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Phytochemical Analysis of Canna Indica Linn. of Root

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Abstract: ***Canna indica L.commonly known as keli the name Canna aries from the Greek word for a cane or reed .Canna is the only genus in the family Cannaceae and 19 species of flowering plants. Using the soxhlet process, powder content was extracted with various, solvents such as petroleum ether, ethanol, and methanol. In the college laboratories, the voucher specimen was kept.The extracted plant roots was dried and purverized in order to obtain powder. Preliminary phytochemical investigation was carried out of determine phytoconstituents. Various phyto constituents like Alkaloid, Glycoside, Carbohydrates, Steroids, Protein and Flavonoids are shown present.***
Keywords: Canna indica L, Materials and methods, phytochemical analysis.

I. INTRODUCTION

Indian therapeutic plants are the elixir of Ayurveda and Ayurvedic treatments. Healing with medicinal plants is as old as mankind itself. When used wisely and clocking with the basic principles, they produce miraculous effects [1]. Nature's wealth utilization for health aids and the remedy, prevention, and treatment of diseases plays a big role in human civilization, with a reliance of many human populations particularly in developing countries[2]. *Canna indica* L. (canna lily, even though not a true lily) commonly known as Keli, the name Canna arises from the Greek word for a cane or reed. Canna is the only genus in the family Cannaceae and 19 species of flowering plants. The species have large, eye-catching foliage and horticulturists have turned it into a large-flowered and bright garden plant. In addition, it is a horticultural plant and is one of the world's richest starch sources. It extensively used as a nutritive agent and has a number of valuable pharmacological activities[3]. The Canna genus is native tropical and sub-tropical regions of Southern United State and South to Northern Argentina and the Philippines in settled areas, occurring in wet places and near tikas Canna settlements. In America, wild species grow in the South of the United States, South America, from Venezuela to Argentina and India. Terrestrial plants usually live in tropical and subtropical rainforests, montane, premontane, and gallery forests. Palustrine plants grow in forest edges, wetlands, marshes, and riversides. Many taxa are nitrophilous and mostly found in humid loose soils, near streams, in uncultivated public lands or on roadsides. The plant prefers acid, neutral, and basic (alkaline) soils. It cannot grow in the shade. It needs moist soil good quality humus [4, 5].

Figure No.1: The whole plant of *Canna indica L.*

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A. Traditional Uses of Canna indica L.

1) *Rhizome:* A decoction of the fresh rhizome is used as febrifuge, dropsy, dyspepsia, diuretic, antipyretic, gonorrhea, and women with irregular menses. Macerated rhizomes are used to ease nosebleeds. Rhizome has been used with other medicinal plants for cancer treatment.
2) *Root:* A decoction of the root used in the treatment of gonorrhea and amenorrhea. The powdered root as a cure for diarrhea and dysentery, diaphoretic, diuretic, stimulant, and demulcent and is administered in fevers and dropsy.
3) *Leaves:* Leaves used for malaria and infusion of leaves used as Leaves used for malaria and infusion of leaves used as a diuretic. Smoke from the burning leaves is said to be insecticidal. Freshly squashed leaves are used in baths against rheumatic pains and arthritis and applied to ulcers[6].

II. MATERIALS AND METHODS

A. Collection And Drying Of The Plant Material

The *Canna indica L.*plant was collected from the Kolhapur district. The collected plant material was washed thoroughly under running tap water, air-dried at room temperature under the shade for 8-10 days. The root were separated manually by hand picking. The dried root were crushed to the fine powder and stored in tightly sealed polyethylene bags.

B. Authentication of Plant Species

The plant was authenticated by Prof. D. G. Jagtap, Head of Department of Botany Principal Shri. Vijaysinha Yadav Arts and Science College, Peth Vadgaon, Dist.- Kolhapur.

C. Extraction of Plant Material

Plant of *Canna indica L.*were extracted in a soxhlet extractor, successively with Petroleum ether (60°-80°), Chloroform, and Ethanol (95%) for 24-36 hrs for each solvent Figure No. 2. After extraction with each solvent, the solvent was evaporated and residue was air dried. The residues from each extract were dried and the resultant extracts were stored in an air tight container for further use. The extract was subjected to preliminary phytochemical testing.

Figure No. 2 Soxhlet extraction of *Canna indica L.*

D. Chemical Test For Carbohydrates

Mono-saccharides are the building blocks of carbohydrates. Di, oligo and polysaccharides on hydrolysis in presence of mineral acid yield monosaccharide units. These are optically active compound and respond to various colour reaction and identification tests.

1) *Molish Test:* Aqueous solution of the extract mixed with few drop of molish reagent(α napthol) and conc. H2SO4(sulphuric acid) was added along the wall of the tube. Formation of purple coloured ring at junction indicated presence of carbohydrates.

