

The species of the *Platycheirus scutatus* (Meigen) complex in central Europe, with description of *Platycheirus speighti* spec. nov. from the Alps (Diptera, Syrphidae)

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The *Platycheirus scutatus* complex is represented in central Europe by four species: *Platycheirus scutatus*, *P. aurolateralis*, *P. splendidus*, and *P. speighti* spec. nov. The latter is described and the diagnostic characters of all four species are given, together with a key to the ♂. The females are not identifiable with certainty. While *P. speighti* occurs in the subalpine and alpine regions of the Alps (Austria, France, Italy, and Switzerland), the other species are widespread in central Europe, though *P. aurolateralis* and *P. splendidus* are rare. For *P. aurolateralis* and *P. splendidus* records from continental Europe are listed.

Zusammenfassung

Aus dem *Platycheirus scutatus*-Komplex kommen in Mitteleuropa vier Arten vor: *Platycheirus scutatus*, *P. aurolateralis*, *P. splendidus* und *P. speighti* spec. nov. Letztere wird beschrieben, Anmerkungen zu den diagnostischen Merkmalen aller Arten werden gemacht und ein Schlüssel für die ♂ wird vorgelegt. Die Weibchen sind nicht sicher zu unterscheiden. Während *P. speighti* nur aus der subalpinen und alpinen Region der Alpen (Frankreich, Italien, Österreich und Schweiz) bekannt ist, sind die anderen Arten weit verbreitet, wobei *P. aurolateralis* und *P. splendidus* im allgemeinen selten und nur von jeweils wenigen Stellen nachgewiesen sind. Für *P. aurolateralis* und *P. splendidus* werden Funddaten mitgeteilt.

Introduction

In the last thirty years the genus *Platycheirus* Lapeletier & Serville has been the subject of taxonomic investigations by several workers. In various species groups a number of hitherto overlooked species have been recognised. As a result, the number of species known from central Europe increased from about 20 in 1970 to 35 in 2002. One of the species until recently believed to be unmistakable is *P. scutatus* (Meigen, 1822).

In 1992 we caught in the central Alps a series of specimens which were readily identified as close to *P. scutatus*, but with clearly different mid tibiae. Subsequent investigations of the matter revealed the presence of four species of the *scutatus* group in central Europe. While two of the additional species are widespread but scarce, in the lowlands of this region, the third is still unknown from anywhere outside the Alps and is probably an endemic. The lowland species have been described by Rotheray (1998) as *P. splendidus*, and by Stubbs (2002) as *P. aurolateralis*, respectively, both from British material. The Alpine species is described here as *Platycheirus speighti* spec. nov.

Material, methods and terminology

Altogether 745 specimens (421 ♂, 324 ♀) from Austria, Belgium, France, Germany, Italy, Norway, Switzerland, and single specimens from Slovenia and the "Riesengebirge" (at the border of Czech Republic with Poland) have been examined. The data for *aurolateralis*, *splendidus*, and *speighti* are listed below. The material is from our personal collections and from the collections of the persons and institutions listed in the acknowledgements. The information given for distribution, altitudinal range, habitat and flower visits are from the labels only.

The area of cell bm covered with microtrichia has been estimated. All other numerical characters have been obtained from using an ocular micrometer, at the highest possible magnification (max. 169x) for which the measured distance is within the micrometer scale. Measurements are carried out in such a way that both ends of the distance are situated in the same plane. The width of the face has been measured at the widest point between central knob and antennal sockets. The angle of approximation of the eyes has been taken from the widest angle between the eye margins in vertical view (the result is heavily dependent on the correct orientation of the specimen). Specimens with the mouth opening being collapsed have been omitted. The height of ta3:1 and t3 and the proportions of ta3:3 are measured without the setae. The length of T2 is defined as the length at the mid-line, its width is taken from the anterior margin. Body length is the distance from the front margin of the frons to the apex of the abdomen, wing length is the distance from the base of the epaulet to the apex of the wing.

The drawings have been prepared from dry specimens using a drawing mirror. Generally hairs have been omitted from the drawings except for the figures of the tr1 and the t2.

In general, the morphological terminology of McAlpine (1981) has been followed.

Abbreviations: bm = basal medial cell; f = femur; t = tibia; ta = tarsus (e.g. ta3:1 = first tarsomere of hind tarsus); tr1 = fore trochanter; S3 = 3rd sternite; T = tergite(s); L/W = ratio length : width; \bar{x} = arithmetic mean; SD = standard deviation; n = sample size; DEIC = Deutsches Entomologisches Institut Eberswalde-Finow; NHMB = Naturhistorisches Museum Basel; SMNS = Staatliches Museum für Naturkunde Stuttgart.

