利用酵素法提昇胡蘿蔔濃縮汁收率及品質之研究

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ABSTRACT

This research was based on the Shiang Yang (sun-facing) variety of carrot, which possess antioxidant activity with peak season of harvest in the winter. After sorting, the produce was taken off the mud from the surface by washing with the clean water, crushed into small pieces by the high-speed crusher. The crude carrot puree after being blanched (90~95℃ for 30 sec.) and cooled, was obtained and frozen at -18℃ for later study. Adding Pectinex Smash XXL & Rapidase X-press 0.005% each to the defrozen carrot puree at 45℃ for 60 min., the extracting rate of carrot juice from puree could be increased to 75.16% from the 61.08% of the puree without the enzyme treatment. The results indicated that pectic enzymes did have the advantage on increasing the extracting rate of carrot juice from puree. The physicochemical indices of the carrot juice extracted from the purees treated with pectinolytic enzymes, such as titratable acidity (0.19-0.21 %), total soluble solids (6.73-7.23 oBrix). turbidity (126.7-128.5 ntu) and formol nitrogen (31.17-32.20 mg/100g) were significantly higher ($p<0.05$). The pH (4.93-4.97) and viscosity (48.00-51.83 cps) were lower than those from untreated purees. The Hunter L, a, b values and ash content (0.848-855%) remained unchanged. The sensory evaluation results showed that the overall flavor scores of enzyme treated samples were not significantly different from those not treated. The carrot juice described above was concentrated to 36 , 45 , and 60 Brix respectively, and then stored at -10 oC and -20 oC for four months. There was no significant difference among the quality indices of the pH value, titratable acidity, soluble solids, sucrose, glucose, fructose, and organic acids. However, the values of Hunter L, a, b, total plate count and the total carotene would decrease more with the storage time, regardless of the storage temperature. The results of sensory evaluation indicate a that the concentrated carrot juice of high soluble solids would preserve the original taste after storing four months at different temperatures. The enzyme-treated carrot juice could be more easily concentrated than unenzyme-treated. The advantages of enzyme processing could not only shorten the concentration time（6.78-9.57%）but also increase the final soluble solids to 60oBrix from 36oBrix. The results of this study could be applied to improve both the processing procedure and storage conditions of concentrated carrot juice, and reduce the frozen costs, storage space, and processing cost. Finally, the outcomes may help the Taiwan carrot juice manufacturer to abate the competitive impact of China juice manufacturer after both joining the WTO.

Keywords : carrot juice concentrate ; quality index. ; yield ; pectinolytic enzyme

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