

MALE REPRODUCTIVE SYSTEM IN INSECTS

Introduction

The male insect has male reproductive system in the abdominal cavity. It is elongated and presented above the intestine of the insect. Male reproductive system of insect is typically consisted into following parts or organ:-

1. TESTES
2. VAS DEFERENS
3. SEMINAL VESICLE
4. EJACULATORY DUCT
5. AEDEGUS
6. ACCESSORY DUCT

1. TESTES

One pair of testes are situated in the mid part of the abdominal cavity and embedded in the mass of fat bodies above the intestine of insect. Each testes is oval in shape and extended from 2nd to 6th abdominal segment of the insect. Both testes are composed of a number of testicular follicles or sperm tube which produce sperms. Some beetle has only one follicle and grasshopper has more than hundred follicles in each testes. Testicular follicle is creamy white in colour in immature male but in the mature male they are yellow due to large amount of fatty tissue investing them. The wall of the follicle is formed by the layer of epithelial cell laying on the basement membrane which is supposed to absorb nutrients from the haemolymph for the germ cells.

A Small stalk like structure present at the base of testicular follicle is called Vas efferens.

Each testicular follicle is consisted into following zones:-

1. **GERMARIUM**
2. **THE ZONE OF GROWTH**
3. **THE ZONE OF MATURATION AND REDUCTION**
4. **THE ZONE OF TRANSFORMATION**

GERMARIUM

The distal end of each testicular follicles is called Germarium or the zone of spermatogonia because it densely packed with spermatogonia. The apical cell is presented in the upper part of the follicles which served as nurse cell for development of spermatogonia.

THE ZONE OF GROWTH

A Zone of development is recognised below the germarium called the zone of growth. This zone is also called the zone of spermatocytes because it has a spermatogenesis for formation of spermatocyte.

THE ZONE OF MATURATION

It is also called zone of reduction because the spermatocyte undergo meiosis and produce haploid spermatids. Each spermatocyte is divided first into two spermatids and then into 4 spermatogonia. The first division was reduction division.

THE ZONE OF TRANSFORMATION

The zone of transformation is usually presented at the base of follicle near the vas efferens. It is a basal transformation zone or the zone of spermatogenesis where the spermatid become transformed into flagellated sperms. The cyst wall get dissolved and and the bundle of mature spermatozoa occur regularly. The sperm of insect is filamentous with very narrow head. The head and the tail of the sperm are of approximately the same diameter.

2. VAS DEFERENS

One pair vas efferens are present at the posterior end of the testes of insect. The testicular follicles are terminated into a short and fine vas efferens which lead into one of the period vas deferens. The vas deferens run posteriorly passing dorsoventrally around the intestine and accessory gland and looping ventrally, it joins the seminal vesicle of insect. Vas deferens are simple tube and mesodermal in origin and formed by a cellular epithelium with muscle and connective tissue the interior part of vas deferens is called gonadal portion and posterior part is called non gonadal portion. The Gonadal portion of the vas deferens are comparatively thin walled with the large lumen then non gonadal portion, both vas deferens are act as conducting tube which carries the sperm from testes and reached into seminal vesicle of insect.

3. SEMINAL VESICLE

One paired sac like seminal vesicle are associated with the base of both vas deferens of insect. It is situated between Vas deferens and ejaculatory duct. The distal part of seminal vesicle was thin and proximal part was thick. The lumen of seminal vesicle are filled with seminal fluid. It is also made up of epithelium muscle and connective tissue. Seminal vesicle is of insect is acted as secretory gland which secretes seminal fluid for nourishment of sperm. During copulation, Semen of male insect are stored.

4. EJACULATORY DUCT

A common and tubular duct is situated at the posterior part of male reproductive system is called ejaculatory duct. In some insects both seminal vesicle are United and formed ejaculatory duct such as in hemiptera and heteroptera. But in some insect both lateral vas deferens are United at posterior part and formed ejaculatory duct such as in grasshopper and Cockroach. The ejaculatory duct of insect is thickened and contractile in nature. It is also made up of special type of contractile muscle.

5. AEDEGUS

A Small and strong aedeagus is situated at the posterior part of ejaculatory duct. It is also called penis of male insect. Aedeagus of insect is ectodermal in origin and lined with cuticle. The ejaculatory duct is formed as a invagination at the posterior part of the last abdominal segment as Aedeagus or penis. It helps in the propulsion of semen during copulation.

6. ACCESSORY DUCT

One pair glandular structure are presented at the base of seminal vesicle are called accessory gland. Accessory glands are tubular structure in Hemiptera but branch in dictyoptera and orthoptera. The wall of accessory gland are formed by three layers of glandular epithelium which secretes fluid for nourishment of sperm and also help for movement of sperm.

