

# Taxonomy of Insects

## Lecture (2)

**Dr. Sanaa Alhadidi**

**Biology Department**

**Collage of Science**

**University of Diyala**



# Lecture Topics

- **Apterygota vs. Pterygota**
- **Exopterygota vs. Endopterygota**
- **Order: Ephemeroptera**
- **Order: Odonata**

# Apterygota vs. Pterygota

<b>subclass Apterygota</b>	<b>subclass Pterygota</b>
wingless	Winged
absent Metamorphosis	Present.
Pleural in thorax is absent	Present
Pregenital abdominal appendages present.	Absent.

# Exopterygota vs. Endopterygota

	<b>Exopterygota</b>	<b>Endopterygota</b>
<b>Wing development</b>	<b>External</b>	<b>Internal</b>
<b>Type of metamorphosis</b>	<b>Incomplete</b>	<b>Complete</b>
<b>Pupal stage</b>	<b>Absent</b>	<b>Present</b>
<b>Immature stage</b>	<b>Naiad or Nymph</b>	<b>Larva</b>
<b>No. of orders</b>	<b>16</b>	<b>9</b>

# Exopterygota (Order: Ephemeroptera)

## Life history and ecology

- Known as mayfly.
- The immature stages are aquatic (naiad).
- Most species are herbivorous (eating algae and aquatic plants).
- Maturation vary ( 4 weeks - one to four years).
- Adults have a very short lifespan they do not feed (mouthparts are vestigial), and some species emerge, reproduce, and die in one day.
- Mayflies are the only living insects that molt again after they have wings.

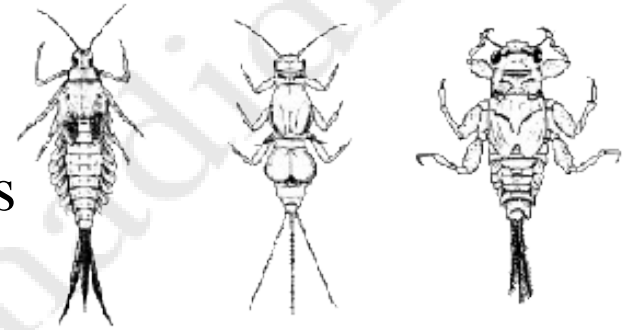
naiad



# Exopterygota(Order: Ephemeroptera)

## Naiad

- Antennae short and bristle-like.
- Four to nine pairs of leaf-like or fan-like gills along the sides of the abdomen.
- Three long filaments at rear of abdomen.



## Adult

- Antennae short and bristle-like.
- Front legs long and often held out in front of body.
- Compound eyes large, usually covering most of the head
- Wings: four membranous wings with many veins front wings large, triangular; hind wings smaller, fan-shaped.
- Abdomen slender, bearing two (or sometimes three) long terminal filaments.



# Exopterygota (Order: Ephemeroptera)

## Distribution

- Common in freshwater habitats.
- Approximately 19 families and >2000 species worldwide.

## Economic Importance

- Naiads are “ecological indicators” of good water quality.
- An important source of food for fish and other aquatic wildlife.
- When the adults emerge in large numbers they pose a nuisance problem.
- Anglers often use mayflies as bait.



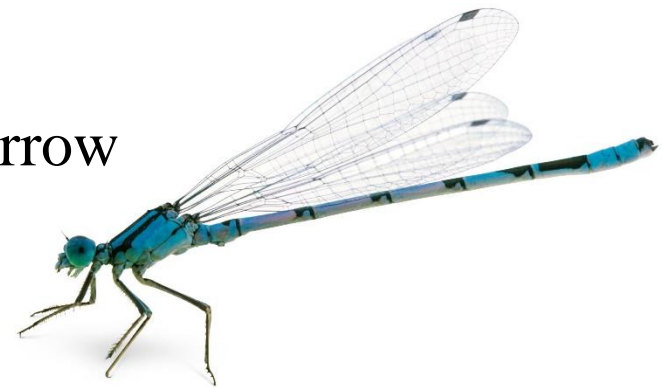


# Exopterygota (Order: Odonata)

## Order: Odonata (Dragonflies and Damselflies)

### Key Characters

- Large compound eyes.
- Rectangular stigma (pigmented patch) near tip of each wing.
- Short, bristle-like antennae.
- In dragonflies, hind wings are broader toward the base than front wings.
- In damselflies, front and hind wings are narrow at the base and similar in size and shape.





