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Pharmacognostical Evaluation of *Clerodendrum Serratum* (Linn.) Moon, (Bharangi) Root

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Abstract

The herbal market in this era is growing very fast and many commercial manufacturers produce either classical or patent Ayurvedic formulations by using the raw drugs available in the market. To maintain the quality standards they have to use only genuine drug which should not be adulterated or substituted. Complete phytochemical investigation of medicinal herbs helps in identification of genuine drug; with this aim this study is planned.

Clerodendrum serratum (Linn.) Moon, (Bharangi) belongs to family Verbenaceae, is being used for the treatment of respiratory disorders since long time. Nowadays many drugs are available in market with the name of Bharangi and there are also some controversial views about the identification of Bharangi. Here an attempt is made to study the plant Pharmacognostically; the part taken for study is the root. Diagnostic features of root and root powder were also worked out and the details were presented. This is an important step towards the standardization of this drug.

Key words: Clerodendrum; Genuine drug; Root; Adulterated.

Introduction

Pharmacognosy is the study of naturally occurring biological substances, principally those derived from plants that find use in medicine. The word "Pharmacognosy "is derived from the Greek 'Pharmacon', 'a drug' and 'gignosco,' to acquire knowledge of., It is closely related to both botany and plant chemistry and both originated from the earlier scientific studies on medicinal plant. The plant kingdom still holds many species of plants containing substances of medicinal value which have yet to be discovered large number of plants constantly being screened for their possible Pharmacological value.

In the beginning of the 20th century the subject Pharmacognosy had developed mainly on the botanical side, being particularly concerned with the description and identification of drugs, both in the whole state and in powder, and with their history, commerce, collection, preparation and storage. Such branches of Pharmacognosy are still of fundamental importance, but rapid development in other areas, particularly Phytochemistry and Pharmacology have enormously expanded the subject. As a result it is now possible to approach the study of medicinal plants from the botanical Photochemical and Pharmacological view points.[1]

Aims and Objectives

To standardize the identification of the root of plant Clerodendrum serratum (Linn.) Moon, a Pharmacognostic study including microscopic and macroscopic characters of the root and root powder was carried out.

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Materials and Method

Collection of sample

Root of Bharangi, were collected in September 2009 from Dang Forest by local people who can identify it. The collected material was put into container and stored. The plant specimen was authenticated by expert of Botany from the department of Pharmacognosy GAU, Jamnagar.

Processing and preservation

The root of Bharangi was collected and preserved. Macroscopic and microscopic characters of root and root powder were studied systematically. Transverse sections were prepared for microscopic examination. Standard stains and chemical reagents were used in all these studies.

Morphology of the plant

Morphology:[2]

Habit: A shrub 0.9 – 2.4 m height, glabrous, hollow branches.

Stem: Bluntly quadrangular.

Leaves: Some ternate as well as opposite.

Petioles: Stout.

Flowers: Numerous, pubescent dichotomous cyme.

Fruit: Drupe.

Root[3]: Pieces of hard, cylindrical, gradually tapering roots, 2 to 5 cm in diameter, splits longitudinally into half in most of the cases. External surface of root is rough, dark brown in colour, with scattered patches of small beady warts and circular scars. The centrally split pieces show a creamish yellow, longitudinally striated woody surface with a well marked pith. The bark is up to 2 mm thick and is always accompanied with substantial portion of woody part of the root.

Chemical composition: Serratogenic acid, queretaroic acid, some phytosterols, iridiod saponins, two glycosides, ferulic acid, arabinose, seutellarin, baicalein[4]

Part used: Root[5]

Pharmacological activity: Root is having anti-inflammatory, antispasmodic, expectorant bronchoconstrictor, anti-allergic property.[6]

Different varieties[7]:

C. indicum is considered as Bharangi by P.V. Sharmaji while other scholars have identified Bharangi as C. serratum Spreng. The former variety is known as Bhandira according to others.

