Case study: The wheat bug (*Nysius huttoni*)
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The general picture of the status of true bugs (Hemiptera: Heteroptera) in the UK within the recent past is one of significant change. This change is reflected in the progressive accumulation of a greater diversity of species, this most emphasised in the terrestrial element of the fauna. This positive change is down to a range of factors but the two most important ones are climate change and trans-national/trans-continental commerce. In South Yorkshire members of the Sorby Invertebrate Group (SIG), the Yorkshire Naturalists' Union (YNU) and other recording groups and individuals have for many years undertaken the recording of terrestrial bugs in the county. Although recording coverage for the county has been patchy in the past, the more recent records that have been made over the last 10-15 years provide less of a geographical bias and give a broad indication of the extent of faunal change taking place in the county as a whole. A paper published by Sorby Natural History Society's recorder of Hemiptera, Jim Flanagan, gave detailed accounts of a total of thirty seven species of true bug (including two aquatic species) new to the county between the years 1999-2013. A further ten species have been added to up to the end of 2017. The majority of these newcomers (excluding a small number of species that are thought to have been overlooked) have become more or less well-established in the county. There is also a small number of these new species which appear to be adventives. No evidence of established populations of these has so far been found.

The wheatbug (*Nysius huttoni*), a member of the groundbug family (Lygaeidae), is one of the more recent arrivals to the South Yorkshire. It is native to New Zealand where it occurs in a wide range of habitats from mountain to lowland on both south and north islands. It is polyphagous on a great range of plant species including non-native weeds originating from Europe such as scarlet pimpernel and many grasses and cultivated crops, hence the origin of the common name. In dry hot years the bug has been known to migrate to crops and cause damage particularly to cereal and Brassica crops but this is thought to occur infrequently. The first occurrences outside of its native range were in Europe from locations in Belgium and the Netherlands (Aukema, 2005). The first sightings were close to the port of Antwerp and it is assumed that the bug was introduced accidentally on shipments. The first records for France were from 2006 in the Nord Department close to the border with Belgium. Over many years there have been many documented interceptions of the bug on shipments coming into the USA, Mexico and Australia in recognition of its potential as an agricultural pest. It seems only a matter of a time, though, before it is establishes itself as a truly global tramp species.

The first British record of wheatbug came from coastal Suffolk at the RSPB nature reserve of North Warren in September 2007 and in the following spring over-wintering adults were found in numbers, including mating pairs, both at North Warren and other nearby RSPB nature reserves such as Minsmere (Cumming, 2008). It is quite possible that these populations may have originated from the nearby ports of Harwich or Felixstowe via shipments from the port cities of Belgium and the Netherlands. Long range dispersal is less likely but possible in certain weather conditions. Wheatbug has since been reported widely across many counties in England and was found new to Yorkshire from a largely sparsely vegetated brownfield site off Rockingham Street in the centre of Sheffield (Plate 1) on 28th September 2014 where a single adult female was obtained from sweep-netting (see specimen in Plate 2: the right forewing was found to be deformed when first examined in the net). This site has now been lost to a recent building development. Up to the end of 2017 there have been a total of seven (VC63 and VC57) records for South Yorkshire, these occurring in the three metropolitan boroughs of Sheffield, Rotherham and Doncaster. In addition there have been two other Yorkshire records, one for West Yorkshire (VC63) for a brownfield site at Mirfield close to the River Calder and one from East Yorkshire (VC61) from another brownfield-type site on the northern edge of Hull near Cottingham. The bug was first reported for Derbyshire (VC57) on 1st August 2013 by Steve Lane who sweep-netted an adult from a brownfield site in the city of Derby. A further record of it from the county was obtained from hand searching in low growing vegetation comprising abundant biting stonecrop (*Sedum acre*) at a disused quarry site at Stanton by Dale during June 2014.

Plate 1. Brownfield site off Rockingham Street. Credit Jim Flanagan

Another VC57 record, but this time within the administrative boundary of Sheffield was found by Sorby NHS Coleopterist Eric Smith in Gillfield Wood on 8th August 2015, atypically sheltering within a piece of fallen timber by a path.

Plate 2. Wheatbug specimen. Credit Jim Flanagan

There are six other species of Nysius groundbug occurring in the UK. All look rather similar in appearance. Correct identification of specimens of most of these species will usually require the use of a microscope. The wheatbug, however, is quite distinctive in that it has a dense cover of longish hairs on the head, pronotum and the hardened parts (corium) of the forewings and this feature can be clearly seen with a hand lens. It also tends to show more contrast with dark and pale areas and is overall a more squat-looking bug (especially the female) in comparison to other *Nysius*.

South Yorkshire now has a total of four Nysius species. The two most commonly found on in South Yorkshire have, until recently, been *N. ericae* and *N. thymi*, with the latter usually more frequently found on sites (including quarries) on the Southern Magnesian Limestone Ridge passing through the Rotherham and Doncaster areas and *N. ericae* more widespread on sparsely vegetated brownfield. There is evidence that the

wheatbug may be as common as these two and nearly all the records so far obtained are mainly from brownfield. It is too early to say what impact the wheatbug will have on its congener species here but possibly some equilibrium may be reached where suitable Nysius habitats can happily accommodate the new arrival without adverse impact. The fourth, *N. senecionis*, is another new arrival to South Yorkshire but was already recorded for elsewhere in Yorkshire as early as 1996 by Bill Dolling from locations on the north side of the Humber Estuary (including Beacon Lagoons Nature Reserve) and from also as far north from the coast at Sandsend in North East Yorkshire (a remarkable development of its national status given that this bug was found new to Britain from East Sussex only four years before the first Yorkshire records!). The South Yorkshire find was for a specimen at a brownfield site at Long Sandall near to the River Don in the Doncaster area in August 2015 which was collected by Stuart Foster, YNU Recorder of Hemiptera. During visits to this site in the same month Stuart also found a small population (males and females) of the wheatbug! In the rest of Yorkshire there is one other *Nysius* species which at present appears to be the only one confirmed record for Britain – *Nysius cymoides*. This was also found by Bill Dolling at Beacon Lagoons Nature Reserve during 2003. It is a perhaps a little more distinctive from other Nysius in that it is smaller and more narrow-bodied and the membrane of the forewings also appear longer. Close examination will show the wing membrane extending well beyond the apex of the abdomen, a feature hardly seen in any other specimens of British *Nysius*. *N. cymoides* is common and widespread across the Mediterranean region and natural dispersal (or assisted) offers the potential for specimens to turn up well outside their normal range. In Britain all Nysius species overwinter as adults and feed on plant sap and seeds of a wide range of hosts. They are to be found particularly in warm environments so well-drained sparsely vegetated brownfield sites which heat up rapidly in the sun are favoured places.

Although the bug has been documented to cause damage to crops in New Zealand, these events appear to be infrequent. So far no crop damage has yet been reported from Europe. This is one reason why the bug has not yet been considered to be a major risk to crops in the UK. Nevertheless Food and Environment Research Agency (FERA) put out an alert through the publication of a Plant Pest Factsheet (Reid & Eyre, 2010) calling for reports of occurrence of the bug to be submitted to them. Current thinking is that there is potential for its development from benign introduction to minor agricultural pest in the future and the trend for a warming climate may increase the chance of this happening.

References

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