



Research Article

**COMPARATIVE PHARMACOGNOSTICAL STUDY OF THE GENUINE AND MARKET
SAMPLES OF THE STEM BARK OF CIRABILWA (*HOLPTELEA INTEGRIFOLIA* PLANCH.)**

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ABSTRACT

Context: The stem bark of *Cirabilwa* (*Holoptelea integrifolia* Planch.) is used for treating various disease conditions including Dyspepsia, Flatulence, Colic, Helminthiasis, Vomiting, Skin diseases, Diabetes Mellitus, Haemorrhoids and Rheumatism in traditional system of medicine since ancient times. As a part of a proposed clinical study, sufficient quantity of the plant drug was required to evaluate the antidyslipidemic effects, which was procured from market. **Aim:** This study was designed to identify and compare the pharmacognostical features of the genuine hand collected samples and market samples of the stem bark of this medicinal plant, so as to prove the genuinity of the market samples before using it for clinical study. **Materials and Methods:** Macroscopic and microscopic methods were applied to determine the diagnostic features of the shade dried samples of the intact stem bark of both samples of the drug and was compared with the available data. **Results:** The shape, color, thickness, odour, consistency, fracture and surface characteristics were determined. Compound microscope images showed the presence of ray cells, stone cells, starch grains, rhomboidal crystals in both the samples. **Conclusion:** The study confirmed the identity of both genuine and market samples. Comparable results were obtained which proved the genuinity of the market samples of the stem bark of *Cirabilwa* (*Holoptelea integrifolia* Planch.).

KEYWORDS: Pharmacognostic, Standardization, *Cirabilwa* (*Holoptelea integrifolia* Planch.) stem bark, Microscopic, Macroscopic.

INTRODUCTION

Now-a-days there is a renewed interest in drugs of natural origin simply because they are considered as green medicine and green medicine is always supposed to be safe. Another factor which emphasizes this attention is the incidences of harmful nature of synthetic drugs which brings obnoxious effects to human beings. The advantage of natural drugs is their easy availability, economic and less or no side effects but the disadvantage is that they are subjected to adulteration. The more effective the natural drug, more is its demand and the chances of non-availability increases. To meet the growing demand, the natural drug is easily adulterated with low grade material. Adulteration or substitution is nothing but replacement of original plant with another plant material or intentionally adding any foreign substance to increase the weight or potency of the product or to decrease its cost. Therapeutic efficacy of medicinal plants depends upon the quality and quantity of chemical constituents. The misuse of herbal medicine or natural products starts with wrong identification. The most common error is one

common vernacular name is given to two or more entirely different species^[1]

All these problems can be solved by pharmacognostic studies of medicinal plants. It is very important and in fact essential to lay down pharmacognostic specifications of medicinal plants which are used in various drugs. Pharmacognosy is the study of medicines derived from natural sources, mainly from plants. It basically deals with standardization, authentication and study of natural drugs. Most of the research in pharmacognosy has been done in identifying controversial species of plants, authentication of commonly used traditional medicinal plants through morphological, phytochemical and physicochemical analysis. The importance of pharmacognosy has been widely felt in recent times. Pharmacognostic studies ensures plant identity, lays down standardization parameters which will help to prevent adulterations. Such studies will help in authentication of the plants and ensures reproducible quality of herbal products which will lead to safety and efficacy of natural products.^[2]

Chirabilwa (*Holoptelea integrifolia* Planch.) is a large spreading, almost glabrous deciduous tree attaining a height of 15–18m, trunk upto 2 metres or more in girth near the ground level, covered with grey pustular mucilaginous bark^[3]. Main pharmacological properties include anti-inflammatory, digestive, carminative, laxative, anthelmintic, depurative, revulsive and urinary astringent action. They are useful in vitiated conditions of *Kapha* and *Pitta*, inflammations, dyspepsia, flatulence, colic, helminthiasis, vomiting, skin diseases, leprosy, diabetes, haemorrhoids and rheumatism.^[4] *Chirabilwa* (*Holoptelea integrifolia* Planch.) is a tree which is included in many *medohara* (antidyslipidemic) groups like *Saalaradi*, *Varanadi*, *Aragwadadi*, *Arkadi* (various groups of herbs) groups of *Susruta Samhita*^[5], *Asanadi*, *Varanadi*, *Aragwadadi* and *Arkadi* groups of *Ashtanga Hridaya*^[6] and *Lekhaniya mahakasaya* group of *Caraka Samhita*^[7]. But no research has been conducted yet to clinically evaluate its *Medohara* (antidyslipidemic) effect as a single drug. Hence a clinical study to evaluate the antidyslipidaemic effect of the stem bark of *Chirabilwa* was taken up.

