

## QUANTIFICATION AND ISOLATION OF ACTINOBACTERIA FROM SOIL ADDED WITH SUGAR CANE VINASSE

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### **Abstract**

Soil is a naturally diverse habitat with highly complex biological communities and great diversity of microorganisms, both eukaryotes and prokaryotes, interacting in a dynamic and steady state. The growth and development of these organisms depend on the interaction of several factors, which include the availability of organic substrates; environmental factors (e.g., temperature, humidity and degree of aeration). Vinasse, a waste product, is characterized by high organic and inorganic matter content, high microbial flora and biochemical oxygen demand, and when discarded in aquatic bodies, becomes a strong pollutant. Therefore, the main objective of this work was to quantify and isolate bacteria with characteristics of actinobacteria from sandy and clayey soil with different management systems. For the quantification of total heterotrophic cultivable bacteria (HCB) and actinobacteria, one fraction of the soil was pretreated. After, the soil samples were processed and inoculated, using the spread plate technique, on Tripytic Soy Agar (TSA) culture medium for BHT growth and medium Glycerol Casein Agar (added with cycloheximide) for actinobacteria growth. The bacterial counting analysis was done at 24, 48 and 72 hours. Then, re-isolation of the bacteria and Gram staining were done to obtain pure cultures. The identification of actinobacteria was done through biochemical tests. The highest HCB count was verified in the sandy soil without vinasse, while in sandy soil with vinasse there was a better actinobacteria growth. The Gram staining allowed to verify that the Gram positive rods were dominant in the clay soil. Biochemical and physiological tests show prevalence of Actinomycetes sp. in the argillaceous soil with vinasse. The actinomycetaceae family was more prevalent in the clayey soil without vinasse. All had the presence of bacteria with uncertain description, predominant ones in the clay soil with vinasse. It is concluded that the soil has its own characteristics that lead to the dominance of bacteria and the vinasse organic matter content facilitates the proliferation of them, as well as provides the growth of specific groups such as actinobacteria.

Actinomycetes, soil microbiota, sugarcane by-product