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Review Article

A REVIEW AND FORMULATION STUDY ON ECLIPTA ALBA (BHRINGRAJ) GREEN TEA AS A NATURAL HEPATOPROTECTIVE AND ANTIBACTERIAL AGENT

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Abstract:

Eclipta alba, also called bhringraj, has been used in Ayurvedic medicine for over 1000 years in India. It is used to treat infective hepatitis, liver cirrhosis, liver enlargement, and other liver and gall bladder problems in India. Drugs that come from nature are very important in the public healthcare system of every country. In India, there are around 2000 natural drugs, with about 400 of them being from minerals or animals, and the rest coming from plants. The traditional systems of medicine like Ayurveda, Siddha, and Unani use 600 to 700 different herbs for treating illnesses.

Natural products have always been interesting to people because of their amazing benefits. Eclipta alba, a medicinal plant, has been used for a long time in traditional medicine to treat various health problems. It has been found to help with diabetes and also protect the liver. Eclipta alba is a small, branching plant that grows for one season. It has been used for a long time in traditional medicine across many countries, especially in warm regions. The plant is known for its healing abilities and has been used for several health benefits like fighting cancer cells, reducing pain, killing bacteria, protecting the liver, stopping bleeding, lowering blood sugar, boosting the immune system, and acting as an antioxidant. It is also thought to help improve overall health and vitality.

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INTRODUCTION:

Eclipta alba, also known as Bhringaraja, Kesharaja, or Kesharanjana in Ayurveda, and Kadim-el-bint in Arabian medicine, is a major liver herb. Eclipta alba has been extensively studied for its hepatoprotective effect, and herbal medicines containing it are available to treat jaundice, liver and gallbladder diseases, and viral hepatitis.

Eclipta alba is a main liver herb in Ayurveda, where it is also called Bhringaraja, Kesharaja, or Kesharanjana. In Arabian medicine, it is known as Kadim-el-bint. It has been studied a lot for its ability to protect the liver. There are many herbal medicines made with Eclipta alba that are used to treat jaundice, liver and gallbladder problems, and viral hepatitis. Eclipta alba (L.) Hassk. Belongs to the family Asteraceae. Some other names for this plant are Eclipta erecta, Eclipta prostrata, and Verbesina alba. Common names include false daisy, bhringraj, dodhak, bhangra, and yerba de tago. The compounds wedelolactone and dimethyl-wedelolactone in the plant help protect the liver from damage caused by carbon tetrachloride, galactosamine, and phalloidin in rats. These compounds are used in herbal medicines for treating liver cirrhosis and infectious hepatitis. There have been many studies on Eclipta alba for its antioxidant, liver-protecting, antibacterial, antiviral, memory-boosting, immune-modulating, and stress-reducing properties. Eclipta alba can grow in a wide variety of environments, including wet areas, canals, rice paddies, and upland fields. It is found around the world, including Southeast and South Asia. Nature has been the main source of many medicines for thousands of years. Among different kinds of plants, medicinal plants are very important. These are plants where one or more parts have substances that are useful for medicine and are used to make new drugs. The plant kingdom is seen as a big source of many important medicines. It has always been a tradition to use medicinal plants. In the beginning, most medicines were made from plants, either in a simple form or a more complex form. Medicines made from plants are also called herbal drugs, botanical drugs, botanicals, phytomedicines, traditional medicines, herbal medicines, traditional Chinese medicines (TCMs), traditional herbal medicinal products, natural health products, or plant food supplements. These phytomedicines are better than synthetic drugs because they are easy to get, cheaper, safer, effective, and have very few side effects. Even many modern medicines come from natural sources like plants. According to data, about a quarter of the medicines used in industrialized countries today come from tropical plants, either directly or indirectly. Medicinal plants have a long history of being used to treat various diseases.

Scientific Classification:

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Asterales
Family: Asteraceae
Genus: Eclipta L.
Species: Eclipta prostrata

Vernacular Names

English: Bhringaraj
Sanskrit: Bhringaraj
Hindi: Bhangara, Bhangaraiya
Bengali: Kesuriya, Kesari
Tamil: Karisalai
Marathi: Maka
Telugu: Guntagalagara

Ayurvedic action of Eclipta alba

- Rasayana Rejuvenative
- Medhya Promotes the intellect
- Kesyha Benefits hair
- Dantya Benefits the teeth
- Tvacya Benefits itching
- Kusthahaghna Destroys skin diseases
- Raktasodhana Purifies the blood
- Raktastambhana Stops bleeding
- Visaghna Destroys poisons in the body
- Caksusya Benefits the eyes
- Krmighna Destroys worms
- Pandughna Reduces anaemia

