Pollinator Academy

Genus: *Xylocopa*

Female

Male

Genus: *Xylocopa* Latreille, 1802

Clade: Anthophila

Family: Apidae

SubFamily: Xylocopinae

Tribe: Xylocopini

Number of species of this genus found in Europe: 9

Morphology & diagnosis

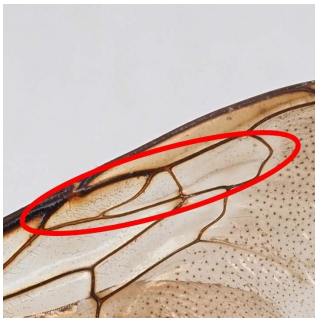
Xylocopa are very large bees, the largest in Europe (13-30 mm). Their robust black bodies make them easy to recognize in the field. Apart from *X. iris*, the rest of *Xylocopa* species are larger than bumble bee queens. They have a long tongue and three submarginal cells, the second cell strongly extending under the first. Their faces are wide and flat. The cuticle is totally black or brown, lacking any light spot except for the species *X. olivieri* where the males show a yellow clypeus and *X. virginica* where the male's face is white. They show clear adaptations to warm climates: the metasoma is flat dorso-ventrally and the pilosity is sparse. Three species show a black cuticle, pilosity and wings, the wings being also characterized by blue iridescent reflections, *Xylocopa iris, X. valga and X. violacea*. In the rest of the species the pilosity show a more varied colour: brown, russet, beige, white and the wings show a hyaline appearance. Females carry two strong teeth at mid-length on the dorsal side of the hind tibia, which can be preceded by one or two rows of aligned teeth or a bumpy surface. The pygidial plate forms an apical spine, which can be bordered by small lateral teeth. The scopa is present on the tibia and metatarsus of the hind legs.

Summary of distinctive traits

- Large to very large species (a)
- Black or brown cuticle, with sometimes yellow or white hairs (b)
- 3 submarginal cells, submarginal cell 3 being much larger than cell 2 (c)
- 2 spines on the external side of the posterior tibia, sometimes under a sculptured area (d)

(a) *Xylocopa violacea*
Female

(b) *Xylocopa amedaei*
Female



(c) *Xylocopa amedaei*
Female

(d) *Xylocopa pubescens*
Female

General comments on identification to species level

A revision of the genus *Xylocopa* with helpful illustrations is provided by Terzo et al. (2007). Some of the European *Xylocopa* species can readily be identified using the yellow hair patterns. The dark species require more subtle traits such as ones related to the pygidial plate, the structure of the external part of the hind tibia and the head punctuation. For the males, the most important criteria are the colour of the metasoma, the colour of the last antennal segments and the shape of the hind metatarsus and femur.

Morphologically similar genera, and how to distinguish them

Xylocopa species could be confused with other large black bees if looked upon only superficially, such as *Chalicodoma muraria* and *Andrena morio.*

