

Therapeutic Potential of Euphorbia Hirta: A Review

Dillibabu. V¹, Dr. J. Karthi²

¹Dept of pharmacy

²Dept of Pharmacognosy

^{1,2} Pallavan Pharmacy College, Kanchipuram.

Abstract- *Euphorbia hirta*, also referred to as garden spurge or asthma weed, is a medicinal plant that has been used traditionally for a very long time in many different cultures. This herbaceous plant is native to tropical climates and is a member of the Euphorbiaceae family. *Euphorbia hirta* is known to have certain medicinal benefits. *E. hirta* is found in hotter regions of Australia and India, usually in roadside waste areas. The chemical composition of *Euphorbia hirta* includes flavonoids, alkaloids, tannins, and triterpenoids. India is well-known across the globe for its Ayurvedic medicine. *Euphorbia hirta* has been traditionally used to treat a variety of conditions, including Respiratory, gonorrhoea, dysentery, jaundice, acne, worm infestations in youngsters, feminine diseases, and digestive issues and tumours. It has various uses, including antibacterial, antifungal, anticancer, antimalarial, antiamoebic, antidiarrheal, antispasmodic, anti-inflammatory, antifungal, antifertility, and antiasthmatic activity.

Keywords- *Euphorbia hirta*, asthma plant, Respiratory, gastrointestinal, antioxidant.

I. INTRODUCTION

Herbs' natural and holistic features have made them more significant in today's trends. A growing number of people are adopting plant-based diets, looking for natural items to replace manufactured ones, and using herbal therapies for overall wellness. Herbs' increasing significance in modern lifestyles can be attributed to their versatility in cosmetics, culinary arts, and therapeutic applications. *Euphorbia hirta*, sometimes referred to as "garden spurge" or "asthma plant," is unique for a number of reasons. Its therapeutic qualities have been utilized historically in many civilizations, especially for the treatment of respiratory ailments like bronchitis, asthma, and coughing. The herb has antibacterial, antiviral, and anti-inflammatory qualities. *Euphorbia hirta* is also recognized for its potential use as a diuretic and in the treatment of gastrointestinal problems and skin conditions. Because of its adaptability in conventional medical systems, scientists are now interested in studying its pharmacological characteristics and therapeutic applications. In traditional herb medicine, *Euphorbia hirta* is a highly sought-after herb. It is used as an infusion or decoction to treat a wide

range of conditions, such as intestinal parasites, peptic ulcers, diarrhea, heartburn, vomiting, amoebic dysentery, asthma, bronchitis, hay fever, laryngeal spasms, emphysema, coughs, colds, kidney stones, menstrual issues, sterility, and venereal diseases.¹ Reduced sugars, terpenoids, alkaloids, steroids, tannins, proteins, lipids, oils, gums, mucilages, glycosides, saponin, coumarin, cardiac glycosides, anthroquinones, flavonoids, and phenolic chemicals were found in *Euphorbia hirta* when it was subjected to a phytochemical screening.² Anti-inflammatory, antioxidant, antitumor, antidiabetic, and free radical-scavenging properties have also been reported for the plant. Other uses include antiallergic, analgesic, anti-anaphylactic, sedative, antiarthritic, antidiarrheal, and spasmogenic properties. GI tract, immune system stimulation, sperm motility, burn wound healing, antithrombocytopenic, diuretic, genotoxic, synergistic, immune-promoting, antiviral, anti-helmentic, antimalarial, antimicrobial, and herbicidal larvicidal and anti-molluscidal properties.³ The chemical components, pharmacological properties, and therapeutic potential of *Euphorbia hirta* will be highlighted in the current review.



Euphorbia hirtalinn.

Taxonomical classification:

Kingtom	Plantae
Class	Magnoliopsida
Order	Malpighiales
Family	Euphorbiaceae
Genus	Euphorbia
Species	hirta
Division	Tracheophyta

Vernacular names:

Tamil	Amampatcharishi
English	Asthma weed
Hindi	Dudhy
Sanskrit	Dugadhika
Bangladesh	Barokerui
Marathi	Govardhan
Gujarat	Dudeli
Orissa	Jhotikhuntian
Malaysia	AmbinJanyan

Botanical description:

Leaves: Short petioles and serrated margins characterise the oppositely oriented, oval to oblong leaves.

