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A review on traditional valuable medicinal plant in *Acalypha indica Linn*

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Abstract
The present study was conducted to provide information on the traditional valuable medicinal uses of *Acalypha indica,* a flowering plant belonging to family euphorbiaceae. It is weed herb, found mostly in waste place on road sides as well as forest localities. It is a valuable medicinal plant with multifarious drug properties and hence the tribals and people of other communities use this plant to cure several diseases and ailment.

Keywords: Medicinal plant, *Acalypha indica,* traditional value, phytochemical, pharmacology.

Introduction
Traditional system of medicine has always important role in meeting global health care needs. India has a peculiar feature of having six recognized systems of medicine. Ayurveda, yoga, Naturopathy, Unani, Siddha and Homeopathy. The current governing system of modern medicine or Allopathy has slowly but surely developed and over the years come to be give a positive response through scientific research and execution. However, the fundamental basis for its development lies in traditional medicine and remedy [1]. Traditional or conventional medicine practices based on natural plants have been recognized by the world health organization (WHO, 2002) as reliable medicine for therapeutic activities. The medicinal plants are available around backyards, settlements, spreading along road sides and house compounds [2]. Plants produce a diverse range of bioactive molecules, making them a rich source of different types of medicines. The most important of these bio active constituents of plants are alkaloids, tannins, flavonoids and phenolic compounds. These substances are usually found in several parts of plants like root, leaf, shoot and bark. More than 80% of modern drugs are derived directly from sources of plants and microbes. Bio active compounds as they contain therapeutic and their complex nature will able to interact with mammalian cell targets. Phyto chemicals naturally isolated from the medicinal plants (MAPS) are used specifically in drug industries. However, these phytochemicals' have certain limitations of low absorption, high toxicity, and other side effects, bio availability and efficacy. Combinatorial chemistry and molecular modelling, they remain an important source for new drugs discovery [3]. *Acalypha indica* proved to be best herbal medicine for various disease including skin diseases therefore an ideal formulation prepared form this plant is used to treat such skin diseases. There is a need of more sophisticated testing methods for pharmacological, toxicological and microbiological activities for determining quality of the herbal formulations. It is, therefore, essential that definite and accurate analytical methods be available to follow consistency and quality of herbal drugs, so that these products exhibit the desired medicinal effects. WHO specifies guidelines for the assessment of the efficacy and quality of herbal drugs as a pre requisite for global harmonization [4].

Traditional value of *Acalypha indica Linn*
Acalypha indica also can be used to treat insect bites [5]. Insect bites cause inflammation of the skin, blisters, and irritation depending on the types of poison released during the sting. Since *Acalypha indica* can cure ailments related to the skin, it is also applied to insect bites to reduce soreness. The leaves also contain good antibacterial activity, anti-fungal activity and anti-oxidant phytochemical which are useful in protecting the skin from external hazards. The released fluid from crushed leaves is useful as a lubricant for child constipation treatment by applying the small ball-shaped made form leaves into the rectum.

Additionally, the fluid is composed of an oily compound to loosen the rectum for faces release and protect the wounded rectum wall. An adult with haemorrhoids can also use the fluid by rubbing it around the rectum. The phytochemicals in side this plant can treat and contract the haemorrhoids through wound healing activities. Furthermore, the fresh leaves possess a high amount of volatile chemicals to treat headaches, epilepsy, ear aches and as an expectorant [6]. Since *Acalypha indica* has an anti-bacterial property, wound healing activities, is edible and safe to consume, people prefer to use this plant to treat sickness related to gum and teeth.

Acalypha indica most practices use this plant when it is still fresh, either as a single use or mixed with other ingredients. The raw fresh leaves contain the most active phytochemical from the original plant including its nutrients, essential oils and volatile compounds. The raw leaves are very useful for abortion since it has stigmasterol which affects estrogenic activity [7].

The raw leaves of *Acalypha indica* can provide many benefits for several treatments when consumed orally including abortion, diarrhoea, acts as an analgesic, emetic, and has anti-inflammatory, anthelmintic, anti-bacterial, anti-cancer, anti hyperlipidaemic, anti-obesity, anti-oxidant, anti-tuberculosis, anti-venom, diuretic, hepatoprotective, vasoconstrictor and wound healing properties. The volatile compound secreted by the leaf can treat a headache, ear aches, epilepsy, and act as an expectorant. The leaves can also be used topically as the following treatments skin ailments, haemorrhoids, constipation, insect bites, wound healing, and is anti-parasitic and anti-bacterial [8-13].

