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A REVIEW ON *HEMISGRAPHIS COLORATA*

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ABSTRACT

Herbal plants are an important part of treating disorder in the medical system because they have been found to be very effective with minimal side effects, hence, most scholars are doing research on them worldwide. A specific mixture made by using medical herbs is now in place due to advancement in science and technology. This has helped to manage various diseases when they are used in the treatment process. despite the fact that people are discovering more every day as far as their utilization is concerned There are strong healing properties in many underappreciated plants that could save your life, the hidden benefits of medicinal plants I will discuss today. People in India know it as Red ivy, an alien plant which grows in India by the name of marginal revenue product (hemigragphizis colarata). This popular name is also called Waffle plant; Java ivy cemetery plant; Alumminium plant; Rted flame ivy; Metal leaf or simply Red ivy belonging to the plant family acnathaceae and botanical genus Hemigraphis. The plant is also called murikootti or murianpacha in its every day language. Since its primary traditional usage is in wound healing.[1] One of these plants, which is Hemigraphis colorata, is very important in medicine and have significantly influenced conventional medical therapy too. The plant has been used to treat bloody dysentery, bacterial infections, fungal infection, hemeroids and wound healing. Over and above this, a host of pharmacological studies in addition say that it is an excellent antibacterial, anti inflammatory, anticancer, antidiabetic, antidiarrheal treatments. Its various phytochemical ingredients like flavanoids, steroids, glycosides, tannins and alkaloids among others might be the driving factor behind such effects. The aim of this

existing review is to put together every single thing that is available now phytochemistry, traditional uses and pharmacological properties.[2]

INTRODUCTION

Plants are important sources of natural products for various therapeutic applications and extensively applied for human health care. Low spreading herbs or vines originate in tropical Malaysia. Hemigraphis Colorata grows horizontal on the ground, with its stems sprawling and spreading roots. The lance shaped leaves of this plant have wavy edges which may be toothed, lobed or notched. Their color is grayish-green, with darker purple undertones and reddish-purple highlights above. The word Hemigraphis literally means ‘half-written’ due to brushes on stamen filaments. Flowers of H. colorata bloom at any given time during the year in the tropics; they are small (1-5 cm across), bell-shaped and have five lobes of which the outer ones are overlappingly peeled-off bracts. These come since they have a length of between 2 to 10cm in their terminal spikes and have white coloration with faint purple marks in the inside. The seed has a white color flat and tiny as for the leaves ovate, cordate, serrate, crenate are between 2-8cm long and 6-4cm wide having obvious veins. It varies from grey green down to dark purple underside coloration but has a reddish purple shade on the upper surface (source).[1]

From time immemorial, people have used products from nature to survive maintain their health. The healing power of plants lies in their active chemicals this knowledge can be used in the design of new drugs that treat many different diseases when combined together with contemporary medicine principal Column. The significance of phytopharmaceuticals have been substantially immense in the development of pharmaceutical drugs over the last few decades. With regards to varying regions of the plants, they typically exhibit a broad spectrum of phytoconstituents consisting primary and secondary metabolites including alkaloids, glycosides, tannins, saponins, resins and gums, each of them possessing distinct pharmacological activity. "phytochemicals and active ingredients produced from plants have been crucial in the creation of pharmaceutical drugs throughout the last few decades. A range of phytoconstituents are found in different regions of the plants. These include primary and secoundary metabolites such as alkaloids, glycosides, tannins, saponins, resins and gums, each of which has unique potency." The importance of traditional plant’ active biological ingredients in agriculture and medicine has ignited scientific curiosity on their biological relevance among several scholars. It is therefore important that more research is done

focusing on their biological processes together with the principal phytochemicals for us to experience their true values or know what they really are. In this regard, today a number of traditional medicinal herbs have undergone extensive laboratory researches. treatments for a range of aliments have been replaced by the naturally occurring secondary metabolites and therapeutic plants.[2]

Figure 1: Hemigraphis colorata.

