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Review Article

PHARMACOLOGICAL ACTIVITIES OF *ECLIPTA ALBA(L.)*

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ABSTRACT

Eclipta Alba (L.) is small branched annual herbaceous plant with a long history of traditional medicines uses in many countries especially in tropical and subtropical regions. The herb has been known for its curative properties and has been utilized as antimytotoxic, analgesic, antibacterial, antihepatotoxic, antihaemorrhagic, antihyperglycemic, antioxidant, immunomodulatory properties and it is considered as a good rejuvenator too. Recent studies showed an antivenom property & corrosion pickling inhibitor action on mild steelin hydrochloric acid. A wide range of chemical compounds including coumestans, alkaloids, thiopenes,flavonoids, polyacetylenes, triterpenes and their glycosides have been isolated from this species. Extracts and metabolites from this plant have been known to possess pharmacological properties. This contribution provides an comprehensive review on ethnomedicinal uses, chemical composition, and the pharmacological profile as medicinal plant. Particular attention is given to antihepatotoxic, analgesic, antioxidant , antihyperglycemic, antiaggresive, wound healing properties and insecticidal effects presented in this review such that the potential use of this plant either in pharmaceutics or as an agricultural resource can be evaluated.

Keywords: Eclipta alba, pharmacological activity, photochemistry Eclipta alba.

INTRODUCTION

Eclipta Alba (L.) is an annual herbaceous plant, commonly known as false daisy. It is an erect or prostrate, much branched, roughly hairy, annual, rooting at the nodes; the leaves are opposite, sessile and lanceolate. Belonging to family Asteraceae. it is also known as Bhringaraj and Karisilakanni, which is found a common weed throughout India ascending up to 6000 ft. The genus name comes from the Greek word meaning "Deficient," with reference to the absence of the bristles and awns on the fruits. The specific Eclipta alba means white which refers to the color of the flowers. Main active principles consist of coumestans like wedelolactone, desmethylwedelolactone[1], furanocoumarins, oleanane & taraxastane glycosides[2]. Eclipta alba (L.) has been used in various parts of tropical and sub-tropical regions like south America, Asia, Africa. There are three kinds of Eclipta Alba the white-flowering, the yellow-flowering, and the black-fruiting, but all three grow throughout India by marshes, rivers, and lakes or on the foothills of the Himalayas.

MATERIAL AND MATHOD

The polyherbal drug under evaluation was developed and provided by M/S Natural Remedies, Bangalore. It contains the extracts of Withania somnifera, Emblica officinalis, Ocimum sanctum and few other related medicinal plants.[3,4,5,6]

PREPARATION OF EXTRACT

The dried powdered plant material (Leaves, roots, aerial part,stem, seeds) was extracted with chloroform in a Soxhlet extraction apparatus. The solvent was removed under reduced pressure and semi solid mass was obtained (Yield 16.7%). The extract showed positive test for alkaloids,

volatile oils and saponins. The extract at the different doses of 50,100 and 200 Mg/kg was suspended in aqueous Tween 80 solution (2%)

PHYTOCHEMISTRY:

Eclipta Alba (L.) contains wide range of active principles which includes coumestans, alkaloids, flavonoids, glycosides, polyacetylenes, and triterpenoids. The leaves contain stigmasterol, a-terthienylmethanol, wedelolactone, demethylwedelolactone and demethylwedelolactone-7-glucoside[1]. The roots give hentriacontanol and heptacosanol. The roots contain polyacetylene substituted thiophenes.The aerial part is reported to contain a phytosterol, P-amyrin in the n-hexane extract and luteolin-7-glucoside, P-glucoside of phytosterol, a glucoside of a triterpenic acid and wedelolactone in polar solvent extract[7]. The polypeptides isolated from the plant yield cystine, glutamic acid, phenyl alanine, tyrosine and methionine on hydrolysis. Nicotine and nicotinic acid are reported to occur in this plant [7].

