Optimization of extraction of novel pectinase enzyme discovered in red pitaya (Hylocereus polyrhizus) peel

Abstract

Plant peels could be a potential source of novel pectinases for use in various industrial applications due to their broad substrate specificity with high stability under extreme conditions. Therefore, the extraction conditions of a novel pectinase enzyme from pitaya peel was optimized in this study. The effect of extraction variables, namely buffer to sample ratio (2:1 to 8:1, X1), extraction temperature (−15 to +25 °C, X2) and buffer pH (4.0 to 12.0, X3) on specific activity, temperature stability, storage stability and surfactant agent stability of pectinase from pitaya peel was investigated. The study demonstrated that the optimum conditions for the extraction of pectinase from pitaya sources could improve the enzymatic characteristics of the enzyme and protect its activity and stability during the extraction procedure. The optimum extraction conditions cause the pectinase to achieve high specific activity (15.31 U/mg), temperature stability (78%), storage stability (88%) and surfactant agent stability (83%). The most desirable conditions to achieve the highest activity and stability of pectinase enzyme from pitaya peel were the use of 5:1 buffer to sample ratio at 5 °C and pH 8.0.

Keyword: Fruit enzyme; Specific activity; Temperature stability; Storage stability; Surfactant agent stability