2) *Fehling Solution Test:* It is generally used for reducing sugar and composed of two solution, which are mixed in situ. Fehling solution A composed of 0.5% of copper sulphate whereas Fehling solution B composed of sodium potassium tartrate. Equal volume of Fehling A and Fehling B solution were mixed (1ml each) and 2ml aqueous solution of extract was added followed by boiling for 5-10 minutes on water bath. Formation of reddish brown coloured precipitate due to formation of cuprous oxide indicated presence of reducing sugar.
3) *Benedicts Test:* It is used for reducing sugars and composed of mainly copper sulphate and sodium hydroxide. To the aqueous solution of extract, 1ml of benedict solution was added and heated almost to boiling formation of green precipitate in order of increasing concentration of imple sugar in the test solution, due to formation of cuperous oxide.

E. Chemical Test for Lipids

1) *Biuret Test:* The aqueous solution of protein added in hot water. Few drop of Biuret reagent (potassium hydroxide, copper sulphate and sodium potassium tartarate) were added, which turned blue reagent to violet.

F. Chemical test for Alkaloids

1) *Dragendroff's Test:* The test was carried out by taking sodium iodide with 5.2g of basic bismuth carbonate in 50 ml of glacial acetic acid and boiling for few minutes. It was allowed to stand overnight. The precipitate was filtered off. To the red brown filterate, ethyl acetate and water were added. Then 20 ml of acetic acid was added and volume was made up to 100 ml with water. Extract was added to this solution. Reddish brown precipitate showed the presence of alkaloids.
2) *Mayer's Test:* The test was performed by dissolving mercuric chloride in distilled water (A) and 5g of potassium iodide in of distilled water (B). Solution A and B were mixed together and the volume adjusted to 100 ml with water followed by addition of extract. Cream colour precipitate showed the presence of alkaloid.
3) *Hager Test:* This was performed by dissolving 10 mg of picric acid in 100 ml distilled water and adding the extract to it. Yellow colour precipitate showed the presence of alkaloid.
4) *Wagner's Test:* This test was performed by taking 1.27 g of iodine and 2 g of potassium iodide in 5 ml of water and the volume was made up to with water and 2 ml of extract was added. It produced reddish brown precipitate with the alkaloid.

G. Chemical Test for Glycosides

1) *Borntrager's Test:* In this test 5-10 ml of dilute hydrochloride acid (HCL) was added in 0.5 gm. Of extract and boiled on water bath for 10 minutes. Solution was filtrate was extracted with benzene and mixed with ammonia solution. Red colour was obtained in ammonia layer that indicated the presence of anthraquinone glycoside.
2) *Keller Killani Test:* In this test alcoholic extract of the drug was mixed with equal volume of water and 0.5 ml of strong lead acetate solution was added followed by stirring. Filtrate was extracted with equal volume of chloroform. Chloroform extract was evaporated to dryness and residue was dissolved in 3 ml of glacial acetic acid with addition of few drops of ferric chloride solution. The resultant solution was transferred to a test tube containing 2 ml of conc. sulphuric acid. Reddish brown layer was found which turned bluish green after standing due to presence of digitoxose.

H. Chemical Test for Saponins

1) *Foam Test:* In this test 0.5 gm of extract was added in 10-20 ml of water, shaken for few minutes formation of frothing which persisted for 60-120seconds, showed presence of saponins.

I. Chemical Test for Steroids

1) *Libermann Bruchard Test:* In this test alcoholic extract of crude drug was extracted with chloroform. Few deops of conc. sulphuric acid were added from the side of the wall of test tube. Formation of violet to blue coloured ring at the junction of two liquid, indicated the presence of steroid moiety.

J. Chemical Test for Flavonoids

1) *Ammonia Test:* In this test filter paper dipped in alcoholic solution of extract was exposed to ammonia vapour. Formation of yellow spot on filter paper showed the presence of flavonoids.
2) *Chemical Test For Phenolic Compounds:* In this test extract solution was treated with 10% ethanolic ferric chloride. Formation of bluish green or dark colour indicated the presence of phenolic compounds.

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III. RESULTS AND DISCUSSION

Canna indica L. was successively extracted by using the Soxhlet assembly taking the different solvents such as Petroleum ether, Chloroform and Methanol based on the increasing polarity. All the extracts were evaporated to remove excess of solvent in a water bath. These extracts were then stored in air tight container at cold temperature (approx. 15^{o}C). These extracts were then used for further chemical test for phytochemical investigation for protein, amino acid, glycoside, alkaloid, phenolic compounds, flavonoids, steroids and tannins etc. the results of phytochemical screening of *Canna indica L* plant extracts are mentioned in the following Table No. 01

Sr. No.	Test	Petroleum Ether	Ethanol	Methanol
1	Test for carbohydrates I. Molish test II. Fehling solution test III. Benedicts's test	 - - +	 - + -	 + - +
2	Test for proteins I. Biuret test II. Million's test	 - +	 - -	 + +
3	Test for amino acids I. Ninhydrine test	 +	 +	 -
4	Test for steroids I.Libermann Burchurd test	 -	 +	 -
5	Test for glycosides I.Keller killani test II.Foam Test	 - +	 + -	 + +
6	Test for flavonoids I. Sulphuric acid test	 +	 -	 +
7	Test for alkaloids I. Dragendroff's test II.Mayer's test III.Wagner's test	 - + -	 + + +	 - - +

