Review Article

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BIOLOGICAL EFFECTS OF HEMIGRAPHIS ALTERNATE–A REVIEW

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Abstract

Hemigraphis alternate (Acanthaceae) is a tropical perpetual spice essentially developed as an elaborate indoor and open air plant, as a result of its alluring and clear foliage. In society medication, the leaves are ground into a glue and applied on new slice wounds to advance injury mending and used to treat , anti inflammation, antidiarrhoea, Anti-nociceptive ,antibacterial, antidiabetic, and antioxidant action. It is usually known as Red fire ivy, Purple waffle plant and Murikootti. It is an adaptable tropical low-crawling lasting spice that arrives at a stature of 15 to 30 cm.2. Customary information in regards to the utilization of this plant contrasts yet the logical investigation accessible to help this information is highly restricted. This writing audit was planned to restate all the open data on H. colorata in a brief structure with the goal that specialists, who are intrigued, get about the restorative strength of this plant initially.

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INTRODUCTION

Preceding the introduction of engineered prescriptions, man relied upon the recovering properties of therapeutic plants. A couple of individuals regard these plants as a result of the obsolete conviction which says plants are made to smoothly man with food, clinical treatment, and various effects. It is considered 80% of the 5.2 billion people of the world live in the less advanced countries and the World Health Organization checks that about 80% of these people rely just upon standard drug for their fundamental human administrations needs. Helpful plants are the "spine" of traditional drug, which suggests more than 3.3 billion people in the less developed countries utilize restorative plants constantly [1]. There are around 2000 ethnic social occasions on the planet, and essentially every get-together has its own standard clinical data and experiences [2-3]. India is home to a few indigenous clans with a rich legacy of information on the employments of restorative plants. India has differed atmospheres and topographical areas that have caused a wide conveyance of individual restorative plant species to such an extent that every clan has its own plants and customs. In this investigation, we dissected the restorative plants with most remedial use in the district.

INTRODUCTION TO PLANT (HEMIGRAPHIS ALTERNATE)

Hemigraphis colorata (Acanthaceae), an intriguing plant adjusted to India, is a flexible tropical low-crawling perpetual spice that arrives at a tallness of 15 to 30 cm. It prostrates and spreads with establishing stems when developed on ground, and on hanging bushels it falls over perfectly. Truly, Hemigraphis signifies 'half composition' in light of the fact that the fiber of the external stamen bear

brushes [4]. The leaf has metallic purple gloss on upper surface and a strong dull purple on ventral side. The leaves are inverse, praise to cordate, serrate-crenate, around 2 to 8 cm long and 4 to 6 cm wide, bearing all around characterized veins. It blossoms unpredictably during the time in the tropics. Blossoms are little (1 to 1.5 cm distance across), five lobed, chime molded with imbricate bracts. These are white in shading with black out purple checks inside and show up in terminal 2 to 10 cm long spikes. Containers are little, thin, oval, straight and light green in shading. Seeds are little, level and white in shading [5-8].

The social insurance arrangement of the conventional populace of India depends for the most part on indigenous frameworks of medication dependent on plants and plant separates. Prior, H. colorata was utilized to enliven aquariums and goldfish bowls. However, the plant has the tremendous capacity to assuage vitiated pitta, new twisted, cuts, ulcers, irritations and skin grievances. In fables, the leaf juice is applied legitimately on open injury to quit draining [9]. In people medication, it utilized inside to fix iron deficiency [10]. Generally, the leaves are expended to patch nerve stones, extreme monthly cycle and as a prophylactic. In Vanuatu, sap of leaf buds are crushed in water and alcoholic at day break for 4 days as preventative and to prompt sterility [11]. In Java, leaves are utilized to treat grisly diarrhea and hemorrhoids (heaps). It is likewise credited with diuretic skill (figure 01).

Figure 01: *Hemigraphis colorata*

PLANT PROFILE [12]

Kingdom : Plantae
Order : Lamiales
Family : Acanthaceae
Genus : Hemigraphis
Species : Colorata
Common name:
English: red flameivy,Metal leaf,Cemetery plant
Malayalam: murkooti
Sanskrit: vranaropani.

