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# Neutraceutical Potential of Edible Flowers

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**Abstract:** *The increasing interest in nutraceuticals has exaggerated exploration into new foods that have positive effects on human wellbeing. Even more we see edible flowers as a new way of nutritional health. Edible flowers are a very good source of valuable nutrients, which improves our health. People are eating vegetables in the form of leaves as well as flower. In present study, author have tried to analyse various phytochemical from edible flowers (Sasbania grandiflora L., Moringa oleifera Lam., Musa paradisiaca L.) We investigated the Proximate parameters and mineral content of edible flower. Results showed that It is found that the majorgroups of dietary phytochemicals in edible flowers include flavonoids, phenolic acids,and anthocyanins and they are capable of exerting antioxidant, anti-inflammatory,anti-diabetic, anticancer, cardioprotective, hepatoprotective gastroprotective, and genoprotective effects. Taking into consideration the current recommended dietary allowances (RDAs), these flowers could contribute in beneficial way to the human diet. This article helps to popularize the edible flowers among consumers and food industry which are very potent source of nutraceutical compounds.*

**Keywords**: Edible flowers, nutrition, bioactive compound

## I. INTRODUCTION

Flowers are the integral part of our culture since ancient times and are mentioned as wonder of nature and symbol of beauty in the literature. They are not only grown for decorative purpose, but also have some nutritive and biological properties [1,2,3,4] and used in culinary art for centuries. Edible flowers are part of several local cuisines, including Asian, European and Middle Eastern [5]. In the past, edible flowers were consumed traditionally as vegetables and for their medicinal properties whereas recently scientists accentuate on their nutritional and phytochemical profiles [6.7]. It is therefore essential, first and foremost, to improve nutrition education aimed at proposing flowers as a usual gastronomy.

A numerous types of tree flowers are present in nature and few of them such as Rhdodendron, Bauhinia, Mahua, Gulmohar, Palash, Sesbania, Woodfordia, Simbal, etc. are being utilized traditionally as food and medicine by the localities of India. These flowers are rich in phytochemical (flavonoids, anthocyanins, phenolic acids, carotenoids, tannins, saponins) and possessing numerous health benefits (antioxidant activity, anti-inflammation, anti-cancer activity, anti-diabetic activity, hepatoprotective activity). Now a day's edible flowers are receiving renewed interest as rich sources of bioactive compounds.

*Musa paradisiaca*, *Moringa oleifera* and *Sesbania grandiflora,* are commonly consumed by local people. However, because of the low availability (i.e. short blooming period and at limited places) and poor post-harvest life, these flowers are commonly utilized by the local people as food and medicines during their respective flowering times only. Therefore, in the present study, phytochemical and mineral analysis were carried out of edible flowers.

## II. MATERIAL AND METHOD

The collection of *Musa paradisiaca*, *Moringa oleifera* and *Sesbania grandiflora* flower was carried out during flowering.The collected flowers were washed thoroughly and removed the excess water at room temperature. The samples were powdered using a lab grinder. The samples were used for phytochemical screening.



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Ash value and Moisture was calculated by following the method of AOAC [16]. Crude fiber, Crude fat, crude protein content was determined by following the method of Sadasivam and Manikam[17]. Carbohydrates were estimated by Anthron method [18] with some modification. The Atwater system was used to determine the energy values. [19] The acid digestion method of Toth *et al*. [20] has been followed for the analysis of inorganic constituents. The level of Calcium, Magnesium, Sodium, Iron, Manganese, Zinc, and Copper were estimated by using Atomic Absorption Spectrophotometer. A titrimetric method described by Sadasivam and Manikam[17] was followed to determine ascorbic acid content of the flower.

**Statistical analysis:**

All tests were carried out in triplicate and the results were presented as means ± SEM. A completely randomized statistical design was used. Collected data were statistically analyzed by analysis of variance (ANOVA) by the statistical package SPSS for windows (2001), standard version.

## II. RESULT AND DISCUSSION

There have been very fewer comprehensive investigations on the nutritional and phytochemical composition of edible flowers. Most of the prior reports focus only on the polyphenol composition and antioxidant properties of edible flowers. A comprehensive analysis of nutritional and phytochemical composition is essential for enhanced utilization and value addition of edible flowers that seldom find applications in mainstream foods. In this direction, the present study, describes the phytochemical and mineral composition of selected edible flowers for the identification of potential compounds in an attempt to broaden the existing knowledge on these flowers for their nutraceutical applications.

