

Phytochemical Analysis of *Canna indica* L.

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ABSTRACT

The medical plant *Canna indica* L. was selected for Isolation and Characterization of its medicinal value based on phytochemical studies. This plant was collected from Sacred grove forest of Aanaivari village, Rayavaram Panchayat Arimalam block, Pudukkottai District, Tamil Nadu, India during the month of February 2010. The collected plants and their parts were cleaned with tap water and dried under shade, then ground well to find powder. About 100g of dry leaf powder of *Canna indica* L. was extracted with solvent ethanol using Soxhlet apparatus at 60-70 degree temperature. Greenish black waxy residue was obtained. The residue was used for phytochemical and Characterization studies. Phytochemical constituent like alkaloids, flavonoids, carbohydrates, glycosides, phytosterols, fixed oil and fats, proteins, phenolic compounds, tannins and saponins of ethanol solvent extract of *Canna indica* L.. were analysed qualitatively. In conclusion, these results suggest that *Canna indica* L.. might be a source of large amount of proto alkaloids it is an antibiotic and antioxidant. Therefore, this result may suggest that *Canna indica* L.. extracts posses' compounds with antioxidant and antimicrobial properties which can be used as Phyto cancer agents in new drugs for therapy of diseases in human.

Key words : *Canna indica* L., phytochemicals, antioxidant, antimicrobial.

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INTRODUCTION

The use of traditional medicine and medicinal plants in most developing countries, as a normative basis for the maintenance of good health, has been widely observed. Furthermore, an increasing reliance on the use of medicinal plants in the industrialized societies has been traced to the extraction & development of several drugs and chemotherapeutics from these plants as well as from traditionally used rural herbal remedies have become more popular in the treatment of minor ailments, & also on account of the increasing costs of personal health maintenance [1-20]. Indeed, the market & public demand has been so great that there is a great risk that many medicinal plants today, face either extinction or loss of genetic diversity. The World Health Organization (WHO) estimated that 80% of the population of developing countries relies on traditional medicines, mostly plant drugs, for their primary health care needs [21-30]. Also, modern pharmacopoeia still contains at least 25% drugs derived from plants and many others which are synthetic analogues built on prototypes compounds isolated from plants. Demand for medicinal plant is increasing in both developing and developed countries due to growing recognition of natural products, being non-narcotic, having no side effects, easily available at affordable prices and sometimes the only source of health care available to the poor. Medicinal plant sector has traditionally occupied an important position in the socio cultural, spiritual & medicinal arena of rural & tribal lives of India [31-40]. A number of compounds extracted from various species of higher plants have shown antiviral activity. Examples included tannins, flavones, alkaloids, that displayed in vitro against numerous viruses. It has been suggested that selection of plant on the basis of ethno medical considerations gives a higher hit rate than screening programmes of general synthetic products [41-45].

Plant description

Canna indica L. (also known as saka siri, Indian shot, canna, bandera, chancle, coyol, or platanillo, Kardal in Marathi) is a species of the *Canna* genus, belonging to the family Cannaceae, a native of the Caribbean and tropical Americas that is also widely cultivated as a garden plant. It is a perennial growing from 0.5m to 2.5m, depending on the variety. It is hardy to zone 10 and is frost tender. In the northern latitudes it is in flower from August to October, and the seeds ripen in October. The flowers are hermaphrodite. The seeds are small, globular, black pellets, hard and heavy enough to sink in water. They resemble shotgun pellets giving rise to the plant's common name of Indian Shot.

They are widely used for jewellery. In the last three decades of the 20th century, *Canna* species have been categorised by two different taxonomists, Paulus Johannes Maria Maas from the Netherlands and Nobuyuki Tanaka from Japan. Maas regards *C. coccinea*, *C. compacta*, *C. discolor*, *C. patens* and *C. speciosa* as synonyms or varieties of *C. indica*, while Tanaka recognises several additional varieties of *C. indica*. *Canna indica* var. *indica* L. A medium sized species; green foliage, oblong shaped, spreading habit; triangular stems, coloured green; spikes of flowers are erect, self-coloured red, staminodes are long and narrow, edges regular, petals red, partial self-cleaning; fertile both ways, self-pollinating and also true to type, capsules globose; rhizomes are thick, up to 3 cm in diameter, coloured purple; tillering is prolific. Introduced by Linnaeus. [46].

