

Review Article

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## **MARJARA MOHINI (*ACALYPHA INDICA*) LINN. AND ITS THERAPEUTIC POTENTIAL IN TRADITIONAL MEDICINE IN SRI LANKA: A REVIEW**

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### **Abstract –**

Since, ancient time medicinal plants have been used as traditional remedies to treat numerous human illnesses. *Acalypha indica* is one of the weed medicinal plants used in Traditional medicine as remedies in various human organ systems. Almost every portion of the plant has its own medicinal value and pharmacological importance. Different types of secondary metabolites in the plant play an important role in treatment and prevention of many diseases. It can be used for manufacturing medicines in present pharmaceutical industry. This review article aims to provide a review on therapeutic value of *A. indica* in various Traditions. This plant widely used in Traditional systems in Sri Lanka including Ayurveda, Siddha, Homeopathy and Indigenous Medicine. According to the analyzed data, it possesses best pharmacological actions in wound healing effect, anti-venom property and anti-fertility activity. Many pharmacological studies of *A. indica* have been demonstrated for their anti-oxidant, anti-microbial, anti-inflammatory, anti-diabetic, wound healing, anti-venom and anti-fertility activities. It is effective in a wide range of clinical applications for the treatment of anthelmintic, cathartic, diuretic, emetic and expectorant. According to the system-based analysis, it is most effective in Respiratory and Gastrointestinal systems. It could be concluded that *A. indica* is one of the most important medicinal plants which possesses multifunctional effects in all the human organ systems in relation with Traditional medical systems practiced in Sri Lanka.

**Keywords:** *Acalypha indica*, Traditional medicine, Remedies, Pharmacology

## 1. Introduction

*Acalypha indica* is one of the herbal plants that contain important medicinal value used in traditional medicine. It belongs to Euphorbiaceae, a large family of flowering plants. Majority of the plant species are distributed in the Indo-Malayan region and tropical America. *A.indica* is an annual herb about 80cm high, a wild plant and commonly found in waste places or fields. For a long time, this plant has been used as a traditional medicine of various countries for various human illnesses.<sup>[1]</sup>

Herbal medicines have been playing a major role in treatment and prevention for various diseases and physiological conditions in Traditional methods practiced such as Ayurveda, Siddha, Unani, Homeopathy and Indigenous Medicine. This treatment method also called conventional treatment are gradually vanishing since the previous generations are getting older and dying without passing their knowledge to the next generation and the minor enthusiasm of new generation to develop the conventional method.

This study was done to analyze the therapeutic value of this plant as a traditional remedy in all the traditional systems. As a weed plant it gives lots of benefits in all the human organ systems as a multifunctional herbal medicine. It could be an opportunity in the manufacturing field to produce a modernized multifunctional herbal dosage form without damaging its original traditional therapeutic potential.

## 2. Experimental/ Review

### Historical background

The historical era of Indian medicines chiefly on medicinal plants are available from Vedic period for total coverage of historical aspect. It has been divided into four eras namely;

- i. *Veda kala*
- ii. *Purana kala*
- iii. *Samhita kala*
- iv. *Nighantu kala*

When consider about *Veda*, *Purana* and *Samhita kala* no any descriptions about *Marjaramohini* available. But, in *Nighantu* period firstly references of *Haritamanjari* is found in Bhava prakasha nighantu, where Dr. Chunekar has briefly explained the drug *Haritamanjari* in parishista.<sup>[2]</sup>

**Synonyms:** This plant is described through various synonyms according to its physical characters, properties, actions, habitat, therapeutic uses and specific natural characteristics.

*Marjaramohini, Dadara, Muktavarcha, Aristhamanjari, Rudra, Kuppi, Haritamanjari, Arittamanjariye*

*Marjaramohini:* which bewitches the cats

*Dadara:* Useful in *Dadru vikaras* (Skin diseases)

*Kuppi:* Useful in *Kapha vikaras* (Phlegm)

*Haritamanjari:* Inflorescence is green color

*Rudra:* Spouse of *Ishwara*

*Muktavarcha:* Laxative [3]

## Taxonomy

Table 1. Taxonomic classification

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Malpinghials
Family	Euphorbiaceae
Genus	<i>Acalypha</i>
Species	<i>Acalypha indica</i>

## Vernacular names

Sanskrit: *Marjaramohini*

English: Indian Acalypha

Tamil: *Kuppaimeni/ Poonamayakki*

Hindi: *Khokali/ Kuppi*

Sinhala: *Kuppameniya* [4]

