

## ABSTRACT

### **Phytoremediation and Response of Plantlet Culture *Curcuma zedoaria* Rosc to Addition of $\text{Cu}^{2+}$**

Plantlet culture of *Curcuma zedoaria* Rosc was treated in media containing  $\text{Cu}^{2+}$  with various concentrations (0.0064; 5; 10 and 15 ppm  $\text{Cu}^{2+}$ ). Each group consist of 20 culture bottles and half of them get cultivated meanwhile the others were continued to the next passage. Growth index, pH value and % Brix of the media were measured on each passage to see phytoremediation effect of  $\text{Cu}^{2+}$  about the growth of plantlet culture of *Curcuma zedoaria* Rosc. The ability of *Curcuma zedoaria* Rosc to remediate  $\text{Cu}^{2+}$  in the media were measured by analyzing the  $\text{Cu}^{2+}$  residue and it's accumulation in the plantlet culture biomass with Atomic Absorption Spectrophotometer instrument.

Phytoremediation effect of  $\text{Cu}^{2+}$  in plantlet culture of *Curcuma zedoaria* Rosc can cause direct toxicity by damaging cell stucture. With microscope can be seen damage of tissue culture. Result of monitoring growth index showed difference are significant between group. The accumulation of  $\text{Cu}^{2+}$  in *Curcuma zedoaria* Rosc biomass was  $169.24 \pm 4.43 \mu\text{g/g DW}$ ;  $395.76 \pm 8.48 \mu\text{g/g DW}$ ;  $581.73 \pm 123.09 \mu\text{g/g DW}$  for plantlet culture group 5, 10 and 15 ppm  $\text{Cu}^{2+}$  respectively. The highest accumulation is  $581.73 \pm 123.09 \mu\text{g/g DW}$  or 0.06% w/w DW.

Keywords: *Curcuma zedoaria* Rosc, hyperaccumulator plant, Atomic Absorption Spectrophotometer, phytoremediation of  $\text{Cu}^{2+}$