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A Short Review on Euphorbia Neriifolia

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Abstract:

Euphorbia neriifolia is an herb extensively used in the Indian system of medicine; it is a small deciduous tree of the family Euphorbiaceae. As a tree having number of branches so as Neriifolia having tremendous uses. As traditional medicine the plant is useful in abdominal troubles, bronchitis, tumors, leucoderma, piles, inflammation, and enlargement of spleen, anemia, ulcers, and fever and in chronic respiratory troubles. The plant is reported to contain sugar, tannins, flavonoids, alkaloids and triterpenoidal saponin etc. The plant has been reported to have analgesic, hepatoprotective, immunostimulant, anti-inflammatory, mild CNS depressant, wound healing Radioprotective. It is now considered as a valuable source of unique natural products for development of medicines against various diseases and also for the development of industrial products. This review gives a bird's eye view mainly on the pharmacognostic characteristics, traditional uses, phytochemistry and pharmacological actions of the plant Euphorbia neriifolia.

Keywords: Euphorbia neriifolia, Pharmacological activities, Phytochemistry, Traditional use.

1. INTRODUCTION :-

Euphorbia neriifolia is a species of spurge, which was originally described by Carl Linnaeus in 1753.[1] Sehund (Euphorbia neriifolia Linn.) popularly known as Indian Spurge Tree, Oleander Spurge, Hedge Euphorbia, Sehundah (Ayurveda) and Ilachevikalli (Siddha) belongs to the family Euphorbiaceae. It is attributed with properties such as Ushnaveerya (hot), Snigdha (oily), Katu (pungent), and Laghu (light)[2].

Sehund is a large succulent shrub, with stipular thorns and is found in throughout the Deccan peninsula of India. It is believed to be a native of India and Deccan peninsula is the country of origin (South India). It is commonly found in rock ground, among rock crevices of hills; extensively cultivated in the Bengal for hedges and elsewhere in native villages [3]. Today, it is widely distributed throughout the world. Sehund has been given various names in different regions and languages. The more common local names of Sehund are Shij (Bengal), Dog's Tongue (English), Thor (Gujarati), Ilakkalli (Malayalam), Siju (Oriya), Danda Thohar (Punjab), Dotathur (Rajputana), Snuhi (Sanskrit), Zaqquum (Urdu) [4,5]. Thuhar (*Euphorbia neriifolia*) is a drug of herbal origin, which has been a part of traditional Healthcare in most parts of the world for thousands of years. The specific name, *neriifolia*, Means "Leaves like an oleander." There are over 1500 species of *Euphorbia*'s' family in the World ranging from annual weeds to trees. *Euphorbia neriifolia* is an herb full of spine, Popularly known as 'sehund' or thuhar. It is also called milk hedge in English. As a significant Medicinal plant, the traditional use of *Euphorbia neriifolia* for curing many disease has a long History has effectively been employed for the treatment of various ailments like hudar (rheumatism) irqunnisa (sciatica) niqrous (gout) warm-eshobatein (bronchitis) warm-e-tihal, Waja-ul-uzn (otalgia), iltehab (inflammatory conditions), zeeq-un-nafs (asthma) bars (leucoderma) etc. (Ahmed et al., 2011; Kabiruddin, 2000; Hakeem, 2002; Sharma et al., 2011; Kirtikar and Basu, 2005; Anonymous, 1992) [6,7,8,9,10,11]

Synonyms: -

Euphorbia neriifolia Linn is morphologically similar with a number of other species from genus *Euphorbia*, such as *Euphorbia ligularia* Roxb., *Euphorbia antiquorum* Linn. (*Tridhara sehunda*), *Euphorbia nivulia* Buch. (Ham), *Euphorbia royleana* Boiss. (*Thuhara*), *Euphorbia tirucalli* Linn. (*Kanda snuhi*), *Euphorbia caducifolia* Haines. And *Euphorbia trigona* Haw (*Tridhana sehunda bheda*) [12]

Biological source :-

Euphorbia is a very large and diverse genus of flowering plants, commonly called spurge, in the family *Euphorbiaceae*. "Euphorbia" is sometimes used in ordinary English to collectively refer to all members of *Euphorbiaceae* (in deference to the type genus), not just to members of the genus. [13]

Chemical constituents :-

It is reported to have chemical constituents like, *neriifolin-S*, *neriifolin*, *neriifoliene*, *euphol*, *neriifolione*, *cycloartenol*, *nerifoliol*, *lectin*, *euphonerins A-G*, *3-O-acetyl-8-O-tigloylingol*, *taraxerol*, *antiquorin*, etc. [14]

