# IMPACTS OF CITRIC ACID ON THE PHYTOEXTRACTION OF ZINC (ZN) USING SORGHUM BICOLOR L.M PLANTS

Hamza Badamasi[1*], Muhammad Saminu Dagari[2]

[1]*Department of Chemistry, Federal University Dutse, Dutse, Nigeria, hamza.badamasi@fud.edu.ng*
[2]*Department of Chemistry, Federal University Gashua, Gashua, Nigeria, dagaribuk@gmail.com*
*([*]corresponding author)*

Greenhouse hydroponic experiments were carried out to examine the impacts of citric acid on Zn uptake and phytoextraction potentials of sorghum *(sorghum bicolor L.M).* Two-week-old seedlings transplanted in hydroponic solutions were treated with different doses of Zn in the concentration range of 5, 25, 50, 100 and 200 mg/L alone or in combination with 10 mM citric acid. After 21 day of culture, the plants were harvested, separated into roots and shoots and then dried. Fresh and dry weights, Zn uptake, translocation factor (TF), bioconcentration factor (BCF), proline, ascorbate and pigment contents were determined. The results indicate that Zn uptake, fresh and dry weights, TF, BCF, proline and ascorbate contents were concentration dependent with more significant increase ($P < 0.05$) after application of citric acid. Pigments and protein contents were however, severely decreased with increasing Zn concentrations and appreciated gradually with the addition of citric acid. Thus, citric acid efficiently increased phytoextractability of Zn and *Sorghum bicolor LM* was non-hyperaccumulator of Zn; but may be used for phytoremediation of Zn contaminated environments with assistance of citric acid.

*Keywords: Citric acid, Phytoextraction, Sorghum bicolor L.M, Zn*