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# *Celosia cristata –A beautiful gift of Nature*

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**Abstract**

*Celosia cristata*, commonly known as cockscomb or crested *celosia*, is a popular ornamental plant in the Amaranthaceae family. It is valued for its unique and vibrant flower heads that resemble a rooster's comb, which is where the common name "cockscomb" originates. Aside from its ornamental value, *Celosia cristata* has also been investigated for its potential coloring and medicinal properties. The fresh as well as dried leaves of *Celosia cristata* are mainly used for the coloring matter and the main pigment responsible is betalins. Studies have shown that the cockscomb contain certain compounds which have shown antioxidant, anti-inflammatory effects, anti-microbial and analgesic potential but further research is needed to fully understand its medicinal potential.

**Keywords**: *Celosia cristata; ornamental; color, betalins; medicinal properties*

## Introduction

Medicinal plants are the nature's gift to human beings to help them pursue a disease-free healthy life. A wide variety of therapeutic flowers, plants, and herbs can be found in the Kashmir Valley in northern India. *Celosia cristata*, a herbaceous plant from the family Amaranthaceae (Caryophyllales), is referred to as "Mawal" in the local language. *Celosia cristata* is a stunning and easy-to-grow plant that adds a splash of color and texture to gardens and landscapes, making it a favorite among many gardeners and horticulturists. Its leaves and inflorescences are consumed as vegetables in several regions of the world, including Africa, China, Indonesia, India, and other areas of Asia. (National Research Council, 2006).

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Plants are a valuable source of a lot of secondary metabolites viz. flavonoids, polyphenols, and carotenoids, which possess antioxidant properties. These compounds may vary in type and concentration between different plant species and even different cultivars. Natural antioxidants are drawing more and more interest from researchers and food producers as their capacities to function as reducing agents, chelators of metals promote oxidation, and quenchers of free radicals and thus lower the incidence of degenerative "oxidative" diseases.

*Celosia cristata,* particularly its flower heads, can be used as a natural coloring agent due to the vibrant colors it displays. The bright and distinct pigments found in the flowers can be extracted and used to dye various materials, including fabrics, papers, and foods. To extract the color from *Celosia cristata*, the flowers can be harvested and dried. Once dried, the flowers can be boiled in water or steeped in alcohol to release their pigments. The resulting liquid can then be used as a dye or coloring agent. It's important to note that while Celosia can provide beautiful colors, the intensity and stability of the dye may vary depending on factors such as the part of the plant used, the extraction method, and the material being dyed. Additionally, using natural dyes often requires some experimentation and skill to achieve the desired color shades and fix the colors onto the material effectively. As with any dyeing process, it's essential to consider the environmental impact and sustainability of the materials used. Natural dyes, like those from Celosia, are generally more environmentally friendly than synthetic ones, as they are biodegradable and less likely to release harmful chemicals into the environment.

***Celosia cristata* (Cockscomb)**

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**History**

The exact geographic origins of *Celosia* in the wild are unknown, although speculations include the dry slopes of Africa and India as well as dry stony regions of both North and South America. Wherever they first came from, they are grown in North America since the 18th century. Although reportedly used by Chinese herbalists to stop bleeding, treat diseases of the blood, and infections of the urinary tract, there are no references to its use in any western herbals - modern or centuries old, European or Native American. The name is derived from the Greek and translates to "burning," aptly describing the look of Celosias - especially the yellow, red, and orange plumed varieties - which bear a resemblance to licks of flames erupting from the stems. Before breeding resulted in larger blooms, the crested Celosia, with its small, wavy, fanlike flowers, looked very much like roosters' red combs - hence the popular common name of cockscomb.

**Nomenclature and Classification**

The Celosia species is a small genus of edible and ornamental plants belonging to Amaranthacea. It belongs to kingdom Plantae, order Caryophyllales, family Amaranthaceae, genus Celosia, and species *Cristata*.

It is commonly known as Cockscomb, Crested celosia, Yellow to read or, Red cockscomb, Foxtail amaranth, Fire-flame bush, Shinaji tea, and Woodfordia.

1. **Appearance**: *Celosia cristata* typically grows up to 30 cm in height, although there are smaller varieties available. The plant lacks a woody stem and has either green or bronze/maroon-colored leaves, depending on the cultivar. The flowers are the highlight of this plant, consisting of spikes, plumes, and crests.

2. **Flower Structure**: The flowers of *Celosia cristata* are unique and distinctive. The spikes are the central, upright portion of the flower, while the plumes are feathery extensions that radiate outwards from the spikes. The crests are ruffled or wavy formations that sit atop the spikes. The flowers come in a range of bright colors such as red, yellow, pink, orange, white, and purple.

3. **Growing Conditions**: *Celosia cristata* is adaptable to various growing conditions. It thrives in both humid and arid conditions, making it suitable for a wide range of

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climates. It can be grown in full sun or partial shade and prefers well-draining soil. This plant is drought-tolerant and can withstand high temperatures.