BOTANICAL DESCRIPTION AND GEOGRAPHICAL DISTRIBUTION

The common name of Hemigraphis colorata is metal leaf or tincture plant and it belongs to the family Acanthaceae. Found in places like Asia and the Caribbean as well as different islands in the Indian Ocean and Pacific Ocean including but not limited to Indonesia and Malaysia; this creeping herb can be seen at some tropical parts of the world. Due to its bright colored purple and green leaves which are highly attractive; many people plant it as an ornamental garden flower. These plants are frequently grown as carpets. Once they have taken root, they grow to form huge, dense carpets which completely cover the understorey of natural forests and replace the local vegetation.[3]

MORPHOLOGICAL CHARACTERISTICS

Hemigraphis colorata is a perennial herb which is adaptable and exotic. It reaches 15-30cm in height. The branches on this plant extend outward from the main branch by producing roots from their nodes or are just above the ground The reddish purple coloration is due to anthocyanin pigments present in epidermis cells while dark purple color appears beneath. These leaves have lanceolate shape with a pointed tip near the ground facing end of it being serrate, scalloped or lobed. Middle Right From these leaves, a cluster of minute white flowers emerges. This plant originally comes from Java but has caltivated in India.[2] Buried beneath the scaling purple, the leaves are a sparking silvery-dusty color ranging from 4-8 cm long.[4]

BOTANICAL CLASSIFICATION

Kingdom : plantae

Phylum : spermatophyte

Subphylum : Angiospermae

Class : Dicotyledonae

Order : scorphulariales

Family : acanthaceae

Genus : hemigraphis

Species : colorata

Synonyms : hemigraphis colorata, blechum cordatum, ruelia alternate, ruelia blumeana.[4]

vernacular names

Kannada : Tineture ghida

English : Red flame ivy, metal leaf, cemetery plant, aluminium plant, tincture plant

Sanskrit : vranaropani

Malayalam: murikooti.[5]

PHYTOCHEMICAL CONSTITUENTS

Phytochemicals have traditionally been used for food additives, colors, curing of diseases as well as many other uses. Phytochemicals is a class of secondary metabolites possessing medicinal properties, which are found in plants. The primary and secondary metabolites contained in plants range from carbohydrates, carboxylic acids, proteins, alkaloids, sterols, phenols, saponins, flavonoids, terpinoids, coumarins to tannins.[5] numerous investigations indicate that β-carotene is the primary chemical component found in H.colorata.[2]

CULTIVATION

The plant known as purple waffleplant (hemigraphis colorata) belongs to the acanthaccae family. The plant prostrate it grows on has spreading stems that are rooted. Its leaves have shapes that are slender and angular with serrated, scalloped or lobed margins that resemble stains; they are reddish purple on top and darker purple underneath, having a greyish green coloration throughout. It produces small white blossoms throughout every month of the year without any clear pattern of blooming. It can reach a height of 15 to 30 inches with a very wide spread that is boundless. According to folk medicine, this plant has really good healing properties. We would recommend that Hemsgraphis alternata 'Exotica' be planted in rich well-drained soils, as this is what our research revealed about it. Soils with waterlogged roots should not be left wet; they require consistent moisture and being well drained too when kept indoors so that they do not get completely soaked all times during summer months or winter seasons depending on whether its grown indoors/outdoors respectively For the Hemigraphis colorata 'Narrow leaf', bright indirect light is the best place for its growth.

To prevent the leaves from being burned, it is necessary to place the terrarium where there is moderate to intense light, for example, near the window that allows filtered sunlight. A decorative plant that can be used for interior and exterior decoration due to its beautiful leaves. It is native to tropical Malaysia, south-east Asia and grow n in Manila 14.[6,10]

Soil texture > light
Soil texture>medium
Soil reaction>neutral
Soil drainage>free

RAINFALL

Average annual rainfall low: 1500mm high:3000mm
Description-mm; lower/upper bounds
Description of dry season duration : number of consecutive months.

AIR TEMPERATURE

Average annual temperature lower limit 17c upper limit 30 c.