Aims & Objectives

- To Identify and collect the *Canna indica* L. plant material with specific review of literature.
- To extract the secondary plant metabolites of the plant stem material of the species.
- To isolate, characterize and find out the bioactive metabolites through UV-VIS and FTIR analysis method.
- To correlate the identified metabolites with pharmacological applications.

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MATERIALS AND METHODS

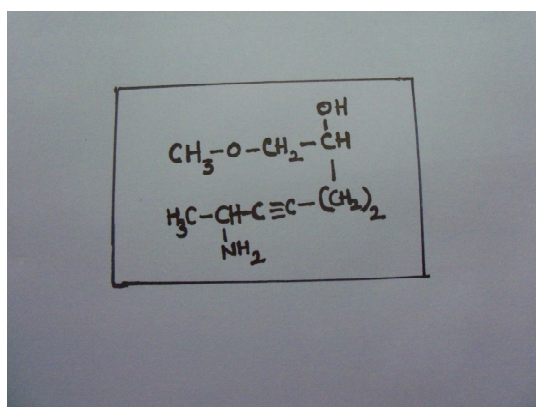
On the basis of its medicinal value which are available in the literature *Canna indica* L. was selected for phytochemical studies. The medicinal plant *Canna indica* L. was collected from Arimalam Village, Pudukkottai district during the month of January – 2010. The collected medicinal plant was brought into the TNSRO laboratory for phytochemical studies.

Phytochemical analysis

About 100 g of dry leaf powder of was *Canna indica* L. extracted with ethanol at 60°C to 70°C by continuous hot percolation using soxhlet apparatus. The extraction was filtered and kept in over at 50°C for 24 hours to evaporate the extracts from them. A greenish black waxy residue was obtained. These extracts were used for phytochemical analysis qualitatively through UV-VIS and FT-IR. Phytochemical analysis for major phyto constituents of the plant extract was undertaken using standard qualitative methods as described by various authors (Vogel 1958, Van 1997, Williams 1949). The plant extracts were screened for the presence of biologically active compounds like alkaloids, flavonoids, glycosides, carbohydrates, phytosteroids and fatty acids, proteins, phenolics, tannins and saponins. [47-52]

RESULTS AND DISCUSSION

Phytochemical constituents like alkaloids, flavonoids, carbohydrates, glycosides, phytosterols, fixed oil and fats, proteins, phenolic compounds, and saponins of *Canna indica* L. were analyzed by qualitatively and reported in Table - 1. On the basis of UV-Vis and FT-IR spectral analysis on *Canna indica* we have found the following data UV-Vis shown in figure 1 yielded 4 elevations (382.89nm, 1.6344 422.36, 0.64656nm, 669.72, 0.28462 and 980.66, 0.079267) and the values were interpreted with table values and confirm the presence of **proto alkaloids** in the given sample. FT-IR result is yielded Maximum peak level 3930.13 cm⁻¹ and Minimum peak level 537.48 cm⁻¹. So that the compound may be **proto alkaloids** The compound may be **9-amino 3,4 dihydroxy 2 methoxy non-6-yne** having molecular weight : GMM, structure is given below



9-amino 3,4 dihydroxy 2 methoxy non-6-yne

Molecular weight: 171 GMM

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CONCLUSION

From the above mentioned results this study reveals the presence of various alkaloids compounds including quins, iso quins, etc. in *Canna indica*. In the present study, UV-Vis and FT-IR procedure was applied for the identification of secondary metabolites. In the effort to study plant of *Canna indica* from the identified localities subjected to alkaloids screening. From this total samples, 78% gave positive result for proto alkaloids, from this 33% gave a positive reaction for iso quenolins . So the final study of the result is indicating the identified plant may be used for antimicrobial, anti helminthetic and anti-inflammatory agent in phyto-pharmaceutical applications.

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Table 1: Depicts various phytochemicals analyzed qualitatively

SI.No	Metabolites	Results
1	Alakloids	+++
2	Flavonoids	++
3	Terpenoids	++
4	Fixed oils	++
5	Phytosterols	+
6	Saponins	-
7	Phenolic compounds	++
8	Fats	++
9	Carbohydrates	++
10	Proteins	++
11	Glycosides	++
12	Tannins	+

+++ present in high concentration, ++ present in medium concentration, + present in low concentration
- not present in the sample

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