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## NUTRITIONAL ANALYSIS OF FRUIT PULP OF *MORINGA OLEIFERA* LAM., FROM SUPERMARKET OF GULBARGA DISTRICT, KARNATAKA, INDIA

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### Keywords:

Nutrients, Elements, Gulbarga District, *Moringa oleifera*

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**ABSTRACT:** *Moringa oleifera* is a native of North India. It is found throughout the tropical region. The plant is used for medicinal and high nutritional purposes throughout India. However, there is no such type of work in the region of the Gulbarga district. So, the present study revealed that the nutritional analysis of fruit pulp of *M. oleifera* from Super Market of Gulbarga district, Karnataka, India. The proximate analysis estimations of moisture, dry matter, ash, crude fiber, crude protein, crude fat, carbohydrates, and mineral estimation were carried out by AOAC (2000), AAS, and other different parameters. The phytochemical tests of the fruit pulp have the highest amount of energy, carbohydrates, calcium, and potassium. The study reveals that *Moringa oleifera* fruit pulp has highly nutritive values and medicinal values. So, it is desired that the *Moringa oleifera* is used regular in the diet to strengthen immunity and prevent diseases.

**INTRODUCTION:** Hennueberg and Stohmann, in the year 1865, established the Weende analysis or proximate analysis or nutritional analysis based on routine analysis of animal feedstuffs by Weende experiment in Weende station of Germany. These nutrients are essential for the physiological functions of the human body. Such nutrients and chemicals like carbohydrates, proteins, and fats play an important role in satisfying human needs for energy and life processes. Each plant has its own nutrient composition besides having pharmacologically and nutritionally important phytochemical<sup>1</sup>.

According to recent UN nutritional value reports, nearly 900 million people still face starvation problems. About two billion people are suffering from deficits of malnutrition especially poor women and children<sup>2, 3, 4</sup>. *Moringa oleifera* is native to north India. It is found throughout the tropical region. *Moringa oleifera* plant is used for medicinal and high nutritional purposes. It is a very common and useful vegetable throughout the district in all seasons. Until there is no phytochemical or nutritional analysis was carried out in the study area. Hence, in this study, the nutritional analysis of fruit pulp of *M. oleifera* was analyzed from different methods and parameters of earlier used.

### MATERIALS AND METHODS:

**Collection and Storage of Sample:** *Moringa oleifera* fruits Sample were collected in clean polythene bags from the supermarket of Gulbarga district in the month of April and May 2019.

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Peeled up the cover of fruit then collected the shed dried fruit pulp of *Moringa oleifera*. Collected samples were ground and made powder then kept under the air-tight bottle for the experiments.

**Methods Used for Nutrient and Elemental Analysis:** Estimation of moisture by air oven method, ash by gravimetric method and nutritive value or Energy of Standard protocols of AOAC (2000) methods <sup>5</sup>, crude fiber by Gravimetric method and crude fat by Ether extract <sup>6</sup>, carbohydrates by Anthrone's Method <sup>7</sup>, Crude protein by Lowry's method <sup>8</sup> and Mineral analysis by AAS <sup>9</sup> were used for the analysis of nutrients from the fruit pulp of *Moringa oleifera* collected from the supermarket of Gulbarga district. All the tests were carried out in three times, and values were obtained by calculating the average of three experiments and data were presented as mean  $\pm$  SEM and also calculated the standard deviation (STDEV).

**RESULTS AND DISCUSSION:** The proximate analyses of nutritive contents of fruit pulp of *Moringa oleifera* has illustrated in **Table 1**. The result is obtained from analytic chemical analysis of fruit pulp of *Moringa oleifera* is established in **Fig. 1**.

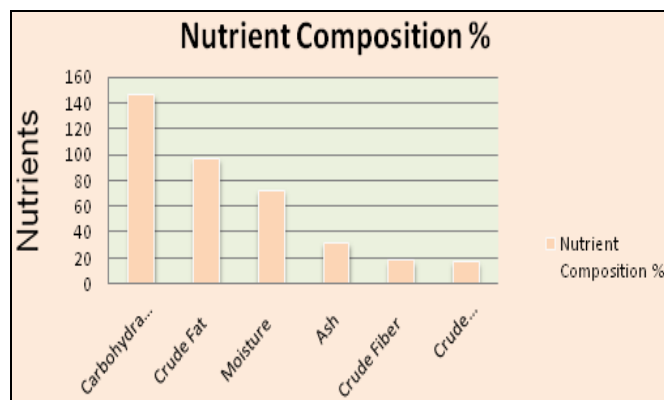
**TABLE 1: THE NUTRITIONAL ANALYSIS OF CONTENTS OF FRUIT PULP OF MORINGA OLEIFERA**

| Nutrients                             | Nutrient Composition %        |
|---------------------------------------|-------------------------------|
| Moisture                              | 72.62 $\pm$ 0.09 %            |
| Ash                                   | 31.8 $\pm$ 0.21 %             |
| Carbohydrates                         | 146.0 $\pm$ 0.09 %            |
| Crude Protein                         | 17.0 $\pm$ 1.6 %              |
| Crude Fat                             | 96.8 $\pm$ 0.19 %             |
| Crude Fiber                           | 17.9 $\pm$ 0.24 %             |
| Nutritive value or Energy (Kcal/100g) | 660.71 $\pm$ 0.09 (Kcal/100g) |

