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Nutritional analysis of edible leafy vegetables used in Takhatpur area Chhattisgarh, India

Namita Bhardwaj[1] and Satroopa Kaushik[2*]
[1] Professor, Department of Chemistry, Dr. C.V. Raman University, Kargi Road, Kota, Bilaspur, C.G.-495113.
[2]Research Scholar, Department of Chemistry, Dr. C.V. Raman University, Kargi Road, Kota, Bilaspur, C.G.-495113.
* Corresponding Author: satroopak1985@gmail.com

ABSTRACT
This presentation discusses the identification and chemical analysis of leafy portions of edible plant species ingested by the people of Takhatpur area in Chhattisgarh. The method used in this study was developed to establish a foundation of knowledge about the edible plant species'food value by chemical examination of edible portion. Some of the nutrients evaluated were ash, moisture, carbs, crude protein, crude fat, crude fiber, calories, and iron.This research work probed the nutritional composition of three traditional leafy vegetables of Takhatpur area: ChatiBhaji (Polygenumplebium), GumeeBhaji (Leucascephatotes), and Poi Bhaji (Basselaalba). Standard analytical techniques were conducted in this assay. The highest value of nutritional compositions were respectively: moisture content (52.6 g/100 g) in Poi Bhaji, crude fiber (6.14 g/100 g)in GumeeBhaji, crude fat (2.91 g/100 g) in Poi bhaji, protein content (6.24 g/100 g) in ChatiBhaji, carbohydrate content (27.18 g/100 g) in ChatiBhaji: Iron content (23.93 g/100 g) in Poi Bhaji, and total energy (98.14Kcal) in GumeeBhaji. These green leafy vegetables are typically taken after being steamed, boiled, or otherwise prepared, and supply essential elements that are beneficial to one's health. According to the findings of this study, Nutrients found in green leafy vegetables are good to the health of humans.
Key words: *Edible leafy vegetable, protein contents, nutritional composition, human health*

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INTRODUCTION

Throughout history, people have relied heavily on wild plants. They have been utilized as human and animal nutrition, medicine, fiber, and more. Many potentially useful wild edible food plants have been identified in the quest to preserve equilibrium between population expansion and agricultural output, especially in developing nations. As a result, starch-based foods are essential, as they meet the dual needs of providing both energy and protein. This means that a lack of protein is common among these populations. An effort is being made to investigate the potential of using obscure wild herbs as nutritional aids to help improve the problem. One way to increase your intake of essential nutrients and fiber through food is to increase your consumption of edible wild plants, which are identified as particularly rich in both of these categories. To avoid nutrient deficiencies and age-related disorders, essential to human survival is the utilization of nearby nutritious herbs and plant material that are known for their particular color, flavor, and medicinal significance in addition to being rich in protein, iron, and calories. [1-2].

Many additional neglected plant components are available throughout certain times of the year, but nearly no information is available about their nutritional significance. In addition, numerous studies have described the nutritional makeup of several kinds of edible plants found in nature that people in developing countries can eat [3-4].The dietary arrangement of a selection of green leafy vegetables native to northern India was studied [5]. Some uncommon leafy vegetables from the forest and marshes of the Konkan region of Maharashtra, India, provided considerably more crude protein than others [6].The purpose of our study was to document the locals' information about these plants and to undertake chemical analysis (the nutrient makeup of these plants has not been described in previous studies from this area).

MATERIAL AND METHODS

All of the chemicals used in the analysis were of analytical-research (AR) quality and were purchased from E-Mark (Germany), Qualigens (India), and Loba. In every stage of the manufacture of the solution, distillation and deionized water were utilized. After being washed with a detergent solution and then nitric acid (20% v/v), followed by cleaning with distilled deionized water after rinsing with tap water, all of the glass goods and plastic containers that were utilized were sterilized. It was also necessary to make stock solutions and other reagents.

Study sites:

This investigation focused on the local village(Belpan) of Takhatpur area in Bilaspur district, which is located in the Indian state of Chhattisgarh. The coordinates for the Takhatpur Tehsil, which makes up part of the Bilaspur district, are 21°58′15.62′′N and 82°8′9.11′′E. This area is in the eastern section of the state of Chhattisgarh and is 103 km east of the state capital of Raipur on the banks of the Manyari River. It has an average elevation of 269 metres (883 ft) and average rainfall here is 1220 mm [7].

