



IDENTIFYING WATER BUGS

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WATER BUGS AND NATURE RESERVE MONITORING

For most of the year, water bugs are a prominent part of the catch when pond-dipping. The 'low point' in the year is in summer, especially July and August, when most species are immature. The young stages, called nymphs, are recognised by their lack of wings, which means the segments of the abdomen are clearly visible from above (or from below, in the case of species which swim upside down!).

With about 50 species in our three counties, the water bugs are diverse enough to tell us a lot about the quality of ponds, ditches and rivers. The best sites will have a rich fauna including scarcer species; poor, polluted sites may have only a handful of common species.

The Nene Valley Survey of invertebrates which we are carrying out this year has concentrated on three groups of species in fresh water - water beetles, water bugs, and pond-snails. All three groups are likely to be useful in monitoring nature reserves in the future. The beetles, with about 270 British species, are likely to be rather more difficult to learn than the other two.

One word of caution - a few species, especially the greater water-boatmen (alias backswimmers) and the saucer-bug, can inflict a very painful wound by injecting digestive enzymes with their beak. The backswimmers can even turn their heads to stab the unwary if they are held carelessly between the fingers.

LITERATURE ON WATER BUGS

Savage, A.A. 1989. *Adults of the British aquatic Hemiptera: Heteroptera*. (FBA Sci. Publ. 50).

The standard modern key. Previous editions by T.T. Macan are quite usable, and occasionally turn up very cheaply second-hand.

Southwood, T.R.E. & Leston, D. 1959. *Land and water bugs of the British Isles*. London: Warne.

The only complete guide to all the bugs, though rather out-of date, it is still very useful for aquatic as well as terrestrial species. Although the original book is long out of print, it is now available both as a CD reproduction and as a facsimile reprint of the book; for details see www.pisces-conservation.com or email pisces@irchouse.demon.co.uk Pisces Conservation Ltd., IRC House, The Square, Pennington, Lymington, Hants SO41 8GN

Kirby, P. 1992. *A review of the scarce and threatened Hemiptera of Great Britain*. Peterborough: Joint Nature Conservation Committee.

A summary of the distribution and biology of the rarest species of bugs in Britain. Includes only a few freshwater species.

Huxley, T. 2003. *Provisional atlas of the British aquatic bugs (Hemiptera, Heteroptera)*. Huntingdon: Biological Records Centre.

Only recently published, an invaluable work, with distribution maps of all species, a clear summary of the habitats of each species, and some helpful hints on identification and field craft.



KEY TO THE COMMONER WATER BUGS OF NORTHANTS, BEDS & CAMBS

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This key includes all the species of water bugs found in the Nene Valley survey, all the other species recorded from modern Northants, and all those found in the Peterborough area except the few species living only in peaty pools and *Sphagnum* moss. About a dozen further species have been recorded, rarely, in Cambridgeshire (a county with rich fenland ditches and mires) and Bedfordshire (heathy areas in the south) - see checklist for details. A few of these additional species are included in the appendix to this key; they have not been included in the key in order to keep it shorter.

All references to illustrations refer to plates in Southwood & Leston (1959) and are in the form "S&L 60 (3,5)" meaning "Southwood & Leston Plate 60 figures 3 and 5". Many of the larger species are instantly recognisable by comparison with pictures.

Most water bugs in the key are identified to species here. A few of the smaller or more closely similar species are taken only as far as a group of 2-4 species. To go further with these, consult a more detailed work such as Savage (1989), or examine the male front leg, the enlarged and flattened last segment of which (the pala) is diagnostic of the species in almost every case (see S&L 62 for illustrations of most species).