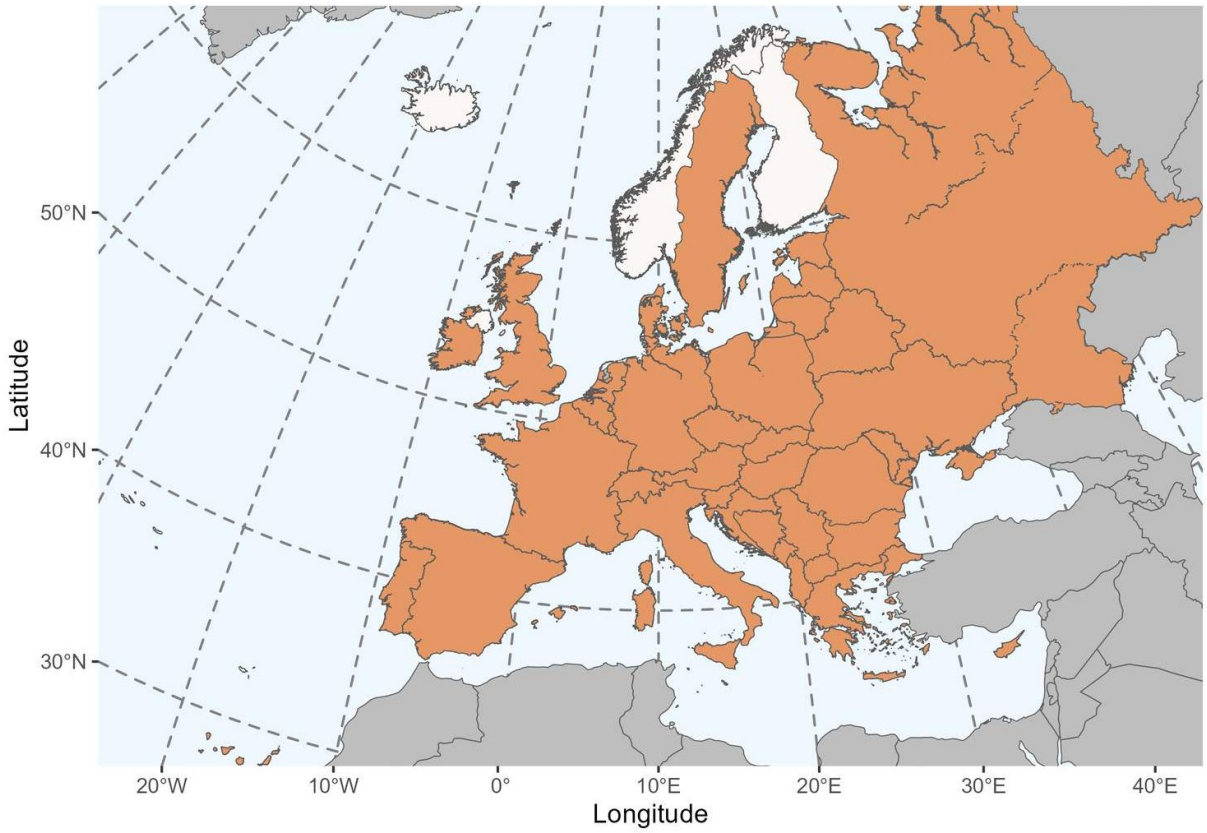
- ***Xylocopa – Andrena - Chalicodoma***

  Xylocopa species have submarginal cell 3 much larger than submarginal cell 2, and only one subantennal suture. *Andrena* species have submarginal cell 3 smaller than submarginal cell 2, and two subantennal sutures.

  Chalicodoma species have only two submarginal cells, and the female wears a thick scopa under the metasoma while *Xylocopa* female wears its scopa on the hind tibia.

Geographical distribution and global diversity

The genus *Xylocopa* occurs and is abundant in all continents except Oceania where they show a limited diversity. They are mainly distributed across the tropical and subtropical regions, and only a few species are present in temperate regions. They occupy, altogether with the Anthophorines, the ecological niche occupied by bumble bees in colder climates. The genus *Xylocopa* is the only genus of its tribe. At the global scale, this genus consists of around 200 species described, from which only 9 occur in Europe. From these, 5 species are endemic and more or less spread eastwards and to North Africa (*X. valga, X. violacea, X. iris, X. cantabrita, X. olivieri*), 2 species are African which have some populations settling permanently in southern Europe (*X. amedaei, X. pubescens*), 1 species installed in England (*X. virginica*) introduced accidentally from the United States and a sub-Saharan Africa species from which one or two specimens have been found by chance in southern Europe but without ever having observed a stable population (*X. nigrita*).



Presence in Europe

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

Biology

Seasonal life cycle

Their flying period ranges from spring to autumn, resembling that of the bumble bees. They often have overlapping generations. They overwinter as adults. Males emerge first, with a common delay of 3-4 weeks between the peak abundance of males and females. The different generations are overlapping, with mothers coexisting with daughters.

Sociality

They are mainly solitary, but certain species can show a facultative social behaviour. Solitary and social nests sometimes are found within the same populations. Mainly the origin of the social nests is cooperation between mother and daughter, or between sisters. In some cases, there can be cooperation between non-kins (Stark 1992).

