

4036347 SCAN / M : MAJOR : ANATOMY ; M.Sc. (ANATOMY)

KEY WORDS : FASCIOLA GIGANTICA / CATHEPSIN L / DIGESTIVE TRACT / EPITHELIUM / *IN SITU* HYBRIDIZATION

SOMPONG SRIBUREE: CHARACTERISTICS OF EPITHELIAL CELLS AND THE EXPRESSION OF CATHEPSIN L GENE IN THE DIGESTIVE TRACT OF FASCIOLA GIGANTICA. THESIS ADVISORS: CHAITIP WANICHANON, Ph.D., PRASERT SOBHON, Ph.D., SUKSIRI VICHASRI GRAMS, Dr.rer.nat., VITHOON VIYANANT, Ph.D. 133 P. ISBN 974-663-766-5

The objectives of this thesis are to classify the type of epithelium lining the digestive tract of *F. gigantica* and the expression of cathepsin L in these epithelia.

Epithelia of the digestive tracts of adults and 50-day-old *F. gigantica*, as studied by light microscopy, consist of two types: the tegumental-type which is a syncytium similar to the tegument; and the digestive-type which is composed of an array of columnar or cuboid digestive cells. The proximal part of the digestive tract, including oral sucker, buccal tube, pharynx, esophagus and part of the tract anterior to caecal bifurcation are lined by tegumental-type epithelium, whereas the caecum is lined by the digestive-type epithelium. The tegumental-type epithelium is characterized by numerous basal infoldings which extend towards the apical surface that is corrugated with cross sections of ridges or microfolds. The digestive-type epithelium is composed of columnar or cuboidal cells containing round basally-located euchromatic nuclei, prominent nucleoli, and numerous stereocilia. The digestive-type epithelial cells could be classified into 3 types: type-1, type-2 and type-3 epithelial cells, exhibit cytoplasm which are densely, moderately and lightly stained, and the quantity of zymogen granules and cell height are decreasing in that order. In contrast, the caecal epithelial cells of metacercariae are remarkably distinct from those of adult and juveniles. These cells are completely filled with large and very dense granules in comparison to those of the adult and 50-day old juveniles. Each cross section of the caecal lumen appears very irregular in shape, and surrounded by only a few epithelial cells.

The localization of cathepsin L gene (Cat L) expression in the digestive tract at each developmental stage of *F. gigantica* (metacercariae, 50-day-old juvenile and adult) was examined by *in situ* hybridization. Digoxigenin-labeled cDNA probe was produced by random priming method for the detection of mRNA coding for *F. gigantica* Cat L. Cat L mRNA was present in abundance in the cytoplasm of caecal epithelium in 50-day-old juvenile and adult stage but not detected in the nuclei. In contrast, epithelium covering the remaining parts of the digestive tract, including oral sucker, buccal tube, pharynx, esophagus and caecal bifurcation, which are tegumental-type epithelium, did not exhibit the presence of Cat L mRNA. In addition, Cat L mRNA could not be detected in metacercarial digestive epithelium.

The synthesis of cathepsin L enzyme in the digestive epithelium was investigated by indirect immunofluorescence, using mouse monoclonal antibody to cathepsin L, and polyclonal mouse anti-native *F. gigantica* Cat L and sheep anti-native *F. hepatica* Cat L as probes. In general, these antibodies gave similar result. The enzyme Cat L was localized in caecal epithelium cells in both 50-day-old juvenile and adult stage, but not in the metacercaria.