



E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(6): 1161-1163
Received: 01-09-2017
Accepted: 02-10-2017

Banashri Lodh
Department of Agronomy,
College of Agriculture,
Odisha University of Agriculture
& Technology, Bhubaneswar,
Odisha, India

Surya Sharma
Department of Agronomy,
College of Agriculture,
Odisha University of Agriculture
& Technology, Bhubaneswar,
Odisha, India

Shrikant Chitale
Department of Agronomy,
College of Agriculture,
Odisha University of Agriculture
& Technology, Bhubaneswar,
Odisha, India

Studies on cooking qualities and organoleptic properties of indigenous scented rice (*Oryza sativa L.*) varieties grown under organic management practices

Banashri Lodh, Surya Sharma and Shrikant Chitale

Abstract

An experiment was conducted at Raipur (C.G.) during *kharif* season of 2015 to assess the response of traditional scented rice cultivars under organic farming. The experiment was laid out in Randomized Block Design (RBD) with three replications. The treatments composed of fifteen (15) indigenous scented rice varieties namely Badshahbhog, Gopalbhog, Vishnubhog, Bisni, Shyamajeera, Karigilas, Kubrimohar, Dubraj, Indira Sugandhit dhan, Gangabaru, Sugandhamati, Lalu 14, Dujai, Lohandi and CR Sugandha dhan-907. Varieties were grown in complete organic environment with supplement of nutrients dose @80:60:30 kg N:P₂O₅:K₂O kg ha⁻¹ provided through cowdung manure, crop residue compost and vermicompost (1/3 part each). Dujai found to be best performing traditional variety in terms of grain yield of 37.22 q/ha and higher net return (Rs. 41989 /ha) over rest of the varieties. In terms of grain as well as kernel length and breadth ratio sugandhamati was found superior than rest of the varieties. Gopalbhog showed highest milling percentage (82.1%). Eleven varieties were considered in the category of strongly scented group. Elongation ratio was higher in Shyamajeera (1.91). However volume expansion ratio was found highest for Indira Sugandhit dhan (3.9). Highest amylose % was observed in Shyamajeera (23.8%). In terms of gel consistency most of the rice varieties fell in the category having soft kernel.

Keywords: Cooking quality, Traditional scented rice, Organic farming

Introduction

Chhattisgarh is rich and well known for its diversity of rice. The wild relatives, cultivated types, aromatic and non-aromatic rice have very vast diversity present throughout the state. Aromatic rice constitutes a small and special group of rices that regarded as best in quality and usually used in preparation of special dishes.

In different pockets of the state number of indigenous scented varieties have been recorded such as Vishnubhog (Pendra), Shyamajeera (Surajpur), Badshahbhog (Jagdalpur), Gangabaru (Sukma), Dubraj (Sihava-Nagari) etc. Introduction of high yielding varieties with excess doses of fertilizer has undoubtedly satisfied the food demand of the nation but in other hand we witnessed a gradual loss in the qualities of these aromatic varieties. Deteriorating qualities along with low yield potential were supposed to be the major causes for their extinction. Having lost the race to high-yielding varieties after the green revolution, a number of indigenous varieties of rice are now making a comeback due to their aroma, taste, low input cost and resilience to climate change. "More and more consumers are asking for the folk varieties these days as the taste is better. And when we grow it with complete organic inputs its desirability gets enhanced by manifolds. Therefore it is necessary to increase the productivity of scented rice without losing the quality since due to low yielding ability these are less preferred by the farmers. Hence, there is a need to catalogue, characterize and conserve the non-basmati traditional aromatic rice landraces.

Materials and Methods

The experiment was conducted during *kharif* season of 2015 at Research cum Instructional farm, I.G.K.V., Raipur (C.G.). The crop growth period received around 881 mm total rainfall. The soil of the experimental site was 'Alfisols' with neutral pH, low in nitrogen (212 kg/ha), medium in phosphorous (17.52 kg/ha) and high in available potassium contents (315 kg/ha). The experiment was laid out in Randomized Block Design with three replications. The treatments composed of fifteen (15) traditional scented rice varieties. Varieties were supplied with 80:60:30 kg N:P₂O₅:K₂O kg ha⁻¹ provided through cowdung manure, crop residue compost and vermicompost (1/3 from each).

Correspondence
Banashri Lodh
Department of Agronomy,
College of Agriculture,
Odisha University of Agriculture
& Technology, Bhubaneswar,
Odisha, India

Results and Discussion

Cooking Quality

The cooking quality preferences vary in different countries (Azeez and Shafi, 1966) [1]. The desired properties may vary from one ethnic group or geographical region to another and may vary from country to country (Juliano *et al.*, 1972) [5].

Aroma

Aroma in rice is the foremost desirable character influenced by genetic makeup of the parents. This trait has a high demand in the global market. Among all the varieties eleven varieties were categorized under highly scented group and the rest (only four) varieties were included under mildly scented group.

Elongation ratio

Elongation ratio is one of the appreciable quality of scented rice and demanded in the market. Among the fifteen varieties the elongation ratio varies between (1.25 to 1.91). Shyamajeera gave the highest elongation ratio (1.91) but no significant difference was witnessed as compare to the varieties such as Badshahbhog (1.9), Gopalbhog (1.87), Vishnubhog (1.81), Bisni (1.79) and Dubraj (1.87).

Volume expansion ratio

Volume expansion ratio ranged from 2.87 to 3.90 among the rice varieties and the maximum value was recorded for the variety Indira Sugandhit dhan (3.9) followed by Shyamajeera (3.82) which were comparable. The lowest value of volume expansion was recorded in case of Lohandi (2.87).

