Pollinator Academy

Genus: *Temnostoma*

Temnostoma vespiforme male habitus

Genus: *Temnostoma*

Family: Syrphidae

Subfamily: Eristalinae

Tribe: Milesiini

Number of species of this genus found in Europe: 7

Description

Head

In the female the eyes do not meet on the frons, there is no facial tubercle. In the male the eyes meet on the frons and on the face there is a small, but distinct, facial tubercle in some species, which is absent in others.

Thorax

Mesanepisternite 1 of the pleura is usually hairy postero-dorsally (bare in males of *T. bombylans*). Mesanipisternite 2 has a short, but distinct, yellow mark, vertically elongate and densely covered in yellow-grey dusting and contrasting strongly with the rest of the thoracic pleura, which are black and almost entirely undusted. The metasternum is covered in long hairs.

Abdomen

In the female 5 tergites are immediately visible on the abdomen.

On each of abdominal tergites 2 – 4 *Temnostoma* species have at least one strongly delimited transverse yellow band across the entire width of the tergite, contrasting strongly with the black ground colour of the tergites. The sternites are black, with a band of dense grey dusting across the entire width of the sternite anteriorly, on each of sternites 3 and 4, which in some species is accompanied by another band of grey dusting posteriorly.

Temnostoma vespiformе male habitus lateral

Temnostoma angustistria male habitus

Temnostoma apiforme male habitus

General comments on identification to species level

Differential diagnosis

In their general appearance, most of the European *Temnostoma* species are close mimics of large social wasps of the genus *Vespula*. *Temnostoma bombiforme* (and *T. angustriatum*, its probable synonym) is more reminiscent of solitary wasps of the family Eumenidae, but without the petiolate abdomen of eumenids. Due to their characteristically large size (body length 14 -18 mm), and rather elongate and tubular abdomen, most *Temnostoma* species are unlikely to be confused with many other European syrphid genera, except *Spilomyia* and perhaps *Milesia* or some species of *Sericomyia*. The smaller species could initially be mistaken for other black and yellow mimics of solitary wasps, such as *Ceriana*, *Sphiximorpha* or even some of the species of *Chrysotoxum*.

In *Temnostoma* the eyes are bare, the arista is bare and the antenna is shorter than the head (in side view). The latter feature provides for separation of *Temnostoma* species from those of *Ceriana*, *Chrysotoxum* and *Sphiximorpha*, in which the antennae are

longer than the head (in side view). The thoracic scutum and pleura are black, with well-defined yellow markings, separating *Temnostoma* species from *Sericomyia*, in which the scutum is devoid of yellow markings posterior to the humeral calli. The upper and lower hair patches on the mesopleural katepisternum are joined posteriorly. The hind femur is simple, without ventral projections, separating the species from *Spilomyia*, in which its ventral surface has a bluntly-pointed projection within the apical half of its length. On the wing, cell r_1 reaches the wing margin, whereas in *Milesia* cell r_1 is petiolate. Cross-vein r-m meets the anterior margin of cell dm within the apical half of the cell's width. Wing veins R_{4+5} and M_1 meet each other apically at an acute angle and R_{4+5} is almost straight, from its junction with cross-vein r-m to the point at which it meets with M_1. In *Milesia* R_{4+5} is deeply curved into wing cell r_{4+5}.

Milesia crabroniformis male habitus

Sphiximorpha subsessilis male habitus

Ceriana conopsoides male habitus

Geographical distribution and global diversity

Temnostoma angusistriatum, *T. carens* and *T. sericomyiaeforme,* are essentially northern (and apparently northern forms of more southern European species), their range in Europe hardly extending south of Fennoscandia, though in the East *T. sericomyiaeforme* also occurs as far south as parts of the Ukraine. *Temnostoma apiforme* is also primarily a northern species in Europe, extending south of Fennoscandia only to mountainous parts of NE France and central Europe. *Temnostoma bombylans* and *T. vespiforme* are the most widely distributed and most frequently encountered species, *T. vespiforme* occurring over much of Fennoscandia and southwards to Northern Spain and almost to the Mediterranean coast in mountainous parts of southern France. Further east it occurs in mountainous parts of Italy and the Balkans, but is absent from strictly Mediterranean parts of the continent and has not been recorded from any of the Mediterranean islands. Indeed, there are no records of any *Temnostoma* species from any of the Mediterranean islands – or from Portugal. That said, one European species of *Temnostoma*, *T. bombylans*, is recorded from N. Africa. In Europe, *T. bombylans* occurs from the southern tip of Sweden to Northern Spain and the Pyrenees and through the mountain massifs of most of central and southern Europe – except strictly Mediterranean parts – to the Ukraine and European Russia. The remaining species *T. meridionale*, is at present known from the southern extreme of Sweden, southwards to the French side of the Pyrenees, but is not yet known from the Iberian peninsula. It is also recorded from the mountain ranges of central Europe, Italy and the Balkan peninsula to Ukraine and the Caucasus. But the ease with which it can be confused with *T. vespiforme*, coupled with the recent occurrence of recognition of its presence in Europe, suggest that our knowledge of the range of *T. meridionale* in Europe is far from complete.

