



PHYSICO-CHEMICAL AND MICROSCOPICAL PROPERTIES OF STARCH FROM TUBERS OF *REMUSATIA VIVIPARA* SCHOTT. MELET

R. P. Jadhav^{1#}, V. R. Naik² and V. B. Kunure^{3#}

^{1#}Department of Botany, GKG College, Kolhapur – 416014, (MS) India

² Director, Varadanjali Herbals Private Ltd. Malad Mumbai-400095 (MS) India

^{3#} Dept. of Botany, SH Kelkar College, Devgad, Sindhudurg – 416014, (MS) India

[#]Research Scholar, JJTU, Jhunjhunu-333001, (Rajasthan) India

ravindrajadhav3535@gmail.com

Abstract:

The present paper deals with Physicochemical and Microscopical properties of starch from tubers of *Remusatia vivipara* plants of family Araceae have been studied and are compared with potato starch. The size of starch grain is smaller as compared to potato and the number of starch grains per mgs of isolated starch is higher in *Remusatia vivipara*. The viscosity pattern of starch paste of *Remusatia vivipara* is considerably lower than that of potato starch. Starch bound lipid, protein percentage is higher in *Remusatia vivipara* than that of potato starch.

Keywords: *Remusatia vivipara*, Viscosity, Starch, Potato.

Introduction:

Remusatia vivipara (Lalkand) a monsoon perennial epiphytic (plate- I, a-b) typically growing on trees in semi evergreen forest of Western Ghats and are tuberous plant with heart shape peltate leaves. In India it is distributed in subtropical Himalaya, Khosia hills, Chota Nagpur and Western Peninsula. In Maharashtra it is reported in Konkan, Neral, Matheran, Deccan, Amboli near Sawantwadi, Khandala and Mahabaleshwar (Cooke 1903). The plant reproduces vegetatively by producing a large number of viviparous bulbils (plate I, e.). The root paste with turmeric is made into ointment and used in itching and root juice with cow's urine is considered to be alexipharmic (Kirtikar and Basu, 1973; Anonymous 1950). Since the physicochemical properties of starch from tubers of *Remusatia vivipara* have remained uninvestigation, these are described in comparison with potato starch.

Material and Methods:

Fresh tubers of *Remusatia vivipara* are collected from Amboli (sawantwadi) were employed for investigation. Starch percentage, starch bound protein, phosphorus and Lipids percentage, amylose percentage were determined according to procedure suggested by Hoffpauir (1949), Johnson (1941), Umbreit et. al. (1972), Knight (1965), and McCready and Hassid (1941) respectively. Procedure of Brautlecht (1953) and Lampitt et. al. (1941) were followed by determination of pH and retro gradation. Methods of Kerr (1950) were employed for determination of synthesis, Viscosity and solubility at room temperature. Methods given by Whistler (1964) were followed for determination of all other properties.

Observation and Discussion:

The physicochemical and microscopical properties of starch *Remusatia vivipara* have been tabulated in table-1 along with corresponding ones of potato.

The tubers are dark brown, rounded, spherical in shape 48mm in length and 32mm broad with 28 to 30gm in average fresh weight. The tubers of *Remusatia vivipara* contains 58% total starch on dry weight basis. The starch grains are white, mostly simple few compound, exhibits variable in shapes such as round, hemicircular, triangular and hexagonal, most polygonal with indentation mark on the surface (plate-I, f.) size varying from 12 to 44 μ m. Hilum distinct in round grains and indistinct in smaller ones, striation prominent in central region.

The isolated starch percentage is lesser than that of potato starch contains 0.58% total ash, 0.83% Starch bound proteins and amylose to amylopectin ratio 28:78 percentage of amylose, total ash. Starch bound lipids and protein is 0.05% and 0.06% respectively.

Conclusion:

Starch percentage of *Remusatia vivipara* is lesser than potato starch. Starch bound lipids and protein percentage, total ash percentage, amylose percentage, Gelatinisation temperature and percentage solubility at room temperature is higher than that of potato starch. On the other hand moisture percentage and retrogradation values of different temperature were low as compared to potato starch. Starch grains are smaller than potato starch and the number of starch grains per mg of isolated starch than that of potato starch. The viscosity pattern of starch paste of *Remusatia vivipara* is considerably lower than that of potato and viscosity increases with increase in temperature and further increase in cooling.

Table-1: comparative account of properties of starch from tubers of *Remusatia vivipara* with potato.

