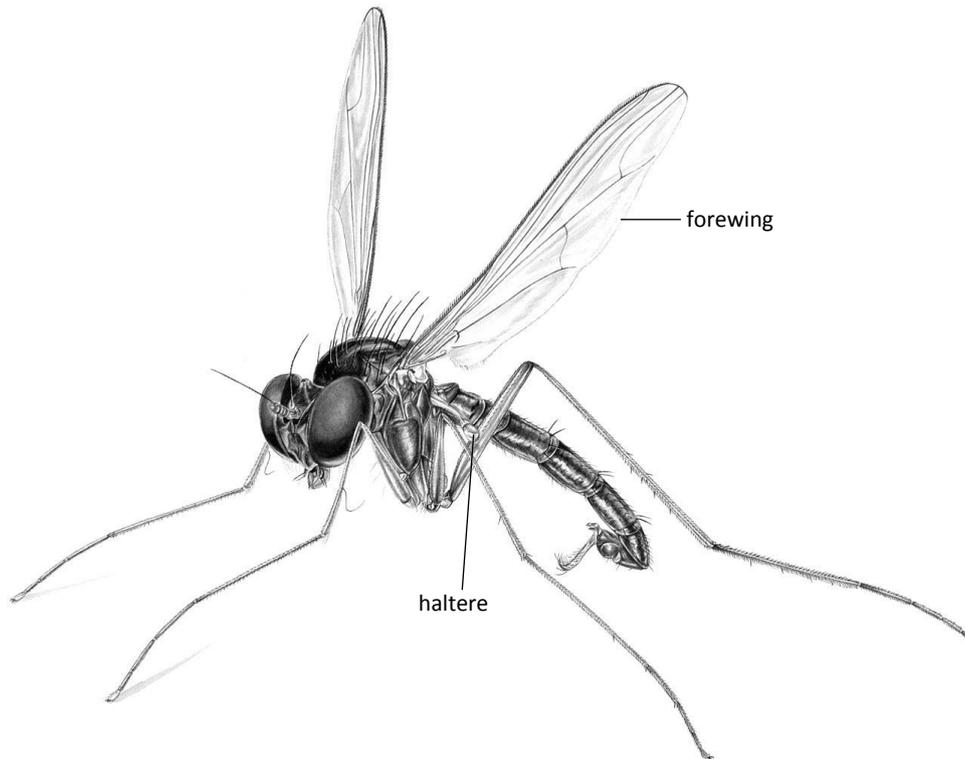


Order Diptera



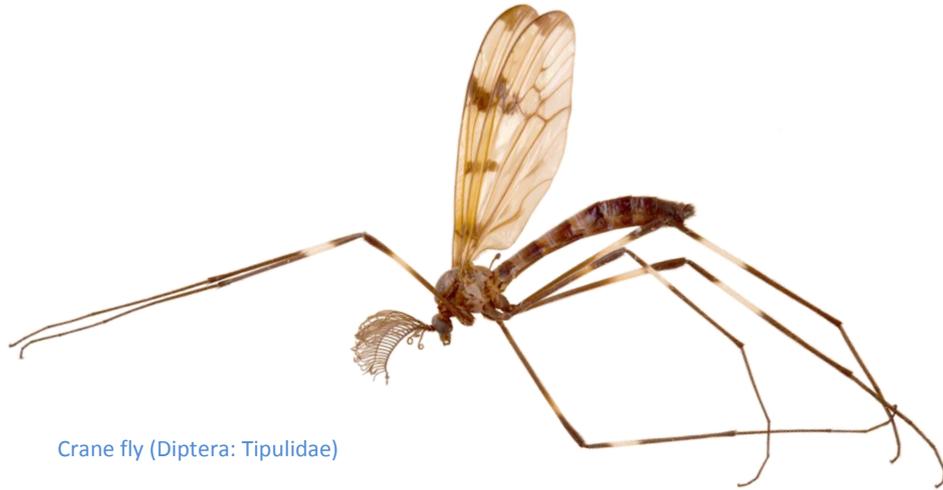
Common names: flies, mosquitoes, horseflies, craneflies, bots, keds, midges, blackflies, fleshflies, fruitflies

Simple diagnosis. Most Diptera differ from the other orders by the structure of their wings, with the forewings well developed, and the hindwings reduced to paddle-shaped or drumstick-shaped structures called halteres. Wingless species have soft spongy mouthparts.

Taxonomic diagnosis. Adult flies are recognised by their membranous forewings with reduced venation and hindwings reduced to halteres; sometimes both pairs of wings are reduced or absent. Mouthparts are of two types or may be absent. In brachyceran flies the clypeus, labrum, maxillae, labium and hypopharynx form a rostrum often with a fleshy labellum (= sponge like structure) apically and the mandibles are reduced. In nematoceran flies (e.g., mosquitoes) the mouthparts are usually long and thin, composed of a number of stylets that are derived from the labrum, hypopharynx, mandibles and maxillae. Other important diagnostic characters are the reduced pro- and metathorax, and a swollen mesothorax, chaetotaxy (= arrangement of bristle like hairs) on the head and thorax, and the tarsi are usually five-segmented.

Other characters are rather variable, however, eyes are usually present and distinct, antennae are either aristate (= last segment with prominent bristle), moniliform (= bead-like) or filiform (thread-like). There are also highly-modified parasitic flies that are dorsoventrally flattened and have a spider-like appearance with elongate legs.

