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Article

Screening of Bioactive Compounds and Medicinal Properties of *Commelina Benghalensis* L.

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Abstract: The present investigation deals with phytochemical screening and medicinal properties of *Commelina Benghalensis* L. Medicinal plants have been used as traditional treatment for numerous human diseases for thousands of years in India. *Commelina Benghalensis* is used in traditional medicine system to cure various diseases. It is used for the treatment of headache, constipation, leprosy, fever, snake bite, jaundice, mouth thrush, insanity, epilepsy, and psychosis, bitter, laxative, anti-infammatory, demulcent, emollient and depressant, diuretic and febrifuge, treat burns and plant juice of roots is used to treat indigestion.

Keywords: *Commelina benghalensis*, phytochemistry, medicinal properties

1. Introduction

Herbal medicine is still the mainstay of about 75–80% of the world population, mainly in the developing countries, for primary health care because of better cultural acceptability, better compatibility with the human body. However, the last few years have seen a major increase in their use in the developed world.

Herbal medicines are the synthesis of therapeutic experiences of generations of practicing physicians of indigenous systems of medicine for over hundreds of years while pharmaceuticals are nutritionally or medicinally enhanced foods with health benefits of recent origin and marketed in developed countries. The marketing of the former under the category of the latter is unethical. Herbal

medicines are also in great demand in the developed world for primary health care because of their efficacy, safety and lesser side effects. They also offer therapeutics for age-related disorders like memory loss, osteoporosis, immune disorders, etc. for which no modern medicine is available. India despite its rich traditional knowledge, heritage of herbal medicines and large biodiversity has a dismal share of the world market due to export of crude extracts and drugs. WHO too has not systematically evaluated traditional medicines despite the fact that it is used for primary health care by about 80% of the world population. However, in 1991 WHO developed guidelines for the assessment of herbal medicine.

Traditional medicine knowledge and its use for finding active chemical structures for medicine, it is necessary to have co-operative efforts between modern and traditional health workers and researchers (Hamill *et al*., 2003). In Uganda, India, as in other developing countries, traditional medicine occupies a central place among rural communities but enough information is not available about the chemical composition and real biological possibilities of most of the plants traditionally in use (Tabuti, 2003; Jayakmumar, 2015).

India is sitting on a gold mine of well-recorded and well-practiced knowledge of traditional herbal medicine. But, unlike China, India has not been able to capitalize on this herbal wealth by promoting its use in the developed world despite their renewed interest in herbal medicines (Jayakumar, 2015). Phytochemicals are bioactive chemicals of plant origin. They are regarded as secondary metabolites because the plants that manufacture them may have little need for them. They are naturally synthesized in all parts of the plant body; bark, leaves, stem, root, flower, fruits, seeds, etc. i.e. any part of the plant body may contain active components (Jayakumar, 2013). The quantity and quality of photochemical present in plant parts may differ from one part to another. In fact, there is lack of information on the distribution of the biological activity in different plant parts essentially related to the difference in distribution of active compounds (Jayakumar *et al*., 2013a & b; Lahlou, 2004).

Photochemical have been recognized as the basis for traditional herbal medicine practiced in the past and currently en vogue in parts of the world. (Lalitha and Jayanthi, 2012). In the search for photochemical that may be of benefit to the pharmaceutical industry, researchers sometimes follow leads provided by local healers in a region (Das *et al*., 2010). Following such leads, plant parts are usually screened for phytochemicals that may be present. The presence of a phytochemical of interest may lead to its further isolation, purification and characterization.

Phytochemicals are non-nutritive plant chemicals that have protective or disease preventive properties. Plant produces these chemicals to protect itself but recent research demonstrates that many phytochemicals can protect humans against various diseases, (Jayakumar *et al*., 2015).

The weed plant like *Commelina bengalensis*, L. are belongs to family commelinaceae. The weeds are commonly found in many crop fields during the season of June to September. Phytochemicals are present in plant have been linked with the healing properties of plants. In addition to their active ingradients weeds plants also contain minerals, vitamins, alkaloids, saponins, phenols, tannins, phytosterols, triterpens, terpenoids as secondary metabolites that are important in supporting a particular activity in plants. Phytochemical components are responsible for both pharmacological use & toxic activities in plants. These metabolites are said to be useful to the plant itself but at higher concentration can be toxic to animals including man.

2. Materials and Methods

The present work deals with the phytochemical analysis and medicinal properties of *Commelina benghalensis* L.

