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PRAPHAPORN LAIMEK : STRUCTURE AND DEVELOPMENT OF NERVE GANGLIA, PERIPHERAL NERVOUS SYSTEM AND SPECIAL SENSORY ORGANS IN HALIOTIS ASININA LINNAEUS. THESIS ADVISORS : CHAITIP WANICHANON, Ph.D., PRASERT SOBHON, Ph.D., PRAPEE SRETARUGSA, Ph.D., MALEEYA KRUATRACHUE, Ph.D. 151P. ISBN 974-663-768-1

This study was undertaken to investigate the histology, classes of cells in the nerve ganglia of adult *H. asinina* and their development, and the morphology and histology of the peripheral nervous system and the special sensory organs. The histology and the development of cerebral, pleuropedal and visceral ganglia during preadult stages of this abalone were studied by LM, using H&E, CH-P and PF stains. In late juvenile and adult ganglia, there are ten types of cells, consisting of three types of neurosecretory cells (NS<sub>1-3</sub>), four types of neurons (NR<sub>1-4</sub>), and three types of neuroglia (NG<sub>1-3</sub>). These cells first appear in 1-month-old abalone in cerebral and pleuropedal ganglia, and their numbers and sizes increase with advancing ages. In the cerebral ganglia; NS, NR<sub>1</sub> are significantly increased in 5-and 10-month-old abalone, reaching maximum number in 12 months, and thereafter remaining constant. In the pleuropedal ganglia, NS and NR<sub>1</sub> are significantly increased in 4-and 7-month-old abalone, reaching maximum number in 11 months, and thereafter remaining constant. In the visceral ganglia, NS and NR<sub>1</sub> first appearing 2-month-old and significantly increase in 4-month-old abalone, reaching maximum number in 11-month-old abalone, and thereafter remaining constant. NR<sub>2</sub>, NR<sub>3</sub>, NR<sub>4</sub> and NG are present in all ganglia early in development from 1-month onwards, and their numbers increase rapidly with advancing age.

There are five groups of peripheral nerves from the central nervous system that supply the body, including the special sensory organs. The special sensory organs consist of a pair of cephalic tentacles, a pair of eyes, a pair of appendage tentacles, numerous epipodial tentacles and the osphradium. The cephalic and epipodial tentacles are similar in structure, but the latter are three times smaller and ten times shorter than cephalic tentacles. Using surface characteristics as observed by LM and SEM, each tentacle is divided into three parts: the basal part exhibits flat surface consisting of small folds and grooves; the middle part has short papillae; and the top part has very high papillae. In cross sections, there is a bundle of nerve which runs along the length of each tentacle, and its branches are distributed among the muscle, and the epithelium which is covered externally by microvilli. The epithelium of the tentacle's base is columnar type and its surface appears flat, with some areas exhibit small curve. At the middle part, the epithelial surface appears like hillocks, and at the top part the epithelium appears in cone-shaped structures. The hillocks of the middle part and the cones at the top are believed to be sensory papillae. In each papilla there are cilia extending out from the top, and there are three types of epithelial cells: the ciliated sensory cells, supporting cells and the goblet cells. The eye is an open vesicle which appears spherical in cross section, with its lens surrounded by the retina. The retina is composed of six layers: pigmented layer, pigmented cell layer, fibrous layer, receptor cell layer, loose connective tissue layer, and a layer of optic nerve, respectively. The receptor cells in the retina can be classified into three types; rc<sub>1</sub>, rc<sub>2</sub> and rc<sub>3</sub>. Appendage tentacle has a half-circle shape and is covered by numerous irregular folds and grooves. In cross sections, it reveals many muscle cells and accompanying nerve fibers that form the core materials surrounded by an epithelium. The epithelium is simple columnar that lies on a thick basement membrane. Three types of cells can be identified in the epithelium, i.e., ciliated sensory cells, supporting cells and mucous secreting cells. The osphradium exhibits many tufts of rod-shaped cilia, paddle-like cilia, granules exocytosed from the pores on the surface of leaves and leaflets. In transverse sections, each of the leaf and leaflet can be divided into two areas: the basal area which consists mainly of two types of large goblet cells, and the apical area that contains a mixture of supporting cells, sensory cells and five types of mucous secreting cells. This study will apply to increase the number of abalone.