

Study on Formulation and Development Aspects of Celosia Argentea

Pansare Sayli Ajit¹, Dr. Ganesh Dama², Dr. Bidkar J.S³

Department of Pharmacognosy

Sharad Chandra Pawar College of Pharmacy Dumberwadi, India

Abstract: Medicinal plants have long been utilized in all cultures as a source of medicine, they are crucial to public health, particularly in developed and emerging nations. *Celosia argentea* has various pharmacological activities, including immunological activity, cytoprotective, inflammation, and mouth sores. It also causes hyperpyrexia of the liver, hepatic asthenia, and heat in blood. It is used to treat a number of illnesses, including fever, diarrhoea, piles, bleeding nose, mouth sores, itching, wounds, jaundice, and gonorrhoea and wound healing.

Making a medication emulsion and adding it to an emulgel is how the topical system is made. Emulgel, a combination of a co-surfactant and a surfactant, is a low interfacial tension, thermodynamically stable formulation with various advantages, including superior thermodynamic stability and enhanced permeability. Emulgel offers both a prolonged release pattern and dual control. Both bioavailability and patient compliance are enhanced with emulgel. The medication content, stability study, skin irritation test, pH, viscosity, particle size, zeta potential, and other

Keywords: Celosia argentea, emulgel, medicinal plants, gelling agent, co-surfactant, surfactant

I. INTRODUCTION

With many climbing branches and vividly coloured bedding plants, *Celosia argentea* L. is an annual herb that grows quickly and is erect, coarse, simple or branching, and smooth. Its height ranges from 0.4 to 2 meters. Strong ridges and frequently sulcate, glabrous²⁴, are present in the stem and herb branches. The leaves of the plant are arranged in an alternate pattern and are lanceolate-oblong to narrow linear, entire, 4 to 14 cm long, acute to obtuse, shortly mucronate with the excurrent midrib, glabrous, bitter in taste and odor, and light green in color. The lamina of the leaves measures 2 to 15 x 0.1-3.2 cm from the centre of the main stem, tapering down to a slender petiole that is not clearly demarcated; the upper and branch leaves are smaller and noticeably reducing, and the leaf axils frequently have small, sterile shoots.

OCCURENCE:

The *Celosia argentea* plant is widely recognised for its culinary uses. Widespread growth of these plants is found in warm temperate and subtropical zones, including W-E Nepal; Bhutan, Cambodia, China, Japan, Korea, India, Laos, Malaysia, Myanmar, Philippines, Russia, Thailand, Vietnam; and Tropical Africa. In the tropical African rainforest zone, *C. argentea* is a significant cultivated vegetable plant. In tropical Africa's savanna regions, the wild variety, known as *C. trigyna*, is used as a potherb. During the rainy season, *Celosia argentea*, a weed, thrives in hilly and arid areas of India and other tropical countries worldwide, primarily in Sri Lanka, Yemen, Indonesia, America, and the West Indies²⁴. Although it grows slowly in the beginning, blossoming may happen 6-7 weeks after seeding.



Drug Profile:

<i>Celosia argentea</i>	
Kingdom	Plantae
Sub- kingdom	Viridiplantae
Division	Tracheophyta
Sub- division	Spermatophytina
Class	Magnoliopsida
Order	Caryophyllales
Family	Amaranthaceae
Genus	Celosia L. – cock's comb
Species	<i>Celosia argentea</i> L. – silver cock's comb

Chemical constituent:

Hyluronic, tetracosanoic, stearic, palmitic and butilinicacid, Beta sitisterol, tinosporin, lupeol, cetyl alcohol, Celogenamide A, celogentin A-D,H,J and K, celosian etc.

CULTIVATION:

Now grown in Tirunelveli, Celosia argentea is primarily grown as a weed in India. Many celosia species are now grown as food and blooming plants in gardens throughout the majority of the equatorial zone's hot and arid regions. It thrives in the rainy season and may be planted successfully in humid climates or during the monsoon. Moderate soil moisture is necessary for the optimal growth of C. argentea, a simple plant. Israel²⁵, Japan, and the Netherlands are among the countries where C. argentea has been grown for cut flower production. The tropical climate in these regions is appropriate for their development.

Applications in medicine:

The seeds and flowers have astringent, hemostatic, ophthalmic, parasiticidal, and poultic properties. Bloody stool, uterine bleeding, haemorrhage, leucorrhoea, and diarrhoea are among the conditions it is used to treat. Trichomonas may be eradicated in 15 minutes with a 20% extract, demonstrating its high effectiveness as a parasiticide. It is an ophthalmic and hypotensive seed. Because it dilates the pupils, it should not be used by those who have glaucoma. It is used to treat bloodshot eyes, blurred vision, cataracts, and hypertension. Moreover, the antibacterial properties of the seed prevent Pseudomonas from growing.

