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DRUG REVIEW ON UTKANTAKA

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Abstract:

Echinops echinatus Roxb. (*E. echinatus*), commonly known as “usnakantaka,” is a xerophytic herbaceous plant traditionally used as a stimulant to treat use the term normal labour , expel round worms, skin papules, diabetes, leucorrhea, sexual debility in Indian traditional system of medicine. The roots, leaves, fruit, and bark are extensively used in folk medicine as well as in Ayurveda. Also, the plant shows a wide range of pharmacological activities such as antifungal, analgesic, diuretic, reproductive, hepatoprotective, antioxidant, anti-inflammatory, wound-healing, antipyretic, and antibacterial properties. The current review focuses on the updated information from various scientific studies and reports of phytoconstituents and pharmacology of this plant. This review also provides adequate information about the use of this plant in an Indian system of medicine, Ayurveda.

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INTRODUCTION

The definition of the drug by “WHO” is as follows; “A drug is any substance or product that is used or intended to be used to modify or to explore physiological systems or pathological status for the benefit of recipient”. According to *Ayurveda*, drug plays a vital role in the treatment of disease. Therefore it is placed in second position in the *Chikitsa Chatushpada* next to the physician. Drugs are described as an instrument (*Karana*) of physician for treating disease. For using the drugs to treat a disease, it is essential to have the complete knowledge regarding the drugs. The consideration of the drugs during the line of treatment for particular ailment has great importance. A drug that is not understood perfectly is comparable to poison, weapons, fire and the thunderbolt, while the perfectly understood drug is comparable to ambrosia¹. *Charaka* has given the ultimate definition of the right medicine and says “That is the right medicine which is capable of providing the health”²

SELECTION OF DRUG:





Fig.1: Root of Utkantaka

Fig. 2: Dried roots of Utkantaka

Fig.3: Herb of Utkantaka

Utkantaka:³

Botanical name: *Echinops echinatus* Roxb.

Family: Asteraceae

Classical name: *Ustrakantaka*

Table No.1: Vernacular names of Utkantaka

Sr. No.	Language	Name
1	Sanskrit	Kantalu, Kantaphala, Utkantaka, Utati
2	Hindi	Gokhru, Uthkanta, utakatira
3	English	Indian globe thistle
4	Gujarati	Shuliyo, Utkanto, Utkato
5	Marathi ⁴	Utkatar, Kate-chendu
6	Kannada ⁴	Brahmadande
7	Telugu ⁴	Brahmadandi
8	Urdu ⁴	Untkatara

MORPHOLOGY:⁵

Annual, prostrate or procumbent-ascending, herbs, 30-70 cm. high, clothed with white cottony pubescence.

Leaves up to 15cm.long,pinnatifid, sessile, oblong, 7-12 cm. long pinnatifid, lobes triangular, spinescent; spines 2-3 cm. long, pale, scabrous above, white, acanthoid beneath. Heads with solitary floret, subtended by 3 whorls of involucre bracts; all united into a compound, densely, bearded ball upto 4cm.across; involucre bracts upto 1.5cm.long, cuspidate, sharp-spinose white, receptacle minute. Anthers with imbricate tail. Style arms recurved, flat, glabrous. Heads compounds, forming a spherical ball, having single bisexual white floret. Corolla 15mm.long, white, tubular, 5-lobed.

Achenes 5-angled, elongate, glabrous bristly and deciduous; pappus bristly; achenes Ca 4 mm. long, obconic, densely villous.

FLOWERING AND FRUITING TIME:

Plant flowers and fruits in February-April or March-May. Generally within the period from spring to summer season.

DISTRIBUTION:

Plant occurs in Afghanistan and India. It is commonly growing on ridges, in waste land along roads, railways tracts and boundaries of cultivated fields. This species is found practically throughout India, ascending to 5,000ft. on the hill.