Cultivation needs :-

Euphorbia neriifolia plants need proper sunlight for their better growth but they can also adapt to grow in the shade as well. They are also found to grow in dry places over the rocky areas in the drained soil of the different villages in India. They quickly grow into large trees without the requirement of any maintenance within a 3–5 year time period. Watering them on a regular basis is required during the growth season (March to September), but collection of water near the root area should not be allowed and they should be kept completely dry in the winter season [15]

Seasonal Collection of Crude Drugs :-

According to Charak samhita, different seasons for the collection of different parts of *E. neriifolia* are mentioned in Table 3. As per Sushrut Samhita, the most preferable time of collection for *E. neriifolia* fruit is the summer season (Grishmaritu), for latex is the early winter (Hemantritu), for the bark is the autumn season (Sharadritu), for the leaves is the rainy season (Varsharitu), and for the roots is before the rainy season (Pravrutaritu).[16]

Traditional uses :-

The plant has been used in Ayurveda, Unani and Sidha. A Traditional uses of *E. neriifolia* (Sehund) as per Ayurveda are – to Improve digestion strength (deepana); induces server purgation (rechana); useful in treating disorders of veta-dosha imbalance Such as neuralgia, paralysis, constipation, bloating, etc; unctuous Oily (snigdha); light to digest (leghu); etc[17]

- a. The leaf of *E. neriifolia* is heated and tied over the area affected with pain and inflammation.
- b. The fresh juice from the leaf is poured inside the ears to treat earache, to defrost skin warts, and in arthritis. The milk latex of *Euphorbia neriifolia* is applied over warts as part of Treatment.
- c. Oil processed from the leaf of *E. neriifolia* and sesame oil is used for external application to treat joint pain.
- d. The paste of the leaf of *E. neriifolia* is applied over the skin to treat skin diseases.
- e. The vaidhyas from ancient times used to use the milky Juice exuded from the injured stems as drastic cathartic and To relieve earache. They are used as a drastic purgative in the enlargement of liver and spleen, syphilis, dropsy, general Anasarca, leprosy, etc. It has been found beneficial for asthma [18,19]
- f. Latex is acrid, laxative, pungent and good for tumours, Abdominal troubles and leucoderma. It is also used as a Purgative, rubefacient, carminative, expectorant, whooping Cough, gonorrhoea, dropsy, leprosy, asthma, dyspepsia, Jaundice, enlargement of the spleen, colic and stone in the Bladder. It is use to remove cutaneous eruptions and warts. It Is liable to cause dermatitis [20,21]. The dried juice with some Other ingredients used as a drastic purgative in the enlargement Of liver and spleen, syphilis, dropsy, general anasarca, leprosy, Etc. Juice is largely used with clarified or fresh butter as an Application to unhealthy ulcers and scabies i.e. it is used for Cleansing the abdomen in cases of poisoning and in severe Constipation. When applied to glandular swellings it prevents Suppuration. Mixed with margosa oil it is applied to rheumatic Limbs. The fresh milk latex of *euphorbia neriifolia* is used in the Preparation of ‘Kshara sutra’, applied for the medicated thread Useful to treat piles and fistula or over external pile mass to Reduce it. Turmeric powder mixed with the juice of *Euphorbia Neriifolia* is recommended to be applied on piles. Thread steeped In the above mentioned mixture is used in ligaturing external Haemorrhoids [22,23]

MORPHOLOGY:-

E. neriifolia is a glabrous, erect branching succulent xerophytic tree or shrub that grows to a height of 20 feet (1.8–4.5 m) with jointed cylindrical or obscurely 5-angled branches [24].*E. neriifolia* is quite similar to *E. nivulia* but may be identified by the location of the thorns, Which, in the former, sprout from warty

nodes, whereas they sprout from flat corky patches bin the latter [25].

• **LEAVE :-**

young leaves are dark green in color and have a leathery feel (Figure 1). Peri-Clinical sections at the third and fourth layers of the peripheral meristem initiate the leaves [26].

Figure 1. Different parts (leaves, latex, fruits, and flowers) of the *Euphorbia neriifolia* plant.

