NUMERICAL DATA

Fluorine in vegetation due to an uncontrolled release of gaseous fluorides from a glassworks: A case study of measurement uncertainty, dispersion pattern and compliance with regulation (2019)

The F contents determined in CRMs, Norway spruce, peach, common hornbeam, common bean and common grape vine together with their associated expanded uncertainties, standard deviations and confidence intervals for the mean.

Sample	*d*	w_F(sam)		*U*sam [a] *s* [b]	*t*$*s*/√$N_{sam}$ [c]
	[m]	[mg g^{-1}]	[mg g^{-1}]	[mg g^{-1}]	[mg g^{-1}]
Norway spruce	90	1209	69	55	**137**
Norway spruce	214	219	28	4	**11**
Norway spruce	258	87.4	9.6	3.9	**9.7**
Norway spruce	295	67.8	8.6	1.2	**2.9**
Norway spruce	393	30.5	8.6	0.9	**2.3**
Norway spruce, control	95032	9.7	8.5	0.3	**0.8**
Peach	242	132	10	4	**9**
Common hornbeam	256	676	36	20	**51**
Common bean	241	539	33	16	**40**
Common grape vine	238	264	28	5	**12**
SRM-2695, high level		295		6	**11**
SRM-2695, low level		**68.0**		**1.7**	**3.2**

[a] Coverage factor k 1.96 to give expanded uncertainty at a 95% confidence level.

[b] 68.3% confidence level.

[c] t ¼ 4.3 to give a 95% confidence level (N ¼ 3).

Source: https://sci-hub.tw/10.1016/j.envpol.2019.02.046

Fluoride network and circular economy as potential model for sustainable development-A review (2019)

Different limitations of fluoride levels

Description	Regulatory Bodies/Country	Concentration (ppm)	Reference
Prescribed fluoride concentration from different regulatory bodies for safe consumption	WHO	0.9 to 1.2	WHO (2008)
	US PHS	0.7 to 1.2	Centers for Disease Control and Prevention (2015) Hattab (2006)
	US EPA	1.4 to 2.4	Buzalaf (2018)
	US Department of Health and Human Services	0.7	
	National Health and Medical Research Council (Australia)	0.6 – 1.1	New South Ministry of Health (2015) Beirne and O'Grady (2012)
	Fluoridation of Water Supply (Ireland)	0.6 – 0.8	Sharma et al. (2017)
	Bureau of Indian Standards	1.0	
Maximum Levels of Fluoride in drinking water in different countries	United States	4.0	(US EPA, n.d.)
	E.U.	1.5	EU (1998)
	Indonesia	1.5	Ministry of Health of the Republic of Indonesia (2010)
	Philippines	1.0	Department of Health Republic of the Philippines (2007)
	Thailand	1.0	("Notification of the Ministry of Industry No. 332 (BE 2521)," 1978) (National Environmental Standards No.81 (Laos), 2017)
	Laos	1.0	(Taipei Water Department, n.d.) Takefuji (2019)
	Taiwan	0.8	
	Japan	<0.8	

Fluoride concentration for the municipal waters may vary from different regulatory bodies or agencies as shown in Table.

Source: https://sci-hub.tw/https://doi.org/10.1016/j.chemosphere.2019.124662

Modeling and analysis of hydrogen fluoride pollution from an aluminum smelter located in Oman (2019)

Three-hour average peak values of HF concentrations simulated on January 15th (winter) and May 15th (summer) from 00:00 h to 23:00 h.

15th of January (winter)			**15th of May (summer)**		
Coordinates (km) Time	**Time(HH:MM)**	**Peak (µg/m^3)**	**Coordinates (km)**	**Time(HH:MM)**	**Peak (µg/m^3)**
−4.5, -1.5	12:00	0.0394	−1.5, 1.5	15:00	0.113
−9.5, 2.5	15:00	0.0390	−2.5, 2.5	15:00	0.111
−13.5, 4.5	18:00	0.0381	−2.5, 0.5	12:00	0.109
−1.5, -0.5	12:00	0.0369	−0.5, 0.5	15:00	0.0.084
−2.5, 0.5	15:00	0.0358	−3.5, 3.5	15:00	0.0.083
−13.5, 3.5	18:00	0.0357	−3.5, 0.5	12:00	0.075
−10.5, 2.5	15:00	0.0355	−1.5, -0.5	12:00	0.0714
−9.5, 2.5	18:00	0.0350	−9.5, -3.5	18:00	0.0713
−1.5, 2.5	09:00	0.0347	−1.5, -0.5	09:00	0.0638
−6.5, 1.5	15:00	0.0345	−4.5, 4.5	15:00	0.0598

