

## ABSTRACT

Febryani, Nawafila. 08620054. 2013. **The Effect of Cu<sup>2+</sup> Metal Ions on the Development and content of secondary metabolites (stigmasterol and sitosterol) callus Purwoceng (*Pimpinella alpine* Molk) in media MS.** Thesis, Biology Department, Science and Technology Faculty of Maulana Malik Ibrahim State Islamic University, Malang.

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**Key words :** Ion Logam Cu<sup>2+</sup>, Purwoceng (*Pimpinella alpine* Molk.), Sitosterol and Stigmasterol

Purwoceng (*Pimpinella alpine* Molk) Is an original Indonesian plant which has many benefits as a drug and categorized almost extinct. Purwoceng reported to have many of them are phytochemical content stigmasterol and sitosterol that can be used as materials for drug. An alternative method for producing secondary metabolites In Vitro is using tissue culture techniques and elicitation using metal ions Cu<sup>2+</sup>. The addition of Cu<sup>2+</sup> elicitor causes stress which causes the production of secondary metabolites increasing in an effort of self-defense, and Cu<sup>2+</sup> elicitor acts as a cofactor of enzymes that play a direct role in the formation of compounds stigmasterol and sitosterol.

The research aims to study the effect of callus growth and increasing levels of stigmasterol and sitosterol with the addition of Cu<sup>2+</sup> metal elicitor with different levels of concentration. Determination of the level of response to Cu<sup>2+</sup> elicitor was done by observing morphological changes and callus weight in Cu<sup>2+</sup> media with concentration of 0 µM (control), 20 µM, 30 µM, and 40 µM. While to know the response to stigmasterol and sitosterol levels tested, it was conducted a test using column chromatography and the results were analyzed descriptively.

The results showed that the addition of Cu<sup>2+</sup> elicitor metal with various concentrations gave response to the development of callus which includes color, texture callus, and callus weight. The major changes happened to the color and weight of callus, it is known that the color changes at each concentration, the higher the concentration of Cu<sup>2+</sup>, the more intense callus color produced and signifies the high production of secondary metabolites which are produced. Callus weight which is known higher on concentration Cu<sup>2+</sup> 40µM is approximately 0.29 grams. Meanwhile, in response to the formation of secondary metabolites known to produce stigmasterol and sitosterol is highest on concentration of Cu<sup>2+</sup> 40µM i.e, 1695,620 ppm and 3128,739 ppm. Based on callus growth and levels stigmasterol and sitosterol, it is known that the concentration of Cu<sup>2+</sup> elicitor by the addition of 40µM is an optimal concentration for callus growth responses and increasing levels of stigmasterol and sitosterol in callus Purwoceng (*Pimpinella alpine* Molk).