Acalypha indica L - an Important Medicinal Plant: a Review of Its Traditional Uses, and Pharmacological Properties

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Abstract
Medicinal herbs are moving from fringe to mainstream use with a greater number of people seeking remedies and health approaches free from side effects caused by synthetic chemicals. India officially recognizes over 3000 plants for their medicinal value. It is generally estimated that over 6000 plants in India are in use in traditional, folk and herbal medicine. This article aims to provide a comprehensive review on the and pharmacological aspects of Acalypha indica. It is obtained from deciduous and mixed-monsoon forests throughout greater parts of India, ascending to 1300 m in outer Himalaya, is widely used in traditional medicinal system of India has been reported to possess hepatoprotective, anti-inflammatory, antitussive, antifungal and also used to check wounds healing and antibacterial. It is known as a rich source of tannins, flavanoids and glycosides. The innumerable medicinal properties and therapeutic uses of Acalypha indica as well as its phytochemical investigations prove its importance as a valuable medicinal plant.

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Key words: Medicinal herbs, Acalypha indica, Pharmacological Properties.

INTRODUCTION
Many of the plants used today were known to the people of ancient cultures throughout the world and were highly considered their preservative and medicinal powers. Scientific experiments on the antimicrobial properties of plants and their components have been documented in the late 19th century Zaika (1975). India has a rich flora that is widely distributed throughout the country. Herbal medicines have been the basis of treatment and cure for various diseases and physiological conditions in traditional methods practiced such as Ayurveda and Homeopathy. Medicinal components
From plants play an important role in conventional as well as western medicine. Plant derived drugs have been a part of the evolution of human, healthcare for thousands of years. Plant based drugs were commonly used in India and China Duraipandiyan et al (2007). At the same time, indigenous people of the rest of the planet were also utilizing plants for curing diseases. Today, nearly 88% of the global populations turn to plant derived medicines as their first line of defense for maintaining health and combating diseases. One hundred and nineteen secondary plant metabolites derived from plants are used globally as drugs; 15% of all angiosperms have been investigated chemically and of that 74% of pharmacologically active plant derived components were discovered. Currently, people of Asia and India are utilizing plants as part of their routine health management Perumal samy et al (2008). Acalypha indica L. (family: Euphorbiaceae) is a weed widely distributed throughout the plains of India. It has been reported to be useful in treating pneumoniae, asthma, rheumatism and several other ailments Chopra (1956). The dried leaves of Acalypha indica was made into a poultice to treat bedsores and wounds and the juice of Acalypha indica is added to oil or lime and used to treat a variety of skin disorders. The leaves of Acalypha grandis have also been reported to possess contraceptive activity Bourdy et al (1992). Several chemical Donw et al (1938) and biological Bauer et al (1923) investigations have been carried out on this plant. In the present study, an attempt has been made to enrich the knowledge of antibacterial activity of Acalypha indica plant extract against Gram positive and Gram-negative bacteria.

Over the last few years, researchers have aimed at identifying and validating plant-derived substances for the treatment of various diseases. Interestingly it is estimated that more than 25% of the modern medicines are directly or indirectly derived from plants. It is worth mentioning that Indian medicinal plants are considered as a vast source of several pharmacologically principles and compounds that are commonly used as home remedies against multiple ailments Pallab Maity et al (2009). Since early 1990s, the
use of forest products for medicine has been emerging as a vital income generating resource for the development of various social groups; hence, there is an increased attention for their long-term sustainability Chandra Prakash Kala (2006). Indian traditional medicine is based on various systems including Ayurveda, Siddha, Unani and Homoeopathy. The evaluation of these drugs is primarily based on phytochemical, pharmacological and allied approaches including various instrumental techniques such chromatography, microscopy and others. With the emerging worldwide interest in adopting and studying traditional systems and exploiting their potential based on different health care systems, the evaluation of the rich heritage of traditional medicine is essential Gupta (2010).

In this regard, one such plant is Acalypha indica L. Acalypha indica has been extensively used in Ayurvedic system of medicine for various ailments. It is decidious and mixed-monsoon forests throughout greater parts of India, is widely used in traditional medicinal system of India has been reported to possess hepatoprotective, anti-inflammatory, antitussive, antifungal and used also check wounds healing and antibacterial Gupta (2010).

**Taxonomic Classification**

Kingdom: Plantae  
Class: Magnoliopsida  
Order: Euphorbiales  
Family: Euphorbiaceae  
Subfamily: Acalyphoideae  
Genus: Acalypha  
Species: Acalypha indica Linn.

