

Insects and People -- Entomology 101

The Ugly Duckling Syndrome - Reproduction and Metamorphosis

Reproductive System

Perpetuation of the species is the ultimate function of the insect

1. Terms

- a. dioecious - males and females (eggs and sperm) - “sexual reproduction”
- b. parthenogenetic - female able to produce viable eggs without fertilization by sperm (asexual reproduction)

2. Male Reproductive System

paired testes (produce sperm) □ vas deferens (tube) □ seminal vesicles (storage) □ accessory glands □ ejaculatory duct □ aedeagus (penis) □ external claspers

3. Female Reproductive System

ovaries (tube-like ovarioles - produce eggs) □ calyx □ oviduct (tube) □ accessory glands □ spermatheca (sperm storage) □ vagina □ ovipositor (egg laying)

Metamorphosis

“change in form”

1. Terms

- a. stage - successive steps - egg, nymph (larva), pupa, adult
- b. instar - growth steps of immatures, produced through molts, number of molts generally between 3-8 (group dependent)
- c. molt - shedding of exoskeleton. Once an insect reaches the adult stage it discontinues molting

2. Types of Metamorphosis

- a. ametabola (no metamorphosis) - growth without change - “primitive” insects that are wingless as adults - immatures called “young”
- b. paurometabolous (gradual or incomplete) - immature looks similar to adult but lacks certain structures - wings develop externally as buds - immature called a nymph
- c. holometabolous (complete or complex) - immature looks nothing like the adult - wings develop internally - immature called a larva (larvae - plural) (maggot, grub, caterpillar, etc.) - passes through an intermediate stage called a pupa (cocoon) - ca. 75-80% of all insects are holometabolous.

3. Hormones: Control of Metamorphosis

metamorphosis is controlled by a complex series of hormonally mediated changes

- a. brain hormone (from brain)
- b. corpus cardiacum - storage of BH
- c. prothoracic gland
- d. molting hormone (ecdysone)
- e. epidermis - molting fluid cells
- f. epidermal cells - secrete new cuticle