ETHNOPHARMACOLOGICAL ACTIVITIES OF TRADITIONAL MEDICINAL PLANT: EVOLVULUS ALSINOIDES

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ABSTRACT

Evolvulus alsinoides L. (E. alsinoides) an important medicinal plant is employed for different ailments in India traditionally and grows in the open and grassy places almost throughout India. The entire plant is considered astringent and useful for treating hemorrhages, also in other medical applications, including as an antipyretic, antiseptic, antioxidant, anticonvulsative, brain tonic, against asthma, bronchitis, scrofula, syphilis. This review summarizes the ethnopharmacological importance of Evolvulus alsinoides L. in traditional Indian medicine.

KEYWORDS: This review summarizes the ethnopharmacological importance of Evolvulus alsinoides L. in traditional Indian medicine.

INTRODUCTION

Several medicinal plants have also been extensively used in the Indian traditional (Ayurveda) system of medicine for the treatment of various diseases. Evolvulus alsinoides is often prostrate, slender and wiry with long hairs. It occurs throughout the region from India to west Cameroon and widely dispersed elsewhere in tropical Africa and worldwide. Some vernacular names of plant in India are: vishnukranta, vishnugandhiy (sanskrit), shankapushpi (hindi), shankhavalli (marathi), shankvel (kannad). In Sri Lanka, roots and stem extract of the plant are used to treat dysentery and depression. Leaves are recommended for asthma and mental disturbances (Rajaqkaruna N et al, 2002). It is used in
insanity, epilepsy and nervous debility. The plant is used in Ayurveda as a brain tonic in the treatment of neurodegenerative diseases, asthma and amnesia (Goyal PR et al, 2005). *E. alsinoides* has been proved to possess scientific potential in central nervous system depression, anxiolytic, tranquillizing, antidepressant, antistress, neurodegenerative, antiamaresic, antioxidant, hypolipidemic, immunomodulatory, analgesic, antifungal, antibacterial, antidiabetic, antiulcer, antcatatonic and cardiovascular activity (Sethiya NK, Nahata A et al, 2009). *E. alsinoides* is reported to contain several types of alkaloids, steroids, flavanoids and coumarins as active chemicals that bring about its biological effects (Sethiya NK, Thakore SG et al, 2009).

**Botanical description**

*Fig. E. alsinoides.*

This is a very slender, more or less branched, spreading or ascending, usually extremely hairy herb. The stems are 20-70 cm long and not twining. The leaves, which are densely clothed with appressed, white and silky hairs, are variable clothed, lanceolate to ovate and usually 0.5-1.0 cm in length; the apex is blunt with a little point and the base is pointed. The flowers are pale blue and 6-8 mm in diameter. The fruit (capsule) is rounded and usually contain 4 seeds. *E. alsinoides* is native to the South America and is widely naturalized all over the world, including India.

**Habitat**

It is a common weed growing wildly in open grassy places throughout India. *Evolvulus alsinoides* L. commonly found in India, Africa, and the Philippines, is an important medicinal
plant employed for different ailments in India traditionally. It grows in open and grassy places throughout almost all of India and subtropical countries of the world.

**Phytochemistry**

In recent studies, researchers reported the presence of chemical constituents like triacontane, pentatriacontane, evolvine, β-sitosterol, two alkaloids betaine and shankpushpin, four unidentified alkaloids A, B, C, caffeic acid, 6-methoxy-7-O-b-glucopyranoside coumarin, 2-C-methyl erythritol, kaempferol-7- O-b-glucopyranoside, kaempferol-3-O-b-glucopyranoside and kaempferol-3-O-b-glucopyranoside and quecetine- 3-O-b-glucopyra-noside in this species (Gupta P et al, 2007).

**Pharmacological properties**

Whole parts of *Evolvulus alsinoides* possess valuable medicinal properties and plant is widely used in ayurveda. The plant reported to contain Shankapushpine, Betaine & also contains volatile oils. The presence of the several active compounds *Evolvulus alsinoides* possess some pharmacological activities which can be used for the cure of several diseases.

**Antioxidant activity**

Free radicals are involved in many disorders, including neurodegenerative diseases and cancer Plant-based drugs containing radical scavengers are gaining importance in the prevention and treatment of such diseases (Desai PV et al, 2008). The antioxidant activity of this plant may be due to the presence of antioxidant phytochemicals like polyphenolics, steroids and triterpenes (Gomathi D et al, 2012; Chen RJ et al, 2001). the antioxidant activity of *E. alsinoides* was evaluated employing in vitro assay methods, such as scavenging activity of ferric reducing antioxidant power (FRAP), hydrogen peroxide and inhibition of lipid peroxidation and the functional groups present in the ethanolic extract were identified through fourier transform infrared spectroscopy (FTIR) technique. The ethanolic extract of *E. alsinoides* used to study the free radical scavenging activity, In vitro lipid peroxidation and FTIR analysis. The ability of plant extract to reduce ferric ions was determined in FRAP assay (Duraisamy Gomathi, Ganesan Ravikumar et al, 2014).

