

Figure 3b. Numbers of species per 10km square. The maximum number of species is 177 in SY89



Figure 3c. Modelled species richness using Frescalo [i].

The resulting modelled species-richness map seems to be highly plausible, demonstrating the importance of the southern woodland belt and showing how perceived weak areas on dot maps are likely to look if recorder effort was constant across the country. Areas of likely low richness are as expected: the Fens of eastern England, parts of central and north Wales, The Pennines and high ground in the Lake District, the southern uplands of Scotland and much of the Highlands and Islands of Scotland. The immense richness of southern England illustrates just how significant demand for new building land in the south-east could be for hoverflies and, as likely as not, much of the rest of Britain's biodiversity.

[i] Frescalo is a computer program that estimates species richness and time trends when recording effort is uneven.

***Melanostoma mellarium* (Meigen, 1822): one step forward in resolving *Melanostoma* identification issues**

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The truism that even the longest march begins with but a single step may have been first used in relation to human endeavour far removed from the naming of hoverflies. But it does seem somewhat appropriate when considering the advance represented by the reinstatement of the species *Melanostoma mellarium*. It's no secret that *Melanostoma* is a bit of a dog's dinner, taxonomically, with either polymorphic species or unrecognised taxa tending to complicate the naming of specimens, even from quite mundane localities. And *Melanostoma*, of one sort or another, can turn up almost everywhere in this part of Europe, from March to October!

Genetic characterisation of Fennoscandian *Melanostoma* populations has led Haarto and Ståhls (2014) to recognise four species in that part of Europe. Their work validates the status of *M. mellinum* (L.) and *M. scalare* (Fab.) as distinct species, at the same time confirming the conclusion of others that *M. mellinum* can exist in forms with large frontal dust spots in the female. They also confirm the separate identity of *M. dubium* sensu auct in Fennoscandia, but establish that *dubium* of Zetterstedt is actually a synonym of *M. mellinum*, so requiring them to give a new name to *dubium* sensu auct., which they name as *Melanostoma certum* Haarto and Ståhls. The fourth species recognised from this genetics work is *Melanostoma mellarium* (Meigen). *M. mellarium*, in its general appearance, overlaps with both *M. mellinum* and *M. scalare* but, now that it has been characterised genetically, its morphological diagnosis becomes possible and keys separating it from other *Melanostoma* species can be produced. From data available to the author it is apparent that *M. mellarium* is widespread in Europe, occurring in Scandinavia, the Alps, the Pyrenees and northern Spain, and in the British Isles. This note is to bring the existence of this rather obscure species to the attention of those interested in the distribution of syrphids in Britain and Ireland. The key provided will hopefully help in separating *M. mellarium* from the other known Atlantic zone species. However the key is not particularly easy to use and if it can be improved upon that would be all to the good. It should also be borne in mind that reinstatement of *M. mellarium* does not resolve all the taxonomic puzzles involving *Melanostoma*! Following the key what is known of the ecology of *M. mellarium* is summarised and other “*Melanostoma* issues” are briefly discussed.

Key to some *Melanostoma* species, 19 December 2014

This key comes with the health warning that it is unlikely to deal with all *Melanostoma* specimens collected in Britain or Ireland.

- 1 Males, eyes meeting on frons 2
 ---- females, eyes separated on frons 5

- 2 Sternite 2 more than 2x as long as the width of its posterior margin; body length 8 – 11mm (junction of cross-vein r-m with wing-vein R4+5 nearly always basal to the junction of wing-vein Sc with the costa; distance between junction of Sc with the costa and vein Rs with the costa greater than the distance between the latter point and the junction of R4+5 with the costa: Figure 1) **scalare** (Fabricius)
widespread in European lowland and montane zones
 ---- sternite 2 less than 2x as long as the width of its posterior margin; body length 6 – 8mm 3

- 3 Hairs on the anterior half of the mesoscutum including many at least as long as half the median length of the scutellum; hairs on the tergites all pale (white/pale grey); body length 6 – 7mm **certum** Haarto and Ståhls + *dubium* sensu auct of Scotland and many parts of the Alps; *montane/ subalpine zones*
 ---- hairs on the anterior half of the mesoscutum no longer than one quarter of the median length of the scutellum; tergites with black hairs intermixed with the pale hairs, especially along the mid-line and close to the posterior margins of the tergites; body length 7 – 8mm 4

- 4 Sternite 2 at least 1.5x as long as its maximum width; mesoscutum usually with black hairs intermixed with the pale hairs (can be predominantly black-haired); body length 7 – 8mm (frons mostly black and shining, dusting restricted to a very narrow band against the eyes) **mellarium** Meigen; *montane/subalpine zones of the British Isles and the Alps; less frequently at lower altitudes*
 ---- sternite 2 no more than 1.25x as long as its maximum width; mesoscutum usually without black hairs (hair-covering brown/greyish-brown); body length 7.5 – 8mm **mellinum** (L.) + various forms of unknown taxonomic status; *widespread in European lowland and montane zones, also strongly migratory and in consequence encountered at higher altitudes*