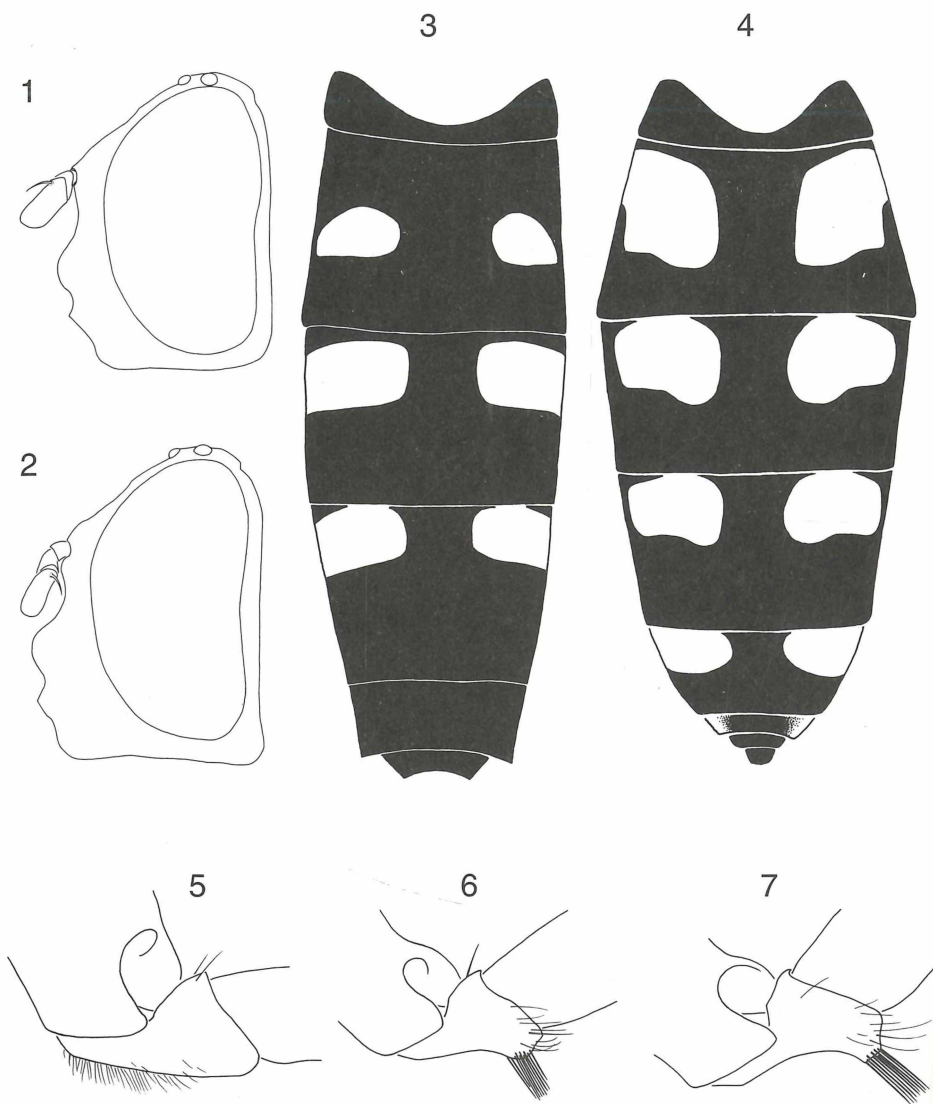
Diagnosis of the *scutatus* group

The species considered here belong to the *albimanus* group, *albimanus* subgroup in the sense of Vockeroth (1990). Within this subgroup the species related to *P. scutatus* are morphologically a well-defined set of very similar species. Specimens can be recognised as belonging to the *scutatus* group by the following characters:

- 1) ♂ $ta1:2$ less than $1/4$ the length of $ta1:1$ (figs. 8-11)
- 2) ♂ with a finger-like process on the anterior mesocoxite
- 3) ♂ with velvety micropubescence on $t2$ on the anterior half ventrally
- 4) ♂ (also ♀ but less distinct) with a small projection on $tr1$ apicoventrally which bears a hair tuft (figs. 6, 7)
- 5) ♂ (figs. 6, 7) and ♀ $tr1$ bare on basal half ventrally
- 6) ♂ and ♀ katapisternum with hairs of the lower hair patch being much shorter than those of the upper hair patch

While the males are easily recognisable by the mid-coxal process and the very characteristic proportions of the tarsomeres of $ta1$ the identification of the females is more difficult using existing keys. They can be separated as follows:

- 1 The hairs of the lower katapisternal hair patch at most as long as $t2$ wide in dorsal view. Postpedicellus reddish yellow ventrally and tergites with light integumental spots 2
- At least some of the hairs of the lower katapisternal hair patch are distinctly longer than $t2$ wide in dorsal view. Postpedicellus reddish yellow below or entirely black. Tergites with or without light integumental spots
 *Platycheirus* div. spp.
- 2 Face more projecting (fig. 2). Notopleuron as densely pollinose as the anepisternum, matt. Abdomen with light integumental spots of a different shape, with spots on $T2-5$ (fig. 4). Anepimeron with long hairs on upper half only (as fig. 16 in van Stenis & Goeldlin 1998). $S3$ with sub-adpressed hairs only. Ventral surface of $tr1$ with short hairs in basal half, bare on apical half (fig. 5). $f2$ anteriorly with a significant depression *peltatus* group p.p.
- Face less projecting (fig. 1). Notopleuron at most with scarce microtrichia, shining, in contrast to the "dusted" anepisternum. Abdomen with light integumental spots of a characteristic shape, usually missing on $T5$ (fig. 3). Anepimeron with long hairs also on lower half. $S3$ anteriorly with erect hairs. Ventral surface of $tr1$ bare on basal half, pilose apically (similar to fig. 6, but without apical bristles). $f2$ anteriorly not depressed *scutatus* group



Figs. 1-2: ♀ head, lateral view. – 1. *P. scutatus*; – 2. *P. peltatus*. – **Figs. 3-4:** ♀ abdomen dorsal view. – 3. *P. scutatus*; – 4. *P. peltatus*. – **Figs. 5-7: tr1 posterior side.** – 5. *P. peltatus* ♀; – 6. *P. scutatus* ♂; – 7. *P. speighti* ♂.

Description of *Platycheirus speighti* spec. nov.

Holotype: ♂ Italien, Vinschgau, Stilfser Joch-S, 2000m, 26.VI.[19]92, leg. J.-H. Stuke. Deposited in the collections of the Instituut voor Taxonomische Zoölogie, Universiteit van Amsterdam. (The collecting site is an alpine pasture near the river Braulio W of the track from the Stilfser Joch pass road to Bormio.)

Paratypes: 7♂ same data, leg. & coll. J.-H. Stuke; 3♂ same data, leg. & coll. D. Doczkal; 3♂ Italien, Vinschgau, Planeital, 1900-2000m, 20.6.1992, leg. & coll. C. Claußen; ♂ Italien Vinschgau, Planeital, 1600-2000m, 31.5.1993, leg. & coll. J.-H. Stuke; ♂ Italien, Vinschgau, Planeital, 1750-1850m, 30.5.1993, leg. & coll. Doczkal; ♂ Zermatt, 22.VI.[19]59, leg. F. Keiser, coll. NHMB; ♂ F. OS Var, 1600-1900m, 7.VI.1995, leg. & coll. L. Verlinden. – Because of the uncertain distinction of the females they have not been designated as paratypes.

