

Title Extraction, thermal stability and kinetic behavior of pectinmethylesterase from hawthorn (*Crataegus pubescens*) fruit

Author Maria A. Vivar-Vera, Juan A. Salazar-Montoya, Graciano Calva-Calva and Emma G. Ramos-Ramírez

Citation LWT - Food Science and Technology, Volume 40, Issue 2 , March 2007, Pages 278-284

Keywords Pectinmethylesterase; *Crataegus pubescens*; Thermal stability; Kinetic behavior; Hawthorn pectin extraction

Abstract

Pectinmethylesterase (PME) extracted from hawthorn (*Crataegus pubescens*) fruit was evaluated for its thermal stability and kinetic behavior. The enzyme extraction process was established after studying different NaCl concentrations (0.5–3.0 moles/L). A maximum PME extraction of 51.61 units/mg protein was obtained using 2 moles/L NaCl. Kinetic parameters (K_m and V_{max}) were determined using a commercial citrus pectin and *C. pubescens* pectin as substrates. The effects of NaCl concentration, pH and temperature on PME activity were investigated. PME showed higher affinity for *C. pubescens* pectin (K_m and V_{max} of 2.84 mg/mL protein, and 64.10 units/mg protein, respectively) than for citrus pectin. *C. pubescens* PME extract showed maximum activity at 0.4 moles/L NaCl, pH 7.5, and 55 °C. The E_a and Q_{10} for thermal activation were 36.27 kJ/mol and 2.01 (20–30 °C), respectively. About 50% of the activity still remained after heating for 25 min at 60 °C, and it was completely inactivated by incubation at 80 °C for 10 min. The Q_{10} and E_a values for thermal inactivation reaction were 20.06 (70–80 °C) and 146.16 kJ/mol, respectively. These results provide useful information about the factors that affect the activity of *C. pubescens* PME, and might be used as a starting point for texture control during post-harvest handling and processing of this fruit.