Gelatinization temperature

Gelatinization temperature of rice as measured in terms of Alkali Spreading Value (ASV) ranged from 3.0 to 7.0. Cooking time of the rice depends on coarseness of the grain. The intermediate ASV indicated the medium disintegration and classified as intermediate GT which highly desirable for quality grain (Bansal *et al.*, 2006) [2]. Indira Sugandhit Dhan and Sugandhamati gave the highest alkali spreading value (7.00) which was found to be significantly superior over rest of the varieties except Dubraj (6.1) and Vishnubhog (5.9).

Classification	Alkali Spreading Value (ASV)	Gelatinization temperature (GT)
1-2	Low	High >74 °C
3	Low, intermediate	High, intermediate
4-5	Intermediate	I Intermediate (70 °C – 74 °C)
6-7	High	Low (55 °C – 69 °C)

Cooking quality of traditional aromatic scented rice

Varieties	Elongation ratio	Alkali spreading value	Amylose content (%)	Volume expansion ratio	Aroma class
Badshahbhog	1.90	5.3	18.93	3.40	Strong
Gopalbhog	1.87	5.5	18.27	3.30	Strong
Vishnubhog	1.81	5.9	17.29	3.42	Strong
Bisni	1.79	3.8	20.82	3.32	Mild
Shyamajeera	1.91	4.1	23.81	3.82	Strong
Karigilas	1.30	3.0	17.15	3.50	Strong
Kubrimohar	1.40	3.1	16.59	3.20	Mild
Dubraj	1.87	6.1	17.83	3.20	Mild
Indira sugandhit dhan	1.30	7.0	22.80	3.90	Strong
Gangabaru	1.40	5.2	19.64	3.00	Strong
Sugandhamati	1.56	7.0	16.43	3.20	Strong
Lalu 14	1.40	4.0	15.66	3.20	Strong
Dujai	1.55	4.1	17.90	3.40	Strong
Lohandi	1.25	3.0	18.30	2.87	Mild
CR Sugandha dhan-907	1.6	5.1	22.12	3.8	Strong
SEm ±	0.04	0.39	0.49	0.17	
CD (P=0.05)	0.13	1.15	1.46	0.51	

Gel consistency

The gel consistency (GC) was measured into soft, medium and hard. All the scented rice varieties were tested for their gel consistency character and it was the GC of the rice samples ranged from 65-70 mm and categorized as soft, this means the tendency of cooked rice to be soft on cooling. Observed that most of the varieties found under soft category class which indicates that are soft in quality.

varieties highest % of amylose was recorded for the variety Shyamajeera (23.81%) followed by 22.8% in Indira Sugandhit dhan.

Organoleptic analysis

The organoleptic-test was conducted for the appearance, cohesiveness, tenderness on touching, tenderness on chewing, taste, aroma, elongation and overall acceptability of cooked rice and evaluated by trained assessors using the above descriptive analysis in a control panels. Sensory specifications are those that can be used to check if a product complies with the stated requirements Costell 2002 [3]. The excellent overall acceptability characters were recorded in Gopalbhog, Badshahbhog, Vishnubhog, Bisni, Shyamjee, Kubrimohar, Dubraj, Gangabaru, Sugandhamati, Dujai, and CR Sugandha dhan-907.

References

1. Azeez MA, Shafi M. 'Quality in Rice'. Technical Bulletin No. 13. Department of Agriculture, West Pakistan,

Scale	Gel length	Gel consistency type
1	81 – 100mm	Soft
2	61 - 80 mm	Soft
3	41 – 60 mm	Intermediate
4	36 – 40 mm	Hard

Amylose content (%)

Rice varieties are grouped on the basis of their amylose content. As per amylose content described by Kumar and Khush (1986), out of 15 varieties, 10 varieties under low (10 - 19%), 5 varieties under intermediate (20-25%) and no varieties were found under high (>25%) group. Among the

- Government of West Pakistan. 1966, 50.
- 2. Bansal UK, Kaur H, Saini RG. Donors for quality characteristics in aromatic rice. *Oryza*, 2006; 43(3):197-202.
 - 3. Costell E. A comparison of sensory methods in quality control. *Food Quality and Preference*. 2002; 13(6):341-353.
 - 4. Dwivedi DK. Response of scented rice (*Oryza sativa*) genotypes to nitrogen under mid-upland situation. *Indian Journal of Agronomy* 1997; 42(1):74-76.
 - 5. Juliano BO. Physicochemical properties of starch and protein in relation to grain quality and nutrition value of rice'. In: Rice Breeding. IRRI, Manila, Philippines. 1972, 389-404.
 - 6. Kumar I, Khush GS. Gene dosage effect of amylose content in rice endosperm. *Japanese J. Genet.* 1996; 61:559-568.
 - 7. Lakra A. Identification and characterization of rice varieties suitable for organic farming. M.Sc Thesis 2012, IGKV, Raipur, 2012.
 - 8. Pandey D. Physiological parameters and productivity of scented rice influenced by different organic and chemical nutrient packages. *International Journal of Tropical Agriculture* © Serials Publications, 2011. ISSN: 0254-8755
 - 9. Prakash YS, Bhaduria PBS, Amitava R. Relative efficiency of organic manure in improving milling and cooking quality of rice. *IRRN*.27 (1): 43-44. properties of some fine rice varieties. *Pak. J Nutr.* 2002; 1(4):188-190.