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Improving biomass production for two biofertilizers strains of *Azotobacter chroococcum* at laboratory level

Ginna Quiroga, Andres Diaz and **Martha Gomez**
Colombian Corporation for Agricultural Research, Colombia

The genre *Azotobacter* sp. represents a group of bacteria that can exert positive effects on the stimulation and plant growth promotion in multiples crops and additionally possess the capacity of asymbiotic nitrogen fixation. In the present work, the biomass production of two strains of *A. chroococcum* (named Ac1 and Ac10) using liquid fermentation for the further production of a biofertilizer was evaluated. For this, a liquid culture medium previously optimized (coded as MBR) was used for a liquid fermentation process in a Infors® model Minifors laboratory bioreactor with a capacity of 3.5 L initially a batch type strategy was applied for generate a baseline for this research. In order to increase process efficiency, the effect of reduce the stirring speed was evaluated; therefore, when a stirring speed of 200 rpm was evaluated while maintaining the air flow and the culture time under conditions of fed-batch type fermentation, an increase in the cell concentration was observed from 1.54E9 CFU/ml to 4.21E9 CFU/mL for Ac1 strain and increase of 2.21E9 CFU/ml to 3.92E9 CFU/ml for AC10 strain with a simultaneous reduction in energy consumption of 96.7%. Additionally, this increase in cell concentration for both strains also promote a rising of parameters of efficiency, biomass concentration and fermentation productivity about two times in comparison with the values determined at baseline.

Biography

Ginna Quiroga has completed her MSc in Advanced Microbiology from Barcelona University and BSc in Chemical Engineering from National University of Colombia. She is now a Professional Support at Bioproducts Pilot Plant of Corpoica since 2014.

adiaz@corpoica.org.co

Anticariogenic properties of certain naturally occurring polyphenols targeting *Streptococcus mutans*

Dimple Goyal, Sukesh Sharma and **Akhtar Mahmood**
Panjab University, India

The role of *S. mutans* in the pathogenesis of dental caries among human populations is well established. To prevent and control the disease, it is imperative to look for new, safe and effective compounds. In this study, we have investigated the effect of naturally occurring polyphenols viz., Gallic, tannic, syringic acids and catechins on certain cariogenic activities of *S. mutans*. The polyphenols inhibited the activities of dextran sucrase (44-89%) and glycosylt ransferase (27-36%), key enzymes of sucrose metabolism in *S. mutans*. The growth of *S. mutans* was also impaired by polyphenols *in vitro*, which yielded MIC of the order of 136 (gallic acid), 50.5 (tannic acid) and 510 (Syringic acid) µg/ml, respectively. The polyphenols reduced biofilm formation, hydrophobicity and acid production by the organism under *in vitro* conditions. Tannic and Gallic acids were more effective in inhibiting the bacterial growth compared to syringic acid or catechins. Flourescence microscopy revealed that in the absence of polyphenols, the cells were present as clumps however; they were well separated in presence of gallic acid (68 µg per ml) or tannic acid (25.5 µg/ml), due to the inhibition of biofilm formation. The present data suggests cariostatic action of Gallic, syringic and tannic acids in *S. mutans* which may have potential use in the prevention and cure of dental caries.

Biography

Dimple Goyal has completed her Master's in Biochemistry from Panjab University. She is currently pursuing her PhD in Biochemistry on topic entitled as "Studies on the interaction of plant polyphenols with dextransucrase activity in *Streptococcus mutans*: Anticariogenic perspective". She has published two publications in international peer review journals. She is the recipient of Research Fellowship from University Grants Commission, New Delhi.

goyaldimple87@gmail.com