

Effect of heavy metal contamination on the DNA Mutation on *Nepenthes* plant from abandoned mine

Abstract

Objective: Heavy metal contamination on water, soil, crops and including to the other living organisms, including their effects on DNA mutation in abandoned mine is highlighted in this study

Methodology: In this study, 6 toxic metals, Zn, Pb, Fe, Cd, Cr and Mn in *Nepenthes* plants at an abandoned copper mine site were investigated. A total of 20 *Nepenthes* plants were collected from different sites of the abandoned mine. Metal concentration was determined using the Inductively Coupled Plasma/Optical Emission Spectrometry (ICP/OES) technique and electrophoresis gel and Inter Simple Sequence Repeat (ISSR) amplification processes for DNA mutation analysis. The total concentration trend of metal concentrations recorded with Cu (up to 88.797 mg kg⁻¹)>Mn (39.018 mg kg⁻¹)>Zn (30.260 mg kg⁻¹)>Pb (8.206 mg kg⁻¹)>Cd (0.168 mg kg⁻¹).

Results: The results also showed that concentration of heavy metals in *Nepenthes* plants collected from the abandoned mine were much higher than in control plants. However, the concentrations were still under the tolerance limit of heavy metals in plants except for Cu concentration. Besides, the concentration of heavy metals generally is higher in the flowers of the plants. For DNA analysis, based on the image obtained the result showed the DNA bands were located at the same location with the control *Nepenthes* which indicated there is no mutation occurred for the *Nepenthes* collected from the abandoned mine.

Conclusion: From the result it is suggested that pitcher plant such *Nepenthes* may act as a potential phytoextraction of heavy metal from contaminated soil or water compounds at the abandoned mine.