

Elements Evaluation of Some Edible Vegetables and Fruits of Iran and India

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Abstract: Fruits and leafy vegetables are believed to occupy a modest place as a source of trace elements due to their high water content. In addition to meeting nutrient intake levels, greater consumption of fruits and vegetables is associated with reduced risk of cardiovascular disease, stroke, and cancers of the mouth, pharynx, esophagus, lungs, stomach, and colon. Results showed *Portulaca oleracia* contains the macro-elements high value such as sodium (7.17 mg g^{-1}), potassium ($14/71 \text{ mg g}^{-1}$), calcium ($18/71 \text{ mg g}^{-1}$) and also it contains high ash value in comparison with other plants. Therefore, *Portulaca oleracia* has high nutritional value. *Eulophia ochreatea* contains maximum micro-elements values such as iron (5.04 mg g^{-1}) and zinc (3.83 mg g^{-1}) in comparison with other plants, therefore it has high nutritional value from point view of trace (micro) elements. *Momordica dioicia* or *Cordia myxa* Roxb have the minimum nutritional values, because they have ash minimum values and contain sodium and calcium minimum values, but *Cordia myxa* has zinc minimum value. *Alocacia indica*, *Asparagus officinalis*, *Chlorophytum comosum*, *Cordia Myxa*, *Eulophia Ochreatea* have medium nutritional values.

Key words: *Eulophia*, minerals, nutritional value and *Portulaca*

INTRODUCTION

Based on available scientific evidence, zinc may be efficacious in the treatment of (childhood) malnutrition, peptic ulcers, leg ulcers, infertility, Wilson's disease, herpes and taste or smell disorders (Al-Marouf, 2006; Gillman, 1995).

Leafy vegetables hold an important place in well-balanced diets. The idea itself of a well-balanced diet changed in recent years and more vegetable and fruits are advised (Ames and Gold, 1996; Bazzano, 2002; Gillman, 1995).

Iron is an essential mineral and an important component of proteins involved in oxygen transport and metabolism.

Plant food sources of iron include dried fruit, peas, asparagus, leafy greens, strawberries and nuts (Black, 2004).

On the other hand, with few exceptions, fruits and leafy vegetables are believed to occupy a modest place as a source of trace elements due to their high water content (Gibson, 1994).

Consumers are looking for variety in their diets and are aware of the health benefits of fresh fruits and vegetables. Of special interest are food sources rich in Calcium (Ca), Magnesium (Mg) and potassium (K). Most of these nutrient requirements can be met by increasing the consumption of fruits and vegetables to 5-13 servings/day. In addition to meeting nutrient intake levels, greater consumption of fruits and vegetables is associated with reduced risk of cardiovascular disease, stroke, and cancers of the mouth, pharynx, esophagus, lungs, stomach, and colon (Joshipura, 2001; Kratzer, 1986).

The present work aimed at determining the total of five nutritionally important minerals (calcium, iron, zinc, sodium and potassium) and ratio of K to Na and minerals contents in the plant foods widely consumed in Iran and India. Kratzer, (1986), Riboli (2003), Lucarini, (1996).

MATERIALS AND METHODS

Collection of Samples: Eight different types of fruits and vegetables (*Alocacia indica* Sch., *Asparagus officinalis* DC., *Chlorophytum comosum* Linn., *Cordia Myxa* Roxb., *Eulophia Ochreatea* Lindl., *Momordica dioicia* Roxb., *Portulaca oleracia* Linn. and *Solanum indicum* Linn.) were purchased from and were collected from various localities of Maharashtra (India) and Iran. Five wild edible plants were collected from Iran viz *Asparagus officinalis*, *Chlorophytum comosum*, *Cordia myxa*, *Portulaca oleracia* and *Solanum indicum* were collected from Iran in October 2006 and April 2007. Efforts made to collect these plants in flowering and fruiting conditions for the correct botanical identification.

Samples Preparation: Fresh fruits and vegetables were cleaned with water and external moisture wiped out with a dry cloth. The edible portion of the individual fruits was separated, dried in a hot air oven at 50°C for 1h. The dried samples were then powdered in a blender for further study. Some of the plants dried under shade so as to prevent the decomposition of chemical compounds present in them.

Determination of Minerals: One gram of each of the sample were dry-ashed in a crucible in a furnace at 550°C for about seven hours. The ash was dissolved in 10 HCl acid in a conical flask. The solution was filtered into a

Table 1: Amounts of Macro elements and Ash of eight edible plants obtained from Iran and India.

