Substantial colony of Scarce Blue-tailed Damselflies *Ischnura pumilio* discovered in Worcestershire.

Andy Warr

With Worcestershire's first observation of Scarce Blue-tailed Damselfly *Ischnura pumilio* (SBTs) at Feckenham Wylde Moor in 2020 (Warr 2020) the only other sighting prior to 2022 comprised a male at Ryall Court Pits, which I found whilst birding the area on 30th August 2021. The latter sighting was of particular interest, as the habitat matched this damselfly's specialised breeding requirements, being lightly vegetated areas of shallow water (01). Further exploration was needed the following summer to establish its true status.

01. Ryall Court Pits 2022. Andy Warr

Ryall Court Pits is situated alongside the River Severn, just north of Upton-upon-Severn and has been an active sand quarry since around 2016-17. Being within the Severn flood plain, operations halt during the winter months to coincide with heightened risk of flooding between November-March. Water levels rise in the pits once pumping ceases, eventually forming sizeable lakes, which remain in situ over four to five months until pumping resumes in early spring. The active pits are drained before resumption of work as were the older depleted areas, creating a unique wetland habitat spanning approximately seven hectares of shallow, water-filled channels, scrapes, runnels, pools and flushes, plus exposed silt, sand and gravel beds. A shallow, slow-flowing stream, both silt and pebble- bedded along its reach, ran half the pits' length and despite this year's exceptionally dry summer, the water levels and flows remained stable throughout the season, so presumably the pit base was below the water table and/or spring fed. Though Crack Willow *Salix fragilis* saplings have established across an extensive area, large parts remain clear and were dominated by Water-plantain *Alisma plantago-aquatica*, Common Spike-rush *Eleocharis palustris* and various grasses, plus stands of Great Reedmace *Typha latifolia*. Other plants recorded included Common Water-crowfoot *Ranunculus aquatilis*, Rosebay Willowherb *Chamaenerion angustifolium*, Toad Rush *Juncus bufonius*, Pink Water-speedwell *Veronica catenata*, Blue Water-speedwell *Veronica anagallis-aquatica*, Red Shank *Persicaria maculosa*, Red Goosefoot *Qxybasis rubra*, Pale Knotweed *Persicaria lapathifolia*, Gypsywort *Lycopus europaeus*, Common Club-rush *Schoenoplectus lacustris*, Celery-leaved Buttercup *Ranunculus sceleratus*, Purple-loosestrife *Lythrum salicaria* and the highly invasive Australian Stonecrop *Crassula helmsii*.

My first search for SBTs during 2022, was made on 12th June and proved an immediate success, recording an impressive tally of 26 males and 16 females, including six coupled (in cop) pairs, plus two egg-laying. All but one (an immature male) were mature individuals and presuming they were all locally bred, emergence must have taken place here a good few days earlier, so annoyingly my first visit was a bit on the late side. A second visit on 15th June produced 19 males, including two pairs in cop, then over the next 24 days, five further explorations saw numbers gradually dwindle with just two of each male and female by 9th July, but no immatures were observed over this period. As with the Feckenham SBTs in 2020, I photographed all individuals I encountered to establish totals on site. The males have very variable blue markings on segments 8, 9 and 10 of the abdomen and appeared unique to the individual in this colony, so by 9th July 58 were logged, plus an estimated 30+ females, including 13 in cop and numerous sighting of egg-laying. Three other species of Damselfly shared the same habitat during these early visits, by far the most common being Blue-tailed *Ischnura elegans*, plus very small numbers of Azure *Coenagrion puella* and Common Blue *Enallagma cyathigerum*.

Only two adult males were noted on daily visits between 15th – 17th July and no adult females, though finally my dream of seeing the stunning immature female orange form, known as *aurantiaca* (02) was realised on 15th, plus the addition of two immature males. Things only got better, with six *aurantiaca* females and three immature males on 16th, then 11 *aurantiaca*, four immature males and a cast skin of a larva or exuvia found on 17th.

02. Female *aurantiaca* Scarce Blue-tailed Damselfly at Ryall Court Pits, 15.7.22. Andy Warr.

Peak emergence occurred between 21st July – 5th August, most visits producing large numbers of newly emerged or fresh immatures, with males and females pretty equal in numbers, though none were seen in adult form until 30th July. At some points SBTs even outnumbered Blue-tailed Damselflies and based on an estimated daily emergent rate of 70 to 100 during this period, totals easily reached over a thousand individuals. A couple of brief searches of the emergent vegetation produced 19 exuviae, all found between 10cm - 50cm above the waterline (03 & 04) on Common Spike-rush, young stems of Great Reedmace and amongst thick clumps of partly submerged grasses.

