Pollinator Academy

Genus: *Ceratina*

Female

Male

Genus: *Ceratina* Latreille, 1802

Clade: Anthophila

Family: Apidae

SubFamily: Xylocopinae

Tribe: Ceratinini

Number of species of this genus found in Europe: 26

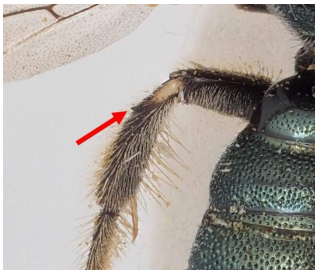
Morphology & diagnosis

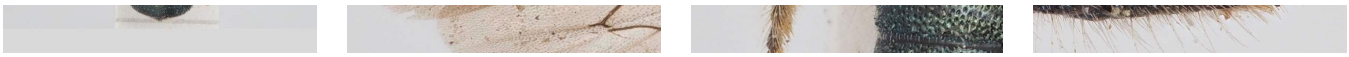
They are small to medium-sized bees (3-13mm) with long tongues. They have a shiny metallic cuticle showing in most species some metallic blue, green or black reflections. They are almost glabrous. The clypeus in this genus is prominent and has a yellow to ivory coloured spot which is large in all males and small, centrally located in most of the females. The antennae show broad tips. A spot light in colour is also found at the base of the tibias, and also in many cases on the pronotal lobes. This slight spot extends in some species to the tibia, tarsi, labrum or mandible. They have three submarginal cells, being the second almost triangular. The metasoma is flattened dorso-ventrally and ovoid in shape, with the broadest segments being 3 and 4. Females do not show a pygidial plate, but tergite 6 often shows a longitudinal carina; they also show two transverse depressions on sterna 2 and 3 called wax glands. In males, tergite 7 shows a strong curve to the ventral side, which, seen from the dorsal view, gives the impression that there are only six segments in the metasoma as in the females. The basitibial plate is not broad and scale-like at the base of the tibia but as a small dorsal tooth situated at a third the length of the hind tibia in both sexes. The subgenus *Pithitis* shows pointed teeth-like axillae facing the posterior side. This genus is recognized for their peaceful temperament, they almost never sting even when held between the fingers.

Summary of distinctive traits

- Black, metallic blue or green cuticle (a)
- Almost hairless (a)
- 3 submarginal cells (b)
- Basitibial plate as a tooth on first dorsal third of the tibia (c)
- Pygidial plate as a longitudinal carina (d)





General comments on *Ceratina* species identification

In this genus it is not necessary to remove the male genitalia for identification. Males can be distinguished using the shape of T7 and pilosity of the posterior leg. Identification criteria of females include body size, colour, size of the pale spots on the face, density of punctation of the face and mesosoma, shape of the hypostomal carina. It is better to use a microscope.