Climate type and description

Af-tropical rain forest climate>60mm prescription per month

Am-tropical monsoon climate tropical monsoon climate (<60mm rain in driest month, but > (100-[annual rain (mm}/25]))

As -tropical savanna climate in dry summer <60 mm rain in most dry month (summer) and < (100-[total annual rain {mm}/25])

Aw- tropical wet and dry savanna climate <60mm precipitation in the direst month (winter) and < (100-[100-[total annual rain {mm}/25]).[7,8,9]

COMMON USES

Despite numerous medicinal uses attributed to the plant, not all of them have been scientifically proven. In order to stop bleeding, leaf juice is squeezed directly into the wound.[10] Its common practice administration aims at treating anemia. In addition, leaves serve as a birth control and cure for gallstones and normally dealt with heavy bleeding during periods.[11,12] In Java, they are used for treating piles and bloody linings on the intestine walls while the whole plant of h.colorata is used.[7]

TRADITIONAL USES

From time immemorial plants have been used in medicine. They contain a host of phytochemicals which have medicinal properties. Since the inception of global research, investigations have been carried out to ascertain their effectiveness and some results have prompted the making of drugs. In treating wounds, h.colorata leaves from south india are used. The plant also has been traditionally used to treat hemorrhoids, bacterial infections and bloody diarrhea, fungal infections and other illness.[5,13] It is believed that the leaves of this plant cure skin conditions too. Freshly extracted leaf juice is used to clot blood hence stopping flow when there is any cut with a sharp object like knife; mashed parts also are applied on open wounds for quick healing. In addition, Hemigraphis colorata is sometimes utilized to prevent pregnancies by inhibiting conception; moreover it can act as a remedy for gallstones, anaemia, heavy menstrual flows through suppressing them completely at one go or gradually over time in the case where they are too severe; this contraceptive action is made possible through the regulation of hormones involved in causing menses.[4] It is also known that Hemigraphis colorata is used for the treatment of anaemia, gallstones, and heavy menstruation as well as a contraceptive.[13]

ANTI OXINDANT ACTIVITY

The dried leaves of h.colurata were found to possess powerful anti-oxidant activity when extracted with n-hexane, acetone, chloroform and ethanol.[14] the in vitro anti-oxidant

potential of hemigraphis colorata leaf has been studied through DPPH radical scavenging assay and reducing capacity; these molecules possess strong anti-oxidant activities as they act as good hydrogen donors. Increasing the number of samples enhanced the reducing power of hemigraphis colorata aqueous and ethanolic extract. A significantly raised percentage of radical scavenging activity was noticed with the increase in extract concentration.[15]

ANTI INFLAMMATORY ACTIVITY

It was noticed that H. colorata had some flavonoids in its leaves which were tested against carrageenan-induced paw edema for their anti-inflammatory properties. As a result of this experiment, it was concluded that flavonoids in the test drug produce its strong anti-inflammatory effects.[16] An in vitro experiment using the HRBC membrane stabilization technique was done. Therefore, it is probable that the inclusion of flavonoids, phenols and tannins might be responsible for the observed anti-inflammatory activity of H. colorata extract.[15]

WOUND HEALING ACTIVITY

The methanolic extract of hemophila colorata has medicinal properties in wounds caused by escherichia coli and klebsiella pneumoniae as a result of its antioxidant present in the concentration formed by the trial dilution (25–100 µg/ml). the action might be due to the presence of antioxidants.[17] There leaf paste which is unrefined aids in the healing of excised wounds better than the untreated control. According to one research finding, hemigraphis colorata leaf's paste enhances quicker wound contraction and epitheliazation amongst rats than in control group. Bandage that has hemigraphis colorata leaf paste was found to enhance faster wound contraction than control group in one experimental setting.[11,12,18] Within a few hours post-application, drug that was used in healing can be found at h.colorata on the wound site as it helped in stopping its discharge from affected part. Antisepic property of leaf preparation is almost similar in efficiency to povidone-iodine. Wound healing activity of hemigraphis colorata.[1,14,19]

ANTI-DIARRHOEAL ACTIVITY

The H.colorata extracts in methanol as well as ethyl acetate are able to inhibit diarrhea on a castor-oil induced mouse model of anti-diarrhea. This therapy increased the period before diarrhea started and decreased the severity of fecal material excretion in a dose-response manner.[2]

ANTI BACTERIAL ACTIVITY

Researchers found that benzen extract from the leaves of H. colorata had potential anti-bacterial activity against streptococcus aureus and attributed it to the fact that it contained phenolic compounds.[20]

