

ABSTRACT

Endophytic bacteria are microorganisms that live in plant tissues without causing harm to the host and are able to produce enzymes as biocatalysts, including protease enzymes that play a role in protein hydrolysis into amino acids. Bacteria have the advantage of a fast life cycle so that they can produce their enzymes on a large scale in a short time. This study aims to obtain protease crude extract from endophytic bacteria, characterize protease crude extract with variable temperature, pH, and incubation time, and determine the activity and specific activity of the protease. A total of 11 endophytic bacterial isolates were previously isolated and screened, with isolates Z3, Z8, and Z10 showing positive results for protease production. This study was conducted through a series of stages, including bacterial rejuvenation, confirmation of phenotypic identity by gram staining, generation of growth curves, protease production in the late exponential phase, protease activity test with Folin reagent, and protease characterization based on temperature, pH, and incubation time. The results showed that the protease produced had an optimum pH at pH 7, optimum temperature at 37°C, and optimal incubation time for 30 minutes. Protease activity test showed the highest activity in isolate Z8 at 22.938 units/ml, followed by Z10 at 20.169 units/ml, and Z3 at 16.862 units/ml. The highest specific activity was achieved by protease isolate Z8 with a value of 50.35 units/mg, indicating the presence of protease from Z8 bacterial protein is higher than other bacterial proteins.

Keywords: Endophytic bacteria, protease activity, protein hydrolysis, enzyme