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# A REVIEW ON PHARMACOLOGY OF HEDYOTIS HERBACEA

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**ABSTRACT**
*The chemical components and their pharmacological effects of Hedyotis herbacea Willd were compiled. Anthraquinones, terpenoids, steroids, flavonoids, organic acids, and polysaccharides are all recognised components of this plant. Hedyotis herbacea Willd has been shown to exhibit a range of pharmacologically significant properties, including anticancer, anti-inflammatory, immunostimulatory, antioxidative, neuroprotective, and hepatoprotective, cytotoxic, antibacterial, antifungal, antioxidant ones.*
**KEYWORDS**- *Hedyotis herbacea, anti-inflammatory, flavonoids, Anti mutagenesis, Hepatoprotective activity*

## INTRODUCTION

The name of the plant is Hedyotis herbacea, in Sanskrit is called CHAYAPARPATIKA. It is grown in mild open sunny location.it is grow in very hard soil also. It has tinny white colour flower, and another identifying feature of this plant is its stem are quadrangle, sharp edged four gonodes.

When you can touch you can feel the angular structure of the stem, it has some small-small leaves. Hedyotis herbacea whole plant is useful and its first taste is bitter and second taste is sweet .it provide also cooling sensation, also reduces fever and give antinflamatory also stomach ache, expectorants it's a tonic herb, tonic means it can be nontoxic and it can be used in small quantity and make some home remedy probably most commonly prepared tea can be made from this. This is mainly used in traditional medicine elephantiasis, fever, lack of appetite, gas issues, blotting, worm infestation, asthma, bronchitis, ulcers and all kind of inflammations.

Phytochemical research on Hedyotis species first was published in 1933 when H. herbacea's medicinal plant's active ingred ients were studied. Since then, several members of the genus

Hedyotis have yielded approximately 50 new chemicals. Alkaloids, anthraquinones, flavonoids, iridoids, triterpenoids, ster ols, lignans, and several more chemicals all have incredibly diverse structural makeups.

In the family Rubiaceae, the species Oldenlandia corymbosa L. and O. herbacea (L.) Roxb. belong to the genus Oldenlandia. In temperate and tropical areas of Africa and Asia, they are typical weeds.[1]

O. herbacea has a tangled, heavily branching stem that is frequently entwined. Small, linear-lanceolate leaves, solitary or in pairs of flowers on long stalks, axillary at the nodes, up to 5 mm in diameter, white or mauve, and small, round capsules are present in the fruits.

O. herbacea is said to be anthelmintic, anti-inflammatory, expectorant, stomatic, and tonic throughout. Elephantiasis, fever, dyspepsia, flatulence, colic, asthma, bronchitis, ulcers, and hydrocele can all be treated with it. Organic substances known as secondary metabolites have no essential purpose in metabolic pathways. In other words, they play no direct role in a plant's typical growth and development. Plants are the main sources of bioactive molecules for the creation of novel medications since they naturally occur in plant tissues and are entirely dependent on their presence and level for medicinal purposes. Either the plant's components or the entire plant can be used to extract the active metabolites. [2]

**Anticancer-** Hedyotis herbacea has been utilised as an anticancer agent in eastern medicine for many years. Recently, it was asserted that H. herbacea inhibits the growth of human cancers such hepatoma, cervical, gastric, and intestinal carcinoma.[4] According to earlier studies (Kim, 1997; Kim et al., 1998; 1999),[6] H. herbacea may have anticancer properties that can inhibit the proliferation

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of some cancer cell lines. Additional research was conducted (Woo et al., 1998)[5] to examine the inhibitory effect of an oldenlandia herbacea methanol extract on the growth and differentiation of human cancer cell lines U937. [7]

By reducing the ability of HL-60 cells to form colonies through the cleavage of Bcl-2 and the activation of bax, H. herbacea decreased the malignant potential of these cells.[8] Oldenlandia herbacea extract significantly increased apoptosis and efficiently reduced the proliferation of all eight cancer cell lines, according to a recent study (Gupta et al., 2004)[3] on the subject. However, the extract had a minimal harmful effect on healthy pancreatic cells. Additionally, the animal model showed a considerable suppression of lungs metastases with no discernible side effects. These findings suggested that oldenlandia herbacea extract might have anticancer properties.[9]

**Anti mutagenesis -** Aflatoxins B1 (AFB1) and benzo (a) pyrene (Bap) metabolism, DNA binding, and mutagenesis were all suppressed by Oldenlandia herbacea,[12] indicating that it may have antimutagenic properties for both substances (Wong et al., 1993a; 1993b).[13] An unscheduled DNA synthesis (UDS) test was used to investigate the antimutagenic benefits of a few Chinese herbal remedies and green tea's ability to combat the effects of cigarette tar (Han et al., 1997).[14] The effects of the total particles material (TPM) extract from cigarette tar on lymphocyte DNA damage were shown to be reduced by 125 g/L of h. herbacea.[15]

