

Effect of cane sugar on β glucosidase activity in the fermentation of *plu- Kao* juice using lactic acid bacteria starters

Papatchaya Kontongdee^{1,2}, Sirinda Yunchalard^{2*}

¹ Graduate School, KhonKaen University, Nai-Muang, Muang District, KhonKaen 40002, Thailand

² Department of Biotechnology, Faculty of Technology, KhonKaen University,

Nai-Muang, Muang District, KhonKaen 40002, Thailand

(*Corresponding author: sirinda@kku.ac.th)

Abstract

Plu-Kao, a traditional medicinal plant in East Asia and the West, is currently being processed by fermenting *plu-kao* juice with cane sugar. Lactic acid bacteria were recovered and isolated from fermented *Plu-kao* juice. Of these it was noted that 14 isolates were found to possess β -glucosidase activity on MRS+3% esculin. β -glucosidase is an enzyme that catalyzes the cleavage of the β -1-4 glycosidic bond of flavonoid glycoside resulting in (i) flavonoid aglycone, an active form of flavonoid glycoside that serves as a more potent antioxidant, and (ii) a free moiety of β -D-glucose. The 14 LAB isolates were analyzed for β -glucosidase activity by cultivating each isolate on modified MRS+cane sugar at 0.5, 1, 2, 3, 7, and 7.5% w/v. The results showed that strains LH 26, LH 59, LH 56 and LH 55 possessed the highest β -glucosidase activities at 17.82, 18.79, 21.81 and 19.92 U/ml when varying the concentrations as 0.5, 1, 7 and 7.5 % w/v respectively, while strain LH 49 were found to possess highest enzyme activity as 27.66 and 26.77 U/ml when cultivating on Modified MRS + cane sugar as 2 and 3 % w/v respectively when determined at 37 °C. The enzyme activities of these 14 positive strains grown on MRS at each sugar concentration given above were in the ranges 8.87 – 17.82, 5.40 – 18.39, 13.15 - 27.66, 4.52- 27.02, 10.44- 21.81 and 5.65 – 19.92U/ ml respectively. In conclusion, the concentration of cane sugar has affected the enzyme activities among the 14 strains, thus optimal concentration of cane sugar can help to enhance this enzyme activity.

Keywords: *Plu-kao* juice, Cane sugar, Flavonoids aglycone, Lactic acid bacteria, β -glucosidase,