## Morphology



Figure 1. *Acalypha indica*

An annual herb, 30-75 cm tall, erect, branches numerous, long, ascending, angular, finely pubescent; leaves simple, alternate, 3.7-9 cm long, 2.8-7 cm broad, rhomboid-ovate, tapering at base, acute, serrate, glabrous, thin, somewhat 3-nerved at base, pale green, finely pubescent on veins beneath; petioles usually longer than the leaf, 2-9.5 cm long, slender, spreading, pubescent, stipules minute; flowers minute, green, unisexual, apetalous, monoecious, sessile or shortly pedicelled, in numerous, lax, erect, axillary spikes, each terminating in a swollen 2-fid apex bearing a seed; fruit capsule small, concealed by the large bract, consisting of three, 2-valved, crustaceous cocci: seeds brown, glabrous, conical, about 1.4mm long.<sup>[3]</sup>

## Distribution

Occurs in the hotter parts of India, Ceylon, Malaya, Burma, Philippine Islands, Polynesia and tropical Africa. In Ceylon, it is a common weed in cultivated and waste ground in the low-country specially, in the dry regions.<sup>[4]</sup>

## Chemical composition

*A. indica* is composed of carbohydrates, lipids, proteins and vitamins as nutrients while as phytochemicals Acalyphamide, Acaindinin, Gallic acid, Caffeic acid, Cysteine, Ferulic acid, Resin, Acetonylgeraniin, Aurantiamide, Corilagin, Stigmasterol, Syringic acid, Tectoquinone and 3,3' Methylene bis in various parts of the plant.<sup>[5]</sup>

## Pharmacological actions <sup>[6]</sup>

1) Analgesic: It is proven that *A. indica* has analgesic properties using hexane extract using writhing reflex method.

- 2) Wound healing: The ethanolic extracts of *Heliotropium indicum*, *Plumbago zeylanicum* and *Acalypha indica* were tested for their wound healing effect in mice. Topical application of total plant ethanolic extract on wounds in rats shown that healing of excision wound per day was 18% while breaking strength of incision wound was 279.75g.
- 3) Anti-oxidant activity: According to the in-vitro studies, plant indicated anti-oxidant potentiality. It was identified as good scavenging in several studies.
- 4) Anti-cancer activity: It was identified as Anti-cancer for methanolic extract of leaves on lung cancer, skin cancer and breast cancer and prostate cancer cell lines.
- 5) Anti-venom properties: The ethanolic leaf extract shown the significant inhibition to *Viper russeli* venom induced lethality, hemorrhage, necrotizing and mast cell degranulation in rats.
- 6) Post coital infertility activity: Four successive solvent extracts of the whole plant were identified for post coital activity in female albino rats.
- 7) Neuro-protection and neuro therapy effect: Neuroprotection effects of extract was determined by the ability of the muscles to show the electrical response after incubating with pancuronium bromide for 10 minutes and after incubating with extracts for 10 minutes for neuro therapy effect.
- 8) Anthelmintic activity: Anthelmintic activity of alcoholic extract of roots were evaluated using *Pheretima posthuma* as test worm and it showed best results.
- 9) Anti-diabetic activity: Decreased blood glucose level of the tested animals shows that the extract exhibit significant anti-diabetic activity when compared to diabetic control group.
- 10) Anti- microbial activity: Leaf extracts were tested for in-vitro anti-microbial activity against *E. coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Salmonella typhus*, *Bacillus subtilis* and fungi including *Candida albicans* and virus including *Herpes simplex*.
- 11) Anti- inflammatory activity: The ethanolic extract of plant showed the potent anti-inflammatory activity in tested animals.
- 12) The cardioprotective property: The ethanolic extract protected the myocardium by decreasing total cholesterol, triglycerol, low-density lipoprotein cholesterol, very low-density lipoprotein cholesterol, fatty acids and phospholipids, and by increasing high density lipoprotein cholesterol in plasma, hepatic and cardiac tissues.