• **INVOLUCRES :-**

Yellowish involucre emerge in clusters of three to seven in a cyme, generally in threes, on a very small fleshy peduncle of around 3.8 mm in length. The lateral flowers in the involucre are pedicelled and bisexual, whereas the center blooms are typically male and sessile. Male involucre, 2-bracteate, bearing a bisexual involucre in the bract axils, the opposing bracts of which may carry a peduncle each and are 3-lobed with a serrated central lobe. Involucre lobes are widely cuneate and fimbriate, and anthers are sagittate and apiculate, similar to those of *E. nivulia* [27].

• **FLOWERS :-**

Male and female flowers occur concurrently inside the same bunch. On slender, inflexible, and forked peduncles, three to seven flowered cymes or panicles develop laterally in the axils of the top leaves. Globose are 1.5–2 mm × 4–5 mm in size, reddish and flattened, noticeable in groups of trees, the center one is subsessile, the lateral ones have a 6–7 mm peduncle, 5 mm oblong, 1–3 mm broad cyathial glands although the corolla is lacking. The involucre is adorned with two roughly round to oval, bright crimson bracts about 3–7 mm in length. The inflorescence, or cluster of flowers on the plant, is of the cyathium type (one female flower and numerous male flowers are present in the same bunch) [28].

• **FRUITS :-**

Fruits resemble capsules. Three-lobed style, stigmas somewhat dilated, smooth, ten to twelve millimeters in diameter, and minutely serrated. They appear in a variety of climates and are only visible in February and March [29].

• **SEEDS :-**

Seed are flat and covered with fine hairs [30].

• **BRANCH :-**

The saccular branches are characterized by a pair of robust stipular spines on the tubercles of branchlet, which are confluent in five vertical spinal lines or ribs. Branches become increasingly obtusely 5-angonous in segmentation. Throughout the plastochronous stages, the central meristem is prominent. The central and peripheral meristems have a tight histogenic connection. Reticulate bark covers the trunk [31].

• **STIPULAR THORNS :-**

The spines are small, about 4–12 mm long, grayish brown to black in color, pointed, and persistent, emerging from short conical truncate distant, and spirally organized tubercles 2–5 mm tall and 2–3 cm separated [32].

• **GLANDS :-**

Glands are transversely oblong and yellow [33].

• POWDER :-

The powder is a creamy golden color. It has epidermal pieces with straight wall sand an abundance of actinocytic and few paracytic stomata. Simple striated cuticle cells With branching laticiferous capillaries as well as granules of starch in the form of a dumb-Bell. When powdered, many stone cells were identified. They are made up of fibers with thick and thin walls, as well as sclereids that originate from the spine. The powder was Dissolved in glycerin and colored with iodine, phloroglucinol, strong hydrochloric acid, and Sudan III. The leaf powder contains abundant calcium oxalate crystals and starch grains Withidioplasmic, rosette, square, prismatic, and acicular shapes. Additionally, the powder Had well-organized annular arteries, anomocytic stomata, and a unicerrate multicellularTrichome with a blunt apex. Schizogonous cells, polyhedral or acutely angled starch grains, And lignified xylem fibers were found in the epidermal cells, spongy parenchyma, xylem Parenchyma, and vittae-volatile. After treatment with HCl, the calcium oxalate crystals Change form from acicular to needle-shaped [34].

• LATEX :-

Latex is a milky sap-like fluid present in cells and arteries that is often injected follow-Ing tissue damage that occur during the laticiferous system's formation [35].

• TAXONOMY :-

The plant belongs to the Eukaryota domain, Plantae kingdom, Magnoliophyta division,Spermatophyte super-division, Magnoliopsida class, Rosidae sub-class, Euphorbiales order,Euphorbiaceae family, Euphorbia genus, and the Euphorbia neriifolia Linn. Species [36].

3.PHARMACOLOGICAL ACTIVITYS :-

• ANTIMICROBIAL ACTIVITY OF E.neriifolia & ITS CONSTITUENT :-

Various extracts of E. neriifolia were observed to exert significant antimicrobial activ-Ities against a wide range of human pathogens (Figure 2). Moreover, some of the major Phytochemicals obtained from the plant showed tremendous activities against different Bacteria, fungi, viruses, and parasites [37,38,39].

Figure 2. Antimicrobial activities of the major phytochemicals obtained from E. neriifolia.

