

Control of Tick Reproduction by Blocking Egg Release

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Angiotensin converting enzyme (ACE) is a carboxypeptidase that removes dipeptides from some oligopeptides. In vertebrates, this enzyme is involved in the control of blood pressure and fertility. Fourteen EST sequences from *Rhipicephalus microplus* matching ACEs were found in GenBank and clustered into four contigs, indicating that this tick has more than one ACE-like protein. 3D models of two of these sequences were built showing differences both in shape and surface electrostatic potential, suggesting again that these enzymes are different. We have previously shown that enalapril-maleate inhibited egg-laying in 69%. To access the expression profile of these ACE-like genes, RNA was extracted from ovary, gut, fat body, malpighi tubules, and hemocytes, single strand cDNA was produced and used as template for RT-PCR. The expression of these genes was different among the tissues, supporting the idea that the different isoforms of this enzyme have diverse physiological roles in this arthropod. The ovary development of the injected ticks was documented showing that enalapril injection did not inhibit ovarian development, but the eggs produced remained inside the engorged female. To identify possible neuropeptides eventually produced by ACE-like and involved in ovarian duct contraction, hemolymph of control and injected ticks was collected and the peptides having MW below 10kDa were analyzed using a HPLC C18 column. Differences in protein profile were observed and the relevant fractions collected to be analyzed by mass spectrometry. The proteins with MW above 10kDa will be analyzed by electrophoresis. Our results support a possible role for an ACE-like protein in the reproduction of *R. microplus*.

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