

TITLE: PH AND TEMPERATURE STABILITY OF LIPOPEPTIDES PRODUCED BY *PAENIBACILLUS ELGII* AC13.

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ABSTRACT: Bacterial resistance to antibiotics has become a recurrent health issue due to the frequent misuse of antibiotics. Thus, studies searching for alternatives to traditional antibiotics have increased. *Paenibacillus elgii* has been drawing attention because of its ability to produce antimicrobial peptides. In previous studies, a strain of *Paenibacillus* called AC13 was isolated from the Cerrado soil; this strain produces lipopeptides called pelgipeptins, which have antimicrobial properties. The objective of this study was to test the stability of pelgipeptins under different pH and temperature values. Pelgipeptins pH stability was evaluated by incubation at 37°C for 12 h under pH values ranging from 2 to 12. For the evaluation of temperature stability, an aliquot of pelgipeptins was incubated for 12 h at the temperatures of 40°C, 60°C, 80°C and 100°C, and after an autoclave cycle. After the treatments the aliquots had their antimicrobial activity tested by means of agar diffusion assays. Changes in the molecules were analyzed by mass spectrometry and RP-HPLC. Data were analyzed using the unpaired T-test, with an alpha of 0.05. According to the obtained p-value, there was no significant difference in the diameter of the inhibition halo of pelgipeptins under pH 2 to 11, indicating that there was no decrease in the antimicrobial activity of these molecules. However, pelgipeptins exposed to pH 12 lost their antimicrobial activity. For temperature, the value of p-value indicates that at 40°C there was no significant difference in pelgipeptin activity compared to the control at 37°C. At temperatures of 60°C, 80°C and 100°C, there is a significant difference in halo diameter, indicating that there was a decrease in the antimicrobial activity of these molecules. For aliquots that were submitted to autoclaving, there was a significant difference in the diameter of the halo compared to the control, however, the antimicrobial activity could still be observed. In conclusion, pelgipeptins exhibit structural and functional stability in the range of pH 2-11 and temperatures from 40°C to 100°C as well as after the autoclaving process.

Key-words: pH, temperature, stability, lipopeptides, pelgipeptins, *Paenibacillus elgii*

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