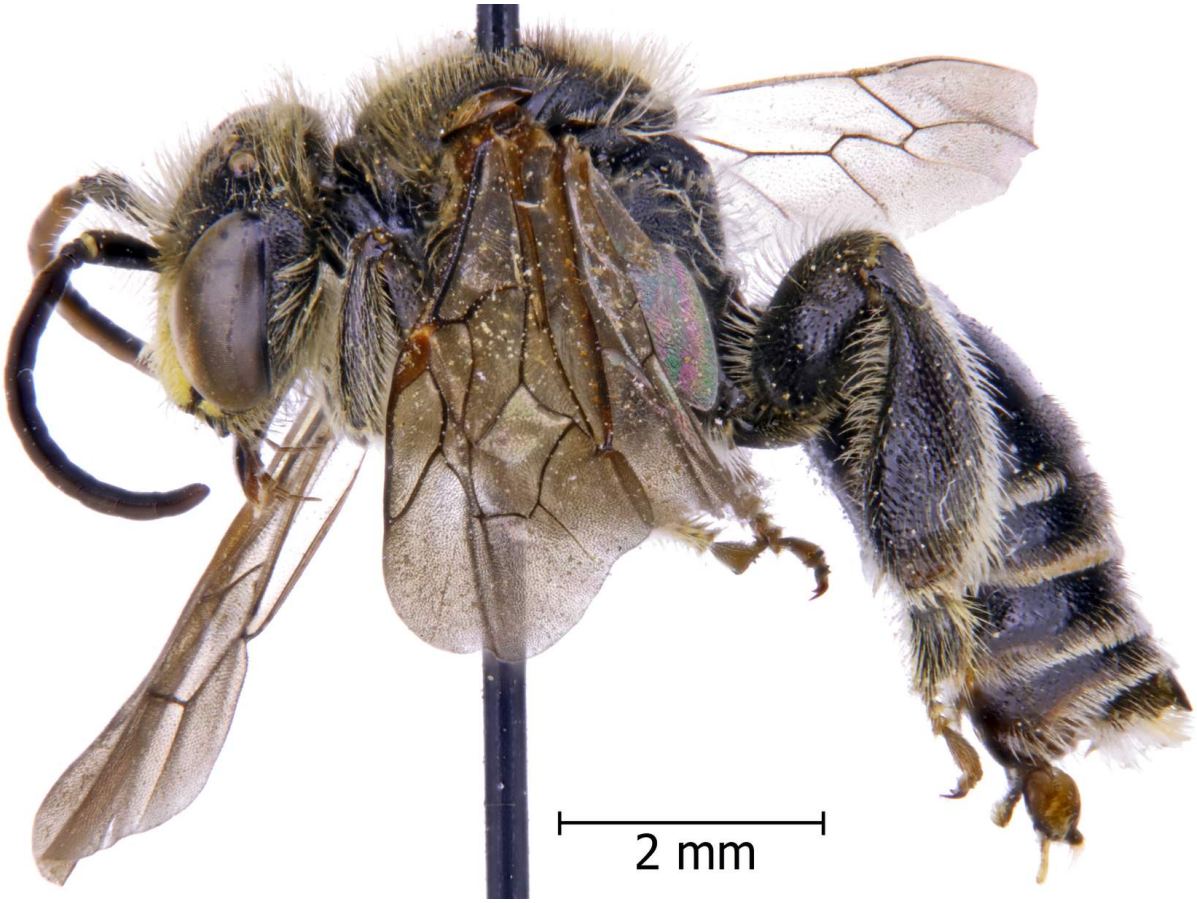
Pollinator Academy

Genus: *Macropis*

Female



Male

Genus: *Macropis* Panzer, 1809

Clade: Anthophila

Family: Melittidae

SubFamily: Melittinae

Tribe: Macropidini

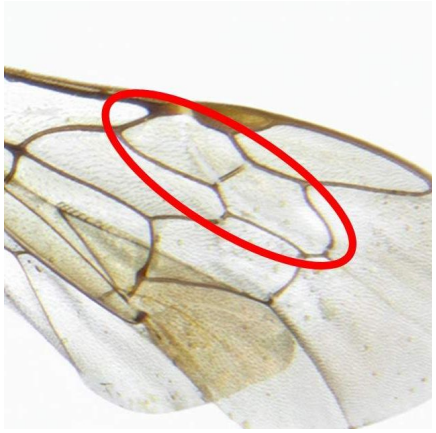
Number of species of this genus found in Europe: 3

Morphology & diagnosis

The three species of the genus *Macropis* present in Europe are medium-sized (8-12mm) with short galea and short tongues. They have two submarginal cells of equal size. The females have a hemispherical glossy black metasoma with tergal bands of dense hairs of light colour that could be more or less interrupted in the middle and with erected sparse hair brush of yellow or light brown colour on the marginal parts of 2-4 sterna. Lastly, their hind legs make them differentiable from all other genera with short tongues: the first tarsal segment is short and very broad showing a pollen brush as dense as in the tibia but in this genus is not long, and they show no pollen brush either on the femur, coxa or trochanter. The Dufour gland is weakly developed, diminutive (Cane et al., 1983). Males are recognized through the yellow cuticle present in their face, the hind legs showing a femur and a tibia strongly dilated and the pygidial plate is well developed. They can be easily recognized in the field by their flower preferences, and the females by the colouration of the pilosity of mid and hind metatarsus and by unusual behavior on the flowers.