Larval Diptera can be recognised by the absence of true legs, and mandibulate mouthparts, which are usually modified forming hooks or fans. Sometimes larvae are acephalic. The abdomen is usually



Crane fly (Diptera: Tipulidae)

8 or 9 segmented, although sometimes the number of segments is reduced. The number of spiracles is also often reduced and only one or two pairs of spiracles are present on the abdomen apically. Sometimes a siphon is apically present on the abdomen.

What can they be confused with? Most adult flies can be recognised by having only one pair of membranous wings. This is very rare in other insects and occurs in the wasp family Mymarommatidae (order Hymenoptera), males of Coccoidea (Hemiptera), and males of the order Strepsiptera. Mymarommatidae can be separated by having two basally constricted abdominal segments, and the wings are fringed with long hairs. The males of Coccidae have reduced mouthparts and a fully developed pronotum. In Strepsiptera the forewings are reduced, whereas the hindwings are membranous and functional.

Wingless dipterans can be confused with wingless hymenopterans, as they both have an oval or roundish shape and a reduced pronotum. However, in Hymenoptera they have chewing mouthparts and the abdomen is constricted basally.



Stalk-eyed fly (Diptera: Platystomatidae)



Louse fly (Diptera: Hippoboscidae)



Wasp mimic (Diptera: Syrphidae)



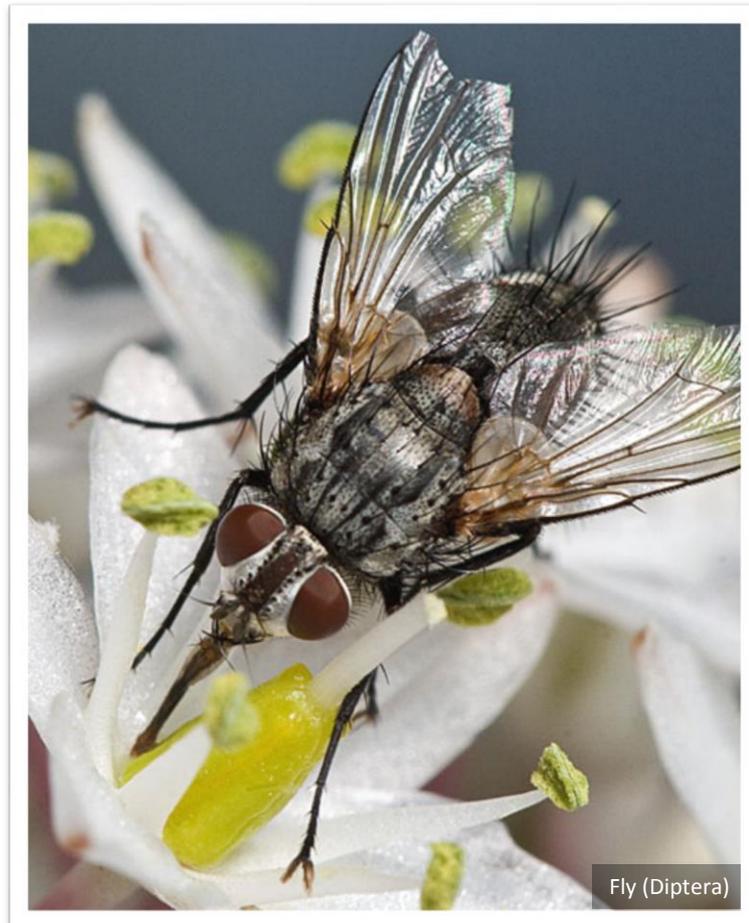
Mosquito (Diptera: Culicidae)

Wingless parasitic flies that live on vertebrates can be confused with members of the suborder Phthiraptera (lice), as they are also dorsoventrally flattened and have piercing and sucking mouthparts. However, the latter can be recognised by the short legs, two pretarsal segments, and the claws are in the shape of large hooks. Parasitic flies also can be similar to bed bugs (family Cimicidae), but the latter differ in having straight sucking mouthparts that are segmented, and the pronotum is well developed.

Larvae of Diptera are legless and are similar to legless larvae of other insect orders, which occur in Coleoptera, Siphonaptera, Strepsiptera, Lepidoptera and Hymenoptera. Females of Strepsiptera also do not have legs. All the listed orders commonly have 10 (rarely 9) abdominal segments, and with more than four pairs of abdominal spiracles. They commonly have mandibulate (= biting and chewing) mouthparts, and never with hooks or fans. The larvae and females of Strepsiptera also have 10 distinct abdominal segments, and their head and thorax are fused and distinctly sclerotised, the mouthparts are reduced. The larvae of Lepidoptera, Coleoptera and Hymenoptera are usually thick and fleshy. Lepidopteran larvae usually have a distinct labium with silk glands, used for silk production.

Biology. Diptera is one of the most diverse groups of insect orders, and flies are abundant in most ecosystems. Many larvae are aquatic. The adults feed on various liquids, including the blood of vertebrates. Larvae are often scrapers or filterers, feeding on decaying materials, fungi or other animals.

Diversity in Papua New Guinea. Flies are cosmopolitan, with more than 150,000 species estimated to occur. Many fly groups are well-known in New Guinea but many still require documentation (Miller 2007).



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