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ANATOMICAL STUDY OF MARKETED SAMPLES OF THE BARK OF *HOLARRHENA ANTIDYSENTERICA* WALL.

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ABSTRACT

Holarrhena antidysenterica Wall. belongs to family Apocynaceae & has often been confused and adulterated with another member of the same family that is *Wrightia tinctoria* R. Br. *Holarrhena antidysenterica* is called Kuruchi, Kuda, Kutaja, Kalinga etc in various languages. *Wrightia tinctoria* is commonly called Ivory wood, Pala indigo, Duhi, Mitaindarjau, vetakutaja, Hayamaraka etc. The plant pacifies vitiated tridoshas, fever, stomachache, skin diseases especially psoriasis and diarrhea. The present study reveals the true anatomical features of *Holarrhena antidysenterica* bark and *Wrightia tinctoria* bark. These are compared to ready-marketed samples of *Holarrhena antidysenterica* bark powder, which showed presence of adulterants like sand & parts of stems of other plants.

KEYWORDS: *Holarrhena antidysenterica* bark, *Wrightia tinctoria* bark, marketed samples, adulterated.

INTRODUCTION

Green plants synthesize and preserve a variety of biochemical products, many of which are extractable and used as chemical feed stocks or as raw material for various scientific investigations. Many secondary metabolites of plant are commercially important and find use in a number of pharmaceutical compounds. However, a sustained supply of the source material often becomes difficult due to the factors like environmental changes, cultural practices, diverse geographical distribution, labour cost, and selection of the superior plant stock, adulteration and over exploitation by pharmaceutical industry. It is observed that the drugs in commerce are frequently adulterated and do not comply with the standards prescribed for authentic drug. *Holarrhena antidysenterica* Wall. belongs to family

Apocynaceae as mentioned by Hooker (1883). It has often been confused and adulterated with another member of the same family that is *Wrightia tinctoria* R. Br. *Holarrhena antidysenterica* pacifies vitiated vata, pitta, diarrhea, dysentery, hemorrhage, hemorrhoids, amoebiasis, hepatitis and skin diseases. Bark is pungent & acrid. The seeds are used as astringent, in leprosy and to cure pains. The leaves are useful as medicine in skin diseases, relieves muscle pain & as aphrodisiac as mentioned by Kirtikar & Basu (2006). *Wrightia tinctoria* is used in flatulence, bilous troubles & tonic as mentioned Agarwal (1997). Phytochemical screening & physico-chemical parameters as mentioned by Wallis (1960) have already been studied by Vaidya (2015).

MATERIALS AND METHODS

The material for the present study was personally collected as shown in the table & authenticated.

Material	Place	Area
Bark of *Holerrhena antidysenterica* Wall.	Sanjay Gandhi National Park	Borivali (East)
Bark of *Wrightia tinctoria* R.Br.	Sanjay Gandhi National Park	Borivali (East)
Market sample -1	D. G. Ayurvedic Sangrah	Andheri (West)
Market sample - 2	Satyam Ayurvedic Store	Vile-Parle (East)
Market sample - 3	Shri. Jiya maa Ayurvedic and General Stores.	Borivali (West)

For Microcopy the method used was suggested by Trease & Evans, (2002).

Take1gm of powdered drug and add dil. NaOH, incubate at 37˚c for 1 hr. filter the powder with muslin cloth in a funnel. Wash it frequently with water, take the residue in a test tube and add about 10 ml of Sodium hypochlorite solution. Keep it for 1 day. Next day filter it again with Muslin cloth in a funnel. Wash it water and the bleached material is used for staining.

As the material is bleached it is to be stained. For this Saffranine is used.

