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Isolation and Characterization of *Remusatia Vivipara* tubers Mucilage

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Research Article

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ABSTRACT

The prospects of natural polymers are brighter as synthetic polymers have certain disadvantages such as high cost, toxicity, environmental pollution during synthesis, non-renewable sources, side effects, less patient compliance, etc. Mucilages form slimy masses in water. Mucilages are typically heterogeneous in composition. Mucilages are polysaccharide complexes formed from sugar and uronic acid units. Mucilages form slimy masses in water, are typically heterogeneous in composition. The tubers of Remusatia Vivipara contain a high proportion of mucilage and it also being used for different therapeutic purposes. However there are no reports on isolation and characterization of mucilage of Remusatia Vivipara. Hence, the present study is planned to isolated and characterized for its morphological characteristics, identification by chemical tests, Solubility, melting range, pH, Swelling index, Ash values, presence of foreign organic matter, test for lead and arsenic, Loss on drying, Density, compressibility index and angle of repose etc. which will be standardizing parameter for future scientist.

KEYWORDS: *Remusatia vivipara, mucilage, isolation and characterization.*

INTRODUCTION

The use of natural gums and mucilage as important part of formulation is with the development of pharmacy and different dosage forms as general exicipients for oral use, eg. In tablets and capsules etc. the options are limited[1]. The prospects of natural polymers are brighter but even here extensive testing will be required. The synthetic polymers have certain disadvantages such as high cost, toxicity, environmental pollution during synthesis, non-renewable sources, side effects, less patient compliance, etc[2]. While the advantages of natural plant based materials include low cost, natural origin, free from side effects, bioacceptable, renewable source, environmental-friendly processing, local availability (especially in developing countries), better patient tolerance as well as public acceptance, from edible sources, etc[3].

Mucilages are polysaccharide complexes formed from sugar and uronic acid units. mucilages form slimy masses in water, are typically heterogeneous in composition. Upon hydrolysis, arabinose, galactose, glucose, mannose, xylose and various uronic acids are the most frequently observed components. Mucilages are obtained mainly from rhizomes, seeds or other plant parts. Some are obtained from marine algae, and from selected microorganisms[4]. In present study the tubers of *Remusatia Vivipara* were selected for the isolation of mucilage. The seeds of *Remusatia Vivipara* also known as Lal-kand in Marathi, contain a high proportion of mucilage and it also being used for different therapeutic purposes[5]. The plant exudates (Acacia, karaya, and Tragacanth) have been the traditional gums for pharmaceutical purposes and they still find significant applications. These gums are labour intensive and carry premium price and their use will probably continue to decline[6]. However there are no reports on isolation and characterization of mucilage of *Remusatia Vivipara*. Hence, the present study is planned to isolate and characterize mucilage of *Remusatia Vivipara* Roxb.

MATERIAL AND METHOD:

Materials

The fresh *Remusatia Vivipara* tubers were collected from plants growing in hilly region of shahada, India. The plant was authenticated at the Botany Department of M. J. College, Jalgaon, India. Ethanol (95%), Acetone, trichloro acetic acid, sodium hydroxide and diethyl ether were procured from Space Lab, Nashik. All other chemicals used were of analytical grade and double distilled water was used throughout the experiments.

Extraction of mucilage

The fresh *Remusatia Vivipara* rhizomes were collected and washed with water. The tubers were crushed and soaked in water for 5–6 hours, boiled for 30 minutes and left to stand for 1 hour to allow complete release of the mucilage into the water. The mucilage was extracted using a multi-layer muslin cloth bag to remove the marc from the solution. Acetone (in the volumes of three times to the volume of filtrate) was added to precipitate the mucilage. The mucilage was separated, dried in an oven at 40°C, collected, ground, passed through a # 80 sieve and stored in desiccator at 30°C & 45% relative humidity till use [7-9].

Purification of the Mucilage

The crude mucilage (1 %) was homogenized (Potter homogenizer) with cold dilute trichloro acetic acid solution (5%). The solution was centrifuged (3500 rpm for 20 min), neutralized with sodium hydroxide by drop wise addition and then dialyzed for 30 hours against distilled water. The mucilage was precipitated with ethanol (in the quantities of three times the volumes) and washed successively with ethanol, acetone and diethyl ether. The mucilage so obtained was dried under vacuum (less than 1 Torr at 25°C for 12 hour). The so obtained mucilage was passed through a # 80 sieve and stored in desiccator at 30°C & 45% relative humidity till use[10, 11.]

Characterization of Mucilage

Physical characterization:

The collected mucilage was evaluated for physical characteristics[12, 13] viz., Appearance, Odour, Solubility, percentage yield, average particle size, swelling ratio, weight loss on drying, pH, Charring, density and bio burden.

Chemical characterization:

The extracted mucilage was tested for chemical characteristics for identification, test for Carbohydrate, test for Tannins, test for chloride, Test for sulphate test for Uronic acid. The mucilage was also tested for unwanted chemicals[12, 13] foreign matter, heavy metal and Arsenic.

Flow properties:

The dried *Remusatia Vivipara* rhizomes mucilage was tested for the flow properties[14] viz., Angle of repose, Bulk densities, compressibility index and Hausner's ratio. All these evaluations were carried out as per procedures describe in official books.