Sl.No.	Parts	Chemical constituents
1	Leaves	Wedelolactone[1.6%],desmethywedelolactone,desmethylwedlolactone-7-glucosidde,stigmasterol
2	Roots	Hentriacontanol, heptacosanol & stigmasterol, ecliptal,eclalbatin.
3	Aerial parts	β–amyrin&luteolin-7-0-glucoside,apigenin,cinnaroside,sulphur compounds,eclabasaponins I-VI
4	Stems	wedelolactone
5	Seeds	Sterols, ecliptalbine(alkaloid)
6	Whole plant	Resin, ecliptine, reducing sugar, nicotine, stigmasterol, triterpenesaponin, eclalbatin, ursolic acid, oleanolic acid

PHARMACOLOGICAL PROPERTIES

Anti hepatotoxic property

Eight groups (I-VIII) comprising each of six albino rats of either sex weighing between 180 and 220 gm were selected. Liver damage was induced in groups II to VII by oral administration of 25% carbon tetrachloride in liquid paraffin at a dose of 1.25 ml/kg daily for five days. Group I served as control and received liquid paraffin daily for 5 days orally. From sixth day onwards, groups II to VII received once daily oral dose of either alcoholic or chloroform extracts of *E. alba, T. purpurea* and *B.diffusa* for seven days. The extracts were given at a dose of 200 mg/kg suspended in 0.7% Na-CMC mucilage. Group VIII was the untreated group. Group I and VIII received only the mucilage. On eighth day, sleep time was recorded in animals by injection sodium pentobarbitone at a single dose of 30 mg/kg i., in distilled water. Animals were sacrificed after the study, blood was collected in sterile centrifuge tubes and allowed to clot. Serum was separated and used for the estimation of SGPT, SGOT, SALP and serum bilirubin levels.[8, 9, 10, 11]

Anti hyperlipidemic property

It has been reported that in the atherogenic diet induced hyperlipedemic model, the aqueous leaf extract of the Eclipta.prostrata was given orally to the rats which significantly reduced total cholesterol, triglycerides, total protein. There was a significant elevation in the high density lipoprotein cholesterol levels. 200mg/kg of extract showed better results compared to 100mg/kg.[12] Animal model containing Charles River Sprague-Dawley CD rats. (specific pathogen-free/viral antibody-free Crj/Bgi male, 180 ± 10 g) were fed experimental diets supplemented with 0 mg (control), 25 mg (E25), 50 mg (E50), or 100 mg (E100) of a freeze-dried butanol fraction of E. prostrata per kilogram of diet for 6 weeks which reported significant reduction of serum triacylglycerol and total cholesterol, low-density lipoprotein-cholesterol levels and elevation in the high-density lipoprotein in the E50 and E100 groups respectively when compared with the untreated control group.[13]

Anaphylaxis activity

Preparation of antiserum from rat The Wistar rats of either sex were injected intraperitoneally with 0.2 ml, 10% egg

albumin, and 0.2 ml of Bordetella pertusis vaccine on day 1, 3, and 5. After 21 days of first immunization, blood was collected from orbital plexus under light ether anesthesia. The collected blood was allowed to clot and serum was separated by centrifugation at 1500 rpm. The separated serum was stored at -20ºC until it was used for the experiment.

Then animals were divided into the following groups:
Model Control
Standard (5 mg/kg)
AEEA (250 mg/kg)
AEEA (500 mg/kg)

The antiovalbumin serum was injected intradermally on the clipped dorsal skin of the animal. Drug/extracts were administered to animal according to their group for three consecutive days from the day of sensitization. After treatment, inject 1 ml of 0.5% solution containing 20 mg of egg albumin was injected intravenously through tail vein. Because of antigen-antibody reaction there was increased vascular permeability and dye will penetrate in that tissue area. This area of skin was removed after sacrificed. The skin portion was transferred to the solution of 70% acetone for 24 hrs. The dye was extract out in the acetone and Evans blue dye was measured calorimetrically at 620 nm. The amount of dye penetrate in the skin area reflect the severity of hypersensitivity reactions.