In-vitro bactericidal effectiveness in crude water, acetone, benzene, chloroform, ethanol, and petroleum ether were quantitatively assessed using zone of inhibition for the hemigraphis colorata leaves and stem extracts regarding H.colorata ethanolic extract anti-bacterial properties against k.pneumonia since this plant consists of some chemicals therefore it's ethanolic extract from leaves or stems will inhibit the growth of bacterium's typhi. The H.colorata stem and leaves' ethanol extract can suppress B. cereus, while the petroleum ether extract of H.colorata showed moderate activity on pathogens. The agar diffusion method was used to test the antibacterial effect of hemigraphis colorata's ethanolic leaf extract on S. Marcescens.[20,21]

ANTI DIABETIC ACTIVITY

Results from the 100mg/kg body weight of rats dosage study revealed that the H. colorata extracts in n-hexane and ethyl acetate might have potential anti-diabetic effects on alloxan-induced diabetic rats whereas they suggested that these effects could be ergosteronic and coumarinic in nature. The hypoglycemic and anti diabetic potential of H. while using the glucose tolerance test, Wister rats and swiss albino mice were first investigated by means of this plant. After researching glucose-treated rats, it was established that the ethanol and n-hexane extracts from the whole plant reduces blood sugar. The main reason for the hypoglycemic and antidiabetic activities of the plant extract is the presence of steroids or coumarins.[7]

"The anthelmintic efficacy of H.colorata (40 mg/ml) extracts vary across the breeds against Indian earthworms (pheretima posthuma) at doses of 20 mg/ml, but the anthelmintic activities of albendazole (80 mg/ml) at 10 minutes and 21 minutes are standard. It is conceivable that the ethanolic and aqueous extracts at 43 and 28 minutes respectively may be more potent concentrations.[22]

ANTI - CANCER ACTIVITY

The anti-cancer property of skin cancer cells suggested by H. colorata is particularly directed at A-431. Its cytotoxicity towards normal cells such as HEK-293 is dose-dependent hence

indicating that the nuclear alteration and apoptosis were the primary causes of cell mortality.[23]

ANTINOCICEPTIVE ACTIVITY

The methanol extract was shown to have potent antinociceptive activity against formalin induced paw licking model of analgesic response in mice. Inhibitory action on inflammatory mediators was found to be the mechanism of action of the extracts. As per writing test using acetic acid as irritant, it significantly suppressed writhing. This could be explained through inhibition of endogenous mediators. "The medication significantly reduced writhing activity in mice who underwent acetic acid-induced writhing test – perhaps due to inhibition of endogenous mediators or blocking of prostaglandin pathways."[24]

MISCELLANEOUS ACTIVITY

However, H. colorata-multifarious pharmacological effects due to its phytoconstituents. Additionally, it can be employed for other things as well. Measurements of mass loss, ultraviolet-visible (uv) spectroscopy, plus other methods were used to find out whether or not mild steel corrosion in 1M HCL (303K-323K).[25] Additionally, H colorata nanoparticles play a vital function in the bioremediation of waste water.[26,27]

CONCLUSION

In India and across the globe herbal medicines have been more popular than allopathic therapy nowadays because they are more effective and have fewer side effects. The progress of scientific areas related to pharmaceuticals could lead into development of new forms of herb drugs together with identification and extraction chemicals from herbs for medicinal use. The primary factors that contribute to the pharmacological effect of herbal plant material are phytoconstituents or secondary metabolites. Hemigraphis colorata‘s phytochemical patterns were examined as well as its bioactivities such as antimicrobial, anti-inflammatory, antidiarrheal, antidiabetic, analgesic and hemostatic activities as well as anticancer, antioxidant and anthelmintic activities. In addition, there were other random properties identified in it such as being a strong insect repellant.[2]

One way in which many human diseases are treated is with plant life. The synergistic effect between more than one chemical component resulting in several physiological sites being affected is responsible for the effective medicine properties existing in various plants which serve this purpose. Among plants used by healers in the south Indian tribal areas of India,

Hemigraphis colorata of the Acanthaceae family may be valuable. The plant contains a number of active ingredients, such as coumarins, sterols, sugar, phenols and flavonoids. These constituents make it useful for various purposes like treatment for anemia, diabetics, haemorrhoids as well as remedy for the urinary tract disease and gallstone.[1]

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