2.1. Collection and Preparation of Dried Plant Material

The plant raw material was collected from the Botanical garden, Department of Botany, A.V.C College (Autonomous), Mannampandal. Mayiladuthurai. It was collected during December 2014. The plant material was then dried under the shade. The plant material was then reduced in size by crushing it into smaller pieces using the hand. After the plant material had been dried, it was kept in a proper container until the time of the extraction.

2.2. Preparation of Ethanol Extracts

Fresh weight 40g of *Commelina bengalensis* were taken & subjected to oven for drying. Dry powder of plant species were extracted into solvent like alcohol. Filtrate of these extract were used for further analysis

2.3. Phytochemical Screening of Plant Extracts

The selected species were extracted into solvent like alcohol & distilled water. The aqueous extract was freshly prepared & taken into different test tube. The phytochemical screening of given samples following tests were carried out for analysis.

2.3.1. Detection of Alkaloids

Extracts were dissolved individually in dilute hydrochloric acid & filtered

2.3.1.1. Mayer's test

Filtrates were treated with Mayer's reagent (potassium mercuric iodide). Formation of yellow coloured precipitate indicates the presence of alkaloids

2.3.1.2. Wagner's test

Filtrates were treated with Wagner's reagent (Iodine in potassium Iodide). Formation of brown / reddish precipitate indicates the presence of alkaloids.

2.3.1.3. Dragendroff's test

Filtrates were treated with Dragendroff's reagent (solution of potassium Bismuth Iodide). Formation of red precipitate indicates the presence of alkaloids.

2.3.1.4. Hagers test

Filtrates were treated with hagers reagent (saturated picric acid solution). Presence of alkaloids confirmed by the formation of yellow coloured precipitate

2.3.2. Detection of carbohydrates

Extracts were dissolved individually in 5ml distilled water & filtered. The filtrates were used to test for the presence of carbohydrates

2.3.2.1. Molischs test

Filtrates were treated with 2 drops of alcoholic α- naphthol solution in a test tube. Formation of the violet ring at the junction indicates the presence of carbohydrates.

2.3.2.2. Benedicts test

Filtrate were treated with Benedict's reagent and heated gently. Orange red precipitate indicates the presence of reducing sugars.

2.3.2.3. Fehling's test

Filtrates were hydrolyzed with dil. HCL neutralized with alkali and heated with Fehling's A and B solution. Formation of red precipitate indicates the presence of reducing sugars.

2.3.3. Detection of saponins

2.3.3.1. Froth test

Extracts were diluted with distilled water to 20 ml and this was shaken in a graduated cylinder for 15 minutes. Formation of 1cm layer of foam indicates the presence of saponins.

2.3.4. Detection of phytosterols

2.3.4.1. Salkowsk's Test

Extracts were treated with chloroform and filtered. The filtrates were treated with few drops of conc. sulphuric acid of shaken and allowed to stand. Appearance of golden yellow colour indicates the presence of triterpenes.

2.3.5. Detection of phenols

2.3.5.1. Ferric chloride test

Extracts were treated with 3-4 drops of Ferric Chloride solution. Formation of bluish black colour indicates the presence of phenols.

2.3.6. Detection of flavonoids

2.3.6.1. Alkaline reagent test

Extracts were treated with few drops of sodium hydroxide solution formation of intense yellow colour, which becomes colourless on addition of dilute acid, indicates the presence of Flavonoids.

2.3.7. Test for steroids

5 drops of concentrated H2SO4 were added to 1ml of leaf extract development of red colouration was indicative of a positive reaction for steroids.

2.3.8. Test for terpinoids

2ml of leaf extract treated with 2ml of chloroform and few drops of concentrated H2SO4 occurrence of light orange colouration indicates presence of terpenoids.

2.3.9. Test for glycosides

Extracts was treated with 2ml of Glacial acetic acid, add 1drop of fecl3 and 1ml of concentrated H2SO4 appearance of brown colouration indicates the glycosides.

2.3.10. Test for quinone

Extracts was treated with concentrated HCL appearance of green colouration indicates presence of quinine.

2.3.11. Test for triterpens

To 0.5 g each of the extract was added 2ml of chloroform concentrated H2SO4 [3ml] was carefully added to form a layer. A reddish brown colouration of the interface indicates the presence of terpenoids.

2.3.12. Test for tannins

2ml of leaf extracts with 1% of lead acetate solution occurrence of yellowish precipitate shows presence of tannin.

3. Results and Discussion

Table 1 presents the results of phytochemical screening of *Commelina bengalensis* L.

