Pollinator Academy

Genus: *Hoplitis*

Female

Male

Genus: *Hoplitis* Klug, 1807

Clade: Anthophila

Family: Megachilidae

SubFamily: Megachilinae

Tribe: Osmiini

Number of species of this genus found in Europe: 100

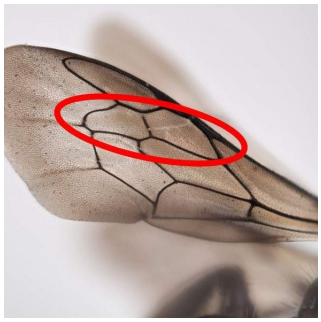
Morphology & diagnosis

The body shape, sculpture and pilosity is highly variable in this diversified genus. They are small to large sized bees (6-16mm) with a black cuticula without metallic reflections and coloured pilosity across the body, which is forming interrupted bands on the gaster. Their forewings bear two submarginal cells, and the marginal cell is rounded at the tip. They have an arolia between the tarsal claws. Both segments 3 and 4 of the labial palpus project laterally. The pronotal lobes are rounded, without carina. Their axillae are not spined and the propodeal enclosure is vestigial without distinct carina bordering its posterior margin. The parapsidial lines of the scutum are long (at least as long as four mesonotal punctures). The first tergum is not carinate but may have a conspicuous angular demarcation between the declive and the horizontal part. The labrum of a female bears a fringe of long hairs but not a preapical tuft of long erect hairs. They have robust to slender mandibules with a distal margin that is usually at most as long as half the length of the mandibule. In males, the metasomal tergum 6 usually has a lateral tooth on the apical margin. The tergum 7 is strongly sclerotized and not hidden by large tergum 6. Their sternum 6 often have basal flaps. Only the males of the *Stenosmia* subgenus do not have lateral teeth on the T6 apical margin and basal flaps on the S6. They can be recognized by the remarkably long stigma on their anterior wings which is half as long as the marginal cell length. Only the *Allosmia*, *Hoplosmia* and *Nasutosmia* subgenera include species with black cuticula, linear parapsidial and males with toothed metasomal tergum 6 (*Nasutosmia*) and may be confused with some *Hoplitis*. Females of *Allosmia* have a remarkably rugose clypeus (entirely and coarsely reticulate). The males are characterized by two-toothed mandibles in combination with the shape of tergum 7, which is either predominantly flat and apically bifid or laterally distinctly curved downwards and apically rounded to truncate. *Hoplosmia* species have spined axillae. Females of *Nasutosmia* have a conspicuous medioapical protuberance on the clypeus while the males have toothed metasomal tergum 6 but no basal flaps on the metasomal sternum 6.

Summary of distinctive traits

- 2 submarginal cells (a)
- Ventral scopa in females (b)

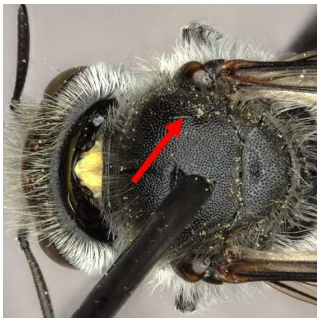
- Arolium present (c)
- Long parapsidal lines (d)



(a) *Hoplitis pallidicornis* Female

(a) *Hoplitis pallidicornis* Female

(a) *Hoplitis tridentata* Male



(a) *Hoplitis pallidicornis* Female

General comments on identification to species level

Some important the criteria for species identification are the mandible shape, hypostomal carina, proboscis, propodeum and T1 punctation and in males genitalia and last tergites. Specimen preparation should therefore include raising the head and opening the mandible to make mouthparts visible, along with extraction of genitalia and extension of segments 6 and 7.

Morphologically similar genera, and how to distinguish them

- ***Hoplitis - Osmia***

  Hoplitis species have a black cuticula, very long parapsidal lines and usually slender mandibules.