Reproduction

Reproduction in this genus takes place in spring. Certain males are territorial, showing a patrolling behaviour where the territories are delimited by the nests, flower patches or landmarks in the landscape. Males have scent glands in the head, thorax, legs and tergites, which play a role in attracting females. Males take the females on flight and land on an adequate spot for the copula, which takes place around the flowers where females forage. In the species *X. violacea*, males approach females while they are foraging and jump on her. There is partner selection, because the males do not attempt copula with all the females that are on their territory. She is in charge of repelling him or not, if he is not rejected the copula lasts several tens of seconds. During the copula, the male touches the female's antennae with his own at regular intervals of a few seconds, level with the last orangey segments, at the same time his body is vibrating strongly and provides a buzzing sound.

Nesting

European species of *Xylocopa* are totally solitary and most of them are wood cutters. The larger species dig their nest in dead wood. Their nest consists of one or more linear galleries with a single opening. The biggest nests can contain up to 20 cells. The cells are separated by walls made of chewed wood mixed with wood fibres. *X. iris,* the smallest species, is stem nesting, and their nests are linear with 5-7 cells. This species is using very large dried-out ligneous annual stems, mainly from Apiaceae. Contrarily, all the species of the subgenus *Proxylocopa* are ground-nesting species. The nest entrances are recognized by an individual odour, which is probably left behind by jaw glands during nest construction. Female lays about ten eggs on average, which take between 6 and 8 weeks to develop as an adult. Nests are often reused.

Parasites

They have no known bee cleptoparasite.

Floral preferences

The *Xylocopa* species are largely polylectic, but they display preferences for large flowers like Fabaceae, Lamiaceae, Asteraceae and Liliaceae. Pollen transport structures include the scopa in the hind legs, but most of the pollen collected is ingested and stored in the crop. Many species of *Xylocopa* are known for their nectar-robbing behaviour. They have a large flight range.

Type species: *Apis violacea* Linnaeus, 1758, by designation of Westwood, 1840: 86.

Synonyms: *Koptorthosoma* Dalla Torre, 1896; *Cyaneoderes* Ashmead, 1899; *Coptorthosoma* Pérez, 1901; *Euryapis* Sandhouse, 1943; *Xilocopa* Latreille, 1802.

Etymology: the name is a reference to their behaviour of nesting in wood, and comes from the Greek *xylo*, meaning *wood*, and *cop*, meaning *cut*.

Common names:
FR: les xylocopes ou abeilles perce-bois
EN: large carpenter bees
GER: der Holzbienen (=wood bees)
NL: de houtbijen (=wood bees)

List of species found in Europe:

1. *Xylocopa (Afroxylocopa) nigrita* (Fabricius 1775)
2. *Xylocopa (Copoxyla) iris* (Christ 1791)
3. *Xylocopa (Koptorthosoma) pubescens* Spinola 1838

4. *Xylocopa (Proxylocopa) olivieri* Lepeletier 1841
5. *Xylocopa (Rhysoxylocopa) amedaei* Lepeletier 1841
6. *Xylocopa (Rhysoxylocopa) cantabrita* Lepeletier 1841
7. *Xylocopa (Xylocopa) valga* Gerstaecker 1872
8. *Xylocopa (Xylocopa) violacea* Linnaeus 1758
9. *Xylocopa (Xylocopoides) virginica* (Linnaeus 1771)

References

Greling, D. & H.R. Hermann. 1978. Biology and Mating Behavior of *Xylocopa virginica L.* (Hymenoptera, Anthophoridae). *Behavioral Ecology and Sociobiology,* 3: 99-111.

Malyshev, S. 1947. The life and instincts of the dwarf carpenter bee, *Xylocopa iris* Christ. *Bulletin de l'Académie des Sciences de l'URSS, Série Biologique*, 1: 53-77.

Terzo, M., S. Iserbyt & P. Rasmont. 2007. Révision des Xylocopinae (Hymenoptera: Apidae) de France et de Belgique. *Annales de la Société entomologique de France (n.s.)*, 43(4): 445-491.

Terzo, M. & P. Rasmont. 1997. Révision des *Xylocopa* Latreille du sous-genre *Copoxyla* Maa des pays circum-méditerranéens (Hymenoptera, Apoidea). *Bulletin de la Société entomologique de France,* 102(4): 367-377.

Vicidomini, S. 1997. Bibliografia italiana sulla biologia della tribù Xylocopini (Hymenoptera: Apidae: Xylocopinae: *Xylocopa* Latreille, 1802). *Bollettino del MuseoCivico di Storia Naturale di Verona*, 21: 351-369.s

Attributions

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