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VIRIYA PANKAO: SPERMATOGENESIS AND CHROMATIN CONDENSATION IN THE MALE GERM CELLS OF THE GIANT AFRICAN SNAIL, ACHATINA FULICA BOWDICH. THESIS ADVISORS: CHAITIP WANICHANON, Ph.D., PRASERT SOBHON, Ph.D., PRAPEE SRETARUGSA, Ph.D., MALEEYA KRUATRACHUE, Ph.D. 127 p. ISBN 974-665-038-6

The aim of this thesis was to study the ovotestis histology, ultrastructure and pattern of chromatin organization in male germ cells during spermatogenic processes in *A. fulica* by light and transmission electron microscopy. The ovotestis was composed of numerous small tubules which were seperated from the surrounding connective tissue by the basement membrane. Each tubule contained various stages of developing male and female germ cells, Sertoli cells, and follicular cells. Based on their size, shape and chromatin condensation pattern, the male germ cells could be classified into a spermatogonium (Sg), six stages of primary spermatocytes, *i.e.*, leptotene (LSc), zygotene (ZSc), pachytene (PSc), diplotene (DSc), diakinesis (DiSc) and metaphase (MSc) spermatocytes, secondary spermatocyte (SSC), ten stages of spermatids (St_{1-10}), and two stages of spermatozoon (Sz_{1-2}). Sg was a spherical-shaped cell; its nucleus contains mostly euchromatin and few small blocks of widely scattered heterochromatin. The heterochromatin blocks became larger and more numerous in LSc and ZSc, which was due to the winding of 30-nm fibers around a single-dense line that was the axis of chromatin condensation. The euchromatin contained individual 30-nm as well as 10-nm chromatin fibers. ZSc also had synaptonemal complex, the tripatite structure. The heterochromatin blocks were enlarged to form a few pieces of chromosomes in DSc and DiSc. The two halves of chromosomes in DiSc were segregated, then moved to be aligned along the equatorial region in MSc. SSc was a round cell, derived from the division of MSc, whose nucleus contained large clumps of heterochromatin along the nuclear envelope and in the central area. St_{1-4} had round-shaped nuclei which became progressively smaller and denser. During transition of SSc to St_1 the dense chromosomes were reorganized into evenly distributed 30 and 10 nm fibers. Thereafter, 30-nm chromatin fibers started to be condensed into heterochromatin blocks again in St_2 and St_3. In St_4 the 30-nm fibers became homogeneously condensed throughout the nucleus. St_5 nucleus was gradually compressed on cephalo-caudal direction to become cup-shape and was indented further to assume an arrow or boomerang shape in St_6, while 30-nm fibers were decreased in size to about 20 nm, and were straightened to form 14-16 nm fibers in St_7. Then, the nucleus became a pear shape in St_8. In St_9 and St_{10} the nucleus started to elongate to form a tapered anterior end, and the chromatin was completely condensed. The straight chromatin fibers were packed into bundles about 120 nm in width which coalesced into dense crystal lattice-liked structure in the spermatozoa. The spermatozoon had a falciform-shape head that contains completely condensed chromatin in the crystal lattice conformation with dense individual 10-nm lines separated by the intervals of 3-4 nm. It was covered anteriorly by a small acrosome. The neck region was composed of centriolar complex surrounded by a rhomboid shape crystalline substance. The mid-piece consisted of axonemal-fibrous complex surrounded by the helical mitochondrial sheath. The end-piece consisted of only axonemal complex surrounded by the plasma membrane.