Research Article

PHARMACOGNOSY AND PHYTOCHEMICAL EVALUATION OF ROOTS OF ECHINOPS ECHINATUS ROXB.

Salve S. D and Bhuktar A. S*
Department of Botany, Vivekanand Art, S. D. Commerce and Science College, Aurangabad, Maharashtra, India
*Corresponding Author Email: savita.312@rediffmail.com

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ABSTRACT

The genus Echinops echinatus Roxb. belongs to family Asteraceae found in India. Commonly known Kantaphala as in Sanskrit Roots used as medicine. It is used in dyspepsia, scrofula, syphilis and fever. An aqueous paste of the root is used in dyspepsia, scrofula, syphilis and fever. An aqueous paste of the root is applied to the lower abdominal region to hasten the process of delivery. It is also advised to take paste internally for quick and safe delivery.

Keywords: Echinops echinatus, Pharmacognosy, Asteraceae

INTRODUCTION

Echinops echinatus Roxb. is an important medicinal plant belongs to family Asteraceae it is distributed in tropical and subtropical region in India. In literature review roots are carminative and diuretic which are used in cough. Powdered roots are mixed with Acacia and applied to the hair to destroy lice. The root is used as abortifacient and aphrodisiac. Infusion of the root is given in seminal debility, impotence, hysteria and its decoction is given in dyspepsia, scrofula, syphilis and fever. An aqueous paste of the root is applied to the lower abdominal region to hasten the process of delivery. It is also advised to take paste internally for quick and safe delivery.

Vernacular name


Echinops echinatus Roxb.

Naik, Flora of Marathwada 475.1998; Shirodkar and Lakshmi in Singh et al., Fl. Maharashtra St. Dict. 2: 207. 2001. Erect, annual herbs, 35-50 cm tall; branches covered with white cottony pubescence. Leaves alternate, sessile lyrate, lanceolate pinnaatifid, oblong, 4-13 × 2-6 cm; ovate lobes, sinuate, spinous pointed. Heads globose compound, 2-3 cm in diameter in stout peduncles. Involutural bracts of individual simple heads scale-like; outer ob lanceolate, 4-6 mm long, glabrous, spinous tipped; intermediate bracts often turned into sharp spines 1.5-3 cm long; capitula I flowered in dense globose, involucral bracts spinescent, intermediate bracts spiny. Florets white bisexual with tubular, 5-lobed; corolla lobes linear, 4-5 mm long, acute, achenes elongated, villous, 3-4 mm long (Figure 3).

MATERIALS AND METHODS

The root of Echinops echinatus Roxb were collected from Aurangabad Maharashtra state, India. The plant was authenticated and voucher specimen were deposited at Vivekanand Arts College Sardar Dalip Singh Commerce and Science College Aurangabad Maharashtra state, India.

Maceration

Root was studied by maceration techniques. The root pieces were boiled in Jeffery fluid (chromic acid 10 % and nitric acid 10 % in 1:1 proportion). The dimensions of the cells were measured with the help of microscope and by micrometry

Microscopy

Qualitative microscopic evaluation was carried out by taking free hand transverse section of fresh root. Section were dehydrated with different alcohol grade and stained with safranin and light green. These permanent preparation where observed in microscope of Echinops echinatus.

Plant sample extraction

25 gram of powder drug was extracted with methanol solvent using soxhlet extractor for 18 hours at 65°C. The extracts were filtered through a Whatman filter paper no. 42 (125 mm) and concentrated at 40°C by using an evaporator and stored in amber color bottle at 4°C. These extracts were sent to Sophisticated Analytical Instrumentation Facility, Indian Institute of Technology Bombay, Powai Mumbai, India. For GC-MS (Gas chromatography mass spectroscopy)
Figure 1: GC-MS chromatogram of methanolic extract of roots of *Echinops echinatus* Roxb.

<table>
<thead>
<tr>
<th>Name of compound</th>
<th>Structure of compound</th>
<th>Retention time</th>
<th>Molecular formula</th>
<th>Molecular weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2H-Fluo[2,3-H]-1-benzopyran-2-one</td>
<td><img src="image" alt="Structure" /></td>
<td>12.7</td>
<td>C₂₀H₁₂O₆</td>
<td>180.16</td>
</tr>
<tr>
<td>D-glucopyranoside, D-glucopyranosyl-D-fructofuranosyl</td>
<td><img src="image" alt="Structure" /></td>
<td>12.7</td>
<td>C₁₄H₂₂O₁₃</td>
<td>504.17</td>
</tr>
<tr>
<td>4(1E)-3-hydroxy-1-propenyl-2-methoxyphenol</td>
<td><img src="image" alt="Structure" /></td>
<td>17.0</td>
<td>C₁₆H₁₄O₄</td>
<td>180.12</td>
</tr>
<tr>
<td>4(1E)-5-hydroxy-1-propenyl-2-methoxyphenol</td>
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<td>180.12</td>
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<tr>
<td>Thianthrene</td>
<td><img src="image" alt="Structure" /></td>
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<td>C₁₂H₁₂S₂</td>
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<tr>
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<td>C₁₃H₁₄O₃</td>
<td>280.13</td>
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<td>Terthiophene</td>
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<td>23.0</td>
<td>C₁₃H₁₄S₃</td>
<td>248</td>
</tr>
</tbody>
</table>

Figure 2: Components identified in roots of *Echinops echinatus* Roxb.
GC-MS analysis

For each sample the analytical method is same while the oven temperature is variable, Injection port temperature is 250, Carrier gas is Helium 1 ml/sec. Inter face temperature is 250, Ion source is at 200. Analysis was done by using E ionization with 70ev, The MS is Accu TOF GCV, Column through the sample passes is HP-5. The MS detection was completed in 36 minutes. The detection employed the NIST Ver. 2.0-year 2005 library.

RESULT AND DISCUSSION

Transverse section of root shows circular in outline. Cork 1 - 3 layered composed of thick walled irregular parenchymatous cells ca 30 - 130 × 30 -200 μm. Phellogen indistinct epidermis single layered unicellular hair composed of squarish to irregular parenchymatous cells ca 30 - 100 × 25 - 220 μm. Cortex 24 - 30 layered composed of circular to squarish parenchymatous cell 50 - 90 × 30 -10 μm. Endodermis distinct single layered composed of circular to squarish small cells ca 12 - 18 ×18 - 30 μm. Pericycle single layered composed of circular to squarish cells ca 10 - 12 × 15 - 20 μm. Vascular bundle present in centre xylem and phloem separated few layer of cambium xylem consist of patches of xylem vessels ca 50 -100 × 30 - 130 μm xylem parenchyma. Medullary rays of 2 - 4 extended from xylem to cortex region composed of squarish cell ca 10 - 12 × 15 - 20 μm. Phloem cells are composed of thin walled cells ca 10 - 12 × 10 - 20 μm devoid of starch grains (Figure 4).
In the present investigation various standardization parameters such as morphology, anatomy, maceration, phytochemical study could be help in authentication of root drug of Echinops echinatus the result of present study will also serve as reference material in preparation of monograph. However isolation of detected phytoconstituent may proceed to find a novel drug.

REFERENCES


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