- 5 Sternite 4 2x or more as wide as long; tergites entirely black, or with at most a pair of very small, round, orange marks on tergite 2; body length 6 – 7.5mm *dubium* (female) sensu auct, of many parts of the Alps and Scotland
 ---- sternite 4 distinctly less than 2x as wide as long; tergites 2 – 4 either with pale markings, or with pale markings on only tergites 3 and 4, or tergites entirely black; body length 6 – 11mm 6

- 6 Hairs on the arista more-or-less outstanding and, in the basal half of its length, slightly longer than half its basal diameter; body length 7.5 - 9mm (junction of cross-vein r-m with wing vein R4+5 nearly always basal to the junction of wing vein Sc with the costa: Figure 1) **scalare** (female)
 ---- hairs on the arista more-or-less adpressed to the arista and all shorter than half the diameter of the arista 7

7 Mesoscutum (measured between the wings) wider than the maximum width of the abdomen (Figure 2b); body length 7 – 8mm (tergites usually with a pair of pale marks on tergite 3 and on tergite 4; tergite 2 usually without a pair of pale marks, but may have a pair of small, obscure pale marks; tergites may be entirely black; when pale marks are present on a tergite they are confined to the anterior half of the tergite: Figure 2b)

..... *mellarium* (female)
 ----- mesoscutum (measured between wings) narrower than the maximum width of the abdomen
 8

8 Lateral to the lunule, the frons is dusted across its entire width, to the eye margins; tergites entirely pale-haired and without pale markings; body length 5 – 7mm *certum* (female)

----- frons, lateral to the lunule, only narrowly dusted along the eye margin, undusted and brightly shining across most of the distance to the eyes; tergites partly black-haired and often with a pair of pale marks on at least tergite 3 and tergite 4; body length 6.5 – 8mm *mellinum* (female) + forms of uncertain taxonomic status

