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Review on pharmacological activity of *Hemigraphis colorata* (Blume) H. G. Hallier

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ABSTRACT

Hemigraphis colorata (syn: *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 usage of this plant differs but the scientific study available to support this knowledge is much limited. This literature review was intended to recapitulate all the accessible information on *H. colorata* in a succinct form so that researchers, who are interested, get all about the medicinal potency of this plant at a glance.

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

1. Introduction

Hemigraphis colorata (Acanthaceae), an exotic plant adapted to India, is a versatile tropical low-creeping perennial herb that reaches a height of 15 to 30 cm. It prostrates and spreads with rooting stems when grown on ground, and on hanging baskets it cascades over beautifully. Literally, *Hemigraphis* means 'half writing' because the filament of the outer stamen bear brushes^[1]. 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 'murian pacha' because of its incredible potency to heal wounds. The leaf has metallic purple lustre on upper surface and a solid dark purple on ventral side. The leaves are opposite, ovate to cordate, serrate-crenate, about 2 to 8 cm long and 4 to 6 cm wide, bearing well-defined veins. It blooms irregularly throughout the year in the tropics. Flowers are small (1 to 1.5 cm diameter), five lobed, bell shaped with imbricate bracts. These are white in colour with faint purple marks within and appear in terminal 2 to 10 cm long spikes. Capsules are small, slender, oval, linear and light green in colour. Seeds are small, flat and white in colour^[2,3,4,5].

2. Ethnobotany

The health care system of the traditional population of India relies mainly on indigenous systems of medicine based on plants and plant extracts. Earlier, *H. colorata* was used to decorate aquariums and goldfish bowls. But the plant has the immense power to pacify vitiated pitta, fresh wound, cuts, ulcers, inflammations and skin complaints. In folklore, the leaf juice is applied directly on open wound to stop bleeding^[6]. In folk medicine, it used internally to cure anemia^[7]. Traditionally, the leaves are consumed to mend gall stones, excessive menstruation and as a contraceptive. In Vanuatu, sap of leaf buds are squeezed in water and drunk at dawn for 4 days as contraceptive and to induce sterility^[8]. In Java, leaves are used to treat bloody dysentery and haemorrhoids (piles). It is also credited with diuretic competence.

3. Phytochemistry and Pharmacology

Phytochemicals have been used as drugs, dyes, and food supplements from time immemorial. The phytochemicals are variety of secondary metabolites, with contributive curative property. The phytoconstituents present in *H. colorata* are phenols, saponins, flavonoids, terpenoids^[9], coumarins, carbohydrates, carboxylic acid, xanthoproteins, tannins, proteins, alkaloids, steroids and sterol^[10].

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The leaves of the plant contain flavonoids, polyphenols, tannins along with high potassium and low sodium levels; stem contains saponins and tannins, while roots contain flavonoids and polyphenols. These phytochemicals provide curative properties.

3.1 Anti-bacterial activity

Benzene extract of *H. colorata* leaves has showed its activity against *Acinetobacter* species and *Streptococcus aureus* [11]. Phenolic compounds found in the extract are responsible for the activity.

3.2 Anti-diabetic activity

The evaluation of hypoglycaemic and anti-diabetic properties revealed that the n-hexane and, to some extent, the ethanol extracts of the whole plant were found to lower the levels of blood glucose in glucose fed rats. The steroids and coumarins present in the extract provide anti-diabetes activity [7].

3.3 Wound healing activity

The crude leaf paste promotes excision wound healing [12, 13]. In mice, the leaf paste provides faster wound contraction and epithelialisation but oral administration is seen ineffective [14]. The excision and incision wound model studies revealed that methanolic extract is comparable to standard reference Vokadine [15]. The herbal scaffold made from chitosan was highly haemostatic and can be effectively applied for infectious wounds [16].

3.4 Anti-oxidant activity

Phenolic compounds are effective hydrogen donor which makes them a good antioxidant. 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 [17].

3.5 Miscellaneous activity

Volatile indoor pollutants created from paints, cleaning agents, odorants etc., can cause various ailments when people are exposed to them. Recently, *H. colorata* was scrutinized as one of the highest rated ornamentals which can remove harmful volatile organic compounds to improve the quality of indoor air [18]. When the plant is used in green technology to identify the potential plant to fight against sediment transport, it is found that this plant gives the least sediment loss value [19].

4. Conclusion

Hemigraphis colorata is a glorious medicinal plant used by the ethnic groups from time immemorial. But literature survey reveals our indifference towards this plant. A proper phytochemical and pharmacological study is the need of the hour, which shall open new pharmacological avenues for this magnificent plant. Such studies are crucial for clinical experimentation and in the development of novel drugs.

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