

**TITLE:** ISOLATION OF ENDOSPORE FORMING BACTERIA AND BIOSURFACTANT PRODUCTION TEST IN COASTAL ENVIRONMENTS IN RIO DE JANEIRO

**AUTHORS:** Casares,J; Argentino,I.C.V; Novello,B; Seldin,L; Jurelevicius,D.A

**INSTITUTION:** Universidade Federal do Rio de Janeiro, Rio de Janeiro,RJ ( Av. Carlos Chagas Filho 373-1° andar, Rio de Janeiro,RJ, Brazil)

**ABSTRACT:**

Endospore forming bacteria can differentiate into a dormant cell when the surrounding is a stressful environment, increasing their resistance and assisting in their survival. Many bacteria that have this characteristic present biotechnological potential because of the capability that they have of producing biosurfactant compounds, which are chemical substances that aid in the interaction between hydrophobic and hydrophilic compounds, like oil and water. Biosurfactants can be applied in diverse industrial branches, such as cosmetics, cleaning products, and more. However, although there are many genus of the phylum Firmicutes with species capable of producing endospores, the production of biosurfactantes is mainly described in bacteria of the *Bacillus* genus. Therefore, the goal of this research is to prospect endospore forming bacteria, biosurfactant producing, of various environments. In order to reach this goal, it was collected samples in Grumari restinga and in Parque Natural Municipal de Grumari (both located in Grumari/RJ), such as: marine water (A), marine sediment (S), restingas soil (R), and forest soil (F). For the isolation of the endospore forming bacteria, the pasteurized samples were plated in Trypticase Soy Broth (TSB) and Marine Broth (MB), and the plates were incubated at 32°C for 48 hours. The cellular shape and the endospore production of each bacterial isolate was confirmed by Gram staining followed by optical microscopy. Then, they were submitted to several screening test for biosurfactant production: oil displacement; drop collapse and hexadecane emulsification test. After isolation, it was obtained a total of 141 bacterial strains. The results of the production of surfactant screening showed that 16 of the bacterial isolates were positive in de drop collapse test and 34 showed positive results in de hexadecane emulsification test. None of the bacteria were positive in the oil displacement test. In the hexadecane emulsification test, one bacterial isolate of the F samples showed a emulsified layer that equal 50%, and 14 bacterial isolates showed layer bigger or equal 10%, being 4 of them from F, 7 from S and 3 from R. Afterwards, it will be performed typing of bacterial isolates strains trough BOX-PCR followed by molecular identification trough sequencing of the rRNA 16s gene. Ultimately, the results obtained in this research will expand the knowledge of endospore forming bacteria and their potential in biosurfactant production.

**Keywords:** Endospore, Biosurfactant, Emulsification

**Development Agency:** LABEM- Laboratory of microbial biotechnology and ecology