The ten highest concentration levels for a three-hour average on the summer modeling day are provided to establish a simple comparison between the one - and three - hour average concentrations. The maximum three-hour average concentration was 0.113 µg/m^3 at 22:00 h and was located at −1.5, 1.5 km, which is very close to the origin.

Source: https://sci-hub.tw/https://doi.org/10.1016/j.scs.2019.101802

Comparative investigation of fluoride adsorption using different absorbents (2018)

Adsorbent		Isotherm Model	pH	Capacity (mg/g)
Natural materials	Natural pumice	F	6.0	4.50
	Natural pumice	F	3.0	1.170
	Natural geomaterial limonite (Iron Ore)	L	7.0	0.269
	Kaolinite clay	L		1.450
	Montmorillonites	F	6.0	3.365
	Untreated reed root	L	7.0	3.547
	Untreated reed stem	L	7.0	0.655
	Untreated reed leaf	L	7.0	0.669
Modified materials	Modified pumice with $FeCl_3$	F	3.0	21.740
	Modified pumice with HDTMA	F	3.0	25.000
	Modified magnetite ore with aluminum and lanthanum ions	L	7.8	M-Al 1.51 M-Na 1.42
	Modified montmorillonite with Fe(III)	L	4.5	9.696
	Modified chitosan with neodymium	L	7.0	22.380
	Modified zeolite with calcium chloride	F/L		1.766
	Desugared reed root	L	7.0	10.860
	Desugared reed stem	L	7.0	6.405
	Desugared reed leaf	L	7.0	5.497
Synthetic materials	$MnCO_3$ nanowires	L	7.0	11.580
	Graphene oxide (GO)-incorporated iron-aluminium mixed oxide	L	7.0	22.900
	Ce-Ti oxides nanoparticles	L	7.0	44.370
	Ce-Ti@Fe_3O_4 nanoparticles	L	7.0	91.070

Source:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5800200/table/ijerph-15-00101-t003/?report=objectonly

Comparison of maximum sorption capacity of fluoride with Pistia stratiotes and biosorbents (2018)

Adsorbent	Maximum adsorption capacity	Reference
Used tea leaves	0.52 mg g^{-1} DW	Methodia and Selvapathy (2005)
Tamarind seed	6.37 mg g^{-1} DW	Murugan and Subramanian, 2006
***Moringa indica* based activated carbon**	0.23 mg g^{-1} DW	Karthikeyan and Ilango, 2007
Spirogyra sp. –IO2	1.27 mg g^{-1} DW	Mohan et al., 2007
Pleurotus ostreatus 1804	1.27 mg g^{-1} DW	Rmanaiah et al., 2007
Tea Waste	3.83 mg g^{-1} DW	Cai et al. 2015
Pista stratiotes	0.006 mg g^{-1} DW	Karmaka et al., 2018

Source: https://link.springer.com/article/10.1007/s13762-017-1439-3

Fluoride accumulation in different plant species. (2018)

