

ABSTRACT

Pectinase is a biocatalyst that facilitates the degradation of pectin into simpler compounds by cleaving the α -1,4-glycosidic bonds between galacturonic acid units. This enzyme is applicable in various industries, including food and textile sectors. As industrial demand for pectinase continues to rise, efficient enzyme sources are needed, one of which is endophytic bacteria. Previous research identified the isolate *Acinetobacter junii* Z3 from *Hibiscus tiliaceus* as a pectinase producer with the highest specific activity in crude extract form. This study aimed to obtain a more purified form of pectinase, to determine its enzymatic activity under different temperature and pH conditions, and to analyze its kinetic parameters, including K_m and V_{max} . The research procedures included rejuvenation and phenotypic confirmation of Z3, adaptation to pectin-containing medium, growth curve construction, enzyme production, purification using ammonium sulfate precipitation, activity assays at various temperatures and pH levels, and kinetic analysis based on the Michaelis–Menten and Lineweaver–Burk models. The highest specific activity of the partially purified pectinase, 152.475 U/mg, was obtained from the 60–80% saturation fraction, with a 64-fold increase in purity compared to the crude extract. The enzyme exhibited optimum activity at 37°C and pH 7.5. The V_{max} and K_m values were 16.678 $\mu\text{mol}/\text{min}$ and 0.026 g/mL (Michaelis–Menten), and 15.400 $\mu\text{mol}/\text{min}$ and 0.022 g/mL (Lineweaver–Burk), respectively. These findings indicate that the purified pectinase demonstrates high catalytic efficiency and holds promising potential for industrial applications.

Keywords : endophytic bacteria, bark of waru plant, pectinase enzyme, partial purification, enzyme kinetics