



Pollinator Academy

Genus: *Melitta*



Female



Male

Genus: *Melitta* Kirby, 1802

Clade: Anthophila

Family: Melittidae

SubFamily: Melittinae

Tribe: Melittini

Number of species of this genus found in Europe: 19

Morphology & diagnosis

Melitta are medium-sized bees (7-14mm) with a relatively short acute tongue. Females are characterized by their relatively-squared shape head, and the antennae truncate at the tip. They have three submarginal cells, the first one being the largest and the second one the smallest. Very hairy bees on the mesonotum and the margin of the terga. The Dufour's gland are remarkably large. The hair band in tergum 5 is usually clearly marked. Males are similar to females, sometimes having the pilosity longer and denser in the abdomen. They are morphologically similar to some species of *Andrena*: they have the same size, shape, coloration and the same light-coloured bands in the hind margins of the terga, and a similar wing venation. To differentiate them in the field it is necessary the trained eye of a specialist. Under the microscope, *Melitta* bees do not show some traits typical of *Andrena*, like the facial foveas, the double subantennal sutures and the flocculus. Contrary to *Andrena*, in many *Melitta* species, the last article of the tarsi is clearly dilated. On the females, scopa are present only in the tibia and the first tarsal segment, where in *Andrena* the scopa is present on the femur and tibia, and additionally many *Andrena* species have well developed propodeal corbicula and trochanteral floccus, which also play the function of the scopa. The males of most *Melitta* species, have antennal segments that thickened on the ventral side. Behaviour and floral preferences are a key point to distinguish them from other morphologically similar genera in the field.

Summary of distinctive traits

- 3 submarginal cells, the 2nd submarginal cell is much smaller than the 3rd (a)
- The last segment of antennae has a bevelled apex (b)
- Last tarsal segment distinctly wider than previous ones (c)



(a) *Melitta hispanica* Female



(b) *Melitta hispanica* Female



(c) *Melitta hispanica* Female

General comments on identification to species level

Species identification requires genitalia observation in males and mouthparts in females. Mouthparts should therefore be extended and mandibles open whenever possible. The species also differ in the color of pubescens, width, and integrity of the tergal bands as well as in the surface structure of the clypeus, scutum, and some other features, especially the structure of male flagellar segments.

Morphologically similar genera, and how to distinguish them

- ***Melitta* - *Andrena***

Melitta species have a single subantennal suture, no facial fovea and most species have an enlarged last tarsal segment. *Andrena* species have two subantennal

sutures, females have facial foveae and the last tarsal segment is of similar width than the previous tarsal segments.

- **Melitta - Dasypoda & Macropis**

Melitta species present 3 submarginal cells and an enlarged last tarsal segment. *Dasypoda & Macropis* species present 2 submarginal cells and a normal last tarsal segment.

- **Melitta - Colletes**

Melitta species have a simple acute glossa and a straight second recurrent vein; 2nd submarginal cell is much smaller than the 3rd. *Colletes* species have a bilobed glossa and an S-shaped second recurrent vein; 2nd and 3rd submarginal cells are nearly equal in size

