

## Potentiality of *Melastoma malabathricum* as phytoremediators of soil with sewage sludge

### ABSTRACT

Heavy metal pollution of the soil environment has become a major source of concern and continues to pose serious health problems to both humans and ecological systems worldwide. Phytoremediation is a biological treatment whereby plants are used to remove pollutant from the environment. An experiment was conducted to evaluate the potential of *Melastoma malabathricum* as a phytoremediator to absorb heavy metals from soil contaminated with sewage sludge. *Melastoma malabathricum* seedlings were planted on six different growth media: T<sub>0</sub> - Control (100 % soil), T<sub>1</sub> (80 % soil + 20 % sewage sludge), T<sub>2</sub> (60 % soil + 40 % sewage sludge), T<sub>3</sub> (40 % soil + 60 % sewage sludge), T<sub>4</sub> (20 % soil + 80 % sewage sludge) and T<sub>5</sub> (100 % sludge). There were differences found in both growth parameters and plant biomass. The highest growth performance such as plant height and number of leaves was found in T<sub>3</sub>. Iron was highly accumulated in the roots, Cu in the stems in T<sub>3</sub>, while Pb was accumulated in leaves in T<sub>5</sub>. The results showed the lowest Translocation Factor (TF) and highest Bioconcentration Factor (BCF) values in relation to the following elements: Cu, Fe, Mn, Pb and Zn. *Melastoma malabathricum* roots are able to uptake and translocate the elements into the plant's shoots. Therefore, it can be considered a good accumulator plant due to its capability of concentrating contaminants in aerial tissue. *Melastoma malabathricum* were thus found to be suitable for absorbing heavy metals in contaminated soils, and this species can also be considered an effective phytoremediator of contaminated soil and mitigator of soil pollution.

**Keyword:** Soil pollution; Phytoremediation; Translocation factor; Bioconcentration factor