Properties		<i>Remusatia Vivipara</i>	Potato
Starch % (Dry weight basis)		58	75
Starch grain	No./mg of starch	58,26300	75,000
	Size (µm)	12 – 48 (15-25)	50-100 (56-60)
	Type	Simple, few compound	Simple, few compound
	Shape	Variable	Variable
	Hilum	Central	Central
	Striation	Indistinct	Indistinct
Ash	Total	0.58	0.22
	Acid soluble	0.32	0.18
	Acid insoluble	0.22	0.04
Starch bound lipids %		0.38	0.05
Starch bound proteins %		0.83	0.06
Amylose %		28	21
Moisture %		13.36	19
% solubility at room temperature		0.43	0.34
pH		6.3	6.5
Phosphorus %		0.068	0.08
Syneresis (water retaintion capacity)		2.6	0.986
Retrogradation	At 7 ^o C	83.3	86.2
	At 37 ^o C	79.9	83.00
	At 63 ^o C	71.6	79.3
Gelatinization temperature. °C		78 – 84	56-60
Pasting temperature		83.5	66
Viscosity	By ostwald viscometer	1.431 C.P.S.	1.672 C.P.U.
	At 95 ^o C	420 B.U.	855 B.U.
	After 15 min. at 95 ^o C	420 B.U.	855 B.U.
	After cooling for 15 min. at 50 ^o C	620 B.U.	855 B.U.

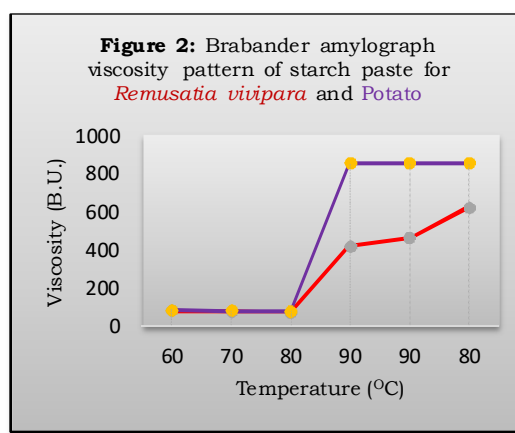
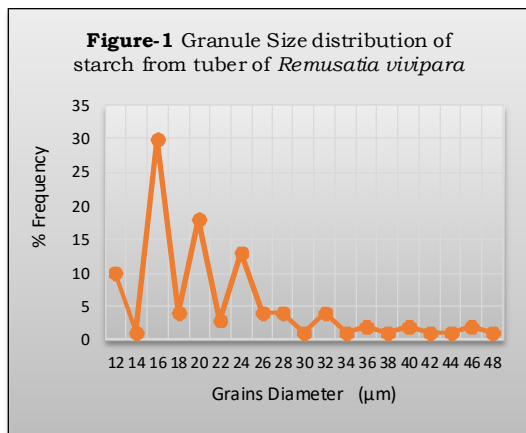
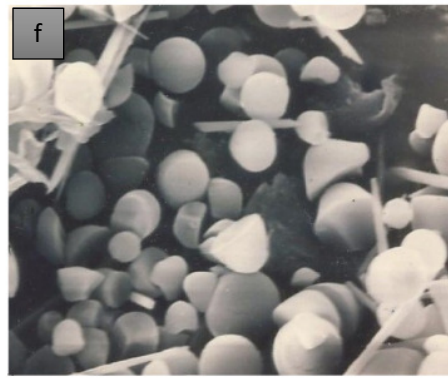
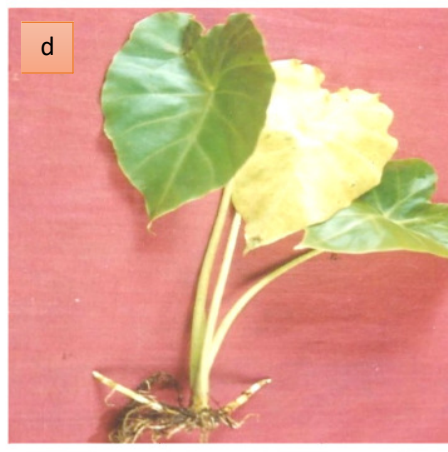
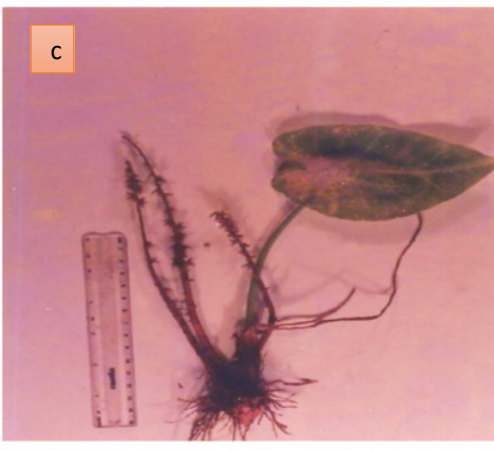


Plate-I: *Remusatia vivipara*



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