

Preliminary Qualitative Phytochemical Analysis of Aqueous Leaf Extract of *Celosia Argentea L.*

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Abstract: *Celosia argentea* is a plant of family *Amaranthaceae* used as traditional medicine for various diseases. The aim of the study is to evaluate the phytochemical analysis of aqueous leaf extract of *celosia argentea*. The aqueous extract of *Celosia argentea* showed the presence of carbohydrates, Flavanoids, Saponins, tannins, phenols Terpenoids and steroids. The objective of the study showed that *C. argentea* has various phytoconstituents and confers their therapeutic potential as evidence for further research work on *Celosia*.

Keywords: *Amaranthaceae*, leucorrhoea, atherosclerosis, abortifacient, Alanine aminotransferase (ALT) and aspartate aminotransferase

1. Introduction

Traditional and alternative medicine is extensively used in the prevention, diagnosis and treatment for various illnesses. The usage plant products types of medicines were used for past 20 years which is easily accessible in some regions (1). Plant derived foods like leaf, vegetables, fruits, etc., are considered to be highly beneficial components in human diet. They contribute great importance in daily life by providing wide range of nutrients, vitamins and other components which widen the therapeutic arsenals. In general, natural products play an important role in the development of novel drugs leads for the treatment and prevention of diseases (2).

Celosia argentea is an herbaceous plant and belongs to *Amaranthaceae* family that grows in a terrestrial habitat. It is an erect plant and grows to a height of 1.0 to 1.6 m under favorable condition. Plant shows simple and spirally arranged leaves, flowers are often pinkish or white colour, fruits are in globular shape and seeds are black. The *C. argentea* has great medicinal value, used in the treatment of fatigue, leucorrhoea, atherosclerosis and osteoporosis (3). The *C. argentea* is used as distinguished leafy vegetable, skin whitening agent as well as medicinal plant for diarrhea, bleeding piles, gastrointestinal diseases, jaundice, sores, ulcers, snakebite and as an abortifacient (4). The anti-inflammatory, antispasmodic, anti-analgesic and can be attributed to their high steroids, tannins, terpenoids and saponins. Pharmaceutical preparations derived from natural sources such as fruits, vegetables or any plant materials often contain compounds that contribute to the antioxidant defense systems and apparently play a role in the protection against degenerative diseases. Since the phytochemicals cure diseases without causing any harm to human beings these can also be depicted as ecofriendly and man friendly medicines (5).

Plant derived compounds have played a vital role in the development of several chemotherapeutic agents. Medicinal plants are rich in various natural phytoconstituents of organic molecules. Medicinal plants contain some organic

compounds which provide definite physiological functions on the human body and these bioactive substances include tannins, alkaloids, carbohydrates, Terpenoids, steroids and Flavanoids. These compounds are synthesized by primary and secondary metabolism of living organisms. Secondary metabolites are chemically and taxonomically extremely diverse compounds with ambiguous function. They are widely used in human therapy, veterinary, agricultural, scientific research and other countless areas (6). The aim of the study is to evaluate the preliminary Phytochemical analysis of aqueous leaf extract of *Celosia argentea L.*

2. Materials and Methods

2.1 Preparation of Plant Extracts

Collected leaves of *Celosia argentea* were air-dried under shade at room temperature and then crushed into coarse powder. This powder was extracted with water by Soxhlet and filtered using Whatman No.1 filter paper and the solvent was removed by evaporator. On removal of the solvent, a brownish black colour residue was obtained.

2.2 Phytochemical Analysis

Preliminary qualitative analysis was carried out to identify the secondary metabolites in aqueous leaf extract of *C. argentea* by following standard procedure (7, 8).

Test for Alkaloids

Plant extract 2 ml was mixed with 3 ml of 1% of HCL on the steam bath. Mayer and Wagner's reagent was added to the mixture. Turbidity of the resulting precipitate was taken as evidence for the presence of alkaloids.

Test for amino acids

To 0.5 ml of plant extract a few drops of 5% of ninhydrin was added and the mixture was boiled. The appearance of violet colour indicates the presence of protein or amino acids.

Test for carbohydrates**Molisch's test**

To 2 ml of plant extract, 1 ml of Molisch's reagent dissolved in distilled water and 1 ml concentrated H₂SO₄ were added. The mixture was added the allowed to stand for two minutes and the diluted with 5 ml of distilled water. Formation of purple or reddish colour indicates the presence of carbohydrates.

