

Report on surveys for the stonefly *Isogenus nubecula* Newman and the caddisfly *Ylodes simulans* (Tjeder) in the River Dee, Cheshire in 2018 and 2019

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Background

The Critically Endangered stonefly *Isogenus nubecula* had not been seen in the UK for 22 years when it was re-discovered by John Davey-Bowker in 2017 in the River Dee, at what had been its main site at Bangor-on-Dee, Wrexham [Davy-Bowker, *et al.* 2018: Re-discovery of the critically endangered 'scarce yellow sally' stonefly in United Kingdom after a 22 year period of absence [*Zootaxa* 4394(2)]. Following this re-discovery, Davy-Bowker was commissioned by Natural Resources Wales to survey the Dee and some tributaries in spring 2018. In 1981, it had been found in the Dee near the mouth of the River Alyn on the Welsh side of the river but where Cheshire is on the opposite bank. Thus one could argue that the species had probably occurred in Cheshire [Mills, M.J. & Andrew, D. 1984:- *Isogenus nubecula* Newman (Plecoptera: Perlodidae) in the Welsh River Dee. *Entomologist's Gazette* **35** 45-51]. If this species is increasing there is the chance it is in the Dee in Cheshire. A small grant from the Tanyptera Trust enabled IW and BW to look at the lower River Dee in Cheshire to look for suitable habitat and, if found, to search for *Isogenus nubecula*. Previous surveys had focussed on sites used by the water quality monitors which, for practical purposes, are near road access points.

The Nationally Rare caddis *Ylodes simulans* is recorded from five river systems in the UK, one of which is the Dee. It has never been found lower down than Bangor-on-Dee, but it seemed sensible to look for suitable habitat, whilst engaged on the *Isogenus* survey, and search for larvae at such sites. In the River Dee larvae have been found amongst the submerged leaves of *Ranunculus* in moderate to fast flow. The species of plant was identified at the time as *Ranunculus fluitans* Lam. and data from the B.S.B.I., kindly supplied by Denbighshire County Recorder Delyth Williams, indicates that this is the species recorded by botanists from the Dee in that area.

Method

The original intention was that IW & BW would accompany Davy-Bowker on an early visit to Bangor-on-Dee to learn how to recognise nymphs of *Isogenus*. Unfortunately, high water levels meant that it was not possible to find a date that suited everyone. The habitat at Bangor is coarse gravel and stones and is fairly unstable due to fast flow. Viewed via the "Google Earth" satellite, the broken water and pale-coloured substratum at Bangor is obvious. Those satellite views did suggest that there were small sections of the Cheshire Dee where there was also broken water and pale substratum. These occur between Shocklach Green (SJ423494) and Churton (SJ403566).

Ranunculus fluitans also seems to like areas of faster flow and is a plant that stabilises the substratum and encourages accumulation of gravel and sand. It is easiest to record from the bank when in flower as it has no emergent leaves and at times of higher flow its presence may be obscured by turbid water flowing above it.

Results

Isogenus nubecula survey

The Dee bank was walked between Holt (SJ41015338) and Castletown (SJ42595046) on 11.3.2018, in the Almere area (SJ40115616 to SJ40315064) on 3.6.2018, and between Farndon

(SJ41055345) and Almere (SJ40935746) on 24.6.2018. A small section of river that lies in Cheshire between SJ42595046 and SJ42324943 has not been walked because there is no public right of way near areas that appear suitable in aerial survey.

We found that the rough water noted on “Google Earth” marked banks of fine gravel or sand rather than coarse gravel and stones. John Davy-Bowker has not found nymphs in that habitat. In 2018 he did look for nymphs near the mouth of the River Alyn, as he has on several occasions in the past decades, but he told IW he was again unsuccessful.

Ylodes simulans survey

No suitable habitat was discovered in Cheshire. Beds of fine-leaved submerged plants were noticed but they proved to be of *Stuckenia pectinata* (L.) Borner and *Ylodes* larvae were not found amongst them. We are unaware of any records of *R. fluitans* from the Dee in Cheshire.

As we were in the area we did look for larvae below Bangor-on-Dee in Wales on 3.6.2018 where there are beds of *Ranunculus fluitans*. We were successful at three places between Bangor (SJ387455) and Pickhill water treatment works (SJ387460), at places on both banks. Very few caddis larvae eat live water-plants. *Ylodes simulans* proved to be very unusual in that it would only eat live filamentous leaves of *Ranunculus*.

Whilst we were not successful in finding *Y. simulans* in Cheshire it is of value to know it certainly still occurs as far down the Dee as Pickhill. Table 1 lists all River Dee records.

Ranunculus fluitans is most conspicuous when it is flowering in June which coincides with a suitable time to search for larvae. The plant may have been overlooked during the March walks due to raised water levels.

Elsewhere in the area, a female of *Ylodes simulans* was taken by Bryan Formstone in a light trap on the Wrexham Industrial Estate at SJ377503 on 22/7/2016. This could have come from the Afon Clywedog or the Dee. *Y. simulans* has never been recorded as larvae from tributaries of its main rivers anywhere in the country. Nevertheless, we sampled the lower Alun (SJ3856 and SJ3956) on 27/6/2019, where there is very little of the plant, and the lower Clywedog (SJ4047) on 3/6/2018 and 27/6/2019 where it is abundant. We did not encounter *Ylodes simulans*.

Conclusion

Isogenus nubecula can be classed as probably extinct in Cheshire.

Ylodes simulans may possibly occur in Cheshire but that seems unlikely. The observation that the larvae would only eat live *Ranunculus* is of value in understanding the species' biology.



An adult *Ylodes simulans* reared from the River Dee. The wing markings are characteristic.

Table 1. Records of *Ylodes simulans* in the River Dee

DATE	GRIDREF	LOCALITY	STAGE	RECORDER NAME
1979	SH98-37-	R. Dee, Llanderfel	Larva	Martin Mills, Dee & Clwyd Water Board
01/07/1979	SJ11-43-	R. Dee, Carrog	Larva	B. & I.D. Wallace
1979	SJ17-42-	R. Dee, Glyndyfrdwy	Larva	B. & I.D. Wallace
03/07/1982	SJ31-40-	R. Dee, Wynnstay Park	Adult	B. & I.D. Wallace
16/08/1987	SH982366	R. Dee, Llandderfel	Adult	B. & I.D. Wallace
10/06/2007	SJ125434	R. Dee, Carrog	Larva	B. & I.D. Wallace
24/07/2008	SJ12-43-	R. Dee, Carrog	Adult	Emma Ross
22/07/2016	SJ377503	Wrexham Industrial Estate	Adult	Bryan Formstone
03/06/2018	SJ387456	R. Dee, Bangor-is-y-coed	Larva	B. & I.D. Wallace
03/06/2018	SJ387460	R. Dee, Pickhill	Larva	B. & I.D. Wallace