

**Research Note:****RICE DIVERSITY IN BANKURA DISTRICT OF WEST BENGAL (INDIA)**

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malay\_mishra@yahoo.com**ABSTRACT**

Rice is the staple food crop of Asian region including India. West Bengal state of India is known as bowl of rice because it constitute major food item and is being cultivated in major portion of agricultural field. India being centre of origin of rice, can boast of large number of local varieties and land races. According to an estimate, we have more than 50,000 varieties of rice. But unfortunately, most of those varieties are fast disappearing because of faulty agricultural practices. Farmers now lured by high yielding varieties have confined themselves to merely fifteen such races and have stopped cultivating local varieties. Needless to mention, these varieties are of immense value in agriculture as they are treasure house of innumerable important genes as they have evolved in particular environment science millions of years. Further, HYVs are highly susceptible to diseases. Developments of disease resistant varieties are possible only with help of such genes which are available in land races only. So far, 65 rare and traditional varieties of rice have been documented and is being tried to be propagated on small farm areas. Kalamkati, Danarguri, Tulsibhog, Nagrasail, Vutmuri, Sitasail, Gobindabhog, Neta, Rupsail, Chandrakanta, Daransail, Kataribhog, Daharnagra, Badshabhog etc. are some noteworthy indigenous cultivars of rice from West Bengal. The paper deals with botanical features of some of these varieties and attempts being taken to conserve them.

**Keywords:** Rice, diversity, Bankura District**INTRODUCTION**

Rice is one of the most important food crops of Asia, including India and is feeding more than 3 billion people. The cultivated rice, *Oryza sativa* originated in South East Asia in humid tropical climate and under influence of local environment and farmers need have evolved into 88,681 different variety, out of that 55,615 are land races, 1,171 are wild races and 32,895 are other varieties. Green revolution is considerably held to improve production of food grains in our country and its role in achieving status of self sufficiency in food grain is beyond any doubt. But high yielding varieties, which are the back bone of green revolution have indirectly stimulated erosion of land races and wild varieties of rice. Presently more than 70% of rice cultivation is being done using high yielding variety (HYV) only. Obviously land races are disappeared fast. Importance of landraces is larger than life in agriculture system, because improvement in existing variety depends upon desirable gene which are possibly present in land races and wild varieties only. Beside food, rice played key role in religion, culture and rituals in South Asia.

Rice provides 23% of global human per capita energy and 16% per capita protein. Rice protein ranks high in nutritional quality among cereals, though protein content is modest. Unmilled rice (brown rice) provides 4.3 to 18.2% protein, averaging 9.5% based on 17,587 cultivars in the IRRI germplasm (Rice Almanac, 1997). Rice also provides minerals, vitamins, and fiber. Milling removes roughly 80% of the thiamine from brown rice. For the majority of Asians who eat rice, the total intake is 2,531 calories per person per day, with 35% coming from rice, which is considerably high. However, breeding efforts to increase protein have so far been largely unsuccessful because of the considerable effects of environment and couples inheritance properties in the triploid rice endosperm tissue.

**MATERIALS AND METHODS**

Extensive survey was conducted in villages of West Bengal and farmers were consulted about the local varieties they have and they plant in their field. Information's gathered were cross verified by other means as well.

Seeds of local landraces were collected and were planted on small study plots with suitable and

Uniform spacing in between two plants (20cm in a row and 25cm in a Colum) in control condition. Measurements of different physical, agronomic and morphological characteristics of these collected landraces at different stages of growth were recorded following National guidelines for the conduct of Test for Distinctness, Uniformity and Stability of Rice (*Oryza sativa* L.). INDIA. ITG/01 dated 03/09/2003, Annexure-I. Date of germination was noted and other parameters like height of the plant, length of panicle, number of panicle, length and width of leaf, basal leaf sheath colour, weight of 1000 grains, length and width of Grains and decorticated Grains(brown rice), Lemma and palea colour, colour of decorticated grains(brown rice), 50% of flowering of the plant, total maturity days, and many other parameters were recorded. These parameters provided morphological, agronomic characteristics as well as physiological characteristics of landraces.

