

## ***Brachyopa silviae* Doczkal & Dziock, *Chrysotoxum gracile* Becker and *Eumerus pusillus* Loew (Diptera, Syrphidae) new to France**

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### **Summary**

The hoverflies *Brachyopa silviae* Doczkal & Dziock, 2004, *Chrysotoxum gracile* Becker, 1921 and *Eumerus pusillus* Loew, 1848 are recorded from France for the first time.

### **Introduction**

The French syrphid list is longer than that for any other European country. But additions to the French list are still being made regularly. The present note adds three species. With other recent additions (Tissot *et al.* 2013), the French list will top 530 species before the end of 2013, amounting to nearly 60% of the known European syrphid fauna. It may be no coincidence that the three species added here were all found in the extreme south of France, which, for syrphids, is arguably the least-prospectred part of the country.

### **Methods**

Together with the records, brief notes are provided for the three species treated here, to indicate how they may be identified and in what circumstances they were found. Nomenclature follows Speight (2012). Determinations were carried out by one of us (MS). Where possible, localities given are accompanied by UTM grid co-ordinates. Morphological terminology follows Speight and Sarthou (2012).

The following abbreviations have been used in the records:

coll. = collected by; JG = Joseph Garrigue; MS = Martin C.D. Speight; M.t. = Malaise trap; VS = Veronique Sarthou.

### **Results**

#### ***Brachyopa silviae* Doczkal & Dziock, 2004**

**Material examined:** Lozère: Parc National des Cévennes: Les Barges, 12-26 May 2011, female, M.t., coll. MS/VS

This species was described from central Germany (Doczkal and Dziock 2004), and there have been no further published records until now. *Brachyopa.silviae* is a *B. insensilis* group species, with no detectable sensory pit on the third antennal segment. It can be distinguished from other members of that group by the key provided by Doczkal and Dziock (2004), and from all currently known European *Brachyopa* species by the key in Speight and Sarthou (2012). Its habitat preferences are as yet not well known. It has been found in humid *Quercus/Carpinus* forest and *Fagus* forest. Malec (2013) records *B. silviae* from a number of localities within and around forest dominated by *Fagus*, but with other tree species also present. The Cévennes locality where it was collected is neutrophilous *Quercus* forest adjacent to mesophilous *Fagus* forest.

***Chrysotoxum gracile* Becker, 1921**

**Material examined:** Ardèche: Forêt de Paiolive: RNR Grads de Naves, 31T 05909 49169, 19 May 2009, male and female, coll. MS; Bildon 31T 05973 49192, 24 May-26 June 2010, M.t., female, coll. VS/MS; R. Granzon gorge, Chibasse, 31T 05921 49155, 8-30 September 2010, female, M.t., coll. VS/MS; Combe de Bouze, 31T 05921 49155, 8 September-4 October 2010, M.t., female, coll. VS/MS.

**Lozère:** PN des Cevennes: Roquedols, 31T 05354 48892, 29 May-5 June 2012, M.t., male, coll. VS/MS; 31T 05360 48898, 12-26 June 2012, male, 24 July-7 August 2012, female, M.t., coll. VS/MS; Marquaire, 31T 05480 48909, 16 May-7 June 2011, male, 24 June 7 July 2011, female, M.t., coll. VS/MS.

*Chrysotoxum gracile* was described from Spain almost a hundred years ago and subsequently recorded from FYR Macedonia (Glumac 1972). The Macedonian records have been confirmed by Ante Vujić (*pers. comm.*), based on re-examination of the type material of *C. gracile*. His interpretation of the species provides the basis for use of the name *gracile* here. Until now, no records of *C. gracile* have been published from parts of Europe between Spain and the Balkans. The following combination of features helps to distinguish the species from other European *Chrysotoxum*:

**Male.** Frons black, partly grey-dusted; hairs on upper parts of eyes longer than a posterior ocellus; antennal segments 1 and 2 together longer than segment 3 and first segment longer than second (viewed from above); hairs on scutellar disc longer than half the length of the scutellum; legs entirely yellow, the tibiae paler yellow than the tarsi and the hind femur paler yellow in the basal half than in the apical half; wings with a brownish smudge posterior to the stigma; yellow marks on the tergites separate from any yellow markings on their lateral margins, the yellow marks on tergite 3 being as deep as those on tergite 4; abdominal sternite 4 less than 3 x as wide as long and surstyli of genitalia symmetrical.



