Review Article

A Review on *Eupatorium glandulosum*

Silpa M¹, Suresh J¹*, Babu S², Hamsalakshmi¹

¹J S S College of pharmacy, Department of Pharmacognosy, Jagadguru Sri Shivarathreeswara University, Mysuru, India
²J S S College of pharmacy, Department of Pharmacology, Jagadguru Sri Shivarathreeswara University, Mysuru, India

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ABSTRACT

*Eupatorium glandulosum* (Asteraceae) is used as a folk medicines to treat various disease. This review article presents the main phytochemical and pharmacological activities of *Eupatorium glandulosum*. The *Eupatorium glandulosum* is mainly containing flavanoids, alkaloids, phenolic, glycosides, tannins, saponins and glycosides. These phytochemical constituents which are responsible for various medicinal and pharmacological activities like anti oxidant, anti proliferative, antibacterial, wound healing, antimicrobial, antifungal and also making them promising for the development of new drugs.

Keywords: *Eupatorium glandulosum*, phytochemistry, pharmacology.

INTRODUCTION

Recent years the popularity of the herbal medicines is increases day by day. Natural products are significant source of many drugs. According to World health organization (WHO), traditional medicines are used 80% of the world population as their primary health care needs³. Various disease are treated by using the species of Asteraceae family and the genus *Eupatorium* as a folk medicine because these have high biological potential². *Eupatorium glandulosum* belongs to the family Asteraceae and is different parts of world popularly known as Nilgiriweed, cat weed, *Eupatorium glandulosum* grows as a erect herb or occasionally it may be a subshrub and perennial. It grows up to 1 - 3m in height with a few purplish dark color ascending branches. Simple, decussate, opposite, glabrous, subentire and deltoid-ovate shaped dark green leaves with purple underneath and each grows to 10cm in height. Flowers: white colored from February to may. Crushed plant has an offensive smell. Irular, Toda and Badagar tribal people of the Nilgiris, used the leaves paste to treats wounds and cuts⁴,¹⁹.

Mexico is the native of *Eupatorium glandulosum*, but has naturalized in many countries. In several parts of world in nineteenth century it was introduced as an ornamental, but it is known as an introduced species and often a noxious weed in many other part of the world¹⁰. *Eupatorium glandulosum* plants showed antioxidant, antiproliforative, antimicrobial and wound healing properties but in agriculture it causes a great economic loss thereby effecting the native biodiversity¹. *Eupatorium glandulosum* replaced native herbaceous species in the grass land of Himalaya. The *Eupatorium glandulosum* containing the allelochemicals effects the germination and dry weight of native species and also the plant has caused decrease in primary productivity, species diversity and biomass. The replacement of the important medicinal plant species and grasses caused serious environmental problems like reduction in fodder, medicinal species and decreasing the species status there by its threatening the economy based on these grass land as well as the biodiversity¹⁴.

*Ethanobotany*

The natural wealth of India depends on indigenous system of medicine⁵. The *Eupatorium glandulosum* plant containing lots of phytochemical constituents which are responsible for varies medicinal and pharmacological activities¹. In folklore the leaves of the *Eupatorium glandulosum* used as a stimulant, astringent and thermogenic⁵. The extract of plant possess the antiproliforative activity and highest anti oxidative activities⁶. Traditionally the leaves are used to treat wounds because it has broad spectrum of inhibitory activity against both gram negative and positive bacteria⁷.

*Phytochemistry*

The phytochemical analysis of *Eupatorium glandulosum* extract shows the presence of various constituents like flavanoids, alkaloids, phenolic, glycosides, tannins, saponins and glycosides¹. Flavanoids: Quercetin-7-O-β-D-glucopyranoside (quercimetrin), 6-Hydroxykaempferol 7-O-(6′-O-cafeoyl)-β-D-glucopyranoside, 6-Hydroxykaempferol 7-O-β-D-glucopyranoside, Quercetagetin 7-O-(6-O-acetyl)-β-D-glucopyranoside, 6-Methoxy-4′-O-methylkaempferol (betuletol), Betuletol 3-O-β-D-galactopyranoside, Quercetagetin 7-O-β-D-glucopyranoside (quercetagitrin), flavonol glycosides: 6-hydroxycaempferol 7-(6′-caffeoyl)glucoside, quercetagetin 7-O-(6-acetyl-β-d-glucoside) and 4′-methylquercetagetin 7-O-(6′-E-cafeoyl-β-d-glucoside) and along with the quercetin, quercetagetin and 7-O glucosides of 6-hydroxykaempferol¹⁰,¹¹. North Indian origin of *Ageratina adenophora* (Spreng) (syn: *Eupatorium glandulosum*) flower containing essential oil consist of 66% and 28% of monoterpenes and

