

**An executive summary of the final report of work done on the Minor Research Project of *Dr A Shridhar* , Department of Physics, entitled “Study of the radiation levels in the underground water samples from various places in the districts of Mangalore, Udupi and Kasaragod” sanctioned by UGC, Vide Sanction Letter No. MRP(S)-0508/13-14/KAMA002/UGC-SWRO, dated 28.3.2014.**

#### EXECUTIVE SUMMARY

People receive exposure from naturally occurring radioactivity in soil, air, water and food. When radon is inhaled into the lungs, it releases high energy alpha radiation that can damage the DNA in the sensitive lung tissue and cause cancer. Ground water can carry additional radon into homes and other buildings , creating a health risk. The water that we are using comes from different sources such as the sea, lake, river, spring and wells dug into the ground. Only 0.3 % of the total water resource on earth is drinkable and suitable for daily use. Ground water is more radioactive than surface water since it passes through rock and soil formations, dissolves many compounds, minerals and radioactive substances. The radio-active elements in drinking water are members of three natural radioactive series. The specific elements of concern are radium, radon and uranium. The nuclides of the uranium series which can be dangerous to health because of their presence in drinking water are radium-226 and radon-222. Activity of a radioactive substance is a measure of the rate of disintegrations in the substance and it is given by

$$R = \lambda N = \frac{0.693 N}{T}$$

The activity is high when number of atoms N is high and also when the half life T of the substance is short. If  $R_0$  is the initial activity, the activity of the radioactive substance after a time t is given by

$$R = R_0 e^{-\lambda t} .$$

Water samples are collected from various places in the districts of Mangalore, Udupi and Kasaragodu. While collecting the samples, the structure of the landscape was given due consideration. Samples were collected from different landscapes such as forest area, low lying cultivated fertile land, hills with laterite stone layers, places fully covered with granite stone structures, places close to river beds and places near the sea.

The readings observed for the radiations from underground water samples in the form of count rate per litre of water as given in various tables is very low. It is very much below the safety level for drinking water. At low lying places and at smaller depths the radiation levels appears to be on the lower side . At larger depths and places with rocks, the radiation level appears to be on the higher side. Similarly in the coastal areas of Mangalore taluk and Kasaragodu district, the radiation levels are

found to be higher. But there is no region where is abnormal radiation levels are found.