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ACCRETION OF FLUORIDE GIST IN FOODSTUFF OF FLUORIDE OVERSTRESSES AREA OF SANGANER TEHSIL, JAIPUR DISTRICT - RAJASTHAN (INDIA)

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Abstract:

The significant component of fluoride is water in fluoride-affected areas, although some foods can contribute too much to the total intake. Plants take fluoride from irrigation water, and some are affected by its inorganic components in water and soil. The current study was conducted to estimate fluoride accumulation in vegetable and cereal crops grown in a potential fluoride-rich area in Sanganer Tehsil in the Jaipur district of Rajasthan, India. A current study was conducted to estimate fluoride accumulation in vegetables, and a grain crop is grown in the potential fluoride area of Sanganer Jaipur, India. Formerly believed to be food does not have a great source of fluoride, but it is now well documented that some types of food may be high in fluoride material. In the current investigation, food items were collected and analyzed from fluoride-prone areas of Sanganer Tehsil of Jaipur District, Rajasthan. Variable F accumulation occurs in a crop (mustard) and vegetables and crops (wheat, spinach, potatoes, tomatoes, eggplants). It has been found that the fluoride content of leafy vegetables [transfer factor (TF)> 1] is higher than that of seed crops along with fruits and tuber vegetables. Fluoride content found in cereal crops be more than vegetables. The maximum concentration of fluoride in Brinjal was 13.6 mg /kg, and wheat 24.45mg/kg. The concentration in water samples was found to be 6.4 ppm.

Keywords: Fluoride, Vegetables, Crops, Accumulations

Introduction:

In the last few decades, it has been steadily increasing. Population, urbanization, industrialization, and inefficient use of resources is encouraged the deterioration of soil and water quality in different parts of the world. Due to various environmental factors are natural or anthropogenic, soil and water resources contamination by disposal hazardous waste, liquid, soil waste industry, sewage disposal, surface impoundments, etc. In many cases, water sources are not displayed insecurely for human consumption; other activities such as irrigation and industrial are required. In recent years, the presence of fluoride in high concentrations in food and water a matter of global concern. Its overt has an estimated population of about 200 million25 countries is facing terrible fate fluorosis [1]. Excess fluoride (0.5–1.5 ppm) in groundwater is a significant problem in many parts

of the world. Fluoride ion intake at sources is mainly dependent on soil and soil type as fluoride ion concentrate. Fluoride is more soluble in acid soils, which increases its reproduction by plants. Most foods taken from plant or animal life are low in fluoride ions. Levels of fluoride ions also vary widely between similar food samples. Some foods concentrate excess fluoride ions by boiling, processing, or contaminating. Some foods, such as vegetables and fruits, usually contain fluoride at low concentrations (0.1 mg/kg - 0.4 mg/kg) and contribute to fluoride intake by humans. The effect of fluoride on growth is complex, varying from positive to adverse effects. Fluoride and its effect on plants have been the subject of intense review. The set standards for fluoride limit in water are 0.8 - 1.5 mg / L. Excess fluoride in vegetation can cause leaf injury, damage to fruits, and yield changes [2]. The ways and patterns of fluoride emissions associated with different intake of fluoride have been described by various researchers [3,4, 5]. Leafy vegetables are particularly susceptible to airborne fluoride ions, and there is a wide variation in the content of vegetables grown in different regions. Cereals usually contain <1ppm of fluoride, where fluoride accumulates in the grain and the embryo [6]. Potato skins can make up to 75% of the total fluoride in a whole fluoride drink. Phosphatic fertilizers are the most important source of fluoride, especially superphosphate, in agricultural land [7,8]. Fluoride in water can significantly contribute to a person's total exposure to this element, but it is not the only source of danger. A person's diet, general state of health, and the body's ability to dispose of fluoride all affect fluoride exposure [9].