Plant name	Total Ash (%)	Sodium (Na) mg g ⁻¹	Potassium (K) mg g ⁻¹	Calcium (Ca) mg g ⁻¹
<i>Alocacia indica</i> Sch.	7.3	4.4	3.4	0.88
<i>Asparagus officinalis</i> DC.	10.7	1.84	10.94	0.67
<i>Portulaca oleracia</i> Linn.	22.6	7.17	14.71	18.71
<i>Momordica dioicia</i> Roxb	6.7	1.51	8.25	0.46
<i>Eulophia ochreata</i> Lindl.	9.1	1.62	4.63	7.37
<i>Solanum indicum</i> Linn.	11.0	1.51	8.32	4.48
<i>Cordia myxa</i> Roxb	6.7	1.62	7.83	0.46
<i>Chlorophytum comosum</i> Linn	10.38	3.95	4.29	13.14

Table 2: Amounts of Trace elements and Ash of eight edible plants obtained from Iran and India.

Plant name	Total Ash (%)	Fe mg g ⁻¹	Zn mg g ⁻¹
<i>Alocacia indica</i> Sch.	7.3	0.48	1.21
<i>Asparagus officinalis</i> DC.	10.7	0.19	2.60
<i>Portulaca oleracia</i> Linn.	22.6	0.48	3.02
<i>Momordica dioicia</i> Roxb.	6.7	0.14	1.34
<i>Eulophia ochreata</i> Lindl.	9.1	5.04	3.83
<i>Solanum indicum</i> Linn.	11.0	10.56	0.95
<i>Cordia myxa</i> Roxb.	6.7	0.51	0.35
<i>Chlorophytum comosum</i> Linn.	10.38	1.89	0.76

100ml standard flask and made up to the mark with distilled water. The individual mineral element was estimated from this solution. Ca, Na and k using the Flame Photometer (Jenway, U.K.) And, Fe and Zn by Atomic Absorption Spectrophotometer .

RESULTS AND DISCUSSION

Sodium value in *Portulaca oleracia* Linn. was maximum and Sodium values in *Momordica dioicia* Roxb., or *Solanum indicum* Linn. were minimum. Sodium value in *Alocacia indica* Sch. was medium (Table 1).

Potassium value in *Portulaca oleracia* Linn. was maximum and Potassium value in *Alocacia indica* Sch. was minimum. Potassium value in *Cordia Myxa* Roxb. was medium (Table 1).

Calcium value in *Portulaca oleracia* Linn. was maximum and Calcium values in *Momordica dioicia* Roxb. or *Cordia myxa* Roxb. were minimum. Calcium value in *Eulophia ochreata* Lindl. was medium (Table 1).

Iron value in *Eulophia ochreata* Lindl. was maximum and Iron value in *Momordica dioicia* Roxb was minimum. Iron value in *Chlorophytum comosum* Linn. was medium (Table 2).

Zinc value in *Eulophia ochreata* Lindl. was maximum and Zinc value in *Cordia myxa* Roxb. was minimum. Zinc value in *Asparagus officinalis* DC. was medium (Table 2).

It is observed that macro-elements values of *Portulaca oleracia* Linn. were high, especially it contains high ash value in comparison with others edible plants. Therefore, *Portulaca oleracia* Linn has high nutritional value from standpoint of macro-elements such as Sodium, Potassium and Calcium. Because *Eulophia ochreata* Lindl. contains micro-elements maximum amounts such as Iron and Zinc in comparison with others edible plants, It has high nutritional value from standpoint of above trace (micro) elements. *Momordica dioicia* Roxb. or *Cordia myxa* Roxb have the minimum nutritional values, because they contain ash minimum values. *Momordica dioicia* Roxb. contain sodium and calcium minimum values, but *Cordia myxa* Roxb. contain zinc

minimum value. *Alocacia indica* Sch., *Asparagus officinalis* DC., *Chlorophytum comosum* Linn., *Cordia Myxa* Roxb., *Eulophia Ochreata* Lined have medium nutritional values, from standpoint of one element.

It is observed that ratio of K to Na and minerals contents in *Portulaca oleracia* was better than others plants because this ratio will increase these minerals usable and absorbance in body.

CONCLUSION

We can conclude these wild edible plants are suitable for consumption and therefore, nutritional values of the plants are good, but it is necessary to study nutritional values in heat processing in next researches.

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