

TITLE: COMPARISON IN THE PRODUCTION PROFILE OF *P. ELGII* LIPOPEPTIDES IN COMPLEX MEDIA

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ABSTRACT:

Paenibacillus elgii AC13 was isolated from Cerrado soil samples for its antimicrobial activity against *Escherichia coli*. It was later found that *P. elgii* AC13 had a family of four well described cyclic lipopeptides produced by a non-ribosomal peptide synthase (NRPS) named Pelgipeptins. There are four Pelgipeptin isoforms, A to D, presenting molecular mass ranging from 1072 to 1100 Da. All isoforms have a three or four-carbon p-hydroxy fatty acid chain attached to the N-terminal region of the peptidic moiety. In addition, the second amino acid residue may be valine or isoleucine. Previous studies have reported the production of linear lipopeptides by *Paenibacillus* sp. when grown on Tryptic Soy Agar, a complex medium. The objective of this study was to characterize and investigate the lipopeptide profile produced by *P. elgii* AC13 grown on different complex media. The lipopeptides were obtained from the supernatant of cultures on Tryptic Soy Broth (TSB), Nutrient Broth, and Muller-Hinton by organic extraction with butanol. The organic phase was dried and purified by RP-HPLC and the chromatographic fractions analyzed by MALDI-ToF-MS/MS mass spectrometry, determining amino acid sequences. *P. elgii* AC13 presented additional linear lipopeptides of masses 1118 Da and 1104 Da, when grown on Nutrient broth, Muller-Hinton broth, and low TSB detection. The amino acid sequence corresponded to the linear sequence of the cyclic Pelgipeptins B and C, which are the isoforms produced in greater abundance. The reason for the occurrence of these linear isoforms is unclear, but it is known that strong alkaline pH breaks the lactone ring of cyclic lipopeptides generating linear forms. However, these media have a buffering effect, maintaining the medium pH around 7.0. It is likely that the composition of some complex media will influence the presence of linear isoforms of Pelgipeptins, since they may not be detected in all complex media tested, under our conditions.

Keywords: biotechnology, bacterial lipopeptides, complex media, chromatographic and mass spectrometry, antimicrobial.

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