

A CASE STUDY

## Assessment of fluoride in drinking water of fluorosis endemic areas of Mandla, M. P.

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This paper highlights the analysis of fluorosis endemic area of Mandla district with special reference to fluoride rich underground drinking water samples collected from 36 different areas of various Tehsils of Mandla district of Madhya Pradesh. All the water samples collected from the hand pump (H.P.) were found to contain excessive fluoride ( $> 1.5$  mg/L). The maximum fluoride concentration (18.2) was found in Surangdevri village near Mahua tree hand pump of Mandla district.

One of the well documented problems concerning drinking water is the presence of fluoride. Fluoride compounds in the earth upper crust are fairly soluble in water. It is found present in both surface and ground water. The concentration of fluoride in ground water is influenced by geochemical characteristics. Minerals like fluorspar, cryolite and fluoroapatite are the main sources of fluoride in ground water. The lower limit of fluoride present in drinking water is mentioned as 1 mg/l. and the maximum permissible limit is fixed as 1.5 mg/l. High fluoride content in water (1.5 mg/l.D) causes fluorosis. Fluorosis is an endemic disease prevalent in 17 states in India (Soni, 2002). There is no cure for this disease except prevention of intake of fluoride (Pande *et al.*, 2001). The regular use of fluoride causes not only dental and skeletal fluorosis (Susheela *et al.*, 2001) but also causes endocrine effect on adrenal gland (Soni and Shrivastava, 2006) and on thyroid gland (Soni and Shrivastava, 2007). Hence, in the present study, an attempt has been made to evaluate the effects of fluoride on the peoples of Mandla district and to provide some control measures.

### MATERIALS AND METHODS

Fluorosis endemic water samples from different endemic areas of Mandla district were collected for survey of underground drinking water of hand pump (H.P.). These areas are selectively affected with fluoride rich water from the identified resources, 36 water samples were collected in clean, dried and sterilized polypropylene bottles with double lid. The samples were brought to the laboratory and analyzed the fluoride quantitatively by using specification electrode method (Mathur and Shukla, 1999).

### RESULTS AND DISCUSSION

In the present study, assessment of fluoride in drinking water of fluorosis endemic areas of Mandla district was noticed using spectrophotometric method and 36 different areas were detected in various Tehsil of Mandla district (M.P.) All the ground water samples collected from the hand pump were found to contain excessive amount of fluoride (5-71 mg/l.). The maximum fluoride concentration (18.2 mg/l.) was found in Surangdevri village, near Mahua tree hand pump of Mandla district as shown in Table 1. Susheela (2001) reported sound planning and implementation of fluoride and fluorosis mitigation programme in an endemic village. Similarly, fluoride in drinking water as a challenged millennium has been reported by Chand (2001). Pande *et al.* (2001) have prepared a fluoride spot detection kit to test the level of fluoride. Besides this, various control measures have been described by various workers in relation to fluoride. Effects of No-char bone to remove fluoride from water was noticed by Ruben *et al.* (2001). Similarly, removal of fluoride from potable water

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