

Platycheirus splendidus sp. n. from Britain formerly confused with *Platycheirus scutatus* (Diptera: Syrphidae)

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In June 1984 eight syrphid larvae were collected from leaf-curl galls of *Schizoneura ulmi* (L.) aphids (Homoptera: Aphididae) on Wych Elm, *Ulmus glabra* L. (Ulmaceae), at Corstorphine Hill, Edinburgh, Scotland. They resembled the larva of *Platycheirus scutatus* (Meigen) (Dixon, 1960; Rotheray, 1993) but, unlike *P. scutatus*, went into diapause when feeding ended. Puparia were formed in April of the following year and had distinctive black markings on the dorsal surface. Only one male and one female emerged from these puparia but they differed from *P. scutatus* in being smaller, darker and had a different facial dusting pattern.

In June and July 1985 more larvae were collected from aphid galls on *U. glabra* which also entered diapause after feeding and had similar dark markings on the puparia. On comparing adults of this material with those of *P. scutatus*, it became clear that an unrecognised species was confused with *P. scutatus*. The adult, puparium and larva of this new species are described here.

Platycheirus splendidus sp. n.

MATERIAL EXAMINED

Holotype ♂, Scotland: Midlothian, Edinburgh, Corstorphine Hill (NT 2074), bred ex *Schizoneura ulmi* aphid gall on *Ulmus glabra* collected 2.vii.1985, emerged 29.vi.1986. Deposited in the National Museums of Scotland, Edinburgh.

Paratypes. Scotland: 7♂, 8♀, Midlothian, Edinburgh, Corstorphine Hill, all bred ex *S. ulmi* aphid galls on *U. glabra*, 1♂, 1♀ collected 11–21.vi.1984, emerged 16–20.v.1985, rest collected 2.vii.1985, emerged 25.iv–5.v.1986; 10♂, 6♀, Midlothian, Crichton Glen, all bred ex *S. ulmi* aphid galls on *U. glabra*, collected 3.vii.1985, emerged 25.iv.–5.v.1986; 4♂, 2♀, Midlothian, Newbattle Abbey, bred ex *S. ulmi* aphid galls on *U. glabra*, collected 5.vi.–3.vii.1985, emerged v.–vi.1986; 1♂, Midlothian, Edinburgh, Princes Street Gardens, bred ex *S. ulmi* aphid gall on *U. glabra*, collected 12.vii.1985, emerged 25–28.iv.1986; 6♂, 3♀, Perthshire, Dunkeld, The Hermitage, all bred ex *Brachycaudus* sp. aphids on *Silene dioica*, collected 7.vi.1986, emerged iv.–v.1987; 8♀, Perthshire, Ballinluig, banks of R. Tay, ovipositing near *S. ulmi* aphid galls on *U. glabra*, collected 7.vi.1986. All paratypes in the National Museums of Scotland.

Material excluded from type-series. Scotland: single ♂ as follows – Midlothian, Musselburgh, 27.vi.1907; East Lothian, Port Seton, 10.v.1920; Perthshire, Blairgowrie, 25.v.1911; Midlothian, Edinburgh, 2.vi.1932; Kirkcudbrightshire, Rigghead Wood, 12.v.1982; Argyll, Tainish NNR, 4.vii.1987; 2♂, Perthshire, Dunkeld, The Hermitage, 6.vi.1986, all the above males in the National Museums of Scotland; Midlothian, Milton Bridge, 16.iv.1945, Oxford Museum of Natural History (OMNH). England: Worcestershire, Malvern, 25.v.1901, The Natural History Museum, London (BMNH); Suffolk, Mildenhall, 18.v.1909 (OMNH); Oxford, University Parks, 24.v.1926 (OMNH); Oxfordshire, Bagley Wood, 14.iv.1927 (BMNH); Oxford, University Parks, 3.vi.1931 (OMNH); Hampshire, Pornholt Wood, 12.vi.1932 (OMNH); Oxfordshire, Bagley Wood, 22.v.1933 (OMNH); Cornwall, Carbis Bay, 30.iv.1934 (BMNH); Buckinghamshire, Slough, 18.iv.1936 (BMNH); Somerset, Edington, 30.iv.1942, 6.v.1944 (BMNH); Cheshire, Cotterill Clough, 12.iv.1945, University Museum,

Manchester (UMM); Yorkshire, Spurn, 19.vi.1951 (UMM); Cheshire, Wallasey, 4.vi.1963, National Museums on Merseyside; Salop, Whixhall Moss, 22.v.1927, 19.iv.1957 (UMM).

