

TITLE: STUDY OF THE DISTRIBUTION OF FIRMICUTES IN COASTAL ENVIRONMENTS OF RIO DE JANEIRO AND THE USE OF ENDOSPORE-FORMING BACTERIA TO BIOSURFACTANT PRODUCTION

AUTHORS: ARGENTINO, I.C.V.; SELDIN, L.; JURELEVICIUS, D.A.

INSTITUTION: UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, RIO DE JANEIRO, RJ (AVENIDA CARLOS CHAGAS FILHO, 373, CIDADE UNIVERSITÁRIA, INSTITUTO DE MICROBIOLOGIA PAULO DE GÓES, CEP 21941590, RIO DE JANEIRO – RJ, BRAZIL)

ABSTRACT:

The phylum Firmicutes comprise Gram-positive metabolically diverse bacteria which distribution in the environment is still poorly understood. Furthermore, the ability of some members to form endospore is interesting for their biotechnological potential. Thereby, the aims of this study are: (i) analyze the distribution of Firmicutes present in water, soil and sediments samples from different environments from Rio de Janeiro coast; (ii) isolate endospore-forming bacteria to prospect for biosurfactant production. Water, sediment and soil samples were collected from 8 environments: (1) Dois Rios Beach (DR) and (2) Abraão Beach (PA) (Angra dos Reis, RJ); (3) Massambaba Beach (PM), (4) Jacarepiá Lagoon (LJ) and (5) Vermelha Lagoon (LV) (Saquarema, RJ); (6) Grumari Beach (PG), (7) Grumari Restinga (GR) and (8) Municipal Natural Grumari Park (PN) (Grumari, RJ); and (8) Fundão Island (IF) (Rio de Janeiro, RJ). DNA extraction and 16S rRNA gene sequencing assays (using Illumina platform) were performed, and the generated sequences were analyzed using QIIME pipeline version 1.9.0. Sequence data related to Firmicutes was filtered and the richness, diversity and composition were determined. In addition, endospore-forming bacteria were isolated and screening tests for biosurfactant production, such as drop collapse, oil displacement and emulsification test were performed. The highest number of sequences related to Firmicutes was detected in sediment samples from LJ while the lowest number of Firmicutes sequences was obtained in water samples from PM. The richness index ranged from 23.5 (sediments samples-PM) to 637 (sediments samples-LJ), while the diversity index ranged from 2.99 (sediment samples-PM) to 7.04 (sediment samples-LJ). The mainly Firmicutes found in these environments were related to the genus *Bacillus* and to the class Clostridia. Until then, 139 strains were isolated and the results of the screening for 98 strains showed 16 positive isolates in the drop collapse test and 34 positive in the emulsification test. No bacteria were positive in the oil displacement test. Typing of bacterial strains through BOX-PCR followed by 16S rRNA gene sequencing will be performed later. We believe the results obtained will help us to understand the distribution of Firmicutes in different environments, facilitating the research of potential biosurfactant producers.