Sample and sampling:

Three different green leafy vegetable samples have been chosen namely,ChatiBhaji (*Polygenumplebium*), GumeeBhaji (*Leucascephatotes*), and Poi Bhaji (*Basselaalba*). Samples were collected in the month of December 2021 from the Local village (Belpan) of Takhatpur area in Bilaspur district. The information concerning these leafy vegetables is presented in the following Table 1.

Table 1: Green Leafy Vegetables [8]

S.N.	Local Name	Botanical Name	Family	Habit	Most significant plant portion
1	ChatiBhaji	*Polygenumplebium*	Polygonaceae	Weeds	Leaves
2	GumeeBhaji	Leucascephatotes	Lamiaceae	Weeds	Leaves, flower and stem
3	Poi Bhaji	Bassela alba	Basellaceae	Weeds	Leaves, flower and stem

Sample treatment:

Fresh tap water was used to wash the leafy vegetables, and then deionized, distilled water was used to rinse them. These materials were divided into bits and heated at 100 degrees Celsius for around 24 hours after being air-dried for 4 days in the lab. In a mortar and pestle, the samples were reduced to powder. The samples were then transferred into a labeled plastic container for examination after being filtered over a 2 mm nylon sieve [9-10].

Chemical analysis:

A large quantity of plants was collected for chemical analysis. This powdered material was dried three times for analysis and it was subjected to the following analysis. Crude fiber, carbohydrate crude lipid, moisture, and ashwere all calculated using techniques endorsed by the Association of Official Analytical Chemists (1990). For five hours at 550 degrees Celsius in a muffled furnace, ash was measured in silica crucibles. To get the crude lipid, we used petroleum ether and the nonstop Soxhlet procedure [11].The crude fiber content was calculated using an acid-base digestion method with a 1.25 percent H_2SO_4 and 1.25 percent NaOH solution. Nitrogen was estimated using Kjeldahl techniques. The anthrone process was used to calculate the amount of usable carbohydrate, and spectrophotometry was used to confirm the results. The Digital Bomb calorimeter was used to estimate the caloric value. Iron was estimate using an atomic absorption spectrophotometer at 508 nm [12-13].

RESULT AND DISCUSSION

Table 1 and Fig. 1 are displays the outcomes of the Nutritional composition study of the three green leafy vegetable samples. The moisture content value ranges from 39.86 g/100 g to 52.6 g/100 g.The greatest moisture content was found in PoiBhaji, with 52.6 g/100 g, followed by ChatiBhaji, with 47.12 g/100 g, and GumeeBhaji, with 39.86 g/100 g. The value of crude fiber ranges from 3.02 g/100 g to 6.14 g/100 g. GumeeBhaji (6.14 g/100 g) has the highest value of crude fiber, which measures a vegetable's capacity to act as leafy greens in meals, whereas Poi Bhaji has the lowest value (3.02 g/100 g). The value of crude fat ranges from 2.71 g/100 g to 2.91 g/100 g. PoiBhaji has the highest crude fat (2.91 g/100 g), whereas ChatiBhaji has the lowest amount (2.71 g/100 g). The greatest proportion of carbohydrate content was discovered in GumeeBhaji (27.18 g/100 g), which indicates that GumeeBhaji could be regarded as a comparatively good source of carbohydrate overall and Poi Bhaji contained lowest proportion of carbohydrate content (11.65 g/100 g). ChatiBhaji (6.24 g/100 g) has the maximum Protein content, while PoiBhajihas the minimum values (4.13 g/100 g). The maximum Iron content has been found in Poi Bhaji

(23.96 g/100 g), while ChatiBhajihas the minimum values (10.64 g/100 g).The highest total energy has calculated in GumeeBhaji (98.14 g/100 g), while ChatiBhajihas the minimum values (89.03 g/100 g).