Candidate names rejected. Peck (1988) cites three nominal taxa as synonymous with *P. scutatus* Meigen. The type material of two of these has been examined. The type not seen is that of *quadratus* Macquart, 1829, which, according to Verrall (1901), is a female of *peltatus* Meigen, 1822. In 1838 Meigen introduced the name *sexnotatus* and the lectotype has been examined. Frey (1907) introduced the name *pygmaeus* for a dwarf variety of *scutatus* Meigen. The type specimen of this name was also studied. Neither of these specimens bear characters identifying them as belonging to the material reared from *S. ulmi* galls and these names are consequently rejected.

Etymology. The name *splendidus* is introduced for this new *Platycheirus* species on account of its distinctive shiny face, lacking dusting over and round the facial knob (Figs 4a, c).

Description

Male. Length (tip of frons to tip of abdomen) 6.8–8.3 mm.

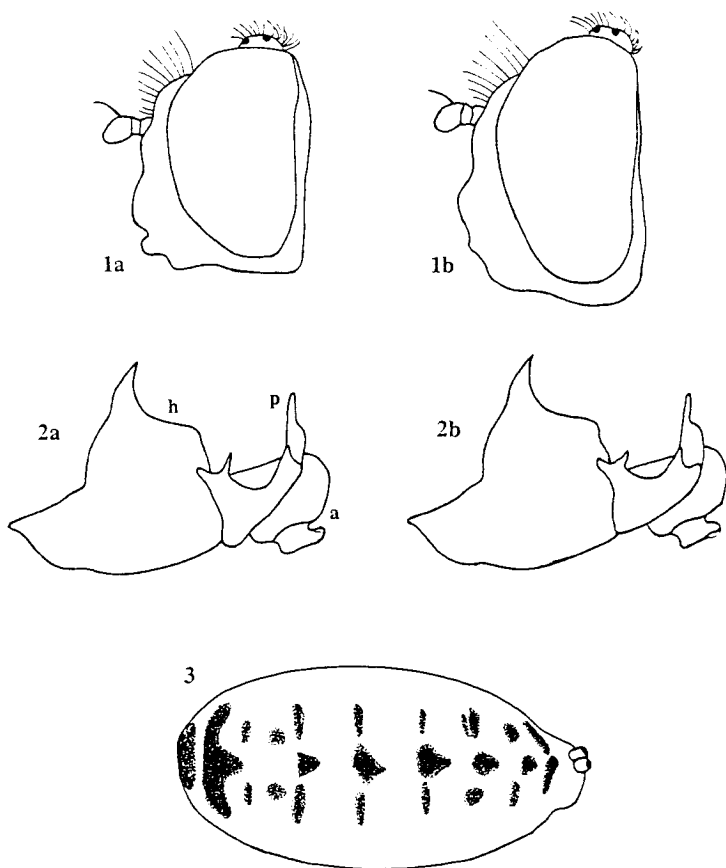
Head. About as broad as length of thorax; eyes bare, joined for a distance equal to that from edge of front ocellus to occiput; angle of approximation of eyes about 100°; face about half as broad as head; frons inflated, dark metallic green, with black erect hairs; facial knob projecting as far as or just beyond upper mouth-edge; upper mouth-edge protruding (Fig. 1a); cheeks with mostly black hairs and sparsely covered with whitish and yellowish dusting so that the black ground colour is obvious; centre of face, including facial knob, with a shining black stripe which is more than one-third as broad as face viewed from above (Fig. 4a); antennae with yellow markings on segments 2 and 3, otherwise black; arista with short inconspicuous hairs at high magnification ($\times 30$).

Thorax. Mesonotum and scutellum moderately shiny greenish black, except for anterior margin of mesonotum which is covered with yellowish gold hairs; wing membrane covered with microtrichia except for a narrow, clear stripe in basal half of 2nd basal cell; halteres yellowish.

Legs. Fore tarsus whitish yellow; first tarsal segment about $5 \times$ as long as second segment; fore tibia dilated just before tip with a tuft of tangled black hairs on lateral margin; anterior surface of fore femur black, otherwise mostly yellow with two clumps of blackish hairs and a clump of whitish hairs at extreme base; fore trochanter with a margin of short, stiff yellow hairs; mid trochanter with a pair of pellucid projections; mid tibia and femur mostly yellow, sometimes with faint black margins, indented medially with an anterior fringe of hairs and a slightly bulbous tip; mid leg with tibia and femur yellow at base and tip, otherwise black; tibia with an anterior fringe of hairs.

