

**THE IDENTIFICATION OF BRITISH ADULT SPECIMENS OF  
*SIGARA LATERALIS* (LEACH), *SIGARA CONCINNA* (FIEBER),  
*CALLICORIXA PRAEUSTA* (FIEBER) AND  
*CALLICORIXA WOLLASTONI* (DOUGLAS & SCOTT) (HEMIPTERA  
HETEROPTERA: CORIXIDAE)**

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### **Introduction**

The four species named in the title of this article all have dark, virtually black, markings on the tarsi and/or claws of the posterior legs. Indeed, typical specimens are most easily identified by the different positions and shapes of these markings which, therefore, have been used as diagnostic features in keys to Corixidae (Saunders 1892; Butler 1923; Macan 1939, 1956, 1965; Southwood & Leston 1959; Savage 1989, 1990). However, it has long been recognised that specimens with atypical markings are sometimes found which, together with newly emerged (teneral) adults, increase the difficulty of accurate identification. In general, the dark markings on mature adults have totally reliable diagnostic features only in *S. lateralis*. The other three species, *S. concinna*, *C. wollastoni* and *C. praeusta*, form an increasingly variable series with the possibility of overlap between all three species. Furthermore, a degree of variation in the perception of a species in the genus *Callicorixa* has exacerbated the problems of identification.

The aim of this communication is to briefly review nomenclature in the genus *Callicorixa*, describe the variation in the dark markings on the posterior legs of all four species, describe alternative diagnostic features, and provide a key to identification based on these alternative features. Attention is also drawn to a small error in the published key to families (Savage 1989) (see the erratum at the end of this article).

### **Nomenclature in the genus *Callicorixa***

As mentioned above, the problems of identification have been exacerbated by taxonomic confusion concerning the status of *C. praeusta* and *C. wollastoni*, itself a reflection of their morphological variation. In an attempt to avoid further confusion the presently accepted generic name, *Callicorixa*, is used in the first part of this account irrespective of generic names used in the original descriptions of the different species.

Saunders (1892) regarded *C. wollastoni* and *C. socia* as varieties of *C.*

*praeusta* but then described three additional species, viz. *C. sodalis*, *C. cognata* and *C. boldi*, although he was suspicious of the status of the last one. Butler (1923) retained these species with the addition of another, *C. caledonica*. China (1938) reviewed the nomenclature of British Corixidae and markedly simplified the taxonomic relationships by retaining just two species, *C. praeusta* and *C. wollastoni*, with *C. caledonica* as a variety of the latter. He also listed *C. socio*, unaccountably omitted by Butler (1923), as a synonym of *C. praeusta*, together with *C. sodalis* and *C. boldi*. This nomenclature was adopted by Macan (1939) after personal consultation with China. Walton (1942, 1943) reinstated *C. caledonica* as a sub-species of *C. wollastoni* but this opinion was rejected in later keys by Macan (1956, 1965) and Southwood & Leston (1959), who retained it only as a variety.

Jansson (1986) retained only two species, *C. praeusta* and *C. wollastoni*. This opinion was followed by Savage (1989, 1990) after examining more than 1000 individuals of *C. wollastoni*. The variety *caledonica* is still retained in some lists of species but it is our opinion that it should be deleted forthwith.

The above account may be summarised, after Jansson (1986), thus:

- Callicorixa praeusta praeusta* (Fieber)
- = *Corixa Boldi* Douglas & Scott, 1870
- = *Corixa socio* Douglas & Scott, 1870
- = *Corixa sodalis* Douglas & Scott, 1870
- Callicorixa wollastoni* (Douglas & Scott)
- Corixa Wollastoni* Douglas & Scott, 1865
- = *Corixa cognata* Douglas & Scott, 1870
- = *Corixa caledonica* Kirkaldy, 1897.

Further details may be found in Jansson (1986).

### **Variation in dark markings on the posterior tarsus and claw**

*S. lateralis* may be recognised by the totally black claw in mature adults irrespective of any markings on the tarsus (Fig. 1, It 1-3). In teneral specimens the claw is always more darkly infuscated than the tarsus. The typical markings of *S. concinna* and *C. praeusta* are found in the vast majority of specimens (Fig. 1, en 1; pr 1). However, *C. wollastoni* shows considerable variation in markings of which two are more common than others (Fig. 1, wl 1, 4). We have found that specimens from the more southerly part of the geographical range show greater variation (Fig. 1, wl 2, 3, 5). Inspection of Fig. 1 shows that similar markings may occur in *S. concinna*, *C. praeusta* and *C. wollastoni* (Fig. 1, en 2; pr 5, 6; wl 4, 5 or pr 4; wl 2, 3 or pr 3; wl 1). Thus, these three species cannot be separated on markings alone. In particular, teneral specimens of *C. praeusta*, with partly developed markings, are often similar to either *S. concinna* or *C. wollastoni*.

