

# **Insect Metamorphosis**

**ENTO-5101**

# What is metamorphosis

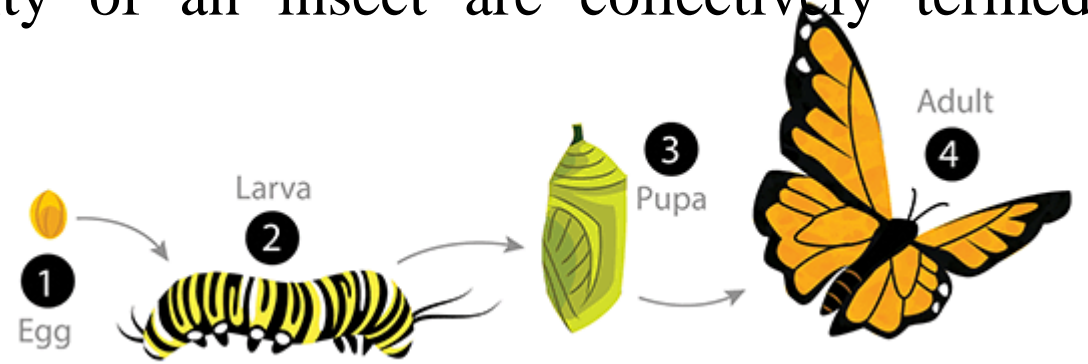
- All changes of form from hatching to maturity of an insect are collectively termed **metamorphosis** (Pl. metamorphoses)

## Ecdysis:

The process of shedding or moulting skin. E.g., snake and all insects

## Exuvia:

The shedded or moulted skin known as Exuvia (sing. Exuvium)



## Instar:

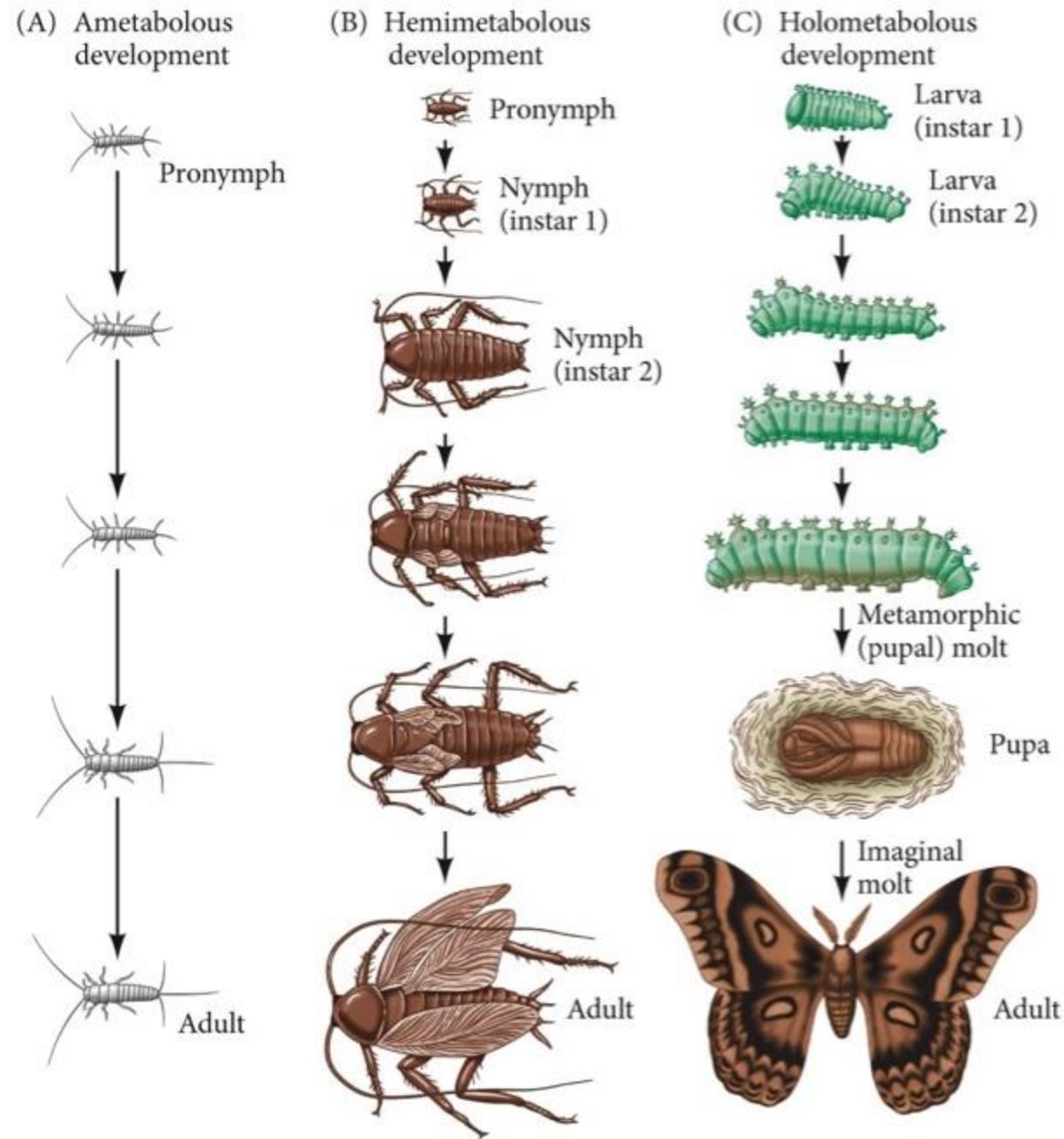
The particular form or shape of an insect between two moultings

