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Cellulose Microfiber Encapsulated Probiotic: Viability, Acid and Bile Tolerance during Storage at Different Temperature

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Abstract

This work aimed to analyze the physicochemical properties of cellulose from OPT used in the fabrication of CMF and evaluate the efficacy of the hydrogel CMF as an encapsulant for *L. fermentum* InaCC B1295 stored at room temperature and in the refrigerator. The Kjeldahl method was used to evaluate the protein content; the gravimetric method was used to determine OPT's ash, moisture, and fiber contents; the Soxhlet method was used to determine the fat content carbohydrates were computed using the difference method. The levels of holocellulose, lignin, and

cellulose were also determined. Viability, acid and bile resistance of strain B1295 were evaluated at various temperatures for 35 days. The most abundant component of OPT fiber was cellulose, followed by hemicellulose and lignin. XRD examination revealed that OPT cellulose has a crystal index of 83.40%. FTIR analysis was used to detect the stretching vibrations of the –OH group on cellulose at 3419.03 cm⁻¹. CMF hydrogel from OPT sustained *L. fermentum* InaCC B1295 survival for up to 28 days at room and refrigerated temperatures. At acidic conditions and in the presence of bile, the viability of *L. fermentum* InaCC B1295 was excellent, with a drop in cell population of less than 0.2 log CFU/g over 35 days at room and refrigerated temperatures. CMF obtained from OPT can be used as an encapsulant to maintain viability, acid resistance and bile of probiotics. There is still a need for research into the usage of CMF from OPT in combination with other encapsulants to extend the storage life of *L. fermentum* InaCC B1295. © 2022 by the authors. Licensee ESJ, Italy.

Author keywords

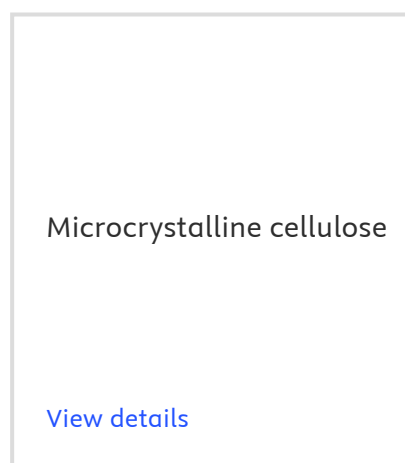
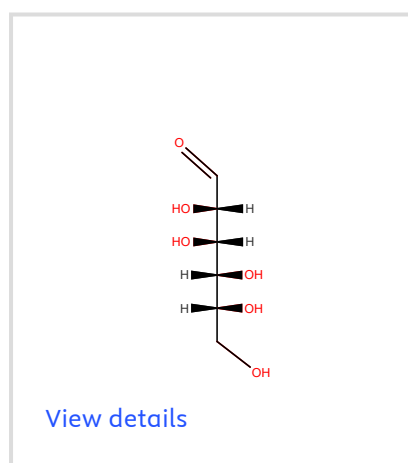
Acid and Bile Tolerance; Cellulose Microfiber; Oil Palm Trunk; Viability

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