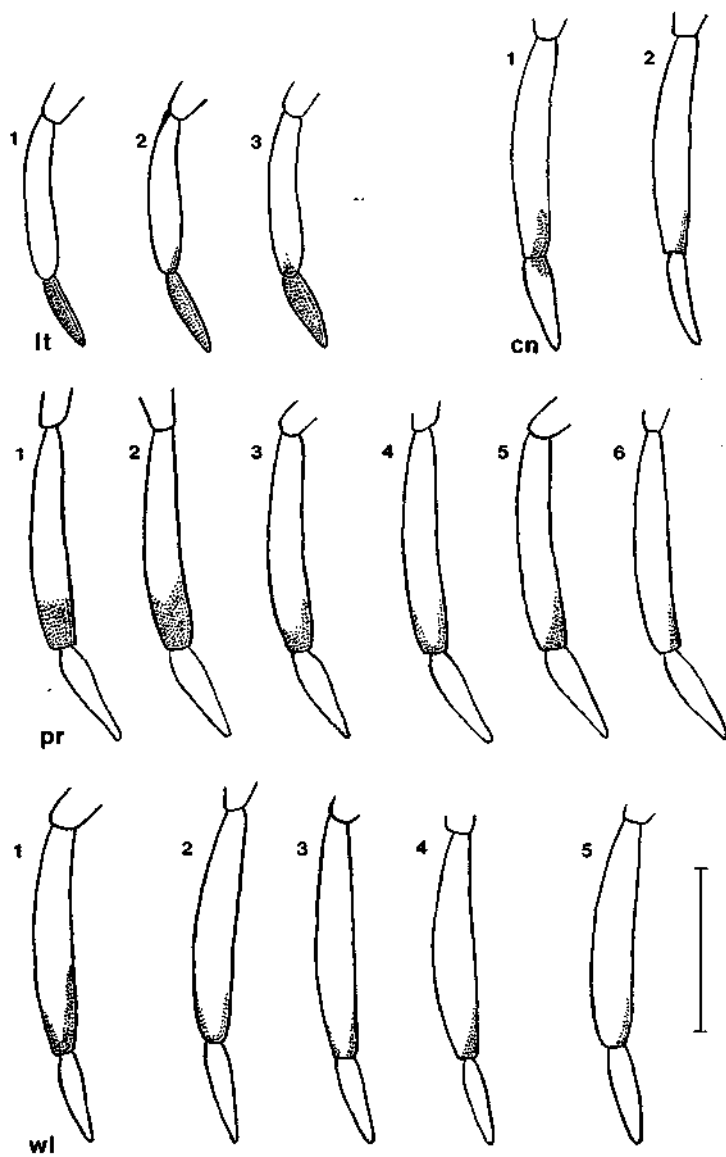


FIG. 1. Posterior tarsi and claws of lt 1-3, *S. lateralis*; cn 1-2, *S. concinna*; pr 1-6, *C. praeusta*; wl 1-5, *C. wollastoni*. (Scale line 1 mm).

### Diagnostic features used in the key

Males may be identified by the arrangement of the paler pegs alone (Fig. 2) except in the very few deformed specimens we have seen. The right parameres of the genitalia provide further evidence except where they are too closely similar, as in *C. praeusta* and *C. wollastoni* (Fig. 2 pr, wl). However, the number and position of hairs on the posterior margins of the middle femora enables ready separation of the last two species (Fig. 4). Similarly, the form of the depressions on the anterior surface of the head enables separation of *S. lateralis* and *S. concinna*.

Females may be most easily separated by differences in the patterns on the hemelytra (Fig. 3). However, this method is less reliable than the criteria given for males, owing to similarities between *C. praeusta* and *C. wollastoni* where the patterns on the proximal margin of the membrane may be very similar. Females of *C. praeusta* and *C. wollastoni* may be more reliably separated by the number of hairs and length of spines on the posterior margins of the middle femora (Fig. 5). These latter differences are clearly defined in specimens we have examined but are less obvious than in males.