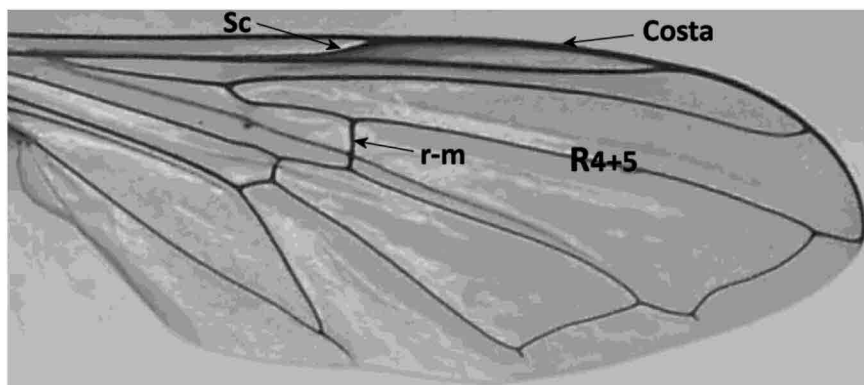


Figure 1: right wing of *Melanostoma scalare*

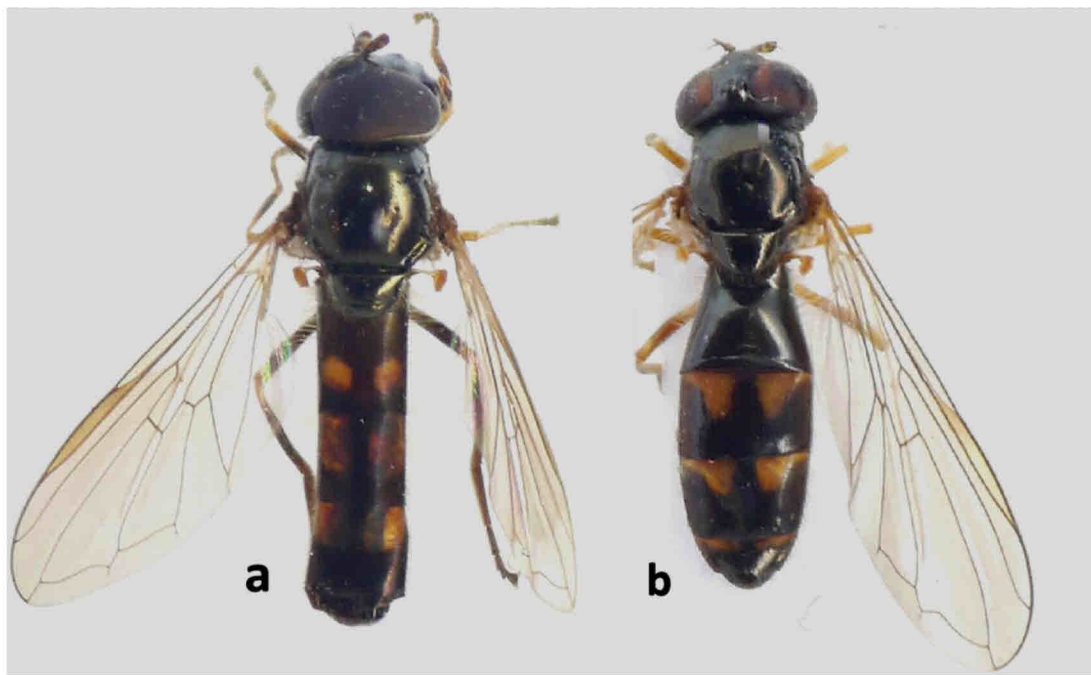


Figure 2: *Melanostoma mellarium*, a = male; b = female.

Melanostoma mellarium

In central Europe, *M. mellarium* is hardly met with below 1000m, but becomes quite frequent in both calcareous and non-calcareous grassland in the subalpine zone. On more acid sites it is usually found along streams. The same is true of the Pyrenees (Jean-Pierre Sarthou, pers.comm.). In Finland, Haarto and Ståhls (2014) refer to *M. mellarium* as found above the tree line. In Atlantic parts of Europe, *M. mellarium* occurs in unimproved upland grassland and moor and also at lower altitudes, being recorded almost at sea level along streams in blanket bog in the west of Ireland. In the limestone grassland at c. 200m alt., in the Burren in Co. Clare, *M. mellarium* also occurs away from streams. This species can be found in flight with other *Melanostoma* species, but has a shorter flight period than both *M. mellinum* and *M. scalare*. *M. mellarium* seems to be univoltine, and is on the wing in June/July. In Britain, scattered records of *M.*

mellarium might be expected along streams in moorland and in upland grassland, from Cornwall to the north of Scotland.

Other taxonomic issues in *Melanostoma*

The opening remark of this note alludes to re-instatement of *M. mellarium* as but a step towards sorting out how many *Melanostoma* species are present in Europe. The above key highlights one of the other issues, by separating females of *M. certum* from females of *M. dubium* sensu auct of the Alps and Scotland. For the moment, one option is to consign these apparent variants to *M. certum*. But, whether they are conspecific with *M. certum* will require a more comprehensive genetic examination of *Melanostoma* populations to decide: Haarto and Ståhls (2014) refer only to genetic characterisation of Fennoscandian populations. There are other more-or-less distinct *Melanostoma* phenotypes in the humid beech forest of the Alps and Vosges mountains, another in the Schwarzwald, another in the rather special, montane wetlands of the Jura and doubtless more elsewhere in Europe. Based on morphology alone it is just not possible to know whether these are discrete species. So far, genetic characterisation of *Melanostoma* populations shows promise in resolving such issues. The next step might usefully be to genetically characterise the British *Melanostoma* populations, in order to clarify the relationship between *M. certum* and Scottish "*M. dubium*", for instance.

The key included in this note is derived from Speight and Sarthou (2014). More information on European *Melanostoma* species can be found in Speight (2014).

References

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***Portevinia maculata* in Norfolk – a targeted survey**

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Among diptera taken by Tony Irwin during a collecting session at Holt Hall, North Norfolk in May 2011 was a male *Portevinia maculata* which represented the first county record for 73 years. This gave rise to the realisation that other populations must be present in the county and as a consequence a targeted survey was undertaken in 2014. It was promoted via Norfolk Wildlife Facebook, Norfolk Wildlife Yahoo Groups and the Norfolk Biodiversity Information Service (NBIS). With a database of Ramsons sites to hand, supplied by Bob Ellis, the Botanical Recorder for East Norfolk, participants were requested to search sites during the spring flowering period when the distinctive males can be found on the inflorescences and foliage of the foodplant. Photographic evidence was requested.

An enthusiastic response led to the discovery of nine sites which included Warren Woods, Cromer where Ken Durrant had recorded the species in 1938. The other sites (in a further 5 ten-kilometre squares) were Ashwellthorpe Lower Wood, Booton Common, Castle Rising Wood, a woodland site near Felbrigg Great Wood, Hockering Wood, Reffley Wood near Kings Lynn, Sheringwood in Beeston Regis and Swanton Novers Great Wood. The stronghold is evidently North Norfolk where further populations can be anticipated in unvisited, mainly private, woodland, and potential sites remain to be surveyed elsewhere.

Above all perhaps, the survey has highlighted how, within Norfolk, a widespread albeit local hoverfly with a short flight period can go undetected if its habitat lies outside the high profile areas of the Broads, Breck and coastline, where most diptera research has been undertaken. The reliance of *Portevinia maculata* on a single foodplant, and the ease with which it can be identified from photographs, make it ideal for a Citizen Science project. A survey run on similar lines to the above in other parts of East Anglia where the species is poorly recorded could well produce similar results.