

Title: ENZYMATIC EVALUATION OF OIL MICROBIOTA FROM RIO GRANDE DO NORTE, BRAZIL

Authors Silvano, L.S., Costa, E. A. S., Edson, E.A., Pedrosa, R. M. A., Rocha, L.L.

Institution UFERSA – Universidade Federal Rural do Semi-árido (Avenida Francisco Mota 572 – Costa e Silva - 59.625.900 – Mossoró- RN)

Abstract:

Microorganisms found in oil have been highly studied due to their capacity of production of valuable bioproducts. One of the most studied groups of bioproducts is the group of enzymes, which are substances that enable several industrial processes and are more advantageous than synthetic enzymes. They cause no harm to the environment and are more stable, they also make industrial processes more specific and efficient, and they have a great versatility. Thus, the objective of this work was to find bacteria present in oil with potential for production of enzymes of industrial interest. For this work, oil samples were collected from the Canto do Amaro reservoir, located in Mossoró, Rio Grande do Norte. In order to isolate microorganisms, two aliquots of the oil sample (10 mL) were added to 90 mL of different media: nutrient broth and minimal mineral medium BH (with 0,1% of a micronutrient solution). The samples added to media were incubated at room temperature under agitation at 150 rpm. In order to select strains capable of producing enzymes, a total of six strains were selected and isolated from these samples and they were cultivated in Nutrient Agar plus substrates such as Tween 80 for determining esterase activity, starch for determining amylolytic activity, gelatin and skim milk for determining proteolytic activity. All six bacteria showed activity for esterase, five were positive for gelatinase and four showed activity for amylase and caseinase. According to the enzymatic rate, bacteria that showed an activity value higher than 1,50 were considered as potential producers of enzymes. Thus, four of them were qualified as amylase producers, 3 as esterase producers and 1 as gelatinase and caseinase producers. From the microorganisms analyzed for amylase activity, the best enzymatic rate in 24 hours was 1.80, while for the proteolytic activity the highest level was 1.76. For caseinase and esterase activity, the best enzymatic rates were 1.59 and 1.57, respectively. The results show that the bacteria isolated from oil has potential to produce important enzymes for different uses and the microorganisms present in this environment should be studied to discover new byproducts of industrial interest.

Keywords: hydrolases, oil, bacteria

Financial support: UFERSA