• ANTIBACTERIAL ACTIVITYS :-

Investigated the antibacterial properties of plant extracts using Microbiological methods, specifically measuring the zones of growth inhibition of threeRepresentative bacteria in the presence of the extracts, namely Pseudomonas aeruginosa, Escherichia coli, and Staphylococcus aureus. The antibacterial activity of ethanol extract of Leaves and petroleum ether extract of pod are greater against the growth of E. coli than Against the growth of S. aureus and P. aeruginosa. This suggests that E. coli-related disorders, Such as wound infections and epidemic infantile diarrhea, may be treated well with these extracts from the leaves and pods. An additional study found that leaf extract had strongHemopoietic activity and enhanced the survival rate of rats when exposed to E. coli-induced Abdominal sepsis [40].

• ANTIFUNGAL ACTIVITY :-

Skin infections are mostly caused by *Candida albicans*, *Candida neoformans*, *Epidermo-Phyton floccosum*, *Melassezia furfur*, *Trychophyton tonsurans*, etc. According to preliminary Results, *E. neriifolia* may have slowed the spread of *Candida tropicalis* and *Candida albicans* in The laboratory [41] Latex milk with Chitosan at 60 μ L dose reduced the percentage of spore germination In *Aspergillus fumigates*, *Aspergillus flavus*, and *Mucor*[42]. In another study, antifungal activity of methanolic extract of stem showed significant Zone of inhibition against *Aspergillus niger* (14 mm) and *Candida albicans* (12 mm) [43].

• ANTIPARASITIC ACTIVITIES :-

Helminthiasis is widespread throughout the world but is more prevalent in under-Developed nations with less maintained personal and environmental hygiene. Numerous Helminthes reside in the human gastrointestinal tract, but others can live in connective Tissue. They cause harm to the host by depriving them of food, inducing blood loss, causing Organ damage, obstructing the intestinal or lymphatic system, and secreting different types Of toxin compounds [98] Another study discovered that the leaves and latex of *E. neriifolia* were utilized to cure helminthiasis. *E. neriifolia* was used efficiently in a blend with several other herbal plants to treat helminthiasis. Swargiary also listed 64 plants that were used to treat helminthiasis in traditional medicine system of India [44].

• ANTIVIRAL ACTIVITY :-

There has been an increase in Chikungunya virus (CHIKV) transmission from Africa And the Indian subcontinent to Southeast Asia, across the Indian Ocean, Caribbean islands, and Central and South America because of the worldwide expansion of the mosquito Vectors *Aedes aegypti* and *Aedes albopictus*. [45,46]. In another study, fifteen diterpenoids obtained from *E. neriifolia* were put to the test For their anti-HIV1 activities. The assay was developed by Chen, according to a feasible And reliable method where Zidovudine (AZT) was used as positive control [47,48]. Drug Concentrations that lower luciferase activity by 50% (EC50) is considered to have antiviral Potency. The cytotoxicity of the drugs was assessed using a CytoTox-Glo cytotoxicity Test (Promega). It was discovered that the 50% of the cytotoxic concentration (CC50) was the concentration at which 50% of cells died. The ratio of CC50 to EC50 is known as the index (SI). 17-dihydroxyatisan-3-one and eurifoloid R, two of the chemicals Examined, showed a clear anti-HIV-1 activity. Both compounds have shown moderate Anti-HIV effects compared to the standard drug azidothymidine [49].

• ANTI – SARS – CoV2 ACTIVITIES OF *E. neriifolia* :-

SARS-CoV-2 has been taking its toll since 2019. Scientists are working intensely to Develop an efficient therapy for this pandemic. Twenty-three chemicals were recovered From the ethanolic extract of *E. neriifolia* leaves, including twenty-two triterpenoids and One flavonoid glycoside. The anti-human coronavirus (HCoV) activity of the isolated Triterpenoid was investigated in order to determine their structure–activity relationship. 3-Friedelanol was more effective against HCV-229E than the standard actinomycin D, Indicating the relevance of the friedelane structure as a template for building new anti-HCoV-229E medicines [50].

CONCLUSION :-

Euphorbia plants are easily distinguishable by their toxic and highly skin irritant milky latex And particular inflorescences, designated as cyathia. They are widely used as ornamental Plants, such as *E. milii* Des Moul., *E. tirucalli* L., and *E. lactea* Roxb. The latex is the most Valuable product obtained from Euphorbia species despite being toxic, it contains several Biologically active natural compounds, such as triterpenoids. Besides, latex is used in Commercially valuable products like paints and natural rubber (intisy rubber obtained from *E. Intisy* Drake). They also have antifungal value. Further studies are needed to be conducted on Them.

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