03. Exuvia of Scarce Blue-tailed Damselfly in situ, Ryall Court Pits, 17.7.22. Andy Warr.

04. Collected exuviae of Scarce Blue-tailed Damselfly (bottom) with larger Blue-tailed Damselfly (top), Ryall Court Pits, 17.7.22. Andy Warr.

Just a handful of immatures were noted on 7th August, though adults were numerous and spreading throughout the works complex. A count across the whole 20 hectares site produced 185 females and 270 males, including over hundred in cop and similar totals were present the next day.

Due to ill heath, I was out of action for most of August, but was pleased to find 45 still present on 27th, comprising 28 males (one immature) and 17 adult females (seven in cop and one egg-laying), whilst by the 3rd September, just four adult females were noted, though 26 males, including a few immatures, seemed a good count for this time of year and one particularly fresh immature (05) showed that emergence continued late into August/early September.

05. Fresh immature male Scarce Blue-tailed Damselfly at Ryall Court Pits, 3.9.22. Andy Warr.

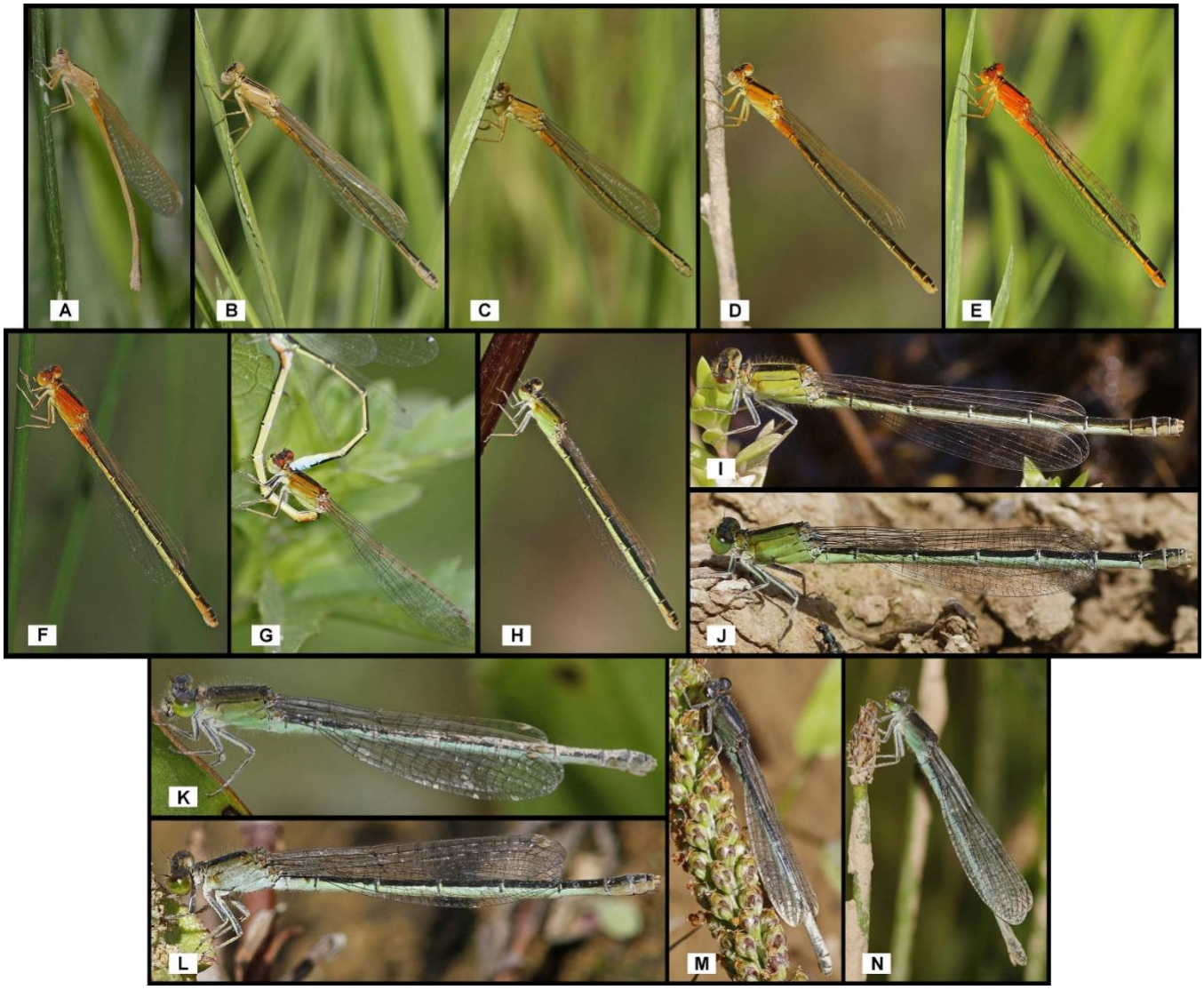
By the 10th September just a single adult female was located, but no males observed. Blue-tailed Damselflies were also absent, with only a few Common Blue Damselflies remaining onsite. I was surprised to find a lone male SBT (06) during my penultimate search on the 17th September, as it seemed a little late in the season, but I also located a couple of Blue-tailed, which have a similar flight period. I returned a couple of days later, but neither Blue-tailed species could be found.