***Acalypha indica* in Ayurveda**

Properties and Actions:

Table 2. *Pancha padartha and Karma* (Five properties and actions) <sup>[7]</sup>

<i>Rasa</i> (Taste)	<i>Tikta, Katu</i>
<i>Guna</i> (Quality)	<i>Laghu, Ruksha</i>
<i>Virya</i> (Potency)	<i>Ushna</i>
<i>Vipaka</i> (Metabolism)	<i>Katu</i>
<i>Doshaghnata</i> (Effect on <i>Thridosha</i> )	<i>Pitta-Kaphashamaka</i>
<i>Karma</i> (Actions)	<i>Krimihara, dadruhara, Kaphahara, Vibhandhanasha, Shoolahara</i>

Preparations: Infusion of roots, powder, decoction, juice, tincture and liquid extract

Uses:

Table 3. Remedies in Ayurveda <sup>[8][9][10]</sup>

Indication	Pharmacological action	Treatment
Constipation	Laxative	Leaf powder or decoction
		Leaf paste made into a ball and inserted into the rectum in children
Scabies	Anthelmintic	Application mixed with garlic
		Fresh leaf juice
Rheumatoid arthritis	Anti-inflammatory	Application mixed with oil forms
		Application with lime and onion
Croup in children	Emetic	Expressed leaf juice one teaspoonful
Chronic bronchitis, Asthma	Expectorant	Expressed leaf juice

Ear-ache	Analgesic	Decoction as Instillation or fomentation around ear
Wounds	Wound healing	Cataplasm of bruised leaves applied to syphilitic ulcers, maggot eaten ulcers
		Dry leaf powder for bed sores
Snake bites	Analgesic	Cataplasm of bruised leaves application
Congestive headache	Analgesic	A piece of cotton soaked in extracted juice of plant/leaf inserted into each nostril

### ***Acalypha indica* in Siddha Medicine**

Properties and Actions:

Table 4. Properties and actions in Siddha Medicine <sup>[11]</sup>

<i>Suvai</i> (Taste)	<i>Kaarpu</i> (Bitter)
<i>Veeriyam</i> (Effect during digestion)	<i>Kaarpu</i>
<i>Pirivu</i> (Post digestive taste)	<i>Kaarpu</i>
Actions	Diuretic, Emetic, Anthelminthic, Anodyne, Cathartic, expectorant, Emmenagogue

Medicinal Uses:

Table 5. Remedies in Siddha Medicine <sup>[12]</sup>

<b>Indication</b>	<b>Pharmacological action</b>	<b>Treatment</b>
Worm infestation	Pels the worms	1-2 tablespoonfuls of juice/ decoction of leaves or root decoction
Body ache	Analgesic	Application of juice of leaves boiled with gingelly
Scabies	Anthelminthic	Application of leaves ground with salt
Painful arthritis	Anti-inflammatory	Paste of leaves along with lime

Ulcers and poisonous bite	Wound healing	Leaf paste with manjal
Headache	Analgesic	Application of leaf juice
Bed sore	Anthelmintic	Bandaging dried leaf powder
Eye infection	Antibiotic	Leaf sap as eye drop
Constipation	Purgative	Decoction of roots/leaves or in powder form or leaf infusion
Maggot infested wound	Wound healing	Leaf powder
Syphilitic ulcers	Wound healing	Poultice of bruised leaves
Induce purgation	Cathartic	Root bruised in water

### ***Acalypha indica* in Homeopathy**

The plant has specific actions in Gastrointestinal system and Respiratory system, which is indicated in incipient phthisis with hard racking cough, bloody expectoration, arterial hemorrhage but afebrile. It gives strength for morning weakness and progressive emaciation. For children suffering from obstinate constipation leaves are used as suppositories. Leaf juice is applied in scabies and crust disease. Juice mixed with onion and lime is used in rheumatism. The juice along with cotton is inserted into each nostril.<sup>[13]</sup>

### ***Acalypha indica* in Desheeya Cikitsa (Indigenous Medicine)**

Prepared Medicines:

*Grahani Vajrakanthi Guliya*

*Mandam Guliya*

*Vasa Guliya*

*Mandam Ateesara Guliya*

*Vireka Thaila*

*Rathnamegha Thaila*

*Anupana for Buddharaja Kalka*

*Anupana for Seetarama Vati* <sup>[14]</sup>



Uses:

Table 6. Remedies in Indigenous Medicine <sup>[15][16][17]</sup>

Indication	Pharmacological action	Treatment
Wounds	Wound healing	Paste of leaves
Constipation in infants	Laxative	Leaf pastes as rectal suppository
Pain	Analgesic	Oil boiled with leaf juice, red onion and lime
Dysuria	Facilitate urination	Leaf pastes as plaster in lower abdomen
Phlegm/ Asthma	Expectorant/ Bronchodialator	Leaf juice with water
Worm infestation	Eradicate worms	Leaf boiled with garlic
Tonsillitis	Expectorant	Application of leaves, <i>Mee aratu</i> and <i>Pushkara</i>
Cough	Cough suppressive	Leaf juice
Convulsion	Anti-convulsant	10 drops of <i>surasava</i>
Induce vomiting	Emetic	Leaf juice

