

Acalypha Indica L. an Important Medicinal Plant with Antimicrobial agents: a Review

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ABSTRACT

Medicinal plant, nowadays are usually by a large resident seeking remedial action from artificial chemicals. Acalypha Indica L. one of medicinal plants, grows all over the world. As of its simple ease this plant is generally used as a traditional medicine and have valuable properties of anthelmintic, purgative and diuretic as well individually too used for curing scabies, asthma, bronchitis, pneumonia. The aim of the present review was to highlight the antimicrobial activity of Acalypha Indica L.. It contains various Bioactive complex as like the acallyphamide, amide along with a few further 2-methylanthraquinone, amides, γ -sitosterol, β sitosterol, tri-O-methyl ellagic acid and stigmasterol with their antimicrobial roles.

Keywords: *Acalypha Indica L., Anti-microbial, Medicinal plant, Bioactive complex*

1. INTRODUCTION

As prehistoric period a large part of the population recognizes the remedial property of numerous plants and the same has been proved by the medical science. India a land of enormous alters in soil along with weather condition is an idyllic position meant for the gardening of great number of plants with medicinal properties and which can be used in cosmetics, agrochemical and perfumery also in pharmaceutical industries. In the beginning of the human society and at present too herbal medicine can be used for the treatment of diverse disease. Rig Veda which was written between 4500-1600 BC being the oldest depository of the human being awareness describes the medical use of plant life in Hindu ethnicity. In conventional and in western medicines plants plays an important part. Derivative rug from the plant is helping the human from the prehistoric period. In India moreover in China plant base drugs are broadly used (Omar R et al., 2002). Many researchers aimed in identifying plants which are used for the treatment of various diseases because of the adverse effects of the synthetic drugs. It is predictable supplementary than 25% of the medicine use nowadays be derivative as of plant life. Indian medical plant life is essential resource used for the cure of numerous diseases (Pallab M et al., 2009). Appropriate towards random apply of viable antimicrobial drugs intended for the treatment of different disease lots of microbial infection encompass developed manifold remedy resistance.

Acalypha Indica L. consists of dry herb of *Acalypha Indica* L. (Linn) belong towards family Euphorbiaceae. *Acalypha Indica* L. is one of the largest plants with 450 species. Two thirds of its species are set up in America, 19 of them in Venezuela, they are basically used at the same time as ornamental, but with the growing of conventional remedy, these species are known for their medical properties, laxatives, pain killer, anti-inflammatory and several others. *Acalypha Indica* L. (Linn) occurs in Nigeria and from Sudan east to Somailia and South throughout DR Congo and East Africa to Southern Africa including South Africa. It is found in the plains of India as a weed in the garden, in dissipate lands and beside the roadsides. It is grown in the hills of Orissa at altitude towards 210 m. This plant mainly grows in Andhra Pradesh, West Bengal, Kerala, and Tamil Nadu (Manisha M et al., 2011). It is a yearly upright aromatic plant 30-75 cm in height. This herb posses the properties like anti-inflammatory, anti-bacterial and antifungal. This plant consists of catachols, alkaloids, phenolic, flavonoids compound, steroid, tannins, saponins. It is extensively acquire the properties of anti-inflammatory, antifungal and hepatoprotective (R K Gupta 2010). Due to the important medicinal plants reported to be associated with this herb, dissimilar part of *Acalypha Indica* L. plant be extract through maceration, sonication techniques and soxhlet extraction via an array of solvents with these plant extract be investigate intended for their anti-microbial action. Quite a few substance (Donw G and Steyn JS 1938) along with organic (Bauer RW et al., 1923) do research vocation contain be conceded away on this plant.

2. SUBSTANCE CONSTITUENT

The plant substance constituent a cyanogenetic glucoside, kaempferol, triacetoneamine, a base and acallyphine, an alkaloid. It too contain the acallyphamide, amide along with a few further 2-

methylanthraquinone, amides, γ -sitosterol, Beta sitosterol, tri-O-methyl ellagic acid and stigmasterol, Beta-sitosterol glucoside, quinine, tannin, resin, n-octacosanol, and essential oil. *Acalypha* is awfully cooperative within the action of sore gums. Plant contain substance, their structure & their specific functions has been described in this study (Figure1, 2& 3, Table 1). Plant Contain Antimicrobial, antimutagenic, antidiabetic, antitumorous, cytotoxic, antibiotic-chemotherapeutic, anti-teratogenic properties which make it important medicinal plant for Medicine purpose.

