

Abstract

The ticks are important blood-feeding parasites and vectors of pathogens. The hard tick *Ixodes ricinus* is the most common species in the Czech Republic that transmits Lyme disease and tick-borne encephalitis. Proteases of the ticks are potential drug targets for the development of new vaccines against these parasites. This work is focused on biochemical analysis of a prolyl endopeptidase from *I. ricinus*, which has not been studied so far. The prolyl endopeptidase was identified in the extract from the tick gut tissue by the measurement of enzyme activity and by visualization on SDS-PAGE after labelling with activity-based probe. The tick prolyl endopeptidase is probably involved in the proteolytic digestion of host blood proteins based on the highest specific activity found in the gut tissue and its upregulation during the blood-feeding period. Biochemical analysis showed that the enzymatic activity of prolyl endopeptidase is (1) dependent on a free cysteine residue in a close proximity of the active site, (2) optimal at a pH range between 8 and 9, and (3) selectively inhibited by peptide inhibitors Z-Ala-Pro-CMK and Z-Pro-Pro-CHO.

Key words: prolyl endopeptidase, proteolysis, enzyme activity, substrate specificity, tick

(In Czech)