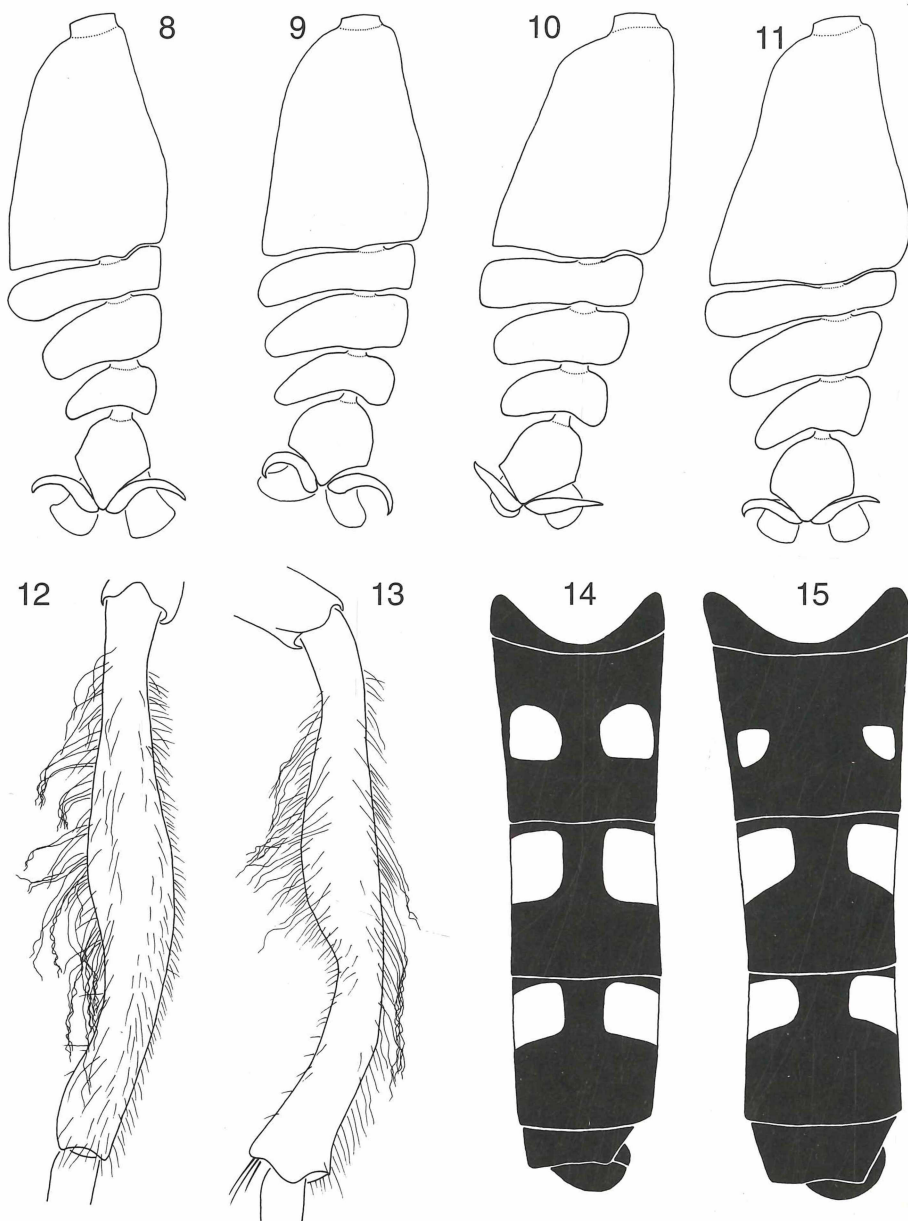
Etymology: The new species is dedicated to M.C.D. Speight in honour of his outstanding contributions to the knowledge of European Syrphidae.

Diagnosis: Characterised by the unique shape of ♂ t2 (figs. 12, 13) and a tooth-like apicoventral projection on tr1 (fig. 7). For further differences from individual species of the *scutatus* group see table 1.

Description

♂: Head: face about half as wide as the head (0.48-0.52 times); inner eye margins slightly converging downwards; face moderately densely covered in yellow to light brown, adpressed microtrichia ("pollinosity"), except for a median stripe from the mouth edge to half way between median knob and antennal sockets, which occupies about 1/3 of the width of face; gena bare of microtrichia except for a very narrow stripe along the eye margin; facial hairs all black or predominantly black with some light hairs; frons somewhat inflated, densely covered in chocolate brown, erect microtrichia, strongly contrasting with the light facial pollinosity; anterior angle of approximation of eyes about 100° (94°-103°); eye contiguity about 3/4 the length of the frons (from anterior end of eye contiguity to upper end of lunula).

Thorax: practically entirely covered in faint dark pollinosity, with yellow to brown hairs mixed with ± numerous black hairs; pleura thinly covered in brown pollinosity; pile on anepisternum and anepimeron partly black, with very strongly curled tips. Wings: entirely covered in microtrichia (one specimen with a small area of bm bare); slightly tinged brown; capitulum darkened. Legs: ventrally, apex of tr1 pointed (fig. 7); f1 extensively black, as in *scutatus*, but with the posterior two of the ventro-basal spots (rarely also one or both of the anterior pair) always light brown; the submedian black spot on the ventral surface of t1 ± triangular and often not reaching the anterior margin; otherwise the ornamentation of the ventral surface as in *scutatus*; for the shape of the tarsomeres of ta1 see fig. 11. t2 (figs. 12, 13) strongly swollen towards the middle, indented apical to the swelling, apical 1/3 bent ventrally by about 30°, apex



Figs. 8-11: ♂ t1 dorsal view. – 8. *P. scutatus*; – 9. *P. aurolateralis*; – 10. *P. splendidus*; – 11. *P. speighti*. – **Figs. 12-13:** *P. speighti* ♂ t2. – 12. dorsal view; – 13. posterior view. – **Figs. 14-15:** ♂ abdomen dorsal view. – 14. *P. scutatus*; – 15. *P. speighti*.

slightly bulbous; without long hairs anterolaterally near base, the ventral, velvety pad of microtrichia bearing only hairs shorter than half the minimum width of t2 in side view. ta3:1 thickened, about 1 ½ times as deep as the apex of t3; ta3:3 about 1 ¼ times as long as wide; ventral half of f3 bare of microtrichia, at most the ventral surface near apex with ± extensive microtrichia.

