



FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

ENT-121: Fundamentals of Entomology

Lecture 19: Insect Anatomy: Reproductive System and Types of Reproduction:

In insect, male and female sexes are mostly separate. Sexual dimorphism is common where the male differ from the female morphologically as in bees, mosquito and cockroach. The other types are:

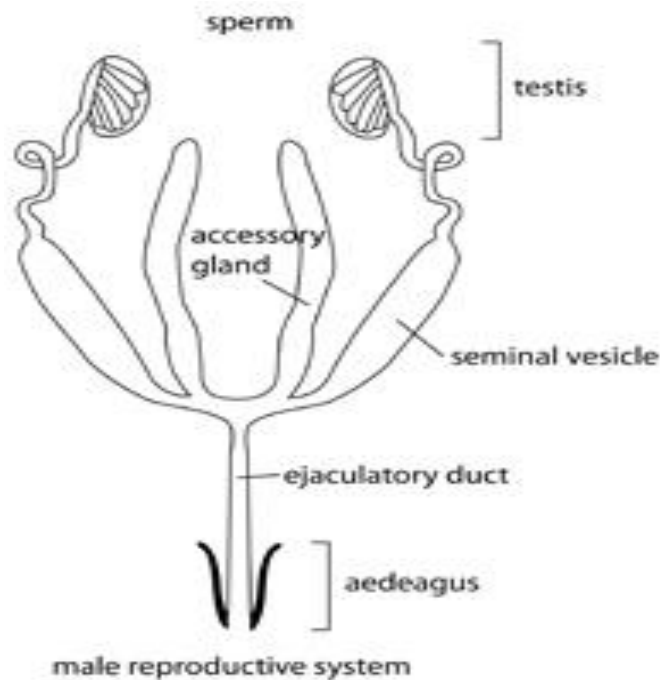
Gynandromorph: (Sexual mosaic) Abnormal individual with secondary sexual characters of both male and female. e.g. mutant *Drosophila*.

Hermaphrodite: Male and female gonads are present in one organism. E.g. Cottony cushion scale.

Female reproductive system:

The main functions of the female reproductive system are egg production and storage of male's spermatozoa until the eggs are ready to be fertilized. The basic components of the female system are paired ovaries, which empty their mature oocytes (eggs) via the calyces (Calyx) into the lateral oviduct which unite to form the common (median) oviduct. The gonopore (opening) of the common oviduct is usually concealed in an inflection of the body wall that typically forms a cavity, the genital chamber. This chamber serves as a copulatory pouch during mating and thus is often known as the bursa copulatrix. Its

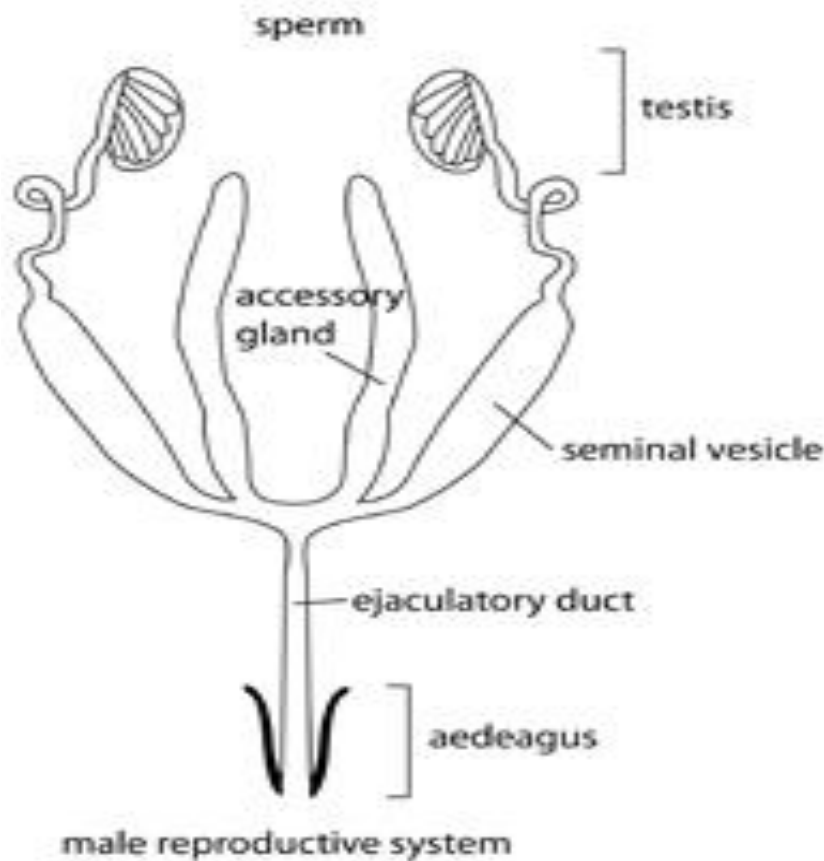
external opening is the vulva. In many insects the vulva is narrow and the genital chamber becomes an enclosed pouch or tube referred to as the vagina.



Male reproductive system:

The main functions of the male reproductive system are the production and storage of spermatozoa and their transport in a viable state to the reproductive tract of the female. Morphologically, the male tract consists of paired testes, each containing a series of testicular

tubes or follicles (in which spermatozoa are produced) which open separately into the sperm duct or vas deferens. This vas deferens expands posteriorly to form a sperm storage organ or seminal vesicle. Tubular paired accessory glands are formed as diverticula of the vasa deferentia.



1. Oviparity: Majority of female insects, are oviparous, lay eggs. Embryonic development occurs after oviposition by utilizing the yolk, e.g. Head louse, moths.

2. Viviparity: Unlike oviparous, here initiation of egg development takes place within the mother. The life cycle is shortened by retention of eggs and even developing young within the mother.

3. Parthenogenesis: Reproduction without fertilization is parthenogenesis.

4. Polyembryony: This form of asexual reproduction involves the production of two or more embryos from one egg by subdivision. Mostly observed in parasitic insects (e.g. *Platygaster*). Nutrition for a large number of developing embryo cannot be supplied by the original egg and is acquired from the host's haemolymph through a specialized enveloping membrane called trophamnion.

5. Paedogenesis: Some insects cut short their life cycles by loss of adult and pupal stages. In this precocious stage gonads develop and give birth to young one by parthenogenesis ie. reproduction by immature insects.