### 3. Results

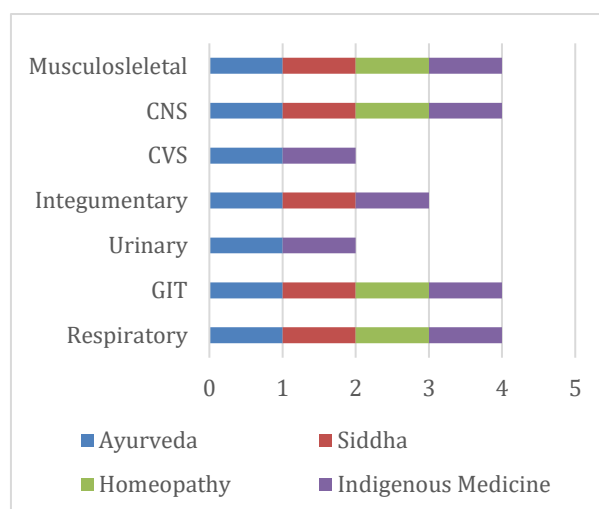


Figure 2. System wise application of *Acalypha indica* in Traditional Systems in Sri Lanka

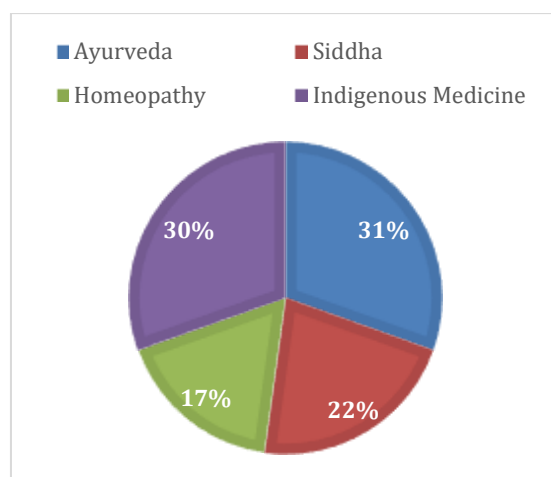


Figure 3. Percentage of Usage

#### 4. Discussion

*Acalypha indica* is one of the medicinal plants which has an important therapeutic value used in Traditional Medical Systems used in Sri Lanka such as Ayurveda Medicine, Siddha Medicine, Homeopathy and Indigenous Medicine.

According to Ayurveda, *Marjara mohini* (*A. indica*) is included in *Amalakyadi Varga* in Bhavaprakasha Nighantu in Bhavamishra. In Nighantu, plant morphology, properties and synonyms have been described. As mentioned about its *pancha padartha* (five properties) it is *pittakapha shamaka* in *doshaghnata*. Therapeutically, it can be used externally as *Twakdosha hara* (Skin infection), *Krimihara* (Worm infestation), *Dadrughna* (Ezema), *Kandughna* (Pruritis) and internally used in *Vibhandha* (Constipation), *Karna shoola* (Ear ache), *Shirahshoola* (Headache) Respiratory disorders like whooping cough, bronchitis, asthma etc.

According to the analysis of therapeutic value based on various Traditional medical systems used in Sri Lanka, it possesses pharmacological actions in all the systems in various percentages including Respiratory system, Gastro intestinal system, Urinary system, Integumentary system, Musculoskeletal system, cardiovascular system and Central nervous system.

Gathered data revealed that Gastrointestinal, Respiratory, Central nervous and Musculoskeletal systems possess same percentages in all the traditions while others showed different percentages. According to the analysis, *A. indica* is most potent in Respiratory and Gastrointestinal systems.

## 5. Conclusion

The literature study conducted on *Acalypha indica* indicated the immense therapeutic potential as a traditional medicine used in the treatment of conditions such as wounds, cough, asthma, inflammatory conditions, diabetes, malaria, cough etc. It is effective as anti-oxidant, emetic, cathartic, anti-microbial, anti-inflammatory, anti-diabetic, wound healing, anti-venom and anti-fertility medicine. Analyzed data revealed that, it is most effective in Respiratory and Gastrointestinal systems while effective in Urinary, Integumentary, Musculoskeletal, Cardiovascular and Central Nervous Systems as various remedies in various traditions. Finally, it can be concluded that *Acalypha indica* is one of the most important medicinal plants which is used in all the Traditional medical systems practiced in Sri Lanka.

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