Applications

1. Medicinal Uses

- a. Liver-Protecting:
Helps repair liver cells and shields the liver from harm caused by harmful substances.
Used in traditional Ayurvedic medicines for treating jaundice and other liver problems.
- b. Hair Growth:
Very commonly used in oils and shampoos to encourage hair growth, cut down on hair loss, and stop hair from turning grey too early.
- c. Wound Healing:
Extracts from the leaves help wounds heal faster by reducing infection and promoting new tissue growth because of their antibacterial and antioxidant qualities.
- d. Fighting Germs:
Works against many kinds of bacteria and fungi, making it helpful for treating skin issues and wounds.
- e. Reducing Inflammation and Pain:
Helps ease swelling and pain in conditions where the body becomes inflamed.
- f. Fighting Oxidative Stress:
Helps protect the body's cells from damage caused by harmful free radicals, which can lead to aging.
- g. Lowering Blood Sugar:
Assists in reducing high blood sugar levels by supporting the body's ability to release insulin.

- h. Possible Cancer-Fighting Properties:
Some research suggests it might slow the growth of certain types of cancer cells.
2. Nutraceutical / Formulation Applications
 - a. Green or Herbal Tea:
Dried Eclipta alba leaves can be made into a special tea that helps protect the liver and has antioxidant benefits.
 - b. Capsules / Tablets:
It can be turned into a powder to make capsules or tablets used for liver support, boosting immunity, and overall health.
 - c. Cosmetic Formulations:
It is used in hair oils, shampoos, conditioners, and natural face creams.
 - d. Herbal Tonics & Syrups:
It is often mixed with other herbs to create drinks that help clean the body and support liver health.

3. Pharmacological / Research Applications

Used as a model plant in studies about medicines from plants.

Extracts are tested for active chemicals like wedelolactone, ecliptine, and luteolin.

It is commonly used in making different kinds of products like herbal tea, ointments, lotions, and capsules.

4.Traditional Medicine Applications

In Ayurveda, it is used in “Bhringraj Taila” and “Liver tonics.”

In Siddha and Unani systems, it is used to treat cough, cold, asthma, and skin problems.

❖ Advantages

1. For Liver Health (Hepatoprotective Advantage)
Protects the liver from harmful substances and illnesses.

Helps the liver cells to repair and grow.Can be useful in treating jaundice, hepatitis, and fatty liver.

2.For Hair and Scalp Helps hair to grow and makes the hair roots strong.

Can prevent hair from turning grey too early.

Helps reduce dandruff and infections on the scalp.

It is often used in natural hair oils and shampoos.

3.Wound Healing and Skin Care

Helps wounds to heal faster because it has properties that fight germs and reduce inflammation.

Used in ointments and creams for cuts, burns, and skin problems.

Can help treat eczema and other skin infections.

4.Anti-inflammatory and Pain Relief Helps reduce swelling and inflammation in the body acts

as a natural way to relieve pain in muscles and joints.

5.Antioxidant Properties

Helps remove harmful chemicals from the body that can damage cells.

Slows down the aging process and helps with overall health.Antimicrobial and Antifungal

Works against different types of bacteria and fungi. Helps prevent infections naturally.

7.Nutraceutical Advantage

Can be made into herbal teas, tonics, or capsules.

Helps the body to detoxify and supports digestion and metabolism.

8.Blood Purifier

Traditionally used to clean the blood and improve skin glow and the body’s ability to fight illness.

Disadvantages

1. Allergic Reactions:

Some people might get skin irritation, rashes, or feel itchy if they apply it directly to the skin.

2. Gastrointestinal Problems:

Taking too much by mouth can cause nausea, vomiting, or diarrhea.

3.Drug Interactions:

It can affect how medicines for diabetes, high blood pressure, or liver issues work, either making them stronger or weaker.

4.Lack of Standardization:

The strength of the active ingredients can change based on where the plant comes from and how it’s processed, which can make the results not reliable.

5.Limited Clinical Evidence:

Most of the research has been done on animals, and there’s not much human study proving it’s safe or effective.

6.Unsafe in Pregnancy and Lactation:

There isn’t enough information on whether it’s safe to use during pregnancy or while breastfeeding, so it’s not advised without a doctor’s guidance.

7.Overdose Risk:

Using it a lot or for a long time might strain the liver and kidneys because of the active chemicals in it.

8.Unpleasant Taste and Odor:

It has a strong bitter taste and smell, which might make drinks like tea or tonics less enjoyable to drink.

Pharmacological Properties

1. Hepatoprotective Activity :-

a study on rats and mice where they caused lung damage using carbon tetrachloride. They found that an alcohol-based extract from E. Alba, also known as Bhringraja, protected the liver when given in doses between 62.5 and 500 mg per kilogram by mouth. This extract helped fix all the damage caused by carbon

tetrachloride. Another study used albino rats that were fed a high-fat diet to check how Bhringraja affects the liver. They discovered that certain plant chemicals in Bhringraja, like Wedelolactone, demethylwedelolactone, and saponins, help protect the liver. These chemicals reduced fat buildup, inflammation, and areas of dead tissue in the liver. They also helped the liver cells repair and grow.