Abdomen. Dull black with pale yellow lateral pubescence which becomes shorter towards tip of abdomen; 2nd tergite with a pair of small yellow ovoid spots; 3rd and 4th tergites with rectangular yellow markings close to anterior margin of each tergite but not reaching side margins; 5th tergite with a pair of indistinct yellowish spots; sternites with bronzy reflections.

Genitalia. Surstylus with one long and one short section coated in setae; aedeagus round-tipped with a fringe of ventral setae; paramere with narrow elongate section tapering at tip, a narrow basal projection longer than basally broad and ventrally a narrow basal section (Fig. 2a).



Figs 1-3. *Platycheirus* species. 1a, *P. splendidus*, holotype ♂, head, lateral view; 1b, *P. scutatus* ♂, head, lateral view; 2a, *P. splendidus*, holotype ♂, genitalia, lateral view, h = hypandrium, p = paramere, a = aedeagus; 2b, *P. scutatus* ♂, genitalia; 3, *P. splendidus*, holotype ♂, puparium, dorsal view.

Female. Length (tip of frons to tip of abdomen) 6.2–7.8 mm.

Head. Not as broad as thorax is long; eyes bare; frons glittering black with a pair of broad dust spots across two-thirds of the frons; facial knob projecting as far as or just beyond upper mouth-edge; cheeks with yellow hairs and sparsely covered with mostly yellowish dusting so that black ground colour is obvious; facial knob with a shiny black stripe which is more than one-third length of face (Fig. 4c); antennae with yellow markings on segments 2 and 3, otherwise black.

Thorax. Mesonotum and scutellum moderately shiny greenish black, covered with pale yellow hairs; wing membrane coated in microtrichia except basal cells; halteres yellow.

Legs. All coxae greyish and dusted; all tarsi blackish; fore- and mid trochanters, tibiae and femura yellow, sometimes with indistinct dark markings; hind leg with tibia and femur yellow at base and tip, otherwise black; fore femur with a long pale bristle at extreme base.

Abdomen. Moderately shiny black with pale yellow lateral pubescence becoming shorter towards tip of abdomen; 2nd tergite with a pair of yellow ovoid spots; 3rd and 4th tergites with rectangular yellow markings close to anterior margin of each tergite but not reaching side margin; sternites with bronzy reflections.

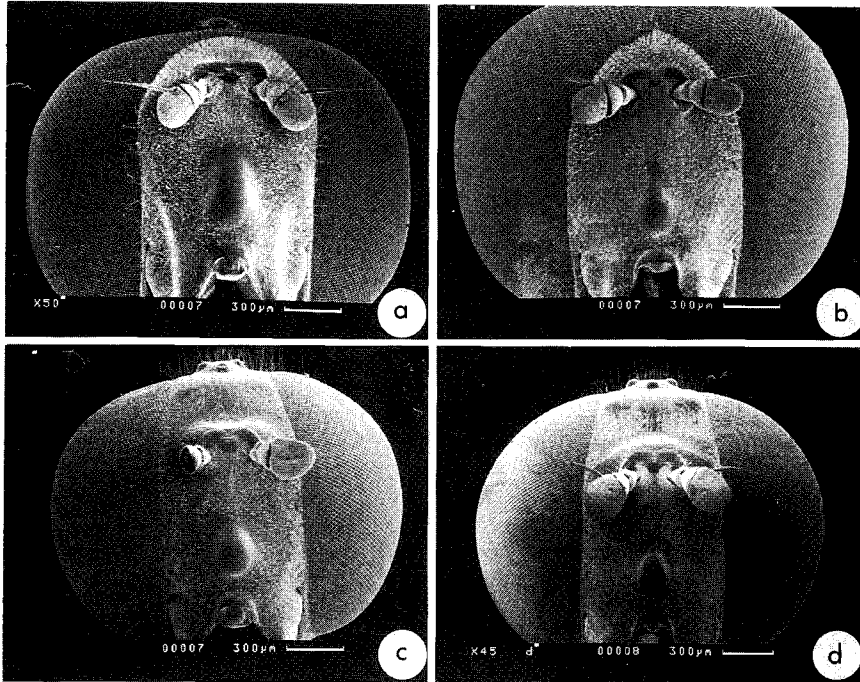
Puparium. Dorsal margin dome-shaped in profile; pale brown with medio-dorsal black markings (Fig. 3); these markings sometimes pale and restricted to anterior part of puparium only.