PHYTOCHEMISTRY

The phytoconstituents in plants can be utilized for different therapeutic purposes. The phytochemical constituents on H. colorata were recognized by looking at the unrefined concentrates of its leaves and stem utilizing different solvents. The phytoconstituents are phenols, saponins, flavonoids, terpenoids [13], coumarins, sugars, carboxylic corrosive, xanthoproteins, tannins, proteins, alkaloids, steroids and sterol [14]. The leaves contain flavonoids, polyphenols, tannins, high potassium and low sodium levels; stem contains saponins and tannins, roots contain flavonoids and polyphenols.

DISTRIBUTION

The tree is native to South-East Asia. Naturalised in some parts of far Notrhern Queensland[15]

DESCRIPTION

Hemigraphis colorata (Blume), 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 is a prostrate growing plant with spreading, rooting stems. The tiny white flowers grow intermittently throughout the year [16].

NORMAL USES

It is asserted in society medicinethat the plant has excellent injury mending movement. The leaves are ground into a glue and applied on new cut injuries. Used to advance pee, checkhemorrhage, stopdysentery, treat veneral sicknesses and to recuperate hemorrhoids [9-10].

CUSTOMARY USES

The entire plant of H.colorata is ground into a glue with water and the plant has the gigantic capacity to mollify vitiated pitta, new twisted, cuts, ulcers, aggravations and skin objections. In old stories, the leaf juice is applied legitimately on open injury to quit draining. In people medication, it utilized inside to fix iron deficiency . Customarily, the leaves are expended to retouch nerve stones, exorbitant feminine cycle and as a prophylactic. In Vanuatu, sap of leaf buds are crushed in water and alcoholic at first light for 4 days as prophylactic and to instigate sterility. In Java, leaves are utilized to treat ridiculous looseness of the bowels and hemorrhoids.

It is likewise credited with diuretic ability. The entire plant of H. colorata is ground into a glue with water and utilized for diabetes mellitus [11].

ANTI-INFLAMMATORY ACTIVITY [17]

Xylene-induced ear edema test

The model of Dai and Liu was followed to evaluate xylene-induced ear edema test in mice . Consisting of five mice in each group, thirty mice were randomly divided into control group (distilled water, 10mL/kg body weight), positive control or standard group (Diclofenac sodium (DS), 100mg/kg body weight), and test groups (MHAL and EAHAL at 200 and 400mg/kg body weight). All mice had been fasted for 16h with water ad libitum. Moreover, mice in the control group, positive control group, and test groups were treated with distilled water at a dose of 10mL/kg, Diclofenac sodium at a dose of 100 mg/kg, as well as MHAL and EAHAL at doses of 200 and 400mg/kg body weight respectively, orally. One hour after oral administration, 20µL of xylene was given to each mouse on the anterior and posterior surfaces of the right ear lobe, resulting induction of ear edema. Here, the untreated left ear was regarded as control. After 1h of xylene application, mice were sacrificed by cutting off both ears with the utilization of 5mm circular sections of the ears, then seized, and finally weighed. The weight of xylene-induced edema was calculated from the difference between the weight of ear treated with xylene (right ear) and the weight of ear left untreated (left ear). The percentage inhibition of ear edema was calculated by the following formula. Inhibition (%)=[1- {Weight of edema (extract or standard drug)/ Weight of edema (normal control)}] X 100.

Cotton pellet-induced granuloma formation

To evaluate the cotton pellet induced granuloma formation in mice, the method of Swingle and Shideman was used with slight modification. Under light chloroform anesthesia and sterile technique, sterilized cotton pellets, weighing (10±1) mg of each pellet, were inserted subcutaneously, one on each side of the abdomen of the animal. Thirty mice were grouped and treated orally as mentioned before, once a day for 7days.After continuous treatment, all mice were sacrificed on the 8th day. Granuloma wetted cotton pellets were removed and dried at 60°C for 24h with a laboratory dryer. Then the dry cotton weight was recorded. The weight of granuloma formation was measured by the weight difference between the removed, dried cotton pellets, and the cotton pellets before insertion. The percentage inhibition of granuloma formation was calculated by the following formula. Inhibition (%)=[1- {Weight of granuloma (extract or standard drug)/ Weight of granuloma (normal control)}] X 100.

