

# Taxonomy of Insects

## Lecture (3)

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# Lecture Topics

- **Order: Orthoptera**
- **Order: Dermaptera**

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# Exopterygota (Order: Orthoptera)

## Life history and Ecology

- Most living members of this order are terrestrial herbivores with modified hind legs that are adapted for jumping.
- Slender, thickened front wings fold back over the abdomen to protect membranous, fan-shaped hind wings.
- Many species have the ability to make and detect sounds.
- Orthoptera is one of the largest and most important groups of plant-feeding insects.
- Development: Hemimetabola, i.e. incomplete metamorphosis (egg, nymph, adult).

# Exopterygota (Order: Orthoptera)

## Appearance of Immatures and Adults

Immatures: structurally similar to adults

### Adults:

- Antennae are filiform.
- Hypognathous Mouthparts
- Pronotum shield like, covering much of thorax.
- Front wings narrow, leathery (tegmina); hind wings fan-like.
- Hind legs usually adapted for jumping (hind femur enlarged).
- Tarsi 3- or 4-segmented.
- Cerci short, unsegmented.

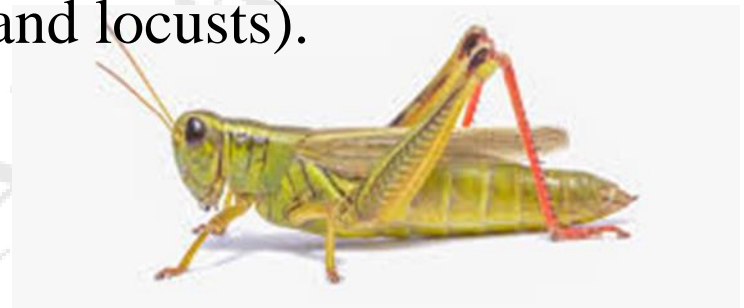


# Exopterygota (Order: Orthoptera)

## Classification

### *Grasshoppers and Locusts*

- **Acrididae** (short-horned grasshoppers and locusts).
- Herbivores.
- Common in grasslands and prairies.
- This family includes many pest species such as the desert locust *Schistocerca gregaria*.
- **Tetrigidae** (pigmy grasshoppers)
- Herbivores.
- Similar to short-horned grasshoppers but with a pronotum that extends to the back of the abdomen.



# Exopterygota (Order: Orthoptera)

## *Katydids*

- **Tettigoniidae** (long-horned grasshoppers and katydids)
- Herbivores.
- Females have a long, blade-like ovipositor.
- Some species are pests of trees and shrubs.



## *Crickets*

- **Gryllidae** (true crickets)
- Herbivores and scavengers.
- Females have a cylindrical or needle-shaped ovipositor.
- This family includes the house cricket, *Acheta domesticus*.





# Exopterygota (Order: Orthoptera)

- **Gryllacrididae** (camel crickets)
- Scavengers.
- Most species have a distinctly hump-backed appearance; a few are cave dwellers.
- **Gryllotalpidae** (mole crickets)
- The front legs are adapted for digging.
- Most species feed on the roots of plants, but some are predatory.



# Exopterygota (Order: Orthoptera)

## Distribution

- Common and abundant throughout the world.
- Approximately 28 families and around 20,000 species worldwide.

## Economic Importance

- Orthoptera insects feed on all types of plants and often cause serious economic damage.
- Swarms of grasshoppers (locusts) regularly appear in parts of Africa, Asia, and North America and destroy crops over wide land areas.
- Mole crickets are major pests in lawns and golf courses in the southern United States.
- Several species of field crickets are reared commercially as fish bait.



# Exopterygota (Order: Dermaptera)

## Life history and Ecology

- Earwigs are mostly scavengers or herbivores a few species may be predatory.
- They hide in dark recesses during the day and become active at night.
- Females lay their eggs in the soil, and may guard them until they hatch.
- Nymphs are similar in appearance to adults, but lack wings.
- The front wings are short, thick, and serve as protective covers for the hind wings.
- Hind wings are large, fan-shaped and pleated. They fold (both length-wise and cross-wise) to fit beneath the front wings when not in use.
- Some species are secondarily wingless.
- In most earwigs, the cerci at the end of the abdomen are enlarged and thickened to form pincers (forceps). These pincers are used in grooming, defense, courtship, and even to help fold the hind wings.

# Exopterygota (Order: Dermaptera)

## Appearance of Immatures and Adults

### Immatures

- Structurally similar to adults.

### Adults

- Antennae slender.
- Prognathous mouthparts.
- Tarsi 3-segmented.
- Front wings short and leathery.
- Hind wings semicircular and pleated.
- Cerci enlarged to form pincers (forceps).



