Thesis Title Structure of the Testis of *Rana tigerina* and Its Changes During Development and Seasonal Variation.

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## ABSTRACT

Testes of 1- to14- month - old *Rana tigerina* , native rice - field frogs of Thailand, were studied by light and tranmission electron microscopes. Based on the nuclear characteristics, twelve stages of male germ cells could be identified in the seminiferous tubules. Primary and secondary spermatogonia are the earliest germ cells that show large euchromatic nuclei with prominent nucleoli. Primary spermatocytes consist of 5 stages: namely, leptotene, zygotene, pachytene,diplotene and metaphase 1 spermatocytes. Nucleoli are not detected in any stages, but the presence of synaptonemal complex is the unique characteristic of a zygotene spermatocyte.Secondary spermatocytes have blocks of completely condensed heterochromatin attached to the nuclear envelopes resembling " clock - face" pattern. There are three stages of

spermatids: the early ,the middle and the late stages. The acrosome starts to form in the middle stage. The cytoplasm of the late stage spermatid becomes highly vacuolized and starts to degenerate. In a fully mature spermatozoon,the nucleus becomes highly elongated, and chromatin completely condensed. Spermatozoa are embedded in the cytoplasm of Sertoli cells. At each stage of division and differentiation, a clone of cells derived from a single spermatogonium is surrounded by processes of follicular cells which may have similar functions and belong to the same group with Sertoli cells. Leydig cells are found between seminiferous tubules, and show dense hormonal granules accumulating in their cytoplasm. During development, testis with hollow sex cords appears during the second month. Spermatogonia are present in the epithelium of sex cords during the early third month. Active spermatogenesis begins during the fourth month,and full production of spermatozoa could be detected from the sixth month onwards. During the breeding period ( from March to September ), there are abundant spermatozoa, round spermatids in seminiferous tubules, while during the non - breeding period ( from October to February ), such cells are much fewer in number.