Among European *Temnostoma* species, only the variants *T. carens* and *T. sericomyiaeforme* appear to be largely endemic to Europe. The range of the others appears to extend from Europe through Eurasia to Japan and the Pacific, or from Europe into N. Africa. In N. America, where *T. vespiforme* was until recently thought to be widespread, N. American material of *T. vespiforme* is now consigned to a separate species, *T. excentrica*.

Presence in Europe

Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia,

Liechtenstein, Lithuania, Luxembourg, Moldova, Montenegro, Netherlands, North Macedonia, Norway, Poland, Romania, Russian Federation - European Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine.

Biology

The data presented here are derived from Speight (2024). *Temnostoma* species are forest syrphids, with larvae which feed in humid rotting wood of fallen deciduous trees. The larvae of European *Temnostoma* species have been observed and described by Heqvist (1957); Krivosheina, M. G. (2003); Krivosheina, N. P. & Mamayev (1962) and Stammer (1933). They are unusual among syrphid larvae in that they bore their own tunnels in the rotting wood they inhabit, using a pair of heavily sclerotised, saw-like outgrowths from the thoracic region of the body. Larval development is slow, apparently taking more than one year. There is considerable overlap between the trees whose wood is inhabited by the different *Temnostoma* species: *Temnostoma angustistriatum* larvae have been found in rotten wood of stumps and trunks of *Alnus, Betula, Fraxinus, Populus tremula, Prunus avium, Quercus, Tilia* and *Ulmus;* larvae of the closely similar *T. bombylans* have been found in rotting wood of *Acer, Fagus, Quercus, Salix* and *Tilia*; the larvae of both *T. apiforme* and *T. sericomyiaeforme* have been found with *Betula,* the larvae of *T. apiforme* also having been found with *Tilia*; the larvae of *T. meridionale* with *Fagus* and larvae of the closely similar *T. vespiforme* with *Acer*, *Alnus, Betula, Fagus, Populus tremula, Quercus, Salix* and *Tilia.* With the exception of *T. meridionale*, European *Temnostoma* species all occur in alluvial hardwood forest, though each of them is known from other forest types as well: *Temnostoma apiforme* also occurs in areas subject to temporary flooding, within northern *Betula* forests and *Fagus/Picea* forest; *T. angustistriatum* is known from taiga forests and other conifer/deciduous mixed forest of northern Europe, and northern *Quercus/Carpinus/Ulmus* forest: both *Temnostoma bomblyans* and *T. vespiforme* are found in humid *Fagus* forest and *Carpinus/Quercus/Ulmus* forest; *T. carens* (larvae unknown) has been found with *Alnus* forest, humid *Betula* forest and *Quercus/Carpinus/Ulmus* forest; *T. sericomyiaeforme* with *Alnus incana* swamp forest. *Temnostoma meridionale* has been found with mesophilous *Fagus* forest and

thermophilus *Quercus* forest. It is not clear what forest types it inhabits at the northern edge of its European range, in southern Sweden.

The flight period of the two northern European *Temnostoma* species variants, *T. carens* and *T. sericomyiaeforme,* is from mid-June to the end of July. For the rest of the European species, occurring further south, the flight period starts in early May and continues into the summer. The striking resemblance of most of them to large species of *Vespula* is not confined to the yellow and black, wasp-like markings on the thorax and abdomen. In their flight mode *Temnostoma* species also emulate wasps and, when they settle, they hold their black, flattened front tarsi close to the head, and jiggle them about, in a fashion highly reminiscent of the way a wasp moves its antennae.

In their flower visiting activities, European *Temnostoma* species are rather similar to one another, all of them occurring on the flowers of shrubs and small trees, including *Cornus, Crataegus, Sambucus nigra, Photinia, Sorbus aucuparia* and *Viburnum opulus*. They also visit the flowers of taller herb layer plants, especially Apiaceae, and some, particularly *T. apiforme* and *T. vespiforme*, are known to frequent the flowers of low growing plants, such as *Euphorbia, Lysimachia, Matricaria, Potentilla* and *Ranunculus*. The latter two Temnostoma species are also known to use the flowers of lianas, like *Clematis, Lonicera xylosteum* and *Rubus fruticosus*. Only *Temnostoma vespiforme* is recorded as visiting pollen-only flowers, in this case *Papaver*.

Type species: *Milesia bombylans Fabricius, 1805*

Common names:
FI - lahurit;
NB - treblomsterfluer;
SV - tigerblomflugor

List of species found in Europe:

1. *Temnostoma angustistriatum* Krivosheina, 2002
2. *Temnostoma apiforme* (Fabricius, 1794)
3. *Temnostoma bombylans* (Fabricius, 1805)
4. *Temnostoma carens* Gaunitz, 1936
5. *Temnostoma meridionale* Krivosheina & Mamayev, 1962
6. *Temnostoma sericomyiaeforme* (Portschinsky, 1886)
7. *Temnostoma vespiforme* (Linnaeus, 1758)

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