CONTINUOUS HYDROLYSIS OF PECTIN IN JUICE OF ANACARDIUM OCCIDENTALE WITH IMMOLIZED KLUYVEROMYCES MARXIANUS-CELLS

Helena K. Kautola², Marcelo Fossa da Paz¹, Flavio C.A. Tavares¹, Laboratório de Genética de Leveduras – Dept. de Genética – ESALQ/USP, Piracicaba, SP, BRAZIL, HAMK University of Applied Sciences, Biotechnology and Food Engineering, P.O.Box 230, FI-13101 Hameenlinna, FINLAND

The hybrid strain of Kluyveromyces marxianus MMIII-41, selected in Brazil, has been tested by Gaspari in 1998 to have a pectinolytic and inulinolytic enzyme activity as well as sucrose inversion ability in the same enzyme. This ability has a great interest for juice industry in clarifying of different fruit juices like cashew fruit and passion fruit juices. Immobilized Kluyveromyces marxianus MMIII-41 was used for the hydrolysis of sucrose, pectin and pectin of cashew fruit juice in batch shake flasks and continuous bioreactors. Carriers used were aspen and eucalyptus wood chips, nylon fibers and synthetic polymer fiber matrix cubes, and expanded polystyrene beads. The best carrier for hydrolysis in shake flasks turned out to be expanded polystyrene with cashew fruit juice. The residence time and pectin concentration in pectin hydrolysis with immobilized Kluyveromyces marxianus -yeast was optimized in continuous columns for one week with pure pectin and cashew fruit juice. In continuous bioreactors the highest sucrose conversion of 97% was reached at a residence time of 76 min. Kluyveromyces marxianus MMIII-41 –yeast immobilized on expanded polystyrene bead –carrier and others proved that this immobilized yeast was able to give an enzyme activity which could hydrolyze sucrose and pectin both in pure substrate and in cashew fruit juice. The results show that the pectinolytic activity of Kluyveromyces marxianus -yeast is high enough to hydrolyze the pectin contained naturally in cashew fruit juice also in continuous hydrolysis.