C.N.S. Activity :-

Studies showed that the water extract of *Eclipta alba* and its broken-down part, given at 300 mg per kg of body weight by mouth, did not cause any special reaction in rats.

2. Antimicrobial Activity :-

Research found that *Eclipta alba* has qualities that can help fight the hepatitis B virus. The extract from its shoots was also effective against bacteria like *Staphylococcus aureus* and *Eclipta Coli*.

3. Anti-inflammatory and anti – analgesic Activity :-

The plant has been reported to have anti-inflammatory and bronchodilator properties because of the coumarin compounds. Further studies confirmed that *Eclipta alba* has analgesic activity. The analgesic effect was tested on albino mice using ethanolic and alkaloidal extracts of *Eclipta alba*. Standard experimental methods like the tail clip test, tail flick test, and acetic acid-induced writhing response were used. Both the ethanol extract and the total alkaloids showed good pain-relieving effects in all the different tests for pain relief.

4. Immunomodulatory Activity :-

Some early research showed that the methanolic extract from *Eclipta alba* has immune-modulating effects. Two compounds, wedelolactone and demethylwedelolactone, found in *Eclipta alba*, were able to stop trypsin from working in a lab test. Both of these compounds worked well, with wedelolactone stopping trypsin at a dose of 2.9 µg/ml and demethylwedelolactone at 3.0 µg/ml.

5. Hair growth and Alopecia :-

Eclipta alba is used in hair oil mixtures because it helps hair grow and keeps it black. A 10% w/v concentration of *Eclipta alba* was the main part of a herbal mixture made to help with hair growth. Alopecia is a skin condition that affects people who lose their hair and can have emotional and social effects on them. *Eclipta alba* is a well-known Ayurvedic plant used for promoting hair growth. In this study, petroleum ether and ethanolic extracts were added to an oil-based cream (a water-in-oil type) and were applied on the skin of shaved albino rats. The time it took for hair to start growing and complete the growth cycle was

measured. A 2% solution of minoxidil was used on the skin as a positive control for comparison. The results showed that treatments with 2% and 5% petroleum ether extracts worked better than the minoxidil 2% treatment. Roy et al. Reported that after using the petroleum ether extract, there were more hair follicles in the anagenic phase, which was higher than in the control group.

7. Anti-cancer Activity :-

Methanolic extract of *Eclipta alba* was tested for its anticancer effects against Ehrlich Ascites Carcinoma (EAC) in Swiss albino mice. On day one, the extract at doses of 250 and 500 mg/kg body weight was given orally and continued for nine days. The anticancer activity was checked by measuring tumour size, number of tumour cells, number of living tumour cells, number of dead tumour cells, average survival time, and increase in lifespan in the experimental models. The extract helped increase the lifespan of mice treated with EAC and improved their blood-related parameters compared to mice with EAC. This study shows that the methanolic extract of *Eclipta alba* has anticancer properties in the tested animal models. Coumestans are also known to act as phytoestrogens. These compounds are found in soya beans and clover. In many countries, they are part of the diet and are used as a preventive agent against breast and prostate cancer. Dasyscyphin-C (saponins), a newly isolated compound from *Eclipta prostrata*, has been reported to show anticancer and cytotoxic activity in laboratory tests on HeLa (human cervical cancer) and vero cell lines at a concentration of 50 micrograms per milliliter.

❖ METHOD:

• Conventional Green Tea Sachet Formulation Method:

❖ Procedure:

- Collection & Authentication of Plant Material.
- Washing.
- Blanching
- Drying
- Cooling
- Size Reduction (Grinding/Pulverization)
- Sieving
- Blending
- Filling into Tea Bags
- Packaging & Labeling

❖ Evaluation tests :

1. Organoleptic Evaluation
2. Weight variation test
3. Moisture content
4. Ash value

5. Extractive value
6. Bulk density/flow property

CONCLUSION:

The formulation of green tea infused with *Eclipta alba* demonstrated promising potential as a natural hepatoprotective and antibacterial beverage. The extract retained bioactive constituents such as wedelolactone, ecliptine, and luteolin, which are known to contribute to liver protection and antimicrobial effect. It possesses a broad spectrum of chemical compounds. Clinical studies have been conducted to explore its pharmacological properties such as hepatotoxicity, proliferation, diabetes, and antifungal effects. The plant holds significant potential in inhibiting the growth of bacterial and fungal infections. Further research on this plant may lead to the discovery of new compounds, which could enhance the study of its pharmacological activity and aid in drug development. It offers a promising method of cure for a wide range of diseases. This plant has the potential to reduce human and environmental damage.