06. The final Scarce Blue-tailed Damselfly of the year at Ryall Court Pits, 17.9.22. Andy Warr

The availability of such large numbers of SBTs over such a long time span, allowed me the opportunity to study both morphology and behaviour across the full range of age and sex and the following observations were made.

Female morphology: Emergent to over- mature.
(See image 07 on next page).

(A) Newly emerged with wings not fully expanded. Washed out pale orange, darker brown along ridge of the abdomen, apart from Segments 1, 2 and top of segment 3. Very narrow, dark pencil sharp line just visible below shoulder stripe and wing veins pale orange.
(B) Fresh Immature. Similar to (A) but wings fully expanded and blacker ridge on abdomen.
(C) Immature. Orange begins to brighten on the abdomen, thorax, eye-spots and legs and the narrow line below the shoulder stripe darkens.
(D) Immature. Orange intensifies throughout, particularly on the wing veins.
(E) Bright immature. Orange now at its most intense, with a slight reddish hue on upper thorax and eye-spots.
(F) Immature, start of transition to adult. As (E) but the ridges of Segments 1, 2 and top of 3 begin to darken, plus sides of the abdomen start to turn olive green.
(G) Transitional to adult. Ridge of abdomen dark throughout, lower thorax very pale olive green and orange becoming duller on upper thorax and sides of abdomen, but eye-spots still vivid orange. Legs begin to lose orange colouration.
(H) Near-adult. Thorax predominantly pale olive, with just a few traces of orange present, eye-spots dark, but orange retained in segments 8, 9 and 10 of the abdomen, plus in the wing veins. Very slight orange hue on legs.
(I) Fresh adult. As (H) but orange lost from abdomen, wing veins and legs. The narrow, black line below the shoulder stripe now very obvious.
(J) Adult. Green colouration darkens throughout.
(K) & (L) Maturing adults. The shoulder stripes begin to darken, making the narrow black line below less conspicuous.
(M) & (N) Over mature adults. Now in their drabbest state, with the upper thorax darkened further: a fine sediment often covers the entire body after egg-laying, making them appear even more nondescript.



07. Female Scarce Blue-tailed Damselflies at Ryall Court Pits in 2022. Andy Warr.

08. Female *aurantiaca* in cop, Ryall Court Pits, 07.08.22. Andy Warr.

Female behaviour.

Newly emerged females were often encountered hiding amongst thick clumps of partly- submerged grasses and once disturbed would make a brief feeble flight, then return to the same clump, or continue to similar nearby cover, generally no more than five or six metres away. Once flight had strengthened, the majority of fresh immatures could be found amongst much taller stands of dense vegetation, such as Common Spike-rush, Great Reedmace, Common Club-rush and Water-plantain, generally avoiding the more open areas, whilst the brighter *aurantiaca* females frequented both densely vegetated areas plus the more lightly vegetated water filled channels, runnels and flushes. Unlike immature female Blue-tailed Damselfly, which will readily couple with a male at this age, only once was an *aurantiaca* female seen in cop (08), so a rare occurrence in this species. Apart from a female in transition to adult (see female morphology 07 - G), all other coupled sightings involved adults. On two occasions, a male Blue-tailed Damselfly attempted unsuccessfully to couple with a female SBT.

