

FLUORIDE CONCENTRATION IN RURAL WATER RESOURCES IN NORTHEASTERN KURDISTAN PROVINCE: TEMPORAL VARIATIONS AND SPATIAL DISTRIBUTION

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SUMMARY: Excess fluoride can adversely affect human health and cause serious dental and medical problems. Since drinking water is an important fluoride source, the evaluation of the fluoride content in water resources is necessary. The aim of this study was to determine the temporal variations and spatial distribution of the drinking water fluoride concentrations in rural drinking water resources in Kurdistan province using geographical information system (GIS) techniques. Forty villages were selected and 80 samples taken in two low- and high-water seasons in the year 2013. Fluoride concentration was measured with the Ion Chromatography (IC) method. Geospatial analysis of the data was done using the ArcGIS software by Environmental Systems Research Institute (Esri). The results showed that the average fluoride concentration in drinking water ranged from 0.096 to 1.102 mg/L with the concentration being less than 0.50 mg F/L in 57 samples (71.25%), between 0.51 and 1.0 mg F/L in 21 samples (26.25 %), and greater than 1.0 mg F/L in 2 samples (2.5%). No difference was present between the concentrations of fluoride in the two-stage sampling with the nonparametric Wilcoxon test.

Keywords: Kurdistan, Iran; Fluoride; Spatial distribution; Temporal variations.

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