ANTI-NOCICEPTIVE STUDY [17]

Formalin-induced paw licking To evaluate the analgesic activity of plant extracts, a slightly modified method of Hunskaar and Hole was applied in formalin-induced paw licking test in mice. Containing five mice in each group, thirty healthy Swiss albino mice were divided into control group (distilled water, 10mL/kg body weight), positive control or standard group (Diclofenac sodium (DS), 100mg/kg body weight), and test groups (MHAL and EAHAL at 200 and 400mg/kg body weight).Mice were fasted for 16h with water ad libitum prior to the experiment. Moreover, mice in the control group, positive control group, and test groups were treated with distilled water at a dose of 10mL/kg, Diclofenac sodium at a dose of 100mg/kg, as well as MHAL and EAHAL at doses of 200 and 400mg/ kg body weight respectively, orally. Each mouse was injected with 20휇L of 2.7% (v/v) formalin solution into the dorsal surface of the left hind paw, 1h after the respective treatment of each group. The time spent in licking, biting, and shaking behaviors was measured in seconds for 5min after formalin injection, which was considered as the acute phase (0–5min). Again, mice were monitored for 5min after 20min of injection which was defined as late phase (20–25min). The percentage of inhibition of licking was calculated by the following formula. Inhibition (%)=[1− (Licking time (standard or extracts) / Licking time (normal control))]×100.

ANTIDIARRHOEAL ACTIVITY [17]

Castor oil induced antidiarrhoeal test A slightly modified method of Shoba and Thomas [35] was applied in castor oil induced antidiarrheal test in mice. It is one of the most acceptable methods to evaluate the antidiarrhoeal activity. By administering 0.5mL of castor oil orally the preliminary screening of animals was performed, and those animals that started diarrhea were selected finally for the test. Thirty diarrheal screened mice were randomly divided into control group (distilled water, 10mL/kg body weight),

positive control or standard group (Loperamide HCl, 3mg/kg body weight), and test groups (MHAL and EAHAL at 200 and 400mg/kg body weight), containing five mice in each group. Screened experimental animals were fasted for around 16h with water ad libitum. Then mice in the control group, standard group, and test groups were treated with distilled water at a dose of 10 mL/kg, Loperamide HCl at a dose of 3mg/kg, as well as MHAL and EAHAL at doses of 200 and 400mg/kg body weight respectively, orally. After 30min of respective treatment, each animal received 0.5mL of castor oil orally for initiating diarrhea. Observation for defecation continued up to 4h on blotting paper lined individual cage was used for placing every animal. Blotting papers were replaced every hour. The number of diarrheal feces was count and recorded for a period of 4h. The percentage of inhibition of defecation was calculated for every group of animals by the following formula. Inhibition (%)=[1- {Number of feces (extract or standard drug) / Number of feces (normal control)}] X 100.

ANTI BACTERIAL MOVEMENT [18]

Benzene concentrate of H. colorata leaves has demonstrated its action against acinetobacter species and Streptococcus aureus. Phenolic mixes found in the concentrate are liable for the action .

ANTI DIABETIC ACTION [10]

The assessment of hypoglycaemic and hostile to diabetic properties uncovered that the n-hexane and, somewhat, the ethanol concentrates of the entire plant were found to bring down the degrees of blood glucose in glucose took care of rodents. The steroids and coumarins present in the concentrate give hostile to diabetes movement .

WOUND MENDING MOVEMENT [12]

The unrefined leaf glue advances extraction wound recuperating . In mice, the leaf glue gives quicker twisted withdrawal and epithelialisation yet oral organization is seen inadequate . The extraction and cut injury model investigations uncovered that methanolic extricate is tantamount to standard reference Vokadine . The natural platform produced using chitosan was profoundly haemostatic and can be adequately applied for irresistible injuries .

HOSTILE TO OXIDANT ACTION [19]

Phenolic mixes are successful hydrogen benefactor which makes them a decent cancer prevention agent. The phenolic acids, for example, chlorogenate, cinnamate, coumarate, gallate and ferulate present in the plant goes about as star oxidants and displays free radical searching action .