Rasa Panchaka: Table No.2: Rasa Panchaka

<i>Rasa</i>	<i>Tikta</i>
<i>Guna</i>	<i>Ruksha, laghu</i>
<i>Virya</i>	<i>Usna</i>
<i>Vipaka</i>	<i>Katu</i>
<i>Dosakarma</i>	<i>Kaphapittasamaka- tridosahara</i>

Seeds (*bija*): *Rasa:Madhura*

Virya:Sita

Vipaka:Madhura

Properties and action: Table No.3: Properties and action

<i>Karma</i>	<i>Roga</i>
<i>Kasaghna</i>	<i>Kasa</i>
<i>Dipana-pacana</i>	<i>Yosapsmaras</i>
<i>Nadibalya</i>	<i>Netraroga</i>
<i>Mutrala</i>	<i>Vrana-apaci</i>
<i>Caksusya</i>	<i>Dourbalya</i>
<i>Jantughna</i>	<i>Agnimandya</i>
<i>Balya</i>	<i>Mutrakrcchra</i>
<i>Ropana (vrana)</i>	<i>Mukhad</i>

PHARMACOLOGICAL REVIEW⁶

- **Antifungal activity**

Several phenolic compounds like apigenin, apigenin-7-o-glucoside, echinacin, and echinaticin have been isolated from *E.echinatus*. Also, two methylated derivatives, echinacin permethyl ether and apigenin-5, 4'-dimethyl ether, have been reported, which were synthesized from echinacin and apigenin-7-o-glucoside. These compounds have been reported for their activity against the germination of conidia of *Alternaria tenuissima* (Kunz.ex Pers.) Wiltshire, which causes leaf blight disease in the pigeon pea (*Cajanus cajan*) at concentrations ranging 25-150 ug/ml. Echinacin at 150ug/ml is considered to be the most potent of these compounds.

- **Analgesic activity**

In one study, the analgesic property of the methanolic extract of the aerial parts and roots has been reported. The analgesic potential has been measured using hot plate, tail immersion, and tail flick models; it was reported that the methanolic extract at 250mg/kg and at 500mg/kg body weight exhibits significant analgesic activity.

- **Diuretic activity**

The metabolic extract of the aerial parts and roots of *E. echinatus* has also been evaluated for diuretic activity in an in vivo Lipschitz test model. The results show a significant increase in urine volume and electrolyte excretion at 250mg/kg and 500mg/kg body weight.

- **Reproductive activity**

The terpenoid fraction prepared from the petroleum ether extract of the roots of *E. echinatus* at the doses of 30mg/kg and 60mg/kg body weight has been evaluated, and it shows a significant decrease in the weight of the reproductive organs. In addition, there was a significant decrease in the levels of serum testosterone and cauda epididymal sperm concentration.

- **Hepatoprotective activity**

The ethanolic extract of *E. echinatus* at 500mg/kg/day and 750 mg/kg/day has been tested in CCI 4-intoxicated rabbits for 7 days, and the serum biochemical parameters and histopathological observations of the liver have been reported. The extract shows significant reinstatement in serum glutamine pyruvate transaminase (SGPT), serum glutamine oxaloacetate transaminase (SGOT), alkaline phosphatase (ALP) levels as compared to CCI 4 and silymarin control groups. Histopathological findings also confirm the hepatoprotective potential of the plant.

- **Antioxidant activity**

The free radical –scavenging property of *E. echinatus* has also been reported in various in vitro models, such as the scavenging of 2,2 diphenyl-1-picrylhydrazyl (DPPH) radical, nitric oxide radical, and superoxide anion.

- **Anti-inflammatory activity**

The ethanol extract of the whole plant of *E. echinatus* was studied in carrageenan, formaldehyde- and adjuvant-induced inflammation in rats. The extract showed significant inhibition of acute inflammation. A triterpenoid “taraxasterol acetate” from *E. echinatus* has been reported for anti-inflammatory potential in albino rats (19mg/kg and 100mg/kg) for carrageenan-, formaldehyde- and adjuvant-induced inflammation. In addition, the isolation and structural

elucidation of a new anti-inflammatory agent (5,7-dihydroxy-8,4'-dimethoxy-flavanone-5-o,L-rhamnopyranosyl-7-o—D-arabinopyranosyl-(1-4)o-b-D-glucopyranoside) from *E.echinatus* has been reported. The compound has been evaluated for anti-inflammatory activity in carrageenan-induced hind paw edema, in which 32.21% inhibition of edema has been reported.

