

Taxonomy of Insects

Lecture (4)

Dr. Sanaa Alhadidi

Biology Department

Collage of Science

University of Diyala



Lecture Topics

- **Order: Dictyoptera**
- **Order: Isoptera**

Dr. Sanaa Alhadidi

Exopterygota (Order: Dictyoptera)

Life history and Ecology

- Dictyoptera = "network wings," referring to the visible network of veins present in the wings of this order.
- In some entomology references, the Dictyoptera may be ranked at the superorder level which includes two or three orders of insects related by evolution and features **Blattodea**, the cockroaches, **Mantodea**, the mantids and **Isoptera** termites (This branch of the insect taxonomic tree is currently under revision).
- Large or medium sized insects.
- Biting mouthparts.

Exopterygota (Order: Dictyoptera)

Life history and Ecology

- They have two pairs of wings, front pair is leathery.
- Antennae are long, and may be longer than the entire body length.
- Cerci are visible, and the hairs on the cercus are very sensitive to air movement in cockroaches, which makes it hard to catch them.
- Females lay their eggs in batches in hard-walled capsules or oothecae.
- Cockroaches are mainly nocturnal and omnivorous.
- Mantids are predators, size ranges from 1 - 15 cm long.

Exopterygota (Order: Dictyoptera)

Classification (the important families)

Blattidae: includes the Oriental cockroach (*Blatta orientalis*) and the American cockroach (*Periplaneta americana*)

Blatellidae :includes the German cockroach (*Blattella germanica*).

Mantidae: this family includes all of the common mantids.



Blatta orientalis



Periplaneta americana



Blattella germanica

Exopterygota (Order: Dictyoptera)

Distribution

- Cockroaches: Common throughout most of the world, most abundant in tropical and subtropical climates, about 5 family and 4000 species worldwide.
- Mantids: about 15 families and 2000 species worldwide, mainly tropical about 35 species reach Southern Europe.



Exopterygota (Order: Dictyoptera)

Economic importance

- Although cockroaches do not sting or bite, they may carry a variety of human pathogens on their bodies.
- The decomposing remains of dead roaches (and their feces) are an important source of household “dander” that may cause allergies in sensitive people.
- Cockroaches also have proven to be very useful as research tools, e.g., studying of insect physiology, morphology and toxicology.
- Praying mantids are considered beneficial insects as they are predators (carnivores) and eat a wide variety of insects so they play a role in biological control.

Exopterygota (Order: Isoptera)

Life history and Ecology

- Common Name: Termites, White Ants
- The termites feeding on wood fibers which are then digested by symbiotic microorganisms within their digestive systems.
- Termites are the only hemimetabolous insects that exhibit true social behavior.
- They build large nests that house an entire colony. Each nest contains adult reproductives (one queen and one king) plus hundreds or thousands of immatures that serve as workers and soldiers.
- Development: incomplete development (egg, nymph, adult).

Exopterygota (Order: Isoptera)

Soldier



worker



soldier



reproductive



winged reproductive



king



queen



secondary queen



worker



soldier



reproductive



winged reproductive



nymph



king



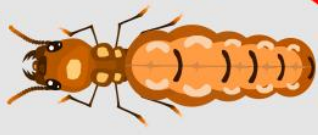
dealate reproductive



egg



queen



Exopterygota (Order: Isoptera)

Appearance

Immature

- Body pale in color, ant-like in appearance but with a broader junction between thorax and abdomen.
- Head large and cylindrical or small and round.
- Mouthparts chewing; sometimes with large mandibles.
- Compound eyes small or absent.
- Antennae beaded.



Exopterygota (Order: Isoptera)

Distribution

- Extremely common in tropical and subtropical climates. Generally less abundant in temperate regions.
- Approximately 7 family and ~2300 species worldwide.

Economic importance

- Termites are an important decomposers, they help break down and recycle up to one third of the annual production of dead wood.
- Termites become economic pests when their appetite for wood and wood products extends to human homes, building materials, forests, and other commercial products.

Exopterygota (Order: Isoptera)

Classification

Rhinotermitidae (Subterranean termites): These insects build nests in the soil and generally infest wood that is in contact with the ground.

Hodotermitidae (Rotten wood termites): Generally found inhabiting moist wood. Contact with the soil is not a requirement.

Kalotermitidae (Dry wood and damp wood termites): These insects nest in the wood itself and do not require contact with the soil.

Termitidae: This is the largest family of termites worldwide.

Usfel websites

<https://genent.cals.ncsu.edu/insect-identification/order-isoptera/>

<https://www.thoughtco.com/superorder-dictyoptera-roaches-and-mantids-1968531>

<https://genent.cals.ncsu.edu/insect-identification/order-blattodea/>

<https://www.bumblebee.org/invertebrates/Dictyoptera1.htm>

<https://www.ento.csiro.au/education/insects/mantodea.html>

Thanks for listening