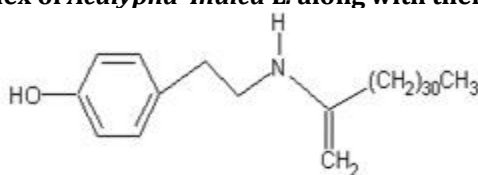
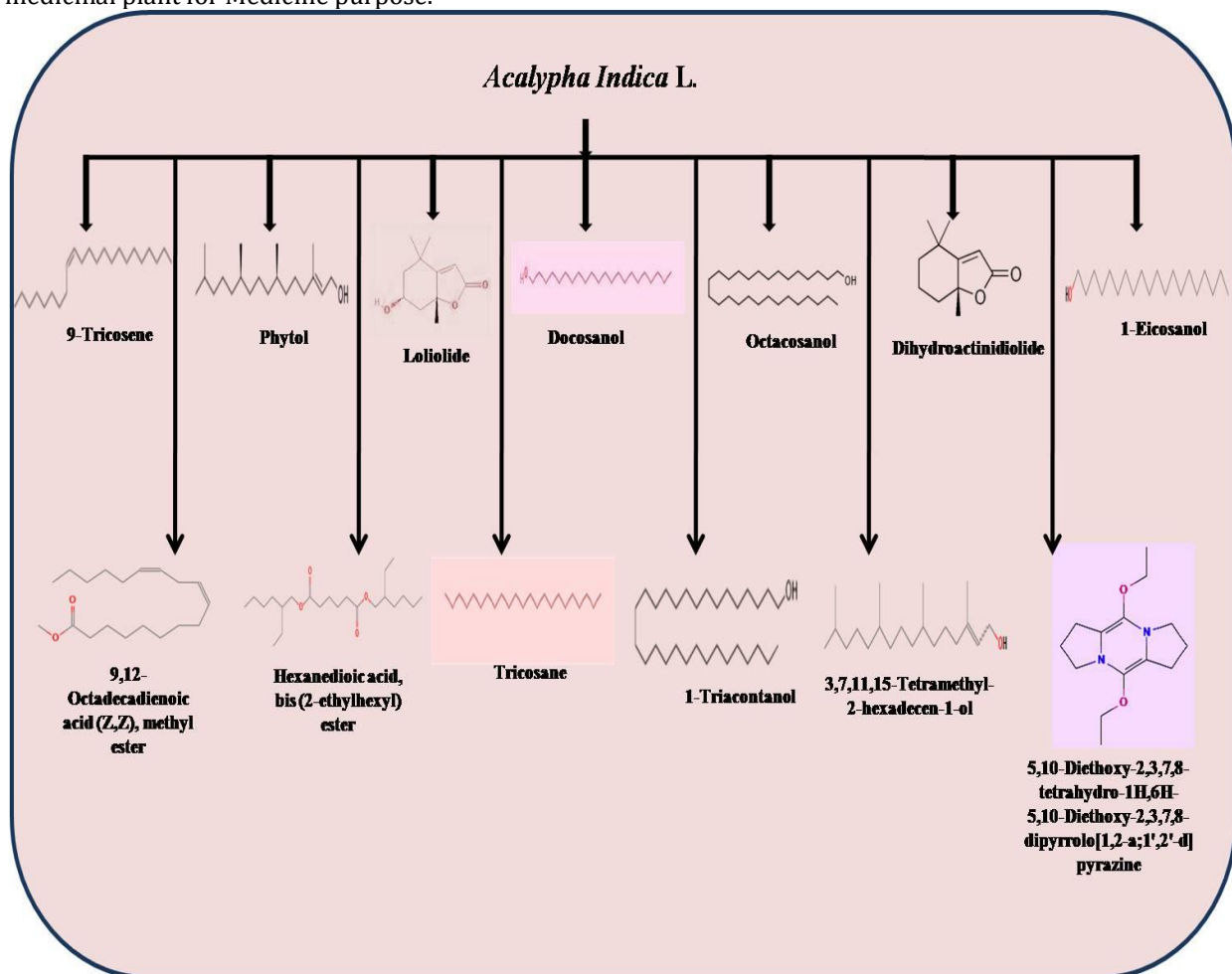