Just two transitional females observed throughout the season, suggesting the change from *aurantiaca* to green adult is very rapid and perhaps takes place in deep cover or even overnight. Adults were found to occupy a range of wetland habitats, including densely packed stands of Water-plantain (09), often up to a metre in height, channels and flushes clogged with various tall grasses and rushes, as well as the sparsely vegetated areas. They also frequented some drier spots, often moving into willow carr and were regularly found perched on bare, sun-baked ground, along the outer slopes of the pit, though always within a few metres of water.

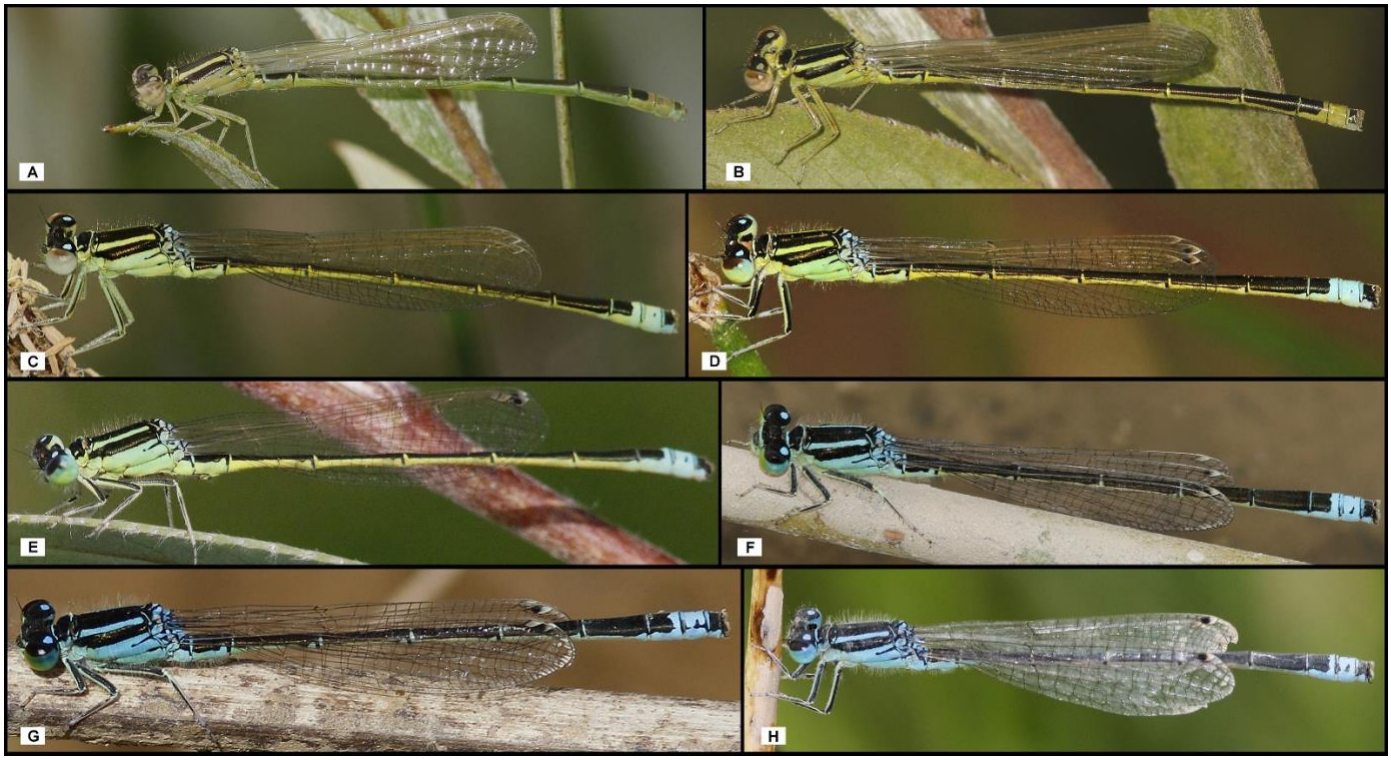
09. Area of Water-plantain which held female Scarce Blue-tailed Damselfly, Ryall Court Pits, 2022. Andy Warr.