Plants Name (botanical name)	Fluoride conc. ($\mu g\ g^{-1}$)	References
Wheat Triticum *aestivum*	5.04±0.15 2.59–4.60	Devika and Nagendra (2009); Jha et al. (2008); Gupta and Deshpande (1998); Jagtap et al. (2012)
Spinach *Spinacea oleracea*	29.15±0.03 42.3±4.1 0.77–4.14	
Cabbage *Brassica oleracea var. capitata*	11.30±0.03	Devika and Nagendra (2009)
Cauliflower *Brassica oleracea var. botrytis*	12.09±0.14	
Fodder	17.53±0.08	
Carrot *Daucus carota subsp. sativus*	10.75±0.04	
Lady Finger *Abelmocus esculenta*	22.19±0.09 1.74–4.00	Devika and Nagendra (2009); Gupta and Deshpande (1998); Jagtap et al. (2012)
Onion *Allium cepa*	10.50±0.09 1.00–3.70	
Potato *Solanum tuberosum*	11.95±0.53 1.27–2.92	
Tomato *Lycopersicon esculuntum*	13.48±0.08	Devika and Nagendra (2009)
Mustard *Brassica juncea*	14.44±0.18	Gautam et al. (2010)
Barley Hordeum vulgare	4.84±0.12	
Vigna radiata	10.700±0.23	
Radish Raphanus raphanistrum subsp. sativus	22.20±0.19	
Pea *Pisum sativum*	8.34±0.11	
Bathua *Chenopodium album*	13.24±0.20	
Coriander	26.94±0.16	Gupta and Banerjee (2011)

Coriandrum sativum		
Bean ***Phaseolus sp.***	15.26±0.32	
Sweet potatoes ***Ipomoea batatas***	0.14±7.0	Gupta and Deshpande (1998); Jagtap et al. (2012)
Sponge gourd ***Luffa cylindrica***	12.8 ± 0.8	Jha et al. (2008)
Banana ***Musa***	0.84-2.90	Gupta and Deshpande (1998); Jagtap et al. (2012)
Grapes ***Vitis Vinifera***	0.84-1.74	
Apple ***Malus***	1.05-5.7	
Guava ***Psidium guajava***	0.24-5.10	
Mango ***Magnifera indica***	0.80-3.70	
Bengal gram ***Cicer arietinum***	3.84-14.8	
Green gram ***Vigna radiata***	2.34-21.2	
AlfaAlfa ***Brome*** ***Orchard*** ***Alta Fescue***	130 106 97 102	Miller et al., 1999
Acalypha indica ***Abutilon indicum*** ***Cleome viscosa*** ***Cassia occidentalis*** ***Ipomea biloba*** ***Asystesia gigantica*** ***Euphorbia hirta*** ***Clitoria ternate*** ***Acacia Arabica*** ***Merremia tridentata*** ***Amaranthus viridis***	12.1 9.8 1.5 5.6 23.1 15.2 12.3 4.6 9.1 5.2 12.1	Devi et al., 2016

Source: https://www.ncbi.nlm.nih.gov/pubmed/29649763

Distribution and pollution evaluation of fluoride in a soil–water–plant system in Shihezi, Xinjiang, China (2017)

The extraction method of F forms.

Forms of F	Extracting solution	Operating conditions
WS-F	60°C redistilled water	Shake 0.5 h
Ex-F	1 mol/L $MgCl_2$ (pH = 7.0)	Shake 1 h in 25°C
Fe/Mn-F	Miscible liquids of 0.04 mol/L $NH_2OH{\cdot}HCl$ and 25% (V/V) acetic acid	Shake 1 h in 60°C
Or-F	0.02 mol/L HNO_3+30% H_2O_2, 3.2 mol/L NH_4AC	Shake 0.5 h in 25°C
Res-F	Subtracting the other four fractions from T-F content	

F Content in different species of plant leaves (mg/kg).

Types of plant leaves	F	Types of plant leaves	F
Brassica pekinensis Rupr.	2.22	*Raphanus sativus Linn.*	2.33
Cleome gynandra Linn.	2.40	*Brassica pekinensis (Lour.) Rupr.*	1.90
Chrysanthemum coronarium Linn.	1.75	*A. persica L. var. compressa*	2.81
Phragmites australis (Cav.) Trin. ex Steud	2.40	*Beassica pekinensis (Lour.) Rupr.*	2.22
Brassica chinensis Linn. var. oleifera			
Makino et Nemoto	1.90	*Karelinia caspia (Pall.) Less.*	2.22

Statistical comparison of F in soil, water and plant leaves.

Sample	Mean value
Soil	614.6 mg/kg
Water	1.754 mg/L
Plant leaves	2.215 mg/kg

F pollution index of soil.

	P_F		
Sample number	P_{mean}	P_{max}	Comprehensive pollution index
77	1.21	2.33	1.86

Source: https://www.tandfonline.com/doi/full/10.1080/10807039.2017.1385386