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Studies InThe Proximate investigation of *Brassica olerecea var. capitate* From Phulambri Village of Aurangabad District of Maharashtra of India

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Abstract

Brassica oleraceae var. capitate is commonly consumed wild vegetable species that underwent proximate study. This study aims to assess *Brassica olerecea var. capitata* proximate composition. While ash analysis is used to estimate the metal ions. The leaves of *Brassica olerecea var. capitata* were found to contain all the necessary micro and trace metals. It was found to include potassium, calcium, iron, magnesium and sodium. All of the important molecules were found and described using the elemental approach. Substances with biological significance. Furthermore, the nutritional value of *Brassica olerecea var. capitata* are a good source of dietary fiber and have something that no other fruits or vegetables contain, namely glucosinolates. As a result, we are interested to learn more about the proximate analyses of *Brassica olerecea var. capitata.*

Key words: *Brassica olerecea var. capitata,* proximate analysis.

Introduction

India has a wide variety of medicinal plants. Since every single molecule in natural products has a specific biological purpose, all natural substances can be regarded as bioactive molecules. Several different physiologically indirect pharmacological activities, or only one. More and more countries in the U.S. and Europe are providing herbal medications to their patients as they recognize the value of nature's green gift. *Brassica olerecea var. capitate* has a distinctive identity in conventional medicine since different parts of it are used to treat various illnesses. Due to the adrenal cortex's anti-cancer, anti-hyperglycemic, anti-pyretic, antibacterial, anti-oxidant activity. *Brassica olerecea var. capitata* leaves have their own unique identity in chemical, pharmacological, and medicinal fields[1-5]. The solubility of powdered leaves in cold water, hot water, dilute

NaOH, dilute HCl, dilute CH3COOH, calculation of moisture, ash content, and acid insoluble ash were all included in the proximate analysis[6-9].Several areas of identifying the physical and physicochemical characteristics of herbal medications are highlighted by the qualitative analysis. Because there are many different elements present. The quality of the herbs used in phytopharmaceutical formulations can also be determined by this sort of examination, which helps with the initial identification of plants [10]. In addition to phyto constituent identification, it is crucial to examine plants' proximate and mineral compositions in order to gain further insight into their nutritional and health benefits. The assessment of the literature found that no prior research had been done on the mineral content and proximate analysis of *Brassica olerecea var. capitata*. As a result, we are interested in researching the proximate analysis and mineral content of *Brassica olerecea var, capitata*.

Material and Methods

Plant materials were obtained from the taluka phulambri in Aurangabad district, Maharashtra, India. To remove dirt and damaged leaves, the collected fresh plant leaves were washed with tap water and then with double distilled water. The washed leaves are then dried at room temperature for 20 days before being ground into powder form with a mechanical grinder and stored in an airtight container for future use.

Proximate Analysis

The determination of physicochemical parameters such as moisture content, total ash value, acid-insoluble ash value, and solubility of the sample was carried out by following the experiment as described by[11]. The Solubility of the sample was checked in cold water, hot water, and 1 percent NaOH, HCl, CH_3COOH the percentage was calculated by using the formula

% of solubility= (loss of weight of sample)/ (weight of sample taken) ×100

Determination of Moisture Content

The purchase of raw drugs with excess water is not only uneconomical, but it also leads to the activation of enzymes and the multiplication of microorganisms when combined with a suitable temperature. Moisture equalization is based on the weight loss of the sample being tested, which is caused primarily by the water content and, in some cases, by small amounts of other volatile substances. Because it combines the drying process and weight recording, the moisture balance is well suited for handling large sample quantities [12].

The oven-drying method was used to determine moisture. The weight of the empty crucible was recorded and kept in the oven for 2 hour at 500C, then 1 gm of dried sample was placed in a crucible (W1) and kept in the oven for 1 hour at 500C. It was then cooled and weighed until the weight remained constant (W2). The moisture content (%) was calculated by using the formula.

$$\% \text{ of moisture} = \frac{\text{Loss of weight of sample}}{\text{Weight of sample taken}} \times 100$$

Determination of Ash Values

The total ash method is intended to determine the total amount of material that remains after ignition. This includes both physiological ash, which is produced by plant tissue, and non-physiological ash, which is the residue of foreign substances (such as sand and earth) that adhere to the plant's surface. When herbal drugs are burned, they produce inorganic ash known as total ash in some plants. This is significant because it demonstrates the care taken in the drug's manufacture. Carbon must be removed at the lowest temperature possible (450o C), or else alkali chlorides, which can be volatile at high temperatures, will be lost. Carbonates, phosphates, silicates, and silica acid are common constituents of total ash [13].