- **Anti-irritant activity**

The anti-irritant activity of *E.echinatus* was investigated in several fractions were tested on abraded and irritated rabbits skin out of five fraction; two were reported to have significant effect.

- **Antibacterial activity**

A mother tincture of *E.echinatus* has been evaluated for antibacterial activity against several micro organisms. It was found to be highly effective against *Escherichia more Details typhi*, moderately effective against *Escherichia More Details coli*, and not very effective against *Pseudomonas aeruginosa* at 200ug/ml and 400ug/ml strength of mother tincture.

- **Antipyretic activity**

The antipyretic activity of the ethanolic extract of *E.echinatus* has been evaluated in rabbits. At 500mg/kg and 750ng/kg, it shows antipyretic activity but less than positive control.

- **Wound-healing activity**

Extracts of *E.echinatus* in petroleum ether, chloroform, ethanol, and distilled water have been evaluated for wound healing activity in excision, incision, and dead space models.

ETHNOBOTANICAL USES:

- The roots of the plant as well as the seeds have aphrodisiac properties. In sexual disability and spermatorrhea, root powder of *E.echinatus* is taken either with equal quantities of turmeric and mustard, or with misri (sugar) or with milk. It is also used by the traditional healers of Chhattisgarh to treat people with poor sexual vitality.
- A mixture of leaf powder or root extract and honey is taken in morning to expel round worms.
- Ash of the whole plant is used with ghee or butter to treat leucorrhoea¹.
- In Gujarat the root barks of *E.echinatus* with milk use to treat diabetes.
- The ash from the spines of the inflorescence is mixed with cow ghee and applied locally to cure eczema.
- In addition, leaf paste is used externally for skin papules.

CHEMICAL CONSTITUENTS⁷

7-hydroxyisoflavone, kaempferol-4'-methylether, kaempferol-7-methylether, myricetin-3-o-a-L-rhamnoside, are reported from the whole plant of *Echinops echinatus*.

PHYTOCHEMISTRY:⁸

Phytochemical screening of the plants has revealed the presence of triterpenoids, isoflavones, glycosides, phenolic compounds, and alkaloids. Various parts of the plant such as roots, leaves, flowers, and other aerial parts were used for the extraction of a variety of phytoconstituents.

PHARMACOGNOSTICAL STUDY

INTRODUCTION:

The word Pharmacognocny is formed by combination of 'Pharmakon' means a drug and 'Gignosy' means 'to acquire knowledge'. So Pharmacognocny can be defined as a branch of biosciences that deals with the knowledge and authentication of medicinal and related products of crude or primary type originated from both plants and animals in the detailed form. Pharmacognocny is an important link between pharmacology and medicinal chemistry any plant which is used medicinally requires detail study prior to its use because the therapeutic efficacy is absolutely depends on the quality of the plant drug used. The detailed Pharmacognostical study of plant help us to differentiate between closely related species of the same genus or related genera of the same family. It is also the first step to standardize a drug which is the need of the day. If the plant drugs are adulterated, then the quality of preparation cannot give the desirable results. The Phamacognostical study was carried out in the Dept. of Pharmacognosy Laboratory, Parul Institute of Ayurveda-Limda. Drug was identified physically. Organoleptic study and powder microscopy were done in the laboratory for the identification.

The certificate is attached here with for the Phamacognostical study of the Drug Utakantaka Moola.

Aims and objectives To identify dry sample of content drug of Utakantaka Moola Macroscopic and Microscopically.

Utakantaka moola churna:

- Organoleptic analysis
- Physico-chemical analysis

1. Loss on Drying
2. Ash Value
3. Water soluble extract
4. Methanol soluble extract
5. PH
6. Acid insoluble ash

Physical properties:

Physical Properties	
Odour	Characteristic
Taste	Tasteless
Colour	Whitish brown
Touch	Root is rough in touch, powder is smooth

Chemical Analysis:

No.	Name of the Test	Value	
1	Loss of drying (at 110oc)	13.63%	9.52%
2	Ash Value	3.7	1.09
3	Water soluble extraction	0.5	
4	Methanol soluble extraction	0.5	
5	pH value by pH paper	6	
6	Acid insoluble Ash value	3.5	-----

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