ABSTRACT

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

Plantlet culture of *Curcuma zedoaria* Rosc was treated in media containing Cu$^{2+}$ with various concentrations (0.0064; 5; 10 and 15 ppm 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 Cu$^{2+}$ about the growth of plantlet culture of *Curcuma zedoaria* Rosc. The ability of *Curcuma zedoaria* Rosc to remediate Cu$^{2+}$ in the media were measured by analyzing the Cu$^{2+}$ residue and it’s accumulation in the plantlet culture biomass with Atomic Absorption Spectrophotometer instrument.

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

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