- 1 Living on surface of water. Antennae conspicuous, and at least as long as head, easily visible to naked eye. Underside of thorax and abdomen covered in white or silver waterproof hairs. **2**
- 1a Living under water. Antennae tiny, not visible to naked eye. Underside without waterproof hairs. **11**
- 2 Hind femur reaching close to tip of abdomen or exceeding it. Pond-skaters and water-measurers (distinctive overall appearance - S&L 59 (2,6)) **3**
- 2a Hind femur not reaching tip of abdomen. Water-crickets S&L 59 (3,5) **9**
- 3 Head and body extremely long and slender, head at least 4 times as long as wide, with eyes about halfway along it. Legs extremely thin and weak, animal walking delicately. Very distinctive - S&L59 (2) [See key at end for another *Hydrometra* species] **Hydrometra stagnorum**
- 3a Head and body much less slender. Head about as wide as long. Eyes near rear of head, almost touching front of thorax. Legs long, but stronger, animal skating rapidly over surface, and able to 'bounce' around on surface film. Very distinctive - see S&L59 (6). *Gerris etc* (pondskaters) **4**
- 4 Very large, 14-16mm long. 6th abdominal segment with a large thick spine pointing backwards on each side, about as long as length of last abdominal segment. **Aquarius paludum**
- 4a Smaller, 6-12mm long. 6th abdominal segment without a large spine at each side; may have a small point at each side, but no more than ¼ length of segment. **5**
- 5 Middle of thorax with a dull yellow, orange or reddish spot. First 2 or 3 antenna segments yellowish. **6**
- 5a Middle of thorax the same black-brown colour as the rest. Whole of antennae completely black. **7**
- 6 Underside of abdomen with a patch or streak of denser silvery hairs on either side of each segment, conspicuously paler and more shining than the grey hairs all over lower surface. 9-11 mm. **Gerris lateralis**
- 6a Underside of abdomen covered in uniform very short dull grey hair, no lighter spots or streaks. 10-12mm. **Gerris thoracicus**
- 7 Hind tibia and tarsus combined are about 2/3 as long as hind femur. A curved line of silver hairs runs across the rear of the pronotum, around the base of the bulge in the middle. Front femur black except for basal half of underside. 6.5-8mm (usually smaller than other pondskaters). Scarce, often among reeds at side of pools. **Gerris argentatus**
- 7a Hind tibia plus tarsus are as long as hind femur. Femur coloured as above, or with more pale markings. No line of silver hairs on pronotum. **8**

- 8 Front femur pale with two black bands, one on the front running from apex for 2/3 of length, the other on back, from apex to halfway along. No teeth on underside of segment 7 of male abdomen. 8-10mm. *Gerris lacustris*
- 8a Front femur black except for basal half of underside. Male with a pair of teeth on underside of 7th abdominal segment. 7-9mm. *Gerris odontogaster*
- 9 3-3.5mm long. Upper surface pale green, edged with thin black lines. Soft and fragile. Among floating pondweeds and lily-pads. S&L59 (3) *Mesovelia furcata*
- 9a Either larger (6-8mm) or smaller (1.4-2.1mm). Mostly black, with silvery hairs or orange-red spots. 10
- 10 Tiny (1.4-2.1mm when adult) *Microvelia reticulata*
[See table at end of key for other *Microvelia* species.]
- 10a Larger (6-8mm when adult). Often with a pair of orange stripes down abdomen. S&L59 (5) *Velia caprai*
- 11 Hind legs not modified for swimming, not fringed with long hairs, though sometimes with a covering of short or downy hairs. 12
- 11a Hind legs modified for swimming, usually flattened and fringed with long hairs; these sometimes flop over and are stuck to the surface of the leg. 15
- 12 Large (8-35mm when adult), flattened or cylindrical, often dark brown. 13
- 12a Tiny (1.8-2.8mm), without breathing tube. Whitish yellow-grey, rather triangular in cross-section. *Plea leachii*
- 13 17-35mm long when adult. Air-breathing tube at tip of abdomen. Upper surface covered by wings when adult. Front legs modified for grasping prey. 14
- 13a 8-10mm. No air-breathing tube. Wingless. Front legs unmodified. Found on stony river bottoms in moderate-fast flow. S&L60 (5) *Aphelocheirus aestivalis*
- 14 Long, thin and parallel-sided, like a stick-insect. Front legs long and slender but grasping, like a praying-mantis. 30-35mm when adult. Pale fawn. Very distinctive appearance - see S&L60(3). **Water-stick-insect** *Ranatra linearis*
- 14a Flat, oval- to -diamond-shaped. Front legs thickset and curved, like a scorpion's. 17-23mm when adult. Dark brownish. Very distinctive appearance - see S&L60(1). **Water-scorpion** *Nepa cinerea*
- 15 Flattened oval animal, about twice as long as wide, 11-15mm long. Front legs with stout swollen-looking femur and long, curved, pointed second joint, strongly adapted for grasping prey, very different from second legs. Very distinctive appearance - see S&L60(4). **Saucer-bug** *Ilyocoris cimicoides*
- 15a Whole animal more elongate, about 3-4 times as long as wide - water-boatmen, e.g. S&L60 (2), S&L63 (1-4). Front legs with more slender, either cylindrical tarsus ending in a pair of tiny claws, or blunt and flattened at the end, like a boxing-glove, much the same as second pair of legs. 16
- 16 Beak (on underside of head) modified for stabbing prey - long, sharp, jointed, flexible (beware! Will try to stab you while it is being handled). Swim with belly upward and wing-covered back downward. Surface of elytra pale pinkish mottled with brown or (one species) black with 2 creamy streaks. Very distinctive - see S&L63. (Backswimmers, *Notonecta*) 17
- 16a Face tapering to a short, rather blunt-looking beak, with no visible segmentation. Vegetarian. Swims with wing surface upper most. Surface of elytra dark with close-set pale yellowish parallel lines. Distinctive - see S&L60 (2) (Lesser water-boatmen, Corixidae) 20
- 17 Smaller (13-15mm). Front edge of pronotum fitting closely to the back of the head, with a sharp point on either side curving round the back of each eye. Wings largely pale, whitish or pink, with darker marbling along the leading edge and near the tip. S&L63 (1) *Notonecta viridis* (= *N. marmorea*)
- 17a Larger (14-16mm). Front of pronotum straight or wavy, but not hugging eyes closely. Colour variable. 18