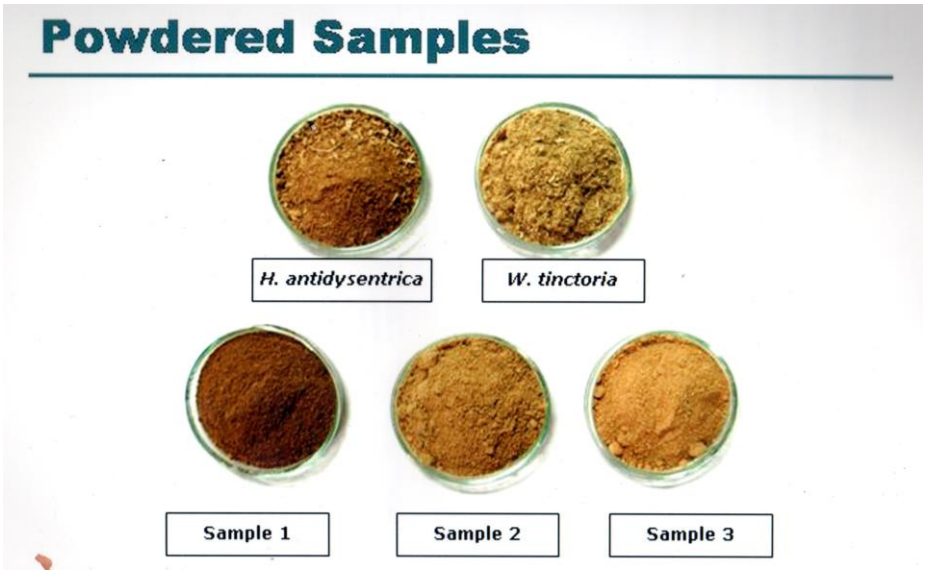
Slides are mounted with pure Glycerol and sealed.

The slides are observed under microscope for various structures.

The microscopic structures are measured with help of ocular and stage micrometer.

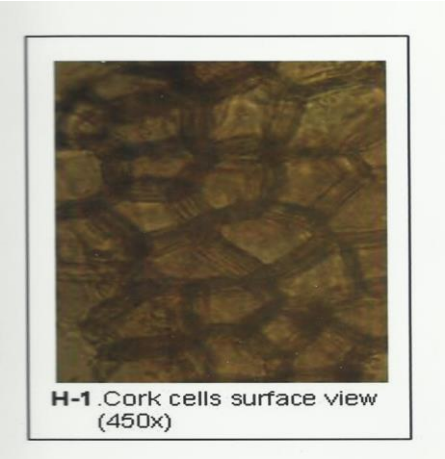
Least count= 0.003mm

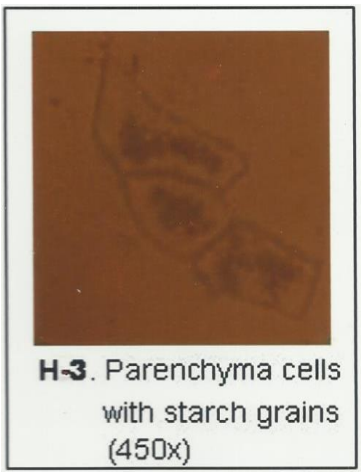
The photographs have been taken using Camera- Nikon Coolpix L5 & Kodak Easy Share CX6200 in Mithibai College.



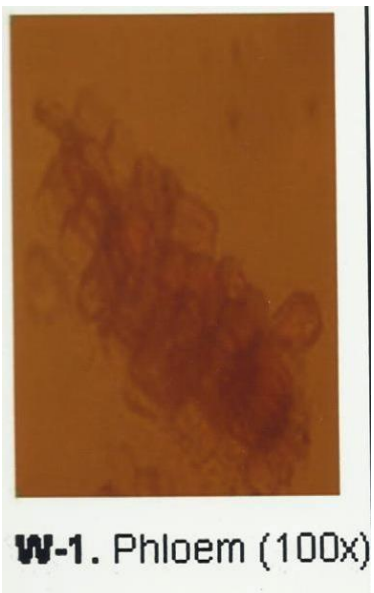
Holarrhena antidysenterica	***Wrightia tinctoria***
Colour: buff to brownish.	Colour: Greyish-dull green.
Shape: recurved	Shape: curved
Dimensions: Length: 10-15 cms Breadth: 3-4 cms Thickness: 6-12 mm	Dimensions: Length: up to 10 cms Breadth: 1-2 cms Thickness: 3-5 mm
Outer surface: deep cracks	Outer surface: furrowed
Inner surface: reddish brown, Fissured	Inner surface: pale green Striated
Fracture: brittle & splintery	Fracture: fibrous

