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Parasitic Insects, Mites and Ticks: Genera of Medical and Veterinary Importance/Mosquitoes and Similar

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Perspective

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ABOUT THE STUDY

Dipteran flies are typical insects. Most species are free-living, but the parasitic species are of great medical and veterinary importance. The wings are one on each side of the middle segment of the thorax. The hind thoracic segment has a pair of modified wings called halteres. These are small knobs on a short stalk that assist flying. At the base of the wings are various extensions of the wing surface, called squamae. The adult body of dipteran flies is divided into an obvious head, thorax and abdomen. The head bears complex mouthparts, sensory palps to assist feeding, eyes and antennae to find hosts and mates. Some types of dipterans that are highly specialized for parasitism (the hippoboscids) either lose their wings when they find a host, or never develop wings. Dipteran flies all have a complete metamorphosis. Most ectoparasitic dipterans feed on their hosts as adults; but an important group feed on their hosts as larvae. These flesh feeding larvae cause the disease myiasis. Of such myiasis flies the ones most highly adapted for parasitism have no mouthparts in the adult stage; all feeding in the life-cycle is done by the larvae. Classification within the Diptera is complex.

The two sub-Orders are Nematocera and Brachycera. Note that the former sub-Order Cyclorrhapha is now placed within the Brachycera. These flies are all typical nematocerans, with long antenna consisting of many similar segments. All mosquitoes are specialized for blood-sucking as adult females. The males feed on plant nectar. Larvae and nymphs inhabit stagnant water. Mouthparts form a long proboscis consisting of a labium as a protective sheath and within this sheath is a bundle of very fine elongated mouthparts that form a flexible piercing and sucking tube. The labium folds up when the piecing mouthparts are in use. Antennae are long. Antennae of females have short fine setae at each segment; male antennae have long fine seta at each segment, appearing like a brush. Legs are very

long and thin and wings have small squamae, and small scales arranged above the wing-veins. Mosquito genera of medical and veterinary importance are grouped into two taxonomic types: culicine (of many genera, Culex is typical), and anopheline (mainly the genus Anopheles). The adults of these two groups have typical resting stances. Larvae and pupae are aquatic and of the two groups have different shape and behavior when suspended below the water surface to breathe. Mosquitoes populations can seasonally, or in permanently favorable larval habitats, build up to dense populations. These cause biting-stress to domestic animals and humans that is severe to intolerable, making wide areas of land uninhabitable. Mosquitoes are biological vectors of numerous pathogenic viruses, bacteria, protozoa, and worms between domestic animals and humans. Here only the most prominent pathogens and diseases are emphasized. There are many genera of mosquitoes of potential medical and veterinary importance but their identification is work for a specialist. Only six representative genera are shown here. Studies of the taxonomy and biology of mosquitoes have revealed extremely complex and varied adaptations, often making very difficult the differentiation of species of significant medical and veterinary importance using the traditional morphological criteria.