Comparison between conventional and alternative peeling methods on peeling efficiencies of Malaysian 'Chok Anan' mango (Mangifera indica L.) fruit

ABSTRACT

Fruit industries require convenient peeling method, especially during puree processing to prevent deterioration of fruit quality and product loss. Therefore, manual, chemical (sodium hydroxide/NaOH) and enzymatic (Pectinex Ultra SP-L) peeling methods were compared to determine the peeling efficiencies of 'Chok Anan' mangoes. The effect of different peeling parameters (concentrations [chemical peeling: 1.6-7.3% of 0.4M-1.83M; enzymatic peeling: 0.005-0.095%], temperatures [chemical peeling: 80-95oC; enzymatic peeling: 25-40°C], and duration of soaking [chemical peeling: 5-10 min; enzymatic peeling: 30-120 min]) were evaluated for peeling yield, peeling time, absorption of chemical and enzyme solution, the penetration depth of NaOH and enzyme activities (reducing sugar analysis). The enzymatic peeling had significantly ($p<0.05$) reduced the time (4.46 min) of mango peeling compared to manual (5.30 min) and chemical (6.49 min) peeling which were time-consuming. The parameters involved resulted in no significant difference ($p>0.05$) in peeling yield (>86%), but there was significant ($p<0.05$) effect on absorption of both NaoH and pectinase solutions at 0.84g/100g (enzymatic) and 2.50g/100 g (chemical), 0.45 mm penetration depth of NaOH and significant decrease in enzyme activities from 20.04g/100 mL to 4.92g/100 mL using reducing sugar analysis. The optimal enzymatic peeling conditions (concentration: 0.009%, temperature: 25oC, duration of soaking: 120 min) had made it possible to recycle the pectinase solution twice thus may be beneficial for the mango processing industry compared to chemical peeling.

Keywords: 'Chok Anan' mango; Chemical peeling; Enzymatic peeling; Peeling efficiency