  Osmia species often have a body with metallic reflection, short parapsidal lines and robust mandibules. The subgenera *Allosmia*, *Hoplosmia* and *Nasutosmia*

includes black species with long parapsidial lines. They may be distinguished from *Hoplitis* species by the rugose clypeus (*Allosmia*), the spined axillae (*Hoplosmia*) or by a remarkable apical projection on the clypeus (*Nasutosmia*).

- ***Hoplitis - Haetosmia***
  Hoplitis species tend to be larger, do not have a dilated probasitarsus and do not have carinate pronotal lobes.
  Haetosmia species tend to be smaller, they have a strongly carinate pronotal lobe and a dilated probasitarsus.

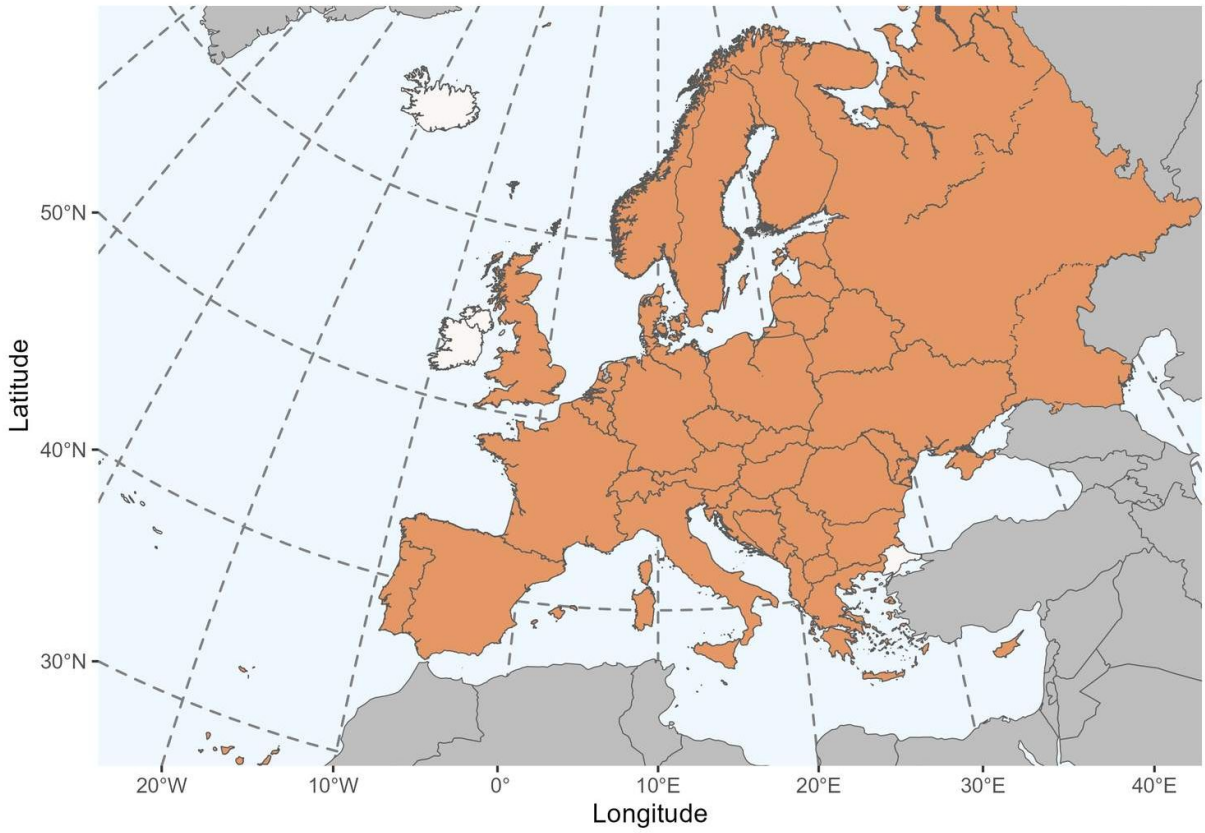
- ***Hoplitis - Chelostoma & Hofferia***
  Hoplitis species have long hairs at the apex of the labrum. Scutellum often shorter than the ITD.
  Chelostoma & *Hofferia* species do not have long hairs at the apex of the labrum. Scutellum as long or longer than the ITD.

