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FLUORIDE CONTAMINATION, CONSEQUENCES AND REMOVAL TECHNIQUES IN WATER: A REVIEW

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S. No.	Organization	F ⁻ (Desirable limit) (ppm)
1.	Bureau of Indian Standards (BIS)	0.6-1.2
2.	The United States Public Health (USPH)	0.8
3.	Indian Standard Institution (ISI)	1.5
4.	Indian Council of Medical Research (ICMR)	1
5.	World Health Organization (WHO)	1.5
6.	The committee on Public Health Engineering Manual and Code of Practice, Government of India	1
7.	The international standard for drinking water	0.5

Table S1[†]: Different organization with fluoride limit



Fig. S1[†]: Source of fluoride



Fig. S2[†]: Fluorine amount in mineral rocks



Fig. S3[†]: Fluoride content (ppm in %) in Fresh water sources



Fig. S4[†]: Fluoride Content in Minerals and Soils (ppm in %)



Fig. S5[†]: Fluoride Content in agricultural crops (a) and (b) (mg/kg)



Fig. S6[†]: Nature of rocks with fluoride concentration

Fluoride Concentration [mg/L]	Health outcomes
<0.5	Dental caries
0.5-1.5	Optimum dental health
1.5-4.0	Dental fluorosis
4.0-10	Dental and skeletal fluorosis
>10.0	Crippling fluorosis
<0.5 0.5-1.5 1.5-4.0 4.0-10 >10.0	Dental caries Optimum dental health Dental fluorosis Dental and skeletal fluorosis Crippling fluorosis

Table S2[†]: Effect of prolonged use of drinking water on human health, related to fluoride content⁹⁴







Fig. S7[†]: Strategies for improving adsorbent defluoridation performance

Name of the programme	Location (Area)	Specified Objectives	
Defluoridation Technology	Ngurdoto Village,	To prevent endemic fluorosis, remove	
Project	Tanzania	excess fluoride from drinking water.	
ICOH Mobile Bus Unit	Ban Sankayom	Increasing public knowledge of the	
Project	Village, Thailand	negative consequences of excessive	
		fluoride use on health.	
National Rural Drinking	India	To provide clean drinking water and	
Water Program (NRDWP)		to tackle the issue of fluorosis	
Fluorosis mitigation project	Ban Sankayom	Fluorosis may be reduced by utilizing	
	Village, Thailand	a bone char defluoridator.	

 Table S4[†]: Worldwide fluorosis mitigation programmes

Name of the programme	Year	Location (Area)	Specified Objectives
Prasanti Technology using	1978	Andhra Pradesh	Within a few weeks, there was
Acticated Alumina			evidence of improvement.
UNICEF in India using	1996-	Andhra Pradesh	Adsorption process in Activated
Household based	2002	and Rajasthan	Alumina
defluoridation			
Sachetana Plus	2006	Tumkur district,	Rainwater harvesting for
		Karnataka	fluoride mitigation
Nalgonda Fluorosis	2004	Nalgonda District,	To offer settlements with low-
Mitigation		Andhra Pradesh	fluoride water.
programme		(currently in	
		Telangana)	
Project SARITA	1996	Dungarpur district	Activated Alumina filters and
		of Rajasthan	Nalgonda-based drum sets were
			used in defluoridation and
			community awareness efforts.
Sonbhadra Fluorosis	2004	Sonbhadra district,	Water quality monitoring,
mitigation project		Uttar Pradesh	public awareness, and other
			issues are being investigated.
Western Orissa Fluorosis	2005	Nuapada,	To reduce the risk of fluorosis.
Mitigation programme		Kalahandi,	
		Bolangir,	
		and Burger	
		district, Orissa	
MP Fluorosis mitigation	2008	Dhar District,	To reduce the risk of fluorosis.
project		Madhya Pradesh	
Integrated Fluorosis	2005	Jhabua District,	Fluorosis is a disease that
Mitigation		Madhya Pradesh	affects both children and adults.
Fluoride Removal by IISc	2005	Kolar, Karnataka	To give water that is low in
method			fluoride
Hogenakkal water supply	2008	Dharmapuri and	Fluorosis prevention and local
and fluorosis		Krishnagiri	government capacity
		District,	strengthening
		Tamilnadu	

 Table S5[†]: Indian fluorosis mitigation programmes