Microscopic study of *Holarrhena antidysenterica*

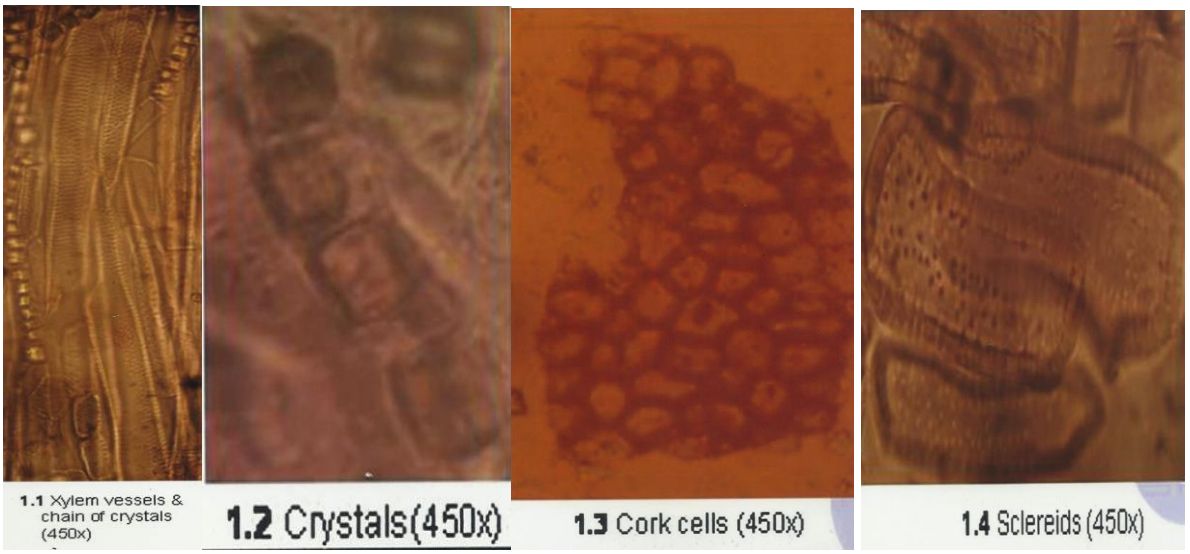




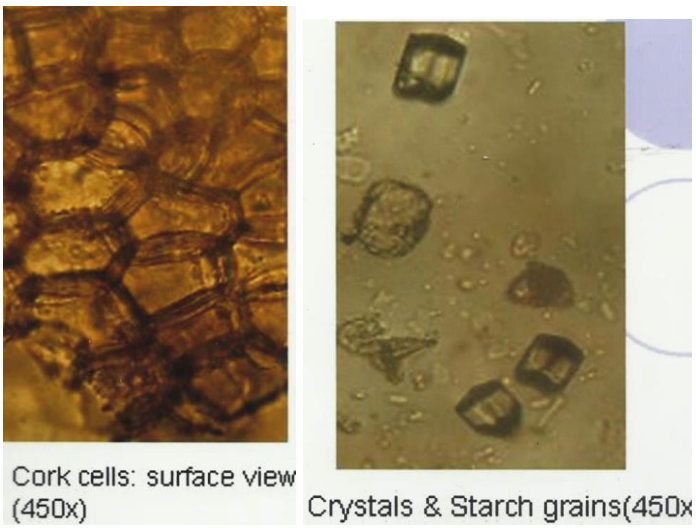
Microscopic study of *Wrightia tinctoria*