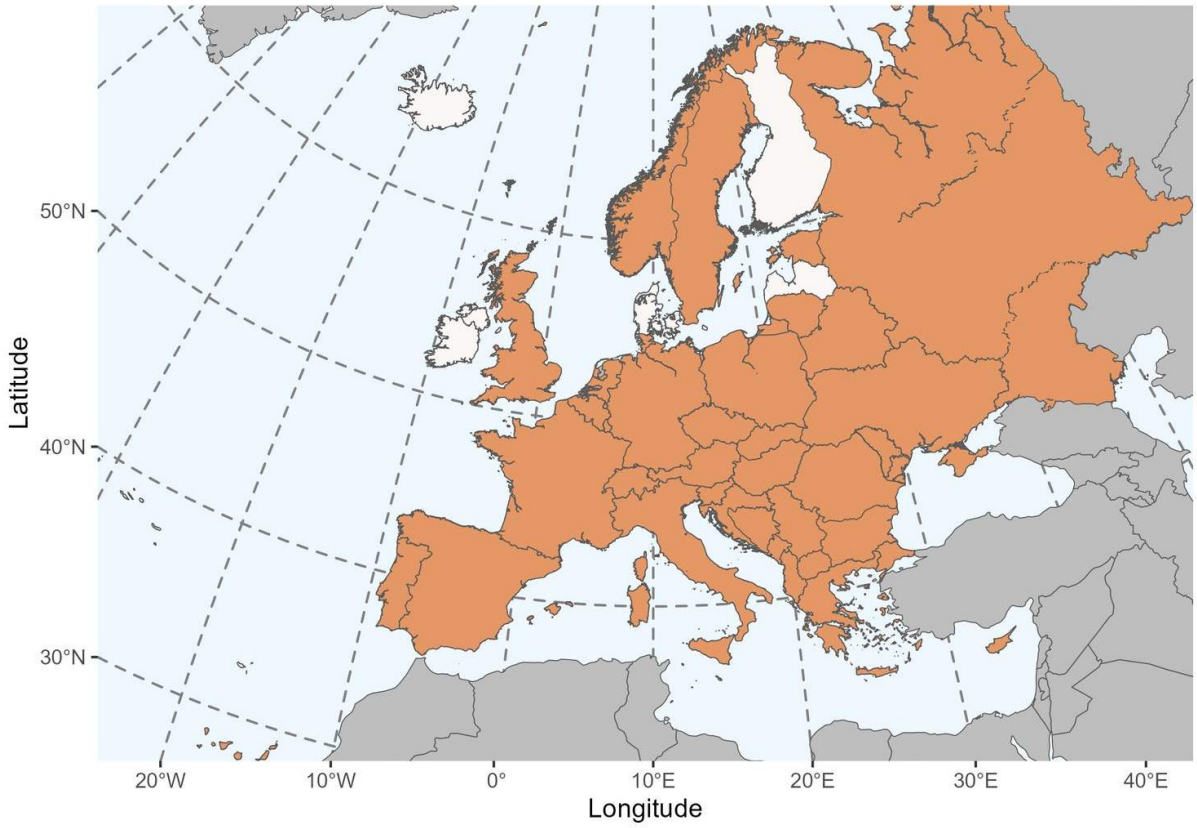
Morphologically similar genera, and how to distinguish them

There are several small black bees that can be confused with *Ceratina*, however most of them have a 'short tongue' morphology, while *Ceratina* species have a 'long tongue' one. Some genera like '*Panurgus*' may have long mouthparts, but the morphology remains that of a 'short-tongue' (short glossa and palpi with segment of similar size). In addition, they have only two submarginal cells.

Geographical distribution and global diversity

The genus *Ceratina* is abundant everywhere on the globe except on Oceania, which has been colonized by only a few species coming from Asia (Terzo, 2000). The greatest diversity occurs in tropical regions. The different subgenera are broadly limited to a subcontinent, in a few cases expanding a bit from the particular subcontinent. The subgenus *Euceratina* is distributed along

the West-Palaearctic and Central Asia regions. But in the same region there can be found species of other subgenera, from Asian (*Neoceratina*) or African (*Ceratina s.s., Pithitis*) origin. In total, 27 species of *Ceratina* have been found in Europe. *Ceratina* have strong preference for warm places. Thus, they are principally distributed along the Mediterranean basin. The farther from the Mediterranean climate, the lower the number species of the genus are represented, both in latitude and in altitude.



Presence in Europe

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

Biology

Seasonal life cycle

The increase of temperature along the day stimulates them (Terzo et al., 1994). They start flying in the beginning of spring in the warmer areas. They are univoltine and their flying period extends from April to September. They overwinter as adults. Males normally emerge before females, being a gap of 3-4 between the abundance peak for both sexes. At the end of summer, some new adults leave their maternal nests and find a place to hibernate, but most of them stay in their maternal nests, normally within stems, and they hibernate in groups after removing the cell walls that separate them.

Reproduction

The copula takes place close to the nesting area, commonly on the flowers. The females build their nest once fecundated. Eggs need 6-8 to develop into adults. At least one species of the genus, *C. dallatorreana*, reproduces by thelytokous parthenogenesis : females are not fertilized and produce female clones only. In some populations of *C. parvula*, almost no males are present, and thus the same mechanism is expected to occur in this species.

