caddis species of the Family Limnephilidae:- *Limnephilus rhombicus* (Linnaeus, 1758), *Chaetopteryx villosa* (Fabricius, 1798), *Anabolia nervosa* (Curtis, 1834) and *Halesus radiatus* (Curtis, 1834), which have somewhat loose case structures, were also

checked for the presence of oligochaetes. Caddis cases were dismantled using fine forceps under a dissecting microscope (Plate 2). A total of 219 *L. flavicornis/marmoratus* cases and 35 cases of other Limnephilidae were examined. Oligochaetes found were mounted on glass slides and identified using the keys of Timm and Veldhuijzen van Zanten, 2002) and/or Van Haaren and Soors (2013).

Results

Oligochaetes were not found in cases of caddis other than *Limnephilus flavicornis/marmoratus*. *Nais communis* was found at 21 of the 47 sampling sites and in 48 of the 219 *L. flavicornis/marmoratus* cases examined. Eight of these cases also contained other oligochaete species. A further seven cases contained only oligochaetes other than *N. communis.*

Nais communis records in cases of *Limnephilus flavicornis/marmoratus*

County Carlow

Drain to River Barrow (S6837 5450), 7 March 2023, 1 *L. marmoratus*, 26 *N. communis*.

River Barrow, upstream of Bagenalstown weir (S7073 6234), 17 January 2025, 13 *L. flavicornis/marmoratus*, 1 *N. communis*.

County Clare

Ballyallia Lough (R3466 8085), 12 November 2024, 10 *L. flavicornis/marmoratus*, 5 *N. communis* in 3 cases.

Lough Inchiquin (R2757 8946), 12 November 2024, 8 *L. flavicornis/marmoratus*, 3 *N. communis* in 3 cases.

County Cork

Ballybeg Pond, Buttevant (R5433 0753), 11 March 2024, 1 *L. flavicornis/marmoratus*, 2 *N. communis*.

Monanimy Pond, Killavullen (R6516 0077), 28 December 2024, 22 *L. flavicornis/marmoratus*, 12 *N. communis* in 6 cases.

River Lee, Lee Fields, Cork City (W6439 7145), 30 December 2024, 1 *L. flavicornis/marmoratus*, 1 *N. communis*.

The Gearagh (W6439 7145), 2 February, 2025, 5 *L. flavicornis/marmoratus*, 2 *N. communis* in 1 case.

County Kerry

Caragh Lough (V7031 8827), 13 January 2025, 10 *L. flavicornis/marmoratus*, 3 *N. communis* in 3 cases.

Lough Currane (V5099 6563), 21 January 2025, 9 *L. flavicornis/marmoratus*, 27 *N. communis* in 8 cases.

Lough Leane (V9754 8774), 27 January 2025, 6 *L. flavicornis/marmoratus*, 1 *N. communis*.
Muckross Lake (V9656 8579), 27 January 2025, 10 *L. flavicornis/marmoratus*, 2 *N. communis* in 2 cases.

County Kildare

River Barrow, upstream of Athy weir (S6833 9336), 17 January 2025, 9 *L. flavicornis/marmoratus*, 1 *N. communis*.

County Kilkenny

Lough Cullin (X6129 1861), 29 December 2024, 15 *L. flavicornis/marmoratus*, 1 *N. communis*.

County Tipperary

River Suir upstream of Cahir Weir (S0513 2498), 22 November 2024, 9 *L. flavicornis/marmoratus*, 2 *N. communis* in 2 cases.
River Suir upstream of Clonmel Weir (S2012 2222), 22 November 2024, 1 *L. flavicornis/marmoratus*, 1 *N. communis*.
River Suir upstream of Holycross Weir (S0905 5417), 12 December 2024, 1 *L. flavicornis/marmoratus*, 1 *N. communis*.
Silver Stream (R9412 9421), 5 November 2024, 11 *L. flavicornis/marmoratus*, 3 *N. communis* in 3 cases.

County Waterford

Knockaderry Reservoir (S4984 0649), 28 December 2024, 22 *L. flavicornis/marmoratus*, 1 *N. communis*.

County Wexford

Ballykelly Lake (X6129 2122), 31 December, 2024, 18 *L. flavicornis/marmoratus*, 13 *N. communis* in 6 cases.

County Wicklow

River Slaney upstream of Baltinglass Weir (S8662 8884), 3 May 2024, 1 *L. flavicornis/marmoratus*, 1 *N. communis*.

Three *L. flavicornis* and seven *L. marmoratus* larvae were identified from 10 caddis cases containing *N. communis* at the following sites.

Limnephilus flavicornis

Ballyallia Lough (R3466 8085), 12 November 2024.
Lough Inchiquin (R2757 8946), 12 November 2024.
Muckross Lake (V9656 8579), 27 January 2025.

Limnephilus marmoratus

Ballybeg Pond, Buttevant (R5433 0753), 11 March 2024.
Ballykelly Lake (X6129 2122), 31 December, 2024.
Caragh Lough (V7031 8827), 13 January 2025.

Drain to River Barrow (S6837 5450), 7 March 2023.
Knockaderry Reservoir (S4984 0649), 28 December 2024.
Lough Currane (V5099 6563), 21 January 2025.
Lough Leane (V9754 8774), 27 January 2025.

A total of 30 specimens from seven other oligochaete taxa were found in cases of *L. flavicornis/marmoratus* across ten sites.

The maximum length of *N. communis* specimens found in this study was c. 2.3mm.

Discussion

On continental Europe, *Nais communis* has been found in colonies of Bryozoa and Porifera (Van Haaren and Soors, 2013). However, its association with cased caddis larvae has, up until now, been unknown (Tarmo Timm, pers. comm.). Of the 47 sites sampled in this study, *N. communis* was found in *Limnephilus flavicornis/marmoratus* cases at 21 sites (44.7% occurrence). If seven sites sampled during the summer period, when *L. flavicornis* and *L. marmoratus* are at the adult stage of their life cycles, are excluded, the occurrence rises to 52.5% of sites, with an average of 2.3 *N. communis* per case. This compares with an average of 0.14 individuals per case for a combination of all the other seven oligochaete species found. After *N. communis*, the species with the next highest occurrence in *L. flavicornis/marmoratus* cases was *N. christinae*, with 15 individuals (0.07 per case). These data suggest a commensal, rather than an accidental relationship between *N. communis* and *L. flavicornis/marmoratus*.

N. communis has now been verifiably recorded in Counties Carlow, Clare, Cork, Kerry, Kilkenny, Tipperary, Waterford, Wexford and Wicklow.

As no oligochaetes were found in empty cases during the summer months, when *L. flavicornis* and *L. marmoratus* are at the adult stage of their life cycles, it must be presumed that either small *N. communis* utilise other microhabitats or that *N. communis* does not reproduce during this period. The single *N. communis* found on 22 April, 2002 was less than 2.5mm long, like all the specimens found in this survey, and, although it was found free in the sorting-tray, it was in an invertebrate sample that included several *L. flavicornis/marmoratus* larvae. As Timm (1999) gives a length range of *N. communis* of 1.5 mm to 12 mm, this raises the question as to where larger specimens are to be found. It is possible that some of the earlier identifications of *N. communis* were correct and that recently these small pale worms have often been overlooked.

The records in this paper will be sent to the National Biodiversity Data Centre.

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PLATE 1. *Limnephilus marmoratus* larva in case. Photograph: Pascal Sweeney.

PLATE 2. *Nais communis* in dismantled case of *Limnephilus flavicornis/marmoratus* larva. Photograph: Pascal Sweeney.