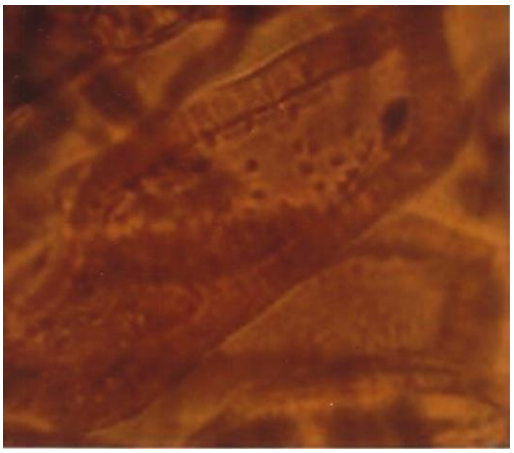


Microscopic study of SAMPLE 1



Microscopic study of SAMPLE 2



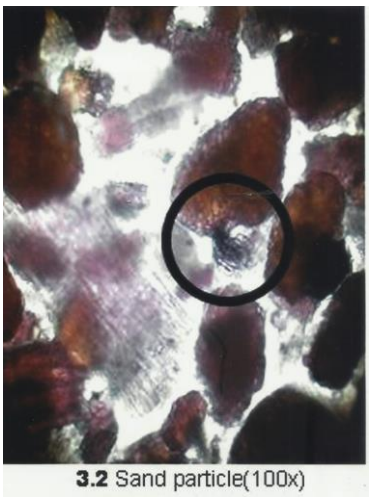


Sclereid- 450 X

Phloem- 450 X

Microscopic study of SAMPLE 3

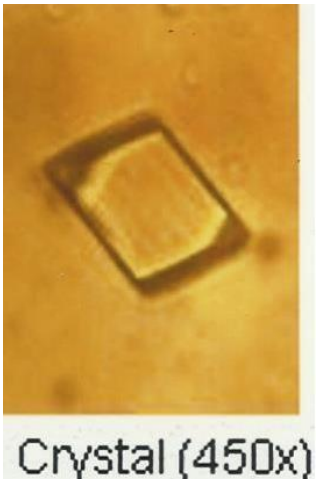
3.1 Sclereid group (450x)



3.2 Sand particle(100x)

3.3 Sclereid layer(450x)

3.4 Silica granule(100x)



Crystal (450x)

	H.a	***W.t.***	**S1**	**S2**	**S3**
Structure Cork	Most of the cells strongly thickened on the inner walls, lignified each cell is abt. 1.2µ	Thin-walled and lignified. each cell upto 3µ	Thick walled, lignified. 1.2µ	Thick-walled, lignified 1.2µ	-
Phloem	6µ	3µ-7.5µ	3.6µ- 6µ	6µ	-
Fibres	-	Abundant. Long, tapering ends Length= 42.9µ Width=1.2µ-2.4µ	-	-	-
Calcium oxalate crystals	Prisms ,1.5µ	Prisms, 1.5µ-2.1µ	Chain of prismatic crystals in parenchymatous cells,upto1.5µ	Prisms, 1.5µ	Prisms, 1.5µ
Stone cells/ sclereids	Isolated and in small groups	Few isolated cells	Isolated up to 5.1µ and in small groups of 16.5µ	Isolated up to 5.1µ and in small groups of 16.5µ	**large ovoid groups. from18µ up to 30µ**
Starch grains	Spherical, few are elongated. Up to 0.3µ	Present	Present	Present	**Absent**
Extra	-	Secretory tissue: unbranched Latex cells.	**Xylem vessels with tapering ends and pitted thickenings About - 6µ**	-	**Sand particles 27µ Fine black sand particles.**

H.a.- Holarrhena antidysenerica

W.t. – Wrightia tinctoria

S1, S2, S3- Marketed Samples

RESULT AND DISCUSSION

Market Sample 1 is powder of *Holarrhena antidysenterica* Wall. bark but as it shows xylem elements it is adulterated with other part of stem other than bark.

Market Sample 2 is the original powder of *H. antidysenterica.* It is unadulterated. Market Sample 3 is not the powder of *H. antidysenterica* Wall. and it is adulterated with silica and fine sand particles to increase its weight.

The external characters of the barks are such as to preclude adulteration, the rust- brown colour of *H. antidysentrica* being characteristic; the bitter rust-red powder given by latter is totally different from the tasteless grey powder obtained from *W. tinctoria.* But the diagnostic features of the drugs in unground condition have largely disappeared in the powder and new modified characters have become prominent.

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