- ***Hoplitis - Heriades & Stenoheriades***
  Hoplitis species don't have a transverse carina on the T1.
  Heriades & *Stenoheriades* species do have a transverse carina on the T1.

- ***Hoplitis - Protosmia***
  Hoplitis species have a vestigial propodeal triangle and a stout body-shape. The labrum bears an apical tuft of long hairs.
  Protosmia species have a marked propodeal triangle and a slender body-shape. The labrum do not have a conspicuous tuft of long hair.

Geographical distribution and global diversity

This genus is distributed along Europe, Africa, Asia and North America. There are more than 370 described species at the global scale, most of them on the Mediterranean basin, desertic parts of Europe and temperate parts of Asia.



Presence in Europe

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

Biology

Seasonal life cycle

They are univoltine summer species. They overwinter as a prepupa. In some cases it can overwinter for two consecutive years.

Reproduction

Males are territorial, their territory including areas with the host plant of the females. As soon as one female approaches, the male tries to copulate. Females only copulate once.

Nesting

There is a huge diversity of nesting behaviours in this genus. They may nest in excavated burrows in the soil or in pithy stems, in pre-existing cavities (e.g. insect burrows) in dead wood, pithy stems, galls, in the soil, in empty snail shells, in fissures or holes in rocks (e.g. many *Hoplitis* s. str.). Some species are mason bees and build exposed nests. All species are solitary. Some species line the interior walls of the nest cells with slices of leaves or petals, like *Megachile*.

Parasites

They are parasitized by species of the genera *Stelis*, *Aglaoapis*, and *Coelioxys*.

Floral preferences

Most of the species are oligolectic. Some are oligolectic on members of the family Fabaceae, others on *Echium* (Boraginaceae), or *Helianthemum* (Asteraceae). A few species are polylectic but still show preferences for the genus and families for which there are oligolectic species.

Type species: *Apis adunca* Panzer, 1798, monobasic.

Synonyms: *Ctenosmia* Thomson, 1872; *Bytinskia* Mavromoustakis, 1954; *Annosmia* Warncke, 1991; Coloplitis Griswold, 1998.

Etymology: this name comes from the Greek root 'hoplo', meaning 'weapon', by extension 'with a spine'.

Common names:
FR: les Hoplitis
GER: der Mauerbienen
NL: kleine metselbijen

List of species found in Europe:

1. *Hoplitis (Alcidamea) acuticornis* (Dufour & Perris, 1840)
2. *Hoplitis (Hoplitis) adunca* (Panzer, 1798)
3. *Hoplitis (Anthocopa) agis* (Benoist, 1929)
4. *Hoplitis (Stenosmia) albatera* (Warncke, 1991)
5. *Hoplitis (Anthocopa) albiscopa* (Friese, 1899)
6. *Hoplitis (Anthocopa) anipuncta* (Alfken, 1935)
7. *Hoplitis (Hoplitis) annulata* (Latreille, 1811)
8. *Hoplitis (Micreriades) antalyae* Tkalců, 2000
9. *Hoplitis (Hoplitis) anthocopoides* (Schenck, 1853)
10. *Hoplitis (Anthocopa) antigae* (Pérez, 1895)
11. *Hoplitis (Anthocopa) batyamae* (van der Zanden, 1986)
12. *Hoplitis (Hoplitis) benoisti* (Alfken, 1935)
13. *Hoplitis (Alcidamea) bicallosa* (Morawitz, 1876)
14. *Hoplitis (Hoplitis) bihamata* (Costa, 1885)
15. *Hoplitis (Alcidamea) bispinosa* van der Zanden, 1992