## Stadium:

The period between two moultings is called stadium (pl . stadia)

## Imago:

The adult of an insect is called imago (pl. imagoes)



# Types of Metamorphosis

Insects have following types of metamorphosis:

1. **Ametabola** (without metamorphosis)
2. **Hemimetabola** (simple, direct or incomplete metamorphosis)
3. **Holometabola** (complex, indirect or complete metamorphosis)

# 1. Ametabola

- Insects in which the young ones pass through no or slight changes to become adults are said to be without metamorphosis

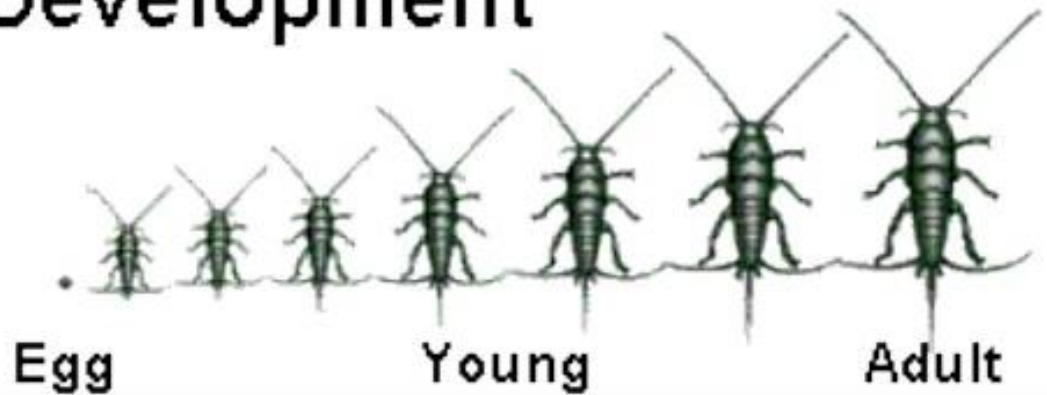
## Examples:

- Silverfish, Telson tails, Springtails, etc.
- These Insects also called Apterygota
- Young one is called **nymph**

which is similar in appearance to the adult, but smaller in size

- These insects have three life stages, viz., egg, nymph and adult

## Ametabolous Development



# Anamorphosis

- Increase in abdominal segments during postembryonic development

## For example:

- Nymphs of tselontails have 8 abdominal segments
- Three more segments are added between last segment
- Anamorphosis does not change the appearance