The results here are, the carbohydrates (146.0  $\pm$  0.09%) content was highest than crude fat content (96.8  $\pm$  0.19%), moisture (72.62  $\pm$  0.09%), ash (31.8  $\pm$  0.21%), crude fiber (17.9  $\pm$  0.24%) and lowest amount of nutrient crude Protein (17.0  $\pm$  1.6%).

Finally, we calculated the total consumed energy in Kcal/100g present in the fruit pulp of *Moringa oleifera* plant. The nutritive value was the maximum amount in fruit pulp of *Moringa oleifera* 154.68  $\pm$  0.16 (Kcal/100g). The elemental analyses of contents content of fruit pulp of *Moringa*

*oleifera* **Table 2**. It results from the macronutrients of Potassium (58.104 mg/100 g), Calcium (23.904 mg/100 g), and Magnesium (02.846 mg/100g) contents were highest than micronutrients contents Aluminum (1.119 mg/100 g) and other Cadmium (0.0060 mg/100 g) very negligible amount of elements.



**TABLE 2: ELEMENTAL ANALYSIS OF CONTENT OF FRUIT PULP OF MORINGA OLEIFERA**

| Elements              | Elements Composition (mg/100g) |        |
|-----------------------|--------------------------------|--------|
| <b>Macro-elements</b> | Potassium (K)                  | 58.104 |
| <b>Micronutrients</b> | Calcium (Ca)                   | 23.904 |
|                       | Magnesium (Mg)                 | 02.846 |
|                       | Cadmium (Cd)                   | 0.0060 |
|                       | Manganese (Mn)                 | 0.0481 |
|                       | Iron (Fe)                      | 0.736  |
|                       | Zinc (Zn)                      | 0.190  |
|                       | Copper (Cu)                    | 0.075  |
|                       | Chromium (Cr)                  | 0.013  |
|                       | Molybdenum (Mo)                | 0.104  |
|                       | Aluminum (Al)                  | 1.119  |

The present study revealed that nutritional analysis of wild edible leaves of *Chenopodium album*, *Alternanthera philoxeroides*, *Homalomena aromatic*, *Zanthoxylum rhetsa*, and *Cajanus indicus* was estimated in Meghalaya, India. Protein content was high in leaves of *Cajanus indicus* (15.77  $\pm$  0.03 %) and *Zanthoxylum rhetsa* (13.75  $\pm$  0.05 %).

The concentration of Carbohydrates was the highest quality in *Alternanthera philoxeroides* (73.67  $\pm$  0.30%). The analysis of macronutrients potassium estimated was highest quantity (10.42  $\pm$  0.10) followed by calcium and sodium 10. Fifteen wild edible fruits were carried out by estimating nutritional value and vitamins collected from deciduous forests zone of India. The results show that the nutritional value of many wild fruits has the highest protein, carbohydrates, minerals, and

vitamin contents. The highest percentage of carbohydrates, sugar, and protein were found in wild varieties of plant species, *Mimusops elengi* (18.1%), *Ziziphus rugosa* (20.7%), and *Carissa spinarum* (3.6%), *Bridelia tomentosa* (3.1%) than cultivated species<sup>11</sup>. The estimations of chemical composition and mineral contents of leaf, fruit pulp, and seed parts of *Aegle marmelos* were reported. It was recorded that the highest source of carbohydrates and dietary fiber in g/100g.

The highest mineral contents were found in leaves *i.e.*, iron ( $22.5 \pm 0.09$ ) followed by chromium ( $19.5 \pm 0.20$ ) and zinc ( $6.5 \pm 0.06$ )<sup>12</sup>. The presence of total protein, amino acid, vitamins, minerals, total fat, and total fiber was studied from the leaves extract of *Moringa*<sup>13</sup>. However, the study proved that the fruit pulp of *Moringa oleifera* contains the highest amount of carbohydrates, protein, and energy.

**CONCLUSION:** *Moringa oleifera* is a well-known vegetable all over the world. It is commonly found in the tropical and subtropical regions of India. The study reveals that *Moringa oleifera* fruit pulp has highly nutritive values and medicinal values. The phytochemical tests of the fruit pulp have the highest amount of energy, carbohydrates, calcium, and potassium. So, it desired the *Moringa oleifera* vegetable can become regular use in the diet, and it gives immunity to human beings.

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