

## **ASSESSMENT OF INHERENT TOXICITY OF CERTAIN ROCKS AND ITS IMPACT ON HUMAN HEALTH – A STUDY AT PAMBAR RIVER SUB – BASIN, NW TAMIL NADU, INDIA**

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Minerals present in the rocks will be differing from their physical and chemical properties and this determines the intensity of impact of inherent toxicity of rock. The essence of rocks will be seen readily in soil and groundwater by weathering and rock – water interaction in aquifers, respectively. By studying these elements the inherent quality of rocks and transformation of this to the environment can be understood. Therefore a study was conducted in Pambar River Sub – Basin, NW Tamil Nadu, India, to see the interaction of rock with water and soil and the impingement of these natural components on human health. Samples of groundwater, rock and soil from several locations of the basin were collected and analyzed for chemical composition. Ion chromatography was used to cognize the composition of groundwater; similarly, EDAX analysis evidenced the chemistry of rocks and soils. The essential ion that decides the quality of groundwater is Fluoride. The presence of fluoride at different quantities has different effects on human health. The desirable range of fluoride in drinkingwater is 0.6 to 1.5 mg/l (BIS, 1992). In the study area most of the groundwater is offered with fluoride ion above 1.5 mg/l up to 3.85 mg/l, by the rocks and fractures that form the aquifer system. Analysis of rock indicates the abundance of apatite ( $\text{Ca}_5(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH})$ ) mineral with 20% calcium, 9.5% phosphate and chlorine 2.3%, in the Carbonatite intrusion which leads to the concentration of fluoride in groundwater. The intake of fluoridated water affects the human health by driving them to dental and skeletal fluorosis. In the study area children below the age of 10 years and people who are residing there for generations are displaying dental fluorosis. And also, the groundwater in the area is hard to very hard because of higher amount of Calcium and Magnesium ions in groundwater, because of release of these ions from calcites and pyroxenes in the rocks of different origin. Accession of more amount of calcium has lead to development of kidney stones. There is another way of transformation of the ions to human health and that is intake of food products that are cultivated in the soil resulted from weathering of the rocks. The analysis of the components in vegetables and spices grown in the area are showing dominance of the minerals which are dominant in the soils. Even though several studies were conducted in the area to delineate the result of rocks and water on human health this is a comprehensive study of all the aspects of impact of rock through various components to human health and has proved the contribution of rocks to human health in various ways.

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