Summary of distinctive traits

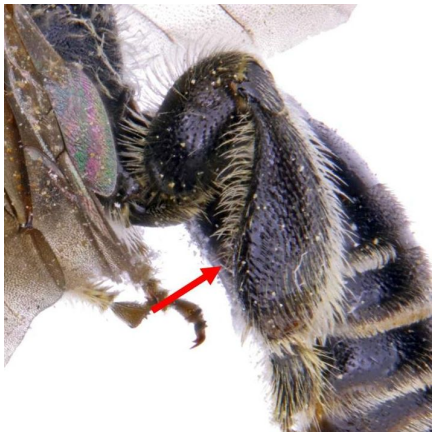
- Forewings with 2 submarginal cells, which are approximately the same size (a)
- Metasoma hemispherical, shiny black (b)
- 2nd tarsal segment is attached to the ventral side of the hind basitarsus of females and both of these segments of the hind legs are strongly widened
- Well-developed pygidial plates in males
- Males with strongly thickened hind legs and with partial (only on the clypeus) or completely yellow marks on the lower half of the face



(a) *Macropis europaea* Female

(b) *Macropis europaea* Female

(c) *Macropis europaea* Female



(d) *Macropis europaea* Male

(e) *Macropis europaea* Male

General comments on *Macropis* species identification

The males of the different species within the genus can be recognized by the colour of the supraclypeal and paraocular areas, labrum and by the genitalia. It is recommended

to extract the genitalia when preparing the specimens. For the females, the main diagnostic character is the surface structure of the propodeum and the colour of the hair on the metatibial and metabasitarsal scopa.