As a part of a proposed clinical study, sufficient quantity of the plant drug was required to evaluate the antidyslipidemic effects. So this opened up another area of research wherein for such huge requirements the researchers have to either depend upon market samples or collect the drug directly from the wild. Hence it was planned to do the pharmacognostical study to check the genuinity and purity of market sample against the genuine hand collected sample. Shade dried samples of both market and genuine samples of the drug were studied and compared to prove the genuineness of the study drug.

MATERIALS AND METHODS

Plant material

The genuine samples of the stem bark of *Chirabilwa* (*Holoptelea integrifolia* Planch.) were collected from the herbal garden of Pharmacognosy Unit, Govt. Ayurveda College, Trivandrum, India during January 2011. The plant identification was done by Mr. G.R. Jayakumar, Senior Research officer, Pharmacognosy Unit, Govt. Ayurveda College, Trivandrum. Market samples were collected from the local market of Trivandrum, India during January 2011. Voucher specimens were preserved in the Herbarium at the Department of Dravyagunavijnana, Ahalia Ayurveda College, Kerala, India [Fig. 1]. The collected market samples were washed well to remove mud and soil contaminants and dried in shade for the study, while genuine hand collected samples were studied afresh.

Macroscopic studies

Materials

Hand lens, water, Vernier calipers

Methodology

The samples of the stem bark of *Holoptelea integrifolia* Planch. were taken and washed in running water. Then it was thoroughly examined using naked eye and hand lens and observed for colour, shape, odor, taste, and other surface characteristics. Thickness was measured using Vernier Calipers.

Microscopic evaluation

Materials

Razor, stains, glass slides, water, cover slips, glycerine, compound microscope.

Methodology:

A thin transparent uniform cut free hand section was made and washed thoroughly in water. It was stained in aqueous safranin for 3 minutes and was washed several times till no colour of safranin comes out in water. The section was then mounted with a drop of glycerine and direct images were taken. All the images presented were taken by the author using digital camera.

RESULTS

Macroscopic characters

Genuine samples are greenish grey in colour and range from 1-1.5 cm in thickness. Cream coloured inner portion is slightly harder. The old stem bark is greyish brown in colour with a lot of lenticels. The bark is brittle which has a bad odour.

Microscopic characters

The cork tissue in the bark consists of many rows of regularly arranged thin walled tangentially elongated cells. The peripheral rows of cells appear narrower than more recently formed cells situated towards the interior.

The phelloderm consists of 8-12 rows of slightly thick walled tangentially elongated cells. In the phelloderm, stone cells are found either solitary or in groups. They have pitted walls. Some of the phelloderm cells contain rhomboidal crystals and starch grains.

The major part of the parenchymatous part consists of thin walled cells not arranged in a regular order. Stone cells, either isolated in groups of 2 to many are present in this region. These cells in Transverse section are circular or rectangular, which are slightly radially elongated.

The phloem region is fairly wide which contain sclerenchymatous fibres which are in groups, containing 15-25 cells. Some of the parenchyma cells adjacent to the fibre group contain rhomboidal

crystals of calcium oxalate. Some other cells contain starch grains. Inner region of phloem is devoid of fibres. The phloem rays are uni, bi or rarely multiseriate, which are homogenous type [Fig.2, Fig.3].