Fig 2: Chemical Structure of Acalyphamide

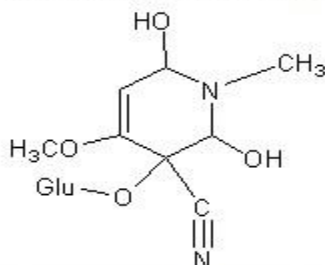


Fig 3: Chemical Structure of Acalyphine

Table 1: Bioactive complex of *Acalypha Indica* L. along with its organic properties

Complex	Possible organic properties	References
9-Tricosene	Pesticides, Insect pheromone	(Lin CC et al., 2015) (Kavran et al., 2015)
Phytol	Antimicrobial, antimutagenic, antidiabetic, antitumorous, cytotoxic, antibiotic-chemotherapeutic, anti-teratogenic	(Islam MT et al., 2015)
Loliolide	Inhibitor of cellular senescence during human, Dermal Fibroblast, Inhibitor of hepatitis C virus access	(Chung CY et al., 2016)
Docosanol	Antivital agent of herpes simplex virus	(Yang et al., 2015)
Octacosanol	Growth along with lying performance inside pourty, Scheming of blood metabolism, Proliferation moreover migration of human umbilical vein endothelial cells	(Leung DT and Sacks, 2004) (Peng K et al., 2016)
9,12-Octadecadienoic acid (Z,Z), methyl ester	Anticancer	(Kumar NR et al., 2012)
Hexanedioic acid, bis (2-ethylhexyl) ester	Antibacterial activity	(Ge S et al., 2015)
1-Triacontanol	Promotion of plant growth with flowering	(Peng W et al., 2014)
3,7,11,15-Tetramethyl-2-hexadecen-1-ol	Drug resistance reverse agents	(Khandaker et al., 2013)
Dihydroactinidiolide	Cat attractant, photoacclimation during plants, pheromone intended for insects, Photoacclimation into plant	(Upadhyay et al., 1860)
1-Eicosanol	Antibacterial with antifungal activity, antitumor activity in vitro plus in vivo in mice model	(Albone ES 1975) (Shumbe L et al., 2014)
Tricosane	Insect pheromone; Pesticides	(Figueiredo et al., 2014)
5,10-Diethoxy-2,3,7,8-tetrahydro-1H,6H-5,10-Diethoxy-2,3,7,8-dipyrrolo[1,2-a;1',2'-d] pyrazine	Antifungal activity	(Kavitha et al., 2009)

3. TRADITIONAL USES

The root of this plant is treating as a stimulant, harsh and tough purgative (Silberbush et al., 2010). The leaves extract of the plant reduces mutagenicity in *E. coli*. The leaves are laxative while a moisturizer for the diagnosis of facial paralysis (Li H et al., 2012). The leaves of the plant can be used in the diagnosis of jaundice, piles and also externally skin eruptions, ring worms. Leaf be use like painkiller the same as an antipyretic, it be a tonic used for malaria also fever. It is too apply inside anthrax, blood poisoning, along with anti-dysentric, anti-dibetic and leprosy intended for the elimination of abdominal obstacle (Khare CP et al., 2007) and they are also helpful in the treatment of asthma (Kirtikar KR and Basu BD 2006). The leaves of the plant contain too be report toward seize the superiority of contraceptive action (Vaishnav MM and Gupta KR 1996). The extract of the origin is to be able to condensed the blood sugar stage via 30% (Vaishnava MM et al., 1993). Leaves possess anti-periodic with laxative properties and the leaf extract can be applied to insect bites (Bourdy G and Walter A 1992). Root is of use during agitation, heart disease plus retain excretions. The 50 % ethanol extracts of pods reveals the anti-fertility activity in female albino rats. Cough can be easily cured by making burnt pods with little salt along with honey 3-4 times. Roots are worn during the cure of antipyretic, diabetes, helpful in coffer complaint, gorge plight, eyes defect along with the diagnosis of cardiac disorder, stiff situation, ulcer, wound, boils furthermore diverse crust disease. The extract of the root bark among alcohol be capable of exist use meant for backward fever. The seed is slightly sweet and also possess laxative, carminative, cooling improves the appetite (Chopra RN et al., 2006). Seed powder is used in amoebiasis. The extract of the flower inhibits the ovarian utility with excite the utility of uterine in albino rats. The pulp of the fruit around the seed is used in curing diabetes. Outwardly it is of use used for the