❖ **Taxonomical Classification of *Remusatia Vivipara*Lindl.**

Kingdom	Plantae
Phylum	*Tracheophyta*
Class	*Liliopsida*
Order	*Arales*
Family	*Araceae*
Genus	*Remusatia*

❖ **Physicochemical Characteristics of mucilage from *Remusatia Vivipara*Lindl**

Sr. No.	Tests	Observations
1.	Description	Faint brownish powder.
2.	Solubility	Forms colloidal solution, soluble in luck warm water, Practically insoluble in ethanol, acetone, ether and chloroform.
3.	Odour	Characteristic
4.	Appearance	Amorphous
5.	***Identification*** : a) Mounted in 96% ethanol b) Mounted in ruthenium red c) Mounted in Iodine solution.	 Transparent angular masses. Particles stained red. Particles stained blue.
6.	Melting range	Decomposes above 1800c
7.	PH (1%w/v)	Neutral.
8.	Loss on drying	6 %
9.	Ash value	4.7 %
10.	Acid insoluble ash.	0.3 %
11.	Swelling index	16
12.	Test for Carbohydrate (Mollish test)	+
14.	Test for chloride (Silver-nitrate test)	–
15.	Test for Sulphate (Barium chloride test)	–
16.	Uronic acid test	+
17.	Test for foreign matter	NMT 0.1 %
18.	Test for heavy metal as lead.	20 - 25 ppm.
19.	Test for Arsenic.	Less than 1 ppm.

+ Present. – Absent

❖ **Data showing the different ash values of seeds of *Remusatia Vivipara*Lindl**

Sr .No.	Types of Ash	Ash Value in %w/w
1	Total ash	4.7 %
2	Acid insoluble ash	0.3 %
3	Sulphated ash	0.9 %

❖ **Physico-chemical characteristics of mucilage of seeds of *Remusatia Vivipara*Lindl**

Sr. No.	Parameter	Result
1	Solubility	Soluble in warm water, Practically insoluble in ethanol, acetone, ether, and chloroform
2	Swelling index in distilled water	17.0
3	Loss on drying	6 %
4	Angle of repose	25^0
5	Bulk density	0.61 gm/cc
6	Tapped density	0.72 gm/cc
7	Carr index (%)	15.27
8	Hausner ratio	1.18

RESULT AND DISCUSSION

The mucilage is isolated by dissolving in water and precipitating in 90% alcohol and dried at room temperature, total yield of mucilage by alcohol precipitation was found to be 9 % W/W. The morphological and physical evaluatory study of isolated mucilage shows, it is Faint brownish powder, with characteristic odour and amorphous in nature. When dissolved in water, it gives neutral, colloidal solution; it is soluble in luck warm water, practically insoluble in ethanol, acetone, ether and chloroform. Moisture content of mucilage was found to be 6 % was found to be within official limit. Mucilage decomposes above 1800c, which is a characteristic of most of the polysaccharide. The foreign matter in this mucilage was found to be not more than 0.1 and the heavy metal as lead were found to be 20-25 ppm Arsenic was found to be Less than 1 ppm. The swelling index was found to be 16. And ash values as total ash, acid insoluble ash and sulphated ash 4.7%, 0.3% and 0.9% respectively, the 0.3 % of acid insoluble ash value indicate the negligible amount of sandy material. The isolated mucilage was studied for its physicochemical parameters such as angle of repose, density. The angle of repose

indicated that the powder was having good flow. The bulk density and tapped density of mucilage was found to be 0.61 and 0.72 gm/cc. The result of chemical test shows presence of carbohydrate & uronic acid which is general constituent of mucilage. While the absence of Tannins, chloride and sulphate shows the purity of mucilage.

REFERENCES:

1. Martin malmsten , Surfactants and polymers in drug delivery, vol. 122, 215.
2. Young and Lovell , Introduction to polymers, 2nd edition, 2-20.
3. Lippincott Williams and wilkins ,Remington, The science and Practice of pharmacy, 21st edition, vol. I, 223,305, 320,756.
4. Rangari VD, Pharmacognosy and Phytochemistry, 1st edition carrier publication, Nashik, 2002, 204
5. Anonymous, Indian medicinal plant, Arya Vaidya sala, Orient Longman, Madras, Vol. 3, 313.
6. Tyler, v., Brady, L .R. and Robbers, J. E., "Pharmacognosy", 8th edition, Lea and Febiger, Philadelphia, USA, 1988, 43
7. Sharma .S, Bharadwaj S and Gupta G.D., Fast dissolving tablets of promethazine theoclate by using natural super disintegrants, Research J.Pharm and Tech., 2008,1(3), 218-224.
8. Deveswaran R, Bharath S, Sharon Furtado, and Basavaraj B.V., Studies on the disintegrant properties of mucilage and seed powder of Plantago ovate, International Journal of Chem Tech Research., 2009,1(3), 621-626,.
9. Sumathi, S., Ray A.R. Release behavior of drugs from tamarind seed polysaccharide tablets. J. Pharm. Pharmaceut. Sci. 2002; 5(1): 12-18.
10. Kokate C.K., "Practical Pharmacognosy", 3rd Ed, Vallabh Prakashan, Delhi, 1991, PP-107-109.
11. Indian Pharmacopoeia Vol.II, ministry of health and Family Welfare, Govt. of India, Controller of Publications, New Delhi, 1985, A-73, A-88, A-122.
12. Ghule B.V., Darwhekar G.D., Jain D.K., Yeole P.G. Evaluation of binding properties of Eulophia campestris wall mucilage Indian J. Pharm. Sci. 2006; 68(5): 566-569.
13. Martin Alfred. Physical Pharmacy. 4th ed. Maryland, USA: Lippincott Williams & Wilkins; 1991. pp.423.
14. Aulton M.E. Pharmaceutics-The Science of Dosage Forms Design. 2nd ed. London: Churchill Livingstone; 1988. pp.600.

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