### A diagnostic feature not used in the key

*S. lateralis* and *S. concinna* may be separated from each other and from *C. praeusta* and *C. wollastoni* together by the degree of wrinkling of the corium of the hemelytron. If the corium of a dry specimen is used as a mirror to reflect light up a binocular microscope at magnification x40, it appears smooth in *S. lateralis*, slightly wrinkled in *S. concinna* and markedly wrinkled in the remaining two species.

### Key to separate two species of *Sigara* and two of *Callicorixa*

Couplet 1 of the key below is an alternative for couplet 11 of the key to Family Corixidae given on page 76 of the FBA key to adults, by Savage (1989). After separation of males and females in couplet 2, our new key separates the four species considered here in couplets 3 to 8. These provide an alternative to couplets 32 to 34 on page 108 of Savage (1989). We would be pleased to receive comments from users of the new key.

- |   |   |                 |
|---|---|-----------------|
| 1 | Posterior tarsus and claw clear*—   | Other Corixidae |
| — | Posterior tarsus and/or claw* with dark (black) markings or at least some infuscation of these parts (brownish) so that they appear darker than the proximal part of the tarsus (Fig. 1)— | 2               |

\* The posterior leg should be viewed by transmitted light at magnification x20 and the long hairs totally brushed away to each side.

- 2 Males\* 3
- Females\* 6  
 \* Males and females may be separated by reference to pages 68–69 of Savage (1989).
- 3 One row of palar pegs (Fig. 2, cn, lt)†; right paramere rounded or truncate distally (Fig. 2, cn, lt); corial markings irregular (Fig. 3, lt, cn)— 4
- Two rows of palar pegs (Fig. 2, pr, wl)†; right paramere pointed distally (Fig. 2, pr, wl); corial markings rather regularly transverse (Fig. 3, pr, wl)— 5  
 † The palar pegs and right parameres should be examined at magnification x40. Corial markings on the hemielytra should be viewed by transmitted light after being deflected to one side.
- 4 Palar pegs forming a sharp curve distally (Fig. 2, cn); right paramere truncate distally (Fig. 2, cn); dark areas of hemielytron *more* extensive than light areas (Fig. 3, cn); depression on anterior surface of head rather rectangular and shallow.  
 Length 6.0–7.5 mm— **Sigara concinna** (Fieber)
- Palar pegs forming an almost straight line (Fig. 2, lt); right paramere rounded distally (Fig. 2, lt); dark areas of hemielytron *less* extensive than light areas (Fig. 3, lt); depression on anterior surface of head oval and deep.  
 Length 5.0–6.0 mm— **Sigara lateralis** (Leach)
- 5 Pala with a central constriction on dorsal margin (Fig. 2, pr); middle femur‡ with a row of fine long hairs only on distal posterior margin (Fig. 4, pr); markings on membrane of hemielytron distinct (Fig. 3, pr).  
 Length 7.0–8.0 mm— **Callicorixa praeusta** (Fieber)
- Pala without a constriction (Fig. 2, wl); middle femur‡ with a row of coarse long hairs along virtually the whole length of the posterior margin (Fig. 4, wl); markings at proximal margin of membrane of hemielytron showing little contrast between light and dark areas (Fig. 3, wl).  
 Length 6.0–8.0 mm— **Callicorixa wollastoni** (Douglas & Scott)  
 ‡ A middle leg should be removed for examination of the femur. It should be placed on a slide in water or ethanol, illuminated from one side, and rotated until the hairs catch the light at magnification x40. Note that the hairs may have fallen away in dried or mounted specimens.

