ABSTRACT

THE EFFECT OF LIGHT INTENSITY AND NITROGEN CONCENTRATION ON THE GROWTH AND PRODUCTION OF CIPLUKAN CALUS FLAVONOIDS (*Physalis angulata* L.)

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Techniques for increasing the production of secondary metabolites, including flavonoids, can be done through in-vitro techniques, one of which is callus culture. Increasing nitrogen concentration in the culture medium and light intensity affect growth and flavonoid production. This research aims to determine the effect of differences in light intensity combined with nitrogen concentration in MS media on flavonoid production in ciplukan callus cultures. The explant used was the first leaf (plumula) of ciplukan sprouts which was germinated in vitro. Ciplukan sprout plumules that were 7 days after germination were planted in media containing MS medium; BAP 2 mg/L; 2,4-D 2 mg/L; sucrose 40 g/L. The explants that have been planted are placed on a shelf to be treated with light intensity. The research design used a 3×3 factorial Completely Randomized Design (CRD), in the form of nitrogen concentration in the media (0.5 times the nitrogen concentration in normal MS, 1 times the nitrogen concentration in normal MS, and 1.5 times the nitrogen concentration in normal MS), and light intensity treatments of 2000, 3000, and 4000 lux with seven replications. Flavonoid content analysis was carried out using a Shimadzu Mini 1240 UV-Vis spectrophotometer. Data were analyzed using ANOVA and DMRT. The results showed that light intensity could increase growth and flavonoid production in callus cultures from ciplukan plumula. Nitrogen concentration in the culture medium can increase growth and flavonoid production in callus cultures from ciplukan plumula. There is an interaction between light intensity and nitrogen concentration on the wet weight and dry weight of callus from ciplukan plumula. Treatment with a light intensity of 4000 lux with a normal nitrogen concentration of 0.5 MS produced the highest wet weight and dry weight of callus, while the highest total flavonoid content was obtained at normal nitrogen concentration.

Key words: plumula, ciplukan, callus, nitrogen, light intensity