D-56 Accumulation of selected heavy metals in paddy field sediment and biota

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The presence of potentially toxic amounts of heavy metals in agrochemicals is of grave concern because of the possibility of soil and plants becoming contaminated and causing a dangerous influx of toxic metals into the food chain.

The aim of this study was to determine the level of heavy metal accumulation in the paddy plant (*Oryza sativa),* in different parts viz root, shoot and seed during different growth stages and in Rice seed bug (*Leptocorisa acuta).*

Heavy metals were analysed using the Energy Dispersive X-ray Fluorescence Analysis method.

According to this study, agrochemicals used in the field, 3,4 DPA, Hedonal and Marshall do not cause accumulation of Iron, Copper, Zinc or Chromium in the paddy plant either in the root, shoot or seed or in the soil of the field. Therefore there is no possibility of these metals contaminating the human food chain due to the consumption of rice under the field conditions studied. The Iron content of the paddy seed is higher than the levels reported for rice but Copper and Zinc levels are similar. This could be due to the high level of iron in the soil of the area. Chromium accumulated in the root but was not translocated to other parts. Hence, there is no possibility of food chain transfer of Chromium as a result of consuming this rice. As Copper is bio-accumulated in paddy relative to soil and Zinc and Chromium of the root show a positive correlation with the soil concentration, if these metals are added to the field through anthropogenic activities, there is a possibility of it accumulating in the plant. However, hazardous metals such as Arsenic, Mercury and Lead were not detected in any of the paddy, sediment or *Leptocorisa acuta* samples analysed.

In *Leptocorisa acuta,* Iron, Copper and Zinc are bio-accumulated from the paddy seed. There is also bio-magnification of Copper and Zinc in this food chain. Therefore if there is any addition of these metals to the paddy field via agrochemicals there can be potentially detrimental effects in the terrestrial biota.