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**Groundwater hydrochemistry of Rajnandgaon district, Chhattisgarh, Central India**

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**Abstract**

The spreading of fluorosis diseases in Central India related to high concentrations of fluoride ion (F−) is a cause of major concern. In this work, the hydrochemistry of the aquifers related to Seonath River, in Rajnandgaon district, Chhattisgarh state, India, has been studied, focusing on the presence and sources of F−. Hydrochemical parameters were analyzed in the post-monsoon season in 160 wells located in nine tehsils, finding F− concentrations ranging from 0.6 to 18.5 mg L−1. Seasonal variations were also studied in Chhuikhadan tehsil, in which the highest F− values were registered, finding a noticeable enrichment in the pre-monsoon months. In many locations of the district, F− concentrations exceeded the recommended value of 1.5 mg L−1, which have led to the appearance of several health issues. Multidimensional analysis statistical methods were adopted to investigate the sources of F−, and the mineralization of bedrock elements into the groundwater was observed to be the primary source.

**Keywords:**

APCS–MLR; aquifer; fluoride; PCA; Seonath River; source apportionment.

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