

**PHYTOEXTRACTION OF METALS AND NUTRIENTS BY THE
MONOCOTYLEDONOUS SEDGES IN *THAULLA* AREA OF
MANKADAWALA TANK, ANURADHAPURA,
SRI LANKA**

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Small tank based farming in Sri Lanka is recognized as a globally important agricultural system. The upper peripheral area of a small tank (*Thaulla*) is one important element in this ecosystem. Hydrophytes in the *Thaulla* region play a major role in purifying inflow water to the tank. This study was conducted to investigate the phytoextraction ability of four naturally grown sedges in *Thaulla* area of *Mankadawala* tank in Anuradhapura. The accumulation of total N, P, K, Na, Mg, Ca, Zn, Cu, Fe, Mn, As, Pb and Cd in these sedges were assessed using both plant and soil samples collected from 20 sampling points in *Thaulla*. The same sedges were sampled at 12 points at closer vicinity, away from *Thaulla* area. Differences in nutrients and other element absorption in these varieties were tested using an ANCOVA with a mean separation of Bonferroni at a 95% confidence level. Friedman's nonparametric test was used to assess the visual attractiveness of these sedges. Shoots of the sedges extracted from the *Thaulla* exhibited significantly greater values ($p < 0.05$) of P, K, Na, Mg, and Mn than that in their roots. Biological accumulation factor, biological translocation factor, and biological concentration factor were calculated and were not significantly different among the four varieties. However, all these values were >1 for all the varieties indicating their potential ability to use as hyperaccumulators. Aesthetic appeal evaluation of sedges revealed that *Typha angustifolia* had significantly ($p < 0.05$) higher evaluators' acceptance. This study revealed, the higher nutrient and metal accumulation in *Thaulla* soil and higher phytoextraction ability of tested four sedges naturally grown in *Thaulla* area. *Typha angustifolia*, with its' high potential for nutrient and metal buildup as well as the highest aesthetic appeal, can be chosen as the best variety for the constructed wetland.

Keywords: Heavy metals, Nutrients, Phytoextraction, Small tank