

Qualitative phytochemical profiling and ethnobotany of *Celosia Argentea* L.

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DOI: <https://doi.org/10.66856/ijbs.2026.11.3.11198>

Abstract

Present study aimed to carry out preliminary phytochemical profiling of *C. argentea* and to document its ethnobotanical relevance within local communities. Plant material was collected, shade-dried, and extracted using standard solvent extraction methods, followed by qualitative phytochemical screening for major secondary metabolites. The analysis revealed the presence of alkaloids, flavonoids, tannins, saponins, glycosides, phenols, and terpenoids, which are known to contribute to antioxidant, antimicrobial, and anti-inflammatory activities. Ethnobotanical data, obtained through semi-structured interviews with local Vaidya of korku tribe community of Maharashtra, highlighted the plant's diverse applications in treating gastrointestinal disorders, skin infections, and as a nutritional leafy vegetable. The integration of phytochemical results with ethnobotanical findings supports the traditional uses of *C. argentea* and underscores its potential as a candidate for further pharmacological investigation. This study contributes to the scientific validation of traditional knowledge and emphasizes the importance of conserving medicinal plants and associated cultural heritage.

Keywords: *Celosia argentea*, Phytochemical screening, Ethnobotany, Korku tribes Melghat

Introduction

Celosia argentea commonly known as cock comb is a leafy vegetable widely consumed in various regions due to its nutritional and medicinal properties. Traditionally used in African, Middle Eastern, and Asian cuisines in India specially Melghat of Maharashtra widely used as wild vegetable's by Korku tribes this plant has gained attention for its rich phytochemical composition, including flavonoids, alkaloids, tannins, and phenolic compounds. (4) Advances in functional food production is focused on the use of natural food additives and its incorporation into commonly consumed food products. The consumer's awareness of the need to eat healthy foods known as functional foods, that is, foods beyond the basic nutritional requirements, has increased. (1) *Celosia* species plays a significant role in traditional medicine to cure many diseases like fever, diarrhoea, wounds, mouth sores, gonorrhoea, itching, jaundice and inflammation. *Celosia argentea* L. (2) Diets rich in fresh fruits and vegetables are also protective against chronic, degenerative diseases. (3)

Plant descriptions

Silver cockscombs are upright, branching plants that grow to a height of 60 to 75 cm. They have heavily veined, narrow, elliptic or lance-shaped leaves that are 5 to 15 cm long, as well as hundreds of tiny flowers arranged in thick spikes of silver-white blooms that typically stand above the foliage. They are lovely plants that produce a large number of soft, fluffy spikes. When dried, the blossom resembles a wonderful straw. With 10–13 cm flower spikes on 60 cm stems, it provides cut flowers or permanent flower arrangements with new shape and color. Because the individual flowers are silvery-white at the bases, thin, cylindrical pink or rose flowerheads have a metallic luster.

Classification of *Celosia argentea* (L.)

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Caryophyllales

Family: Amaranthaceae

Genus: *Celosia*

Species: *argentea* (L.)



Picture: - *Celosia argentina*

Material and Method

Collection of Material.

The plant material were collected from Melghat region Dist. Amravati, (M. S.) India during the winter season of 2024.

The material was thoroughly washed with water to remove soil dust and take fresh weight was taken. Then leaves were shade dried naturally at room temperature and weighed the leaves were crushed in fine powder and stored in air tight bottles. Powder was used for phytochemical test. Extraction was carried out in different organic solvent. Such as methanol, petroleum ether, chloroform, and distilled water. For 6 to 8 hrs. at room temperature.

Selection of vegetable

Name of Plant	Fresh wt. [gm]	Dry. wt. [gm]
<i>Celosia Argentea</i>	305 gm	100 gm

Preparation of Extract by Maceration Method.

Leaves of *Celosia argentea*, were crushed in powder form with the help of grinder and stored in air tight bottles. The plant powder was taken in a test tube with solvents viz distilled water, methanol, petroleum ether were added in test tube then leaves powder of all three plant were added in test tube and shaken well to soaked. The solution then filtered with the help of filter paper and filtered extract of the selected plant samples were taken and used for phytochemical analysis.

Test for alkaloids

Dragendorff's test

1 or 2 mL of Dragendorff's reagent was added to a few mL of filtrate by the side of the test tube. A prominent yellow precipitate gave positive indication.

Test for tannins

Alkaline reagent test

Test solution when treated with sodium hydroxide solution exhibited yellow to red precipitate within short time confirming presence of tannins.

Test for flavonoids

2 mL of extract was treated with 2-3 drops of 20% sodium hydroxide solution. Formation of deep yellow colour, which becomes colourless on addition of dil. HCl indicate the presence of flavonoids.

Test for saponins

Foam test

To 2 mL of extract was added 6 mL of distilled water in a test tube. Then the mixture was shaken vigorously and observed for the formation of persistent foam indicating the presence of saponins.

Test for carbohydrates

Molish's test

Few drops of Molish's reagent were added to 2 mL of the extract followed by addition of 2 mL of conc. H₂SO₄ down the side of the test tube. Mixture was then allowed to stand for 2-3 minutes. Formation of a red or dull violet colour at the interphase gave a positive test.

Test for proteins and amino acids

Millon's test

Extract after treatment with 2 mL of Millon's reagent showed white precipitate, which turned red upon gentle heating.

Test for steroids

2 mL of acetic anhydride was added to 0.5 g extract of each sample with 2 mL of H₂SO₄ and was observed for colour change from violet to blue or green.

Determination of nutritive value

The quantitative estimation of carbohydrates, proteins and fats was carried out using dried material (100 g). Carbohydrates, proteins, fats were determined quantitatively by standard procedures.

Table: Phytochemical analysis of *Celosia Argentea*

no.	Sr.	Nutritional value	D/W	Methanol	Petroleum Ether
1		Carbohydrates	++	+	++
2		Protein	+	+	+
3		Fats	-	-	-
4		Alkaloid	++	+	+
5		Flavonoid	++	+	++
6		Phenol	+	-	--
7		Saponin	+	++	+
8		Tannin	+	+	++

(+) = Present, (-) = Absent. (++) = Highly

Present

Phytochemical screening showed on the (Table 2) suggests that the substances like tannins, saponins flavonoids, alkaloids, proteins, and carbohydrates may be the medicinally active constituent of leaves of *Celosia Argentea*. Carbohydrate and protein present in all solvent. While fat are absent in all solvent. Both alkaloid and flavonoid present in all solvent. while phenol are absent in both methanol and petroleum ether. saponin and tannin are exhibited positive test in all solvent.

Result and Discussion

The present study indicates that the wild leafy vegetable plants having significant potential and is rich in nutritional composition. Investigation comprises the presence of different phytoconstituents such as alkaloids, tannins, saponins, flavonoids, carbohydrates and proteins. From the study undertaken it can be concluded that the wild leafy vegetables from Melghat region contains appreciable amount of phytochemical and bioactive compound which are useful for native peoples. The biological activities and chemical constituents report review confirm the therapeutic value of *celosia argentea*.

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