Procedure

An ignited and weighed silica crucible which contains 2gm of the powdered sample was incinerated slowly by raising the temperature in a muffle furnace at 500ºC for 2-4 hours. The sample was carbon-free. It was cooled in desiccators and weighed. The procedure was repeated until a constant weight was obtained. The percentage of total ash was calculated

$$\% \text{ of ash} = \frac{\text{Loss of weight of sample}}{\text{Weight of sample taken}} \times 100$$

Acid Insoluble Ash

The residue obtained after boiling all of the ash with dilute hydrochloric acid and igniting the remaining insoluble matter is known as acid-insoluble ash. This metric assesses the amount of silica present, particularly sand and silica. When whole ash is treated with dilute hydrochloric acid, minerals react to form soluble salts, and the residue, which is mostly silica, is the acid-insoluble ash [14].

The ash was boiled with 25ml of 40% concentrated hydrochloric acid in a silica crucible for 5 minutes. The insoluble ash was collected on ash less filter paper by filtration and washed with hot water. The filter paper was rinsed repeatedly with hot water until the filtrate was free from acid. The insoluble ash was transferred into a reweighed silica crucible. The percentage of acid-ins ash was calculated. The filter paper containing the insoluble matter was transferred to the original crucible, dried on a hot plate, and ignited to a constant weight in the muffle furnace at 450-500 ºC. The silica crucible was removed from the muffle furnace and allowed to cool the desiccator for 30 minutes, and then weighed.

% acid-insoluble ash = Weight of acid-insoluble residue / Weight of the sample taken x 100

The acid-insoluble ash was calculated and the results are shown in Table No.-1

Table No.-1

Sr.No	Solubility	Loss of weight of sample	Amount of sample taken	%
1	Moisture contain	0.237	2gm	11.85
2	Total ash	0.16	2gm	8
3	Acid insoluble value	0.72	2gm	36
4	Cold water	0.91	2gm	45.5
5	Hot Water	0.51	2gm	25.5
6	NaOH	0.69	2gm	34.5
7	HCl	0.86	2gm	43
8	CH_3COOH	0.237	2gm	11.85

Test for elements in ash analysis:

Test for elements in ash content were performed by two methods.

i) Ash dissolved in 20% hydrochloric acid.

ii) Ash dissolved in 20% nitric acid.

Ash dissolved in 20% hydrochloric acid:

At 500 °C sample of *Brassica olerecea var. cpitata* was taken and kept in furnace for 2 hrs. After formation of ash of sample it was transferred into conical flask. 20% hydrochloric acid was added in it, the reaction mixture was continuously shaken vigorously for 1 hr and it was filtered. To determine Ca, Fe, Mg and S elements present in the ash of the root sample of *Brassica olerecea var.capitata* the filtrate was taken for qualitative analysis. The result are given in table no.-2.

Table No.-2

Sr.No	Elements	Result
1	Ca	+ve
2	Mg	+ve
3	S	+ve
4	Fe	+ve

Ash dissolved in 20% nitric acid

Sample of *Brassica olerecea var. capitata* was taken; it was kept in furnace for 2 hrs. After formation of ash it was transferred in a conical flask to it 20% nitric acid was added, the reaction mixture was continuously shaken for 1 hr and it was filtered. To determine Na and Cl elements present in the ash of the sample of the *Brassica olerecea var.capitata* the filtrate was taken for qualitative analysis. The result are given in table no.-3

Table No.-3

Sr.No	Element	Result
1	Na	+ ve
2	Cl	+ ve

Result and Discussion:

The results of the proximate analysis support the use of the leaves as a food supplement. From the result, it was found that the total ash content obtained from dry leaves is 8%. Ash content is generally taken to be a measure of the mineral content of original food. The moderate moisture content provides for an activity of water-soluble enzymes and coenzymes needed for the metabolic activities of the plant. The total moisture content is 11.8% and the total acid insoluble ash is 36%. The proximate composition of the plant is depicted in table no.-1.

Conclusion:

The use of the leaves as a food supplement is encouraged by the findings of the proximate analysis. In this study, the entire element profile is established, and it is discovered that the leaves of *Brassica olerecea var. capitata* contain a number of pharmacologically active substances.The leaves of to improve health, it is possible to promote the daily use of *Brassica olerecea var. capitata*.

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