## RESULTS AND DISCUSSION

Some common land races of rice cultivated by the tribal and rural community of farmers of Bankura district in near past are given table – (I). Out of the landraces of rice enlisted agronomic study were performed on- Dharnagra, Suakalma, Vutmuri, Tulsibhog, Sitalal, Gobindabhog, Rupsal, Kalamkati, Neta, Nagrasal, Danarguri, Chandrakanta, Daharlagra, Badsahabhog, Raghusal etc. Germination result and other agronomic, morphological and physiological parameters are represented in table- (II). Germination of seed took place from 3 days to 7 days, depending upon different landraces. Sitalal variety germinated in 3 days, Chandrakanta, Vutmuri, Nagrasal, Dharansal, Neta, Suakalma germinated in 4 days. Gobindabhog, Daharlagra, Badshabhog, and Raghusal germinated in 5 days. Danarguri, Kalamkati germinated in 6 days, whereas Tulsibhog took 7 days in germination. Height of plant ranges from 100cm to 190 cm. Minimum height 100 cm was recorded for Raghusal variety, whereas maximum height of 190 cm was recorded for Nagrasal variety. Height of Neta, Vutmuri, Danarguri and Daharlagra variety was also less than 150 cm. Height of Dharansal, Suakalma, Tulsibhog, Sitalal, Gobindabhog, Rupsal, Kalamkati, Chandrakanta and Badshabhog variety was 160, 154, 155, 180, 166, 154, 165, 160 and 150 cm respectively.

Length of panicle varied between 22.5 cm to 31.5 cm. The minimum length of panical was reported from Raghusal variety was 22.5 cm and the maximum length was reported from Sitalal variety was 31.5 cm. In Dharansal, Suakalma, Vutmuri, Tulsibhog, Gobindabhog, Rupsal, Kalamkati, Neta, Nagrasal, Danarguri, Chandrakanta, Daharlagra, and Badshabhog variety the length of panical was 24.5, 30.1, 25.3, 29.5, 25.2, 25.1, 23.4, 23.5, 27.5, 30.5, 28.5, 26.5 and 29.5 cm respectively. Seed per panicle was also noted. Minimum seed per panicle was reported from Vutmuri variety was 79 seeds per panicle. Maximum seed per panicle was reported from Tulsibhog was 264 per panicle. In Dharansal, Suakalma, Sitalal, Rupsal, Kalamkati, Neta, Nagrasal, Chandrakanta, Daharlagra, Badshabhog and Raghusal variety seeds per panicle was 148, 126, 179, 115, 150, 114, 146, 165, 176, 196 and 116 respectively. In Danarguri and Gobindabhog variety seed per panicle was 246 and 208 respectively. Weight of 1000 seed was also reported. The minimum and maximum weight was varied from 10.1 gm to 25.3 gm. The minimum weight of 1000 seed was noted from Tulsibhog variety was 10.1 gm and maximum weight was reported from Nagrasal variety was 33.6 gm. In Gobindobhog, Danarguri, Daharlagra, Badshabhog, and Sitalal variety the weight of 1000 grain was also below 20gm, it was 11.1, 11.0, 19.1, 11.6 and 15.9 gm respectively. In Dharansal, Suakalma, Vutmuri, Rupsal, Kalamkati, Neta, Chandrakanta, and Raghusal variety the weight of 1000 seeds was 22.4, 25.3, 20.4, 22.7, 22.6, 20.5, 23.0, 24.5 gm respectively.

Length of leaf and dimension of flag leaf was also noted. Dimension of flag leaf ranging from 99 sq cm to 206 sq cm. The lower dimension reported from Danarguri variety was 99 sq cm and maximum dimension of leaf was noted from Dharansal variety was 206 sq cm. In Suakalma, Vutmuri, Tulsibhog, Sitalal, Gobindabhog, Rupsal, Kalamkati, Neta and Nagrasal variety the dimension was 144, 137, 123, 128, 112, 167, 162, 139, 196 sq cm respectively. In Chandrakanta, Daharlagra, Badshabhog and Raghusal variety the dimension of leaf was 174, 149, 125, and 145sq cm respectively. Grain length and grain width was also investigated, maximum grain length was noted from Suakalma

Table 2: Morphological and physiological characteristics of 15 investigated landraces of rice of Bankura District