Abdomen (fig. 15): T2 usually a little shorter than wide anteriorly (L/W = 0.85-1.04), T3 about as long as wide (L/W = 0.96-1.08); T2-4 with ± obscured, yellow integumental spots, on T2 usually much smaller than those on T3, the ± square black area between the spots on T3+4 about 1/3 the width of the respective T; the posterior margins of the spots oblique. Terminalia very similar to *P. scutatus*, apparently without clear differences.

Size: body length (without antennae) 8.1-9.4 mm; wing length 6.7-7.5 mm.

♀: At present not reliably distinguishable from the other species of the *P. scutatus* group. The specimens believed to be *P. speighti* are characterised by a wide face (0.43-0.46 the width of the head), wide frons (1.1-1.2 times as long [from anterior ocellus to upper margin of antennal sockets] as wide at the anterior ocellus), wide gena (0.43-0.52 the width of the subcranial cavity) which is bare of microtrichia except for a narrow stripe along the eye margin, cell bm is completely covered with microtrichia, or has at most small bare areas basally, f3 is largely bare of microtrichia ventrally for half of its length, and the microtrichia on T5 are confined to the basal half.

Key to the males of the central European species of the *Platycheirus scutatus* group

- 1 Frons densely covered with light greyish or yellowish, adpressed microtrichia, not contrasting with facial pollinosity. The undusted median facial stripe occupying at most 1/5 the width of the face. Facial pile pale, often with some black hairs mixed in. ta1:3 less than twice as wide as long (fig. 8). T2 with large, bright yellow, integumental spots, separated from each other for a distance little wider than the distance between the spots on T3. Posterior margins of spots on T3+4 almost parallel to the front margin of the tergites, the black area between the spots on T3 about 1½-2 times as long as wide (fig. 14) *scutatus* (Meigen)
- frons covered with dark, erect microtrichia, strongly contrasting with facial pollinosity. The undusted median facial stripe occupying at least ¼ the width of the face. Facial pile black, usually mixed with several pale hairs. ta1:3 at least twice as wide as long (figs. 9-11). T2 with or without small integumental spots. Posterior margins of spots on T3+4 oblique, the black area between the spots on T3 about as long as wide or shorter than wide (fig. 15) 2

- 2 t2 (figs. 12, 13) strongly swollen; its apical part bent downward at an angle of about 30°; without an anterolateral hair tuft basally. tr1 apicoventrally pointed (fig. 7). t1 ventrally with a submedian dark spot of \pm triangular shape *speighti* spec. nov.
- t2 not or only slightly swollen; its apical part bent downward at an angle of ca. 20°; with an anterolateral hair tuft at base. tr1 apicoventrally right-angled (as in fig. 6). t1 ventrally with a submedian dark spot of \pm rectangular shape 3
- 3 t2 ventrally across full width with long hairs (about as long as the depth of t2) in basal half, that extend well towards the apex. f1+2 extensively black (as in *scutatus*). T2 often without spots *aurolateralis* Stubbs
- t2 ventrally with short hairs (about as long as half the depth of t2 at its narrowest point) which leave a median stripe bare in the basal half of the tibia and which are largely restricted to its basal half. f1+2 with more or less reduced black markings. T2 always with spots *splendidus* Rotheray

Differences between the females

Each of the reliable characters found to distinguish the males is sex-dependent. The females are extremely similar to each other. Although it seems they have some differences, too, their separation is not yet possible due to strong variability and the identity of the available specimens being a priori unknown. ♂ and ♀ caught at the same site do not help because up to three species may occur at the same site (e.g. at the type locality of *P. speighti*). *P. scutatus* is well separated from *P. speighti* by its narrow face (0.38-0.41), narrow gena (which is entirely covered in microtrichia or nearly so), f3 ventrally extensively microtrichose, roughly half of bm bare of microtrichia, and T5 being microtrichose on the anterior 0.6-0.7 of its length. *P. aurolateralis* and *P. splendidus* are intermediate between *P. scutatus* and *P. speighti*. Probably the microtrichose gena is a useful character to separate *P. scutatus* from *P. aurolateralis* and *P. splendidus*. So far no convincing differences between the females of *P. aurolateralis* and *P. splendidus* have been found. The range of intra-specific variation of the characters given above and all other characters examined is overlapping between *P. aurolateralis*, *P. splendidus* and *P. speighti*. However, the specimens with the widest face, frons, and gena and most specimens with bm entirely covered with microtrichia are from high altitudes from the Alps, suggesting these are *P. speighti*. But there is no clear gap in the range of variation in the characters mentioned, between the specimens from the Alps and from outside the Alps, respectively. Therefore, the specimens believed to be *P. speighti* might be mixed with *P. aurolateralis*, less probably also with *P. splendidus* (of which the ♂ is rarely found above 1500m). The matter requires further investigation.

Notes on candidate names

Peck (1988) lists three taxa as synonyms of *scutatus*:

Syrphus scutatus Meigen, 1822, p. 333f: Some of the characters given in the description of the ♂ (Meigen 1822) are diagnostic for the *P. scutatus* group in the present sense as a whole, especially the description of the fore leg (see fig. 3c on pl. LXXXI in Morge 1976). The coloured figure drawn by Meigen and published in Morge (1976: pl. LXXXI, fig. 3b) shows a specimen with a light frons, the anterior eye angle is apparently less than 90°, and the light spots on T2 are roughly of the same size as those on T3. This is *scutatus* in the sense of recent authors like Rotheray (1998), Smit (2001), and Stubbs (2002).

Syrphus quadratus Macquart, 1829, p. 320: In *Platycheirus* a junior secondary homonym of *quadratus* Say (1823) (originally described as a *Scaeva*). Not available.