Third stage larva. Length 7–9 mm; breadth 2 mm; height 1.5 mm; subrectangular in cross-section; tapering anteriorly, truncate posteriorly; outline smooth from above; end segment dorso-ventrally flattened with one medial and one lateral pair of locomotory lobes; dorsal vestiture of dome-shaped papillae; ventral surface smooth, almost clear of vestiture; larva green with whitish triangular markings in the dorsal field and flecked white; larva turning mottled white, brown and pink during diapause; posterior respiratory process broader than long, brown and shiny, patchily nodulate; spiracular plates level, pale, turning black on pupariation and separated by a groove; three equally spaced spiracular openings.

Comparison with *P. scutatus*

Platycheirus splendidus is most similar to *P. scutatus* and it will run to that species in keys such as that of Stubbs & Falk (1983). Both the males and females can be distinguished from *P. scutatus* by the following combination of characters: underside of pro- and mesothoracic pairs of legs usually yellow in *P. splendidus* but black or extensively black in *P. scutatus*; face shiny with medial stripe broader than central knob (Fig. 4). Additional characters which separate males are: upper mouth-edge more produced in *P. splendidus* than in *P. scutatus* (Figs 1a, b); paramere with longer than broad basal projection (Fig. 2a), this projection about as long as broad in *P. scutatus* (Fig. 2b). Puparia can be distinguished by dark markings which are usually present on the dorsal surface only in *P. splendidus* (Fig. 3). No consistent morphological characters have been found to separate third stage larvae.

Biological differences include the univoltinism of *P. splendidus* compared with the bi- or trivoltinism of *P. scutatus*. In southern Britain *P. scutatus* has two or sometimes three generations per annum with a flight period from May to October (Pollard, 1971; Rotheray, 1979). Capture dates of *P. scutatus* in Scotland suggest a similarly long flight period (10 May to 6 October: n = 107). However, capture dates of *P. splendidus* reveal a much shorter flight period, from 12 April to 4 July. Furthermore, larvae of *P. scutatus* collected May–June, both in Scotland and southern Britain, always pupated and emerged in July: none entered diapause (n = 93). However, no larvae of *P. splendidus* collected in May and June pupated. They all entered diapause and emerged in April or May of the following year (n = 49).



Figs 4a-b. *Platycleirus* species. Anterior view of heads of (a) *P. splendidus* ♂; (b) *P. scutatus* ♂; (c) *P. splendidus* ♀; (d) *P. scutatus* ♀.

Moreover, *P. splendidus* is unusual for including in its range of prey an arboreal aphid, *S. ulmi*. Most other *Platycleirus* species breed in the herb layer on non-arboreal prey (Rotheray & Gilbert, 1989). It was noticeable, however, that *P. splendidus* larvae were only found in shaded galls low down on trees, usually below 1.5 m, although galls occurred as high as 5 m. Chandler (1968) showed that the female of *P. scutatus* usually oviposits below 30 cm. Possibly *P. splendidus* has a similar but higher preference for oviposition. It was also noticeable that *P. scutatus* larvae were not found in galls of this aphid, despite their occurrence in the surrounding herb layer at several sites in Midlothian and Perthshire. There is, however, some overlap in prey ranges. For example larvae of both species have been found attacking *Brachycaudus* aphids on *Silene dioica* (L.) Clairv. in Perthshire.

Discussion

In Britain the range of *Platycleirus splendidus* extends from Cornwall to Perthshire, but the species appears to be more common in the north. It is probable that it shares a common ancestor with *P. scutatus* and may have

diverged in the north where features such as dark coloration, univoltinism and ability to utilise a common spring species of aphid outside the apparent range of *P. scutatus* may underlie such a speciation event. Another spring-flying, univoltine and relatively dark syrphid is *Platycheirus (Pachysphyria) ambiguus* (Fallén). This species is also exceptional among *Platycheirus* for its choice of prey which are arboreal aphids on *Prunus* and *Malus* (Dušek & Láška, 1959; Láška & Starý, 1980). Other syrphids also exist that are spring-flying, univoltine and dark in colour compared with other species in the same genus, such as *Epistrophe eligans* (Harris) and *Melangyna quadrimaculata* (Verrall). The existence of these characteristics in several unrelated species suggests a shared mode of speciation.

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