Development of domestic defluoridation unit



White opaque



Occurrences of dental and skeletal fluorosis amongst the residents of fluoride affected areas



Fig.2: Developed domestic defluoridation unit

The presence of fluoride in groundwater is an environmental concern in more than 20 developed and developing countries, including India. More than 17 states in India have reported cases of fluorosis (the most common health problem due to fluoride), and roughly 66 million people are at risk due to the ingestion of high fluoride containing water. This highlights the seriousness of this problem, and the need for an economical and accessible treatment technology.

Use of natural materials such as bone char for defluoridation is one of the most studied method, but in a country like India, the biggest limitation is that treating drinking water with bone char conflicts with religious beliefs of people. Hydroxyapatite $(Ca_{10}(PO_4)_6(OH)_2)$ is a non-toxic, natural, and bio-compatible material which is one of the main constituent of bones.

Our group is working on using synthetic hydroxyapatite as an effective adsorbent of fluoride with sufficient defluoridation capacity. We have developed a bucket filter for defluoridation of groundwater at domestic level to be used by individual families. Initial field investigations in some of the affected villages of Madhya Pradesh have demonstrated effective treatment by this unit. At almost all locations, significant defluoridation was achieved resulting in treated water of drinking water quality.

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