

Hemigraphis colorata-A pharmacological Review

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Abstract- *Hemigraphis colorata* (Synonym: *Hemigraphis alternata*) is a tropical perennial herb chiefly grown as an ornamental indoor and outdoor plant, because of its attractive and vivid foliage. In folk medicine, the leaves are ground into a paste and applied on fresh cut wounds to promote wound healing and used to treat anaemia. Traditional knowledge regarding the use of this plant differs, but the scientific study available to support this knowledge is very limited. This literature review was intended to recapitulate the main pharmacological activities of *Hemigraphis colorata* are in wound healing, ulcers, inflammation, diabetes mellitus and it is used to promote urination.

Keywords: *Hemigraphis colorata*, Wound healing, Leaf, Phytochemical

I. INTRODUCTION

Plants around us are a wide source of natural products for various therapeutic processes and play a major role in the treatment of human disease. *Hemigraphis colorata* (Acanthaceae), is a versatile tropical low-creeping perennial herb that reaches a height of 15 to 30 cm, which is a versatile and exotic plant adapted to India. It is a prostrate growing plant with spreading, rooting stems when grown on ground, with its stony leaves having slender and lance shaped with toothed, scalloped or lobed margins. They are grayish green stained with red purple above and darker purple beneath. Literally, *Hemigraphis* means 'half writing' because the filament of the outer stamen bear brushes. The plant is known by several names such as Aluminium plant, Cemetery plant, Metal leaf, Red flame Ivy, Waffle plant, Java Ivy etc. In Kerala, the plant is popular in the name 'murikootti' or 'muriyan pacha' because of its incredible potency to heal wounds. The therapeutic efficacy of medicinal plants is attributed to their bioactive components, which can be combined into contemporary medical systems to create novel drug formulations for medical conditions. Over the past few decades plant-derived phytochemicals and active components have played a major role in pharmaceutical drug discoveries and its development. Different parts of plants provide a variety of phytoconstituents, comprising primary and secondary metabolites like alkaloids, glycosides, tannins, saponins, resins, and gums, each of which has a specific relevance in terms of the potency.



Fig 1: Leaves of *Hemigraphis Colorata*

II. PLANT PROFILE

Scientific classification

Kingdom: Plantae
Phylum: Spermatophytic
Subphylum: Angiospermae
Order: Lamiales
Family: Acanthaceae
Genus: *Hemigraphis*
Species: *Colorata*
Synonym: *Hemigraphis alternata*

III. DISTRIBUTION

Hemigraphis colorata is a creeping herb native to Indonesia and Malaysia, distributed in tropical and subtropical countries like Asia, America, the Caribbean and many islands of the Indian and Pacific Ocean. It has been widely commercialised as an ornamental plant due to its attractive and vivid foliage of green and purple colour. Often planted as the carpet plant. Once rooted, the species spreads out to produce vast dense carpets that completely cover the understory of natural forests, replacing native flora in the process

IV. PHYTOCHEMICAL CONSTITUENTS

Phytochemicals are a group of secondary metabolites which provide the therapeutic property. They are of a long traditional history and have been utilised as ailments, dyes, and food additives. The plant is rich in both primary and secondary metabolites comprising

of phenols, saponins, flavonoids, terpenoids, coumarins, carbohydrates, carboxylic acid, xanthoproteins, tannins, proteins, alkaloids, steroids, and sterol. The phenolic acids such as chlorogenate, cinnamate, coumarate, gallate and ferulate present in the plant acts as pro-oxidants and exhibits free radical scavenging activity. The steroids and coumarins present in the extract provide anti-diabetes activity [9]. The crude leaf paste promotes excision wound healing. Overall studies suggests that the active constituent present in the *H. colorata* is β - Carotene

