New Biological Activity of the Human Fibrinopeptide A

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Triatomine bugs (Hemiptera, Reduviidae), are blood-sucking ectoparasites arthropods of great social, economic and medical relevance. These insects are exposed to a wide variety of pathogens and attempting to survive, they developed important defense mechanisms, mainly their innate immune response. On the liquid fraction of the innate immunity, they produce antimicrobial peptides (AMPs). These molecules represent a major form of insect defense. Despite the new researchs, descriptions of these AMPs are still very limited in triatomines. The objective of this study was to evaluate and identify the presence of AMPs in the hemolymph of *Triatoma infestans,* triatomine of great importance in the transmission of Chagas disease. The hemolymph of 17 induced triatomines was collected, subjected to acid extraction, purification, and elution with different concentrations of acetonitrile. Subsequently, the fractions were separated in the HPLC and each peak was tested for growth inhibition of Gram-positive *(Micrococcus luteus*, strain A270) and Gram-negative bacteria (*Escherichia coli*, strain SBS363) and yeast (*Candida parapsilosis*, strain IOC 4564). Samples that showed inhibitory activity were submitted to a hemolytic assay to verify their toxicity. Those same samples were processed in the mass spectrometer and analyzed using the software Fingerprint, Blast and databases research and "*De Novo*" sequencing. Nine molecules showed antimicrobial activity, of which only one showed a hemolytical potential. Of those molecules, one was confirmed as the human fibrinopeptide A. In insects, the closest molecules related to fibrinogen are the Fibrinogen-Related Proteins, which does not have similarity to the fibrinopeptide A from humans. As already described in the tick *Boophilus microplus,* we believe that the *T. infestans* is absorving the peptide from the blood feeding. It may sugest a mechanism of internalization of this peptide on the insect, as described in *Rhodnius prolixus,* a related Hemiptera. In conclusion, taken all our data together, a new biological activity of the human fibrinopeptide A is being revealed and we expect to achieve a better characterization of a new pathway of the immune system of this insect.

Key Words: Fibrinopeptide A, *Triatoma infestans*, and Antimicrobial Peptides.
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