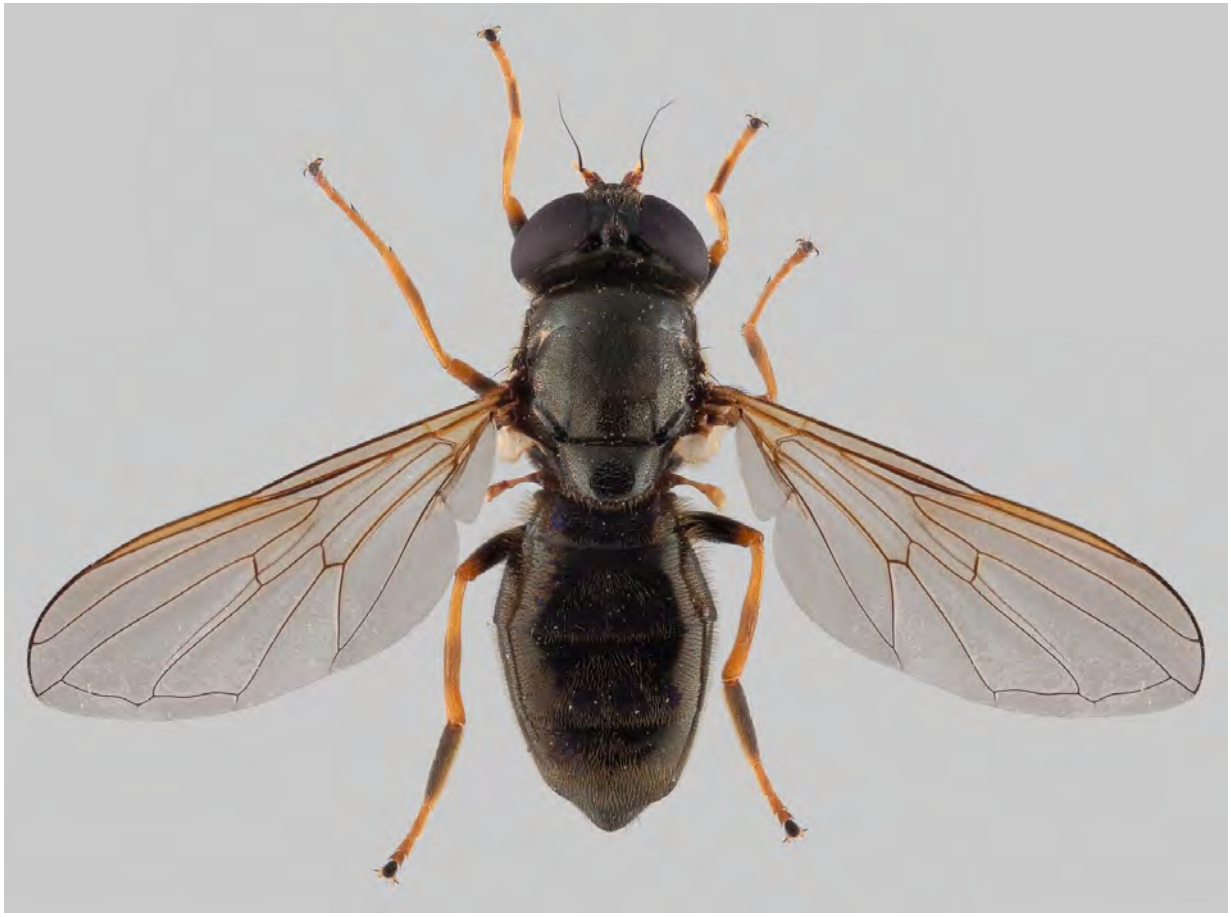
Pollinator Academy

Genus: *Cheilosia*



Cheilosia pagana female

Genus: *Cheilosia* Meigen, 1822

Family: Syrphidae

Subfamily: Eristalinae

Tribe: Rhingiini

Number of species of this genus found in Europe: 120

Description

Head

Black, exceptionally part of the face, gena or lunule are reddish to yellow. The facial tubercle is distinct but variable in size and shape, and is species specific characteristic. The face is mostly partly dusted, and sometimes also hairy. The parafacia typically extend from about anterior tentorial pit to the level of the antennal fossa, and the width of the parafacial, and presence of dusting and pilosity on parafacia is variable. The eye is entirely bare, or with short or long hairs (sometimes only partly bare or with microscopic hairs), the colour of eye hairs ranges from white or yellowish to black. The lunule is narrow, and the shape of the medial process of the lunule ranges from narrow and pointed to broad and blunt. The antennal fossa are connected or separated by the medial extension of the lunule. The shape and width of the frons variable, in the holoptic males the frons is variably raised, with presence of pilosity and dusting variable between species. The frontal angle in male ranges from acute to obtuse. The frons of the dichoptic female is typically less dusted, mostly with three longitudinal frontal furrows visible

(one medial and two lateral), extending from vertex to frontal prominence area. Vertex is dusted or shiny. Ocellar triangle is isosceles or equilateral. Basoflagellomere with colour ranging from bright orange to dull black, and shape from roundish, squarish or elongated, arista is inserted dorsally in basal half (sometimes arista placed more forward). Arista is bare, or with short or long pilosity. The basoflagellomere is always larger in the female.

Thorax

