

Gonadal Structure and Gametogenesis of the Webspinner (Insecta: Embioptera: Oligotomidae: *Oligotoma saundersii*)

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Abstract : The gonadal structure and development stages of germ cells of the webspinner, *Oligotoma saundersii* were described for both sexes. Detailed histological studies in female showed a pair of ovaries, which consisted of large numbers of panoistic ovarioles joined by short pedicels that connected to a common oviduct and embedded in the adipose tissue. Each ovariole is divided into 3 regions: terminal filament, germarium and vitellarium. The germarium usually contains the prefollicular cells and oogonia. The vitellarium contained various stages of oocyte development that can be classified into 4 stages: 1) Previtellogenic oocyte, the nucleus is presented in the center and the follicular epitheliums are arranged with squamous epithelium. 2) Early vitellogenic oocyte, the ooplasm is finely filled with yolk granule as spherical spheres and the follicular epithelium is shown to be cuboidal epitheliums. 3) Late vitellogenic oocyte, the follicular epithelium increased its thickness as columnar epithelium. The yolk granules are spread toward the central domain, multiplied and increased in size during in this stage. 4) Mature stage, this stage presented the enlargement of the yolk granules. In male, each testis was composed of five testicular tubes. Each testicular tube contained only two stages; spermatids and spermatozoa based on the pattern of chromatin condensation and other characteristics. This research has possibility of providing invaluable information regarding the reproductive histology of this species of webspinner for future references and continual studies.

Keywords: insect reproduction, histology, oogenesis, ovarian structure, webspinner

Introduction

Oligotoma saundersii (Westwood, 1837), a relatively small to medium species of webspinner belonging to the family Oligotomidae (Embioptera), is found throughout both tropical and temperate regions. It is also considered to have been a major introduction of Embiopteran among this genus in East Asia [1] [2]. Recently, *O. saundersii* was identified within Thailand for the first time and therefore is thought likely to be found throughout the country [3]. Additionally, its host plant preference is very diverse i.e. *Acacia auriculaeformis* A., Cunn. Ex Benth, *Diospyros rhodocalyx* Kurz., Dehnh, *Mangifera indica* and *Cassia javanica* L.) [3]. Even though the external morphology of *O. saundersii* has been studied by many researchers [3] [4] [5] [6], the study of internal morphology (particularly of cell and tissue levels) is still limited.

Regarding the histological aspect concerning the cells and tissues of webspinner, only *Archembiu hatesi* (MacLahlan, 1877) of the

family Archembiiidae was investigated on its muscular, nervous, digestive, and reproductive systems [7]. Therefore, additional histological studies of other species of the embioptera group should be undertaken. Herein, the specimens of *Oligotoma saundersii* were examined to reveal the picture of gonadal structure and gametogenesis. The structures were described and illustrated.

Materials and Methods

Adult *Oligotoma saundersii* (6.5- 6.9 mm in body length) were obtained from a public park located in the Plaichumpol sub-district, Mueang district, Phitsanulok province and bred in the Laboratory of the Pathobiology department, Faculty of Science, Mahidol University, Bangkok, Thailand. We collected a total of 10 individuals (5 males and 5 females), which were euthanized by rapid cooling method [8].