Uses:

- 1) Antioxidant
- 2) Anti-diabetic
- 3) Anti-cancer
- 4) Wound healing activity
- 5) Diarrhoea
- 6) Urethral disorder
- 7) Chest troubles

- 8) Stomachache
- 9) Hypotensive
- 10) Glaucoma etc

Pharmacological Activities:**Immunological Activity:**

One of the chemical components of *C. argentea*, the celosian, exhibits immune-stimulating effects. This plant's seeds contain a polymer called celosian, which is acidic. In animal models of chemical and immunological liver injury, celosian was discovered to be a strong antihepatotoxic agent. Celosia is considered an immune-stimulating drug due to a study that shown its ability to promote the synthesis of nitric oxide (NO), gamma interferon (IFN-gamma), interleukin-1 beta (IL-1 beta), and tumor necrosis factor-alpha (TNF-alpha) using a variety of in-vitro experimental methods.

Anti-inflammatory activity:

In animal models such as cotton pellet-induced chronic inflammation and carrageenan-induced acute edema in the rat paw, the flavonoid fraction from the alcoholic extract of *C. argentea* leaves was studied for its anti-inflammatory potential in an in vivo study²⁷. Subsequent research disclosed that celosin E, F, G, and cristatins are the triterpenoids known as saponins that were extracted from the seeds of *C. argentea*. In vitro techniques are used to evaluate these active ingredients for their anti-inflammatory properties.

Anti-Oxidant activity:

Celosia argentea, which has been shown to have a high concentration of plant phenolic, was assessed for its capacity to scavenge the dangerous radicals produced by in vitro techniques. Three extracts from *C. argentea* were used in the study: the aerial portion, seed, and root extracts. According to reports, the plant contains a lot of phenols; the overall phenolic content of the seed extract was substantial when compared across the three extracts. The study found that the extract from seeds had the greatest capacity to scavenge the damaging radicals that were produced, with the extract from aerial components coming in second. That being said, it was discovered that the root extract have very little antioxidant capacity. Therefore, it might be said that *C. argentea* seed extract could assist in preventing damage caused by dangerous free radicals by scavenging.

Wound healing activity:

The healing efficacy of alcohol extract of *C. argentea* an ointment formulated (10 % w/w) using a rat burn wound model. This result confirmed that, a salutary action of the *C. argentea* extract on wound healing, and also suggested that this may be due to mitogenic and motogenic promotion of dermal fibroblasts. *C. argentea* considered as one of wound healing medicinal plant in India along with various medicinal plants like, *Aloe vera*, *Azadirachta indica*, *Carica papaya*, *Cinnamomum zeylanicum*, *Curcuma longa*, *Ocimum sanctum*, *Nelumbonucifera*, and others.

Anti-bacterial activity:

According to a study, the antimicrobial properties of *Datura Alba* and *C. argentea* leaf extracts were assessed against pathogens isolated from burn patients with infection. The results are equivalent to the traditional antibiotic cream, Silver Sulphadiazine, and the disc-diffusion technique demonstrated a considerable zone of lysis against all the bacteria examined. When *Daturaalba* and *C. argentea* extracts were tested for effectiveness, the *Datura alba* extract showed more than a 50% increase in antibacterial activity.

Anti-diabetic activity:

In streptozotocin-induced diabetic rats, the ethanolic extract of *C. argentea* has a strong hypoglycemic effect. Argentina's *Celosia* LINN. Widely utilized in Indian traditional medicine to cure diabetes mellitus, this plant is also referred to as "Cocks Comb" and its seeds. In this work, rats with alloxan-induced diabetes were used to assess the

effects of an alcoholic extract of *Celosia argentea* seeds (ACAS) on body weight and blood glucose levels. In rats with diabetes produced by alloxan, ACAS was observed to lessen the rise in blood glucose (27.8% at 250 mg/kg and 38.8% at 500 mg/kg body weight). For two weeks, alloxan-induced diabetic rats received chronic administration of ACAS, which significantly ($p, 0.01$) decreased their blood glucose levels. Additionally, in diabetic rats given alloxan, the extract stopped the rats' bodies from losing weight.

II. CONCLUSION

Based on the results of this study, *Celosia argentea* possesses strong anti-diabetic, antimutagenic, anti-cancer, anti-inflammatory, and anti-oxidant properties. Various properties might be exploited to build herbal remedies that are useful for treating various disorders.