Syrphus sexnotatus Meigen, 1838, p. 134f: The description (Meigen 1838) is certainly of a species of the *scutatus* group but contains no character which could help to identify it.

Platycheirus scutatus var. *pygmaeus* Frey, 1907, p. 69: Frey (1907) introduced the name *pygmaeus* for a dwarf variety of *scutatus* Meigen.

Rotheray (1998) studied the name-bearing types of both taxa and states that neither of the specimens bear characters identifying them as belonging to material of *splendidus* reared from *Schizoneura ulmi* (L.) aphids, without any comment to which species they belong. As already mentioned by Smit (2001), Stubbs (2002), and van de Weyer (2002) the characters to separate the ♀ of *P. splendidus* from *P. scutatus* as given by Rotheray (1998), who did not know the existence of a further British species of that group, are not diagnostic. This agrees well with our observations. Therefore, a re-examination of the type specimens of *sexnotatus* and *pygmaeus* is desirable, as soon as reliable characters for separating the females are available.

Stubbs (2002) described *P. aurolateralis* without reference to the taxa in question, making it liable to future synonymisation. The locus typicus of *Syrphus sexnotatus* is within the range of his new species. Both *P. aurolateralis* and *P. splendidus* are on average smaller than *P. scutatus* and both occur in Scandinavia. Therefore it is possible that *pygmaeus* is not a variety of *P. scutatus*, but the correct name of one of its siblings.

We did not examine the type specimens of *sexnotatus* and *pygmaeus* because, due to the still uncertain distinction of the females of *P. aurolateralis*, *P. splendidus* and *P. speighti*, no clear result could have been expected from an examination of their morphology. However, both *Syrphus sexnotatus* and *Platycheirus scuatus* var. *pygmaeus*, have been described from areas where *P. speighti* is unknown, making it unlikely one of these names applies to *P. speighti*.

character / taxon	<i>scutatus</i> (Meigen)	<i>aurolateralis</i> Stubbs
angle of approximation of eyes	$\bar{x} = 90^\circ$ (82°-93°) SD = 2.77, n = 20	$\bar{x} = 100^\circ$ (93°-105°) SD = 2.51, n = 26
length of eye contiguity : length of frons	$\bar{x} = 1.02$ (0.86-1.19) SD = 0.083, n = 22	$\bar{x} = 0.82$ (0.71-1.0) SD = 0.079, n = 24
frons	usually not inflated	slightly inflated
microtrichia (= pollinosity) on frons	adpressed, light grey or yellowish, not contrasting with facial pollinosity	erect, dark (blackish), contrasting with facial pollinosity
maximum width of face : width of head	$\bar{x} = 0.44$ (0.41-0.47) SD = 0.0126, n = 55	$\bar{x} = 0.48$ (0.45-0.52) SD = 0.0187, n = 38
width of undusted central stripe of face : width of face	$\bar{x} = 0.17$ (0.09-0.23) SD = 0.032, n = 43	$\bar{x} = 0.31$ (0.21-0.38) SD = 0.041, n = 35
predominant colour of facial hairs	pale (whitish or yellowish)	black
pollinosity on gena	present (often scattered)	absent
presence of black hairs on mesonotum (number of specimens / examined)	usually absent (3/37)	usually present (often very few) (25/33)
presence of black hairs on thoracic pleura (number of specimens / examined)	sometimes present on anepisternum (12/37), always absent on anepi- meron	always present on anepi- sternum and sometimes on anepimeron (8/33)
colour of wing membrane	clear	with brownish tinge
proportion of cell bm covered in microtrichia	most specimens with less than 90%	(nearly) 100%, rarely up to 10% bare
colour of capitulum	yellow	usually light brown
ventral apex of tr1	right angled (fig. 6)	right angled (as fig. 6)
dark spots on ventral surface of fl basally	4 black spots	usually 4 black spots
dark submedian spot on ventral surface of t1	a \pm rectangular complete cross band	a \pm rectangular complete cross band
proportions of tal:1-4	see fig. 8	see fig. 9

<i>splendidus</i> Rotheray	<i>speighti</i> spec. nov.
\bar{x} = 94° (89°-101°) SD = 2.66, n = 30	\bar{x} = 99° (94°-103°) SD = 2.34, n = 16
\bar{x} = 0.89 (0.76-1.0) SD = 0.066, n = 22	\bar{x} = 0.74 (0.69-0.78) SD = 0.032, n = 16
slightly inflated	slightly inflated
erect, dark (blackish), contrasting with facial pollinosity	erect, dark (blackish), contrasting with facial pollinosity
\bar{x} = 0.46 (0.43-0.49) SD = 0.0125, n = 38	\bar{x} = 0.5 (0.48-0.52) SD = 0.0134, n = 17
\bar{x} = 0.32 (0.24-0.39) SD = 0.030, n = 34	\bar{x} = 0.32 (0.28-0.35) SD = 0.020, n = 17
black	black
absent	absent
usually present (often very few) (28/38)	always present (18/18)
present on anepisternum (37/38), absent on anepi- meron (1/38)	always present on anepi- sternum and anepimeron
with brownish tinge	with brownish tinge
(nearly) 100%, rarely up to 15% bare	100%, rarely with small bare area
usually light brown	brown
right angled (as fig. 6)	pointed (fig. 7)
usually 4 light brown spots	usually 2 anterior black and always 2 posterior light brown spots
a ± rectangular complete cross band	± triangular, often not reaching posterior margin
see fig. 10	see fig. 11

Table 1 (part 1): Morphological differences between adult ♂ specimens of the central European species of the *Platycheirus scutatus* group.

