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Research Article

ESTIMATION OF FLUORIDE CONTENT IN GROUND GROWTH GREEN VEGETABLES LEAVES (AMARANTHS) AT SURROUNDING VILLAGES OF NALGONDA DISTRICT ANDHRA PRADESH BY USING KIT COLOUR COMPARISON METHOD

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ABSTRACT

Fluoride is found to be an important trace element playing a key role in the dental and skeletal formation in humans. It is generally believed that including human being consume fluoride largely from drinking water sources and the total daily intake of fluoride by individuals from water and other sources varies from place to place depending on the amount of fluoride availability in water and other sources including food. Earlier it was believed that food was not a rich source of fluoride for humans but it is now well documented that certain types of food can have high fluoride content. Therefore the present research work is to study the fluoride content in leafy vegetable samples(amaranthus) collected from five different gram panchayat's(villages) of Nalgonda district by using kit colour comparison method and report the fluoride content in the collected samples. finally it was found that the fluoride content in all the samples were found to ranging from 2.20-2.85mg/kg which is considered to be under safe zone(0.3-2.8mg/kg) and consumption of this leafy vegetables will not affect the humans.
Keywords: Dental and skeletal formation, Fluoride, Leaf vegetable, Food, Kit colour Comparison method, Nalgonda.

INTRODUCTION

Fluorine is the 13th most abundant element of the earthcrust. It represents about 0.3 g/kg of earth's crust. It occurs mainly in the form of chemical compounds such as sodium fluoride or hydrogen fluoride which are present in minerals fluorspar, fluorapatite, topaz and cryolite. In India the states of Andhra Pradesh, Bihar, Chhattisgarh, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal are affected by fluoride contamination in water. This involves about 9000 villages affecting 30million people [1]. Digging up of bore well for irrigation has resulted in declining levels of ground water. As a result, deeper aquifers are used and the water in these aquifers contains a higher level of fluoride. Many factors affect the fluoride content such as volcanic rocks, granite and gneissic rocks and sediments of marine origin in mountainous areas. These rocks high in fluoride content are often found underground affecting ground water. Thus high concentrations of fluoride in water are generally found in ground waters [2].Ground water fluoride contents in high levels are present in all the 33 districts and have become a serious health related issue in 23 districts of Rajasthan [3,4,5]. Estimation finds that 65% of India's villages are exposed to fluoride risk [6]. The WHO guideline for fluoride is 1.5 mg/L [7] if there is not enough fluoride content within

the water, this may result in tooth decay and dental caries. Higher fluoride concentration exerts a negative effects on the course of metabolic processes and an individual may suffer from skeletal fluorosis, dental fluorosis, non skeletal manifestation or a combination of the above [8,9]. The present study was carried out to assess the fluoride content of underground water in Dausa district, Rajasthan.

MATERIALS AND METHODS

The study was carried out in five main villages of Nalgonda district of Andhra Pradesh state. Total 05 ground Source Green Vegetable (s) samples were collected and analyzed for fluoride content. Nalgonda districts a semi arid part of Andhra Pradesh. The weather is generally dry and so high temperature & hills area. The people of the nalgonda district use ground water for irrigation fields and also for drinking but the water is having high concentration of fluoride. Green vegetables (ground growth) samples were collected from different sources viz small villages open Vegetables Markets from randomly selected villages and stored in polythene bottles. Fluoride concentration was analyzed with the help of kit colour comparison method. In order to achieve satisfactory results a buffer, Total Ionic Strength Adjustment Buffer (TISAB) was used to maintain a suitable ionic strength.

Collection and storage of plants:

Plants were collected from the different villages (thoragallu, chityala, anantharam, arjalabavi, duppalapally) of nalgonda district. They were collected from the place of cultivation by cutting method. They are transferred in to air tight polythene bag's and then to refrigerator for storage purpose

Preparation of leaves juice:

At first plants are cleanly washed with distilled water. Then the leaves of the plant were picked they are transferred to the juice mixer to obtain the juice, this juice now obtained is filtered by using clean cloth in to the juice storing bottles which are washed thoroughly washed before this juice is used for further experimentation part.

Estimation of fluoride content

The method used for estimation is known as kit colour comparison method it's generally practised in the government RWD lab units for estimation of the fluoride content in rural villages of nalgonda.This is very simple and easy technique to follow and implement .At first a cleanly washed test-tube is taken in that 4ml of the leaf juice is taken and 1ml of fluoride reagent is added by using pipette then observed for the colour change the obtained colour is compared to the colour meter card and values were noted.

Table: 1 Statistical Data

S. No	Names of Villages in Nalgonda District	Fluoride content (Approximately)
1	Thoragallu	2.31mg/lit
2	Chityala	2.85mg/lit
3	Anatharam	2.31mg/lit
4	Arjalabavi	2.50mg/lit
5	Duppalapally	2.20mg/lit

RESULTS AND DISCUSSIONS

The results of fluoride concentration in ground source green vegetable (s) samples are depicted in the table-1 from different places in Nalgonda district were examined for fluoride content. 05 samples in fluoride concentration were found beyond permissible limit. Earlier it was considered that major amount of fluorine entering in to body is only through the drinking water in Nalgonda district and it caused the various health problems but later it was found that fluorine sources were available in the vegetables also .so, we collected green leafy vegetables(Amaranthus) from different villages of Nalgonda district to analyse the fluoride content and we found that the fluoride content in samples were ranging from 2.20-2.85mg/kg, which is in the normal range as per the WHO guidelines

CONCLUSION

Since samples (green leaves of Amaranthus) analysed for the presence of fluoride content showed the normal fluoride levels (0.3-2.8mg/kg) in them, we can conclude that the intake of this green leafy vegetables in our diet will not affect the body and will not lead to any complications that are actually caused due to the presence of higher fluorine levels in the body.

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