16. *Hoplitis (Anthocopa) bisulca* (Gerstaecker, 1869)
17. *Hoplitis (Alcidamea) brachypogon* (Pérez, 1870)
18. *Hoplitis (Pentadentosmia) cadiza* (Warncke, 1991)
19. *Hoplitis (Alcidamea) campanularis* (Morawitz, 1877)
20. *Hoplitis (Hoplitis) carinata* (Stanek, 1969)
21. *Hoplitis (Alcidamea) ciliaris* (Pérez, 1902)
22. *Hoplitis (Alcidamea) claviventris* (Thomson, 1872)
23. *Hoplitis (Anthocopa) corcyraea* (Tkalců, 1979)
24. *Hoplitis (Anthocopa) cristatula* (van der Zanden, 1990)
25. *Hoplitis (Alcidamea) curtula* (Pérez, 1896)
26. *Hoplitis (Alcidamea) curvipes* (Morawitz, 1872)
27. *Hoplitis (Anthocopa) cypriaca* (Mavromoustakis, 1938)
28. *Hoplitis (Anthocopa) dalmatica* (Morawitz, 1871)
29. *Hoplitis (Hoplitis) fabrei* van der Zanden, 1987
30. *Hoplitis (Anthocopa) fasciculata* (Alfken, 1934)
31. *Hoplitis (Hoplitis) fertoni* (Pérez, 1891)
32. *Hoplitis (Alcidamea) fulva* (Eversmann, 1852)
33. *Hoplitis (Alcidamea) galbula* (Warncke, 1991)
34. *Hoplitis (Hoplitis) galichicae* Müller, 2016
35. *Hoplitis (Anthocopa) graeca* (Tkalců, 2001)
36. *Hoplitis (Alcidamea) grossepunctata* (Kohl, 1905)
37. *Hoplitis (Anthocopa) grumi* (Morawitz, 1894)
38. *Hoplitis (Micreriades) haemi* Tkalců, 2001
39. *Hoplitis (Hoplitis) hilbera Müller, 2012*
40. *Hoplitis (Hoplitis) holmboei* (Mavromoustakis, 1949)
41. *Hoplitis (Hoplitis) idaensis* (Warncke, 1991)
42. *Hoplitis (Micreriades) illyrica* (Noskiewicz, 1926)

43. *Hoplitis (Hoplitis) insularis* (Schmiedeknecht, 1885)
44. *Hoplitis (Anthocopa) jakovlevi* (Radoskowski, 1874)
45. *Hoplitis (Hoplitis) jheringii* (Ducke, 1898)
46. *Hoplitis (Pentadentosmia) laevifrons* (Morawitz, 1872)
47. *Hoplitis (Hoplitis) lepeletieri* (Pérez, 1879)
48. *Hoplitis (Alcidamea) leucomelana* (Kirby, 1802)
49. *Hoplitis (Alcidamea) limassolica* (Mavromoustakis, 1937)
50. *Hoplitis (Hoplitis) lithodorae* Müller, 2012
51. *Hoplitis (Hoplitis) loti* (Morawitz, 1867)
52. *Hoplitis (Chlidoplitis) lysholmi* (Friese, 1899)
53. *Hoplitis (Hoplitis) manicata* (Morice, 1901)
54. *Hoplitis (Anthocopa) manuelae* Müller, 2012
55. *Hoplitis (Hoplitis) marchali* (Pérez, 1902)
56. *Hoplitis (Micreriades) mazzuccoi* (Schwarz & Gusenleitner, 2005)
57. *Hoplitis (Alcidamea) mitis* (Nylander, 1852)
58. *Hoplitis (Anthocopa) mocsáryi* (Friese, 1895)
59. *Hoplitis (Alcidamea) mollis* Tkalců, 2001
60. *Hoplitis (Hoplitis) monticola* Müller, 2012
61. *Hoplitis (Pentadentosmia) moricei* (Friese, 1899)
62. *Hoplitis (Anthocopa) nicolaei* Müller, 2012
63. *Hoplitis (Anthocopa) obtusa* (Friese, 1899)
64. *Hoplitis (Alcidamea) occidentalis* Müller, 2012
65. *Hoplitis (Hoplitis) ochraceicornis* (Ferton, 1902)
66. *Hoplitis (Chlidoplitis) onychophora* (Mavromoustakis, 1939)
67. *Hoplitis (Hoplitis) pallicornis* (Friese, 1895)
68. *Hoplitis (Anthocopa) papaveris* (Latreille, 1799)
69. *Hoplitis (Micreriades) parnesica* (Mavromoustakis, 1958)

