

Optimisation of ultrasound-assisted extraction of pectinase enzyme from Guava (*Psidium guajava*) peel: enzyme recovery, specific activity, temperature and storage stability

ABSTRACT

This study aimed to investigate the effects of the ultrasound-assisted extraction conditions on the yield, specific activity, temperature, and storage stability of the pectinase enzyme from guava peel. The ultrasound variables studied were sonication time (10–30 min), ultrasound temperature (30–50°C), pH (2.0–8.0), and solvent-to-sample ratio (2:1 mL/g to 6:1 mL/g). The main goal was to optimize the ultrasound-assisted extraction conditions to maximize the recovery of pectinase from guava peel with the most desirable enzyme-specific activity and stability. Under the optimum conditions, a high yield (96.2%), good specific activity (18.2 U/mg), temperature stability (88.3%), and storage stability (90.3%) of the extracted enzyme were achieved. The optimal conditions were 20 min sonication time, 40°C temperature, at pH 5.0, using a 4:1 mL/g solvent-to-sample ratio. The study demonstrated that optimization of ultrasound-assisted process conditions for the enzyme extraction could improve the enzymatic characteristics and yield of the enzyme.

Keyword: Enzymatic properties; Extraction; Guava peel; Pectinase; Ultrasound-assisted process; Yield