**Plate 1.** *Chrysotoxum gracile*, female, showing bitonal leg colouration

**Female.** The features of the antennae, legs, wings and abdominal tergites are the same in the female as in the male, but the scutellar hairs are so short as to be virtually absent. The general appearance of the female is shown in Plate 1.

*Chrysotoxum gracile* is included in Sack's (1928-32) keys, but there it is indicated that the body of this species is "schlanke wie *C. lineare*", which is a bit misleading, since the abdomen of *C. gracile* is marginally narrower than in *C. festivum*, but not so narrow as in *C. lineare*. *Chrysotoxum gracile* is not included in more recent identification keys, so a provisional key to European *Chrysotoxum* species with which *C. gracile* might be confused is provided here. European species in which the third antennal segment is distinctly longer than the first two segments combined are not covered by the key, because they are not likely to be confused with *C. gracile*. Resolution of the status of the taxon *Chrysotoxum latifasciatum*, Becker probably requires genetic investigation and is beyond the scope of the present note. Its separation from *C. octomaculatum* Curtis is not addressed in the key.

**Provisional key to European *Chrysotoxum* species with which *C. gracile* might be confused**

- 1 Antennal segment 3 shorter than segments 1 + 2 together, or no longer than 1 + 2 together ..... **2**
- Antennal segment 3 distinctly longer than segments 1 + 2 together .....  
.....other European *Chrysotoxum* species not covered by the key
- 2 Males (eyes meeting on frons) ..... **3**
- Females (eyes separated) ..... **15**
- 3 All hairs on scutellar disc much shorter than half the median length of the scutellum ..... **4**
- At least some of the hairs on the scutellar disc longer (often much longer) than half the median length of the scutellum ..... **5**
- 4 Lateral margins of tergites 1-5 entirely black; abdomen no wider than head (pale markings on tergites not reaching side margins) ..... *lineare* (Zetterstedt), male
- Lateral margins of tergites 1-5 partly yellow; abdomen distinctly wider than head (anterior margin of yellow markings on anterior half of tergite 2 convex, only roughly parallel with the anterior margin of the tergite for at most half their width, curving gradually towards the posterior as they approach the lateral margins of the tergite; antennal segment 1 distinctly longer than antennal segment 2) ..... *parmense* Rondani, male (partim)
- 5 Yellow transverse marks on abdominal tergite 3 as deep as the yellow marks on tergite 4 ..... **6**
- Maximum depth of the yellow bars on tergite 3 less than half the depth of the yellow bars on tergite 4, or reduced to minute spots, or even absent ..... *bicinctum* (Linnaeus), male
- 6 Abdominal sternite 4 more than 4 times as wide (at anterior margin) as long (median length) and surstyli of terminalia extremely asymmetrical .. *cautum* (Harris), male (*partim*)
- Sternite 4 at most 3 times as wide (at anterior margin) as long (median length) and surstyli symmetrical ..... **7**