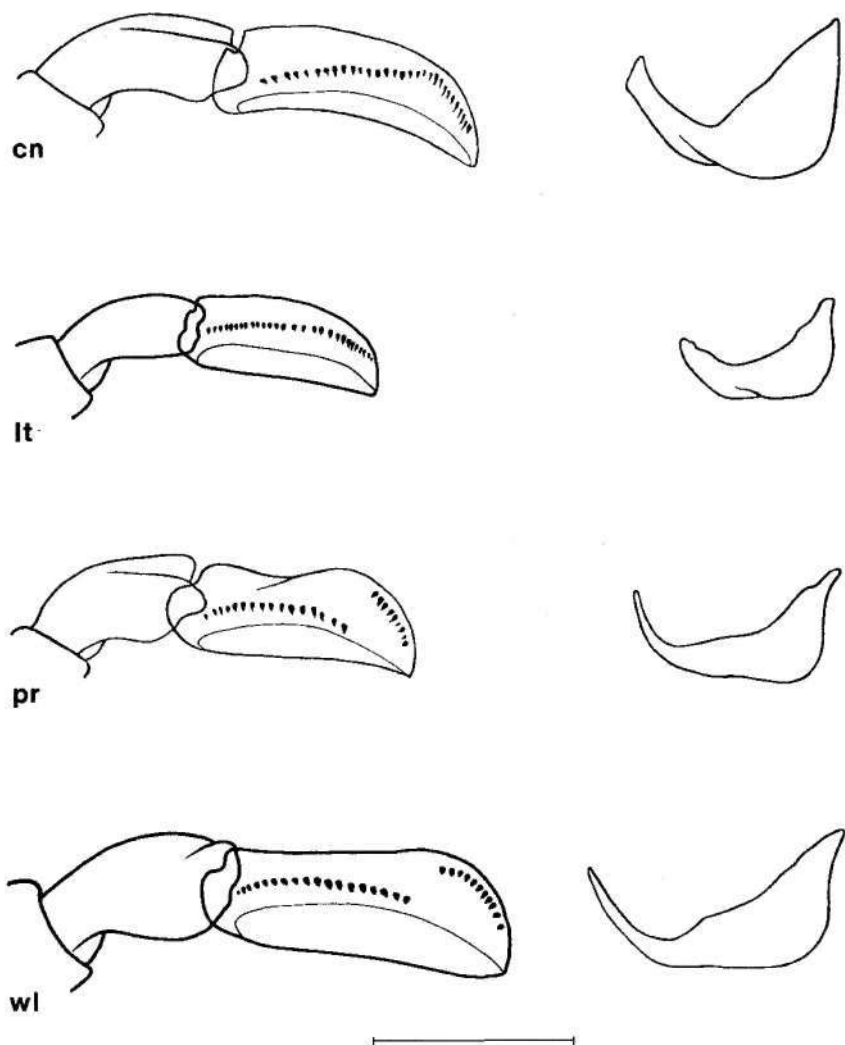


FIG. 2. Pala and right paramere of male *cn*, *S. concinna*; *lt*, *S. lateralis*; *pr* *C. praeusta*; *wl* *C. wollastoni*. (Scale line 0.5 mm). Reproduced, with permission, from Savage (1989).

- 6 Corial markingsf irregular (Fig. 3, lt, cn)— 7  
 — Corial markings† rather regularly transverse (Fig. 3, pr wl)— 8  
 † See note to couplet 3.

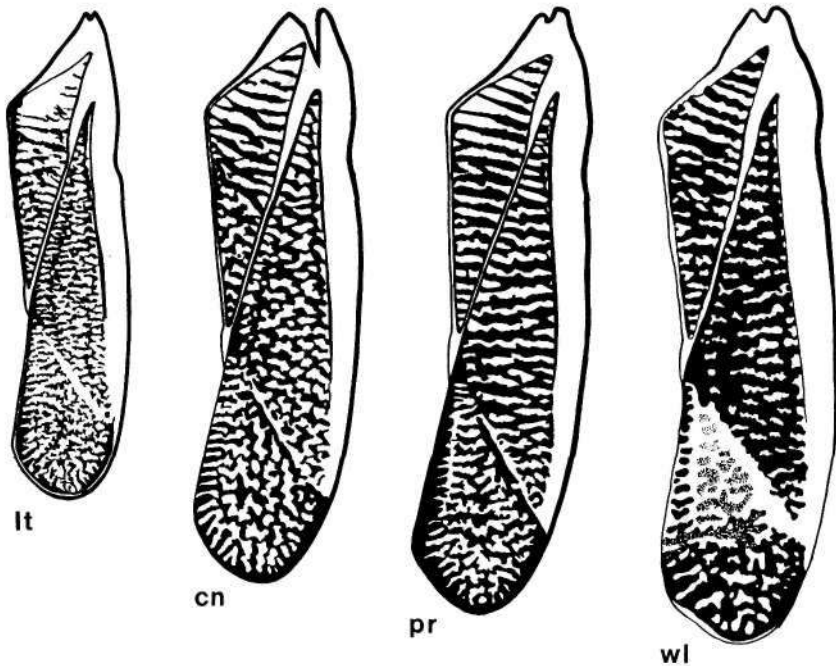


FIG. 3. Hemelytron of lt, *S. concinna*; *S. lateralis*; cn, *C. concinna*; pr, *C. praeusta*; wl *C. wollastoni*. (Scale line 1 mm). Reproduced, with permission, from Savage (1989).