**Anticonvulsant activity**

Phytochemical screening of the extract revealed the presence of secondary metabolites such as saponins, tannins and flavonoids. *Evolvulus alsinoides* extract produced a 50-100% protection of the mice against pentylentetrazole (PTZ) induced seizure at doses of 100-
400mg/kg. The protection of the extract against PTZ induced convulsion suggested that the extract interacts with GABA-ergic neurotransmission. The PTZ test is assumed to identify anticonvulsant drugs effective against myoclonic and absence seizures. *E alsinoides* significantly attenuated electrically induced seizure in mice. Electroshock seizures are characterized by tonic extension of the hind limb and abolition of this activity is taken as anticonvulsant action. (Abubakar K., et al, 2013).

**Anti-diabetic activity**
The high levels of all glycoproteins were observed in the tissues of the streptozotacin induced rats when compared with the normal control rats. Treatment with ethanolic extract of *E. alsinoides* for 45 days resulted in a significant reduction of glycoproteins in the tissues of diabetic rats and there was no significant difference were observed between control and *E. alsinoides* alone group rats. Administration of *E. alsinoides* extract decreases the content of sialic acid in the liver and kidney of streptozotacin induced diabetic rats. (Duraisamy Gomathi et al, 2013).

**Antibacterial activity**
At a concentration of 1025mg/ml, the highest zone of clearance was obtained from ethanol extract against *Klebsiella pneumoniae* with a diameter of 38mm. This was followed by *Pseudomonas aeruginosa* (33 mm), *Salmonella typhi* (30 mm) and *Escherichia coli* (26 mm) respectively. The lowest zone of inhibition at this concentration was 8mm against *Staphylococcus aureus*. Higher growth inhibition was obtained with the ethanol extract compared with aqueous extracts (Omogbai B. A. & Eze F. A., 2011).

**Antimalarial activity**
To carry out enzyme inhibition studies, lactate dehydrogenase was cloned from *Plasmodium falciparum* 3D7 strain using expression vector pET28a and expressed in *Escherichia coli* BL21 (DE3). The gene coding for plasmodium falciparum specific lactate dehydrogenase (*Pf*LDH) was cloned in *Escherichia coli* and recombinant protein was purified by Ni-affinity chromatography. Recombinant *Pf*LDH and bovine lactate dehydrogenase were diluted to 18 kU/L concentration in phosphate buffered saline (pH 7.4) containing 1 mg/mL bovine serum albumin and 1 mmol/L phenylmethanesulfonyl fluoride, and from this stock, 30 mL enzyme was used in the assay. Methanol extract of *E. alsinoides* was tested at 50 mg/mL concentration for *Pf*LDH inhibitory activity. Methanol extract of *E. alsinoides* reduced
P/LDH activity to (25.04±0.51) %. Effects of E. alsinoides were statistically significant at 0.001 levels (Neeraj Sethia et al, 2013).

**Anti-inflammatory activity**
The chloroform and ethyl acetate extracts were showed graded dose response. The chloroform, ethyl acetate extracts were protected 27.4% and 28.3% at 120min, it indicates that *Evolvulus alsinoides* extracts are considerably reduced the inflammation but when compared with standard drug at 12.5mg/kg body weight was not that much potent drug, but the extracts were reduced the inflammation caused by prostaglandins, histamine and 5-hydroxy tryptamine at intial stage, later stage is not that much acceptable which is caused by many factors (Purma Aravinda Reddy et al, 2013).

**CONCLUSION**
*Evolvulus alsinoides* is used in traditional medicine in East Asia, India, Africa and Philippines to cure fever, cough, cold, venereal diseases, adenitis and dementia. *Evolvulus alsinoides* has also reported in the treatment of neurodegenerative diseases, asthma and amnesia. *Evolvulus alsinoides* contain bioactive principles that may be of benefit in the treatment of various diseases. This further provides validity for the use of the plant for the management of neurodegeneration in traditional medicine. Further research is encouraged in the area of isolation and characterization of the bioactive compounds from *Evolvulus alsinoides*.

**REFERENCE**
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