REFERENCES

- [1]. Germplasm Resources Information Network. United States Department of Agriculture. 2001; accessed on April 2, 2013.
- [2]. Aladesanwa RD, Adenawoola AR, Olowolafe OG Effects of atrazine residue on the growth and development of *Celosia argentea* under screen house conditions in Nigeria. *Crop Protection*, 2001; 20: 321-324.
- [3]. Koh HL, Chua TK, Tan CH A Guide to Medicinal Plant, an Illustrated, Scientific and Medicinal Approach, World Scientific, Singapore, 2009; 292.
- [4]. Wee YC, A Guide to Medicinal Plants, Singapore Science Centre Publication, Singapore, 1992.
- [5]. Feng N, Xue Q, Guo QH, Zhao R, Guo ML Genetic Diversity and Population Structure of *Celosia argentea* and Related Species Revealed by SRAP, *Biochem Genet*, 2009; 47:521-532.
- [6]. Uusiku NP, Oelofse A, Duodu KG, Bester MJ, Faber M Nutritional value of leafy vegetables of sub-Saharan Africa and their potential contribution to human health: A review, *J Food Compos Anal*, 2010; 23:499-509.
- [7]. Kirtikar K. R., Basu B. D., "Indian Medicinal Plants," III, Bishen Singh, Mahendra Paul Singh, Dehradun, 1995, pp. 2053—2054.
- [8]. Anonymous, "The Wealth of India," CSIR, New Delhi. IA, 1992, pp. 414—415.
- [9]. Hase K., Kadota S., Basnet P., *Planta Medica*, 63, 216—219 (1997).
- [10]. Vetrivelvan T., Jegadeesan M., *Indian Drugs*, 37, 286—290 (2000).
- [11]. Shah M. B., Patel K. N., Chauhan M. G., *Inter. J. Pharmacog.*, 31, 223—234 (1993).
- [12]. Karthikeyan A, Shanthi V, Nagasathaya A. Preliminary phytochemical and antibacterial screening of crude extract of the leaf of *Adhatodavasica* L. *Int J Green Pharm*, 3:78-80 (2009).
- [13]. Lozoya M, Lozoya X. Pharmacological properties in vitro of various extracts of *Mimosa pudica* Linn. *Tepescohuite Arch Invest Mex*, 87-93 (1989).
- [14]. Aiyelaagbe O.O. Antibacterial activity of *Jatropha multifida* roots. *Fitoterapia* 72: 544-546 (2001).
- [15]. <http://parisaramahiti.kar.nic.in/medicinal-plants>
- [16]. <http://indiabiodiversity.org/biodiv/species/show/33021>
- [17]. *Lost Crops of Africa: Volume II: Vegetables*, 2006.
- [18]. Jain GC Hepatoprotective activity of ethanolic extract of *Celosia argentea* Linn. seeds in rats. *J Phytological Res*, 2005; 18 (1): 87-90.
- [19]. Ron P, Eitan S, Abraham HH Horticultural techniques to improve *Celosia plumosa* growth for cut flowers, *Scientia Horticulturae*, 1995; 63:209-214.
- [20]. <https://www.pinterest.com/pin/celosia+argentea>.
- [21]. Koh HL, Chua TK, Tan CH. A Guide to Medicinal plants: An illustrated, Scientific and Medical Approach. Singapore: World Scientific Publishing Co.Pte. Ltd.; 2009.:42-43.
- [22]. Schliemann W, Cai Y, Degenkolb T, Schmidt J, Corke H. Betalains of *Celosia argentea*. *Phytochemistry*. 2001 Sep;58(1):159-65.
- [23]. Wu QB, Wang Y, Guo ML Triterpenoid Saponins from the Seeds of *Celosia argentea* and Their Anti-inflammatory and Antitumor Activities, *Chem Pharm Bull*, 2011; 59:666-671.
- [24]. www.natural-medicinal-herbs.net

- [25]. Colegate SM, Molyneux RJ Bioactive natural products: detection, isolation, and structural determination. CRC Press Tylor and Francis Group, 2008: 1-100.
- [26]. Hase K, Basnet P, Kadota S, Namba T Immunostimulating activity of Celosian, an antihepatotoxic polysaccharide isolated from *Celosia argentea*, *Planta Med*, 1997; 63(3):216-219.
- [27]. Santosh SB, Sohan SC, Anupama AS, Devanand BS, Manohar JP Anti-inflammatory activity of an isolated flavonoid fraction from *Celosia argentea* Linn, *J Medicinal Plants Res*, 2008; 2(3):52-54.
- [28]. Rukhsana AR, Manohar JP, Priyanka G, Areej S Evaluation of antioxidant potential of *Celosia argentea* extracts *Pharmacognosy Journal*, 2013: 1-2.
- [29]. Jain GC Hepatoprotective activity of ethanolic extract of *Celosia argentea* Linn. seeds in rats. *J Phytological Res*, 2005; 18 (1): 87-90.
- [30]. Morita H, Shimbo K, Shigemori H, Kobayashi J Antimitotic activity of moroidin, a bicyclic peptide from the seeds of *Celosia argentea*, *Bioorg Med Chem Lett*, 2000; 10:469-471