DISCUSSION

Chirabilwa (*Holoptelea integrifolia* Planch.) is a drug known from *Samhita* period, but detailed description is seen in *Nighantus* (dictionaries for herbs). Primary aim of the study was to test the antidyslipidaemic effects of the stem bark of the plant. *Cirivilwa* was selected as the study drug because it is included in many *Medohara ganas* (Group of drugs used in diseases of fatty tissues) by various Acharyas and it possesses *Tikta*, *Kasaya rasa* (Bitter, Astringent taste), *Laghu rooksha guna* (Light & rough qualities), *Ushna veerya* (Hot in potency) and *Katu vipaka* (Pungent transformation upon digestion).

As the primary aim of this work is a clinical study, large amount of drugs were necessary. So it was collected from market. Pharmacognostical studies of the study drug were done prior to clinical study to prove the genuinity of the market sample. This study is designed to identify and compare the pharmacognostical features of the genuine hand collected samples and market samples of the stem bark of this medicinal plant. Macroscopic and microscopic methods were applied to determine the diagnostic features of the shade dried samples of the intact stem bark of both samples of the drug and was compared with the available data. The shape, color, thickness, odour, consistency, fracture and surface characteristics were determined. Though pharmacognostic standards alone may not always be adequate to ensure their quality, but can play a major role to standardize a plant drug. The study confirmed the identity of both genuine and market samples. Comparable results were obtained which proved the genuinity of the market samples of the stem bark of

Cirabilwa (*Holoptelea integrifolia* Planch.). So further clinical study was conducted after confirming the identity of the drug.

CONCLUSION

The pharmacognostical evaluation of stem bark of *Chirabilwa* (*Holoptelea integrifolia* Planch.) provided specific parameters that will be helpful in proper identification, scientific evaluation and authentication of the drug. The study proved the genuinity of the market samples. Compound microscope images showed the presence of ray cells, stone cells, starch grains, rhomboidal crystals in both the samples. Although the genuinity of the market sample was confirmed in this study, market samples should mandatorily be subjected to pharmacognostical analysis before conducting clinical study.

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Stem bark of *H. integrifolia* (genuine)

Stem bark of *H. integrifolia* (market)



Powder of stem bark of *H.integrifolia* (genuine) Powder of Stem bark of *H. integrifolia* (market)

Fig. 1:- Morphology of the stem bark and its *choorna* of the genuine and market samples of *Chirabilwa* (*Holoptelea integrifolia* Planch.)