- 7 Frons yellow, entirely undusted; eye hairs sparse and shorter than the length of a posterior ocellus (eye suture half as long as the frons in the mid-line; legs entirely yellow) ..... *parmense* Rondani, male (*partim*)
- Frons black, partly or mostly dusted yellow-grey; eye hairs dense on upper part of eye and longer than a posterior ocellus ..... **8**
- 8** The pair of transverse yellow markings (banana or boomerang-shaped) on each tergite separate from any yellow marking on the lateral margins of the tergite, on tergites 2-4 (sometimes reaching side margins on tergite 5) ..... **9**
- The pair of transverse yellow markings (banana or boomerang-shaped) on each tergite reaching yellow marks on the lateral margins of the tergite, on at least tergite 4 (and often on tergites 2, 3 and 5 also) ..... **13**
- 9** Legs entirely yellow ..... **10**
- Legs with at least the fore and mid femora black basally ..... **12**
- 10** Antennal segment 1 longer than antennal segment 2 (viewed from above); legs with tarsi slightly darker yellow than the tibiae and the apical half of the hind femur slightly darker yellow than the basal half (frons yellow-haired; scutellar disc yellow-haired; wing with a dark smudge below the stigma; ventral surface of rolled-over margin of tergites partly yellow) ..... *gracile* Becker, male
- Antennal segment 1 shorter than antennal segment 2, or the same length as segment 2 (viewed from above); legs of uniform yellow colour throughout ..... **11**
- 11** Ventral part of rolled-over margin of tergites 2-4 black, or almost entirely black (may be yellowish for less than 50% of the length of the tergite, on tergite 4); wings with a brownish smudge in the marginal and submarginal cells, posterior to the stigma ..... *festivum* (Linnaeus), male
- Ventral part of rolled-over margin of tergites 2-4 at least 50% yellow on each tergite; wing without brownish smudge, though anterior half of wing membrane may be generally yellowish ..... *elegans* Loew male (*partim*)
- 12** Ventral part of rolled-over margin of tergites entirely black; outer, lateral surface of antennae with antennal segment 1 longer than antennal segment 2 (mesoscutum entirely yellow-haired; hypopleuron usually entirely black; wing membrane usually with a brown smudge behind and apical to the stigma; hind femur usually all yellow; abdomen in dorsal view wider than head; anterior half of sternite 3 usually with no hairs longer than one sixth the length of the sternite) ..... *vernale* Loew, male
- Ventral part of rolled-over margin of tergites 3 and 4 (at least) partly/mostly yellow; outer, lateral surface of antennae with segment 1 the same length as, or shorter than, segment 2 (all femora vaguely, but progressively darkened in basal sixth of length; mesoscutum usually entirely yellow-haired, though black hairs may be intermixed on the disc or just above the wing-bases; hypopleuron usually with a yellow mark; wing membrane usually without dark markings, vaguely yellowish) ..... *elegans* Loew, male (*partim*)

- 13** Anterior margin of yellow markings on anterior half of tergite 2 straight and parallel with anterior margin of tergite, except on the outer sixth of their width, where they bend abruptly towards the posterior ..... *verralli* Collin, male
- Anterior margin of yellow markings on anterior half of tergite 2 convex, only roughly parallel with the anterior margin of the tergite for at most half of their width, curving gradually towards the posterior as they approach the lateral margins of the tergite ..... **14**
- 14** Tergite 4 (and usually tergite 3 also) with the transverse, basal, black band interrupted before the side margins of the tergite by a yellow, longitudinal streak and resuming again along the actual margin of the tergite (legs entirely yellow) ..... *octomaculatum* Curtis male
- Tergites 3 + 4 with the basal black band reaching the lateral margins of the tergites uninterrupted ..... *elegans* Loew, male (*partim*)
- 15** Yellow transverse marks on abdominal tergite 3 as deep as the yellow marks on tergite 4 ..... **16**
- Maximum depth of the yellow bars on tergite 3 less than half the depth of the yellow bars on tergite 4, or reduced to minute spots, or even absent (usually, hairs on scutellar disc all much shorter than median length of scutellum, though occasionally a few longer hairs may be present on scutellar margin ..... *bicinctum* (Linnaeus), female
- 16** Hairs on scutellar disc very short, none of them longer than one third of the median length of the scutellum ..... **19**
- Some (or all) of the hairs on the scutellar disc at least as long as half the median length of the scutellum ..... **17**
- 17** Tergite 6 with a median, longitudinal, membranous cleft down entire length; most of the hairs on the scutellar disc almost as long as the length of scutellum in the mid-line ..... *cautum* (Harris), female
- Tergite 6 without a median, longitudinal, membranous cleft; most of hairs on scutellar disc shorter than half the median length of the scutellum ..... **18**
- 18** Anterior margin of yellow markings on anterior half of tergite 2 straight and parallel with anterior margin of tergite, except on the outer sixth of their width, where they bend abruptly towards the posterior ..... *verralli* Collin, female (*partim*)
- Anterior margin of yellow markings on anterior half of tergite 2 convex, only roughly parallel with the anterior margin of the tergite for at most half of their width, curving gradually towards the posterior as they approach the lateral margins of the tergite ..... *elegans* Loew, female
- 19** The pair of transverse yellow markings (banana or boomerang-shaped) on each tergite reaching the side margins of the tergite, on at least tergite 4 (and often on tergites 2, 3 and 5 also) ..... **23**
- The pair of transverse yellow markings (banana or boomerang-shaped) on each tergite not reaching the side margins of the tergite, on tergites 2-4 (sometimes reaching side margins on tergite 5) ..... **20**
- 20** Legs entirely yellow ..... **21**

