

Bioaccumulation of arsenic(As) and phosphorous by transplanting Aman rice in arsenic-contaminated clay soils.

ABSTRACT

Arsenic pollution in soil and water has aroused a considerable attention. Inorganic species of arsenic are associated with various internal cancers and create other health problems. An experiment was conducted to investigate the effect of soil arsenic (As) concentration on arsenic and phosphorous accumulation in root, straw, husk and grain of rice (*Oryza sativa*). BRRI dhan 33 and BR 11 rice varieties were planted on six levels of As contaminated growth media (T1=3.2, T2=11.6, T3=18.7, T4=38.6, T5=57.8 and T6=80.3 ppm As) in a Completely Randomized Design (CRD) with six replications (Completely Randomized Design). Arsenic concentrations in root, straw, husk and grain were increased significantly with increasing soil As concentration. It was observed that As was highly concentrated in the roots, whereas, phosphorous was high in the grain. Among the treatments, T6 showed highest As accumulation. Arsenic contents in grain and husk of BR 11 were found higher than those of grain and husk of BRRI dhan 33. The straw and root of BRRI dhan 33 showed higher concentration of As than straw and root of BR 11. Phosphorous concentrations in straw, husk and grain were also increased with increase of soil As concentrations. *Oryza sativa* showed high bioconcentration factor (BCF) and low translocation factor (TF). Therefore, As content in grains did not exceed the maximum permissible limit of 1 mg As kg⁻¹, but straw As is highly risky for animal health as well as human food-chain. It could be concluded that BRRI dhan 33 can be cultivated instead of BR11 in As contaminated soil.

Keyword: Soil As; BRRI dhan 33; BR11; Arsenic accumulation; Bioconcentration; Translocation.