

Evaluation of Sour Buttermilk as potential source of biosurfactants

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Butter made from a fermented cream is known as cultured butter and it presents various advantages in comparison with non-fermented butter. When butter is produced through a fermentation stage lactic bacteria convert sugars into lactic acid and other prebiotic substances as lactic acid bacteria are considered probiotic microorganisms. Moreover, the lactic acid fermentation process produces additional aroma compounds, including diacetyl, which give a more savoring product that it is very appreciated by consumers.

On the other hand, it is known that lactic acid bacteria produce biosurfactants (Rodríguez-López et al., 2019; Vecino et al., 2015) and hence the buttermilk stream, obtained during the elaboration of culture butter involving a lactic acid bacterium, can be a potential source of biosurfactants.

Based on the information described above in this work sour buttermilk, a secondary stream from culture butter, was evaluated as potential direct source of biosurfactants. Therefore, source buttermilk provided by FEIRACO was diluted in water at 1 g/L and several dilutions were established. Following the surface tension (ST) of these dilutions was measured using a K20 Easy Dyne Tensiometer supplied by Krüss GmbH (Hamburg, Germany), allowing the use of the Wilhelmy plate method. After that the critical micellar concentration (CMC) of this stream was calculated following the protocol established in previous works (Vecino et al., 2014).

The results obtained revealed that source buttermilk can reduce the ST of water in more than 20 units with a CMC lower than 0.5 g/L, being this value more favorable than the CMC reported in the literature in comparison with the biosurfactants extracts produced by lactic acid bacteria in controlled fermentation that gave CMC higher than 0.5 g/L (Vecino et al., 2018). **Figure 1** shows the aspect of sour buttermilk and the variation of surface tension with the concentration of this secondary stream that fits the isotherm model proposed by Li & Lu (Lu & LiZ., 2001).

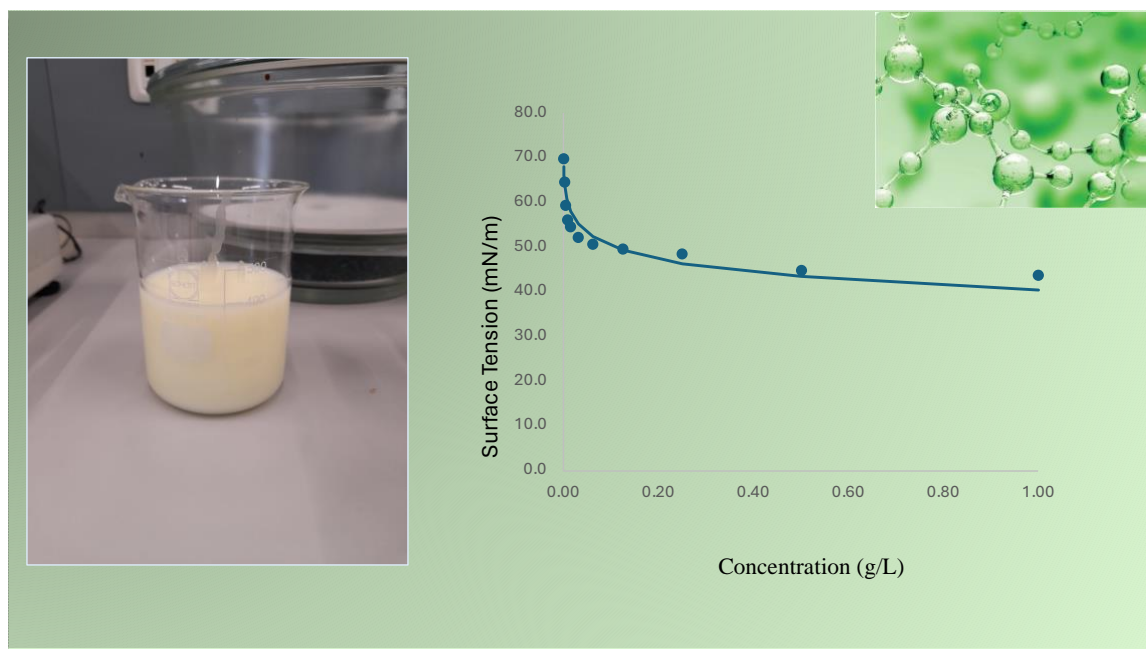


Figure 1. Aspect of sour buttermilk and the variation of surface tension (ST) with the concentration

Based on these results it can be concluded that the secondary stream obtained during cultured butter production it is a potential source for the extraction of biosurfactants and open the door to the valorization of this stream promoting a more sustainable environmental by stimulating the production of more sustainable and biocompatible surface-active agents and also promoting industrial symbiosis.

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