Black, or exceptionally with postpronotum, scutellum, and postalar calli partly yellow. Always at least partly hairy, the length, composition, inclination and colour of pilosity on pleurae, and scutum and scutellum varies greatly and is often species-specific. Scutellum margin with or without stronger, differentiated black bristles (sometimes these bristles yellow). The notopleural area, wing base area and postalar callus with or without black bristles. Pleura always with some pilosity and often also with dusting. Anepisternum with postero-dorsal triangular corner of anterior part with or without hairs in addition to dusting, sometimes hairs on pleural sclerites apically crinkly (wavy). Dorsal and ventral hair patches of katepisternum confluent or separated.

Wings

Hyaline, or with dark-brown markings medially and/or along veins, mostly completely covered with microtrichia. Colour of veins range from yellow to dark-brown. Cells R_1 and R_{2+3} of wing open, medial

cross-vein (r-m) located before middle of discal cell. Vein M_1 meets R_{4+5} at a right, acute or obtuse angle.

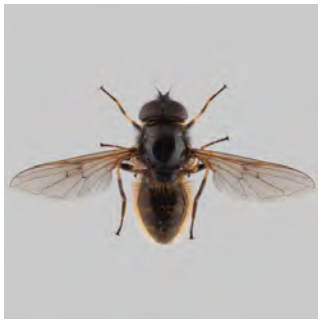
Abdomen

Black, hairy, with length, composition, inclination and colour of pilosity variable, also presence and extent of dusting on tergites and sternites variable.

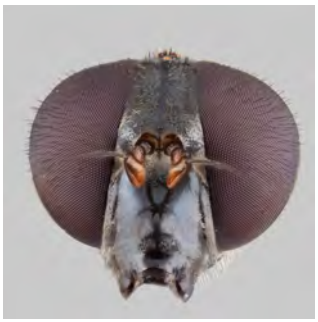
Legs

Simple, with femora, tibiae and tarsi unicolorous black or yellow, or bi-coloured. Legs are hairy, length, composition and colour of leg pilosity is variable. Fore coxa sometimes with a basal spur.

Cheilosia illustrata male habitus



Cheilosia montana male habitus



Cheilosia carbonaria female head

Cheilosia nigripes male head

General comments on identification to species level

Among the most abundant and ubiquitous genera in the Palaearctic region is the genus *Cheilosia*. The genus *Cheilosia* comprises small

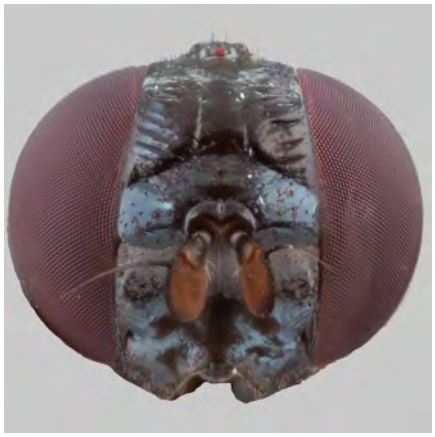
to average sized, with body length 4.5 - 15 mm, moderately robust black hoverflies with both sexes defined by characteristics of the face, namely the presence of a distinct facial tubercle and parafacia. Additionally, the lunule above the antenna is narrow, and the abdomen is elongate or broadly oval. The frons of the female has longitudinal furrows if such are present.

