

LECTURE 10.

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. Some times the vasa deferentia themselves are glandular and fulfil the functions of accessory glands. The paired vasa deferentia unite where they lead into **ejaculatory duct** (the tube that transports the semen or the sperm to the gonopore). Accessory glands are 1-3 pairs associated with vasa deferentia or ejaculatory duct. Its function is to produce seminal fluid and **spermatophores** (sperm containing capsule).

Types of reproduction

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. Four main types of viviparity are observed in different insect groups.
 - i. **Ovoviviparity**: Fertilized eggs containing yolk are incubated inside the reproductive tract of the female and hatching of egg occur just prior to or

soon

after oviposition e.g. Thrips, some cockroaches, few beetles, and flesh fly.

Fecundity of this group is low.

ii. **Pseudoplacental viviparity:** This occurs when a yolk deficient egg develops in

the genital tract of the female. The mother provides a special placenta-like tissue,

through which nutrients are transferred to developing embryos. There is no oral

feeding and larvae are laid upon hatching. e.g. aphids, some earwigs, psocids and

polytenid bugs.

iii. **Haemocoelous viviparity:** This involves embryos developing free in the female's

haemolymph with nutrients taken up by osmosis. This form of internal parasitism

occurs only in strepsiptera and some gall midges.

iv. **Adenotrophic viviparity:** This occurs when a poorly developed larva hatches and

feeds orally from accessory gland (milk gland) secretion within the uterus of the

mother. The full grown larva is deposited and pupates immediately (e.g.) Tsetse

flies, louse, ked, bat flies.

3. Parthenogenesis : Reproduction without fertilization is

parthenogenesis. Different

types of parthenogenesis are as follows:

a. **Based on occurrence**

i. Facultative (not compulsory) e.g. bee.

ii. Obligatory or constant (compulsory) e.g. stick insect

iii. Cyclic/ sporadic: alternation of gamic and agamic population.

e.g. aphid.

b. **Based on sex produced:**

i. Arrhenotoky: Produce male e.g. bee

ii. Thelytoky: produce female e.g. aphids

iii. Amphitoky / deuterotoky: produce both male and female e.g. Cynipid

wasp.

c. Based on meiosis:

i. Apomictic : no meiosis occurs

ii. Automictic : meiosis occurs, but diploidy is maintained

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.

i. Larval paedogenesis - e.g. Gall midges

ii. Pupal paedogenesis – eg. *Miaster* sp.

Sources

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