Morphologically similar genera, and how to distinguish them

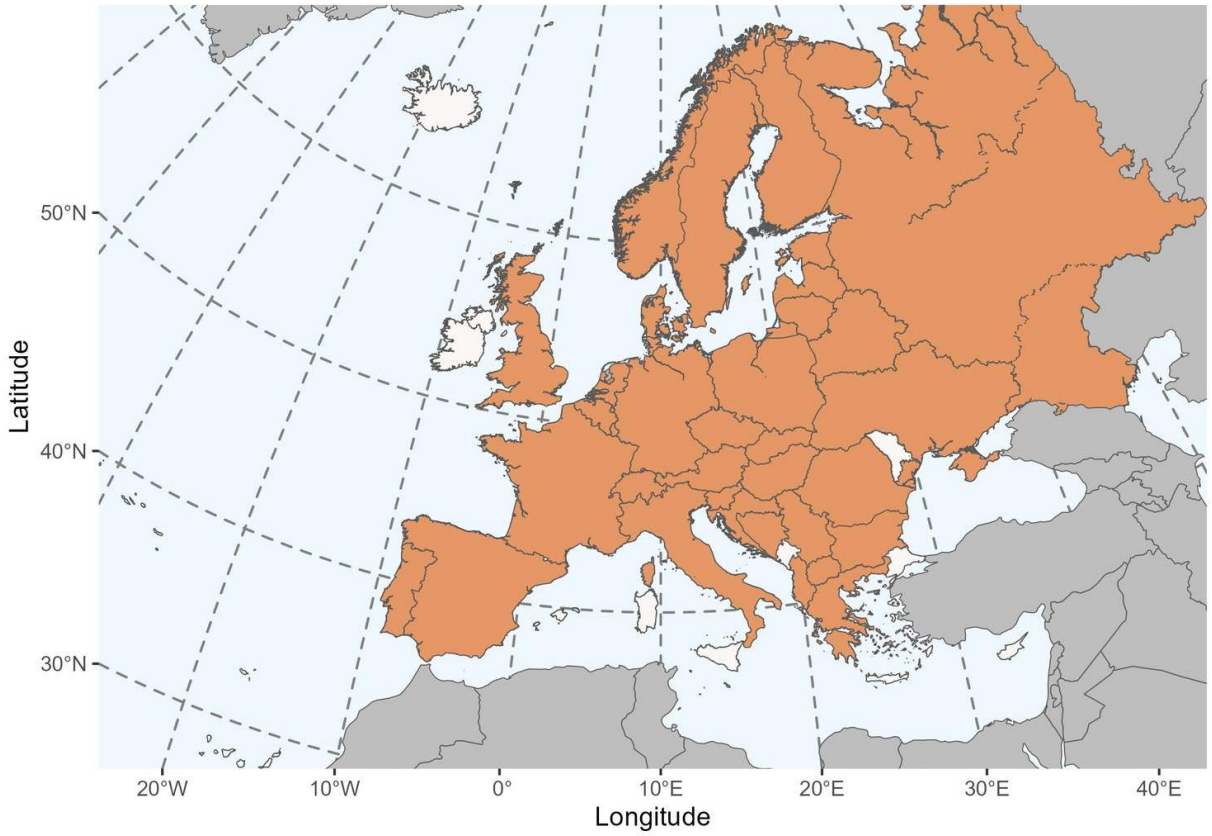
- ***Macropis* - *Melitta***
  Macropis species have a normal last tarsal segment.
  Melitta species have an enlarged last tarsal segment.

- ***Macropis* - *Eucera* & Anthophorini**
  Macropis species have short mouthparts (short-tongue morphology), a developed marginal cell and males have antennae not extremely elongated. Submarginal cells approximately the same size.
  Eucera and Anthophorini species have long mouthparts (long-tongue morphology), the 2nd submarginal cell is larger than the 1st.

- ***Macropis* - Rophitini**
  When comparing them to the tribe Rophitini, *Macropis* appear more massive, and the antennae insertion is higher on the face.

Geographical distribution and global diversity

At the global scale, the genus *Macropis* has 16 species and 3 subgenera, which is relatively low (Michez & Patiny 2005). The distribution encompasses the Holarctic region, showing the highest diversity in eastern Asia where all three subgenera appear (Michener 1981).



Presence in Europe

Albania, Austria, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece (mainland), Hungary, Italy (mainland), Latvia, Liechtenstein, Lithuania, Luxembourg, Netherlands, North Macedonia, Norway, Poland, Portugal (mainland), Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain (mainland), Sweden, Switzerland, UK, Ukraine.