Taxonomic Classification of Bharangi. (Clerodendrum serratum (Linn.)[8]

Kingdom: Plantae

Phylum: Magnoliophyta

Class: Angiospermae

Order: Lamiales

Family: Verbenaceae

Genus: Clerodendrum

Species: Clerodendrum serratum

Distribution

More or less throughout India, Ceylon.[9]

Macroscopic and Microscopic characters of root Clerodendrum serratum (Linn.)

Morphology of root: Mature root hard, woody, cylindrical, upto 5 cm thick, external surface light brown having elongated lenticels. Bark thin and easily separated from a board wood which shows marked medullary rays and concentric growth rings in a transversely cut surface.

Microscopy: Transverse section of root Clerodendrum serratum (Linn.) shows stratified cork composed of 10 – 15 layers of thin walled, tangentially elongated cells. Secondary cortex wide, outer 2 or 3 layers radially arranged and tangentially elongated.

Some cells contain acicular crystals of calcium oxalate and a few contain brown colouring matter, secondary phloem consists of sieve elements and parenchyma mostly collapsed in outer region, secondary xylem diffused porous consisting of vessels, tracheids, fibres and xylem parenchyma traversed by xylem rays. Xylem fibres moderately thick walled with mostly tapering, pointed ends and oblique bordered pits, xylem parenchyma square to rectangular with simple pits on their walls, acicular crystals and abundant simple and compound starch grains present in a number of cells throughout the region.

Study of root powder of Clerodendrum serratum (Linn.)

Microscopic slides of the powder was prepared by using various mountains including:

1. Distilled water
2. Glycerine Alcohol and water
3. Phloroglucinol and Hydrochloric acid for staining lignified tissues.
4. Iodine water for testing starch grain
5. Hydrochloric acid
6. Sulphuric acid
7. Acetic acid for identification of crystals of calcium oxalate and carbonates etc.

Discussion

The T. S. of mature root shows outer stratified cork, composed of 10-15 layers of lignified tangentially elongated rectangular cells followed by cortex. Cortex radially arranged and tangentially elongated circular to ellipsoidal embedded with patches of thick walled stone cells, simple and compound starch grains with some yellowish brown content and some prismatic crystals of calcium oxalate throughout cortical cells, phloem parenchyma modified into ceretenchyma followed by the cortex. The secondary xylem having diffused porous arrangement consisting of vessels, tracheids, fibres and xylem parenchyma embedded by bi to tri seriated medullary rays. The primary wood occupied the central portion of the transverse section xylem mostly monarch to tetrarch, xylem bundles with xylem fibres, xylem parenchyma without leaving pith. Medullary rays starting from the centre reaching upto cortex zone and radially elongated.

Root powder of C. serratum is light brown in colour. Under microscopic examination it shows vessels reticulate, spiral and with bordered pits, simple and compound starch grains, which are round to oval shape and stone cells.

Conclusion

Pharmacognostic study of any medicinal plant is very much useful regarding the identification and its property. In this study we have done the study of root of Clerodendrum serratum (Linn.) which belong to family Verbenaceae.

This plant is commonly available throughout India. It is a shrub with 1-3 m high,glabrous hollow branches. Its root is mainly indicated for respiratory disorder. Root are hard, woody, and cylindrical, upto 5 cm thick. Its bark is thin which can be easily separatedand having elongated lenticels. Recent pharmacological findings indicate that its root possess significant activities like anti-inflammatory, antispasmodic, expectorant broncho constrictor, anti-allergic property which comply with the claim made in the traditional medicinal text.

Chief microscopic characters include cortical parenchyma containing starch grains and patches of stone cells. In powder microscopy it shows prismatic crystals of calcium oxalate, simple and compound starch grains, thick walled pitted stone cells, group of pitted tracheids. Such a study would serve as a useful gauge in standardization of the root material and ensuring quality formulations.

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