Differential diagnosis

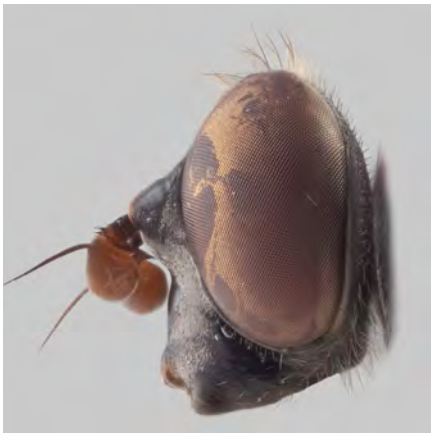
A wide range of hoverfly genera comprise black bodied species with a more or less distinct facial tubercle, which thus morphologically resemble *Cheilosia*. These include the eristaline genera *Chrysogaster*, *Chrysosyrphus*, *Lejota*, *Katara, Melanogaster*, *Orthonevra* and *Portevinia,* and some pipizine genera e.g. *Pipiza, Trichopsomyia* and *Pipizella*. The genera *Chrysogaster*, *Chrysosyrphus* and *Melanogaster* have only a small, or an indistinct, facial tubercle, and the females of genera *Chrysogaster* and *Melanogaster* additionally have distinct transverse furrows on the frons (distinct facial tubercle and smooth frons in *Cheilosia*). In the genus *Katara* both sexes are dichoptic, and the frons has striae in the anterolateral parts (male is holoptic and frons is smooth in *Cheilosia*). Genus *Lejota* has a protruded frons and a concave face (frons not protruded and face not concave in *Cheilosia*). The genera *Lejogaster* and *Orthonevra* differ by having a black body with strong green or blue metallic reflections (in *Cheilosia* the body is shiny black or dull black, and sometimes with a slight metallic reflection). All pipizine genera have a flat, hairy face lacking a facial tubercle and have no distinct parafacia along the eye (face with a distinct

tubercle and with parafacia in *Cheilosia*). *Portevinia* has a face with a very indistinct facial tubercle and a distinctly broad half-moon shaped lunule (facial tubercle distinct and lunule narrow, not half-moon shaped in *Cheilosia*). Additionally, the eye in the male is connected (or nearly connected) over a short distance on top of head in *Portevinia* (eyes are connected over a longer distance in *Cheilosia*). All mentioned genera also have a wing vein pattern different from that in genus *Cheilosia*.

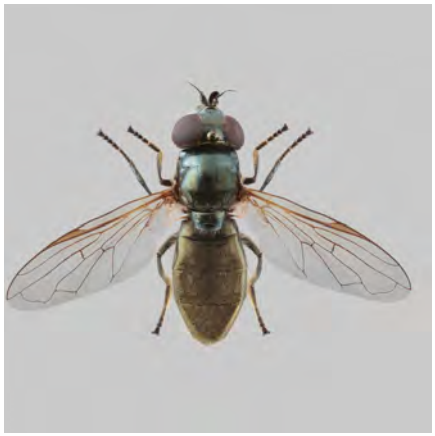
Chrysogaster solstitialis male head



Chrysogaster basalis female head



Lejota ruficornis male head



Lejogaster metallina male habitus

Portevinia maculata male head

Pipiza lugubris male head

Geographical distribution and global diversity

Cheilosia occurs in the Holarctic and Oriental regions with over 450 known species worldwide, and about 120 species have been recorded for from all countries of Europe (excluding the Azores and Canary Islands).