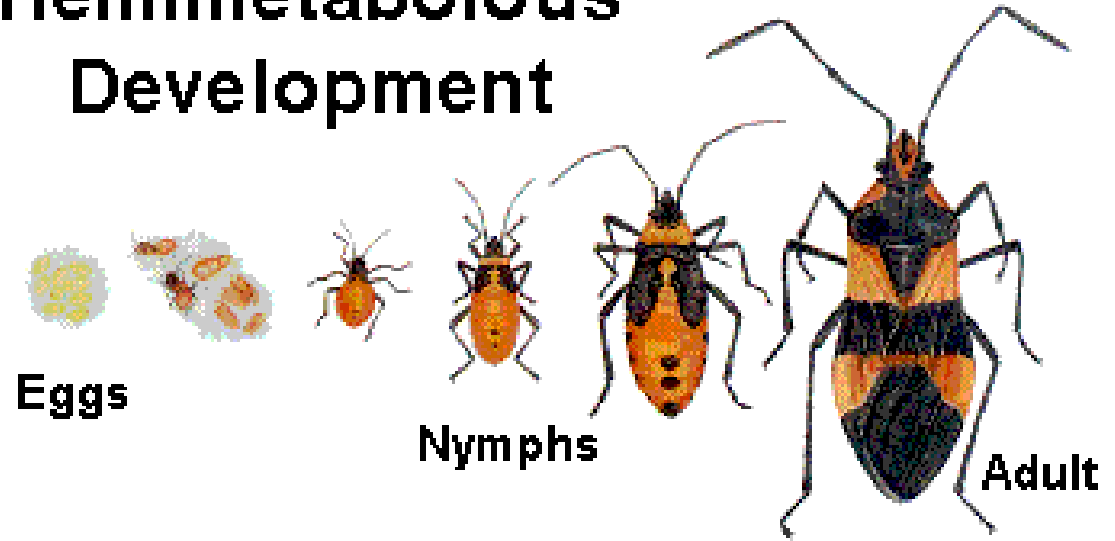
# 2. Hemimetabola

- Insects in which the young ones pass through simple or gradual changes
- These have no pupal stage are said to be with **simple** metamorphosis

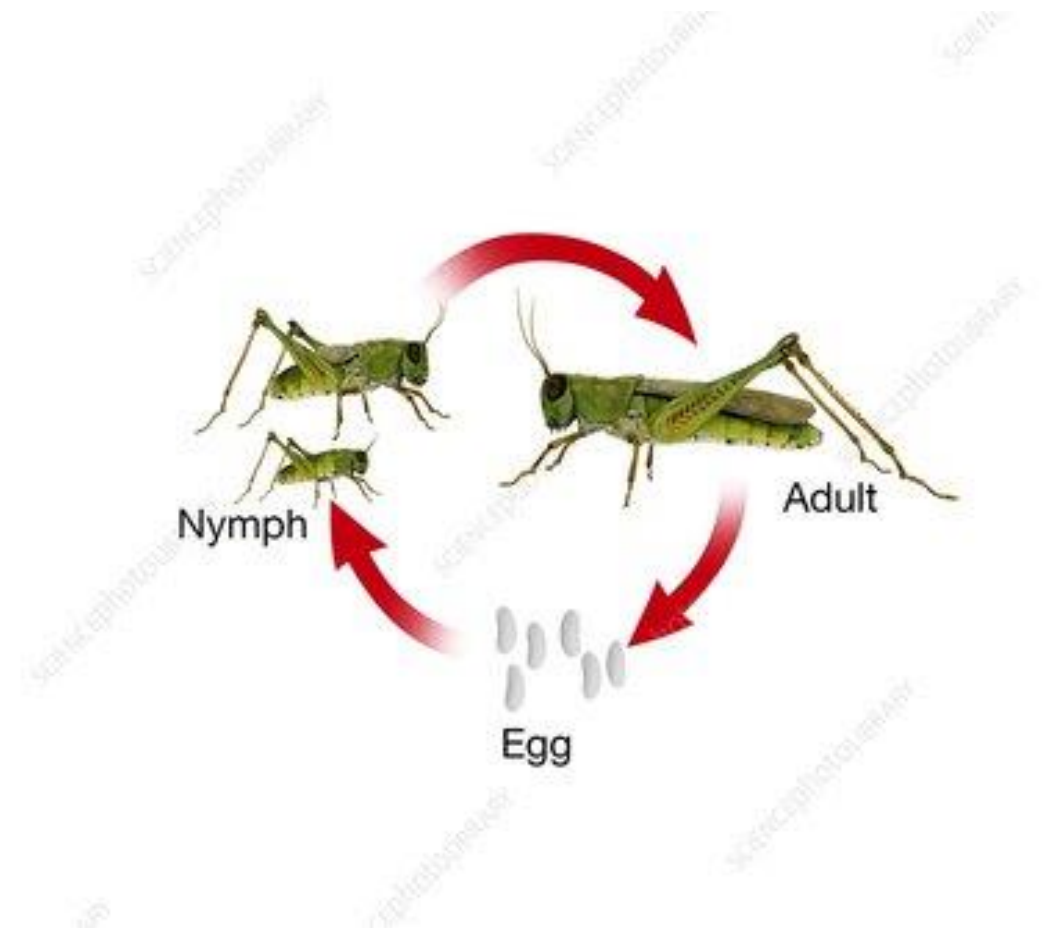
## Examples:

