

CHEMICAL CHARACTERIZATION OF PADDY SOIL AND WATER FROM CHRONIC KIDNEY DISEASE PREVAILING AREAS OF PADAVIYA

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The definitive cause for the Chronic Kidney Disease (CKD) prevailing in the North Central Province of Sri Lanka has not yet been identified. A study was carried out in Padaviya during the period January-June 2013 in selected 12 paddy fields of CKD patients to determine quality of paddy soil, drinking water and irrigation water. Surface paddy soils, irrigation water and drinking water collected and analyzed at the Nuclear Analytical Laboratory of the Atomic Energy Authority and Soil and Water Resources Management Laboratory at Faculty of Agriculture, Rajarata University of Sri Lanka. Forty-one surface (0-25 cm depth) soil samples were collected from paddy

fields and soil pH, electrical conductivity (EC), total dissolved solids (TDS), Na, K, Ca, Mg, available N, PO₄ and organic matter (OM) content were determined. Twelve irrigation water samples and fourteen drinking water samples were analyzed for Na, K, Ca, Mg, PO₄, NH₄, NO₃, Mn, Fe, Ni, Cu, Zn, Br, Rb, Sr, Ba, Pb, Cd and other parameters such as pH, EC, TDS. The soil pH ranged from 5.63-7.16 and pH of irrigation water and drinking water ranged 5.9-7.5 and 6.52-7.73 respectively. Soil OM% ranged from 1.16-5.49 % and exchangeable Na, K, Ca, Mg, available N, exchangeable PO₄ ranged from 40-726, 8.7-216.9, 154-22471, 303-2667, 28-77 and 0.80-57.90 mg/kg dry weight, respectively. The concentrations of Na, K, Ca, Mg, NH₄, NO₃, PO₄ in irrigation water were 10-94, 1-4, 0.4-62.0, 8-28, 0.27-1.33, 0.01-0.09, 0.11-0.21 and for drinking water 7-80, 0.1-3.9, 14-143, 7-44, 0.06-0.45, 0.00-0.12, 0.10-0.22 mg/l. Heavy metals in both water samples were within permissible levels except for Cd (permissible levels for drinking water are 0.005 and 0.01 mg respectively. Cadmium concentration in irrigation water ranged from 0.006-0.281 and in drinking water range 0.006-0.501 mg/l.

Key words: Chronic kidney disease, Drinking water, Irrigation water, Paddy soil