- 18** Wings heavily mottled with reddish or dark brown. Upper surface of thorax beneath wings (lever wings up gently with a pin or forceps) orange with a semicircular black spot on either side - see S&L63 (2). *Notonecta maculata*
- 18a** Wings often plain pale pinkish (sometimes mottled or largely blackish). Area of thorax underneath wings all dark. **19**
- 19** Wings pale pink, variably mottled with brown. Very common in all kinds of freshwater habitats. S&L63 (3) *Notonecta glauca*
- 19a** Wings blackish with two long pale cream streaks toward the base. Scarce, confined to acid and peaty waters. S&L63 (4) *Notonecta obliqua*
- 20** Large, 9-13mm long and at least 3.5mm wide. Surface of pronotum smooth and shiny (view with light from a low angle). **21**
- 20a** Smaller, 1.7-9mm long (usually under 8mm) and no more than 3mm wide. Surface of pronotum usually finely wrinkled, transversely or longitudinally; (view with light from a low angle). **25**
- 21** Larger, 12-14mm long. Pronotum with 15-20 pale transverse lines. **22**
- 21a** Smaller, 8-11mm long. Pronotum with 10-14 pale lines. **23**
- 22** Middle tibia with a notch or bay on its hind edge just before it joins the femur. Usually found in small numbers, often mixed with next species. *Corixa dentipes*
- 22a** Middle leg hardly any narrower at the point where it joins the femur. Very common almost everywhere. *Corixa punctata*
- 23** 10-11mm. Dark lines on wings are broader than the pale lines. Surface of pronotum smooth and shiny. *Corixa panzeri*
- 23a** 8-9mm. Pale lines on wings broader than dark lines. Surface of pronotum with fine transverse wrinkles. **24**
- 24** Pronotum with a keel or ridge down the midline from front edge almost or completely to hind edge. 7.5-10mm *Arctocorisa germari*
- 24a** Pronotum without a keel, or with a small oval lump at front edge, or a faint keel extending no more than 1/3 the way from front margin. 8-9mm. *Sigara distincta*
- 25** Pronotum uniform pale brown, not blackish with pale lines. Front tarsi long and slender segments, penultimate with 12 long stout bristles, S&L61 (4). **26**
- 25a** Pronotum blackish with pale transverse lines. Front tarsi flattened or clubbed, S&L61 (5), S&L62. **27**
- 26** 3-4.5mm long. Pronotum 3 times as broad as long. *Cymatia coleoprata*
- 26a** 5.5-6.5mm. Pronotum twice as broad as long. *Cymatia bonsdorffi*
- 27** At least small parts of hind leg darkened, either the last segment (tarsus) or the apex of penultimate part of leg (tibia), or both. e.g. S&L61 (11). **28**
- 27a** Hind leg entirely pale (beware: the dark swimming hairs which fringe the leg may lie over the leg, and sometimes become matted). **29**
- [3 CHOICES]**
- 28a** 5-6.5mm long. Last segment of hind leg (tarsus) entirely dark, rest of leg entirely pale. *Sigara lateralis*
- 28b** 6-7.5mm long. Last segment of hind leg (tarsus) with a small dark patch at its base. Previous segment (tibia) with a small dark mark at its apex, on the hind side only. *Sigara concinna*
- 28c** 7-8mm. Last segment of hind leg entirely pale. Previous segment with whole of its apex dark for about ¼ its total length, S&L61 (11). *Callicorixa praeusta*