4. **Longevity:** The flowers of *Celosia cristata* are known for their long-lasting nature. They can remain in bloom for up to 8 weeks, adding color and visual interest to gardens and landscapes.

5. **Seed Production**: Each flower of *Celosia cristata* can produce a high number of seeds, with up to 1500 seeds per gram. This abundance of seeds allows for easy propagation of the plant.

6. **Uses**: *Celosia cristata* is primarily grown as an ornamental plant for its attractive flowers. It is commonly used in flower beds, borders, containers, and floral arrangements to provide a vibrant and unique touch. The plant's compact size makes it suitable for gardens of various sizes.

7. **Cultural Significance**: *Celosia cristata* holds cultural significance in different parts of the world. It is often used in traditional ceremonies, festivals, and floral displays. In some cultures, the dried flowers are preserved for decorative purposes.

**Chemical Composition**

The analysis of *Celosia cristata* L. showed that the protein content in dried samples is about 18.40%, 23.60% and 25.04% in the inflorescence, leaf and stalk and seed respectively. These proteins are rich in all kinds of amino acid; many kinds of vitamins such as B1, B2, C, E and beta-carotene are in high content and dietary fiber. and inorganic elements are abundant, the amount of fat in seed is about 10.1%((Rubini *et al.*,2012 and De Bao *et al.*, 1994).

The total polyphenols, flavonoids and tannin contents of methanolic extracts on the cockscome flowers were 6.80, 2.34 and 6.23mg/g extract residue, respectively (Woo *et al.*, 2011). Cochliophilin A (5-hydroxy-6, 7-methylenedioxyflavone), known as a host-specific attractant towards the zoospores of Aphanomyces cochlioides was isolated from Celosia cristata, that is susceptible to the pathogen. Its content in Celosia seedlings was quantified as 1.4 µg/g fresh weight. A new isoflavone, cristatein (5-hydroxy-6- hy-droxymethyl -7,2 0 -dimethoxyisoflavone, 2), and five known flavonoids were also identified (Yaolin *et al.*, 2010)

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The plant contained betanin, and several sterols. The inflorescence contained amarantin, isoamarantin, celosianin and isocelosianin. The seeds contain 10.1- 12.8% of protein and yield 7.2-7.9% fatty oil. The plant also contained choline esters of hyaluronic acid (Prashar *et al.*, 2012). Six compounds were isolated from the ethanolic extract of *Celosia cristata*, and identified as 4- hydroxyphenethyl alcohol, kaempferol, quercetin, β- sitosterol, 2-hydrox octadecanoic acid and stigmasterol (Xiang *et al.*, 2012).

**Medicinal uses-**

It has been used for the treatment of various conditions such as fatigue, atherosclerosis, leucorrhoea, osteoporosis, liver-heat, eyesight improvement, clearing wind-heat, anti-inflammatory, dysentery, menstrual bleeding, inflammation and worms. Some of the claimed medicinal benefits of *Celosia*:

1. **Anti-inflammatory properties:** Some studies have indicated that extracts from Celosia cristata may possess anti-inflammatory properties. These properties could be attributed to various bioactive compounds present in the plant.
2. **Antioxidant activity:** The plant contains certain antioxidants that may help combat oxidative stress in the body. Antioxidants play a vital role in neutralizing free radicals, which can cause cellular damage and contribute to various health issues.
3. **Anti-microbial effects:** Certain extracts from Celosia have shown potential antimicrobial activity against certain bacteria and fungi in laboratory studies. This suggests a possible role in combating infections, but more research is needed to establish its efficacy.
4. **Analgesic potential:** In some traditional systems of medicine, Celosia cristata has been used to alleviate pain and discomfort. Some studies have shown that the plant extracts may have mild analgesic properties.

**Marketing**

The dried flowers are available for purchase in powdered or whole flower form, as well as the availability of seeds and plantlets. These dried flowers are sold by local spice vendors known as "Bohris", and that they can be purchased for USD 20-25 per kilogram in dried form and USD 32-35 per kilogram in powdered form. Fresh flowers are available for a limited period

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of time from May to September.Overall, *Celosia cristata* is a versatile and visually striking annual plant that is cherished for its colorful. It is easy to grow, adaptable to different climates, and adds beauty to gardens and landscapes.

**Conclusion-**

The ayurvedic and the synthetic science of medication agree the vitality of number of activities present in the plant of *Celosia cristata*. The plant being angiosperm has a beautiful inflorescence and found to be of commercial importance for the development of landscapes in various western countries as well. Such species with aesthetic and medicinal use is definitely to be evaluated more in detail so a medicated formulation can also be devised out of it. The use of *celosia cristata* is endorsed safe as a food colorant and is used profusely in traditional cuisine. It is natural, preservative free and easily cultivable in the courtyard requiring minimal inputs. There is compelling evidence about the hazards of synthetic food colorants which are believed to be carcinogenic and also stimulating hyperactivity among children. Promotion of these edible flowers and educating masses would need to be up-scaled as natural and safe food colorants coupled with their nutritive.

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