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ACCUMULATION OF ESSENTIAL AND TOXIC ELEMENTS IN SRI LANKAN RICE (*Oryza sativa* L.)

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Rice is the staple food in many Asian countries, including Sri Lanka, and has a high demand because it provides essential carbohydrates, protein, and minerals. Among essential minerals, zinc (Zn) and iron (Fe) are globally deficient and are more common among rice-consuming populations. Rice plants also accumulate toxic elements, especially arsenic (As) and cadmium (Cd), which can cause serious health issues. Close attention is currently given towards cultivating high-quality rice that is less in toxic elements and high in nutrient values. However, there is a lack of information on trace element accumulation of Sri Lankan traditional rice genotypes. Therefore, a glasshouse experiment was conducted using genetically diverse ten rice cultivars with three replicas to assess toxic and essential elements in rice grains, and rice grains were analyzed using an ICP-MS. The varietal difference in Fe accumulation was significant, and the highest accumulation was observed in *Beheth heenati*, while At 362 and Bg 300 were identified as lower Fe accumulating varieties. The highest Zn accumulation was shown by *Kahawanu*, followed by *Pachchaperumal* and *Beheth heenati*. The native variety, *Behethheenati*, accumulated a higher amount of essential trace elements, including Zn, Fe, Mn, Ni, Co, V, Mo, and Cu. The highest Cd accumulation was observed in At 362 while Bg 300 showed the lowest, followed by *Madathawalu* and *Kahawanu*. Arsenic has shown a significant difference in their accumulation in different varieties. The highest As accumulation was observed in *Kalu heenati*, while the lowest was found in At 362, followed by *Kahawanu* and Bg 300. Among the cultivar tested, *Kahawanu* and Bg 300 were identified as relatively lower in both As and Cd concentrations in grains. As a result, these genotypes can be used in further studies on developing varieties with high nutrients and low toxic elements while achieving other desired characteristics.

Keywords: Essential nutrients, Genetically diverse rice cultivars, Toxic elements