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Pharmacognostic, Phytochemical &Pharmacological Study of Chrysanthemum indicum

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Abstract: *Chrysanthemum indicum is a blossom herb which is usually growing in August to October month. Chrysanthemum indicum is native of Europe, North Eastern, & Asia. It is also called as Chrysanthus.In chrysanthemum many phytoconstituents are present like flavonoids, tannins, terpenoids & Glycosides which shows different pharmacological activities like Anti-inflammatory, anti-microbial, & antioxidant. chrysanthemum is mainly used as herbal remedies. In future chrysanthemum indicum is mainly used for New drug development process because of their present bioactive compound.*

Keywords: Chrysanthemum indicum, Asteracea, Flavonoids, Glycosides, Tannins, Pharmacological activities, Bioactive compound

I. INTRODUCTION

Plants contain major component which is used in herbal industry for preparation of herbal medicines. Different parts of medicinal plants show various pharmacological activities. *Chrysanthemum indicum* has a long history for the treatment of respiratory disease, inflammation hypertension & mainly used in Korean & Chinese medicine. The crop is important as floricultural, ornamental and medicinal used in modern time. This flower crop is native to East Asia and has been grown in garden for more than 2500 years. It is globally the second economically most vital floricultural crop following rose, and one of the most significant ornamental species. It is one of the most important ornamental crops around the world, it is produced as both cut flower in field and pot plant. Many plants, which have been identified as yet through pharmacology, folk medicinehomoeopathy and ethno pharmacology, are being investigated for their medicinal usage and may be proved so in due course of time.This crop use as nerve sedative, anti-oxidant, anti-inflammatory, antimutagenic, anti-microbial, anti-fungal, anti-angiogenic, anti-atherosclerosis and nematocidal goodsFrom this plant different formulation was prepared in Herbal industry i.e. Creams, lotion & tincture.

Synonyms
Shevanti (in Sanskrit)
Chandramalika (in Hindi)
Chrysantheum(in English)

Biological Source
It consists of dried leaves of *Chrysanthemum indicum.* Belongs to family Asteraceae. It also known as shevanti.

Scientific Classification
Kingdom: Plantae
Phylum :Tracheophyta
Class : Angiosperms
Clade :Asterids
Order : Asterales
Family :Astreaceae
Genus : Chrysanthemum
Species : C. Indicum L

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Discription

Chrysanthemum indicum is a perennial herb belonging to the family Asteraceae.

Chrysanthemums, often called mums or chrysanths, are of the genus (Chrysanthemum) constituting approximately 30 species of perennial which is native to Asia. They have alternately arranged leaves divided into leaflets with toothed or occasionally smooth edges. The compound inflorescence is an array of several flower heads, or sometimes a solitary head. The head has a base covered in layers of phyllaries. The simple row of ray florets is white, yellow, or red; many horticultural specimens have been bred to bear many rows of ray florets in a great variety of colours. The disc florets of wild taxa are yellow. Pollen grains are appropriately 34 microns. The fruit is a ribbed achene. Chrysanthemums start blooming early in the autumn. This is also known as the favourite flower for the month of November.Appearence, aroma& colour of theChrysantheum indicum are the main attractive features of research.

Distribution

They are native to Asia and north eastern, Europe. Most species originate from east Asia and the center of diversity in china.

Morphological Characters

- Color: Green
- Odor: Characteristics
- Taste: Bitter
- Shape: Oval-Orbicular
- Size: 8cm length/6cm Width.

Microscopical Characters- [16]

Lamina-Dorsiventral nature.

Epidermis- single layered rectangular cells distinct cuticle, coveringtrichomes and few stomata are also seen.

Mesophyll

- Palisade- single layered compact with radially elongated cells.
- Spongyparenchyma- four to six layered loosely arranged with intracellular spaces presence of calcium oxalate crystals.

Lower Epidermis

- Similar to upper epidermis has many stomata and more trichomes.
- Covering trichomes- uniserate, multicellular wavy covering trichomes with blunt apex.
- Rubiaceous and caryphyllous stomata- paracytic or parallel celled and diacytic or cross celled stomata.