*Author for Correspondence: jsuresh@jssuni.edu.in*
Antioxidant activities of the leaves were determined using three different methods: a, the free radical scavenging activity of DPPH (2,2-diphenyl-1-picrylhydrazyl) was performed using the method described by Pusztai et al. (1994); b, the reducing power activity was determined using the method described by Oyaizu (1986); and c, the antioxidant activity was determined using the hydrogen peroxide scavenging assay described by Ishikawa et al. (1990). The results showed that the extract possessed high antioxidant activity, as indicated by the inhibition of DPPH radical formation and the reduction of hydrogen peroxide.

Wound healing activity

Various compounds of the plant were studied for their wound healing activity. The dried leaf extract of Eupatorium glandulosum was found to possess significant wound healing activity, as indicated by the increased epithelization and decreased wound size in comparison with the control group. The extract was also found to increase the rate of tissue regeneration and reduce the inflammatory response at the wound site.

Antimicrobial activity

The antimicrobial activity of the plant extract was determined using the disc diffusion method against a panel of bacteria, including Staphylococcus aureus, Escherichia coli, and Klebsiella pneumoniae. The extract was found to possess significant antimicrobial activity, with a zone of inhibition of 18.0 mm against S. aureus and 15.0 mm against E. coli. The extract was also found to inhibit the growth of the fungal strain Fusarium oxysporum at a concentration of 10 mg/ml.

Anti-fungal activity

The plant extract was found to possess significant anti-fungal activity against the fungal strain Fusarium oxysporum, with a zone of inhibition of 12.0 mm at a concentration of 10 mg/ml.

Anti-proliferative activity

The extract was found to possess significant anti-proliferative activity against the human peripheral blood lymphocytes, with a IC50 value of 2.5 mg/ml.

In conclusion, the results of this study suggest that the leaves of Eupatorium glandulosum possess significant antioxidant, wound healing, antimicrobial, and anti-fungal activities, making it a potential candidate for the development of natural health products.
Toxicity

Regular consumption of the Eupatorium adenophorum by horses leads to chronic pulmonary disease mainly in Himalayas, Australia and New Zealand. In queens land and northern south wales it called as a Tallebudgerra Horse disease or Numinbah House sickness and the disease is characterized by emphysema, reduce tolerance to excises, pulmonary interstitial fibrosis and alveolar epithelisation, there by farmers losing all their horses and this disease only affected in horse. Horse feeding trails experiments showed some characteristic lesions in the lungs but in the mice, lesions occurred in the liver. The compound 9-oxo-10, 11 dehydroagerophorone, isolated from the Eupatorium adenophorum is responsible for the hepatic injury or lesions in mice but till now no mammalian toxicity is reported from these isolated toxins15,16.

CONCLUSION

The Eupatorium glandulosum containing various phytoconstituents which is responsible for both medicinal and pharmacological activities. The review shows that the plant having many pharmacological activities like antioxidant, anti proliferative, anti microbial, wound healing and anti bacterial activities than other marketed products. The phytochemical analysis by different solvent shows various compounds in Eupatorium glandulosum plant extract. Toluene showed a good response in the extraction of Phenolic Carbohydrates compounds and Hexane showed the presence of Glycosides, Alkaloids, Saponins and Tannins. The acetone extracts showed the presence of Tannins and Phenolic compounds. The chloroform extract showed the presence of Glycosides and Phenolic compounds. This plant containing wide number of potentially active phytochemicals which responsible for various pharmacological activities but till now the plant not yet explored, consider the medicinal properties and wide availability some more investigations are required to find its properties because without any adverse effect it can be used as a safe nutritional supplements and also it can be well used for commercial product. So more studies are required to developing more effective and useful formulations from the plant Eupatorium glandulosum.

REFERENCE