Immunomodulator activity

It has been reported that protection of neuronal tissues may be possibly due to the immunomodulatory action of Eclipta alba. Therefore, Eclipta Alba can serve as a potential memory modulator. Experimentation made to assess the immunomodulatory activity of methanol extracts of whole plant of E. alba (1.6% wedelolactone) at five dose levels (dose-response relationship) ranging from 100 to 500 mg/kg using carbon clearance, antibody titer and cyclophosphamide immunosuppression parameters significantly increased phagocytic index and antibody titer and the F ratios of the phagocytic index and WBC count were also significant. The aqueous leaf extract Eclipta alba was fed into a fish (tilapia, Oreochromis mossambicus) at 0, 0.01, 0.1 or 1% levels as a diet for 3 weeks. After each week, non-specific humoral (lysozyme, antiprotease and complement) and cellular (myeloperoxidase content, production of reactive oxygen and nitrogen species) responses and disease resistance against Aeromonas hydrophila were noted which resulted in increased activity of non-specific immune parameters. The results indicate that dietary intake of E. alba aqueous leaf extract enhances the non-specific immune responses and disease resistance of O. mossambicus against A. Hydrophila[14,15,16.]

Analgesic and Anti-inflammatory activity

Albino wistar rats were used to investigate anti-inflammatory activity in which methanolic extract was administered orally. 100 and 200 mg/kg showed significant anti-inflammatory activity in carrageenin and egg white induced hind paw edema in rats which was compared with indomethacin (10 mg/kg) and cyproheptadine (8 mg/kg). Analgesic effect was studied on albino mice using ethanolic and alkaloidal extract of Eclipta Alba. Standard experimental models such as the tail clip method, the tail flick method and the acetic acid induced writhing response were used which showed both the ethanol extract as well as the total alkaloids produced good analgesic activity in all the different models of analgesia used. The total alkaloidal fraction was the most efficacious in all models tested.[17,18.]

Antidiabetic activity

The choloroform extract of eclipta alba exhibitedsignificant antidiabetic activities in alloxan induced diabetic rats. This extract has showed improvement in parameters like body weight and lipid profile by enhancing effect on cellular antioxidant defenses to protect against oxidative damage. Present efforts are directed to isolate the active constituents from this fraction and confirmation of mechanism of action.[19,20]

Hair growth & Alopecia

Eclipta Alba is used in hair oil preparations since it promotes hair growth and maintains hair black. 10%w/v of Eclipta alba was an main ingredient in the preparation of herbal formulation for hair growth. Alopecia is a dermatological disorder with psychosocial implications on patients with hair loss. Eclipta Alba is a well-known Ayurvedic herb for hair growth. In the reported work Petroleum ether & ethanolic extracts were incorporated into oleaginous cream (water in oil cream base) and applied topically on shaved denuded skin of albino rats. The time (in days) required for hair growth initiation as well as completion of hair growth cycle

was recorded. Minoxidil 2% solution was applied topically and served as positive control for comparison. The result of treatment with 2 and 5% petroleum ether extracts were better than the positive control minoxidi[21]

Anticancer activity

The inhibitory effect of the crude methanolic extract of Eclipta alba has been tested in vitro against a panel of colon cancer and normal intestinal cells using MTT cytotox assays. Plant extracts inhibited the proliferation of colon cancer cells in a concentration-dependent manner and more cytotoxic to cancer cells than to normal cells. The cancer cell lines for further test and assay methods were sent to cancer cell lines, New Delhi to obtain the results.[22,23]

CONCLUSIONS

Eclipta Alba offers a remarkable activity for curing of many diseases. It has a wide range of chemical constituents. Clinical investigations have been done on pharmacological activities like hepatotoxicity, proliferative, diabetic, hypolipedemic etc. It has a greater potential to inhibit the growth of the bacteria and fungus. Further investigation of the plant can increase the isolation of the newer molecules which will be helpful for the study of the pharmacological activities and to discover from the plant thus preventing the human and the economic losses in the environment.

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