Presence in Europe

Albania, Austria, Belgium, Bosnia & Herzegovina, Bulgaria, Crete, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France (including Corsica), Germany, Greece, Hungary, Italy (including Sicilia and Sardinia), Kosovo, Liechtenstein, Lithuania, Luxembourg, Montenegro, North Macedonia, Norway, Poland, Portugal (except Azores), Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain (including Baleares but not Canary islands), Sweden, Switzerland, The Netherlands, UK, Ukraine.

Biology

Adult behaviour and flower preferences. Cheilosia hoverflies often bask in the sun on leaves of herbaceous plants and bushes, and fly

low in or over the vegetation. Most species visit flowers for nectar and pollen, flies are often found on many species of Compositae, other examples of flowers visited include *Taraxacum*, *Caltha, Crataegus, Ranunculus* and *Salix*. The males are territorial, and hover in the air a few meters above the ground. Some species fly very early in the spring over a short period of time (a few weeks), but the majority of the species are late spring or summer flying species. Some species are bi-voltine in part of their distributional area, and thus have two flight periods (spring/early summer and autumn).

Reproduction and larval biology. The larval host plant is known for about half of the species, in some cases only as observations of egg-laying on a specific plant. Most species appear to utilize only a few host plant species or host fungi. The larvae develop in the roots, base, stem or leaves of herbaceous plants, or in fungal fruiting bodies (mainly Boletaceae) for an overview see Rotheray 1994). Known host plants include species of genera *Allium, Anthriscus, Carduus, Cirsium, Hieracium, Hylotelephium, Leontodon, Petasites, Primula, Ranunculus, Rhodiola, Sempervivum, Sonchus* and *Taraxacum* (Doczkal 1996 and references therein; Rotheray 1988a,b, 1990, 1991; Stubbs 1980; Stuke 2000 and references therein).

Seasonal life cycle. The developmental cycle is mostly annual, and the larvae pass three developmental stages. The larva pupates in the ground in late summer or autumn, and (most species)

overwinter as a puparium. Some species are bi-voltine or multivoltine, and generations can have morphological variability in their appearance (e.g. colour of hairs).

Type species: *Syrphus flavipes* Panzer, 1797, by designation of Coquillett 1910: 521.

Common names:
EN: Blacklets;
FI: keilaset;
SE: örtblomflugor;
DK: urtesvirrefluer

List of species found in Europe:

Presently about 120 *Cheilosia* species are known from Europe classified into eight subgenera.

References

Barkalov, A.V. & Ståhls, G. (1997) Revision of the Palaearctic bare-eyed and black-legged species of the genus *Cheilosia* Meigen (Diptera, Syrphidae). *Acta Zoologica Fennica*, 208, 1–74.

Bartsch, H., Binkiewicz, E., Klintbjer, A., Rådén, A. and Nasibov, E. (2009) *Blomflugor: Eristalinae and Microdontinae. Nationalnyckeln till Sveriges flora och flora, DH 53b*. Artdatabanken, SLU, Uppsala.

Becker, T. (1894) Revision der Gattung *Chilosia* Meigen. — Nova Acta der Ksl. Leop.-Carol. Deutschen Akademie der Naturforsch. LXII, 3, 154–521.

Claussen, C. 1998. Die europäischen Arten der *Cheilosia alpina*-Gruppe (Diptera, Syrphidae). *Bonn. zoologische Beiträge*, 381-410.

Doczkal, D. (1996) Observations on host plants and behaviour of egg-laying females of *Cheilosia* Meigen (Diptera, Syrphidae) in central Europe. *Volucella*, 2, 77–85.

Haarto, A & Kerppola, S. (2007) *Suomen Kukkakärpäset ja lähialueiden lajeja [Finnish hoverflies and some species in adjacent countries]*. Otavan Kirjapaino Oy, Keuruu.