emigration in flatulent tummy ache, while salad dressing intended for gouty otherwise stiff joint. The fruit flesh is used for constipation, tummy ache, chlorosis along with urinary disorder. The bark seizes stimulant also antidycentric property helpful in administering of leprosy, jaundice and heart disease.

4. IMPORTANT PHARMACOLOGICAL ACTIVITIES IN *ACALYPHA INDICA L.*

Knowledge of individual constituent is most important in determining the pharmacological activity of the plant. A drug prepared from this plant marked its presence on alimentary canal and respiratory organs. *Acalypha Indica L.* leaves are used in Malaysia in treatments related to headache, fever and flu, whereas the roots are boiled to wash haemorrhoids.

In the western parts of Africa the plant is used in the form of decoction. Palms are used to press the leaves and the juice extracted is applied on the effected part of skin infections (Nadakarni KM 2009).

5. USE OF *ACALYPHA INDICA L.* IN HOMEOPATHY

For children suffering from obstinate constipation leaves are used. They are powdered into the paste and made into balls which relaxes the sphincter-ani and produces free motion. Juices from fresh leaves can exist engaged inside scabies furthermore additional crust disease. Juices can also be mixed with lime and onion which gives stimulating effect in rheumatism. The juice of the plant is used along with cotton and inserted into each nostril.

6. ANTIBACTERIAL AND ANTIFUNGAL ACTIVITY

The ethanol extract of *Acalypha Indica L.* shows utmost action versus *Pseudomonas aeruginosa Bacillus cereus, Vibrio cholera, Salmonella typhi*, except *Staphylococcus aureus, Shigela flexneri Pseudomonas aeruginosa*. The ethyl extract of the same shows most embarrassment alongside *Shigela flexneri, Staphylococcus aureus* and ethyl acetate is unwilling toward *Bacillus cereus and Vibro cholera*. A different study reveals so as to ethanol along with water extracts of stem, bark, leaves, stem, of *Acalypha Indica L.* are effective against *Staphylococcus aureus, E. coli* with intended for anti-fungal activity adjacent to *Candidia albican, Microsporum canis* and *Aspergillus fumigates*. The water moreover ethanol extracts exhibits superior antibacterial activity alongside gram positive with this is while strong when numerous viable drugs. The chloroform extract though exposed antifungal activity beside *C. albicans* and *M. canis*. Euphorbiaceae show elevated concentration of phenols, alkaloids and flavonoids (Mahesh Vk et al.,1984).Phenolic, Flavonoids (quercetin, kaempferol, isorhamnetin, isoquercetin) derivatives include strong anti-fungal activity. Activity aligned with *Trichophyton spp.also Microsporum spp.* The antifungal activity of *Acalypha Indica L.* is statistically similar to antifungal drug ketaconazole. Thus they are able to exist used in cure of transmittable disease cause through veteran strain as well as latent anti-microbial agent can exist prepared.

7. ANTI-INFLAMMATORY ACTIVITY

The anti-inflammatory activity was demonstrated in dosage needy approach. Utmost embarrassment through the methanolic extract is pragmatic by 250mg/kg body weight later than three hours of intake, which be compared with the drug phenyl butazone next to a dosage of 100 mg/kg body weight.

8. ANTIOXIDANT ACTIVITY

The antioxidant action of the extracts is examined through superoxide along with hydroxylradical scavenging action with outcome lying on lipid peroxidation. The extract shows considerable antioxidant action.

9. CONCLUSION

The current review shows the medicinal qualities of the plant with diverse bioactive compounds accountable intended for it. Pathogenic bacteria encompass developed the properties of resistance against various available antibiotics. The stem and leaf of *Acalypha Indica L.* have tremendous antibacterial activities against human pathogens. Therefore, from the decades plants had been used in traditional ways; further more pathogenic study should be carried towards examining the unemployed latent of the plant as they are cost effective with fewer side effects.

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