

Cysteine proteinases from *Rhodnius prolixus* midgut and fat body: tissue and temporal expression pattern

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Protein digestion in blood sucking Hemiptera as *Rhodnius prolixus* begin at the posterior midgut, with the action of acidic cysteine proteinases, being completed by the concerted action of carboxy- and aminopeptidases. The temporal and tissue expression pattern of proteases in *R. prolixus* midgut was studied so far with the use of proteic substrates (azocasein). As an initial effort to characterize each of the enzymatic components described above, and the possible influence of trypanosomatids in these individual activities, we studied the expression pattern of proteinases at the midgut and fat body of *R. prolixus* 5<sup>th</sup> instar nymphs using the fluorogenic substrate Z-Phe-Arg-MCA. Activities per animal in the anterior midgut, posterior midgut and fat body respectively range from 1 to 13, 27 to 280 and 16 to 200  $\mu\text{U}/\text{animal}$ , with specific activities ( $\mu\text{U}/\text{mg}$ ) ranging from 0.02 to 7.2, 50 to 920 and 40 to 4,300. Activity at the anterior midgut is higher before feeding (13  $\mu\text{U}/\text{animal}$ ), with two peaks at 9 (7  $\mu\text{U}/\text{animal}$ ) and 19 days after feeding (8  $\mu\text{U}/\text{animal}$ ). Posterior midgut shows two sharp peaks of enzymatic activity at day 2 (150  $\mu\text{U}/\text{animal}$ ) and day 14 (280  $\mu\text{U}/\text{animal}$ ), with a drastic decrease after this day. Fat body activity shows only one peak of activity at day 19 (200  $\mu\text{U}/\text{animal}$ ), and is probably related to moulting events, its expression being possibly controlled at the hormonal level. Anterior midgut activity is residual and is probably not important in digestion of major proteins from blood. The two peaks observed in posterior midgut activity are possibly related to the activation of epithelial secretion of digestive enzymes and perimicrovillar membranes at later days of development.

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