**Table 1. Medicinal uses of flowers**

| Plant Name | Medicinal Uses |
|---|---|
| *Sesbania grandiflora* | *It helps in hypertension, diabetes, healthy bones, cancer, tuberculosis, digestive system, respiratory system, reproductive system* |
| *Moringa oleifera* | *It helps to boost the immune system, protect all over vision, increase milk production in nursing mother, reduces inflammation and swelling, strengthen bones, helps with cold and cleansed the body.* |
| *Musa paradisiaca,* | *It helps in digestive health, prostate enlargement, support bone health, lower blood sugar & cholesterol level, healthy immune system, and red blood cell development, prevent chronic condition, regulate fluid balance, bloating, improve sleep, heart disease risk.* |

**Table 2. Proximate and Mineral Analysis of Edible Flowers**

| *Observation Parameter* | *Sesbania grandiflora* | *Moringa oleifera* | *Musa paradisiaca* |
|---|---|---|---|
| *Moisture (%)* | *77.27 ± 0.37* | ***86.66 ± 3.49*** | *80.45 ± 1.23* |
| *Crude Protein (g 100 $g^{-1}$)* | ***4.40±0.05*** | *3.20±0.04* | *4.34±0.05* |
| *Crude Fat (g 100 $g^{-1}$)* | ***0.60±0.4*** | *0.30±0.3* | *0.45±0.5* |
| *Crude Fiber (g 100 $g^{-1}$)* | *1.7±0.50* | *1.8±0.30* | ***1.9±0.20*** |

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| | | | |
|---|---|---|---|
| *Total Carbohydrate (g 100 $g^{-1}$)* | *72.00±0.22* | *62.00±0.32* | ***78.00±0.42*** |
| *Total ash (%)* | ***5.675 ± 0.07*** | *3.524 ± 0.05* | *4.575 ± 0.02* |
| *Energy (k cal 100 $g^{-1}$)* | *311.00±1.14* | ***321.00±0.14*** | *320.00±1.24* |
| *Calcium (mg 100 $g^{-1}$)* | *140.00±1.83* | *134.00±1.22* | ***145.00±1.23*** |
| *Phosphorus (mg100 $g^{-1}$)* | *140.00±0.14* | ***145.00±0.20*** | *143.00±0.11* |
| *Iron (mg 100 $g^{-1}$)* | *15.00±0.10* | *13.00±0.11* | ***16.00±0.12*** |
| *Vitamin C (mg 100 $g^{-1}$)* | *7±0.50* | ***9±0.30*** | *8±0.20* |

**Values are the mean of three replicates ±SD (standard deviation).**

The moisture content of the flowers ranged between 77 and 86% with the highest moisture content observed in *Moringa oleifera.* The crude protein, crude fatand Total ash content was highest in *Sesbania grandiflora. Moringa oleifera*flower contain high amount of phosphorus, vitamin C and Energy. In the case of crude fiber, calcium, Ironand total carbohydrates was highest in *Musa paradisiaca.*The total protein content of the flowers reported in the present study was relatively higher compared to other commonly consumed edible flowers such as rose, calendula, and sunflower inflorescence. [8,9] The high crude proteins, total ash and crude fat in *S. grandiflora*indicate its nutritional superiority with respect to macronutrients over other flowers. This suggests the flower's popularity as a vegetable and delicacy in the Western Himalayan region. [11] In general, the macronutrient composition of the edible flowers evaluated in the present study was in the range observed in the earlier reports.[10]The results of various studies on edible flowers showed low caloric value, high number of mineral compounds, vitamins, mucilage, amino acids, fibre, carbohydrates, essential oils and proteins [13,14,15]. Many studies revealed that edible flowers possess strong medicinal properties, such as antidiabetic, anti-cancer, anti-anxiety, anti-inflammatory, antimicrobial, diuretic, and immunomodulatory [10].

## III. CONCLUSION

Edible flowers are a valuable source of both macro and microelements, with notable concentrations of phosphorus, calcium and iron. These flowers are characterized by relatively low levels of heavy metals. They play a significant role in human nutrition, offering antioxidants, anticarcinogenic compounds, vitamins, and diverse chemical compositions. Additionally, they exhibit anti-diabetic, antiinflammatory, and anti-microbial properties. Edible flowers are often underutilized but represent a rich resource in terms of nutrition. They are also appreciated for their aesthetic appeal in gardens and for culinary purposes, making them aversatile addition to diets and gardens.

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