Stem: Up to 40 cm in length, hairy and slightly succulent stems

Inflorescence: Cyathia, which are spherical structures with a cluster of little greenish-yellow flowers in them.

Blooming: All year round, reaching its zenith in the warmer months.

Fruits: seed-containing capsules with three lobes.

Hairs: The plant has a little rough texture due to its fine hair covering.

Distribution: *E. hirta*s distributed throughout the hotter parts of India and Australia, often found in waste places along the roadsides.⁴ The plant is also distributed some of the places in Northern America, southern America, Africa, Asia and Australia.⁵

PHYTOCHEMICALS: The plant's ethanolic and methanolic leaf extracts shared many of the same chemical components, including proteins, lipids, oils, gums, and mucilages as main metabolites, as well as alkaloids, flavonoids, and Secondary plant metabolites include terpenoids, tannins, phenols, steroids, glycosides, saponins, and coumarins. amino acids, Anthraquinones and sugars were not found. Aqueous extract, on the other hand, seemed to have the components such as proteins, sugars, tannins, phenols, steroids, saponins, amino acids, and anthraquinones.⁶

class	Name of the compounds	Reference
Flavonoids	Quercetin, quercitrin, quercitol and derivatives containing rhamnose, quercetinrhamnoside, a chlorophenolic acid, rutin, leucocyanidin, leucocyanidol, myricitrin, cyaniding 3,5diglucoside, pelargonium 3,5-digucoside and camphol, flavonol, inositol, tetraaxerol. B-sitosterol and Kaemferol.	Nyeem MA 2017(7)
Terpenoids	Titerpenoids, α -amyrin, β -amyrin, friedelin, teraxerol, and its esters-taraxerone, 11 α , 12 α -oxidoteraxerol, cycloartenol, 24methylene-cycloartenol, euphorbolhexacosonate.	Nyeem MA 2017(7)
Tannins	Dimeric hydrolysable dehydroellagic tannins, euphorbins A, B, E and terchebin, the monomeric hydrolysable tannins geraniin, 2,4,6-tri-o-galloyl- β -D-glucose	CNyeem MA 2017(7)
Acids	Ellagic, gallic, tannins, maleic and tartaric acids.	Nyeem MA 2017(7)
Essential oil	3,7,11,15-tetra methyl-2-hexadecan-1-ol, 6,10,14trimethyl-2pentadecanone, hexaacanal, phytol.	Nyeem MA 2017(7)
Sterols	EuphorolHexacozoneate, sterols cycloarternol, 24-methylenecycloarternol, β -sitosterol, 1-hexacosanol, campesterol,	Vazquez MM1999(8)

Marketed dosage form of euphorbia hirta

EUPHORBIA HIRTA POWDER

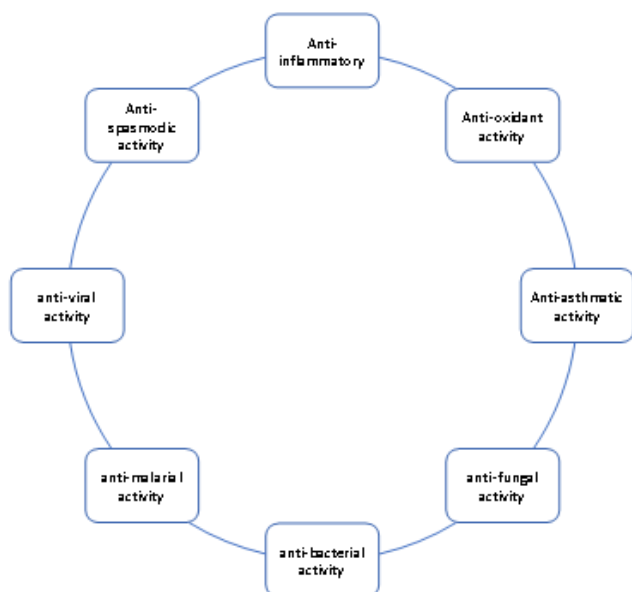
How to use: Amman Pacharisi (Euphorbia hirta)

- Morning mix 5gms of powder in 100ml water, boil the content for a few minutes once the water gets warm, filter the content.
- Dosage: after dinner.

Side effects:

- Nausea and Vomiting
- When applied onto skin it causes skin irritation and allergic reaction.
- During pregnancy and breast breeding it is unsafe to take, it may cause uterus contraction.