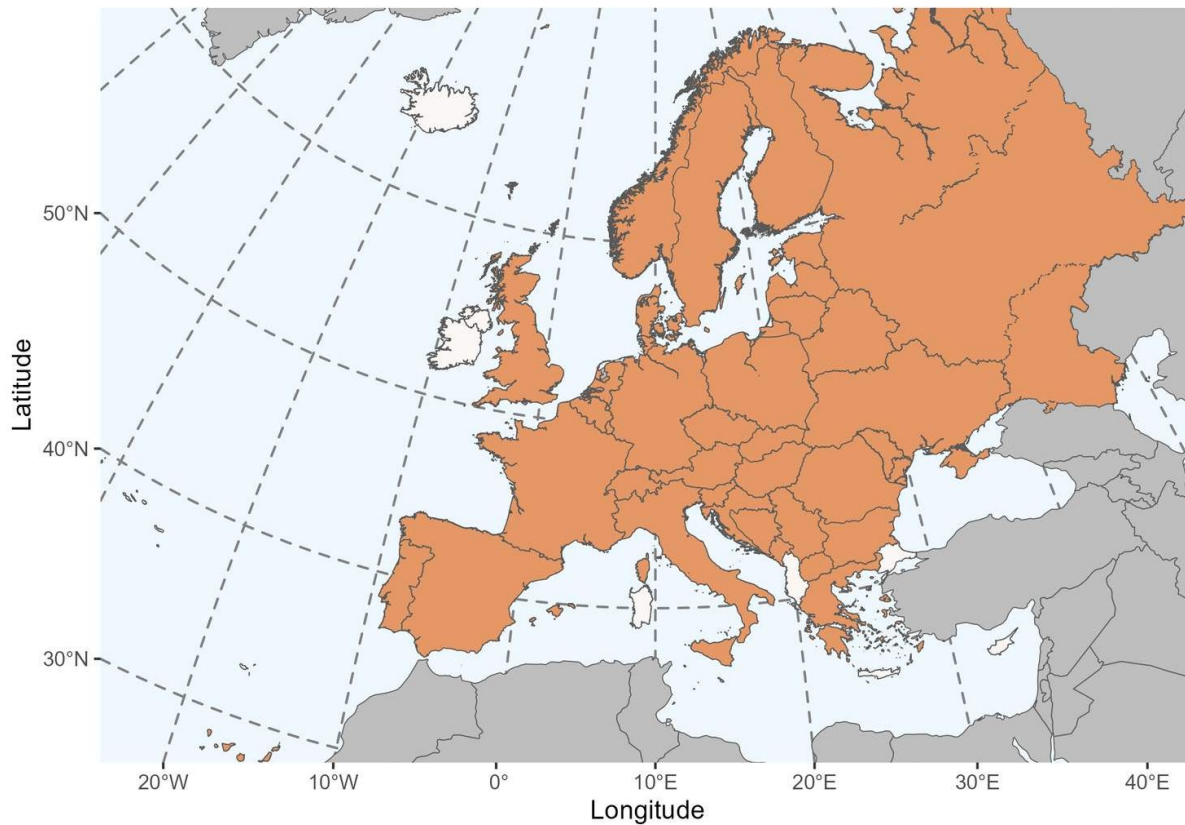
- **Melitta - Halictus**

Melitta species have a straight or slightly curved basal vein. Females have no furrow at the apex of their 5th metasomal tergum. *Halictus* species have a strongly curved basal vein. Females have a bald furrow at the apex of their 5th metasomal tergum.

Geographical distribution and global diversity

The genus *Melitta* occurs basically in temperate parts of Asia, Africa and North America (Michez & Eardley 2007). Most species of the genus are distributed along regions with a temperate to Mediterranean climate from the Old World (Eurasia+Africa), like the Cape region in South Africa, the Mediterranean Basin or the Mid-European valley. No species have been found in tropical or desertic regions. Michez & Eardley (2007) recognised two subgenera, *Cilissa* et *Melitta s.str.*, which have 36 and 7 species, respectively. Michez et al. (2012) described new species for the genus, increasing the total number of species described within the genus to 48. A revision of the genus involving the new South-African species along with molecular data has allowed to

reconsider the taxonomy of the genus and to propose 3 subgenera: *Melitta*, *Afromelitta* et *Plesiomelitta* (Dellicour et al. 2014).



Presence in Europe

Austria, Belarus, Belgium, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece (except Crete), Hungary, Italy (excluding Sardinia), Latvia, Liechtenstein, Lithuania, Luxembourg, Moldova, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom.

Biology

Seasonal life cycle

The European species of the genus are summer species (mid June-August), but it is still possible to see some of them, like *Melitta tricincta*, flying later until the beginning of October. They are univoltine. Males emerge 1-2 weeks before the females. They hibernate as prepupa in a cocoon.

Reproduction

There are not many details known from the reproduction of the genus *Melitta*, but it is easy to observe the males patrolling the area around the favourite flowers of the females of the corresponding species. It is assumed that the copula takes place on the flowers or on their proximity. Males are fast-flying and only land to copulate or forage. Females are monogamous, not being attractive to other males once they have been fecundated.

