In several organisms, the first barrier against microbial infections consists of antimicrobial peptides (AMPs) which are molecules that act as components of the innate immune system. Recent studies have demonstrated that AMPs can perform various functions in different tissues or physiological conditions. In this view, this study was carried out in order to evaluate the multifunctional activity in vivo of an alanine-rich peptide, known as Pa-MAP, derived from the polar fish Pleuronectes americanus. Pa-MAP was evaluated in intraperitoneally infected mice with a sub-lethal concentration of Escherichia coli ATCC 8739 at standard concentrations of 1 and 5 mg.kg⁻¹. At both concentrations, Pa-MAPs exhibited an ability to prevent E. coli infection and increase mice survival, similar to the result observed in mice treated with ampicillin at 2 mg.kg⁻¹. In addition, mice were monitored for weight loss. The results showed that mice treated with Pa-MAPs at 1 mg.kg⁻¹ gained 0.8% of body weight during the 72 h of experiment. The same was observed with Pa-MAP at 5 mg.kg⁻¹, which had a gain of 0.5% in body weight during the treatment. Mice treated with ampicillin at 2 mg.kg⁻¹ show a significant weight loss of 5.6% of body weight. The untreated group exhibited a 5.5% loss of body weight. The immunomodulatory effects were also evaluated by the quantification of IL-10, IL-12, TNF-α, IFN-γ and nitric oxide cytokines in serum, but no immunomodulatory activity was observed. Data presented here suggest that PA-MAP should be used as a novel antibiotic against infection control.

Keywords: antimicrobial peptides; multifunctional; immunomodulatory; in vivo infections
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