

Title: EMULSIFICATION OF EDIBLE OILS USING SURFACE ACTIVE COMPOUNDS PRODUCED BY ENVIRONMENTAL BACTERIA

Authors: Alvarez, V.M.¹, Jurelevicius, D.¹, Marques, J.M.¹, Araujo, L.V.², Freire, D.², Seldin, L.¹

Institute: ¹ Instituto de Microbiologia Paulo de Góes (IMPG), Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, Brazil; ² Instituto de Química, UFRJ, Rio de Janeiro, Brazil.

Abstract:

Surface active compounds (SACs) are versatile molecules produced by microorganisms that are used in food industry to improve organoleptic characteristics needed for food final consumption such as texture and creaminess of dairy products (e.g.: soft cheese and ice creams) and stabilization of edible oil emulsions in salad dressing formulations. In this study, SACs produced by five bacterial strains isolated from environments contaminated with petroleum or derivatives (*Achromobacter spanius* JHT23c, *Bacillus amyloliquefaciens* TSBSO 3.8, *B. amyloliquefaciens* LF2 45, *B. subtilis* LF6 5 and *Ensifer adhaerens* JHT2) were tested for their ability to emulsify edible oils (canola, corn, palm oil, olive and soy) and to investigate their potential as food additives. For this purpose, determination of emulsification indexes (EI) was performed with the different oils plus 48h-culture supernatants obtained from each strain. Although good results were observed for emulsification of corn and canola oils, the best EI were obtained when SACs from *A. spanius* JHT23c (76%) and *E. adhaerens* JHT2 (78%) were used for emulsification of palm oil. Moreover, when 96h-emulsification curves were constructed for palm oil, higher EI were obtained, reaching 90% and 100% of emulsification for *A. spanius* JHT23c and *E. adhaerens* JHT2, respectively. The production of SACs from both strains was evaluated using ten distinct culture media and different NaCl concentrations (0.5 to 10%), pH (4 to 10) and temperatures (28 to 42°C). Optimal conditions for SACs production of *A. spanius* JHT23c were Trypticase Soy Broth (TSB) containing 0.5-3.5% NaCl, pH 6-10 and temperatures of 28-37°C. *Ensifer adhaerens* JHT2 produced the highest amount of SACs in TSB containing 0.5-1.0% NaCl, pH 6-7 and temperatures of 28-37°C. The results indicate that SACs produced by these strains are a promising alternative to improve and maintain stable emulsions in food prepared with edible oils, like salad dressings.

Key words: biosurfactant, edible oil, *Ensifer adhaerens*, *Achromobacter spanius*.

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