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Production of exopolysaccharide from rhizobia with potential bioemulsifying applications

Tereza Cristina Luque Castellane, Érica Mendes Lopes,, João Carlos Campanharo and Eliana Gertrudes de Macedo Lemos
UNESP - Univ Estadual Paulista, Brazil

The potential use of rhizobia under controlled fermentation conditions may result in the production of new extracellular polymeric substances (EPS) having novel and superior properties that will open up new areas of industrial applications and thus increase their demand. The production of EPS and the stability of emulsions formed with soybean oil, diesel oil and toluene using different concentrations of purified EPS derived from wild-type and mutant strains of *Rhizobium tropici* SEMIA 4080 was investigated. The EPS was defined as a heteropolysaccharide composed of six constituent monosaccharides that displayed higher intrinsic viscosity and pseudoplastic non-Newtonian fluid behavior in an aqueous solution. It is remarkable that the wild-type strain of *Rhizobium tropici* SEMIA 4080 were able to grow on diesel, as well as mutant strain (MUTZC3). The higher emulsifying activity was observed with hexane and paraffin liquid oil, as shown by its emulsification index (E_{24}) higher than 50%, SEMIA 4080 with values of 87.2 and 74.3% and mutant (MUTZC3) strain with values 89.6 and 58.7% for hexane and paraffin liquid oil, respectively. These results demonstrate that the EPS of *R. tropici* strains could be attractive for use in industrial and environmental applications, as it had higher intrinsic viscosity and good emulsification activity.

teluque@yahoo.com.br

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