Pharmacognostic and Preliminary Phytochemical Studies of

_Celosia argentea_, L. Leaf

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**ABSTRACT**

Extraction of bioactive compounds from medicinal plants permits demonstration of their physiological activity. The plant selected for the study is _Celosia argentea_ (family Amaranthaceae) which is used traditionally for dysentery, menstrual bleeding, fatigue, atherosclerosis and osteoporosis. The present study was aimed to evaluate the parameters to determine the quality of the plant _C. argentea_. These studies comprises of organoleptic, fluorescence analysis, Physico chemical analysis and preliminary phytochemical screening. The study contributes to the development of standardization parameters of herbal drugs used in our system of medicine.

**Keywords:** Celosia argentea, bioactive compounds, organoleptic, fluorescence analysis, Physico chemical analysis

**INTRODUCTION**

The tenet “Let food be thy medicine and medicine be thy food” advocated by Hippocrates nearly 2500 years ago is receiving renewed interest. In traditional societies nutrition and health care are strongly interconnected and many plants have been consumed both as food and for medicinal purposes. Eating vegetables and fruits has always been associated with health benefits, but the way in which they enhance health has become clear only in the recent decades. Nowadays re-emerging connection between plants and human health especially depends on their antioxidant activities that may delay or reduce the hazardous effects of free radicals. The major causative for the generation of free radicals in food, drug and living systems is the oxidation process.

Nearly one thousand species of plants with edible leaves are known. Leafy vegetables most often come from short lived herbaceous plants. India’s flora comprises of 6000 species of plants used for consumption of which 0.70 metric tons are green leafy vegetables. Therefore, it is now believed that nutritional security entails not only consumption of a balanced diet to meet the needs of macro and micronutrients but also phytonutrients which may play a major role in promoting health and nutrition.

**MATERIALS AND METHODS**

*Organoleptic Study*

The leaf powder of _C. argentea_ was used for these studies. The colour variation and taste were the basis for this test.

*Fluorescence Analysis*

The fluorescence properties were studied under Ultra-Violet (UV) light adopting method. The behaviour of the leaf powder with different chemical reagents were studied and the fluorescence characters were observed under visible light and long UV light at 245 nm.

*Physico chemical analysis*

Physico chemical parameters of the powdered drug such as loss on drying, ash value, extractive value and crude fibre content were performed according to the standard method and as per WHO guidelines on quality control methods for medicinal plant materials.

*Preliminary Phytochemical Analysis*

For the preliminary phytochemical analysis, the extract was prepared by weighing 100 gm of dried powdered leaf and were subjected to maceration with different solvents as per the polarity, methanol, petroleum ether and finally aqueous. The extracts were filtered in each step, concentrated and the solvent was removed by rotary evaporator. The extracts were dried over desiccators and the residues were weighed. The presence and absence of the primary and secondary phytoconstituents was detested by usual prescribed methods.

**Table 1:** Organoleptic study of the _C. argentea_ leaf powder

<table>
<thead>
<tr>
<th></th>
<th>Colour</th>
<th>Light green</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Odour</td>
<td>Pleasant</td>
</tr>
<tr>
<td>2</td>
<td>Taste</td>
<td>Bitter</td>
</tr>
</tbody>
</table>

**Test of Alkaloids**

Mayer’s reagent: To 1 ml of the extract, 2 ml of Mayer’s reagent was added. Appearance of dull white precipitate indicated the presence of alkaloids.

**Test for Flavonoids**
To 1 ml of extract, 1 ml of neutral ferric chloride was added. The formation of brown colour confirmed the presence of flavonoids.

Table 3: Physico chemical evaluation of C. argentea leaf powder

<table>
<thead>
<tr>
<th>S. No</th>
<th>Parameters</th>
<th>Values% w/w</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loss on Drying,</td>
<td>5.3</td>
</tr>
<tr>
<td>2</td>
<td>Total Ash value</td>
<td>5.56</td>
</tr>
<tr>
<td>3</td>
<td>Acid Insoluble Ash</td>
<td>1.33</td>
</tr>
<tr>
<td>4</td>
<td>Water Soluble Ash</td>
<td>2.58</td>
</tr>
<tr>
<td>5</td>
<td>Sulphated Ash</td>
<td>0.62</td>
</tr>
<tr>
<td>6</td>
<td>Water Extractive Value</td>
<td>62.2</td>
</tr>
<tr>
<td>7</td>
<td>Ethanol Extractive Value</td>
<td>17.5</td>
</tr>
</tbody>
</table>

Test for Tannin
To 1 ml of the extract, few ml of 5 per cent neutral ferric chloride was added. The development of a dark bluish colour indicated the presence of tannins.

Test for Phenols
To 1 ml of extract, lead acetate solution was added and the precipitate formation indicated the presence of phenolic compounds.

Test for Steroids
Liebermann-Burchard’s test : The extracts were dissolved in 2 ml of chloroform to which 10 drops of acetic acid and 5 drops of conc. Sulphuric acid were added and mixed. The change of red colour through blue to green indicated the presence of steroids.

Test for Terpenoids
Salkowski test : 5 ml of each extract was mixed in 2 ml of chloroform and conc. H₂SO₄ (3 ml) was carefully added to form a layer. A reddish brown colouration of the interface was formed to show positive results for the presence of terpenoids.

Test for Quinone
To 1 ml of extract, a few drops of conc. HCl is added. An yellowish brown colour is observed which shows the presence of quinone.

Test for Starch
To 1 ml of extract, a few drops of iodine solution. Any characteristic colour change shows the presence of starch.

Test for Fixed Oil and Fat
To 1 ml of extract, a few drops of sudan III solution is added. A shining orange colour obtained shows the presence of fixed oil and fat.

RESULTS AND DISCUSSION
Pharmacognostic Study
The pharmacognostic characters of the leaf powder have been studied by screening the same through the following parameters.

Organoleptic Study
The investigation on organoleptic study of the leaf powders of C. argentea indicated the characters like colour, odour and taste. The colour of the dried leaf powder was light green. The taste and odour of the...
powder were also tested. The taste of the leaf is bitter and on analysis, the leaf powder gives a pleasant odour (Table 1).

Fluorescence Analysis

The leaf powder was treated with various chemicals, exhibiting various colours in day/visible light and UV light. When the powder treated with 1 N NaOH in methanol shows dark green colour in day light, brownish yellow colour in UV light. In 1 N HCl shows dark green colour in visible light and light green colour in UV light. In 50% H2SO4 the leaf powder exhibited varied dark brown colour in visible light and reddish brown colour in UV light, and the results are depicted in Table 2.

Physicochemical Analysis

Analysis of physicochemical constants of the leaf powder C. argentea has been done to evaluate the quality and purity of the drug and establish its identity. Ash values of the drug give an idea about the early matter or organic composition and other impurities present along with the drug. The total ash content of the C. argentea is 5.56%. The water insoluble ash is less than that of acid insoluble ash at and respectively. The water extractive value of C. argentea is more than that of ethanol extractive value.

Phytochemical Screening

Pharmaceutical preparations derived from natural sources such as vegetables often contain compounds that contribute to the antioxidant defense systems and apparently play a role in the protection against degenerative diseases. The phytochemical screening of various extracts revealed presence of alkaloids, cellulose, flavonoids, phenols, steroids, starch, terpenoids, and tannins (Table 4).

CONCLUSION

The comparative and multidisciplinary approach to the study of C. argentea does help in understanding their identification and medicinal importance. The adulterants in drugs obtain from C. argentea can be identified by this investigation. Adulterants if any can be easily identified using these parameters.

REFERENCES