

# **BIOACCUMULATION, GROWTH AND ANTIOXIDANT DEFENSE RESPONSES OF *LEUCAENA* SPECIES DIFFERING IN ARSENIC TOLERANCE**

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## **ABSTRACT**

Arsenic (As) poisoning is a serious threat in Gangetic delta, India. The leguminous tree *Leucaena* has been used extensively as forage and biofuel crop by people of this region. No reports, however, are available regarding response of *Leucaena* species under soil As contamination. The present study aims to ascertain the effect of As on bioaccumulation, growth and antioxidant defense response of *Leucaena leucocephala* and *L. esculenta* in field study and pot experiment (soil spiked with 100 mg As kg<sup>-1</sup>). *L. leucocephala* shoots accumulated significantly higher amount of soil As compared to *L. esculenta*. High bioaccumulation was due to efficient translocation of As from roots to aboveground parts. Normal to enhanced activities of antioxidant defense enzymes and high redox state of ascorbate and glutathione prevented As-induced oxidative damage in *L. leucocephala* plants through efficient scavenging of reactive oxygen species, ensuring normal to even better growth under As exposure. By contrast, low antioxidant defense activities in As-treated *L. esculenta* plants triggered oxidative damage, leading to severe inhibition in plant growth. The results suggest that the high As-accumulation potential and remarkable tolerance of *L. leucocephala* plants to As-toxicity may be exploited as an effective bioresource material to clean-up As-contaminated environment.

**KEYWORDS:** Antioxidant Enzymes, Arsenic, Ascorbate, Glutathione, *Leucaena*, Phytoremediation