ABSTRACT

The liver fluke, *Fasciola hepatica*, is one of the most important parasites of livestock, and it also infects humans. The proteolytic system of trematodes is critical for their interaction with the host and is a potential target for the development of novel vaccines. This work is focused on proteases secreted by *F. hepatica* adults and on FheCy2, a new protease inhibitor from the cystatin family. The proteolytic activity of the secreted proteases was analyzed using: (a) chromogenic protein substrates and fluorogenic peptide substrates, (b) selective protease inhibitors, and (c) a fluorescent activity-based probe for visualization of proteases. The results showed that the secreted proteases are cysteine proteases of papain family belonging to cathepsins L and B. These proteases were effectively inhibited by FheCy2 as demonstrated by enzymological analysis. It can be assumed that FheCy2 participates in the physiological regulation of endogenous proteases secreted by *F. hepatica* adults, which makes it attractive candidate protein for vaccination studies.

Key words: *Fasciola hepatica*, cathepsins, proteolytic activity, substrate specificity, protease inhibitors

(In Czech)