

ABSTRACT

Shofiyah Mahdiyah Putri. 24020120140099. **The Effect of Polyethylene Glycol (PEG) in MS Media on Growth and Flavonoid Content of Tomato Callus Culture (*Solanum lycopersicum* L.)**. Laboratory of Plant Biology Structure and Function, Department of Biology, Faculty of Science and Mathematics, Diponegoro University, Semarang, under the guidance of Yulita Nurchayati and Nintya Setiari.

Flavonoids in tomato skins can be used as base materials for pharmaceutical drugs. The production of flavonoids from tomatoes is relatively low, requiring a large amount of biomass to meet demand. Callus culture is an *in vitro* technique commonly used for the production of secondary metabolites, including flavonoids. The total flavonoid content in the callus can be increased under drought-stress conditions. PEG 6000 is an elicitor that can lower the water potential in the medium, thereby inducing drought stress. This study aimed to determine the effect of adding PEG 6000 on the growth and total flavonoid content of tomato callus. The explants used were cotyledons from Servo variety tomato seedlings. Fourteen-day-old tomato cotyledons were cultivated in callus induction media containing MS, 2 ppm BAP, and 1 ppm 2,4-D for 2 weeks. The calli were then subcultured in callus induction media with the addition of PEG 6000. This study used a Completely Randomized Design (CRD) with a single factor and varying concentrations of PEG 6000 (0%, 1%, 3%, 5%, and 7%) with six repetitions. Data analysis was conducted using ANOVA, followed by DMRT. The parameters measured were both quantitative and qualitative. The total flavonoid content was analyzed using a UV-Vis spectrophotometer. The results showed that the addition of PEG 6000 to the tomato callus culture medium led to reduced callus growth and increased total flavonoid content. The addition of the elicitor PEG 6000 resulted in compact, textured callus. The developmental response of the tomato callus to the addition of PEG 6000 resulted in the formation of globular somatic embryos after 37 days. The addition of 5% PEG 6000 was found to be the concentration that produced the highest total flavonoid content. The results of this study can be used for preliminary screening of plants that are resistant to drought stress.

Keywords: tomato, callus, PEG 6000, secondary metabolites, flavonoids