Biology

Seasonal life cycle

The three European species of the genus are univoltine summer species. Their flight period is short and usually does not exceed 1.5 months (June-July or July August), concurrent with the blooming period of their host plants, *Lysimachia* (originally assigned

to the family Primulaceae, currently belonging to the family Myrsinaceae). All species of *Macropis* characterized by proterandry. They hibernate as prepupa in a cocoon.

Reproduction

Macropis perform the copula on the flowers, from where they immediately tumble out onto the ground. The behaviour of the males is to patrol the host flowers and surrounding areas, as long as nests and flowers visited for nectar while searching for virgin females. Females repel males by pushing up the hind legs once and synchronously, maintaining this posture for several minutes while they continue to forage.

Nesting

All species of *Macropis* are ground-nesting, sometimes creates small nest aggregations (Malyshev, 1929). They associated with more mesophilic habitats – forests, meadows, shores of streams, rivers, lakes (Popov, 1958). The foraging range of the females is quite limited, with the nests being located in general less than 30 m away from *Lysimachia* populations. Females dig in the soil the branched nests that have a curved main burrow, the depth of which usually does not exceed 10-15 cm, and several short branch burrows with horizontally or downward-sloping cells, arranged alone or in a linear row of two brood cells at the end of each branch burrow (Rozen and Jacobson, 1980). Interior walls of the brood cells have a faintly shiny slightly rugose surface, which is covered with the *Lysimachia* plant oil that has a dark olive tint. Such oil lining is waterproof and protect larval food from moisture. The use of vegetable oil for cell lining is due to the fact that the Dufour gland, the secret of which other burrowing bees used for the waterproof lining of the walls, is reduced in Macropis bees (Cane et al. 1983). Vegetable oil is also added to the pollen ball, which is stored for larva feeding. After completely finishing and plugging the cells with pollen balls and eggs, such branch burrow are filled with soil, and the entrance always remains open.

Parasites

The three species of the genus show only one known cleptoparasite: *Epeoloides coecutiens* (Fabricius, 1775).

Floral preferences

The species of *Macropis* are all specialized on the oil-producing genus *Lysimachia* (Primulaceae) (Popov, 1958). On these plants, the females collect both pollen and oil, the latter located on the base of the petals (Vogel, 1974) and stamens. The females show a characteristic behaviour when they forage on these flowers, which consist of raising their hind legs. Unperturbed females on loosestrife flowers use their hind legs to grasp the stamens, even when carrying a full load of pollen. They forage for nectar on other plants also, such as *Lythrum salicaria* (Lythraceae), *Geranium spp*. (Geraniaceae) and many others (Popov, 1958; Schäffler and Dötterl, 2011), because the *Lysimachia* flowers have no nectar (Vogel, 1986), which is necessary for bees as an energy resource. The collection of the oil does not take place with the mouthparts but with the help of the front and middle legs, which have special combs for this purpose. The pollen transported on the hind legs does not remain dry, but due to mixing with oil, they look like a moist, yellow-brown mass. During the day the females alternate the visits for oil only and for pollen and oil.

Sleeping behaviour

Males and sometimes a few females often sleep in groups on mallow, vetches, or other plants near the nest sites.

Type species: *Megilla labiata* Fabricius, 1805 = *Megilla fulvipes* Fabricius, 1805, monobasic.

Etymology: from the Latin *macro-*, meaning large, and *pes-*, meaning foot (or leg by extension), as a reference to the large and strongly thickened hind legs of the males, by which this genus was described.

Common names:
FR: the macropis
GER: der Schenkelbienen (= thigh-boot bees)
NL: de slobkousbijen (= gaiter bees)
EN: the oil-collecting bees

List of species found in Europe:

1. *Macropis (Macropis) europaea* Warncke, 1973
2. *Macropis (Macropis) frivaldszkyi* Mocsáry, 1878
3. *Macropis (Macropis) fulvipes* (Fabricius, 1804)

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Attributions

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