ABSTRACT

Ferly Sevanda Prasetyo. 24020122120005. **The Effect of NaCl Concentration as an Elicitant on the Growth and Capsaicin Content of Large Chili (*Capsicum annuum* L.) Callus.** Plant Structure and Function Laboratory, Department of Biology, Faculty of Science and Mathematics, Diponegoro University, under the supervision of Yulita Nurchayati and Nintya Setiari.

Large chili peppers (*Capsicum annuum* L.) are known to contain the bioactive compound capsaicin. Capsaicin is known to have various pharmacological effects, making it widely used in the pharmaceutical and healthcare industries. One method for increasing capsaicin production is through callus culture using a modified medium supplemented with the elicitor NaCl. This study aims to investigate the effects of adding NaCl at different concentrations on the growth and development of large chili pepper calli, as well as to determine the NaCl concentration that yields the highest capsaicin content. The calli were induced from cotyledon explants in MS medium supplemented with 2 ppm 2,4-D and 2 ppm kinetin. Callus was subcultured into an elicitation medium; the study design used a single-factor RAL with NaCl concentrations (0 ppm, 500 ppm, 1000 ppm, and 1500 ppm) and three replicates. The callus was harvested after 21 days in the elicitation medium to observe morphological parameters (color and texture) and growth parameters (fresh and dry weight), and its capsaicin content was analyzed using spectrophotometry with ethyl acetate as the solvent. The results of the study show that high concentrations of NaCl in the medium cause osmotic stress, which disrupts nutrient uptake and callus metabolism. The addition of NaCl to the medium caused a decrease in fresh weight and dry weight in chili callus, but resulted in callus development with the formation of embryonic callus. The addition of NaCl caused osmotic stress, which led to an increase in the capsaicin content of the callus. A NaCl concentration of 1,000 ppm is recommended to produce the highest capsaicin content in large chili pepper calli. This research is a preliminary study in the screening of plant genotypes tolerant to high-salinity soils.

Keywords: *Callus culture, elicitation, NaCl, capsaicin, osmotic stress*