

## ABSTRACT

**Salvanisa Rahmadhea Widyasari. 24020219130060. Potential of Seed Endophytic Bacteria from Saline Dry Ecosystem to Induce Abiotic Stress Tolerance in Chili. Under the guidance of Sri Pujiyanto dan Sulastri.**

The rising sea water level can cause damage across various sectors, particularly agriculture. An increase in soil salinity and groundwater levels is one of the consequences of sea level rise. Innovations to address salinity and drought stress are crucial for optimizing land use. One potential solution involves a biotechnology approach using endophytic bacteria isolated from plants grown in saline-drought ecosystems. These endophytic bacteria can be found within host plants' roots, stems, leaves, branches, and seeds. This study aimed to isolate endophytic bacteria from seeds in saline-drought ecosystems and assess their ability to induce salinity and drought stress tolerance in chilli. The methodology included isolating seed endophytic bacteria, in vitro tests of chilli plants under salinity and drought conditions, performing physiological characterization of bacterial isolates, and analyzing the data. The physiological characterization of bacterial isolates included tests for phosphate solubilization, nitrogen fixation, exopolysaccharide production, cellulase activity, catalase activity, and protease activity. In vitro tests were conducted under varying salinity stress conditions, using different NaCl concentrations: 0 mM (S0); 100 mM (S1); and 200 mM (S2), and drought stress conditions with different concentrations of polyethylene glycol 6000 MW: 0% (K0); 20% (K1: -1 MPa); and 30% (K2: -1.5 MPa). The bacterial consortium isolate CBj5.26 showed exceptionally promising results in inducing salinity and drought stress tolerance, as indicated by the highest dry weight under high salinity stress (S2K0) and drought stress (S0K1). The CBj5.26 consortium was characterized by its ability to solubilize phosphate, fix nitrogen, and produce cellulase and exopolysaccharides, which likely contributed to the observed stress tolerance. This study demonstrated that chilli plants inoculated with bacterial consortium isolates had better growth than control plants.

*Keywords: drought stress, salinity stress, tolerance induction, bacterial consortium, growth promoting*