Study Area:

The study area is Sanganer Tehsil of Jaipur district Rajasthan, India. Jaipur district connecting the geographical area of 11,061.44 sq km and stretches 26o 25 'between northern latitudes. And 27o 51 'and east longitude 74o 55' and 76o 15 'form the east-central part of Rajasthan, 13 for administrative convenience to the district is divided into Tehsil and 13 blocks. Sanganer Tehsil is connected to the central city of Jaipur. It has a latitude of 26 ° 49'N to 26 ° 51'N and. It was lying in the middle 75 ° 46'E to 75 ° 51'E longitude. Its area is 635.5 ch. Km. The climate of this region is hot with partial dryness and intensity. Temperature (15–45 °C) and precipitation 650 mm (26 inches). The population of Sanganer Tehsil is 573171 as per the 2011 census. Sanganer tehsil ha In the present study, various crop and vegetable samples were collected from the most fluoride-prone area of other analyzed fluoride deposition in the vegetables and crops.

Methodology:

To assess the effect of pollution, samples of crop and vegetable items collected at random from the high fluoride-affected villages in the study area were examined. Irrigation of vegetables and grains from these villages was analyzed by ion-selective electrode method for fluoride from fluoride-containing groundwater samples due to low rainfall in this study area. The fluoride content in these areas was found to be above the allowable limit (> 1.5 ppm) [10]. Crops (wheat, Mustered) and vegetables (potatoes, tomatoes, Spinach leaf, and Brinjal) grown locally in the study area can easily absorb, stir, and accumulate fluoride. Fluoride assessment in crops and vegetables: Collected vegetables washed with distilled water. Then they have roots, stems, leaves, and flowers separate, dry, slice, and mix thoroughly. Later, 100-g specimens of each component were dried at 708 C, passed through the air and on land

40-mesh strainer. The sieve material is sealed in polyethylene plastic bottles. More use. For us, wheat and mustard, 100 g samples ground and 40 mesh crossed the sieve. As mentioned above, the non-sieve material is sealed and stored inside polyethylene plastic bottles. Contains watersoluble F (FH2O) and total F (total) these patterns described in the literature were determined. [11, 12]

Result and Discussion:

Fluoride accumulation in crops and vegetables: Similarly, previous studies on current research have shown that vegetable leaves tend to accumulate fluoride and adversely affect the growth and productivity of many crops [3, 11, 12,]. Similarly, Gautam et al. [13], Fluoride accumulation through vegetables and produce grown in Nava tehsil in Nagaur district was studied, and lettuce showed maximum fluoride concentrations (25.80 µ/ gram) and also analyzed grains for fluoride Gaya, from which Menthe and Chawla were found ration as maximum fluoride (18.98 g / g). According to Bhargava and Bhardwaj [14], large amounts of fluoride enter the human food and beverage chain through the consumption of tea, wheat, cabbage, carrots, and other Indian foods. Various studies in China have suggested that dietary contribution may significantly contribute to total fluoride absorption [15, 16]. This should not be ignored in estimating the amount of fluoride in the diet total fluoride eclipse. The fluoride ion in plants is obtained from polluted air and soil. The fluoride ion in the air enters the plant through the leaves and the earth through the roots [17]. Total water-soluble fluoride F(H2O) and F(T) values in crops and vegetables are shown in Table 1. , Graph.3.

Different patterns of F distribution in plants have been found in other species. The transfer of F to edible components is very low for cereal growing plants (mustard), fruiting vegetables (potatoes), and high transfers to beets (potatoes) leafy vegetables. (spinach) were observed in Table 1. Graph 1-3. Preliminary research has shown that F richness is increased in plant parts where metabolism is high. High F enrichment/translocation in leafy vegetables is attributed to the increased rate of metabolism (or photosynthesis rate) in leaf seedlings compared to seeds/grains of other storage organs (tubers). Excessive metabolic activity may be associated with increased water intake, resulting in increased F concentrations in leaf sprouts/vegetables. Dietary intake of fluoride: The amount of F in the environment is linked to human health. It was found here that each selected adult family member needs an average of 500 grams of food, 500 grams of vegetable food, and 5 liters of water per day.

