

ABSTRACT

Trichobilharzia regenti is a neurotropic fluke belonging to family Schistosomatidae. Larvae called schistosomula migrate in the definitive hosts (anseriform birds) through the central nervous system (CNS) to their final location in nasal mucosa, where they mature and lay eggs. In contrast with that, the infection of accidental mammalian hosts (including human), is often stopped already in the skin immediately after entering the host. However, some schistosomula are able to reach CNS of experimentally infected mice, and survive there temporarily. Reaction to the CNS infection of mice is usually provided by microglia, astrocytes or the other immune cells infiltrated from the hosts blood. Parasite protects itself against the host reaction with its tegument. It does not serve only as mechanical barrier, but also as main secretory organ that is capable of active immune evasion.

Changes within CNS of the vertebrate hosts, caused by migrating schistosomula of *T. regenti*, were already described by routine histological and immunohistochemical methods. Till now, there was a lack of informations about interactions of immune cells of the host and the tegument of the parasite on ultrastructural level. To fill this gap in knowledge, two different methods were used: (1) immunohistochemistry in light and electron microscopy, and (2) standard transmission electron microscopy (TEM). Besides confirmation of already known facts, the presence of morphologically distinctive bipolar microglia was detected in close vicinity of migrating schistosomula in both bird and mammalian hosts. Hereafter, direct relationship between intestinal content and precise localization of schistosomula in the spinal cord of the host was observed. New protocol for labeling of immune cells in spinal cords of ducks with lectins was introduced as a replacement for unsuccessful use of antibodies. Combination of TEM with antibody labeling confirmed ultrastructural characterization of particular cell types in the hosts spinal cord and direct influence of these cells to the tegument of parasite in different phases of infection was described on ultrastructural level.

The main benefit of this thesis consists in use of advanced imaging methods for precise observation of changes caused by the presence of parasite in the CNS under *in situ* conditions that contributed to a better understanding the process of infection in mice and ducks.

Key words: *Trichobilharzia regenti*, central nervous system, microglia, astrocytes, tegument, ultrastructure, immunohistochemistry, immunogold, transmission electron microscopy.