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AN ECO SUSTAINABLE TECHNIQUE TO REDUCE CADMIUM AVAILABILITY TO *Amaranthus caudatus* GROWN UNDER AGRICULTURAL WASTE AND FERTILISER AMENDED SOIL: GROWTH AND PHYSIOLOGICAL RESPONSE

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Abstract

Present study deals with a technology that reduces the cadmium(Cd) availability to the leafy vegetable *Amaranthus caudatus* from Cd contaminated soil ($6 \mu\text{g Cd g}^{-1}$ soil), amended with farmyard manure FYM, FYM+NPK and agricultural wastes (rice husk; RH and saw dust; SD) at different doses (0.5 %, 2 %, 5 % and 10 %). Among all the doses 5 % was found to be the best for each amendment showing maximum reduction in phytoavailability of Cd hence better vegetable yield. At this dose the reduction in Cd availability showed the order FYM + NPK combination (45 %) > FYM (36 %) > RH (23 %) > SD (14 %). Freundlich equation suggested that among all the doses, 5 % showed better metal adsorbing property. The correlation matrix also suggested that decrease in Cd availability due to amendment was positively correlated with its reduction in edible portion of the plants. At 5 % dose of each amendment, there were maximum metabolic activities such as photosynthetic O_2 yield, PS II activity and respiration rate. This technique appears to be cost effective, easy to apply in metal contaminated fields and can also reduced health risk by reducing food chain contamination.

Key words: agricultural waste, *Amaranthus caudatus*, bioconcentration factor, cadmium, contamination, heavy metal, phytoavailability

Received: September, 2011; Revised final: March, 2012; Accepted: April, 2012

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