character / taxon	<i>scutatus</i> (Meigen)	<i>aurolateralis</i> Stubbs
shape of t2	with nearly parallel margins	with nearly parallel margins
angle between dorsal outline of the bent apical part of t2 with the straight basal part	ca. 20°	ca. 20°
long hairs on anterolateral surface in basal half of t2	very few or absent	many
length of hairs on ventral surface of t2	at most half as long as minimum width of t2	about as long as minimum width of t2
distribution of hairs on the velvety basal area of ventral surface of t2	across full width on about ¼ of the length of the velvety pad, otherwise with the median line bare	across full width on entire length of the velvety pad
height of ta3:1 / height of t3 apex	1.18 (1.07-1.36) SD = 0.073, n = 20	1.33 (1.15-1.57) SD = 0.097, n = 20
L/W of ta3:3	\bar{x} = 1.52 (1.27-1.87) SD = 0.125, n = 34	\bar{x} = 1.27 (1.13-1.53) SD = 0.108, n = 29
microtrichia covering on ventral surface of f3	always complete in apical half, sometimes with small areas bare basally	usually complete in apical half and bare in basal half, but often also partly microtrichose in basal half
L/W of T2	\bar{x} = 1.09 (0.99-1.23) SD = 0.054, n = 42	\bar{x} = 0.94 (0.84-1.07) SD = 0.056, n = 34
presence of light integumental spots on T2	always present, nearly as large as those on T3	absent or rudimentary (each ca. half the material studied)
posterior margin of spots on T3	fig. 14, their posterior margins almost parallel to the fore margin of the segment	similar to fig. 15, their posterior margins oblique
shape of dark area between the spots on T3	about 1½-2 times as long as wide	± square or shorter than wide
body length (without antennae)	\bar{x} = 8.7 (7.0-10.0) mm SD = 0.698, n = 44	\bar{x} = 7.8 (5.7-9.3) mm SD = 0.948, n = 38
wing length	\bar{x} = 7.0 (5.6-7.9) mm SD = 0.599, n = 48	\bar{x} = 6.4 (5-7.5) mm SD = 0.670, n = 40

<i>splendidus</i> Rotheray	<i>speighti</i> spec. nov.
with nearly parallel margins	strongly swollen (figs. 12, 13)
ca. 20°	ca. 30°
few	absent
at most half as long as minimum width of t2	at most half as long as minimum width of t2
confined to the lateral margins of the velvety pad, with the median line bare	across full width on entire length of the velvety pad
1.46 (1.31-1.69) SD = 0.096, n = 20	1.47 (1.36-1.57) SD = 0.073, n = 18
\bar{x} = 1.27 (1.14-1.5) SD = 0.08, n = 32	\bar{x} = 1.24 (1.05-1.44) SD = 0.116, n = 16
usually complete in apical half and bare in basal half, but often also partly microtrichose in basal half	always bare in basal half, ± reduced in apical half
\bar{x} = 0.94 (0.85-1.11) SD = 0.063, n = 36	\bar{x} = 0.91 (0.85-1.04) SD = 0.063, n = 11
always present, but much smaller than those on T3	always present, usually smaller than those on T3
similar to fig. 15, their posterior margins oblique	fig. 15, their posterior margins oblique
± square	± square
\bar{x} = 8 (6.3-9.3) mm SD = 0.688, n = 35	\bar{x} = 8.7 (8.1-9.4) mm SD = 0.417, n = 16
\bar{x} = 6.4 (5.2-7.4) mm SD = 0.479, n = 40	\bar{x} = 7.2 (6.7-7.5) mm SD = 0.262, n = 17

Table 1 (part 2): Morphological differences between adult ♂ specimens of the central European species of the *Platycheirus scutatus* group.

Recently, Kassebeer (1998) described another new *scutatus* group species, *P. atlasi*, from the Atlas mountains in Morocco. This species was not available to us for study. Its description and figures contain the following differences from *P. speighti*: 1) basal cells extensively bare of microtrichia; 2) proportions of $t_1:3$ very different, similar to *P. scutatus*; 3) t_2 posterolaterally with a denser hair tuft; 4) base of t_2 anterolaterally with a tuft of long hairs; 5) t_2 without a distinct median swelling; 6) posterior corners of T4 with a few short black hairs; 7) the median and posterior dull brown areas of T2-4 with sparse, short, adpressed black hairs. As the description of *P. atlasi* ♂ was based on three specimens only, one or the other character could turn out to be more variable than currently known. However, at least characters 2 to 5 are presumably constant, judged from the other species of the group.

Notes on the individual species

Platycheirus scutatus (Meigen, 1822): Distribution in central Europe: The majority (86% of the ♂) of specimens studied belong to *scutatus* s.s. The species is present in Austria, Belgium, France, Germany, Switzerland, and in Norway. Apparently more or less abundant everywhere except for high altitudes in the Alps, where it is replaced by the following species, in particular *P. aurolateralis* and *P. speighti*.

Platycheirus speighti spec. nov.: Distribution in central Europe: Only known from the Alps and recorded from Austria, France, Italy, and Switzerland. This species was not represented in the extensive material studied from Norway (coll. Nielsen), so we assume it is missing in Scandinavia. The altitudinal range is from 1600m to 2250m, though one specimen was also caught at 1374m. As a species flying in high montane to alpine regions *P. speighti* is certainly univoltine. At two sites in Canton Valais P. Goeldlin caught 6♂ and 12♀, sitting on *Myosotis alpestris*. Records: see type material. Additional records from Switzerland: ♂ Van d'en Haut (VS), 1374m, 4.VI.1999, leg. P. Goeldlin; 5♂ Lac de Moiry (VS), 2250m, 19.-25.VII.1999, leg. P. Goeldlin.

Platycheirus aurolateralis Stubbs, 2002: One specimen has been reared from larva. Its puparium has no conspicuous dark markings dorsally as is described for *P. splendidus* (Rotheray 1998). Distribution in central Europe: Widespread. Recorded from Austria, France, Germany, Italy, Slovenia, Switzerland, and Norway. One specimen without precise data is from the Riesengebirge at the border of Czech Republic with Poland. Apparently everywhere much rarer than *P. scutatus*. The altitudinal range is from 325m to 2100m. The majority of the specimens are from the Alps, the few specimens caught outside the Alps are from low-mountain regions. Records from lowlands are totally missing. Judged from the collecting data *P. aurolateralis* is probably bivoltine at lower sites. The specimens collected by F. Malec in central Germany are all either from May/June or from August. One specimen (coll. Schmid) was observed on the flowers of *Thesium bavaricum*.

