ASSESSMENT OF HEAVY METAL ABSORPTION BY RICE PLANTS IN CONTAMINATED WATER

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The presence of heavy metals in groundwater and surface water used for agriculture has become a significant environmental problem. Industrial activities that release heavy metals into the environment through the discharge of industrial effluents are one of the sources responsible for this problem. Heavy metals such as Fe, Mn, Cr, Zn, and Al, which are present in food crops, can have a negative impact on human health. Neutron activation analysis (NAA) was used in this study to examine the uptake of these heavy metals by rice plants in contaminated water at two different pH values, i.e., pH 1 and pH 7. The concentration of heavy metals in the contaminated water was measured using ICP-MS to ensure that the heavy metals were transferred to the soil or rice plants during the five-day period. The rice plants were then separated into roots and shoots, and neutron activation analysis was used to examine the distribution of heavy metals in the components studied. The average heavy metal concentration in the shoots at pH 1 was Fe > Mn > Al > Zn > Cr, while at pH 7 it was Mn > Al > Fe > Zn > Cr. Of these, Mn had the highest TF (transfer factor) value of 0.88 at pH 1, while Cr had the lowest TF value of 0.02. Similarly, Mn had the highest TF value of 0.39 at pH 7, while Cr had the lowest TF value of 0.01. The study concludes that heavy metals mobility depends on water pH which direct effect on soil pH, so neutral water should be preferred for rice plants to prevent transferring of heavy metals to the plant, which could lead to health risks.