Name of Landraces	Weight of 1000 grains (g m)	Germination time (days)	Height of Plant (cm)	Length of leaf (cm)	Dimension of Flag Leaf (sq cm)	50% of flowering (in days)	Length of panicle (cm)	Seeds / Panicle	Lemma & Palea colour	Grain Length (mm)	Grain Width (mm)	Maturity (days)	Decorative grain colour
DHARANSAL	22.4	4	160	58	206	94	24.5	148	Straw	8.4	2.5	120	White
SUAKALMA	25.3	4	154	67	144	95	30.1	126	Straw	9.6	2.6	134	White
VUTMURI	20.4	4	135	23	137	49	25.3	79	Black	7.2	2.4	92	Light brown
TULSIBHOG	10.1	7	155	71.5	123	93	29.5	264	Purple black	6.2	2.2	133	White
SITASAL	15.9	3	180	67	128	94	31.5	179	Reddish to light purple	8.8	2.4	135	White
GOBINDABHOG	11.1	5	166	68.5	112	94	25.2	208	Gold furrows on straw	5.8	2.2	135	White
RUPPAL	22.7	4	154	67	167	93	25.1	115	Gold furrows on straw	9.2	2.6	129	White
KALAMKATI	22.6	6	165	66.5	162	92	23.4	150	Straw	9.3	2.5	128	White
NETA	20.5	4	147	44	139	78	23.5	114	Gold furrows on straw	8.2	2.8	110	Red
NAGRASAL	33.6	4	190	64.5	196	95	27.5	146	Gold furrows on straw	8.6	3.0	139	Light Brown
DANARGURI	11.0	6	140	63	99	94	30.5	246	Straw	6.6	2.2	142	White
CHANDRAKANTA	23.0	4	160	74.5	174	95	28.5	165	Gold furrows on straw	8.6	2.6	134	Light red
DAHRLAGRA	19.1	5	118	50	149	56	26.5	176	Straw	8.9	2.0	96	White
BADSHABHOG	11.6	5	150	59.5	125	94	29.5	196	Gold furrows on straw	6.2	2.2	129	White
RAGHUSAL	24.5	5	100	45	145	94	22.5	116	Straw	8.4	2.4	128	White

BADAM SARU	CHOTODIDI	JAMAY NADU	KHEUCH	NIKUNJA
BADSHABHOG	DAHARLAGRA	JHARA(SADA)	LAL TIPA/PANATI	NONA BOGRA
BASHKATI	DANARGURI	JHARA/URI	LANGAL MURA	NUGEM(BARO)
BASKAMANI	DANGA PATNAI	KAKUA	LIKE KAKUA	PATNAI-23
BHADOI	DHARANSAL	KALAMKATI	MALABATI	RAGHUSAL
BHURI	DUDH KALAM	KALMA/SUPER BUMPER	MALSIRA	RUPSAL
BHURISAL	DUDHESWAR	KALO DHOPA	MARICH SAL	SINDURMUKHI
BHUTMURI	FUL PAGRI	KALO KUMRO	MASURI	SITA
BIRAH	FULKHAR	KALO NUNEA	MEDI	SITASAL
BOMBAL MUGI	GANGAJALI	KALOBAYAR	MIHIDANA	SUAKALMA
BYAMAJHUPI	GHEUS	KANAKCHUR	MUKTA	TAL MUGUR DHAN
CHANDRAKANTA	GOBINDABHOG	KATARIBHOG	NAGRASAL	TULSIBHOG
CHINAKAMINI	JAL DHEPA	KHAJURCHARI	NETA	VALKI/BUNDI

variety was 9.6mm and minimum length was noted from Gobindabhog variety was 5.8 mm. Maximum grain width was noted from Nagrasal variety was 3.0 mm and minimum width was noted from Daharlagra variety was 2.0 mm. Total maturity days was also noted, minimum maturity was noted from Vutmuri variety was 92 days and maximum duration was noted from Nagrasal variety was 139 days. Lemma and palea colour and decorticated grain colour of different variety was also noted.

Deb (1995,1996,2001&2) has studied various local varieties prevalent in West Bengal and stressed upon need of their conservation. Agnihotri (2001) has also studied ecophysiology of local rice varieties of Kumaun district. Singh

and Singh (1997) have studied local varieties of aromatic rice. The present study adds a new dimension confining itself to West Bengal. Importance these varieties are immense keeping their gene pool in mind. In present era when much stress is being laid on conservation of land races, we cannot afford to loose landraces of rice varieties. Another important issue is sustainable agriculture in present situation where climate change is adversely affecting agricultural productivity. Beyond any doubt, local varieties which have sustained in particular climatic condition since thousands of years back are better suited as compared to HYVs. So, proper solution of climate change vis-a-vis agriculture is in conserving land races of rice.

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