**Traditional uses**

The root is prescribed as a tonic, astringent, febrifuge and strong purgative Khare (2007). The leaves extract reduced mutagenecity in E. coli Gupta et al (2008). Extract of the root bark with alcohol can be used for backwart fever. The leaves are laxative and used externally as emollient, a poultice is used for chilblains, in insect bites, swelling, rheumatism and facial paralysis. Expressed juice of the leaves is a safe, certain and speedy emetic for children in one teaspoonful (1d) of Research in Botany 201

**Important pharmacological activities in Acalypha indica**

**Acalypha indica in Homeopathy:**

A drug having a marked action on the alimentary canal and respiratory organs. It is indicated in incipient phthisis, with hard, racking cough, bloody expectoration, arterial hemorrhage, but no febrile disturbance. Very weak in the morning, gains strength during day. Progressive emaciation. All pathological hemorrhages having notably a morning worse.

**Acalypha indica in Ayurveda:**

**Preparations** - Infusion of root, powder, decoction, cataplasm, succus (juice expressed), tincture and liquid extract.

**Uses**

Leaves possess laxative properties; “are used as a substitute for senega”; are used in the form of powder or decoction; mixed with garlic they are used as Anthelmintic in worms. Mixed with garlic they are applied to scabies; and their juice mixed with oil forms an application in rheumatic arthritis. Expressed juice of the leaves is a safe, certain and speedy emetic for children in one teaspoonful (1 drachm) doses, in cases of croup; in smaller doses it is expectorant, and is useful in chronic bronchitis, asthma and consumption.

Decoction is employed in ear-ache as instillation and also as fomentation round the aching ear; and a cataplasm of the bruised leaves is applied to syphilitic ulcers, to maggot-eaten sores and also to relieve the pain of snakebites. “Juice
from fresh leaves may be employed in scabies and other skin diseases, and with lime and onion it is a good stimulating application in rheumatism. Powder of dry leaves is used in bed sores. In congestive headache a piece of cotton saturated with the expressed juice of the plant or leaves and inserted into each nostril is said to relieve it by ‘causing hemorrhage from the nose. In cases of obstinate constipation of children the leaves ground into a paste and made into a ball and introduced into the rectum, relax the sphincter ani and produces free motions. An infusion of the root or the root bruised in Water, acts as a cathartic.

**Anti-inflammatory Activity:**

Maximum inhibition by the methanolic extract was observed at 250 mg/kg body weight after three hours of ingestion, which was comparable to that of the standard drug phenylbutazone at a dose of 100mg/kg body weight. The anti-inflammatory activity also demonstrated in dose dependent manner.

**Anti bacterial and anti fungal activity:**

The ethanol extract of *Acalypha indica* showed maximum inhibition against *Bacillus cereus*, *Bacillus subtilis*, *Escherichia coli*, *Salmoneilla typhi*, *Vibrio cholera* and *Pseudomonas aeruginosa* but proved to be resistant against *Pseudomonas aeruginosa*, *Shigella flexneri*, *Staphilococcus aureus*, *Klebsiella pneumoniae*, *Vibrio cholerae* and *Bacillus cereus*. The ethyl acetate extract of *Acalypha indica* showed maximum inhibition against *Staphilococcus aureus*, *Klebsiella pneumoniae* and *Shigella flexneri* ethyl acetate was resistant to *Vibrio cholerae* and *Bacillus cereus*. *Pseudomonas aeruginosa* was resistant to ethyl acetate extract of *Acalypha indica*. Another study proved that ethanol and water extract of leaves, stems, seeds and roots from *Acalypha indica* were effective against two bacterial *Escherichia coli* (Gram-negative bacteria), *Staphilococcus aureus* (Gram-positive bacteria) and for anti-fungal activity against three fungi, *Aspergillus fumigatus*, *Microsporum canis* (molds) and *Candida albican* (yeast). *Microsporum canis* showed dose-dependent sensitivity towards aqueous leaves and roots extract, but resistant to both ethanol and water stems, roots and seeds extracts. *Aspergillus fumigatus* and *Candida albican* were resistant to both ethanol and water extract of all *Acalypha indica*.

**Antioxidant Activity:**

The Antioxidant activity of the extracts was analyzed by evaluating superoxide and hydroxyl radical scavenging activity and effect on lipid peroxidation. The ethanol extract showed significant antioxidant activity in all the free radical scavenging tests.

**CONCLUSION:**

The present study show the pharmacological study of the plant and various bio active compound responsible for it which have been reported. The whole plants have been used in traditional medicine for decades and the studies done yet have authenticated the practice. Earlier as described the plant have been used in the Ayurveda and homeopathy medicine. However, more clinical and pathological studies must be conducted to investigate the unexploited potential of the plant.

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