STUDY OF THE ACTION MECHANISM OF THE MICROPLUSIN, AN ANTIMICROBIAL PEPTIDE WITH COPPER CHELATING PROPERTY

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Invertebrates have an efficient mechanism against microbial infection through the production of antimicrobial peptides (AMPs). We are investigating the antimicrobial mechanism of microplusin, a cell-free hemolymph and egg AMP from the cattle tick *Boophilus microplus*. It is a peptide with 10,204 Da and six cysteine residues (Dev Comp Immunol, 28: 198, 2004). The recombinant microplusin is effective against several Gram-positive bacteria and filamentous fungi. This peptide has a bacteriostatic effect against *Micrococcus luteus*, however, no membrane permeabilization was observed. Besides, analysis performed by transmission electronic microscopy, revealed that around 10% of the bacteria lost their cellular contents. We verified by mass spectrometry that microplusin has a cooper chelating property. In addition, we observed that microplusin activity was 33-fold lower in the presence of the cooper and this reduction is dose-dependent. We also demonstrated that microplusin activity depends on a direct contact with bacteria. Thus, our results indicate that microplusin chelating property may affect the interaction between peptide and bacteria components. However, an additional nutricional effect can not be discarded yet. Currently, we are doing structure studies of microplusin.
Key words: antimicrobial; peptide; tick. Supported by FAPESP and CNPq