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UPTAKE AND DISTRIBUTION OF NATURALLY OCCURRING RADIOACTIVE ELEMENTS IN PLANTS FROM A HIGH RADIATION AREA-BERUWALA

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The behaviour of radium and thorium, two of the natural radioelements entering the plants growing in the monazite bearing soils at Beruwala was investigated using gamma ray spectroscopy. From fifteen plant species studied accumulation of these two radionuclides was high in Ipomoea pescaprae, Clerodendrum inerme, and Lippia nodiflora. The extent of accumulation of the radionuclides by the different plant species studied can be correlated to the differences in soil pH, growth habits and growth pattern.

Relatively little information is available on the distribution and mobility of radium in plants, mechanisms involved in its uptake, upward transport and its metabolic fate in plants. To examine the metabolic fate of radium absorbed by plants, chemical characterization of the radionuclides in plant tissues was carried out. This study indicated that 22% of radium was in ionic forms including salts such as oxalates, phosphates and carbonates. Acetate insoluble pectates and some protein accounted for another 22% of radium. Calcium pectate is known to be precipitated by this treatment. As radium behaves chemically similarly to Ca this fraction represents the pectates of radium. Levels of radium in the remaining proteins and polysaccharides accounted for a further 22%. In contrast levels of

radium associated with cellulose, lignin and nucleic acids were negligible. These investigations form a part of a programme aimed at understanding the behaviour of naturally occurring radioelements in plants.