

Characterization of serine protease from mango (*Mangifera indica* cv. Chokanan) peel

ABSTRACT

Mango (*Mangifera indica* cv. Chokanan) is one of the most popular tropical fruits in the world and currently ranked 5th in total world production among the major fruit crops. Mango peel is one of the major wastes of food and beverage industries, however, it can be used as a valuable, economic and available media sources for commercially producing the natural enzymes. This study aimed at characterizing serine protease which was previously purified from mango peel by alcohol salt aqueous two-phase system (ATPS). The molecular weight of purified protease was determined with sodium dodecyl polyacrylamide sulfate gel electrophoresis (SDS-PAGE) to be 65 kDa, it showed maximum activity (> 80%) at pH 4-10 and exhibited high thermal stability (>90%) for 60 min at 65°C with the highest activity at 70°C and at pH 8. Its activity was strongly inhibited by PMSF, but not by EDTA, pepstatin, or cysteine protease inhibitors. The activity of the protease was activated by Ca²⁺ and Mg²⁺ while Li⁺, Na⁺, K⁺ and Sn²⁺ had no effect on the protease activity. However, reduction in the activity of protease was observed in the presence of Ba²⁺, Zn²⁺, Pb²⁺, Co²⁺, Mn²⁺ and Cu²⁺. The enzyme was resistant to denaturation by sodium dodecyl sulfate and the non-ionic surfactants such as Tween 80 and Triton X-100. The properties of serine protease extracted from mango peel and discussed in this study made it applicable in industrial processes that are performed under high temperature, in alkaline medium, or in the presence of denaturants and surfactants.

Keyword: Characterization; Mango peel; Serine protease; Stability