

**TITLE:** SCREENING OF BACTERIA ABLE TO PRODUCE EPS USING XYLOSE AS A CARBON SOURCE

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**ABSTRACT**

Exopolysaccharides (EPS) are macromolecule compounds of monosaccharides and sugar derivatives. They can be used in the food industry to improve the texture, sensorial qualities, nutritional properties, the stability of fermented products and also can be widely used in the cosmetic and pharmaceutical industries as bioflocculants, bioabsorbents, and heavy metal absorbers. This study aimed to compare EPS production of 22 bacterial strains using xylose as the sole carbon source for cost reduction as they're a derivative of sugarcane industry waste – bagasse (green chemistry). The strains maintained in a freezer at -80° C were reactivated in MRS medium. For EPS production, the strains were inoculated in SDM medium at 36° C, under stirring for 20 h. Samples were withdrawn twice, at T0 and after 20 h of fermentation, for EPS extraction and pH monitoring. Crude EPS was precipitated from the supernatant by adding 2 volumes of cold ethanol stored at 4° C for 24 h and then it was collected by centrifugation at 10,000 xg for 20 min. The pellet was dried at 40° C and dissolved in deionized water. From EPS were quantified total sugar (by phenol sulfuric method at 495 nm) and dry weigh (g L<sup>-1</sup>). After 20 h of fermentation *Lactobacillus casei* (Ke 8), *Sporolactobacillus nakayamae* (Vini 6) and 2 strains of *Leuconostoc mesenteroides* (CH25 and B512) showed a decrease in the pH, probably due to the fact that these are lactic acid producing bacteria, while *Pediococcus pentosaceus* (CCC 3), *L. rhamnosus* (B103), and 2 strains of *L. casei* (Ke 2 and Ke 11) showed higher pH values. The highest EPS yield was obtained with *Weissella paramesenteroides* (CH 24) which showed an increase of 120%, followed by *L. paracasei* (Ke 7) with an increase of about 60% and *Bacillus coagulans* (Ale 3) with an increase of 33.33%. The B103 and another strain of *Weissella paramesenteroides* (CC 28) maintained production, while the other 16 isolates presented a decrease in production. The highest amount of total sugar in EPS was obtained with *Weissella paramesenteroides* (strain CC 29) followed by B103 and *Pediococcus pentosaceus* (BSLM 9). For the calculations we adopted as a reference the initial value (T0). The variation in the EPS production can be associated to the different metabolic mechanisms among the studied bacteria, as well as species and genera. Therefore, this study showed an important contribution regarding EPS production, exploring new carbon sources as xylose for scaling-up production.

**Keywords:** bacteria, EPS, Xylose

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