Hellrigl, K. (1992) Die Fichtenharzfliege *Cheilosia morio* Zett. (Dipt., Syrphidae) als physiologischer Schädling an Fichten in Südtirol. *Anzeiger für Schädlingskunde, Pflanzenschutz und Umweltschutz*, 65, 33–36. https://doi.org/10.1007/bf01907121

Hövemeyer, K. (1992) Population studies of *Cheilosia fasciata* (Diptera: Syrphidae), a leaf miner of *Allium ursinum*. *Ecological Entomology*, 17, 331–337. https://doi.org/10.1111/j.1365-2311.1992.tb01066.x

Loew, H. (1857) Die europäischen Arten der Gattung *Cheilosia*. *Verhandlungen der Zoologische-Botanischen Veereins in Wien*, 7, 579–616.

Rotheray, G.E. (1988a) Larval morphology and feeding patterns of four *Cheilosia* species (Diptera: Syrphidae) associated with *Cirsium palustre* L. Scopoli (Compositae) in Scotland. *Journal of Natural History*, 22, 17-25.

Rotheray, G.E. (1988b) Morphology and feeding behaviour of the leaf-mining larva of *Cheilosia semifasciata* (Diptera: Syrphidae). *Journal of Natural History*, 22, 865–873. https://doi.org/10.1080/00222938800770581

Rotheray, G. E. (1990) The relationship between feeding mode and morphology in *Cheilosia* larvae (Diptera, Syrphidae). *Journal of Natural History*, 24, 7-19. DOI: 10.1080/00222939000770021

Rotheray, G.E. (1991) Larval stages of 17 rare or poorly known British hoverflies (Diptera: Syrphidae). *Journal of Natural History*, 25, 945-969.

Rotheray, G.E. (1994) Colour guide to hoverfly larvae (Diptera, Syrphidae) in Britain and Europe. *Dipterists Digest*, 1–156.

Speight, M.C.D. (2020) Species accounts of European Syrphidae, 2020. *Syrph the Net, the database of European Syrphidae (Diptera)*, vol. 104, Syrph the Net publications, Dublin, 314 pp.

Stubbs, A.E. (1980) The rearing of *Cheilosia paganus* and *C. fraterna*. *Entomologist's Record & Journal of Variation*, 92, 114–117.

Stuke, J.-H. (2000) Phylogenetische Rekonstruktion der Verwandtschaftsbeziehungen innerhalb der Gattung *Cheilosia* Meigen, 1822 anhand der Larvenstadien (Diptera: Syrphidae). *Studia Dipterologica, Supplement*, 8, 1-113.

Stuke, J.-H. & Carstensen, L.-B. (2002) Die Biologie und Morphologie der dritten Larvenstadien von vier Mitteleuropäischen *Cheilosia* Arten (Diptera: Syrphidae). *Beiträge zur Entomologie*, 52, 283–307.

Torp, E. (1984) De danske svirrefluer (Diptera: Syrphidae), Kendetegn, levevis og udbredelse. *Danmarks Dyreliv*, 1, 1–300.

Vujić, A. (1996) Genus *Cheilosia* Meigen and related genera (Diptera, Syrphidae) on the Balkan peninsula. *Matica srpska*, Novi Sad, 196 pp.

Attributions

This factsheet was created by Taxo-Fly and is one of the outputs from a network of European Initiatives dedicated to pollinators, such as the EU Pollinator Monitoring Scheme (EUPoMS), the Preparatory Action for EU Pollinator Monitoring Scheme and Indicators (SPRING project), the Horizon 2020 Europe research projects (POSHBEE, SAFEGUARD), and European National action plans for pollinators.

Authors

Photographs: Sander Bot (Taxo-Fly team)

Text: Ante Vujić, Gunilla Ståhls, Sander Bot (Taxo-Fly team)

Reviewer: Leendert-Jan van der Ent (Taxo-Fly team)

Image rights

Most images created under the Taxo-Fly project have an open Creative Commons license (CC BY 4.0). However, some images are licensed to the European Union and shared under the Creative Commons license Attribution-NonCommercial 4.0 International (CC-BY-NC 4.0). This is indicated in the image caption.