Midrib

- Collenchyma- Below upper epidermis and above lower epidermis.
- Vascular bundle- these are arc shaped, xylem- lignified, phloem- non lignified

Uses

- Traditionally, chrysanthemum indicum was used as a folk remedy to treat the deterioration of bone and muscle ocular inflammation and headache.
- It is used in the traditional treatment of several infectious diseases such as pneumonia, colitis, cancer, fever and hypertensive symptoms.
- Tea of chrysanthemum Indicum has been used to treat anxiety by vacillating relaxation and curing insomnia.
- When chrysanthemum indicum is conjunction with black paper it is used in the treatment of gonorrhea and hypertension.

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- An essential oil obtained from the plant contains chrysanthenone, this is active on the brain centre affected by Parkinson's disease.
- Traditionally medicines from these plants have promising properties in improving liver function, decreasing inflammation.
- Leaves are depurative and used in China in the treatment of migraine.
- Chrysanthemum plants have been shown to reduce air pollution by the NASA clean air study.
- It shows Analgesic, antibiotics and antifungal activities shows.
- It combination with other herb Chrysanthemum is also used to treat Prostate cancer.

II. METHODOLOGY

2.1 Determination of Physical Constant

a) Determination of Ash Value

Ash value are helpful in determining the quality and purity of a crude drug, especially in the powdered form. the objective of ashing vegetable drug is to remove all traces of organic matter, which may otherwise interfere in an analytical determination. On incineration, crude normally roots an ash usually consisting of carbonates, phosphate and silicate of sodium, potassium. calcium and magnesium. The total ash of a crude drug reflects the care taken in taken in its preparation. A higher limit of acid-insoluble ash is improved, especially in cases where silica may be present or when the calcium oxalate content of the drug is very high.

b) Total Ash Value

Weighed accurately about 2g of the powdered drug in a tarred silica crucible. In cinerated at a temperure not exceeding 450°C for 4 hrs, until free from carbon cooled and weighed. Calculate the percentage of ash with reference to air-dried drug using following formula,

Total ash value of the sample-100(z-x)/y %

c) Acid Insoluble Ash Value

Using 25 ml of dil. hydrochloric acid wash the ash from the dish used for total ash into a 100 ml beaker Place a mere gauze over a Bunsen burner and boil for 5min.Filter through an ash less filter paper, wash the residue twice with hot water. Ignite a crucible in the flame, cool and weigh. Put the filter-paper and residue together into the crucible; heat gently until vapours cease to be evolved and then mora strongly until all carbon has been removed. Cool in a desiccator. Weight the residue and calculate the acid insoluble ash of the crude drug with the reference to the air dry sample of the drug,

Formula:

Acid-insoluble ash value of the sample -100-a/y%

d) Loss on Drying

Weight about 1.5 gm of the powdered drug into weighted flat and thin porcelain dish. Dry in the oven at 100°C or 105°C, until two consecutive weighing do not differ more than 0. 5mg.Cool in a desiccators and weigh. The loss in weight is usually recorded as moisture.

Formula: % Loss on drying: - Loss in weight of the sample /wt. of the sample 100.

Table 1: Physical constant of plants

Sr.no	Physical constant	Chrysanthemum indicum
1	Ash values (%w/w) **Total Ash** Leaves **Acid Insoluble Ash** Leaves	 42% 31%
2	Loss on Drying	35%

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EXTRACTION: [17]

a) Water Extract

5gm of powder in 50ml of water, then soak for one day, then next day boil in water bath up to:1 and half hrs.

b) Ethanolic Extract

5gm of powder in 50ml of Ethanol, then soak for one day. Use the extract for Glycoside content test.

Table 2: Nature, Colour of Chrysanthemum indicum extract

Sr. No	Extract	Plant Part	Nature of Extract	Colour	Weight(ml)
1.	Aqueous	Leaves	Liquid	Green	50

Phytochemical Investigation [16]

The dried leaves were extracted with water. The behaviour of powder with various chemical reagent & preliminary chemical test for various extracts were also carried out according to the
standard procedure describes by Kokate and Horborne.

