DISCOVERY OF PHARMACOGNOSTICAL CHARACTERS FROM ROOTS OF STEREOSPERMUM COLAIS BUCH.

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ABSTRACT

The objective of present studies deals with the macroscopically and microscopically studies of roots of Stereospermum colais. Some distinct and different characters were observed with section of young thin roots. Physiochemical parameters of the roots powder were also carried out. The present study on Pharmacognostical investigation of Stereospermum colais. roots might be useful to supplement information in regard to its identification parameters assumed significantly in the way of acceptability of herbal drugs in present scenario lacking regulatory laws to control quality of herbal drugs. Result: Discovery of Pharmacognostical characters of root of stereospermum colais revealed presence of various identifying characters which may act as identification standards for pharmacognocist, botanist and other related authorities of medicinal and aromatic plants. The important characters which have been revealed from the root showed a cork consisting of 15 to 20 rows of lignified cubical cells; secondary cortex narrow consisting of 2 to 5 rows of thin-walled parenchymatous cells with cortical fibers and occasional stone cells etc.

Keywords
Stereospermum colais. roots,
Pharmacognostical,
Physiochemical studies.

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INTRODUCTION

Of late, the term phyotherapy has been introduced as a more accurate synonym for herbal or botanical medicine. The term ‘phytopharmacotherapy’ has been coined recently to denote the use of herbal medicines in the treatment of disease. The inclusion of herbal-based products as dietary supplements is yet another recent development. Herbal medicine is the fast evolving into multidisciplinary science-incorporating aspects of ethno pharmacology, toxicology and biochemistry, in addition to botany, pharmacognosy and phytochemistry1.

Among plant derived chemicals, the flavonoids are the most effective group of compounds for general ailments because of their strong antioxidant efficacy. According to modern medicine, a number of the diseases are caused by the overproduction of free radicals. These highly reactive radicals may damage the biological macro molecules including oxidation of enzymes, modification of amino acids, fragmentation of proteins, nucleic acids, etc. Even though the body system has several ‘safeguard’ mechanisms, these may not be sufficient to overcome the insult produced by excess stress. In such circumstances, supplementation of nontoxic antioxidants may have a chemoprotective role in the body 2.

Microscopical techniques provide detailed information about the crude drugs by virtue of its two main analytical uses. Firstly its property to magnify, permits the fine structure of minute objects to be visualized and thereby confirm the structural details of plant drugs under evaluation. Secondly these techniques can be used in the determination of the optical as well as microchemical properties of the crude drug specimen under study.3

MATERIALS AND METHODS

Plant material

The plant specimens for the proposed study were collected from the Pathnur ghat (Taluka Ardhapur, Dist. Nanded, M.S.) and authenticated by Dr. Arvin S. Dhake, Associate professor, Department of Botany, Dr. Babasaheb Ambedkar marathwada University, Aurangabad, M.S.

About 3kg roots from the ground were uprooted by digging since the selected plant is a large tree. And suitable fresh roots are selected for microscopical study. The roots were air dried and powdered by using a big metallic mortar and pestle followed by mechanical grinding. The powdered drug was then stored at room temperature and used for the powder microscopy and extraction purpose.

MICROSCOPICAL STUDIES

The free-hand section of roost were prepared from fresh plant material and finally stained with various staining reagents as per standard procedures. The disaggregation of plant material was performed by reported method. In brief, scales were disaggregated by means of boiling in an aqueous solution of NaOH (5 % w/v) for 5 min. After cooling and washing with water, pieces were treated with an aqueous solution of chromic acid (25 % v/v) for 30 min at room temperature. The sections were cleared with chloral hydrate solution, stained with phloroglucinol - hydrochloric acid (1:1) and toluidine blue6 Powdered drug was used for the observation of powder microscopical character. The powdered drug was separately treated with phloroglucinol - hydrochloric acid(1:1)solution, acetic acid and iodine solution to determine the presence of the lignified fibres, Calcium oxalate crystals and starch grains respectively. A series of digital images captured using a Motic Digital microscope fitted with 1/3 CCD camera imaging accessory and using Motic Images 2000 (1.3 version) analysis software. The micrometric data were generated from average of 30 measurements for each sample and expressed as lower limit mean+SD7.

