Optimization of pectinase extraction from mango (Mangifera indica cv. Chokanan) peel using response surface methodology

ABSTRACT

Today pectinases (EC 3.2.1.15) have become an integral part of the food and feed industry and plant peel could be a potential source of pectinase. Thus, the main objective of the study was the optimization of pectinase extraction from mango (Mangifera indica cv. Chokanan) peel. For this purpose, response surface methodology (RSM) was employed to optimize the extraction conditions and the effect of independent variables, namely temperature (-25 to +25°C), mixing time (2–10 min) and pH of buffer (1–8), on specific activity, storage stability, temperature stability and surfactant agent stability of pectinase from mango peel was investigated. The study demonstrated that using optimum temperature, mixing time and pH of buffer, protected pectinase during extraction, as indicated by low activity and low stability loss. It was found that the interaction effect of mixing time and buffer content improved the pectinase stability, and pH of buffer had the most significant effect on specific activity of the pectinase. The ideal condition of 2.5°C temperature, 6 min mixing time at pH 4.5 was established for pectinase extraction from mango peel. The result indicated that the optimized extraction of pectinase from mango peel provides high activity and stability of pectinase in harsh conditions, which makes the enzyme suitable for use in various types of industry and biotechnological applications. Furthermore, there was not any significant ($p>0.05$) difference between the experimental and predicted values. This ensured that the response surface models used to indicate property changes of pectinase as a function of enzyme extraction conditions were sufficient.