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STANDARDISATION OF DIKAMALI

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ABSTRACT: The gum Kidamali is an important oleoresin drug in the Indian System of Medicine. The market sample of Madras Crude drug trade has been identified as the gums of Gardenia gummifera Linn. f. of Rubiaceae. The morphology, microscopical structure of the source material, the fluorescence analysis and the chemical studies including thin layer chromatography of the drug are reported.

Introduction

In Indian System of Medicine, the gum Dikamali is one of the important drugs. The drug is antispasmodic, antiseptic, anthelmintic and stimulant. It is used as a sedative externally on scalp with other oils. The gum Dikamali of Madras crude drug trade has been identified in out analytical laboratory as the gum of Gardenia gummifera Linn. F. as described in various Materia Madicae. An attempt has been initiated in our Laboratory to evolve a workable standard for the gum Dikamali.

Materials and Methods

The gum Dikamali was procured in the local market. Based upon the anatomical characters of the vegetative remnants, filtered from the alcoholic solution of the commercial gum, the source was determined.

The proximate chemical analysis like loss on drying, moisture content, volatile matter, ash content, water insoluble ash, alkalinity of the water soluble ash, acid insoluble ash, water soluble extractive, alcohol soluble extractive, Resin content and plant remnants present were determined for the crude commercial drug by standard pharmacopoeial methods (Indian Pharmacopoeia 1970) and the results are furnished in Table II.

Acid value and Saponification value determinations have to be conducted by potentiometric titration method because the gum contains Gardenin, which is a flavonoid derivative and it will mask the colour of the indicator due to its property of given pink colour when it comes in contact with alkalis. The values are furnished in Table III.

The drug was powdered and extracted in a Soxhlet extractor with ethanol. The extract along with the authentic sample of gardenin were subjected to thin layer chromatography on Silicagel. G. layer (0.2 mm thickness) using Benzene and methanol in the ratio

95:5 as solvant system. After development the plate was dried and sprayed with Antimony III Chloride I Chloroform and kept at a temperature of 110^{o}C for 15 minutes. The colour, number of spots and hRf values under U.V. long wave radiation were recorded and the details are furnished in Table IV).

Observation and Results

Macroscopical Characters:

The gum is in the form of irregular masses of dull olive green colour, mixed with the sticks and leaf buds of the source plant. The gum dissolves rapidly in rectified spirit and smells like cat's urine.

The vegetative fragments are mainly of the leaf buds in which the nerves are 10-20 number and the sticks are of 0.5 to 1.5 cm. long and 0.2 to 0.3 cm. diameter. They are grayish brown to almost black in colour when the sticks are broken into pieces, the yellow oleo- resin of the gum are noted.

Microscopical Character of the Sticks (Young Stem):

The epidermis is single layered, lignified and the cells are 14-17.5-24.5 x 10.5-21-24.5 microns. Below it, there is 6-8 layers of Collenchymatous tissue of sizes 8.5-10.5-17.5X10.5-17.5-21 microns. The pericycle is of Sclerenchymatous and in continuous layers, the cells are 10.5-14-21 microns in size. Two types of Calcium oxalate Crystals are found scattered in the tissues, of which the rosette type is 17.5-24.5 microns and the prism type is 14-17.5 microns dia.

TABLE – I

Fluorescence Analysis

S.NO	Treatment	Day Light	U.V. Long Wave
1.	Powder as such	Greenish Yellow	Brown with blue spots
2.	Powder + Water	do	do
3.	Powder + 50% HCI	do	Pale Pink
4.	Powder + 50% H_2SO_4	Yellow	Pink
5.	Powder + O.IN. NaOH	Reddish brown	Bright violet
6.	Powder + Benzene	L. Yellow	Light Pink
7.	Powder + Hexane	L. Yellow	do
8.	Powder + Acetone	L. Yellow	do
9.	Water Soluble extractive	Pale Yellow	Pale Pink
10.	Alcohol Soluble extractive	Golden Yellow	Light Pink

TABLE –II

Chemical Studies

Proximate analysis

S.No.	Analytical Findings	%W/W
1.	Loss on drying at 110oC	20.510
2.	Ash content	5.691
3.	Water insoluble ash	2.438
4.	Acid insoluble ash	0.281
5.	Alkalinity of the ash	0.3969ml. of. 0.1 Hcl/gm.
6.	Plant remnants	36.435
7.	Resin content	63.062
8.	Volatile matter	0.153
9.	Water soluble matter	2.804
10.	Alcohol soluble matter	62.89

TABLE – III

S.No	Analytical Findings	Value
1.	Acid value	38.79
2.	Saponification value	123.49
3.	Iodine value	73.9906

TABLE-IV

T.L.C of the Alcoholic Extract

Stationary Phase	: Silicagel. G.
Solvent System	: Benzene +Methanol
Ratio	: 95:5
Run	: 14.00 cm.
Spray Reagent	: Antimony III chloride in chloroform
Detection	: Sprayed and dried at 110oC for 15 minutes and viewed under U.V. Long wave radiation.

DIKAMALI GUM			GARDENIN		
No. of spots	Colour of Spots	hRf	No. of spots	Colour of Spots	hRf
15 Spots	Blue	12.25	1 Spot	Brown	82.5
	Pale Yellow	14.29			
	Brick red	16.43			
	Brick red	19.28			
	Yellow	22.14			
	Brown	32.14			
	Brown	37.14			
	Brick red	42.85			
	Brick red	52.14			
	Brown	58.57			
	Brown	66.43			
	Rose	72.14			
	Rose	77.85			
	Brown	83.07			
	Rose	92.14			

Discussion

The macro and microscopical character of the vegetative fragments present tin the gum indicates that the source is Gardenia gummifera Linn. the T.L.C study of the commercial gum and the authentic sample of Gardenia gave 15 and 1 spot respectively under Ultra Violet Long Wave. The brown coloured spot of commercial gum having the hRf value 83.07 corresponds with the brown colour spot of hRf 82.5 of the Gardenin. Hence from the similarity of hRf values and colour of spots, it is concluded that the market sample also contain Gardenin which is characteristic of the gum Dikamali.

The Chemical studies, fluorescence analysis and the T.L.C. studies can very well be accepted as one of the standard methods in analyzing the drug. Further analysing are also in progress in or laboratory.

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