Table 2: Nutritional composition of green leafy vegetables (mg/100 g DW)

S. N.	Parameters	ChatiBhaji	GumeeBhaji	Poi Bhaji
1	Moisture content	47.12	39.86	52.6
2	Crude Fibre	5.79	6.14	3.02
3	Crude fat	2.71	2.89	2.91
4	Protein	6.24	5.13	4.13
5	Carbohydrate content	22.19	27.18	11.65
6	Iron	10.64	18.73	23.96
7	Total energy (Kcal)	89.03	98.14	95.12

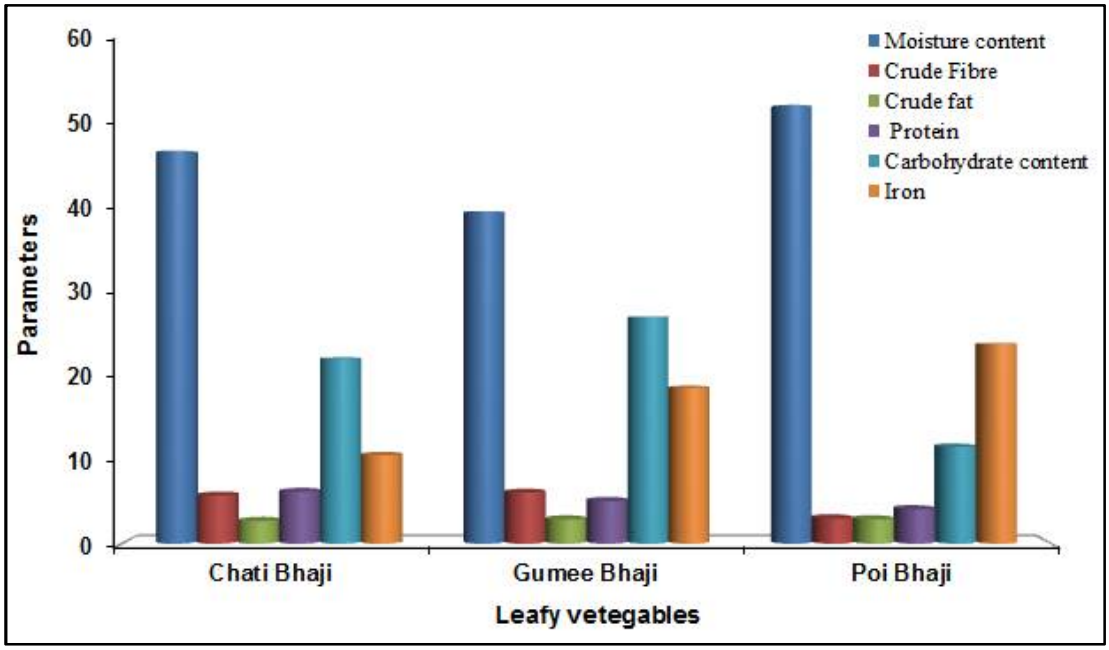

Figure 1: Nutritional composition of green leafy vegetables

Proteins, macromolecules that can be found in food, are crucial for cellular structure and function. In order to describe the physiological qualities and biological roles of foods, the characterization of proteins is essential and for nutritional labeling of those products. The investigation of carbohydrates is also very essential due to the fact that they constitute a sizeable component of the body's energy source. The examination of carbohydrates can disclose the nutritional content of food products, as well as a standard for their identification, their capacity to retain water, their flavours, and other pleasant sensations, as well as their stability. Iron is an important nutrient has a role crucial role in different metabolic function and health development. As a result of its many positive effects on health, fiber in the diet is also a crucial factor in nutritional analysis, including the avoidance of cardiovascular problems, colon cancer, kidney illness, and diabetes, to name just a few of these conditions. In addition, dietary fiber has a part in lowering the likelihood of becoming obese [14-17].

Recent findings point to the possibility of using traditional foods like green vegetables. Since these plants have been shown to have beneficial nutritional properties, we think they could be used to help address the problem of undernourishment, which is particularly acute in rural regions. It is crucial to understand the nutritional content of wild plant foods in order to identify the locations of traditional food resources used by indigenous peoples. Because of people's ignorance and prejudice, it's crucial to educate the public about the value of wild plants for food production and encourage them to view them on equal footing with farmed crops.

CONCLUSION

Because of their widespread consumption in the Takhatpur region of the Bilaspur district in Chhattisgarh, three different kinds of green leafy vegetables were chosen for this research work. Since green leafy vegetables include a substantial number of different nutrient compositions, it is strongly suggested that

the consumption of green leafy vegetable in the diet will be very fruitful. As a result of the high nutrient content that they hold, leafy greens are recognized for their ability to support metabolic processes, growth, and development. The samples that were evaluated are advantageous for human consumption as a consequence of the high levels of energy, protein, and nutrients that they contain.

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CONFLICT OF INTEREST
The authors declare that there is no conflict of interest regarding the publication of this research paper.

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