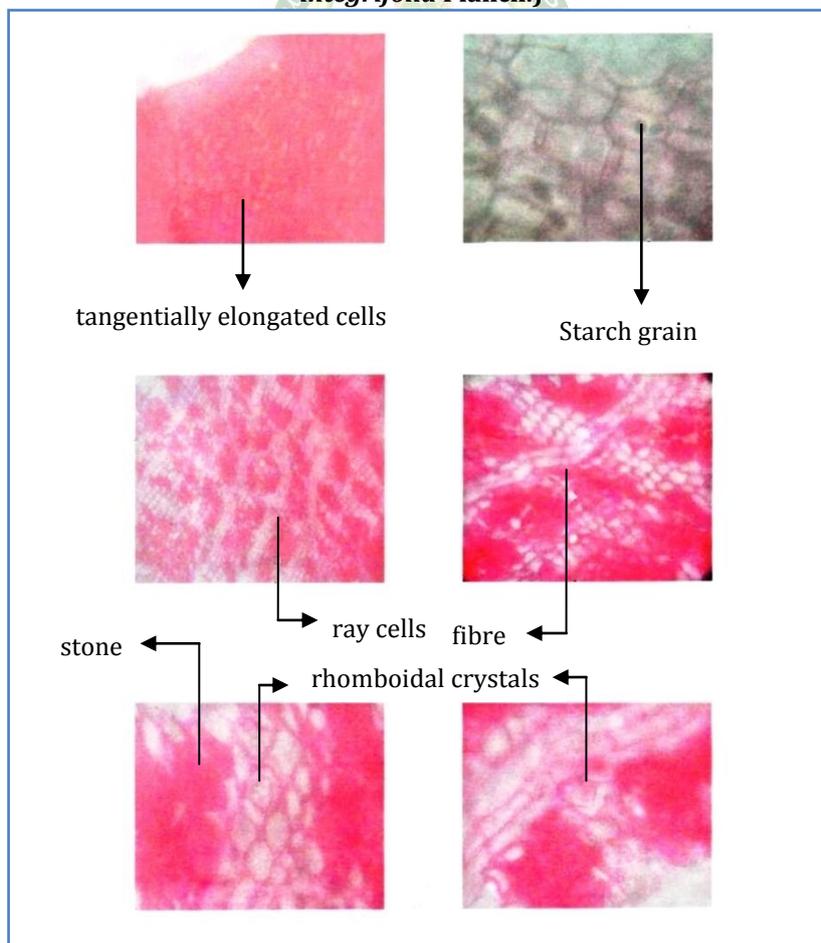


Fig.2. Microscopical features of market samples of the stem bark of *Holoptelea integrifolia* (Roxb.) (Planch.)

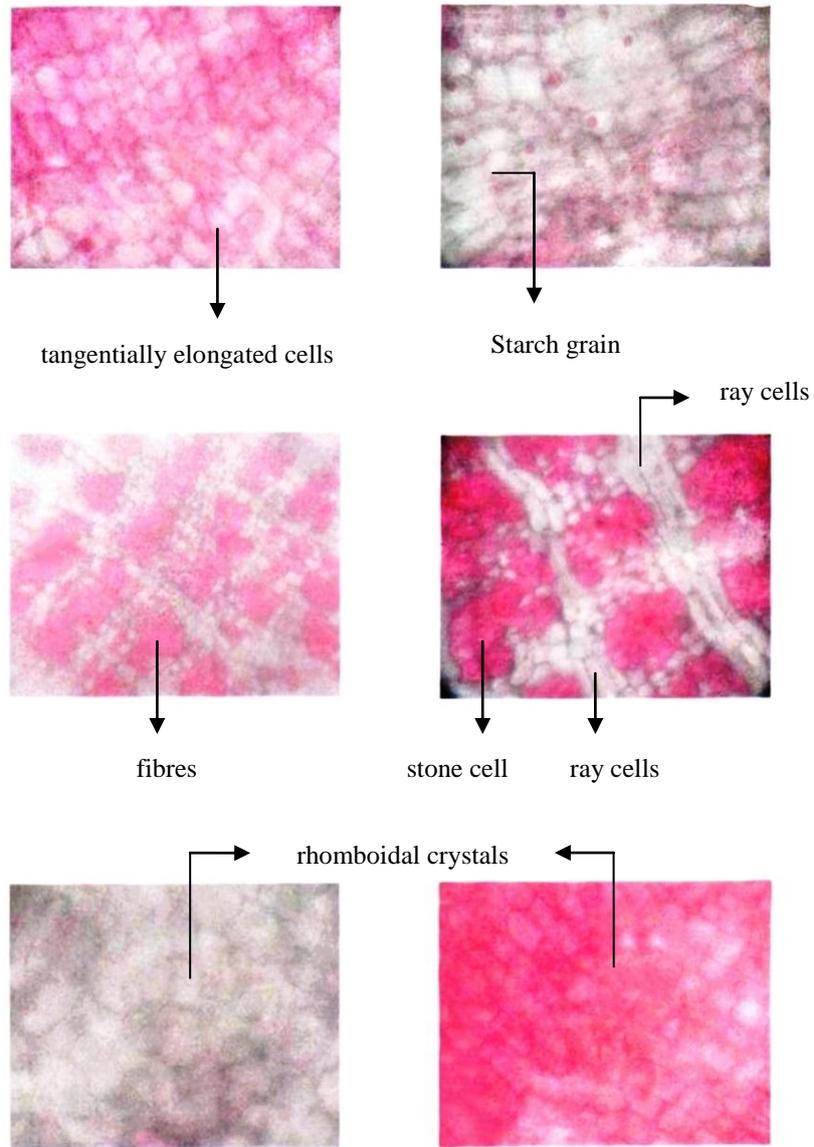


Fig.3. Microscopical features of genuine samples of the stem bark of *Holoptelea integrifolia* (Roxb.) (Planch.)