

**Review Article****ETHNO-PHARMACOLOGICAL AND PHYTOCHEMICAL CONSTITUENTS REVIEW  
OF *ECHINOPS ECHINATUS* ROXB.**

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**ABSTRACT**

*Echinopsechinatus*Roxb. is a traditional plant that use medically traditional prescribing system. *E. echinatus* found in different in regions of Pakistan and India. Different evaluation methods are wereuse to know the phytochemical and pharmacological activities such as anti-inflammatory, Diuretic, analgesic, anti fertility of the plant. The aim of this review to summarized the works on *E. echinatus*.It is concluded that besides of in-vivo studies, it also need to check the in-vitro studies of the plant. This miracle plant also need to more explore and discussion.

**Keywords:** *Echinopsechinatus*, *ethnopharmacolgy*, *phytochemistry*, *antiferility plant*

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**INTRODUCTION**

The genus Euphorbia comprises the largest genus belong to spurge family that belong to virtually 2000 species.Euphorbiaceae is the heading family between the Angiospermae having 300 genera and 5000 species.*Echinopsechinatus*Roxbis the useful traditional medicinal plant. The chemical constituents of *Echinopsechinatus*Roxbare studied for their biological activity and medicinal applications. The more common phytochemicals present in *E.echinatus*areechinopsine, echinopsidineandechinozolinone. The commonly part used are whole plants, Roots, Seeds and Leaves. *E. echinatus*widely distributed in Afghanistan, Pakistan, India

**Taxonomic Classification**

Kingdom	Plantae
Phylum	Magnoliophyta
Class	Magnoliopsida
Subclass	Asteridae
Order	Asterales
Family	Asteraceae
Genus	Echinops
Species	Echinatus

Common names:

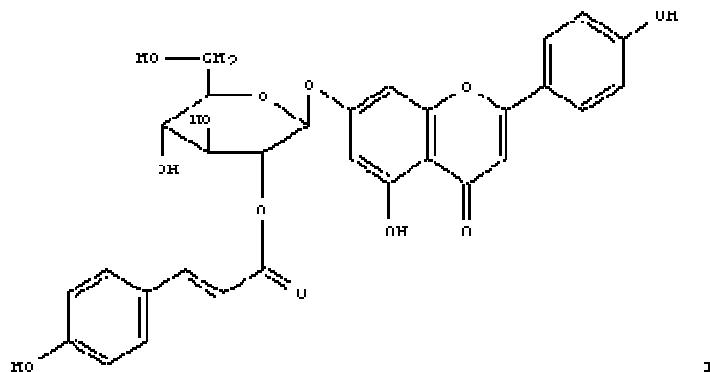
1. English: Indian Globe Thistle
2. Gujarati: Shuliyo, Utkanto, Utkato
3. Hindi: Gokhru, Uthkanta, Utakatira
4. Sanskrit: Kantalu, Kantaphala, Utati,
5. Urdu : Utkantaka,

### Botanical Morphology:

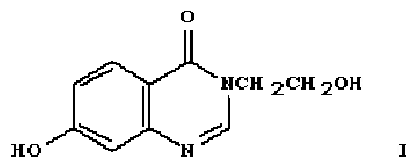
*E. echinatus* is a stiff, young, yearly herb having almost one to three feet in height, having widely spreading branches from base

**Leaves** are the lobes triangular and oblong, sessile, sinuate and spiny, covered with cottony wool beneath, oblong, pinnatifid, alternate, the spines often 2.5 cm long. deeply pinnatifid leaves are 7 to 12 cm long.

**Flower** heads are white or purple with compact, globosely bunched at the ends of branches; involucre surrounded by tough white bristles approaching poppous-hairs; poppus short, yellowish, making a short cylinder-shaped brush above the achenedomes occur in solitary white sphere-shaped balls, 3 to 5 cm across.



A minor alkaloid 7-hydroxyechinozolinone (I) is reported from the flowers of *E. echinatus*



### Traditional Uses:

Alterative, diuretic, nerve tonic (used in hoarse cough, dyspepsia, scrofula, hysteria), anti-inflammatory and anti-fungal. In Pakistan and India, it uses the suspension of root bark powder in milk (100g/ 250ml) for the treatment of diabetes. The traditional Aurveda healers of Chhattis-garh, India use *E. echinous* herb internally and externally for the treatment of sexual disorders. In case of patients having poor sexual vitality, aqueous paste of the root bark powder is applied externally on the male genitals one hour before intercourse. *E. echinosis* advised to inhale the fumes obtained by

burning the leaves & roots to patients of respiratory disorders predominantly asthma to get fast and everlasting relief.

The root is abortifacient aphrodisiac. The seeds are sweet and aphrodisiac (Aurveda). The plant is bitter, stomachic, antipyretic, analgesic, increases the appetite stimulates the liver, useful in brain disease, used in ophthalmic, chronic fever, pains in the joints, inflammations, the root is aphrodisiac (yunani).

### Phytochemistry:

Aerial parts of the plant contain alkaloids, echinopsine, echinopsidine and echinozolinone. Taraxasterol acetate, Apigenin and its derivatives, echinacin and echinaticin. 2',5,7-trihydroxy-3,6-dimethoxy flavone-7-O- $\beta$ -D-galactopyranosyl-[1 $\rightarrow$ 4]-O- $\alpha$ -L-rhamnopyranoside is testified from the seeds. Apigenin, apigenin-7-O-glucoside, and a new acyl-flavone-glucoside named echitin (I) and a minor alkaloid 7-hydroxy echinozolinone (I) were obtained from the flowers of *E. echinatus*

An anti-inflammatory active flavanone-glycoside 5,7-dihydroxy-8,4'-dimethoxyflavanone-5-O- $\alpha$ -L-rhamnopyranosyl-7-O- $\beta$ -D-arabinopyranosyl-(1 $\rightarrow$ 4)-O- $\beta$ -D-glucopyranoside A along with a known compd. dihydroquercetin-4'-Me ether is also reported from leaves.. Four phenolic compounds; apigenin, apigenin-7-O-glucoside, echinacin (I), and echinaticin (II), were reported from *E. echinatus* Roxb.