The root of the fresh *Acalypha indica* is useful as an anthelmintic and anti-arthritis through oral consumption. The root also acts as a neuro protective and wound healing agent through topical applications. The raw whole plant can be prepared for bronchitis treatment, emmenagogue, anti-oxidant, diuretic, anti-bacteria, anti-diabetic, anti-inflammation, anti-ulcer, estrogenic, anti urolithiasis and anti-implantation. Topical use from the fresh whole plant is suitable for wound treatment and external fungi infections for dermatology ailment. The combination of *Acalypha indica* with other remedies is dependent on practitioner knowledge to optimize the therapeutic effectiveness. The binder used in ethnomedicinal practice like oil or lime juice is useful for a homogeneous distribution of the phytochemicals, maintaining the crushed leaves shape, and increasing the treatment ability [14-20].

Table 1: Phyto Chemicals present in *Acalypha indica Linn* from Differetn part of the plant in leaf, root and flower

Phytochemical	Plant part
Analyphamide	Whole plant
Acaindinin	Leaf
Acetonylgeraniin	Whole plant
Aurantiamide	Leaf
Caffeic acid	Whole plant
Corilagin	Leaf
Cysteine	Whole plant
Ferulic acid	Leaf
Gallic acid	Whole plant
Stigmasterol	Root
Resin	Leaf
Syringic acid	Whole plant
Tocoquinone	Leaf
Triacetonamine	Leaf
3,3 methylene bis (4 hydroxyl coumarin)	Root

Table 2: Bio active compounds of *Acalypha indica Linn* along with its traditional uses

Bio active compounds	Traditional uses
Phytol	Antimicrobial, anti-diabetic, cytotoxic, anti-biotic
9-tricosene	Pesticides, insect pheromone
1-triacontanol	Promotion of plant growth with flowering
9,12-octadecadienoic acid (Z,Z), methylester	Anticancer
Dihydroactinidiolide	Cat attractant, photo acclimation during plants
1-Eicosanol	Anti-bacterial, Anti-fungal activity
Tricosane	Insect pheromone, Pesticide
Loliolide	Inhibitor of cellular senescence during human
Docosanol	Antiviral agent of herpes simplex virus
3,7,11,15-tetramethyl 2-hexadecen-1-01	Drug resistance
Hexane dioic acid, bis (2-ethylhexyl) ester	Antibacterial activity
Octacosanol	Blood metabolism
5,10-diethoxy-2,3,7,8-tetrahydro-1H,6H-5,10-Diethoxy-2,3,7,8-dipyrrolo pyrazine	Anti-fungal activity

Table 3: Medicinal uses of *Acalypha indica*

***Acalypha indica* plant parts**	**Medicinal uses**
Leaf paste, Powder of dry leaves	Anthelmintic
Leaves, Leave juice	Anti-parasite
Dried leaves Decoction	Aphrodisiac
Decoction of Leaves	Asthma
Whole plant is crushed and the juice is applied	Bronchitis
Leaves and paste apply the rectum to relax the sphincter and produces relief motions	Constipation
Leaves, Dried leaves, Leaf juice	Dermatology ailment
Leaves, roots and seeds	Diarrhea
Leaf decoction	Ear ache
Leaf Juices	Emetic
Leaves mixed with *Cardiospermum halicacabum* and boiled in *Azadirachta indica* oil. extract is consumed	Epilepsy
Root	Fever
Powder of decoction	Gum and teeth disease
Leaf decoction	Head ache
Crushing and leaf decoction	Hemorrhoids
Leaf poultice	Insect bites
Root infusion	Laxative
Root extract	Lowered Blood Sugar
Whole plant decoction	Mouth ulcer
Leaves are ground with ginger	Pimples
Fresh leaf juice	Rheumatoid arthritis
Leaf decoction	Syphilitic ulcer
Whole plant	Wound healing

Conclusion

Acalypha indica the whole plant is applicable for treatment depending on the therapeutic activities. The most potential therapeutic treatments are as anthelmintic, anti-inflammatory, antibacterial, anticancer, antidiabetic, anti-hyperlipidaemia, anti-obesity and antivenom agents is hepatoprotective and has hypoxia and wound healing properties.

Some pharmacological studies have shown a very good potential to be explored and furthered because the test results

obtained have been almost comparable or better than the used standard, however, the test results are still not enough and should be supported by a few related tests including clinical trials. The responsible compound that reacts with the pharmacological studies should be isolated from the extract and purified for further analysis. There is a potential to find a new natural drug as an alternative to existing drugs.

There are many types of research that can be done with this plant in the future since the supply resource of this plant is not an issue. This plant is considered as a low-cost herb and can easily grow with minimum preservation. Further studies related to *Acalypha indica* essential oil and volatile compound are highly recommended since as of yet there are no detailed studies of these compounds. The result from this study could answer questions regarding several ethnomedicinal practices, especially related to the inhalation method. For the future, many studies can be conducted to explore this plants capabilities primarily related to therapeutic activities that have not been reviewed on this paper.

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