Fluorescence analysis:

Fluorescence study of powdered drug of root of Stereospermum colais was performed by following a standard procedure6. In this study the powdered root was treated with various acidic and basic solvents and observed in UV visible chamber under short and long wavelength region simultaneously7,8. Fluorescence is a important factor which reveals various chemical constituents show fluorescence in the visible range in day light. Uv light gives fluorescence to many natural products such as berberin (an alkaloid) which do not generally produce fluorescence in day light. If the active constituents are not themselves fluorescent, they can be converted into fluorescent derivatives by using reagents. Hence it plays an important role for the pharmacognostical parameter for the evaluation of crude drugs.9

PHYSIOCHEMICAL PARAMETER10-12

Ash values are indicative to some extent of care taken in collection and preparation of drug for market and of foreign matter content of natural drug. The object of determining ash value of vegetable drugs is to remove all traces of organic matter which may otherwise interfere in analytical determination. On incineration, crude drugs normally leave an ash usually consisting of carbonates, phosphates and silicates of sodium, potassium, calcium and magnesium.

The total ash, acid-insoluble ash, water soluble ash and sulphated ash values, moisture content etc have been determined according to Indian Pharmacopoeial methods and other official books.

RESULTS AND DISCUSSION

Macroscopic

The Stereospermum colais (Yellow Snake Tree ) is 15–20 m tall, trunk 15–25 cm in diameter, large leaves 25–50 cm; leaflets 3-6 on each side of midrib, long elliptic, 8-14 X 2.5–6 cm. Large, pale yellow, trumpet shaped flowers occur in panicles. Flowers are pale yellow, slightly curved, about 2 cm, upper lip 2-lobed, lower lip 3-lobed, tomentose at mouth, tube terete13,14.
Root up to 8 mm or more in thickness, hard, having lateral roots, light brown in colour; fracture, fibrous; odor and taste not distinct. (Figure 1)

Figure 1: Root showing morphology

**Microscopic**

Root shows a cork consisting of 15 to 20 rows of lignified cubical cells; secondary cortex narrow consisting of 2 to 5 rows of thin-walled parenchymatous cells with cortical fibers and occasional stone cells, (figure 2.1 and 3.1) a few containing brownish contents; secondary phloem wide, forming bulk of the bark in the form of long, radial strip that are conical due to the medullary rays (figure 3.1) funnelling out in the phloem region; phloem fiber (figure 3.1) are single; phloem rays uni to multiseriate; cambium distinct; secondary xylem very wide composed of usual elements, vessels small (upto 90 in diameter, surrounded by xylem parenchyma; medullary rays in the system mostly uniseriate, consisting of thin-walled cells. Starch granules and calcium oxalate are absent (figure 4).
Figure 4 powder microscopy (vessel elements), figure 4.1 cork cell figure 4.2 stone cells

Table 1: Showing result of fluorescent study and physicochemical study on root of Stereospemum colais.

<table>
<thead>
<tr>
<th>Fluorescent study</th>
<th>Long UV light</th>
<th>Short UV light</th>
<th>Physicochemical study Parameters</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powder as such</td>
<td>Yellow</td>
<td>Yellowish green</td>
<td>pH (1% solution)</td>
<td>5.8</td>
</tr>
<tr>
<td>Powder in distilled water</td>
<td>Yellow</td>
<td>Yellowish green</td>
<td>Loss on drying (LOD)</td>
<td>8.8% W/W</td>
</tr>
<tr>
<td>Powder in Absolute alcohol</td>
<td>Pale green</td>
<td>green</td>
<td>Ash Content</td>
<td>7.2% W/W</td>
</tr>
<tr>
<td>Powder in 10% NaOH</td>
<td>Green</td>
<td>Dark green</td>
<td>Density</td>
<td>0.403 g/ml</td>
</tr>
<tr>
<td>Powder in 10% HNO3</td>
<td>Light green</td>
<td>green</td>
<td>Water soluble extract</td>
<td>20.4% W/W</td>
</tr>
<tr>
<td>Powder in 50% H2S4</td>
<td>Yellow</td>
<td>Pale yellow</td>
<td>Alcohol Soluble residue</td>
<td>10.8% w/W</td>
</tr>
</tbody>
</table>

Conclusion
Medicinal plants play very important role in society for the treatment of various serious ailments of human and animal. Since most of the drugs are plant based and plants can be easily available as a source of new drug as compared to other sources. Hence tremendous researches are carried out on plants for the development of new drugs. The selected medicinal plant is also used as a drug for the treatment of various diseases. In the present study pharmacognostical standards like microscopy, physicochemical parameters and fluorescence analysis have been established which exhibit some useful knowledge regarding their phytoconstituents and may serve as basic identification parameters for further research work.

REFERENCES