Isomeric acyl-flavone-glycosides echinacin (I) and echinaticin (II) were also obtained from *E. echinatus*. In 1997 Chaudhuri PK found the alkaloid the Echinozolinone. Besides of echinopsine and echinopsidine, a new alkaloid echinozolinone, had been recognized in *herb* as 3(2-hydroxyethyl)-4(3H)-quinazolinone from its spectral data [1, 2]. Besides apigenin 'J-O-glucoside, a new acylated lactone had been recognized in *herb* as apigenin 7-O-(4'-cis-pcouyl)-e from spectral and chemical analysis [3, 4]

### Flavones and Flavone glycosides

The four phenolic compounds were isolated apigenin, apigenin-7-O-glucoside, echinacin, and echinaticin in 1988. By the methylation of apigenin-7-O-glucoside and echinacin, two derivatives are obtained i.e. echinacin permethyl ether and apigenin-5,4'-dimethyl ether, respectively. An isoflavone glycoside was isolated during the chromatographic determination of the methanolic extract of *E. echinatus*. The echinoside was the recognized isoflavone [mp 268–270°C, C<sub>27</sub>H<sub>30</sub>O<sub>12</sub>]. IR spectrum shows the occurrence of chelated carbonyl (1650 cm<sup>-21</sup>) and hydroxyl (3300–3650 cm<sup>-21</sup>) functional groups in molecule. On acid hydrolysis, it gave glucose, rhamnose and an aglycone [5, 6].

The glycoside methylation by Hakomori method formed a methylated product which on further introduction to methanolysis gave 3,4,6-trimethoxy-D-glucose and 2,3,4-trimethoxy-L-rhamnose and the aglycone, 7-hydroxyisoflavone.

### Pharmacological Activities:

#### 1. Antifungal activity:

Apigenin, echinacin, apigenin-7-O-glucoside and echinaticin are the four phenolic compounds that were isolated from *E. echinatus*. The methylation of echinacin and apigenin-7-O-glucoside permethylated gave the two derivatives echinacin-permethyl ether

and apigenin-5,4'-dimethyl ether respectively. These all compounds were evaluated against growth of conidia of *Alternaria tenuissima*. Wiltshire, All exposed high effectiveness against the pathogen at concentrations ranging from 25 to 150<sup>-1</sup> mL µg Echinacin, which was highly active at 150<sup>-1</sup>, is considered the most promising of these compounds and its use as a control measure against *Alternaria* blight of pigeon pea [6]

## 2. Anti-inflammatory:

The ethanolic extract of *E. Echinatus* was used to evaluate the anti-inflammatory activity of the plant. This study was conducted on rats. In rats, carrageenan and formaldehyde were used for inflammation and the chronic arthritis by formaldehyde. Plant extract effectively inhibited the acute inflammation. It was also observed that the extracts show more effect when administered parenterally than orally [7, 8].

## 3. Analgesic:-

Methanolic extracts of aerial parts and roots were used to evaluate the Analgesic potential of plant in albino rats. Hot plate, Tail immersion and Tail flick models were used to evaluate the Analgesic activity of plant. The parameter of the study was reaction time. Pentazocine was used as standard. The results indicate that methanolic extracts at 250mg/kg and 500mg/kg, as results indicate the body weight significantly increase in reaction time when test groups compared to control group. The extracts of aerial parts and roots of herb display significant Analgesic activity.

## 4. Diuretic

For Diuretic activity of plant used methanolic extracts of aerial parts and roots in albino rats and using *in vivo* Lipschitz test model for evaluation. The parameters of the model were the volumes of urine and concentration of Na<sup>+</sup> and K<sup>+</sup> ions in urine. The diuretic drug Furosemide was chosen as standard for model. The results of demonstration shows that methanolic-extracts of both parts at 250mg/kg and 500mg/kg body weight express a noteworthy increase in the urine volume and electrolyte such as Na<sup>+</sup> and K<sup>+</sup> ions excretion as compared of test groups to control. [9]

## 5. Effects on testosterone

*E. echinatus* extracts weakened the rise of the prostatic per body (prostatic/ body) weight ratio in which testosterone plays a key role for this ratio. The Butanol fraction of extract showed the best activity as compared to non-fraction extract. The levels of Testosterone were monitored weekly and also measure the prostate-specific antigen (PSA) levels. Further histological studies had shown a significant development in prostatic histo-architecture in the extract-treated groups when these groups compared with testosterone treated group. The studies suggest that the use of *E. echinatus* as Brahmadandi is not justifiable in light of its anti-androgenic action. *E. echinatus* proved to be a promising agent for the treatment of BPH [10]

## 6. Reproductive parameters of male rats:-

To check the reproductive parameter, the terpenoidal fraction was prepared from the petroleum ether extract of the roots of plant. Two different doses of 30mg/kg and 60mg/kg were selected for model using albino rats. Terpenoidal fraction treated rats

exhibited a decrease in reproductive organs weight without disturbing the final body weight of rats, and a significant reduction ( $P < 0.01$ ) in serum testosterone levels and caudaepididymal sperm concentration as compared to albino rats in the control group [11, 12].

## CONCLUSION

It is concluded from above discussed summarized review, that *Echinopsechinatus* a miracle plant, it need more finding and discussion to for *E.echinatus* herb. There is also need of *in-vitro* studies to explore the mechanisms of plant activities.

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