POTENTIAL APPLICATIONS OF BIOSURFACTANT EXTRACT OBTAINED FROM CORN STEEP LIQUOR IN HAIR FORMULATIONS

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Biosurfactants (BS) have great advantages as an eco-friendly alternative to synthetic surfactants used in hair formulations. Human hair contains fatty acids (palmitic, palmitoleic, oleic and stearic acid) that prevent hair dryness and avoid the lower scalp hair density. These fatty acids are included in the composition of biosurfactant extract obtained from corn steep liquor (CSL) (Vecino et al., 2015). The adsorption of surfactants on hair depends on its ionic charge. Normally, hair surface has a negative charge, so it adsorbs cationic surfactants. For this reason, hair conditioners and also hair sunscreens contain cationic surfactants, mainly quaternary ammonium salts, which absorb UV light, protecting hair surface from dryness and oxidation. Contrarily, shampoo formulations are composed by anionic surface-active agents, which can induce, in many cases, hair protein loss, hair dryness, opacity and difficulty of handling.
In order to know if biosurfactant extract, obtained from CSL, could be adsorbed on hair, its ionic behavior was evaluated by using anionic and cationic resins using a solid/liquid ratio of 1:10 at room temperature. After that, adsorption experiments using human hair were established at room temperature with hair/biosurfactant solution ratio of 1:50.
The amount of BS entrapped by the resins or by the hair was quantified based on the increase of surface tension of water solutions, containing biosurfactant, after 30 minutes of contact with the resins or with the hair.
BS, extracted from CSL, showed good properties to be included in conditioners and mild shampoos formulations because it was entrapped for both cationic and anionic resins, showing an amphoteric behavior. Moreover, BS was entrapped by hair, with a capacity similar to that obtained by other authors, using a quaternary ammonium cationic surfactant. Therefore, this biosurfactant extract, obtained from the corn wet milling industry, possess interesting properties to compete with the chemical surfactants included in hair formulations.

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