Table 1: The phytochemical screening of *Commelina bengalensis* L.

Sl/No	Name of the Phytochemical	Name of the Test	Alcoholic Extract
1.	Detection of alkaloids	Mayer's test	+
		Wagner's test	+
		Dragendroff's test	-
		Hager's test	+
2.	Detection of carbohydrates	Molisch's test	+
		Benedicts test	+
		Fehling test	+
3.	Detection of saponins	Froth test	-
4.	Detection of phytosterol	Salkowski's test	+
5.	Detection of phenols	Ferric chloride test	-
6.	Detection of Flavonoids	Alkaline reagent test	+
7.	Test for Steroids		-
8.	Test for Terpenoids		+
9.	Test for Glycosides		-
10.	Test for Quinon		+
11.	Test for Triterpens		-
12.	Test for Tannins		+

Many countries, traditional medicines are deeply rooted in their cultures. It has become an indispensable treatment regimens and a subject of interests for the pharmaceutical companies for the following reasons, it is holistic in nature and has no side effects as opposed to modern allopathic drugs, the traditional medicines are cheap and easily available in the markets especially in developing countries as compared to modern drugs which are very expensive; c) most of the traditional medical systems are supported by long clinical use with properly recorded pharmacopoeias and are being supported by the scientific validation processes and traditional medicines are the reservoirs of ethno-medical and ethno-botanical information which are the keys for opening many new modern drug leads.

Plants have the ability to synthesize a wide variety of chemical compounds that are used to perform important biological functions, and to defend against attack from predators such as insects, fungi and herbivorous mammals. Many of these phytochemicals have beneficial effects on long-term health when consumed by humans, and can be used to effectively treat human diseases. At least 12,000 such compounds have been isolated so far; a number estimated to be less than 10% of the total. These phytochemicals are divided into primary metabolites such as sugars and fats, which are found in all

plants; and secondary metabolites compounds which are found in a smaller range of plants, serving a more specific function, (Jayakumar *et al.*, 2013).

The use of plants as medicines predates written human history. Ethnobotany (the study of traditional human uses of plants) is recognized as an effective way to discover future medicines. In 2001, researchers identified 122 compounds used in modern medicine which were derived from "ethnomedical" plant sources; 80% of these have had an ethnomedical use identical or related to the current use of the active elements of the plant. Many of the pharmaceuticals currently available to physicians have a long history of use as herbal remedies, including aspirin, digitalis, quinine, and opium, (Jayakumar, 2013).

Commelina benghalensis is used in traditional medicine system to treat various ailments. It is used for the treatment of headache, constipation, leprosy, fever, snake bite and jaundice. It is also used in the treatment of mouth thrush, insanity, epilepsy and psychosis. In Lesotho it is applied to treat infertility in women and in India it is used as bitter, laxative, anti-infammatory, demulcent, emollient and depressant.

The phytochemical screening carried out on *Commelina benghalensis* L. reveals the presence of glycosides, saponins, terpenes, sterols and phenols were not detected. The presence of some of these secondary metabolites suggests that the plant might be of medicinal importance and supports the bases for some of the ethno uses. For instance, the presence of alkaloids, Flavonoids, carbohydrates, phytosterol, terpenoids,quinon and tannins suggest that the plant might have an antioxidant, anti-allergic, anti-inflammatory, anti- microbial, anti- cancer activity (Kunle and Egharevba, 2009). It also suggests that the plant might have diuretic properties (Jayvir *et al*., 2002). The presence of tannins shows that the plant is astringent as documented and suggests that it might have antiviral and anti-bacterial activities and can aid in wound healing and burns (Haslem, 1989). Some researchers have also reported that some saponins have anti-cancer and immunemodulatory properties (Kunle and Egharevba, 2009; Evan, 2002). They are also used as flavoring agents, in aromatherapy, perfumery etc. Examples are eucalyptus oil, lemon oil and peppermint. Thymol has been reported to possess anti-bacterial properties (Evan 2002). Therefore these phytochemicals may be the reason for anti‑inflammatory activity of ethanolic extract of leaves of *Commelina benghalensis*.

4. Conclusion

Medicinal plants are a source of great economic value all over the world. Hence that these important genetic resources. The phytochemical studies on the alcoholic extract of *Commelina bengalensis* have revealed the presence of carpohydrate, phytosterols, flavonoids and others such as terpenoids and tannins. Therefore above analysis has revealed that, the plants are very rich in

phytochemicals. As they possess these chemical principles they are effective against several disease parameters.

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