❖ REFERENCES:

1. Chaudhary H, Dhuna V, Singh J, Kamboj SS, Seshadri S. Evaluation of hydro-alcoholic extract of *Eclipta alba* for its anticancer potential: an in vitro study. *Journal of ethnopharmacology*. 2011 Jun 22;136(2):363-7.
2. Jehan Bakht JB, Amjad Islam AI, Mohammad Shafi MS. Antimicrobial potentials of *Eclipta alba* by well diffusion method. (2)
3. Datta K, Singh AT, Mukherjee A, Bhat B, Ramesh B, Burman AC. *Eclipta alba* extract with potential for hair growth promoting activity. *Journal of Ethnopharmacology*. 2009 Jul 30;124(3):450-6.(3)
4. Mithun NM, Shashidhara S, Vivek Kumar R. *Eclipta alba* (L.) A review on its phytochemical and pharmacological profile. *Pharmacologyonline*. 2011;1(1):345-57.
5. Baig MI, Bhagwat VG. Study the efficacy of Galactin Vet Bolus on milk yield in dairy Cows. *Veterinary world*. 2009; 2 (4):140-42.
6. Ananthi J, Prakasam A, Pugalendi KV. Antihyperglycemic activity of *Eclipta alba* leaf on alloxan-induced diabetic rats. *The Yale journal of biology and medicine*. 2003;76(3):97.
7. Gupta A, Kumar A, Kumar D, Nandan S, Shankar K, Varshney S, Rajan S, Srivastava A, Gupta S, Kanojiya S, Narender T. Ethyl acetate fraction of *Eclipta alba*: a potential phytopharmaceutical targeting adipocyte differentiation. *Biomedicine & Pharmacotherapy*. 2017 Dec 1;96:572-83.
8. Thenmozhi M, Jayanthi M. PHYTOCHEMICAL SCREENING AND ANTIOXIDANT ACTIVITY OF *ECLIPTA ALBA* L. *Asian Journal of Pharmaceutical and Clinical Research*. 2019 Feb 7:215-8.
9. Benes P, Knopfova L, Trcka F, Nemajerova A, Pinheiro D, Soucek K, Fojta M, Smarda J. Inhibition of topoisomerase I α : novel function of wedelolactone. *Cancer Lett*. 2011;303(1):29-38.
10. Teschke R, Bahre R. Severe hepatotoxicity by Indian herbal products: a structured causality assessment. *Ann Hepatol*. 2009;8(3):258-66.
11. Lal VK, Kumar A, Kumar P, Yadav KS. Screening of leaves and roots of *Eclipta alba* for hepatoprotective activity. *Arch Appl Sci Res*. 2010;2(1):86-94.
12. Kim DI, Lee SH, Choi JH, Lillehoj HS, Yu MH, Lee GS. The butanol fraction of *Eclipta prostrata* (Linn) effectively reduces serum lipid levels and improves antioxidant activities in CD rats. *Nutr Res*. 2008;28(8):550-4.
13. Sivarajan VV. *Ayurvedic drugs and their plant sources*. 1st ed. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.; 1994. P.119.
14. Kumari I, Kaurav H, Chaudhary G. *Eclipta alba* (bhringraj): A promising hepatoprotective and hair growth stimulating herb. *Asian Journal of Pharmaceutical and Clinical Research*. 2021 May 31;14(7):16-23.
15. Yorek N, Aydin H, Ugulu I, Dogan Y. An investigation on students' perceptions of biodiversity. *Online Submiss*. 2008;7:175-84.
16. Ateş DA, Turgay Ö. Antimicrobial activities of various medicinal and commercial plant extracts. *Turk J Biol*. 2003;27:157-62.
17. Khanna VG, Kannabiran K. Anticancer-cytotoxic activity of saponins isolated from the leaves of *Gymnema sylvestre* and *Eclipta prostrata* on HeLa cells. *Int J Green Pharm*. 2009;3:227-9.
18. Khanna VG, Kannabiran K. Anticancer-cytotoxic activity of saponins isolated from the leaves of *Gymnema sylvestre* and *Eclipta prostrata* on HeLa cells. *Int J Green Pharm*. 2009;3(3):227-229.
19. Ghorbani A. Studies on pharmaceutical ethnobotany in the region of Turkmen Sahra, north of Iran. Part 1: General results. *J Ethnopharmacol*. 2005;102(1):58-68.
20. Chukwuma EC, Soladoye MO, Feyisola RT. Traditional medicine and the future of medicinal plants in Nigeria. *J Med Plants Stud*. 2015;3(4):23-29.