

PHYTO - PHARMACOGNOSTICAL EVALUATION OF ECHINOPS ECHINATUS ROXB. ROOT

Alpa Nakum¹, Preeti Pandya², Akanksha Sharma^{3*} and Dhara Lakkad⁴

¹Assistant Professor, Department of Panchakarma, Eva Ayurvedic College, Supedi, Gujarat, India.

²Laboratory Assistant, Pharmacognosy Laboratory, Institute for Postgraduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar, Gujarat – 361008.

³Ayurvedic Medical Officer (M.D Panchakarma) at Department of Ayush Govt. of J&K.

⁴Assistant Professor, Department of Prasootitantra and Streeroga, Shree Swaminarayan Ayurvedic College, Kalol, Gujarat.

Article Received on
08 Dec. 2021,

Revised on 28 Dec. 2021,
Accepted on 18 January 2022

DOI: 10.20959/wjpr20222-22975

*Corresponding Author

Dr. Akanksha Sharma

Ayurvedic Medical Officer
(M.D Panchakarma) at
Department of Ayush Govt.
of J&K.

ABSTRACT

Many plants in our surroundings are being used traditionally, but there are no references available in classics of those drugs. One among the plant is *Echinops echinatus* Roxb. (family: Asteraceae) and known as Indian Globe Thistle. It is an erect branched herb about a meter high. It has short, stout stems, branching from the base, covered with white cottony hair. Alternately arranged oblong, deeply pinnatifid leaves are 7-12 cm long. Flower-heads occur in solitary white spherical balls, 3-5 cm across. Petals of the tiny white flowers are 5 mm long. Flowers are surrounded by straight, strong, white bristles. Its root is used in many conditions regionally all over India and it is available in all dry

habitats. In Gujarat it is used as *Vrushya dravya* (aphrodisiacs), *Dhatupushtikar dravya* (compliance of seven *dhatu*s), in *Mootra kruchha* (difficult micturition), *Shira shoola* (headache) and *Sandhivata* (arthritis). As it is very useful and available plant in many disorders, it was thought to undertake this study in detail. **Aim:** The present work was carried out to investigate and authenticate the drug by its pharmacognostical profile. **Materials and Methods:** The fresh roots of *Echinops echinatus* Roxb. from the family Asteraceae was procured for the study. Transverse section and its powder, histochemical tests and phytochemical investigations were done. **Result:** The detail transverse section of root showed outermost 3-4 layered lignified uneven dark brown colored cork, centrally xylem made up of

vessels, paranchymas, fibres covered with wide ring of phloem, medullary rays multiseriated oil deposition observed throughout the section. **Conclusion:** Drug taken was identified as *Echinops echinatus* Roxb. Root with its typical morphological character like lignified parenchyma in cortex, pitted vessels & oil globules.

KEYWORDS: *Echinops echinatus*, Folklore, Organoleptic, Pharmacognosy.

INTRODUCTION

Some plants are not found in the classical texts, but they are used in the tribal area for medicinal purposes in various diseases and all these plants are covered under the folklore medicinal plants. One among them is *Echinops echinatus* Roxb. It is a glabrous herb found in tropical and sub tropical region of India, Pakistan and Afghanistan. *Echinops echinatus* Roxb. is an erect branched herb about a meter high. It has short, stout stems, branching from the base, covered with white cottony hair. Leaves are alternately arranged, oblong and deeply pinnatifid. The leaves are 7-12 cm long. Flower heads occur in solitary white spherical balls, 3-5 cm across. Petals of the tiny white flowers are 5 mm long. Flowers are surrounded by straight, strong and white bristles. Odour is pungent and taste is bitter. The roots are pounded and mixed with acacia gum and applied to the hair to destroy lice. The powder roots are also applied to wounds in cattles to destroy maggots (Hughes-Buller). On searching with different references it is found that no scientific work has been carried out yet on the root of *Echinops echinatus* Roxb. The work on pharmacognostical characters of its root, is not reported yet. So the present study deals with the detailed pharmacognostical characters of the same.

MATERIALS AND METHODS

Collection and Authentication

Fresh roots were collected from the natural habitat of the surrounding area of Jamnagar, in the month of July, 2017 as per *Ayurvedic* criteria for collecting the plant parts. Proper identification and authentication was done with the help of different floras and other standard references. Fresh collected plant is preserved in a glass jar containing formalin: glacial acetic acid: alcohol (1: 1: 18).