# Exopterygota (Order: Dermaptera)

## Classification

### Forficulidae (Common earwigs)

- This family includes several cosmopolitan species, including

*Forficula auricularia*.



### Labiduridae

- Reddish-brown earwigs with long cerci.



Salvador Vitanza, Ph.D.

### Carcinophoridae

- Dark brown or black insects with reddish brown legs and small cerci.



# Exopterygota (Order: Dermaptera)

## Economic Importance

- Most earwigs have little or no economic importance.
- A few species, if abundant can be of economic importance because they also feed on soft plant tissues such as leaves and fruits.
- Some species can be beneficial because they feed on soft-bodied pests such as aphids and on insect eggs.



# Usfel websites

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

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

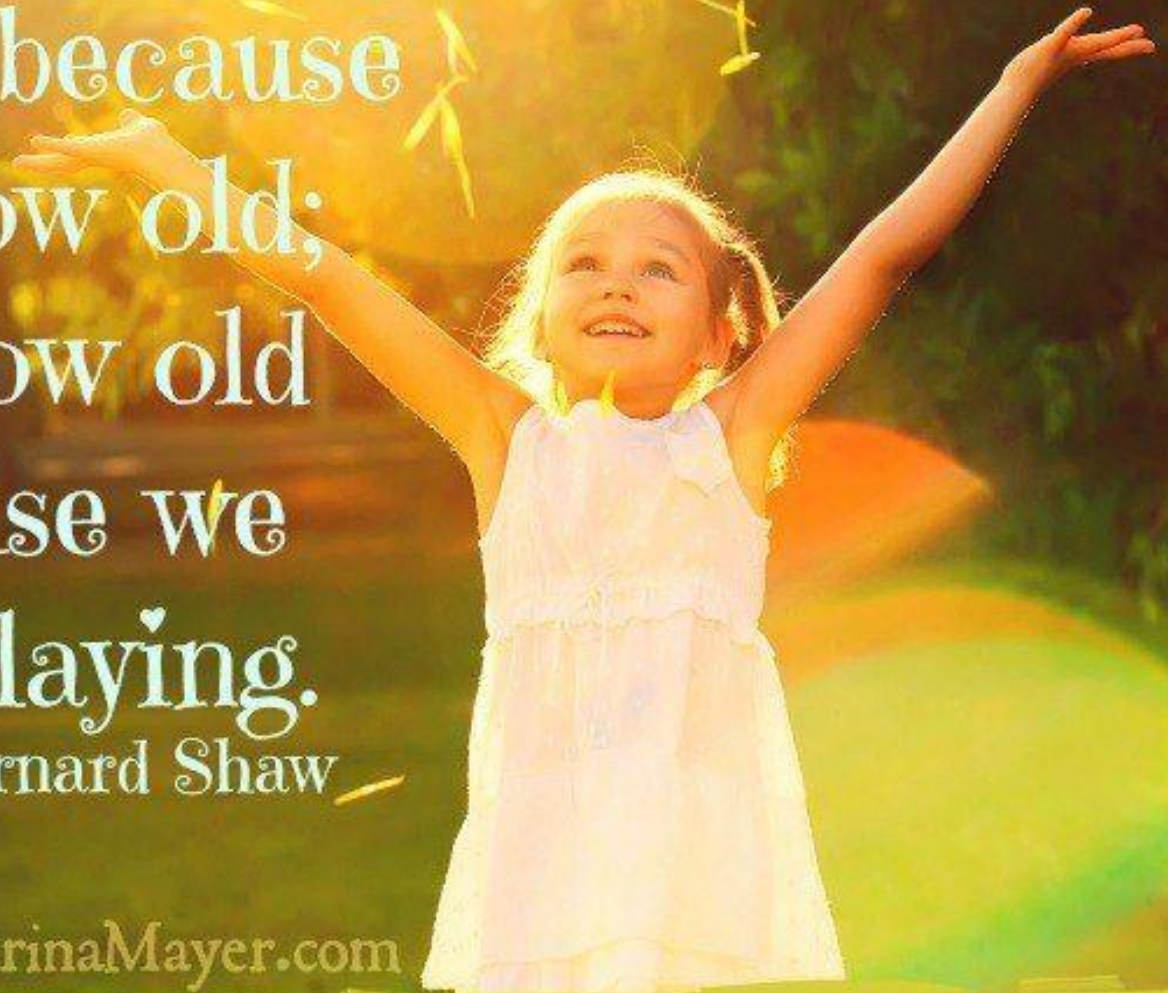
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We don't stop  
playing because  
we grow old;  
we grow old  
because we  
stop playing.  
George Bernard Shaw

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Thanks for listening