Test for glycosides**Liebermann's test**

2 ml of the extract was taken and 2 ml of chloroform and 2 ml of acetic acid were added to it. The solution was cooled well in ice sulphuric acid was added carefully followed by a few drops of 5% of ferric chloride was added. A colour change from violet to blue to green indicates the presence of glycosides. This was under layered with 1 ml of concentrated sulphuric acid. The formation of a brown ring at the interface indicates the presence of cardiac glycosides.

Test for proteins**Biuret test**

To 0.5 ml of plant extract, add 4% NaOH solution and a few drops of 1% CuSO₄ solution was added, appeared of violet colour indicates the presence of protein.

Test for Saponins

5 ml of the sample was shaken vigorously with 5 ml of distilled water in a test tube and warmed. The formation of stable foam was taken as an indication of the presence of Saponins.

Test for steroids

The plant sample was mixed with 2 ml chloroform and concentrated H₂ SO₄ was added sidewise. A red colour produced in the lower chloroform layer indicated the presence of steroids.

Test for tannins

2 ml of sample was stirred with 2 ml of distilled water and few drops of FeCl₃ solution were added. Formation of a green precipitate indicates the presence of tannins.

Test for phenolic compounds

To 1 ml of the extract, 2 ml of distilled water, followed by a few drops of 10% ferric chloride were added, formation of blue or green colour indicates the presence of phenols.

Test for Terpenoids

2 ml of crude extract was dissolved in 2 ml of chloroform and evaporated to dry 2 ml of concentrated sulphuric acid was added then and heated for about 2 minutes. Development of grayish colour indicates the presence of Terpenoids.

3. Results and Discussion

The preliminary qualitative analysis of *Celosia argentea* was shown in the table 1. The table shows the presence of active compounds like carbohydrates, alkaloids, Flavanoids, glycosides, Saponins, steroids, tannins, Phenolic compounds and Terpenoids.

Table 1: Qualitative analysis of aqueous leaf extract of *C. argentea*

Phytochemical studies (Name of the compounds)	Indication
Carbohydrates	+
Protein	-
Alkaloids	-
Amino acids	+
Flavanoids	+
Glycosides	+
Saponins	+
Steroids	+
Tannins	+
Phenolic compounds	+
Terpenoids	+

The Phytochemical qualitative study on the plant extract shows the presence of various compounds which are known to exhibit medicinal value and large number of physiological activities (7). The Phenolic compounds are one of the largest and most ubiquitous groups of plant metabolites (9). They possess biological properties such as antiapoptosis, antiaging, anticarcinigen, anti-inflammatory, antiatherosclerosis, cardiovascular protection and improvement of endothelial function, as well as inhibition of angiogenesis and cell proliferation activities (10). Several studies have described the antioxidant property of medicinal plants which are rich in phenolic compounds (11). Natural antioxidant which has plant is the main source in the form of Phenolic compounds such as Flavanoids, phenolis acids, tocopherols, etc. (12). Tannins bind to proline rich protein and interfere with protein synthesis. Flavanoids are hydroxylated Phenolic substance known to be synthesized by plants in response to microbial infection and they have been found to be antibacterial substance against wide array of microorganisms in-vitro. Their activity is probably due to their ability to complex with extracellular and soluble proteins and to complex with bacterial cell wall (13). They also are effective antioxidant and show strong anticancer activity (14).

The plant extracts were also revealed to contain Saponins which are known to produce inhibitory effect on inflammation (15). Saponin has the property of precipitation and coagulating red blood cells. Some of the characteristics of Saponins include the formation of foams in the aqueous solutions, hemolytic activity, cholesterol binding property and bitterness (16). Steroids have been reported to have antibacterial properties and they are very important compounds especially due to their relationship with the compounds such as sex hormones (17). Alkaloids have been associated with medicinal use for centuries and one of their common biological properties is their cytotoxicity (18). Several workers have reported the analgesic, antispasmodic and antibacterial properties of alkaloids (19).

4. Conclusion

Phytochemical screening of the plant is helpful for the standardization of drug by verifying the effectiveness and safety of folk medicines. The extract of *Celosia argentea* was found to contain carbohydrates, Flavanoids, Saponins, tannins, phenols Terpenoids and steroids. The identified phytochemical proved that the plants are an increasing

valuable reservoir of bioactive compounds or substantial medicinal merit.

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