PHARMACOGNOSTICAL AND PHYTOCHEMICAL INVESTIGATION OF LINARIA RAMOSISSIMA (WALL.) JANCH ROOT

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ABSTRACT

The herb of Linaria ramosissima (Wall.) Janch., commonly known in Gujarati as “Bhintgilodi” and “Kanoti”, is a perennial, hairy, much branched herb with variable, triangular to hastate leaves and axillary & solitary yellow coloured flowers. The drug is reputed in folklore system of medicine for various therapeutic properties like antidiabetic, diuretic, purgative, Raktapittahara etc. The root is used in case of scorpion and snake bite indicating it to contain some antidote constituents. As the plant is not explored scientifically as yet, it was thought worth to evaluate each and every part of the plant thoroughly and the roots being first selected for this. Present study deals with detailed macroscopy and microscopy of root, which includes its powder microscopy. Important diagnostic characters like, lignified cork cells, simple & pitted thick walled sclereids and stone cells, pitted vessels, fibres etc. were observed.  

Keywords: Linaria ramosissima (Wall.) Janch., Scrophulariaceae, Kanoti, Bhintgilodi.

INTRODUCTION

Culture of tribal people is well established and reputed not only in India but all over the world. Linaria ramosissima (Wall.) Janch. commonly known as kanoti (fig. no. 1)¹⁻⁶ is a folklore herb known to possess good antidiabetic properties¹⁻³⁻⁷. In some folklore literature the drug is notified for its other therapeutic properties also like, raktapittahara (Bleeding disorders), rechak (pugative), mutral (diuretic), tikta (bitter)⁷ etc. The literature further specified the use of root in case of snake and scorpion bite.¹⁻³ It is a perennial, slender hairy herb, often much branched from the base with ovate-tringular to lanceolate variable shaped leaves and yellow coloured, solitary & axillary flowers, found throughout India in stony and rocky places and on ruined and old walls of forts and buildings.¹⁻⁶ As all the parts of the plant are medicinally important including root, it was thought worth to study them individually, hence the root part was selected first for the scientific investigation dealing with its macro and micro examinations.
MATERIAL AND METHODS

The plant was collected when it was in full bloom in rainy season, from the places located around the Jamnagar and was washed thoroughly with running water to remove adherent soil, dirt etc and dried in shade. The arial portion was carefully separated and kept aside for the future investigation. Roots were cut into 1 to 2cm long pieces, few were preserved in FAA (Formalin90:Aceti acid7:Alcohol 3)\[8\] for microscopic investigation, and the remaining roots were made into 40 # powder and stored in well closed containers away from the light. Herbarium was also prepared and submitted to Pharmacognosy museum of I.P.G.T. & R.A., Jamnagar vide Herbarium no. 6015 for future reference. Free hand sections were taken from the preserved materials of the root and observed as such under the microscope for the presence of ergastic cell contents and other contents.\[9\]

The section was cleared with chloral hydrate and then was stained with phloroglucinol and hydrochloric acid to observe the lignifications of the cell wall if any.\[9\] The histochemical tests were also performed to detect the location of various cell contents by using various reagents. \[9\] For isolation of the xylem and other lignified elements like sclereids, stone cells etc. the roots were subjected for the schultz’s maceration process.\[9\]

Sections and diagnostic characters of the powders were drawn by using camera lucida and photographs were also taken.

RESULT & DISCUSSION

Morphology:

The roots are cylindrical, tortuous, occasionally branched, 5-10cm in length and 0.5-1cm in diameter; surface is rough, faintly longitudinally striated, fissured shows thin lateral tiny roots or scars left by them at places; fracture is short, fractured surface is yellowish white, externally it is pale yellowish brown in colour; odour not characteristic; Taste astringent and bitter. (Fig no.2)

Microscopy:

The Diagrammatic TS of the root is circular in outline with irregular margin of the outer cork, central wide xylem occupying the major area of the section, encircled by narrow phloem, a discontinuous band of pericyclic sclereids, group of stone cells and a narrow parenchymatous outer cortex. (Fig no.3)
The Detailed TS shows outer 3 to 5 rows of horizontally running rectangular cells of lignified cork, easily getting detached at places, followed by 4 to 5 rows of thin walled parenchymatous cortex; pericycle is characterized by the presence of isolated or groups of thick walled sclereids and the stone cells running in discontinuous band followed by parenchymatous phloem consisting of sieve tubes, parenchymas and uni to biseriate medullary rays in continuation with that of xylem rays; xylem is very wide, consists of isolated or rarely small groups of 2-3 vessels. Fibres are thick walled, occupying the major area of the xylem, parenchyma are vessicentric and paratracheal; medullary rays are uni to biseriate, lignified, pitted, almost parallel to each other, homogenous. (Fig no. 4)
POWDER MICROSCOPY

Organoleptic characters – Course, gritty, brownish coloured with astringent, bitter taste and devoid of any odour.

Diagnostic characters of the powder shows, lignified cork cells in surface view and in transverse view; group of thick walled, pitted pericyclic sclereids and stone cells, pitted isolated or groups of xylem vessels; thick walled, thin walled pitted and septed fibres. (Fig no.5)

Figure 4
Section photograph of Root

Figure 5
Powder character of Root
**Figure 6**
Isolated elements of the Root

**Abbreviation:**
Ck = cork, co = cortex, Sc & St : Sclereids & stons cells, Ph = Phloem, Xy = xylem, MR = Medullary rays

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Elements</th>
<th>Length</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fibres</td>
<td>347 - 624.6</td>
<td>13.88 - 27.76</td>
</tr>
<tr>
<td>2</td>
<td>Xylem vessels (Pitted vessels)</td>
<td>208.2 - 416.4</td>
<td>13.88 - 55.52</td>
</tr>
<tr>
<td>3</td>
<td>Sclereids</td>
<td>180.44 - 347</td>
<td>13.88 - 41.64</td>
</tr>
</tbody>
</table>
Dimensions of the lignified elements of the vessels, fibres and sclereids has been mentioned in table no.1 (Fig no.6)

CONCLUSION

The presence of Pharmacognostical characters such as lignified cork cells, simple & pitted thick walled sclereids and stone cells, pitted vessels, fibres etc. can serve as important microscopic diagnostic characters of the drug Linaria ramosissima (Wall.) Janch. Root.

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REFERENCES


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