Records: Austria: ♂ Radstädter Tauern, Obertauern, 1900m, 23.VII.1992, leg. C. Kassebeer; ♂ Tirol, Pfunds, Tscheywiesen, 1700m, 16.VI.1990, leg. L. Verlinden. – France: ♂ Bisoul (F: 05), 2000m, 15.VI.1995, leg. L. Verlinden; ♂ F:05, Ceillac, Bois Noire, 1900-2100m, 6.VI.1996, leg. L. Verlinden. – Germany: ♂ Allgäuer Alpen, Oberstdorf, Nebelhorn, 1900-2200m, 5.VII.1994, leg. J.-H. Stuke; ♂ Bayern, Oberstdorf, Moor W Torkopf, TK8626NE, 1780m, 30.VII.1995, leg. D. Doczkal; ♂ Baden-Württemberg, Malsch-Völkersbach, Moosalbital, 325-350m, 8.V.1992, leg. D. Doczkal; ♂ Baden-Württemberg, Schwäbische Alb, Balingen, Hörnle, 950m, 2.VII.1994, on *Thesium bavaricum*, leg. A. Grossmann, coll. U. Schmid; ♂ without data (certainly from Baden-Württemberg), leg. E. Kiefer; ♂ 1.1km N Pfeffingen, 4.V.1993, leg. F. Malec; ♂ 1.5 km E Zierenberg, NB29, 15.V. [19]85, leg. F. Malec; ♂ 900m S Wellerode, NB47, 9.VIII.[19]89, leg. F. Malec; ♂ Kassel, Auf der Schubach 99, 21.VIII.[19]87, leg. F. Malec; ♂ TK5614, 1.5km W Holzheim, 25.VI.1991, leg. F. Malec; ♂ 4km E Nieste, 16.VIII.[19]91, leg. F. Malec. – Italy: ♂ Vinschgau, Stilsfer Joch-S, 2000m, 26.VI. [19]92, leg. J.-H. Stuke; ♂ Stilsfer Joch-S, Valle del Braulio, env. refuge disposal site, 1600m, 26.VI.1992, leg. D. Doczkal; ♂ N Veneto, Val Pádola, Bosco di Rinfreddo, ca. 2.5km E Kreuzberg pass, 1700-1900m, 7.VII.1990, leg. C. Claußen; ♂ N Veneto, Val Pádola, E Kreuzberg pass, above C.ra di Rinfreddo, 1800-1900, 26.VII.1989, leg. C. Claußen; 2♂ dto, 1900-2000m, 9.VII.1990, leg. C. Claußen; ♂ dto, 2000-2300m, 26.VII.1989, leg. C. Claußen; ♂ Vinschgau, Planeital, flood plain, 1700m, 27.VI.1992, leg. C. Claußen; ♂ Vinschgau, Planeital, 1750-1850m, 30.V.1993, leg. D. Doczkal; ♂ Vinschgau, Schliniger Tal, 1700-2200m, 2.VI.1993, leg. J.-H. Stuke. Slovenia: ♂ Istria, Monte Anagnore, leg. Oldenberg, coll. DEIC. – Czech Republic or Poland: ♂ Riesengebirge, 27.VII.[19]09, leg. Lichtwardt, coll. DEIC. – Switzerland: ♂ Le Mont (VD), Fontaine des Meules, 16.IV.[19]91, leg. P. Goeldlin; ♂ dto, 14.V.[19]92; ♂ Valais, Col de Bretolet, 13.VIII.[19]62, leg. J. Aubert; ♂ dto., 26.VII.[19]68; ♂ + puparium Fribourg, Sâles, Les Mosses, 7.V.1987, leg. A. Maibach; ♂ Jura, Lucelles I-II Etang ruisseau, 1.V.1988, leg. A. Maibach; ♂ L. de Bret [?], VIII.1965, leg. P. Goeldlin; ♂ Vaud, Les Pléiades, 6.VII.1967, leg. P. Goeldlin; ♂ Vaud, Agittes, 1.VI.1968, leg. P. Goeldlin; ♂ Van den Haut (VS), 1374m, 4.VI.1999, leg. P. Goeldlin; ♂ Gletsch, 1800m, 8.VII.1998, leg., det. & coll. M. Speight. – Norway: ♂ Spiterstulen, On: Lom, 1.VII.1974, leg. T. Nielsen; ♂ Paradis, HOy: Fana, 31.V.1970, leg. T. Nielsen; ♂ HOy: Bergen, 3.VI.1970, leg. A. Fjellberg; ♂ Bodø (EIS 130), Nsy: Bodø, 17.-18.VI.1981, leg. T. Nielsen; ♂ VE: Tjøme, 25.V.1970, leg. A. Fjellberg; ♂ Geilo, BV: Hol, 14.VI.1973, leg. T. Nielsen.

Platycheirus splendidus Rotheray, 1998: Distribution in central Europe: Widespread. Recorded from Austria, Belgium, Germany, Italy, Switzerland, and Norway. Apparently everywhere much rarer than *P. scutatus*. The altitudinal range is from 5m to 2000m, but only three records are from above 1500m. Although the majority of data are from mountainous areas, the species is also recorded from lowlands (Rhine valley, Schleswig-Holstein in N Germany, Belgium). The collecting data from outside the Alps suggest that *P. splendidus* is bivoltine in central Europe. This is in contrast to Rotheray (1998) who reports capture dates for Britain from mid April to the beginning of July. F. Malec observed one specimen on the flowers of *Heracleum sphondylium*.