Nesting

Ceratina nest inside plant stems and are solitary. Most of the species prefer nesting in dry broken stems of brambles (*Rubus sp.*), where they can readily access the medulla. To create the nest they chew the medulla to generate an empty space along a large proportion of the stem length. The structure of the nest is lineal, the cells separated by walls of chewed medulla. There can be up to 10 cells in the nest of the most prolific species such as *C. cucurbitina*. The large species of the genus can nest in dry hollow stems of certain large species of Apiaceae, like *C. chalcites*. The fertilized eggs are laid first and occupy the deepest cells of the nest, they will give birth to females. The cells closest to the opening of the nest contain the unfertilized eggs that will give birth to the males. The latter will come out a few days before the females. Once the nest is ready, the female dies. However, in some tropical species, the female stays in the nest until the next generation emerges. It looks like the females are in charge of taking care of the young emerged adults providing them with nectar before they depart for their overwintering site. This maternal behaviour is quite unusual in bees.

Parasites

They have no known bee cleptoparasites. In any case, their nests are not free of attack as dead adults have been found within the nests with the abdomens swollen due to dipteran pupae.

Floral preferences

Ceratina are mostly polylectic but they display floral preferences for species of Lamiaceae, Rosaceae, Asteraceae and Dipsacaceae that grow close to their nest. They sometimes tend to forage on plant species normally not visited by bees. The pollen is carried back to the nest mostly in the crop.

Type species: *Hylaeus albilabris, 1793 = Apis cucurbitina Rossi, 1792,* Monobasic, Placed on official List of Generic Names in Zoology by Commission Opinion 1011 (1973).

Synonyms: *Clavicera* Latreille, 1802

Etymology: from the Greek *cerato*, meaning *horn*, as a reference to their thick antennae

Common names:
FR: les cératines
EN: the small carpenter bees
GER: der Keulhornbienen (= bees with leg-like antennae)
NL: de ertsbijen (=metallic bees).

List of species found in Europe:

1. *Ceratina (Euceratina) acuta* Friese, 1896
2. *Ceratina (Euceratina) albosticta* Cockerell, 1931
3. *Ceratina (Neoceratina) bispinosa* Handlirsch, 1889
4. *Ceratina (Euceratina) callosa* (Fabricius, 1794)
5. *Ceratina (Euceratina) chalcites* Germar, 1839

6. *Ceratina (Euceratina) chalybea* Chevrier, 1872
7. *Ceratina (Euceratina) chrysomalla* Gerstaecker, 1869
8. *Ceratina (Ceratina) cucurbitina* (Rossi, 1972)
9. *Ceratina (Euceratina) cyanea* (Kirby, 1802)
10. *Ceratina (Euceratina) cypriaca* Mavromoustakis, 1949
11. *Ceratina (Euceratina) dallatorreana* Friese, 1896
12. *Ceratina (Euceratina) dentiventris* Gerstaecker, 1869
13. *Ceratina (Euceratina) gravidula* Gerstaecker, 1869
14. *Ceratina (Euceratina) loewi* Gerstaecker, 1869
15. *Ceratina (Euceratina) mandibularis* Friese, 1896
16. *Ceratina (Euceratina) mocsaryi* Friese, 1896
17. *Ceratina (Euceratina) moricei* Friese, 1899
18. *Ceratina (Euceratina) nigroaenea* Gerstaecker, 1869
19. *Ceratina (Euceratina) nigrolabiata* Friese, 1896
20. *Ceratina (Ceratina) parvula* Smith, 1854
21. *Ceratina (Euceratina) sakagamii* Terzo, 1998
22. *Ceratina (Euceratina) saundersi* Daly, 1983
23. *Ceratina (Neoceratina) schwarzi* Kocourek, 1998
24. *Ceratina (Pithitis) tarsata* Morawitz, 1872
25. *Ceratina (Euceratina) teunisseni* Terzo & Rasmont, 1997
26. *Ceratina (Euceratina) zandeni* Terzo, 1998

Subgenera found in Europe:

1. *Ceratina s.str.* Latreille, 1802;

2. *Euceratina Hirashima*, Moure and Daly, 1971;

3. *Neoceratina* Perkins, 1912;

4. *Pithitis* Klug, 1807.

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Funded by the European Commission