Test for Glycosides

Keller-Killiani Test

To 2 ml extract, glacial acetic acid, one drop 5% FeCl3 and conc. H2SO4 were added. Reddish brown appears at junction of the two liquid layers and upper layer appears bluish green indicates the presence of glycosides.

Test for Tannins

Ferric chloride Test

To 2 ml of test solution, a few drops of 5% ferric chloride solution was added. Formation of blue color indicated the presence of hydrolysable tannins.

Test for Flavonoids

To Small quantity of residue, add lead acetate solution. Yellow colored precipitate is formed.

Test for Terpenoids

Salkowski Test

Extract 5 ml was mixed with chloroform 2 ml, and concentrated sulphuric acid 3 ml was carefully added to form a layer. A reddish brown coloration of the inter face was formed to show positive results for the presence of terpenoids.

Test for the steroid

Salkowski Test:

Take 2 ml of test extract and add 2 ml chloroform and 2 ml conc. sulphuric acid, Shake well the mixture, chloroform layer appears as red and acid layer will show greenish yellow colour.

Test for Carbohydrates

Molisch Test

2 ml of sample + 2 drops of Molisch reagent and conc. Sulphuric acid slowly by sides, formation of purple ring indicates presence of carbohydrates.

Test for alkaloids

Wagner's test:

Take about 1 ml of extract and add to 2 ml of Wagner's reagent (Iodine in potassium iodide), Reddish brown precipitate indicates the presence of alkaloids.

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Table 1: Identification Test

Sr. No	Name of the test	Result
1	Test for Glycosides	+
2	Test for Tannins	+
3	Test for Flavonoids	+
4	Test forTerpenoids	+
5	Test for Steroid	-
6	Test for Carbohydrates	-
7	Test for Alkaloids	-

Pharmacological activity [22]

Antibacterial, antitumor, anti-inflammatory and antiviral activity shows on sesquiterpenoid Sesquiterpenoid shows that has low cytotoxic activity on the normal cells. While playing role of anticancer. In this lactone have sesquiterpenoid in stronger anti-tumour activity.

A. Anti-tumour Activity

Sesquiterpenoid shows that has low cytotoxic activity on the normal cells. While playing role of anticancer. In this lactone have sesquiterpenoid in stronger anti-tumour activity.

B. Anticancer Activity

Anticancer activity of chrysanthemum indicum has been get more attention, especially in type of hepatocellular carcinoma but the anticancer mechanism of chrysanthemum indicum is still not clear and needs more research study.

C. Anti-inflammatory Activity

Chrysanthemum indicum is an herbal plant used to treat various diseases related to immune system. Chrysanthemum indicum contain large amount of flavonoids which shows anti- inflammatory effects.

Different chemical compounds are extracted from chrysanthemum indicum flows which also found inhibitory activity against Nitric oxide in lipopolysaccharides activated macrophage. Also phytochemical studies indicated anti-nociceptive & Anti- inflammatory activity has been reported

D. Antiviral Activity

There are various compounds isolated from chrysanthemum indicum have antiviral activities. Ten sesquiterpenoids like chrysanthemum in A, Chrysanthemum in B, Chrysanthemum in C, and Chrysanthemum in D, etc. These compounds inhibited the porcine epidemic diarrhoea virus (PEDV) protein expression, which showed that these all compounds increased cell viability against the cell death in PEDV-injected cells.

III. CONCLUSION

From the present study it is concluded that the plant chrysanthemum indicum have various bioactive components like flavonoids which are essential for anti-oxidant activity. There are various pharmacological activities of chrysanthemum indicum has been reported in present study. Chrysanthemum indicum would hold to increase its potential to use these plant as a source of new drugs. In this study various pharmacological activities like antioxidant, anticancer, antitumor, anti-inflammatory has been reported this study indica that chrysanthemum indicum is a potential herbal medicine.

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