Conclusion :

After examining the current study data, it was observed that fluoride enters not only through water but also with many foods. The fluoride of foods depends on the amount of fluoride in the soil and the water used for irrigation. Fluoride in water can significantly contribute to a person's total exposure to this element, but it is not the only source of danger. Fluoride in the diet plays an essential role in causing fluorosis, while fluoride plays a significant role in drinking water. The amount of fluoride in foods varies everywhere. Fluoride levels also vary widely between samples of the same diet.

Therefore, the role of diet in fluorosis can be concluded to be a dual-edge reaction, so the amount of fluoride in the diet should not be neglected in estimating total fluoride increase.

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Table: 1. Water-soluble and total fluoride content in seeds and edible part of Vegetables collected from high fluoride prone areas of Sanganer Tehsil of Jaipur District.

S.No.	Crop/vegetable	F(Total) (mg/kg)	F(H2O) (mg/kg)
1.	Mustard	8.40±0.21	2.67± 0.408
2.	Wheat	24.45 ±342	8.87±487
3.	Brinjal	13.89±1.16	1.29± 0.09
4.	Spinach leaf	12.21±0.12	6.70 ± 0.12
5.	Tomato	10.25±0.10	4.22± 0.10
6.	Potato	7.01±0.15	2.00± 0.02

Fig: 1. Showing F(Total mg/kg) in crops and vegetables analyzed from high fluoride irrigated area of Sanganer Tehsil Sanganer, Jaipur District

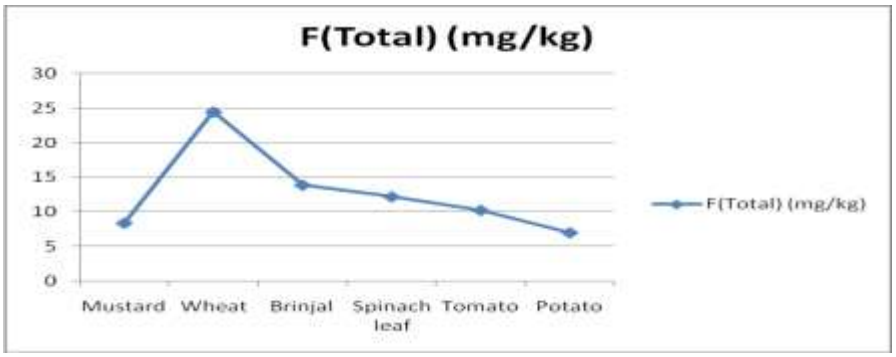

Fig: 2. Showing F(H2O)(mg/kg) in crops and vegetables analyzed from high fluoride irrigated area of Sanganer Tehsil Sanganer, Jaipur District

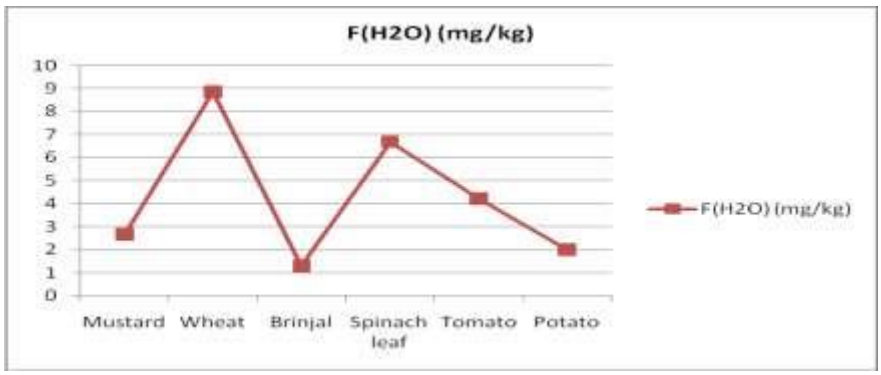

Fig.3. Water-soluble and total fluoride content in seeds and edible part of Vegetables collected from high fluoride prone areas of Sanganer Tehsil of Jaipur District.