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Research Article

**PHARMACOGNOSTIC STUDIES OF BARK OF CARRISA  
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**Abstract:**

*Carrisa carandas* belongs to the dogbane family Apocynaceae founds to be widely distributed throughout India. The present study investigates various qualitative and quantitative parameters like macroscopy, microscopic evaluation of bark powder and physicochemical constants of the bark of *Carrisa carandas*. Microscopic evaluation of powders of the bark revealed the presence of various cellular structures such as sclereids, fragment of cork, single acicular type of calcium oxalate crystals, pericyclic fibre and bordered pitted type of xylem vessels. Establishment of its quality parameters including physicochemical evaluation such as the moisture contents(1.08%), foreign organic matter(0.2%), total ash(1.6%), acid insoluble ash( 0.28%), water soluble ash( 1.1%), extractive values like ethanol-soluble extractives(0.81%) and water-soluble extractives( 0.44%) were calculated. Macroscopical and microscopical evaluation of bark gave special identification characters. These features play important role for the standardization of plant materials, isolation of bioactive principles, ensuring the quality of formulation and also useful to distinguish it from its related species.

**Keywords:** *Carrisa carandas*, Apocynaceae, Macroscopy, Microscopy, Physicochemical parameters**Corresponding author:****Manpreet Kaur,**

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**INTRODUCTION:**

*Carrisa carandas* belongs to the dogbane family Apocynaceae[1] founds to be widely distributed throughout India. Phytochemical screening of the root extract showed presence of small quantities of alkaloids, flavonoids, saponins and large amounts of cardiac glycosides, triterpenoids, phenolic compounds and tannins in the crude extract[2]. The plant is used as ingredient in a number of ayurvedic formulations and preparation, which includes: Marmagutika, Hridya mahakashaya, Kalkantaka rasa, Kshudrakarvanda yoga, and Marichadi vati. Plant is widely used traditionally for diarrhoea, stomachic, fever, cardiovascular diseases, vermifuge and insect repellent[3]. The present work has been designed to delineate the pharmacognostic profile of bark of *Carrisa carandas*.

**MATERIALS AND METHODS:****Collection and preparation**

The bark of *Carrisa carandas* plant was collected from medicinal garden of G.H.G Khalsa College of Pharmacy, Gurusar Sadhar, Ludhiana, Punjab and was authenticated by head of the botany department of Punjab Agricultural University Ludhiana. A voucher specimen (CK-1) was deposited in the departmental herbarium of G.H.G Khalsa College of Pharmacy, Gurusar Sadhar, Ludhiana, Punjab. The bark pieces were dried in shade and coarsely powdered. Small amount of pieces of bark were finely powdered for microscopic studies.

**Morphological features**

The collected plant bark was washed, cleaned and dried for further use. The following macroscopic characters of the bark of the plant were noted; colour, odour, taste, size and shape, fracture and surface.

**Microscopic features**

Transverse section of bark and its powder characteristics were identified with routine reagents such as chloral hydrate, glycerine, lactophenol and iodine solution etc to study the cells, fibre, xylem vessels, starch grains, calcium oxalate crystals etc. Permanent slide of TS of root was prepared to observe the presence and arrangement of cellular structures as per the procedure of Johansen [4] and the representative figures were taken with the help microscopic image camera.

**Physicochemical parameters**

The various physicochemical parameters such as total ash, acid insoluble ash, water soluble ash, moisture content, extractive value (water and alcohol ) have been studied as per Indian Pharmacopoeia[5].

**RESULTS AND DISCUSSION:****Macroscopy**

The colour of the pieces of bark was dark brown externally and light brown internally. The odour and taste was characteristic. Fracture was smooth and texture of bark was rough.



Plate – 1 Photograph of bark of *Carrisa carandas*

**Microscopy**

After preparation of slide using chloral hydrate and glycerine T.S (transverse section) examine under microscope fragments of cork, cortex, sclereids, calcium oxalate crystals and medullary rays were seen. Powder microscopy showed the presence of

sclereids, fragment of cork, single acicular type of calcium oxalate crystals, pericyclic fibre and bordered pitted type of xylem vessels. When the powdered drug was cleared with chloral hydrate and mounted in lactophenol followed by iodine solution showed small ovoid and rounded starch grains.

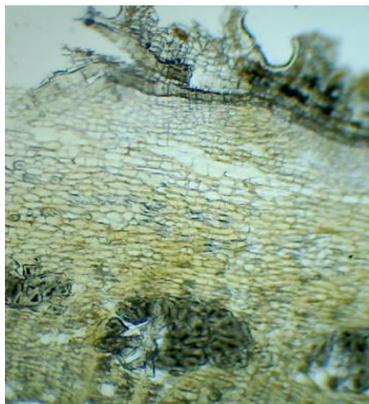


Fig-1



Fig-2



Fig-3

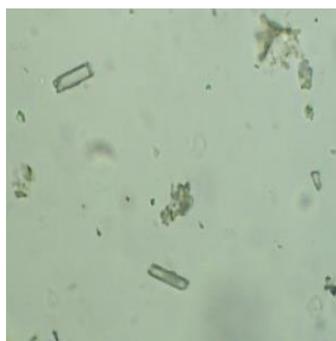


Fig-4



Fig-5



Fig-6



Fig-7

Fig-1 – T.S of bark showing cork, cortex, sclereids and medullary rays; Fig-2 – showing cork cells; Fig-3- Sclereids; Fig-4 single acicular calcium oxalate crystals; Fig-5- pericyclic fibre; Fig-6 - bordered pitted type of xylem vessels; Fig-7-rounded and oval starch grains.

#### Physicochemical parameters

The physico-chemical parameters are shown in Table 1. The physicochemical constants are particularly important in the evaluation of purity of crude drugs. These parameters are usually helpful in prevention of adulteration and in authentication of crude drug. The moisture content is very important factor for the stability of crude drug because moisture enhances the fungal and bacterial growth. The longer shelf life can be achieved only by reducing the moisture content. The total ash value indicates the presence of earthy matter, inorganic components and other impurities in the crude drug. Acid insoluble ash value indicates high digestibility when the plant is consumed. The extractive values are primarily useful for the determination of exhausted or adulterated drugs.

**Table 1: Results of Physicochemical analysis of the bark of *Carrisa carandas***

Physicochemical constant	Percent (w/w)
Loss on drying	1.08%
Foreign matter	0.2%
Total ash value	1.6%
Acid insoluble ash	0.28%
Water soluble ash	1.1%
Alcohol extractive value	0.81%
Water soluble extractive value	0.44%

#### CONCLUSION:

Different pharmacognostic and physicochemical standards including macroscopy, microscopy, foreign matter, ash values, extractive values and loss on drying were generated to substantiate data on bark of *Carrisa carandas*. The present study provides the detailed summary of pharmacognostical characters of bark to give clear standards for the identification of drug.

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