TITLE: ECTOINE ACCUMULATION AND HYPO-OSMOTIC SHOCK BY THE HALOPHILIC BACTERIA HALOMONAS SALINA

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ABSTRACT:

Halomonas salina is a halophilic bacterium that produces ectoine in order to protect itself against the deleterious effects of desiccation, freezing, heat stress, and others. Besides the osmotic function, ectoine research aroused big interest in biotechnology circles, regarding the protection of enzymes, proteins, nucleic acids, biomembranes and even role cells. One of the most important features in ectoine production is the ability to quickly adapt to different salt concentrations. With the increase of salinity, the compatible solute will be synthetized, and with this decrease some bacteria are able to secrete it, in a process named “bacterial milking”. In the bioprocess for ectoine synthesis this feature is very important because the cost with product recovery decreases, once there is no need to cause cellular lysis. There is no evidence of this ability in literature for *Halomonas salina*. In order to investigate it, different ectoine fractions were analyzed, such as the extracellular (present in the supernatant) and those secreted in different time intervals. For the application of the hypo-osmotic shock, the culture was centrifuged, resuspended in distilled water and incubated for 30 minutes, then centrifuged again and the supernatant analyzed. In condition of low aeration (in Erlenmeyer flasks), the “bacterial milking” provided a 400% higher ectoine concentration (from 33 mg/L to 201 mg/L, with a total of 234 mg/L). Once the applied system was a bioreactor, the proportion of ectoine from the “bacterial milking” decreased (1:1), but the concentration increased, from 2,360 g/L to 2,404, with a total of 4,764 g/L.

Despite this smaller proportion, its concentration is still very significant and essential for the viability of the process, which then presents a volumetric productivity of 0.238 g / L. In addition, now we have the description of “bacterial milking” fraction, making the concentration values of ectoine produced by *Halomonas salina* even more attractive. Only intervals of 30 minutes were tested, and now it is necessary to study the kinetics of secretion of the compatible solute.

Keywords: compatible solutes, ectoine, halophilic bacterium, fermentation

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