

Thesis Title	Structure and Histology of Digestive, Excretory and Reproductive systems in <i>Fasciola gigantica</i>
Name	Ardool Meepool
Degree	Master of Science (Anatomy)
Thesis Supervisory Committee	Chaitip Wanichanon, Ph.D. Prasert Sobhon, Ph.D. Suchart Upatham, Ph.D.
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ABSTRACT

Digestive system of *Fasciola gigantica* consists of oral sucker, buccal tube, pharynx, esophagus and caeca. The oral sucker is located at the anterior tip of the body and is connected with the pharynx by the buccal tube. The epithelium of the oral sucker, buccal tube, pharynx and esophagus are stratified squamous type. The caecum is continuous with the esophagus and bifurcates into left and right main caeca extending towards the posterior end of the body. Both main caeca give off numerous medial and lateral branches. The epithelium of the caecum varies from tall columnar to low cuboidal with apical branching and long microvilli depending on volume of the food in their lumen. There are two types of epithelial cells of caecum: type-I is tall and heavily stained with methylene

blue, and type-II is shorter, palely stained and shows dilatation of RER. A lot of zymogen granules are released from type-II epithelial cells.

Excretory system is composed of a main bladder and branching tubules. The smallest branches are located between the parenchyma cells and contact with all other organs. These branches converge to become the larger branches located just under the ventral and dorsal tegument, and extend towards the posterior part of the body. The larger branches are connected with the elongated main bladder located at the midline in the posterior 2/3 of the body. Finally, the main bladder opens out at the posterior end of the body. Epithelial cells of the main bladder and its branches are simple squamous type. Epithelial cells receive waste products from the surrounding parenchyma cells and concentrate it into excretory granules which are excreted into the lumen by exocytosis.

The liver fluke, *F. gigantica*, is a hermaphroditic parasite which has both female and male sex organs. Female sex organs consist of ovary and oviduct, vitelline gland and its duct, ootype, Mehlis gland, uterus, female genital canal and genital pore. The ovary is a branching tubular organ which is located anterior to testis, and is unilateral to uterus. There are four stages of cells in the ovary: oogonia, oocytes, immature ova and mature ova. Mature ova are transferred to ootype by oviduct. Vitelline gland are located bilaterally posterior to the testis. Vitelline gland consists of multiple acini in close aggregation. The mature vitelline contain shell granules located peripherally and paler yolk granules located centrally. Two longitudinal vitelline ducts collect detached vitelline cells from each side of body and

open into the ootype via the median vitelline duct. Unicellular Mehlis glands surround the ootype and send cytoplasmic processes to its wall. There are two types of Mehlis gland cells: the M1 is located peripherally and the M2 is located more centrally. Secretion of the Mehlis gland induces vitelline cells to secrete dense granules to form eggshell. The uterus is a coiling tube in continuation from ootype; it extends to the anterior part of the body. The uterine epithelium is flat cuboidal with long microvilli. Eggs are formed at the proximal part of uterus and develop during their transit along the uterus and eventually pass into the female genital canal and genital pore. One egg consists of one zygote cell surrounded by numerous vitelline cells which are ensheathed within the egg shell. Vitelline cells in the egg are broken up and release their granules containing food materials for the development of the zygote to miracidia.

Male sex organ consists of testis, vas deferens, seminal vesicle, prostate gland and its duct and male genital canal. Testis is located in the central part of the body; it has two groups of seminiferous tubules separated into left and right lobes by the tube-like bladder which run along the central axis of the body. Spermatogonia are located at periphery of seminiferous tubule, and develop to spermatocytes, spermatids, and spermatozoa which are distributed tandemly towards the center. Two vasa efferentia collect spermatozoa from each lobe of the testis and transfer through the vas deferens to be stored in the seminal vesicle which is located dorsal to the ventral sucker. Anterior to the seminal vesicle is male genital canal which is surrounded by unicellular prostate gland cells. These gland

cells extend their cytoplasmic processes to the prostatic duct located in central part of the gland, and secrete some materials into the epithelium of the duct. During copulation the spermatozoa and prostate gland secretion are ejaculated out of the body via the common genital pore.