Nutrition in animals

(Extension material for Level 2 Biology Study Guide, ISBN 978-1-927194-11-9, page 195)

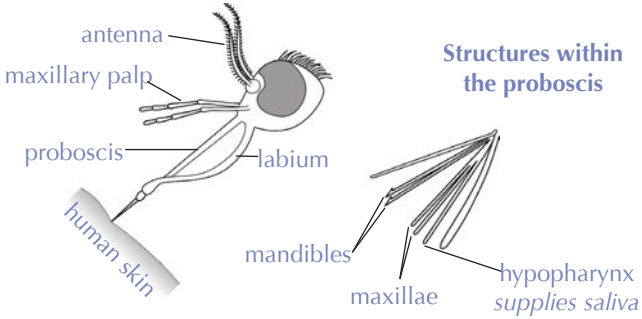
Fluid feeders

Some fluid feeders, like the hydatids tapeworm (an endoparasite), 'wallow' in their food, absorbing digested food directly through their skin. Other fluid feeders suck up their food using specialised mouthparts (e.g. butterflies feeding on the nectar of flowers use tube-like mouthparts). The mosquito is a highly-specialised fluid feeder, an ectoparasite feeding on blood. Like many ectoparasites, mosquitoes have piercing/sucking mouthparts.

Example

Feeding in the mosquito

The mouthparts of the mosquito suck blood by forming a piercing **proboscis** or tube. When a mosquito feeds, **mandibles** (jaws) inside the proboscis open up the wound, which is deepened by **maxillae**. Blood is sucked up in a tube formed from the mouthparts of the upper jaw. The lower jaw acts as a sheath for the proboscis.

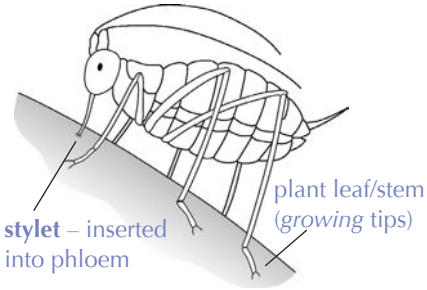


Specialised mouthparts of the mosquito

Removal of blood is aided by saliva which contains an **anticoagulant** to prevent the victim's blood clotting. This is typical of other blood-feeding parasites (e.g. leeches).

Feeding in aphids

Sap in phloem vessels in plants is under high pressure; once a phloem vessel is punctured by the stylet of an aphid, sap is forced into the aphid's food canal. As they feed, aphids often transmit plant viruses to their food plants. These viruses can sometimes kill the plants.



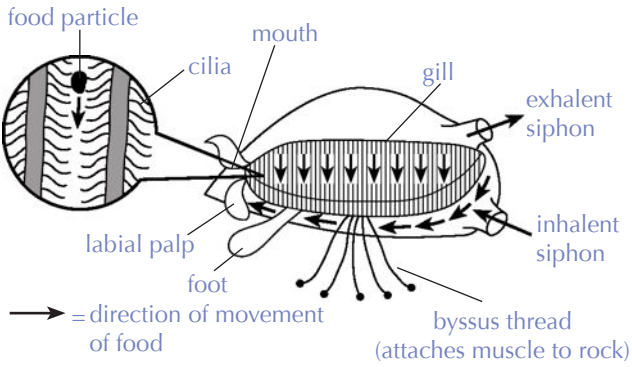
Filter feeders

Filter feeders sieve minute particles (plankton) from water. Filter feeding is a common feeding method found in many taxonomic groups, e.g.:

- Plankton-eating fish, such as herrings and mullet, trap food on filaments across the openings of their gill slits.
- Whales trap plankton in a thick, hairy sieve called baleen.
- Barnacles trap particles in a net formed from the fine bristles that cover their legs.
- Many shellfish such as pipi, toheroa and mussels are also filter feeders, using modified gills.

Example

Filter-feeding in the common mussel *(Perna canaliculus)*



Filter-feeding in mussels can easily be seen by placing a drop of carmine dye in the water around the mussel. Removing one shell will reveal the action of the gills in collecting and sieving the dye particles.

Currents set up by the beating of cilia on the gills draw water into the *inhalent* siphon, then over the gills. The two gills are covered with sticky mucus, which traps particles. These particles are moved by cilia to the edge of the gill to form a sticky tube. Particles in the tube are sorted and directed to the mouth by the **labial palps**. Water leaves the mussel by the *exhalent* siphon.