Pharmacognostic studies

Morphological characters were studied by observing the root as such and with the help of the dissecting microscope. For detailed microscopical observation, free hand thin transverse section passing through the midrib were taken, and cleared with chloral hydrate and observed

as such for the presence of any crystals, then were stained with Phloroglucinol and Hydrochloric acid to notice the lignified elements like fibres, vessels etc. Photographs of the section were also taken. Powder characters were observed and histochemical tests carried out, as per the guidelines of *Ayurvedic Pharmacopoeia of India*.

RESULTS AND OBSERVATIONS

Morphology

The colour was dark cream in inner and creamish brown from outer, odour was slightly sweetish, taste was sweetish bitter, touch was smooth, soft, and shape was cylindrical, tap root system, with the scars of rootlet, somewhat tortuous, and length- 9cm*1cm, width - 14cm*0.9cm in size. (Table 1)

Table 1: Organoleptic characteristics of root.

S. no.	Characteristics	Observation
1	Colour	Dark cream in inner and creamish brown from outer
2	Odour	Slightly sweetish
3	Texture	Smooth, soft
4	Taste	Sweetish bitter

Microscopic description

Transverse section of root: A Diagrammatic TS of Root Shows circular out line having centrally xylem with multiseriated medullary rays, covered with phloem, cortical region and outermost cork.

The detail TS of root shows outermost 3-4 layered lignified uneven dark brown colored cork broken at places; cortex wide with few scattered lignified parenchyma cells; centrally xylem made up of vessels, parenchymas, fibres covered with wide ring of phloem, medullary rays multiseriated oil deposition observed through out the section.

Histochemical screening of root

Qualitative analysis by histochemical screening revealed the presence of tannin, crystals and lignin.

Histochemical test

Reagent	Observation	Characteristics
Phloroglucinol + Concentrated HCL	Pink colour	Lignin present
Concentrated HCL (1:1)	dissolved	Crystals present
FeCl ₃	Black colour	Tannin present

Organoleptic characteristics of root powder

Organoleptic evaluation of powder of roots of *Echinops echinatus* Roxb. revealed its yellowish green colour, aromatic odour and slightly bitter taste.

Powder microscopy

Diagnostic characters of the *Echinops echinatus* Roxb. root powder were presence of cork cells in surface view, pitted vessels, cortical parenchyma cell with oil globules. Fibres, tangentially cut cork cells.

Photographs

Diagrammatic view of T. S. root



Figure 1: Whole plant.



Figure 2: Root.



Figure 3: Microscopic view of root.

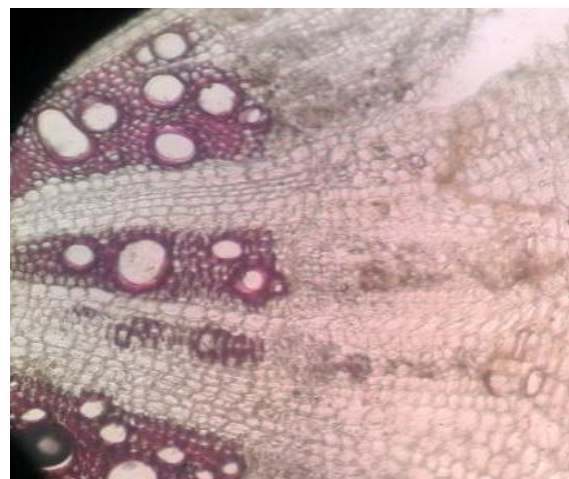


Figure 4: Medullary rays.

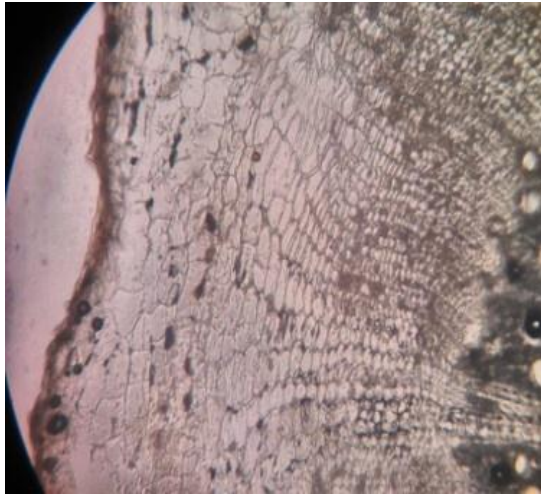


Figure 5: Cork.

