

Oestridae

Thomas Pape & Daniel Whitmore (1998 Checklist: Thomas Pape & Marcel Leclercq)

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Diagnosis: Large, robust flies (15-25 mm) with body clothed with pile-like setosity, which varies from short (*Oestromyia*, *Oestrus*, *Pharyngomyia*) to long and furry (*Cephenemyia*, *Gasterophilus*, *Hypoderma*), in some cases giving the species a marked bumble bee-like appearance. Antenna with short postpedicel and bare arista. Mouthparts reduced to minute vestiges. First instar larva usually with one or two bands of robust spines anteriorly on each segment. Posterior segment with numerous crochet-like spines (*Cephenemyia*, *Oestrus*) or with tubular extensions carrying the posterior spiracles (*Gasterophilus*). Second and third instar larva often with strong spines encircling the segments anteriorly, but dorsal surface bare in *Oestrus*. Posterior spiracle with slits almost straight (*Gasterophilus*) or forming a porous plate (*Cephenemyia*, *Hypoderma*, *Oestromyia*, *Oestrus*).

Biology: All Oestridae are obligate parasites of mammals, with larvae living in skin boils (Hypodermatinae), naso-pharyngeal cavities (Oestrinae) or the intestinal tract (most Gasterophilinae). Adult females of European species emerge with mature eggs and mate soon after. Species of European Hypodermatinae glue their eggs to individual hairs of the host. The first instars of *Hypoderma* spp. show an extensive subcutaneous migration before settling and forming a swelling under the skin (warble or skin boil). Species of Oestrinae are ovularviparous, with eggs hatching when they are squirted towards the muzzle of their host, from where the first instar larvae migrate into the pharyngeal area (*Cephenemyia*, *Pharyngomyia*) or the frontal sinuses (*Oestrus*). The first instars of *Gasterophilus* spp. migrate subcutaneously on cheeks or lips or inside the mouth in the epithelium of the tongue or the gums before they enter the gastrointestinal tract. When the larva is mature, it leaves the host, backing out of the warble, passing through the anus or exiting via the nostrils, and pupates in the ground. *Oestromyia leporina* produces skin boils in small rodents, while the remaining European species parasitise larger hosts like horses and asses (*Gasterophilus*) or ruminants (*Cephenemyia*, *Hypoderma*, *Pharyngomyia*).

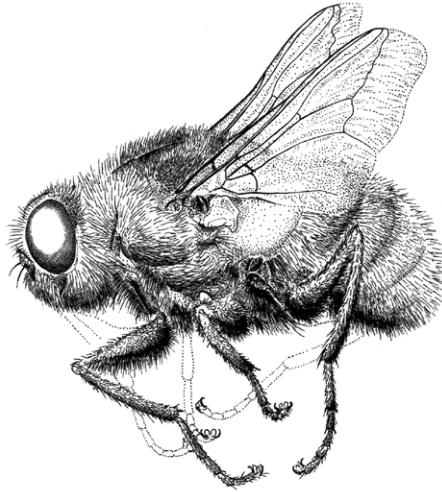
Nomenclature and classification: According to Evenhuis & Pape (2021).

Number of species: CH: 11 (1998 Checklist: 11),

BE: 8, CZ: 13, DE: 14, FR: 16, GB 10, HU: 13, IT: 12, NL: 10, SK: 13, Europe: 23, World: 155. (Pape 2004, Li et al. 2019b, Pape [unpubl])

Level of faunistic knowledge in Switzerland: Good.

General references: Colwell et al. (2006) [general, economic importance, management], Grunin (1965, 1966, 1969) [keys, Palaearctic species], Li et al. (2018, 2019a, 2019b) [world *Gasterophilus*], Minář (2000a, 2000b, 2000c) [general, Palaearctic fauna, keys to genera], Pape (2001, 2006) [phylogeny, evolution], Soos & Minář (1986a, 1986b, 1986c) [catalogue, Palaearctic species].



Hypoderma bovis,
male (CMPD A, p. 479).

References to the Swiss fauna: Bouvier (1971), Brocard & Pfister (1991), Büttiker (1962), Pfister & Charbon (2014), Sauter & Huber (1988), Pape & Leclercq (1998).

Checklist

Gasterophilinae

Gasterophilus Leach, 1817

- *haemorrhoidalis* (Linnaeus, 1758) ! N1
- *intestinalis* (De Geer, 1776) !
- *nasalis* (Linnaeus, 1758) L
- *pecorum* (Fabricius, 1794) L

Hypodermatinae

Hypoderma Latreille, 1818

- *bovis* (Linnaeus, 1758) ! [1]
- *lineatum* (de Villers, 1789) !

Oestromyia Brauer, 1860

- *leporina* (Pallas, 1778) !

Oestrinae

Cephenemyia Latreille, 1818

- *auribarbis* (Meigen, 1824) ! [2]
- *stimulator* (Clark, 1815) !

Oestrus Linnaeus, 1758

- *ovis* Linnaeus, 1758 !

Pharyngomyia Schiner, 1861
- *picta* (Meigen, 1824) !

Notes

N1 *Gasterophilus flavipes* Olivier, 1811 was recently resurrected as a valid species (Li et al. 2019a) and its presence in Switzerland is possible. It is very similar to *G. haemorrhoidalis* and *G. inermis*.

Species records

- [1] 1M, VS, Col de Torrent, 1.7.1929, leg. Erwin Lindner (SMNS)
[2] 1M, GR, St. Bernardin-Pass, 17.6.1960, 2000 m, leg. William Frederick Reinig (SMNS)

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