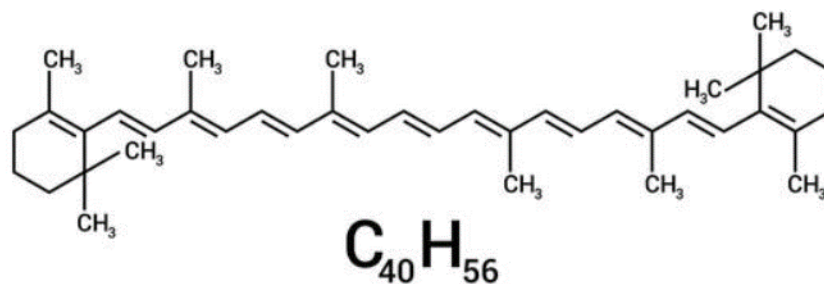


Fig 2: Structure of β -carotene

V. PHARMACOLOGICAL ACTIVITY

Antioxidant activity

The crude extracts indicated remarkable antioxidant activity in terms of DPPH free radical scavenging activity and ferric reducing potential, it also showed presence of significant polyphenolic content such as phenolic compounds, flavanols and flavanoids. The phenolic acids such as chlorogenate, cinnamate, coumarate, gallate, and ferulate present in the plant acts as pro-oxidants and exhibits free radical scavenging activity. Phenolic compounds are effective hydrogen donor which makes them a good antioxidant.

Antibacterial activity

The antibacterial study of ethanolic leaf extract of *Hemigraphis colorata* was determined by agar diffusion method and it shows antibacterial activity against *Escherichia coli* (-) and *Bacillus subtilis* (+). The antibacterial potential increase with increase in concentration of plant extract. The antibacterial activity against *Acinetobacter* species and *Streptococcus aureus* is shown by the benzene extract of *H. colorata* Leaves, which is due to the presence of phenolic contents in the plant extract which is due to the presence of phenolic contents in the plant extract.

Antidiabetic activity

The potential antidiabetic activity was reported with n-hexane and ethyl acetate extracts of *H. Colorata* against alloxan induced diabetic rats. The presence of steroids & coumarins in the plant extract is responsible for the hypoglycaemic and anti-diabetic effects.

Anthelmintic activity

Studies reported that the different extracts of *H. colorata* showed anthelmintic activity against Indian earthworms at different concentrations. It was found that standard Albendazole (80mg/ml) showed the action in 10minutes when compared with the fresh juice extract (80mg/ml) at 21 minutes.

Anti-cancer activity

The anti-cancer activity against Skin cancer cell line-A431 and Normal cell HEK-293 indicated cytotoxicity in a dose dependent manner in the extracts of *H. colorata*. It was proved that apoptosis and nuclear damage occurred as a result of cell toxicity.

Antinociceptive activity

The antinociceptive activity against formalin induced paw licking in mice were reported with methanol and ethyl acetate extracts of dried leaf of *H. colorata*, the results indicated that the extract were effective against both acute and late phases by inhibiting inflammatory mediators.

Wound healing activity

The crude leaf promotes excision wound healing. The report concerning wound healing properties of *Hemigraphis colorata* by in vivo methods and results encouraged the use of *Hemigraphis colorata* for the topical management of wound and in-depth study about the active constituents is necessary. Effect of *Hemigraphis colorata* on wound healing and inflammation studies in mice, the oral administration of extract was ineffective. The wound contraction and epithelialisation were faster in the leaf paste applied on mice.

VI. USES

Studies have been carried around the globe, to verify their efficacy of the herbal medicine. Traditionally, plants are important in the treatment of different ailments, due to its phytochemicals present in it. The fresh leaves are collected and ground into a paste and applied to wounds because of its incredible potency to heal wounds. The plant is used in the treatment of bloody dysentery, fungal infection, haemorrhoids and bacterial infections. The paste of these plant leaves has been used in treating fresh cuts, the juice of the fresh leaves is used as a coagulant in order to prevent blood lose, sometimes it is used as a oral contraceptives to prevent pregnancy. The plant *Hemigraphis colorata* is also known to be used for treating anaemia, gall stones, excessive menstruation and as a

contraceptive. In Vanuatu the sap of leaf buds are squeezed in water and drunk at dawn for 4 days as contraceptive and to induce sterility.

VII. CONCLUSION

Hemigraphis colorata is a versatile medicinal plant used traditionally from olden days in different parts of the world. The development of science and technology in the forthcoming years, may lead to the development of herbal drugs and also helps in the identification as well as isolation of different chemical entities. The recent study reveals the phytochemistry and pharmacological studies of *Hemigraphis colorata*. As this herb is mainly used to heal wound, but a proper phytochemical and pharmacological screening is essential which provides a new pharmacological avenue for this plant.

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