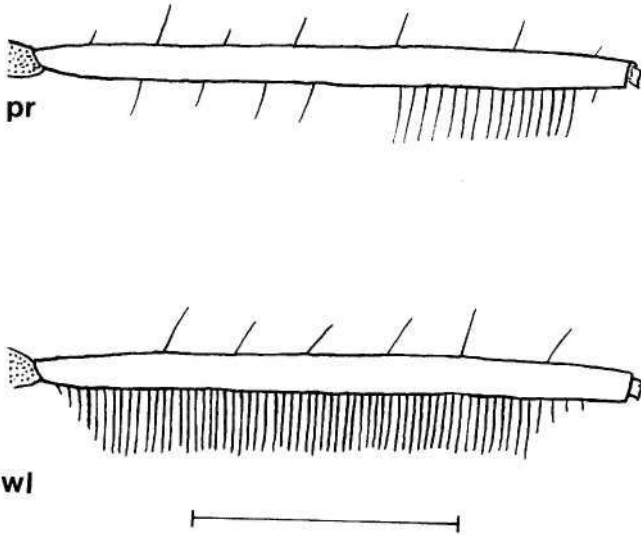


FIG. 4. Femur of middle leg of male of pr, *C. praeusta*; wl, *C. wollastoni*. The spines are omitted. (Scale line 1mm).

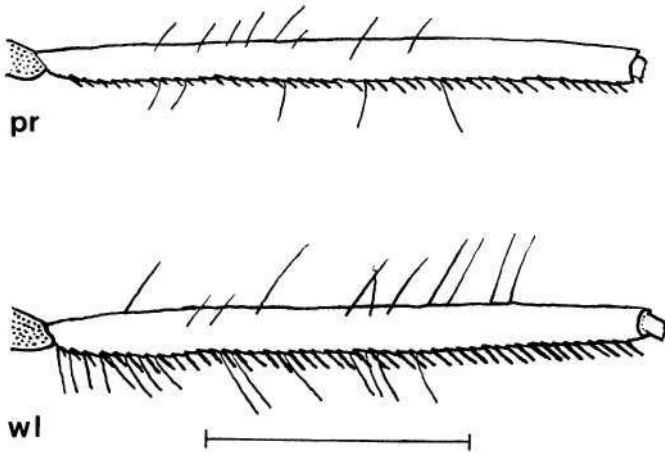


FIG. 5. Femur of middle leg of female of pr, *C. praeusta*; wl, *C. wollastoni*. Only one row of spines is shown. (Scale line 1mm).



- 7 Dark areas of hemielytron *more* extensive than light areas (Fig. 3, en).  
Length 6.0-7.5 mm— **Sigara concinna** (Fieber)
- Dark areas of hemielytron *less* extensive than light areas (Fig. 3, It).  
Length 5.3-6.0 mm— **Sigara lateralis** (Leach)
- 8 Markings on membrane of hemielytron distinct (Fig. 3, pr); middle femur\*  
with rows of posterior spines which, distally, reach up to one-third of its  
width and up to 10 long hairs wider than the femur (Fig. 5, pr).  
Length 7.0-8.0 mm— **Callicorixa praeusta** (Fieber)
- Markings at proximal margin of membrane of hemielytron showing little  
contrast between light and dark areas (Fig. 3, wl); middle femur†with  
rows of posterior spines which, distally, reach to almost one half of its  
width and more than 20 long hairs wider than the femur (Fig. 5, wl).  
Length 6.0-8.0 mm— **Callicorixa wollastoni** (Douglas & Scott)  
X See note to couplet 5.

### Acknowledgements

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**Erratum for FBA Scientific Publication 50:-**

**Adults of the British Aquatic Hemiptera Heteroptera: a key with ecological notes, by A. A. Savage**

In the key to families on page 26, there is a small error in the second half of couplet 10(8) where the second word, "wider", should be replaced by "narrower". This part of the couplet should then read as follows.

- Pronotum narrower anteriorly than posteriorly in dorsal view and, together with the hemelytra, smooth (figs 12N, 28); tarsi two-segmented. Length 13.0-16.0 mm— NOTONECTIDAE, p. 54

The correct shape of the pronotum is clearly visible in the text-figures and users of the key are unlikely to have misidentified specimens, especially as the notonectids (backswimmers or water-boatmen) are a distinctive group of waterbugs.