Nesting

All the species dig a nest in the ground and are solitary. Nests are constructed on areas of sparse vegetation, the entrance to the nests is often at the base of grass clumps and is surrounded by a small mound. Females build nests in different types of soil, both dense (for example, *M. leporina*; Malyshev 1923; Celary, 2006) and loose (*M. americana*; Komondy, Jack, 2021), singly, without creating aggregations. The nest has a simple branching architecture, its depth varies from 25 to 40 cm. The main burrow is vertical, from it at different depths, starting from about 10 cm, the female builds almost horizontal laterals 2-5 cm long, each of which leads to one brood cell. Cells backside more or less inclined downwards (sometimes up to 70°; Malyshev 1923). The cell walls are covered with a secretory lining secreted by Dufour's gland, which is very developed in representatives of this genus. A food for larva stored in the cell has a dough-like consistency, which occupies about one-third of the cell volume, and female does not form a pollen ball, as do most burrowing bees. After laying an egg, which is placed on the top of the pollen mass mixed with nectar, the female plugged the cell and densely filled with soil the lateral burrow leading to the cell. The female builds from 7 to 12 cells in one nest (Malyshev 1923; Celary, 2006). After feeding, the larva spins a dense cocoon in which it hibernates.

Parasites

Their known cleptoparasites are of the genus *Nomada*, including the species *Nomada flavopicta*

Floral preferences

The species of *Melitta* are almost all specialized on only plant genus, or even a single plant species (Michez et al. 2008). Many species of *Melitta* are specialised on Fabaceae, like *Melitta leporina* (specifically on *Medicago sativa*; for a number of countries, this bee is listed as an important pollinator of alfalfa), *Melitta dimidiata* (on the plant genus *Onobrychis*) and the species of the genus endemic to Spain (for example, *M. hispanica* and *M. murciana*). Other species show specialization on rarer plants, like the genus *Lythrum* for *M. nigricans*, the genus *Odontites* for *M. tricineta* and the genus *Campanula* for *M. haemorrhoidalis* (Dellicour et al. 2014) and *M. budensis* (Radchenko, Pesenko, 1994). There are also a few polylectic species. *Melitta* mixes pollen and nectar when foraging, and transports it on the hind legs.



Type species: *Melitta tricineta* Kirby, 1802, by designation of Richards, 1935: 172.

Synonyms: *Cilissa* Leach, 1812; *Kirbya* Lepeletier, 1841; *Pseudocilissa* Radoszkowski, 1891; *Brachycephalapis* Viereck, 1909.

Etymology: from the Greek *melitta*, 'the bee'

Common names:

FR: les mélittes

GER: der Sägehornbienen (= bees with saw-like antennae)

NL: de dikpootbijen (NI) (= large-legged bee)

EN: the Blunthorn bees (= bees with bevelled antennae)

List of species found in Europe:

1. *Melitta (Melitta) aegyptiaca* (Radoszkowski, 1876)

2. *Melitta (Melitta) budashkini* Radchenko & Ivanov, 2012
 3. *Melitta (Melitta) budensis* (Mocsáry, 1878)
 4. *Melitta (Melitta) dimidiata* Morawitz, 1876
 5. *Melitta (Melitta) haemorrhoidalis* (Fabricius, 1775)
 6. *Melitta (Melitta) hispanica* Friese, 1900
 7. *Melitta (Melitta) iberica* Warncke, 1973
 8. *Melitta (Melitta) kastiliensis* Warncke, 1973
 9. *Melitta (Melitta) leporina* (Panzer, 1799)
 10. *Melitta (Melitta) maura* (Pérez, 1896)
 11. *Melitta (Melitta) melanura* (Radoskwocki, 1891)
 12. *Melitta (Melitta) murciana* Warncke, 1973
 13. *Melitta (Melitta) nigricans* Alfken, 1905
 14. *Melitta (Melitta) schmiedeknechti* Friese, 1898
 15. *Melitta (Melitta) seitzi* Alfken, 1927
 16. *Melitta (Melitta) sibirica* (Morawitz, 1888)
 17. *Melitta (Melitta) tomentosa* Friese, 1900
 18. *Melitta (Melitta) tricincta* Kirby, 1802
 19. *Melitta (Melitta) udmurtica* Sitdikov, 1986
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