Note: + indicates presence and - indicates absence of phytoconstituents

IV. CONCLUSION

Phytochemicals found present in the *Canna indica L.* indicates their potential as a source of principles that may supply novel medicines. The root of *Canna indica L.* petroleum ether extract found to be phytochemicals are present protein, carbohydrates, flavonoids, alkaloids and amino acids. The root of *Canna indica L* ethanol extract found to be phytochemicals are present protein, alkaloid, amino acid, glycoside, steroids and carbohydrates. The root of *Canna indica L* methanol extract found to be phytochemicals are present alkaloids, glycosides, carbohydrates, flavonoids and proteins

Considering the above facts, isolation, purification and characterization of the phytochemicals found in this species may introduce a future medicine that will change the life of mankind. Furthermore, a detailed study needs to ascertain their antioxidant, anti-inflammatory, anticancer activities.

Considering the above facts, isolation, purification and characterization of the phytochemicals found in this species may introduce a future medicine that will change the life of mankind. Furthermore, a detailed study needs to ascertain their antioxidant, antiobesity, antiulcer, antifungal activities.

V. ACKNOWLEDGMENT

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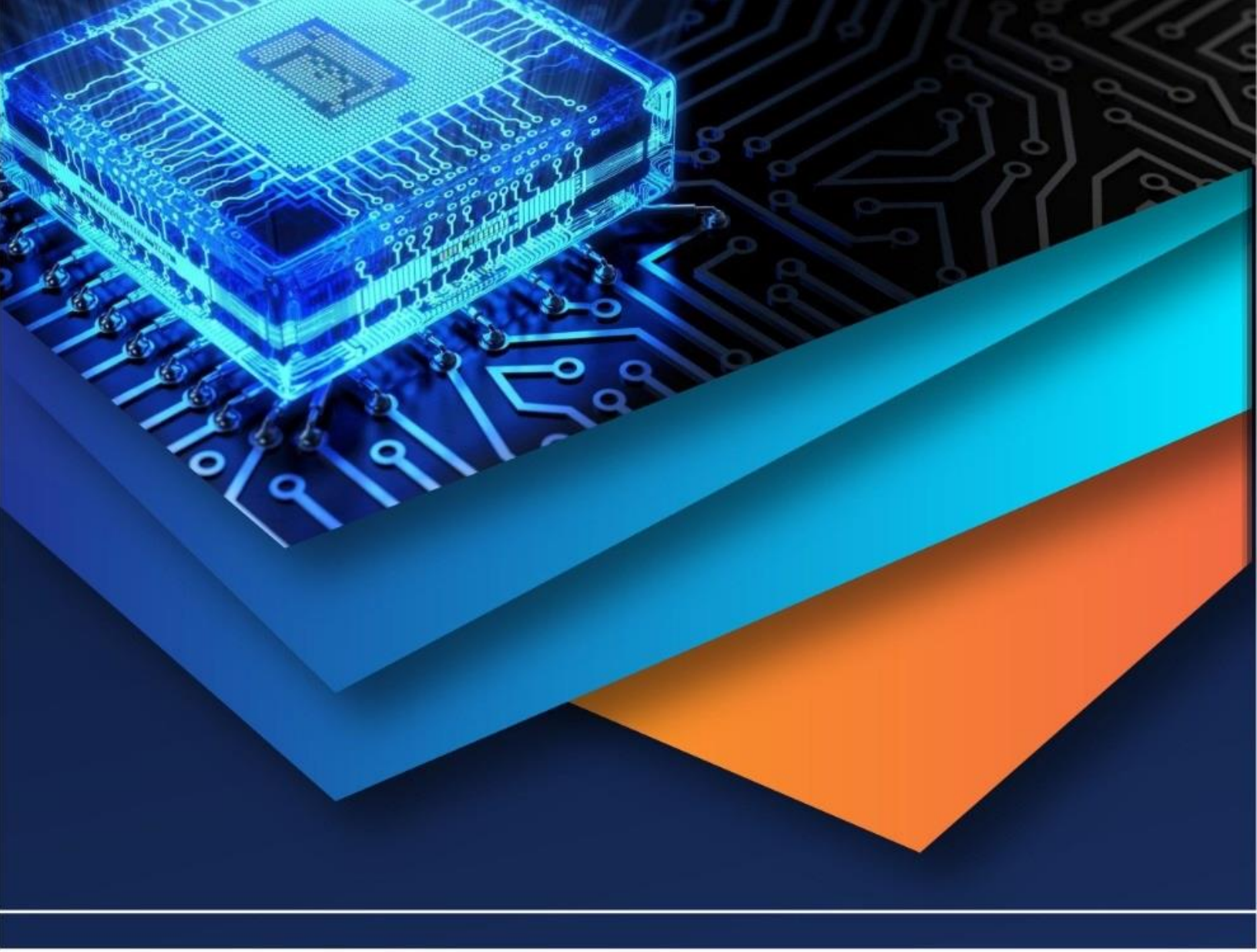

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