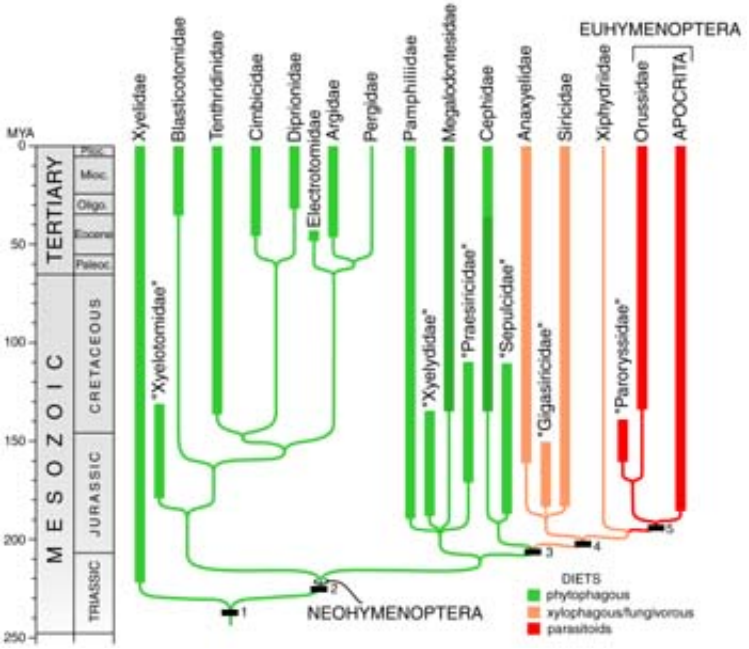
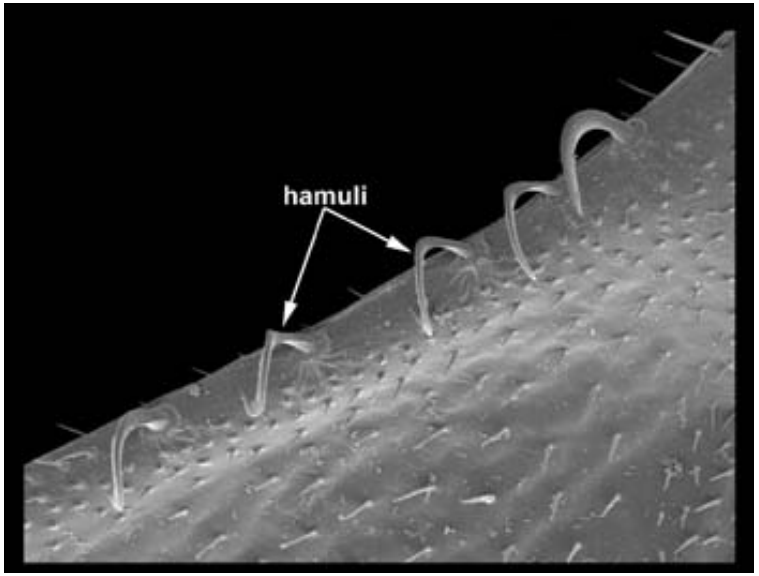
Insect Orders VI: Hymenoptera (Ants, bees and wasps)

- **Classification.** More than 125,000 described species, divided into 2 suborders. The paraplyletic Symphyta include sawflies and wood wasps, Apocrita include parasitic wasps, solitary and social wasps, solitary and social bees and the ants. Two informal groups in the Apocrita. Parasitica include the parasitic wasps and the Aculeata include the “stinging” Hymenoptera (ants, bees and wasps).

- **Structure.** A distinctive feature of the Hymenoptera is the presence of the hamuli, or small hooks that attach the hindwings and forewings together. This facilitates synchronized wing movement and enhances maneuverability during flight. Head is usually attached by a thin neck, allowing increased movement of the head. Mouthparts of adult varies from typical chewing mandibles (sawflies, ants and wasps) to highly modified lapping mouthparts in bees. Abdomen and thorax in ants, wasps and bees connected by a narrow waist (petiole). Entire order has haploid males and diploid females (haplodiploidy), which gives females control of offspring sex ratio and is a important precursor of eusocial behavior. Many species in the Aculeata possess a modified ovipositor which functions as a defensive weapon, the sting. Many species in the Aculeata build distinctive nest structures.





Hymenoptera

- **Natural History.** Adults feed on nectar or other liquid food for their own nutrition. However, adults of many aculeate species collect food for their offspring, including pollen (bees), nectar, insect or arthropod prey, or scavenged vertebrate flesh. Provisions for offspring are usually returned to a nest. Food habits of the larvae can be divided into 4 broad categories: 1) phyophagy (Symphyata), 2) parasitic on insect hosts with a few phytophagous offshoots (gall makers) (Parasitica), 3) solitary providers (Aculeata in part), and 4) social providers in which larvae feed on specially prepared food (Aculeata in part). Eusocial behavior evolved at least 11 times independently in the Hymenoptera. Haplodiploidy and nest provisioning are the most important preadaptations to eusocial behavior. Hymenoptera is an extremely important group for humans. Social and solitary bees are important pollinators of crops. Parasitic Hymenoptera, predatory social wasps and ants provide biological control of insect pests.