70. *Hoplitis (Anthocopa) peniculifera* Müller, 2012

71. *Hoplitis (Hoplitis) perambigua* (Peters, 1975)

72. *Hoplitis (Anthocopa) perezi* (Ferton, 1895)

73. *Hoplitis (Hoplitis) pici* (Friese, 1899)

74. *Hoplitis (Pentadentosmia) pomaria* (Warncke, 1991)

75. *Hoplitis (Alcidamea) praestans* (Morawitz, 1893)

76. *Hoplitis (Alcidamea) princeps* (Morawitz, 1873)

77. *Hoplitis (Anthocopa) pulchella* (Pérez, 1895)

78. *Hoplitis (Pentadentosmia) quinquespinosa* (Friese, 1899)

79. *Hoplitis (Hoplitis) ravouxi* (Pérez, 1902)

80. *Hoplitis (Formicapis) robusta* (Nylander, 1848)

81. *Hoplitis (Anthocopa) saundersi* (Vachal, 1891)

82. *Hoplitis (Anthocopa) saxialis* (van der Zanden, 1994)

83. *Hoplitis (Anthocopa) serainae* Müller, 2012

84. *Hoplitis (Hoplitis) stecki* (Frey-Gessner, 1908)

85. *Hoplitis (Alcidamea) stellaris* (Warncke, 1991)

86. *Hoplitis (Hoplitis) strymonia* Tkalců, 1998

87. *Hoplitis (Alcidamea) subbutea* (Warncke, 1991)

88. *Hoplitis (Hoplitis) submanicata* van der Zanden, 1984

89. *Hoplitis (Anthocopa) taurica* (Radoszkowski, 1874)

90. *Hoplitis (Micreriades) tenuispina* (Alfken, 1937)

91. *Hoplitis (Chlidoplitis) teucrii* (Benoist, 1927)

92. *Hoplitis (Megahoplitis) tigrina* (Morawitz, 1972)

93. *Hoplitis (Hoplitis) tkalcuella* Le Goff, 2003

94. *Hoplitis (Alcidamea) tridentata* (Dufour & Perris, 1840)

95. *Hoplitis (Alcidamea) tuberculata* (Nylander, 1848)

96. *Hoplitis (Alcidamea) turcestanica* (Dalla Torre, 1896)

97. *Hoplitis (Anthocopa) villosa* (Schenck, 1853)
98. *Hoplitis (Anthocopa) yermasoyiae* (Mavromoustakis, 1938)
99. *Hoplitis (Anthocopa) zaianorum* (Benoist, 1927)
100. *Hoplitis (Tkalcua) zandeni* (Teunissen & van Achterberg, 1992)

Subgenera found in Europe:

- *Alcidamea* Cresson, 1864
- *Anthocopa* Lepeletier and Serville, 1825
- *Chlidoplitis* Griswold, 1998
- *Formicapis* Sladen, 1916
- *Hoplitis* s.str. Klug, 1807
- *Megahoplitis* Tkalců, 1993
- *Micreriades* Mavromoustakis, 1958
- *Pentadentosmia* Warncke, 1991
- *Stenosmia* Michener, 1941
- *Tkalcua* Kocak & Kemal 2010

References

Müller A. 2016. *Hoplitis (Hoplitis) galichicae* spec. nov., a new osmiine bee species from Macedonia with key to the European representatives of the *Hoplitis adunca* species group (Megachilidae, Osmiini). *Zootaxa*, 4111(2) : 167-176.

Nieuwenhuijsen H. 2014. Determinatietabel voor de Nederlandse soorten metselbijen (*Hoplitis* en *Osmia*). Hymeno Varia, 8 : 29-39.

Sedivy C., Dorn S., Müller A. 2013. Molecular phylogeny of the bee genus *Hoplitis* (Megachilidae: Osmiini) – how does nesting biology affect biogeography? *Zoological Journal of the Linnean Society*, 167: 28-42.

Attributions

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