RESEARCH PAPER

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Comparative Pharmacognostical, Physicochemical and Antibacterial Studies on Seeds of *Holarrhena antidysenterica* wall and *Wrightia tinctoria* R.Br.

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Holarrhena antidysenterica Wall, an ingredient of the formulation Kurchi Bismuth Iodide, has often been confused and adulterated with another member of the same family, that is Wrightia tinctoria R.Br. A comparative study was carried out on both the seeds which included pharmacognostical and physiochemical evaluation. The antibacterial screening of the various extracts of the seeds of H. antidysenterica and W. tinctoria were carried out and the chloroform and methanolic extracts of both the seeds were found to possess antibacterial activity. The determination of bitter-value was carried out only on the seeds of H. antidysenterica, since its seeds were found to be bitter compared to the seeds of W. tinctoria which are tasteless.

HOLARRHENA antidysenterica and **Wrightia tinctoria** seeds appear very similar and are often confused to be one and the same. The aim of this project was to carry out a comparative pharmacognostical and physicochemical evaluation, as well as, antibacterial screening on both the seeds. **H. antidysenterica** is found in Uttar Pradesh, Kerala and Assam. The seeds have astringent, antidysenteric, anthelmintic and stomachic properties. **W. tinctoria** occurs in Rajasthan, Madhya Pradesh and the pernisular India. The seeds have anthelmintic properties and they are used in flatulence and bilious affections.

EXPERIMENTAL

Pharmacognostical Evaluation :

The seeds of **H. antidysenterica** and **W. tinctoria** were examined for their colour, taste and size and nature of outer and inner surface. Permanent slides of the transverse sections of both the seeds were prepared[1]. The powdered seeds were treated with various acids/chemical reagents and the colours obtained were observed[2].

Physicochemical Evaluation :

The parameters selected for the physico-chemical evaluation were ash values, extractive values[3], analysis of ash of major elements[4,5] and fluorescence analysis. The fluorescence analysis was done by methods A,B, and C given by Chase and Pratt[6,7].

Antibacterial Screening :

The antibacterial screening of the petroleum ether, chloroform, methanol and water extracts were carried out using agar-cup plate method. The organisms used were **Bacillus substilis, Staphylococcus aureus. Pseudomonas aeruginosa** and **Escherichia coli**[8].

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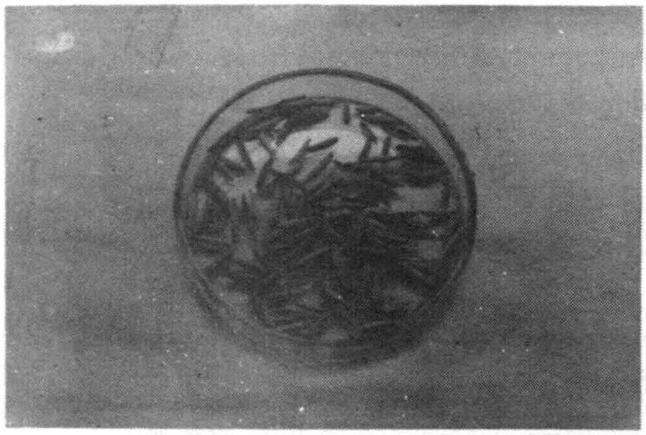

Fig.1 Seeds of H. antidysenterica wall

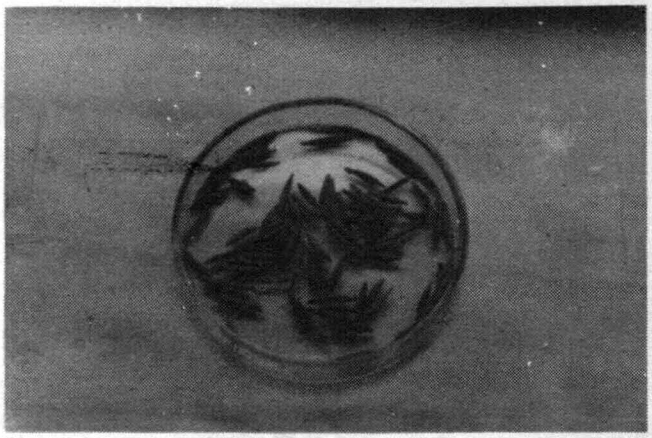

Fig.2 Seeds of W. tinctorial R.Br.

Bitter-value determination :

The bitter value of the seeds of **H. antidysenterica** was determined[10].

RESULTS AND DISCUSSION

The seeds of **H. antidysenterica** are about 8 mm long, has a brown outer surface, white inner surface, convex, dorsal surface and concave or nearly flat ventral surface. **(Fig. 1)** seeds of **W. tinctoria** are about 1.3 to 2 cm long, reddish-brown exteriorly, with a pinkish-violet inner surface and a pointed apex **(Fig. 2)**.

The transverse section of both the seeds showed the presence of testa and endosperm. However in **H. antidysenterica** the cotyledons have a twisted arrangement where as a concentric arrangements was seen in **W. tinctoria**.

Powdered seeds were treated with Con.H_2SO_4, Con.HCl, Con.HNO_3, Picric acid, KOH, gl.acetic acid. **H. antidysenterica** showed yellow or orange colour where as **W. tinctoria** showed mainly brown or orange colour.

The ash values, extractive values and the results of the elemental analysis of both the seeds are given in **Table 1**. The fluorescence analysis of the powdered seeds resveal that only the seeds of **H. antidysentrica** show bluish white fluorescence under 366 nm by method A while, **W. tinctoria** does not exhibit fluorescence by any of the three methods.

The colours exhibited by the various extracts (Benzene, Carbon tetrachloride, Pet.ether, chloroform, ethyl acetate, acetone, methanol, ethanol and water) of the seeds of **H. antidysenterica** were green and yellow and **W. tinctoria** were purple and lavender under ordinary light and UV light.

The antibacterial screening showed that the chloroform and methanolic extracts of the seeds of **H. antidysenterica** and W. **tinctoria** possessed antibacterial activity. The results are given in **Table 2**.

The bitter value of the seeds of **H. antidysenterica** was found to be 11,000.

Table No. 1

Ash Values	Percentage w/w	
	H.a	**W.t.**
Total ash	4.49	4.9
Acid insoluble ash	0.32	0.39
Water soluble ash	0.60	0.70

H.a. : H. antidysenterica
w.t. : W. tinctoria

Extractive value	Percentage w/w	
	H.a	**W.t**
Water soluble extractive	17.55	15.41
Alcohol soluble extractive	11.19	22.64

	Mgs of element/gm of powdered drug (mg/g)		
Drug	Na	K	Ca
H. antidysenterica	0.14	0.359	0.179
W. tinctoria	0.175	0.605	0.233

Table No. 2: Results of antibacterial screening

BACTERIA	Zone of inhibition in mm							
	Pet. Ether		Chloroform		Methanol		Water	
	H.a	**W.t**	**H.a**	**W.t**	**H.a**	**W.t**	**H.a**	**W.t**
a) **B.subtilis**	-	-	14	14	20	18	-	-
b) **S.aureus**	-	-	11	12	15	14	-	-
c) **P.Aeruginosa**	-	-	12	13	12	12	-	
d) **E.coli**	-	-	12	13	13	13	-	-

Note : Diameter of the cup is 9 mm.

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