- Fore and mid femora black at base ..... **22**
  
- 21** Antennal segment 1 shorter than antennal segment two (viewed from above), or no longer than antennal segment two; scutellar disc usually partly black-haired; femur, tibia and tarsomeres of all legs of a uniform yellow colour; body length 12-15mm (wings with a brownish smudge behind the stigma; pale marks on tergite 2 reaching into the posterior half of the tergite only in the apical quarter or fifth of the length of the pale marks) ..... *festivum* (Linnaeus), female
- Antennal segment 1 longer than antennal segment 2 (viewed from above); scutellar disc entirely, or almost entirely, yellow-haired; tarsomeres of all legs a darker yellow than the corresponding tibiae (which are whitish-yellow); hind femur pale yellow in the basal half of its length and mid-yellow in its apical half (wings with a brownish smudge behind the stigma)..... *gracile* Becker, female
  
- 22** Tergites 2-4 together <2x as long as their maximum width (wings entirely covered in microtrichia; pale marks on tergite 2 reaching into posterior half of tergite in apical third/half of the length of the pale marks) ..... *vernale* Loew, female
- Tergites 2-4 together >2x as long as their maximum width (all femora black at base) ..... *lineare* (Zetterstedt), female
  
- 23** Mesoscutal and scutellar hairs short but distinct; 2<sup>nd</sup> basal cell of wing with 0-20% of surface bare of microtrichia; the two pale (grey), longitudinal dust stripes on the mesoscutum extending posteriorly only as far as the wing bases (i.e. not reaching back to anterior margin of postalar calli) ..... **24**
- Mesoscutal hairs so short the disc appears bare; scutellar disc bare; the two pale (yellow-grey) dust stripes on the mesoscutum extending posteriorly almost to same level as the posterior margin of the postalar calli; 2<sup>nd</sup> basal cell 50% bare of microtrichia (pale marks on tergite 2 bending away from anterior margin of tergite in outer half of their width) ..... *parmense* Rondani, female
  
- 24** Mesoscutum predominantly yellow-haired, and entirely yellow-haired anterior to the transverse suture, but with patch of black setae close to lateral margin, just posterior to transverse suture; 2<sup>nd</sup> basal cell of wing with 5-20% of surface bare of microtrichia; basal black bands on tergites 3 & 4 usually interrupted just before lateral margin of the abdomen by a yellow streak, the lateral margin of each tergite being black in the basal half ..... *octomaculatum* Curtis, female
- Mesoscutum almost entirely covered in black hairs, some yellow hairs intermixed anterior to transverse suture and patch of mostly yellow hairs just above lateral margin, posterior to transverse suture; 2<sup>nd</sup> basal cell of wing with 0-5% of surface bare of microtrichia; basal black bands on tergites 3 and 4 reaching the lateral margin of the abdomen uninterrupted ..... *verralli* Collin, female (*partim*)

In the field, *C. gracile* appears closely similar to *C. festivum*, but is generally smaller in size (body length 9.5-12mm).