- 29 Pale transverse lines across wings continuous, S&L61 (7). Male palp rather square-ended, S&L62 (3, 4). On underside of thorax, small triangular plate pointing backwards from bases of middle legs is long, pointed and narrow, distinctly longer than its width at its base. 30
- 29a Pale lines across wings broken, so there are 2-3 irregular dark bands running longitudinally, S&L61 (6). Male palps with upper edge smoothly curved from end. On underside, small triangular plate pointing backwards from bases of middle legs is shorter and more blunt, about as long as its width at its base, or shorter. 32
- 30 Larger, 7-9mm. Dark parts of pronotum and wings almost black, strongly contrasting with pale transverse stripes. 31
- 30a Smaller, 5.5-6mm. Dark parts of pronotum and wings brownish and less contrasting with pale stripes. *Hesperocorixa moesta*
- 31 Pronotum with 6 pale stripes and with pale edges. 7-8mm. *Hesperocorixa linnaei*
- 31a Pronotum with 7-9 pale stripes, and with dark edges. 7-9mm. *Hesperocorixa sahlbergi*
- 32 Larger, 7.5-10mm. Go back to 24
- 32a Smaller, 5-8mm. 33
[Few individuals will actually fall in overlap of sizes - if they do, try both ways]
- 33 Wings smooth and shiny. 6-6.5mm long. *Sigara stagnalis*
- 33a Wings finely wrinkled (view with light from a low angle). 34
- [3 CHOICES]**
- 34a Above 6.5mm long, no scutellum visible (small triangular plate between wings at their bases) *Sigara falleni, Sigara dorsalis, Sigara striata*
[These 3 species are difficult to distinguish - see books for details]
- 34b Medium size, 5-6.8mm, no scutellum visible. 35
- 34c Tiny, 2-2.5mm. Scutellum visible. *Micronecta scholtzi*
[Note: there are three other species recorded from Bedfordshire. They are difficult to distinguish, but are 1.7-2.2mm long: check other books for details of *M. minutissima*, *M. poweri* and *M. griseola*]
- 35 Pronotum with 4-6 pale lines. Dark markings on wings are more extensive than pale. 5.5-6.8mm. *Sigara fossarum*
- 35a Pronotum with more than 6 pale lines. Dark and pale markings on wings roughly equal in extent. 5-6.5mm. *Sigara nigrolineata*
[Note: two other species, *Sigara limitata* and *Sigara scotti*, are recorded from Bedfordshire and Huntingdonshire respectively.]

APPENDIX: SPECIES NOT YET SEEN IN NORTHANTS

In the following accounts, the currently known species are compared with potential additions to the county list.

Hydrometra species

Larger, 9-12mm long when adult, blackish brown. Upper surface dull. Last 2 segments of male abdomen with a small tooth at either side, that on 6th segment larger than that on 7th. Common and widespread at water margins.

Hydrometra stagnorum

Smaller, 7-9mm long when adult, reddish-brown. Upper surface rather glossy. Only 6th abdominal segment of male with a small tooth at either side. Very rare species found in shady parts of fens and fen-ditches in East Anglia (not yet seen in Beds, Cambs or Northants).

Hydrometra gracilentia

Identifying rarer *Microvelia* species (see Savage, not S&L, for illustrations)

	<i>Microvelia reticulata</i>	<i>Microvelia pygmaea</i>	<i>Microvelia buenoi</i>
<i>Fully winged:</i>	5 or so pale patches on wings, the central patch in form of a curved hook. Sides of pronotum pointed.	6 or so small pale patches but no hook-like whitish patch. Sides of pronotum bluntly squared off.	2 or 3 large oval pale patches but no hook-like patch. Sides of pronotum rounded.
<i>Wingless:</i>	A pair of short white transverse stripes of short hairs across the pronotum near the front, one on either side of midline. The segment at rear of pronotum a single simply-curved strip, curving forward at sides and backward in middle.	A pair of short white transverse stripes of short hairs across the pronotum near the front, one on either side of midline. Pronotum curves back over next segment, so at rear of pronotum, a blunt triangular flap projects at either outer corner, but nothing in middle.	A single streak of white hairs on midline near front of thorax. Segment behind pronotum in shape of a pair of curves, with a forward curve on the midline and backward on either side, moustache-like.