# Exopterygota (Order: Odonata)

## Classification

Order: Odonata

Suborder 1 :Anisoptera (Dragonflies)

Family 1: Aeshnidae

Family 2: Gomphidae

Family 3: Libellulidae

Suborder 2 :Zygoptera (Damselflies)

Family 1: Calopterygidae

Family 2: Coenagrionidae

Family 3: Lestidae



# Exopterygota (Order: Odonata)

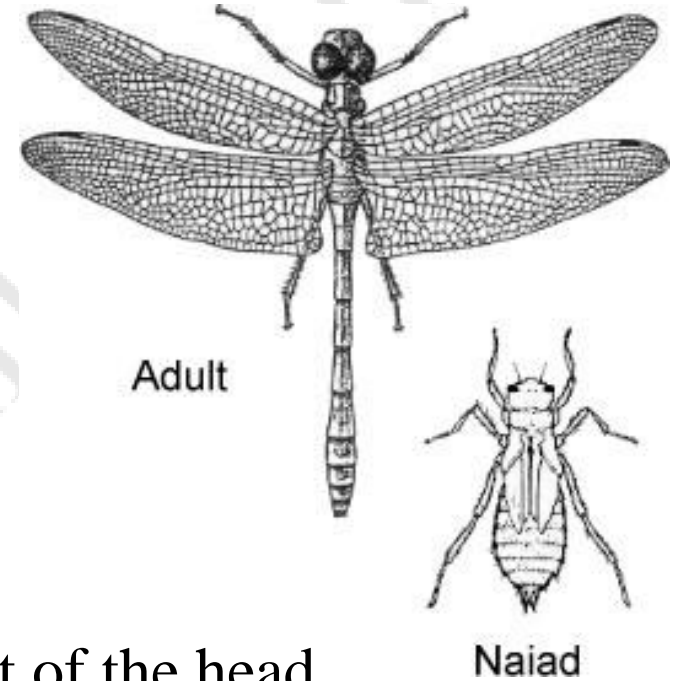
## Suborder :Anisoptera (Dragonflies)

### Naiad

- Labial adapted for catching prey.
- Body robust.

### Adults:

- Antennae short and bristle-like.
- Compound eyes large, often covering most of the head.
- Four membranous wings with many veins and crossveines.
- Base of hind wing broader than forewing.
- One distinctively pigmented cell (stigma) on leading edge of wing.
- Abdomen: long and slender.



# Exopterygota (Order: Odonata)

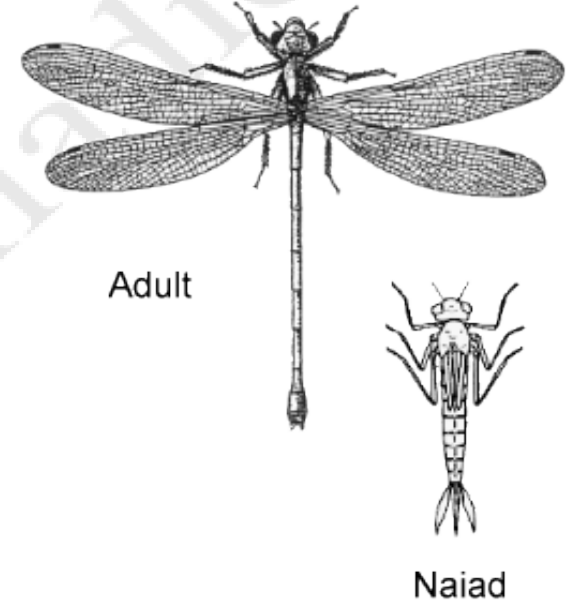
## Damselflies

### Naiad

- Labial adapted for catching prey.
- Three leaf-like gills at rear of abdomen.
- Body usually long and slender.

### Adults:

- Antennae short and bristle-like.
- Compound eyes large, often covering most of the head.
- Four membranous wings with many veins and crossveines.
- Base of wings narrow, stalk-like.
- One distinctively pigmented cell (stigma) on leading edge of wing.
- Abdomen: long and slender.



# Exopterygota (Order: Odonata)

## Life history and Ecology

- Odonata are predaceous both as immatures and adults.
- Females laid eggs singly in fresh water by dipping their abdomen when they oviposit.
- Eggs hatch into aquatic immatures (naiads).
- **Distribution:**
- Common worldwide.
- Approximately 29 families and >5000 species worldwide.

# Exopterygota (Order: Odonata)

## Economic importance

- Most dragonflies and damselflies are regarded as beneficial insects because they feed on small flying insects such as mosquitoes.
- They may also catch and eat honey bees — then they are regarded as pests.
- In some parts of Europe, dragonflies are considered a threat to the poultry industry (chickens, turkeys, ducks, and geese) because they transmit *Prosthogonimus pellucidus*, a parasitic flatworm.

# Usfel websites

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

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

Dr. Sanaa Alhadidi

Thanks for listening