**Hepatoprotective activity-** In a CCl4 and D-galactosamine (D-GalN)-induced liver damage model, Taiwanese researchers (Lin et al., 2002) investigated the hepatoprotective properties of H. herbacea.[16] The hepatotoxic effect of H. herbacea was assessed by evaluating serum glutamate oxalate transaminase (sGOT) and serum glutamate pyruvate transaminas The findings showed that H. herbacea had a substantial impact in lowering sGOT and sGPT's acute rise.[17]
24 hours after the hepatotoxins were administered intraperitoneally, concentration and reduced the severity of liver injury [18]

**Neuroprotective activity-** Using primary cultures of rat cortical neurons that have been glutamate-insulated as a screening system, a search for neuroprotective substances from natural sources was conducted (Kim et al., 2001).[19] In an in vitro test technique, H. herbacea extract shown considerable neuroprotective efficacy against the harmful effects of glutamate.

**Cytotoxic and other bioactivities -** A cytotoxic agent is defined as a material that can destroy cells, particularly cancer cells, in the National Cancer Dictionary. These substances might prevent cell growth or shrink tumour cell size. Numerous studies have shown that Hedyotis plant species have the ability to act as an anticancer agent by preventing tumour cell growth, migration, metastasis, and invasion before they worsen. The compound's mode of action may involve altering the tumour cell's growth-related signalling pathway, cell immunity, and antioxidant activity (Han et al. 2020).[20]

**Antibacterial and antifungal activities -** microbial origin, interest in plant bioactives as a high-potential source of antimicrobial molecules has recently increased (Gomaa et al. 2019; Belfarhi et al. 2020).
Other species, such as Oldenlandia herbacea, shown strong effectiveness against S. aureus and Escherichia coli despite the lengthy history of uses of microorganisms. The presence of 1,2-dihydroxy anthraquinone (Alizarin), which was detected in all antimicrobial bioactive fractions, was thought to be responsible for the antibacterial activity (Ahmad et al. 2005).[21] Another study revealed that Oldenlandia herbacea's methanolic extract has potent, broad-spectrum antimicrobial properties against Gram positive and Gram negative bacteria, including Bacillus species, Escherichia coli, Klebsiella species, Proteus species, Pseudomonas species, and Staphylococcus aureus, with very little antifungal activity against Candida albicans (Hussain and Kumaresan, 2013; Das et al. 2019).[22]

**Antioxidant properties -** Despite the numerous historical uses of products with microbial origins, according to a 2005 study by Ahmad et al., Hedyotis species have more antioxidant effects than Vitamin E. The further investigation of the in vitro antioxidant activity of Hedyotis corymbosa (L.) Lam was carried out by Sasikumar et al. (2010). In this work, the aerial portions were obtained by extracting the plant materials using methanol as the solvent.[23]

According to Christhudas et al(2013) .[24]'s study, H. herbacea extract is more capable of reducing than butylated hydroxytoluene. More powerful than the hexane and ethyl acetate extracts was the H. herbacea methanolic extract. With more samples, the extract's potency rose.[25]

H. herbacea showed a promising antioxidant capability against free radicals, according to a recent study by Das and Bharali (2020). Seven Hedyotis species' methanolic extracts were examined for their antioxidant potential as well as their cytotoxic, anti-inflammatory, and antibacterial properties.[26]

## CONCLUSION

Only 13 species of the genus Hedyotis have yielded more than forty novel compounds up until recently. The goal of this review, the first for the genus, is to demonstrate the extremely.The biological importance of these substances as well as the many

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structural traits shared by members of this genus.These antioxidant qualities, which in turn may be connected to the anti-inflammatory, cytotoxic, and neuroprotective actions, may explain why some of the plants from this genus are used as significant components in Chinese herbal remedies. We have also observed that various phytochemical studies on the methanolic fraction of K herbacea from different parts of the world, such as Korea, China, Taiwan, and Malaysia, have produced the same type of compounds, demonstrating in this case that climatic conditions did not affect the phytochemical components of the plant.

The quercetin derivatives, which have been shown to be superoxide radical scavengers, are among the antioxidative components.The active acylated iridoid glycosides (in the presence of cinnamoyl, coumaroyl, and feruloyl groups) and flavonol glycosides are the neuroprotective components in the genus.

The two most frequent triterpenes identified in Hedyotis are ursolic and oleanolic acids, both of which have been shown to have cytotoxic effects. Although bioactivities on the anthraquinones isolated specifically from this genus have not been described, several anthraquinones from the same family have well-established antileukemic, cytotoxic, antiviral, and antibacterial characteristics.Hedyotis plants are known to have strong antioxidant components, according to our findings and data from other sources.Hedyotis herbacea Willd's chemical make-up and its pharmacological effects were gathered. This plant is known to contain anthraquinones, terpenoids, steroids, flavonoids, organic acids, and polysaccharides. It has been demonstrated that Hedyotis herbacea Willd possesses a variety of pharmacologically significant traits, such as anticancer, anti-inflammatory, immunostimulatory, antioxidative, neuroprotective, and hepatoprotective ones. It also possesses cytotoxic, antibacterial, antifungal, and antibacterial properties.

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