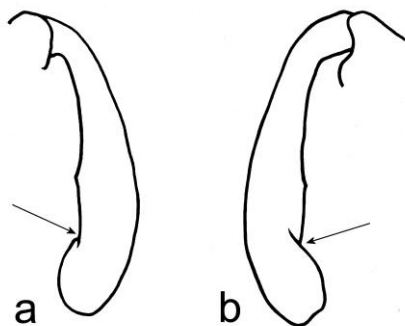
The two French localities where *C. gracile* has been found are rather different in character. The Forêt de Païolive is an extensive tract of karstic *Quercus pubescens* savanna, with both open areas of sub-xeric grassland and patches of more closed-canopy forest, within the

Mediterranean zone. The Cevennes National Park is centred on the massif of Mt Aigoual, and ranges from above 1500m to below 200m, with humid, montane habitats on north-facing slopes and dry, sub-Mediterranean habitats on its southern flanks. Geographically, it is very close to the Mediterranean, but most of its area is far from Mediterranean in character. Geologically, too, it is quite heterogeneous, reflecting volcanic origins. The Malaise trapping, which resulted in the *C. gracile* records, was carried out on the sides of narrow, forested valleys, clothed in neutrophilous/acidophilous *Quercus* forest and humid/mesophilous *Fagus* forest, aspect and geology dictating which sort of forest predominated. In addition forestry activities have much modified the forest character. This mélange of habitats makes it difficult to ascribe habitat-association data to *C. gracile*, based on the Cevennes records. Suffice it to say the species was collected in small, open areas within *Quercus petraea* forest, both in humid situations and where the forest was tending toward a drier, more Mediterranean character, with adjacent *Q. pubescens* and mesophilous *Fagus* forest.

***Eumerus pusillus* Loew, 1848**

**Material examined: Pyrenées-Orientales:** Jardin Méditerranéen, Banyuls-sur-Mer, 31T 05097 47024, 18 March-2 April 2012, male ; 4-18 September 2012, female, M.t., coll. JG/MS

*Eumerus pusillus* is among the more distinctive European species of the genus, on account of one feature. In both sexes the hind tibia has a very sharp, transverse cleft posteriorly, in the apical half of its length (see Fig. 1). In the male, that feature, backed up by an absence of projections of any sort on the hind trochanter, femur or tibia, abdominal tergites not marked with red, eyes meeting on the frons for an appreciable distance (the eye suture is as long as the median length of the frons) and orange third antennal segment, is sufficient to separate it from males of other European species. That feature is similarly diagnostic in the female, accompanied by an abdomen not marked with red, orange third antennal segment and an absence of translucent marks on tergite 2. In addition, longitudinal, grey, mesoscutal dust stripes are more-or-less absent in this species.



**Fig. 1. *Eumerus pusillus*, hind tibia of female; a = anterolateral view; b = posterolateral view; arrows indicate cleft (see text).**

In Europe, *E. pusillus* is strictly a Mediterranean zone species, known from Portugal, Spain, Italy, the Balkan Peninsula and various Mediterranean islands. Its presence in

Mediterranean parts of France might thus be expected, though there has been an absence of records until now. It has been reared from the massive bulb of the geophyte *Urginea maritima*, known as the sea squill (Ricarte *et al.* 2008). The Banyuls locality yielded one specimen from each of two Malaise traps, located in slightly different situations. One trap was in maquis of wild olive (*Olea europaea*), with stony, open patches and thickets of prickly pear (*Opuntia ficus-indica*). The other was in an ancient olive orchard, where the ground vegetation is regularly cleared to reduce the danger of fires. Neither location (or the surround) supports the sea squill and *E. pusillus* may there be using some as yet unknown alternative plant host.

### Acknowledgements

We are grateful to Ante Vujčić (Novi Sad) for information about *Chrysotoxum gracile* and for confirming the identity of *Chrysotoxum gracile* as recognised in this note, and to Antonio Ricarte and Axel Ssymank for their helpful comments on an earlier version of this text. Axel Ssymank also brought to our attention the publication by Franz Malec. Jean-Francois Holthof (Association Païolive) kindly maintained the Païolive Malaise traps and collected the samples from them. We also thank ONF personnel Thomas Barnouin, Michel Deschanel, Olivier Vinet and the late Christian Jarentowski, who, together with Grégoire Gautier of the Parc National des Cévennes, maintained the traps and collected the samples at the Cévennes localities.

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