- Grasshoppers, crickets, cockroaches, termites, bugs, etc.
- Winged or wingless
- **Exopterygota:** Develop wings externally

## Hemimetabolous Development



- The young one is called **nymph** which is similar to the adult
- Smaller in size and with incompletely developed wings
- **Naiids:** Aquatic nymphs known as naiids
- They have three life stages: egg, nymph (naiad) and adult

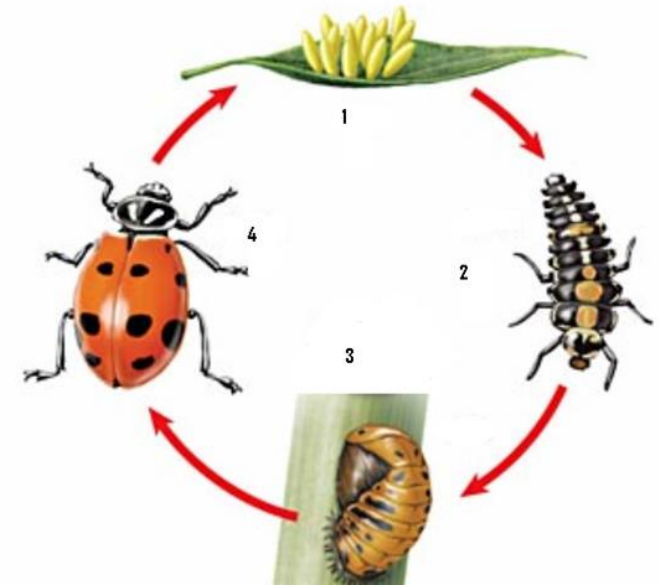
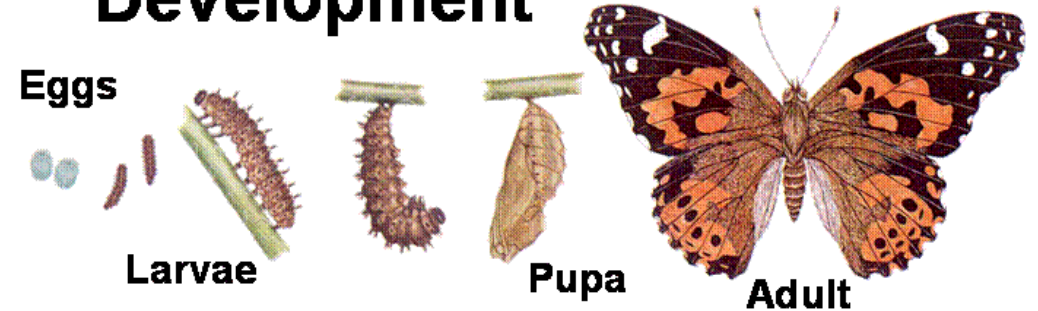




# Holometabola

- Insects in which the young ones pass through complex or marked changes
- **Example:** Butterflies, Beetles, Flies, Bees, Wasps
- Winged or wingless
- **Endopterygota:** Develop wings internally
- The young one is called larva
- Egg, larva, pupa and adult

## Holometabolous Development



# Hypermetamorphosis:

- Complex metamorphosis in which all larval instar are not similar
- Shape of larva either goes on changing in all the instars
- **Examples:** blister beetle