Egg-laying took place on vegetation in shallow water of a depth between 10cm - 30cm and was always unaccompanied. A range of plants were selected, where both stems and leaves were used as egg depositories (10) above and below the waterline. Host plants recorded were Water-plantain, Common Spike-rush, Great Reedmace, Pink Water-speedwell, Redshank, Red Goosefoot, Australian Stonecrop, plus various grasses and pondweeds. On one occasion a dead stick covered in dried silt, hanging just above the water was chosen (10 – centre). Egg-laying was observed no more than 20mm above water, but most often recorded on, or just a couple of millimetres above the waterline. My observations of egg-laying underwater, generally showed only segments 10, 9 and 8 submerged, but occasionally covering up to segment 6, though numerous females, where silt deposits covered the whole abdomen and wings (11), revealed they venture far deeper at times.

10. Egg-laying Scarce Blue-tailed Damselflies, Ryall Court Pits, 2022. Andy Warr.

11. Females covered in sediment after egg-laying, Ryall Court Pits, 2022. Andy Warr.

Male morphology: Emergent to over- mature (See image 12 below).



12. Male Scarce Blue-tailed Damselflies at Ryall Court Pits in 2022. Andy Warr.

(A) Newly emerged with wings not fully expanded. Washed out pale greenish-yellow and the top half of wing veins very pale orange. Already showing the classic pale markings on segments 8, 9 and 10, but coloured greenish-yellow.
(B) Emergent. Similar to (A) but wings fully expanded and orange in wing veins slightly brighter, though not as striking as in female.
(C) Fresh immature. Pale segments on 8, 9 and 10 turning blue, plus sides of thorax beginning to turn pale greenish-blue, though shoulder stripes still yellowish. Pale orange still retained on wing veins, but dark spot on the pterostigma (wing spot) still indistinct
(D) Immature. As (C), but dark pterostigma spot has developed.
(E) Immature. Shoulder stripe and upper half of thorax bluish-green, but still contrasting with the blue tail. No pale orange on wing veins.
(F) & (G) Fresh adults. Upper thorax pretty much blue throughout, so little or no colour contrast with the blue tail. Still a greenish tint in the eye, plus base of thorax.
(H) Mature adult. Blue markings throughout, though some green still present on the lower eye, plus wings dull and worn. A fine sediment may cover the abdomen and wings.

Male behaviour.

Newly emerged males were identical in habitat preference and behaviour to the females, whilst fresh immatures were less selective than females, frequenting both densely vegetated and more open areas in equal numbers. Males became sexually active whilst still immature, patrolling the sparsely vegetated watercourses, or perched on emergent vegetation in search of females and were quite often seen in cop (13). Males are often encountered in densely packed stands of Water-plantain, where females are present and when in cop, occasionally observed in both wet and dry areas of willow carr. Territorial males appeared tolerant of other males on their patch and no aggression was noted against Blue-tailed Damselfly or vice versa.

13. Immature male *in cop* with adult female, Ryall Court Pits, 30.7.22. Andy Warr.

List of Dragonflies and Damselflies recorded at Ryall Court Pits in 2022.

1. Banded Demoiselle *Calopteryx splendens*
2. Emerald Damselfly *Lestes sponsa*
3. Azure Damselfly *Coenagrion puella*
4. Common Blue Damselfly *Enallagma cyathigerum*
5. Scarce Blue-tailed Damselfly *Ischnura pumilio*
6. Blue-tailed Damselfly *Ischnura elegans*
7. Red-eyed Damselfly *Erythromma najas*
8. Small Red-eyed Damselfly *Erythromma viridulum*
9. Migrant Hawker *Aeshna mixta*
10. Emperor Dragonfly *Anax imperator*
11. Four-spotted Chaser *Libellula quadrimaculata*
12. Black-tailed Skimmer *Orthetrum cancellatum*
13. Keeled Skimmer *Orthetrum coerulescens* (1st county record)
14. Common Darter *Sympetrum striolatum*
15. Ruddy Darter *Sympetrum sanguineum*

NOTE: This site is a working sand/gravel pit with no public access. Anyone going there would obviously do so at their own risk.

References

Warr, Andy. 2020. Scarce Blue-tailed Damselfly *Ischnura pumilio* first record for Worcestershire 22nd August 2020. *Worcestershire Record,* 48:26-27,

Images

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