CONCLUSION

H. colorata is an ethno-therapeutic plant which has significant degree of bioactive mixes and in this manner, these species can be utilized as a possible wellspring of medications. It is having the properties, for example, antiinflammation, antidiarrhoea, Anti-nociceptive ,antibacterial, antidiabetic, wound recuperating, and antioxidant action. This spice is a promising injury mending advertiser yet an appropriate phytochemical and pharmacological investigation is the required which gives new pharmacological roads to this plant. This plant can be effectively accessible and developed, in this way can't be a deficiency of crude materials for the phytochemical examination.

REFERENCES

1. Davidson-Hunt I. Ecological ethnobotany: stumbling toward new practices and paradigms. MASA J. 2000;16:1–13.
2. Liu Y, Dao Z, Liu Y, Long C. Medicinal plants used by the Tibetan in Shangri-la, Yannan, China. Ethnobiol. Ethnomed. 2009;5.
3. Kebriaee-zadeh A. Overview of national drug policy of Iran. Iranian J. Pharm. Res. 2003;2:1–2.
4. Gledhill D. The Names of Plants. Edn 4, Cambridge University Press, New York, 2008, 195.
5. Gamble JS. Flora of the Presidency of Madras. The Authority of the secretary of state of Indian council, India 1921; 2:1344.
6. Anonymous. The Glossary of Indian Medicinal Plants. Council of Scientific and Industrial Research, New Delhi, India, 1986, 224.
7. Anonymous. Dictionary of Indian Medicinal Plants. Central Institute of Medicinal and Aromatic Plants, Lucknow, India, 1992, 416.
8. Narasimhan SNY. Medicinal Plants of India. Vol. I, Karnataka, India, 1997, 73.
9. Silja VP, Varma KS, Mohanan KV. Ethnomedicinal plant knowledge of the

Mullu Kuruma tribe of Wayanad district, Kerala. Ind J Tradit Knowl 2008; 7:604-612.

10. Gayathri V, Lekshmi P, Padmanabhan RN. Anti-Diabetes and Hypoglycaemic properties of Hemigraphis colorata in Rats. Int J Pharm Pharm Sci 2012; 4:224-328.
11. Bourdy G, Walter A. Maternity and medicinal plants in Vanuatu I. The cycle of reproduction. J Ethnopharmacol 1992; 37:179-196.
12. Subramoniam A, Evans DA, Rajasekharan S, Nair GS. Effect of Hemigraphis colorata (Blume) H.G. Hallier leaf on wound healing and inflammation in Mice. Ind J Pharmacol 2001; 33:283-285.
13. Saravanan J, Shariff WR, Joshi NH, Varatharajan R, Joshi VG, Karigar AA. Preliminary Pharmacognostical and Phytochemical Studies of Leaves of Hemigraphis colorata. Research Journal of Pharmacognosy and Phytochemistry. 2010; 2(1):15-7.
14. Sheu J, Jayakumar T, Chang C, ChenY, Priya S, Ong E, Chiou H, Elizebeth AR. Pharmacological actions of an ethanolic extracts of the leaves Hemigraphis colorata and Clerodendron phlomoides. Clinical Molecular Medicine 2012; 3:1-3.
15. Irene Skaar, Christopher Adaku, Monica Jordheim, Robert Byamukama, Bernard Kiremire and Qyvind M. Andersen. Purple anthocyanin colouration on lower (abaxial) leaf surface of *Hemigraphis colorata* (Acanthaceae). Phytochemistry. 2014; 105: 141-146.
16. Hallier. H. G and Devi Priya. M., Review on Pharmacological activity of *Hemigraphis colorata*(Blume). International Journal of Herbal Medicine. 2013; 1(3): 120-121.
17. Rahman et al.Anti-inflammatory, antinociceptive and antidiarrhoeal activities of methanol and ethyl acetate extract of Hemigraphis alternata leaves in mice. Clinical Phytoscience 1(2019) 5:16.
18. Anitha, Vimala Thankappan, Antonisamy, Johnson Marimuthu, Jeeva Solaman. Anti-bacterial studies on *Hemigraphis* colorata(Blume) H.G.Hallier and Elephantopusscaber L.Asian Pacific Journal of Tropical Medicine. 2012; 5(1): 52-57.
19. Akhil T. T and Punieethaprabhu. Evaluation of anti-oxidant, anti-inflammatory and cytotoxicity potential of *Hemigraphis colorata.* International Journal of Pharmaceutical Sciences and Research. 2013; 4(9): 3477-3483.