

spectrometry. We also showed that the chemical diversity of the MMWEs produced can be modulated in function of the substrates utilized.

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ADDITION OF FREEZE-DRIED KEFIR STRAINS TO ORANGE JUICE

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Probiotics are frequently included in dairy products. Orange juice is a healthy product consumed frequently by a large percentage of the population being an interesting alternative as probiotic vehicle for people with lactose intolerance or hypercholesterolaemia. The aim of the present study was to obtain a novel functional food by the inclusion of freeze dried strains isolated from kefir to orange juice.

Lactobacillus plantarum CIDCA 8327 and *Kluyveromyces marxianus* CIDCA 8154 were selected based on their probiotic potential previously demonstrated. The resistance of both strains to the freeze-drying process in different media (milk, sucrose 10 % w/v or PBS) and their survival in the dried-powder during the storage at 4 °C were evaluated. The freeze-dried strains were then individually added to reconstituted orange-juice-powder to a final concentration 10⁷-10⁸ CFU/ml. The viability of the lactic acid bacteria and the yeast in orange juice was determined by viable counts on MRS-agar and YGC-agar plates respectively; the turbidity, color, odor and overall acceptability of the products were evaluated by a trained panel of 30 individuals using a nine-point Hedonic scale. The resistance to low pH (2.5 at 37 °C for 3 h) and bile salts (0.5 % w/v), and the adhesion to Caco-2/TC7 cells of the strains after the freeze-drying process and after their inclusion into orange juice were also studied.

L. plantarum CIDCA 8327 was more resistant than *K. marxianus* CIDCA 8154 to the freeze-drying process in all the media tested. The use of sucrose 10 % w/v as cryoprotector improved the survival of both strains and allowed the obtaining of a powder with constant microorganism concentration during 75 days of storage at 4 °C. Once included in the juice, the viable number of both strains remained constant during 8 h of storage at room temperature, indicating that it is not necessary to consume the product immediately after preparation.

The juice added with *K. marxianus* CIDCA 8154 had low acceptability by the sensorial panel. Instead, no significant differences ($\alpha= 0.05$) were observed in the color, turbidity, and overall acceptability between the control and the juice added with *L. plantarum* CIDCA 8327, being this strain selected for further studies.

The freeze-drying of *L. plantarum* CIDCA 8327 and its subsequent inclusion to orange juice did not change its ability to resist bile salts and to adhere to Caco-2/TC-7 cells, whereas the survival to stomach conditions of the freeze-dried strain was 2.5 Log order lower than the survival of the fresh strain. This reduction can however be compensated by increasing the microbial concentration added to the juice. The results indicate that orange juice could be a promising non-dairy vehicle for the delivery of *L. plantarum* CIDCA 8327.

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SCREENING OF BIOSURFACTANT PRODUCER BACTERIA ISOLATED FROM HORTICULTURAL SOILS

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Biosurfactants (BS) are useful for the emulsification of a diversity of hydrophobic compounds thanks to their tensioactive properties. However, the methodologies directed to the detection of new BS are not so simple. The basic tests designed for the screening of BS production have many disadvantages and a lot of difficulties when being implemented. The aim of this work is to compare series of classic tests in order to achieve a successful detection and extraction of surfactants. Twelve isolates from horticultural soil were incubated at 32°C 1 5 days in M9 broth supplemented with commonly used pesticides or glucose as carbon sources. *P. aeruginosa* PA01 was used as positive control. For the BS screening, 2 tests were applied: 1) detection with methylene blue agar (MBA) plates (g/L: (NH₄)₂HPO₄ 1.5, KH₂PO₄ 4, yeast extract 0.4, CTAB 0.2, glucose 20, MB 0.015,