Records: Austria: ♂ Tirol, Pfunds, Tscheywiesen, 1700m, 16.VI.1990, leg. L. Verlinden; ♂ West-Tirol, Paznauntal, Ischgl, Talweg, 1400m, 23.VII.1986, leg. C. Claußen. – Belgium: ♂ Winksele, FS14, Kastanjebos, 22.IV.1982, leg. L. Verlinden. – Germany: ♂ Bayern, Alpen, Einödsbach nr. Oberstdorf, Griesgund, TK8627SE, 1400m, 14.VII.1995, leg. D. Doczkal; ♂ Baden-Württemberg, Umg. Freiburg, Wutachschlucht, Mühle, 25.V.1991, leg. C. Kassebeer; ♂ Baden-Württemberg, Muggensturm b. Rastatt, Gemeindewies, 120m, 19.VIII.1987, leg. D. Doczkal; ♂ Niedersachsen, Osnabrück, Harderberg, 26.IV.1993, leg. C. Franke, coll. J.-H. Stuke; ♂ Schleswig-Holstein, N Roikiersee, NF3375, 8.VIII.1987, leg. C. Claußen; ♂ Schleswig-Holstein, Langbelligau, 14.V.1983, leg. C. Claußen; ♂ Hessen, Habichtswald, 300m NW Erlenloch, 9.V.[19]85, leg. F. Malec; ♂ Hessen, Knüll, Eisenberg, 28.VIII.[19]85, leg. F. Malec; ♂ Hessen, 1.4km SW Beiseförth, 19.VII.1982, leg.

F. Malec; ♂ Kassel, Auf der Schubach 99, 1.IX.[19]85, leg. F. Malec; ♂ dto., 26.VII.[19]87, leg. F. Malec; ♂ Baunsberg, Baunatal, NB28, 6.V.[19]85, leg. F. Malec; ♂ TK5903, 1.7km SW Krautscheid, 6.V.1993, leg. F. Malec; ♂ NB29, 700m S Schloß Wilhelmsthal, 11.VI.[19]87, leg. F. Malec; ♂ NC21, 18.IV.1982, leg. F. Malec; ♂ NB48, Nieste, 24.VIII.[19]88, leg. F. Malec; ♂ Hessen, Kassel, Fuldatal, 2km NE Ihringshausen, 25.VIII.1981, leg. F. Malec; ♂ UR11, Ruine Schellenberg 1.5km NE Waldkirch, 14.VI.1990, leg. F. Malec; ♂ NB85, FH Ölbach 1km N Archfeld, 25.VII.1982, leg. F. Malec; ♂ NB38, Kassel, Karlssae 100m S RP, on flower of *Heracleum sphondylium*, 2.VIII.[19]89, leg. F. Malec; ♂ Lohrberg, 19.VII.[19]59, leg. K. Gruhl, coll. SMNS. – Italy: ♂ Trafoi, VII.[18]96, leg. Oldenberg, coll. DEIC; ♂ Vinschgau, Stilsfer Joch-S, 2000m, 26.VI.1992, leg. J.-H. Stuke. – Switzerland: ♂ Vaud, Les Pléiades, 17.VI.1967, leg. P. Goeldlin; ♂ dto., 20.VI.1967, leg. P. Goeldlin; ♂ dto., 30.VI.1967, leg. P. Goeldlin; ♂ Wallis, Längtal, 1450m, 24.VII.[19]47, leg. F. Keiser, coll. NHMB; ♂ Vaud, Les Dévins, Bex, 17.IV.1967, leg. P. Goeldlin; ♂ dto, 29.IV.1967, leg. P. Goeldlin; 2♂ dto, 8.V.1967, leg. P. Goeldlin; ♂ Cachot, 10.VIII.1973; ♂ Valais, Salvan, Van d'en Haut, Arianes, 1400m, 15.V.1989, leg. P. Goeldlin; ♂ Vaud, Le Brassus, Praz Rodet II, 29.VI.1987, leg. A. Maibach; ♂ Canton Tessin, Piora, 2000m, 10.VII.2001, leg., det. & coll. M. Speight. – Norway: 3♂ Hinna, Ry: Stavanger, 21.IV.1974, leg. T. Nielsen; ♂ Rognan (EIS 127), Nsi: Saltdal; 19.-22.VI.1981, leg. T. Nielsen; ♂ Tromsøya (EIS 162), TRy: Tromsø, 30.VI.1981, leg. T. Nielsen.

Discussion

The species of the *P. scutatus* complex as defined here certainly form a monophyletic species group (perhaps including additional species in other parts of the Holarctic range of *P. scutatus* s.l.). Synapomorphies are: 1) the mid-coxal process; 2) the very short ta1:2; 3) the characteristic distribution of setae on tr1 ventrally; 4) the velvet-like pad of very dense microtrichia on the basal half of the ventral surface of t2.

The differences found between *P. scutatus*, *P. aurolateralis*, *P. splendidus*, and *P. speighti* are summarised in table 1. Altogether, *P. scutatus* is somewhat more distinct from the other species, which are extremely similar to each other. While *P. speighti* has at least two unquestionably autapomorphous characters, namely the pointed ventral apex of tr1 and the swelling of t2, *P. aurolateralis* and *P. splendidus* have only a single autapomorphous character each, the long hairs on ventral surface of t2 and the median bare stripe on the ventral surface of t2, respectively. These character states are apparently unique within the genus.

Despite the high number of characters found in which at least one of the species differs from the others the species of this group are morphologically very similar. Most of the differential characters found are subtle and display a considerable degree of intra-specific variation, with the range of character states observed within the individual species more or less overlapping between the species. Only few character states are confined to a single species and exhibit a distinct gap to the states observed in the other species.

It is probably no accident that the few characters in which the species are well separated from each other refer to the ♂ legs. The particular structures of the fore and mid legs of ♂ *Platycheirus* spp. play a role in their (pre-)copulatory behaviour (Dziocik 2002). In contrast to many other parts of their bodies there is remarkably little variation

in the peculiar structures of these legs. At present no species of the *albimanus* group sensu Vockeroth (1990) are known with identical ♂ fore and/or mid legs. Even within very closely related species complexes like the *P. peltatus* subgroup or *P. clypeatus* subgroup a thorough examination of their legs always reveals certain structural differences between the species. While those *Platycheirus* species which have, apart from specialised setae, simple ♂ legs (*ambiguus* group ["*Pachysphyria*"], *stegnus* group, and *concinus* group sensu Vockeroth 1990) also have rather striking differences in their ♂ terminalia, the terminalia of species with peculiar legs (*albimanus* group sensu Vockeroth 1990) usually show insignificant differences between closely related species (Vockeroth 1990). This applies also to the *P. scutatus* complex.

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