

ABSTRACT

Key words : *Solanum laciniatum* Ait (code of SL-7 and SL-11), Shoot culture, Hg²⁺, Cd²⁺, Pb²⁺ ion; Growth Index; Solasodine, Sitosterol

Heavy metal is one of external factors that influence biosynthesis of secondary metabolites. In this study Hg²⁺, Cd²⁺, Pb²⁺ ions were used as abiotic elicitor. The aim of this study was to investigate external factors influencing the growth index (GI) and the contents of phyto steroid of shoot culture of *Solanum laciniatum* Ait (SL-7 and SL-11). The culture was planted in the Murashige and Skoog media added by 4 ppm benzyladenin and Hg²⁺ ion from 0 to 50 ppm, Cd²⁺ ion from 0 to 25 ppm and Pb²⁺ ion from 0 to 40 ppm. The treatments were set on randomized complete design where metal ions were the independent variable and the growth index as well as the content of solasodine and sitosterol were as dependent variables. The concentration of solasodine was determined by TLC-scanner and sitosterol content was determined by Gas Chromatograph.

Result of this study show that the highest growth index was observed in the control treatment. Increasing concentration of Hg²⁺, Cd²⁺ and Pb²⁺ reduce the growth index. Heavy metal ion of Hg²⁺, Cd²⁺ and Pb²⁺ affected the content of solasodine and sitosterol the shoot culture of SL-7, while on SL-11 only solasodine content was affected. On SL-11 only Hg²⁺ ion sitosterol content while Cd²⁺ and Pb²⁺ ion did not. The highest solasodine concentration was 2364.61 μ g/g DW found on SL-7 as the affected of Cd²⁺ ion addition 10 ppm and the lowest one is 290.74 μ g/g DW as the

affected of Pb^{2+} addition at 20 ppm. The highest content of sitosterol was 939.59 $\mu g/g$ DW found on the addition of 40 ppm Pb^{2+} and the lowest on is 183.68 $\mu g/g$ DW caused by Cd^{2+} ion application at 15 ppm. A transport system enlargement and thick nodes in the area between cells were noticed on the microscopic observation of cross-sectioned of shoot.