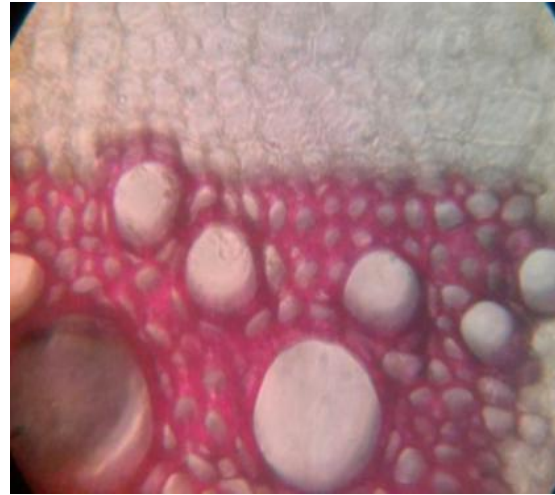


Figure 6: Vessels.

Powder character



Figure 7: Fibers.



Figure 8: Pitted vessels.

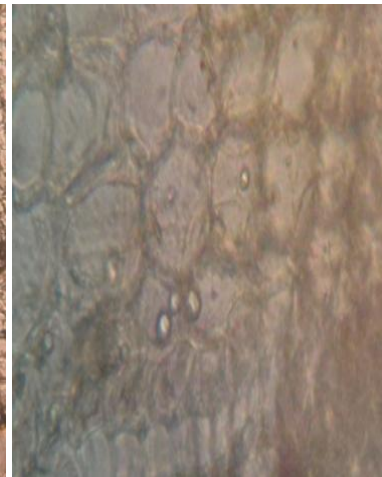


Figure 9: Oil globules.

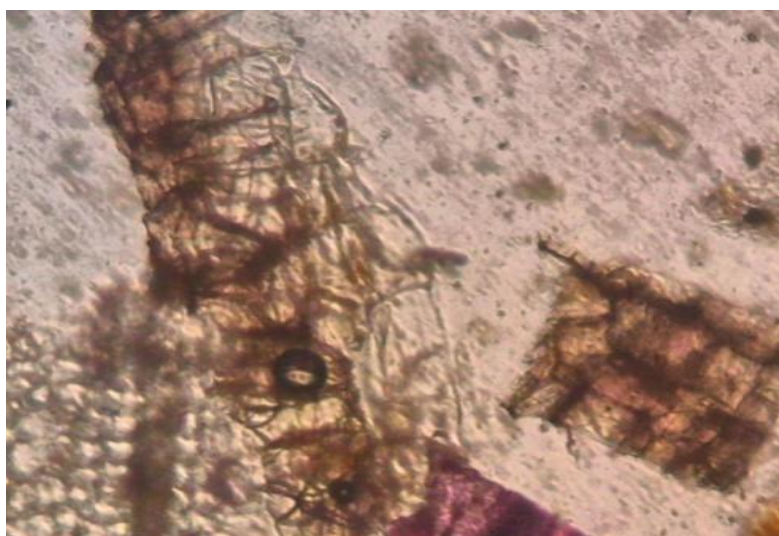


Figure 10: Tangentially cut cork cells.

CONCLUSION

The drug is identified pharmacognostically as *Echinops echinatus* Roxb. with characters like lignified parenchyma in cortex, pitted vessels & oil globules. These are the typical characters of identification of this drug. The observed characters of the drug may help in identification and authentication of the drug as reference for future studies.

REFERENCES

1. Flora of Gujarat state Part-1 by G.L.Shah Printed by K.A. Amin Pg no, 378-379.
2. Flora of saurashtra Part-2 P.V. Bole and J.M.Pathak Pg no, 14-15.
3. Medicinal Plant of Gujarat published by Gujarat Ecological and Research Foundation Gandhinagar Pg no, 178.