PHARMACOLOGY:



- **Anti-malarial activity:** extracted bioactive saponin from the native Euphorbia hirta plant that has larvicidal effects on mosquitoes. *Culex quinquefasciatus* was evaluated against the bioactive saponin that was isolated. Mosquito larvae in their second and fourth instars were exposed to four distinct levels of bioactive saponin. 24-hour LC50 additionally LC90 values were ascertained by means of the probit analysis technique. The obtained data indicates that the bioactive component of the IVth instar larvae of Euphorbia hirta were more susceptible to them.

Compared to larvae in their instar.9 examined the antimalarial properties of E. hirta's isolated flavonol glycosides, myricitrin, and quercitrin. The findings showed that these distinct substances demonstrated

inhibition of growth of Plasmodium falciparum at different focal points.¹⁰

- **Anti-fungal activity:** Using the checkerboard method, the antifungal activity of the methanolic extract of E. hirta leaf against *Candida albicans* has been assessed. The outcome demonstrated that a blend of the extract and antifungal medication (Nystatin) may work in concert with action.¹¹
- **Anti-asthmatic effect:** a comparative ultrastructural analysis employing a mouse model of Babesia-cili asthma to examine platelets and fibrin networks. Fibrin network ultrastructure and platelets from control and asthmatic mice that were given medication with two hydrocortisone concentrations and one concentration of plant matter. Control mice have significant, tight spherical platelets, minor, thin fibres, and thick fibres aggregates that generate pseudopodia. Asthmatic rodents has primary fibres encased in a net similar to secondary fibres and a Granular aggregates of platelets that are loosely linked. Both amounts of hydrocortisone increased the fibrin's platelet aggregate that is more granular and delicate, whereas Euphorbia hirta has no effect on fibrin fragility and stopped the tiny fibres from forming a thick layer that resembled a net over the main fibres.¹²
- **Anti-inflammatory activity:** A study revealed that Euphorbia hirta water extracts have strong and dose-dependent anti-activity related to inflammation in carrageenan rats were given a dosage of to develop edoema in a test 100 milligrammes by body weight in kg. The oil ethanol, methanol, chloroform, ethanolic, and Fruit extracts from water were examined for anti-inflammation in motion. The liquid and Decoctions made of ethanol revealed a maximum proportion of inflammation protection in contrast to other concoctions.¹³
- **Anti-diabetic activity:** In streptozotocin-induced diabetic mice, the antidiabetic potential of an ethanolic extract derived from the leaves, flowers, and stem of Euphorbia hirta was examined. On the fifteenth day of the trial, oral treatment of all extracts significantly reduced the blood glucose level [99]. Ethylacetate with ethanol extract Fractions exhibited activity inhibiting α -glucosidase. In vitro and in vivo tests revealed that Euphorbia hirta the anti-diabetes mechanism of ethanolic extract and ethyl acetate was linked to their antioxidant ability and to α -characteristics that block glucosidase.¹⁴
- **Anti-bacterial activity:** *Bacillus subtili*, *Staphylococcus aureus*, *Escherichia coli*, and *Pseudomonas aeruginosa* were all suppressed in growth by the ethanolic extract of E. hirta, and *Klebsiella pneumonia* was inhibited by the aqueous and chloroform leaf extracts of the same plant. Both bactericidal and noncytotoxic. ^{15,16}

- **Anti-anaphylactic activity:** It was discovered that *E. hirta* sethanolic extract had strong antianaphylactic properties. In rats, *E. hirta* prevented both active and passive cutaneous anaphylaxis (PCA). Mice with paw anaphylaxis. The inhibitory impact *hirta* was noted in the TNF- α and IL6 released from Peritoneal mast cells in rats were stimulated by anti-DNP-HAS. The current study's findings clearly corroborate the conventional application of *E. hirta* as a herbal remedy for Type I allergies-related conditions.17

II. CONCLUSION

The *euphorbia hirta* leaf extracts have a wide range of pharmacological actions and show promise for use in traditional medicine. Additional research can be conducted based on the numerous other traditional uses of *E. hirta* in Ayurveda. Researchers would undoubtedly benefit from this paper in learning about its various qualities. Because of its safety and efficacy, the current article reviews the pharmacological and phytochemicals of this plant.

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