

## Short communication

# Evaluation of aromatic rice varieties in Wayanad, Kerala

Susamma P. George\*, Dijee Bastian, N.V. Radhakrishnan and K.C. Aipe

Regional Agricultural Research Station, Ambalavayal 673593, Wayanad, Kerala

Received 28 January 2002; received in revised form 13 April 2005; accepted 11 May 2005

## Abstract

Three field experiments in randomized complete block design were conducted at Ambalavayal during 1996 to 1998 *kharif* to evaluate the performance of 12 aromatic rice varieties/cultivars. Pooled analysis of the yield data indicates that 'Pusa Basmati-1' had the highest grain yield of 2777 kg ha<sup>-1</sup>. But it was statistically at par with that of 'Jeerakasala' (2743 kg ha<sup>-1</sup>) and IET-12606 (2610 kg ha<sup>-1</sup>), implying the suitability of these three varieties for cultivation in Wayanad district. Regarding grain quality attributes, both 'Pusa Basmati-1' and IET-12606 are long-slender 'scented' varieties, whereas 'Jeerakasala' is a short-bold 'lightly scented' type.

**Keywords:** High ranges, basmati, scented rice

Aromatic rices (*Oryza sativa* L.) such as 'Jeeragamba', 'Rascadam' and 'Basmati' are known for their characteristic fragrance when cooked. They also fetch a premium price in the local and regional markets (often 3 to 4 times more than the ordinary rice varieties), besides having considerable export potential. Although a promising foreign exchange earner (Singh et al., 1997), the cultivation of aromatic rice has been largely restricted to the states of Uttar Pradesh, Punjab and Haryana. In Kerala, despite the agroclimatic conditions of Wayanad being generally favourable for aromatic rice production, only limited cultivation of fine white rice like 'Gandhakasala' and 'Jeerakasala' are currently undertaken. Furthermore, only limited studies have been conducted on aromatic rice cultivation in Wayanad. The present study was undertaken with the objective of evaluating the performance of 12 promising aromatic rice varieties for Wayanad district.

Field experiments were conducted at Ambalavayal for three consecutive *kharif* seasons from 1996 to 1998. The experiments were laid out in randomized complete block design with three replications and having 12

varieties viz., 'Basmati-370', 'Pusa Basmati-1', 'Kasturi', JJ-92, IET-10650, 'Jeerakasala', 'Gandhakasala', IET-12606, IET-13552, IET-13553, IET-13554, IET-13158. The plot size was 20 m<sup>2</sup> and the seedlings were transplanted at a spacing of 20 x 10 cm with a fertilizer schedule of 75:37.5: 37.5 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O ha<sup>-1</sup>. Observations on yield and biometric characters were recorded. Aroma was estimated on milled samples in a cooking test as per the standard evaluation system of rice (IRRI, 1988). Other quality parameters were evaluated (single replicate basis) following standard procedures at the rice quality laboratory of the Directorate of Rice Research, Rajendra-nagar, Hyderabad.

A comparison of the data presented in Table 1 suggests that aromatic rice varieties showed considerable variations in growth and yield characters ( $p < 0.05$ ). 'Pusa Basmati-1', 'Jeerakasala' and IET-12606 were the three top yielders. The yield potential of these varieties can be explained based on the higher number of effective tillers ('Pusa Basmati-1'), increased panicle length ('Jeerakasala') and/or higher number of grains per panicle ('Jeerakasala' and IET-12606). Moreover,

\*Author for correspondence: Phone +91 493 626 0421; Fax 91 493 626 0421

‘Jeerakasala’ is already popular with the farmers of Wayanad, as a *kharif* season cultivar. Coincidentally, it recorded the highest straw yield of 4385 kg ha<sup>-1</sup>, but was statistically at par with ‘Gandhakasala’ (4038 kg ha<sup>-1</sup>; Table 1).

Duration of the 12 varieties ranged from 147 to 190 days under Wayanad conditions (Table 2). ‘Pusa Basmati-1’ (150 days) and JJ-92 (147 days) are early varieties.

Whereas the traditional aromatic rice varieties of Wayanad viz., ‘Jeerakasala’ and ‘Gandhakasala’ are of relatively longer durations (190 days). As regards to quality attributes, ‘Pusa Basmati-1’ belonged to the long-slender category. Other varieties in this group included: ‘Basmati-370’, JJ-92, IET-10650, IET-12606, IET-13552, IET-13554 and IET-13158. In addition, ‘Pusa Basmati-1’, IET-12606 and IET-13158, fall under the ‘scented’ category while all others are only ‘lightly

Table 1. Biometric and yield characteristics of aromatic rice varieties (pooled data for the *kharif* seasons of 1996-98)

Varieties	Plant height (cm)	Effective tillers	Panicle length (cm)	Grains/panicle	Grain yield (kg ha <sup>-1</sup> )	Straw yield (kg ha <sup>-1</sup> )	Duration (days)
‘Basmati-370’	103.9 <sup>b</sup>	7.9 <sup>bcd</sup>	22.9 <sup>b</sup>	81.5 <sup>bcd</sup>	1796 <sup>g</sup>	2943 <sup>bc</sup>	161
‘Pusa Basmati-1’	74.2 <sup>de</sup>	9.1 <sup>a</sup>	21.3 <sup>b</sup>	67.2 <sup>c</sup>	2777 <sup>a</sup>	2226 <sup>def</sup>	150
‘Kasturi’	87.8 <sup>bcd</sup>	7.7 <sup>bcd</sup>	22.9 <sup>b</sup>	85.2 <sup>b</sup>	2330 <sup>de</sup>	2641 <sup>bcd</sup>	165
JJ-92	74.5 <sup>de</sup>	8.4 <sup>abc</sup>	21.4 <sup>b</sup>	71.9 <sup>cde</sup>	2501 <sup>bc</sup>	2188 <sup>ef</sup>	147
IET-10650	74.1 <sup>de</sup>	8.8 <sup>ab</sup>	21.8 <sup>b</sup>	70.9 <sup>de</sup>	2373 <sup>cd</sup>	1622 <sup>f</sup>	163
‘Jeerakasala’	135.9 <sup>a</sup>	7.6 <sup>cd</sup>	27.1 <sup>a</sup>	110.0 <sup>a</sup>	2743 <sup>a</sup>	4385 <sup>a</sup>	190
‘Gandhakasala’	151.9 <sup>a</sup>	6.8 <sup>d</sup>	28.4 <sup>a</sup>	104.8 <sup>a</sup>	2179 <sup>ef</sup>	4038 <sup>a</sup>	190
IET-12606	82.8 <sup>cde</sup>	7.5 <sup>cd</sup>	22.5 <sup>b</sup>	83.4 <sup>bc</sup>	2610 <sup>ab</sup>	3298 <sup>b</sup>	165
IET-13552	82.2 <sup>cde</sup>	7.8 <sup>bcd</sup>	22.6 <sup>b</sup>	83.5 <sup>bc</sup>	2400 <sup>cd</sup>	2339 <sup>cde</sup>	165
IET-13553	90.6 <sup>bcd</sup>	7.6 <sup>cd</sup>	23.6 <sup>b</sup>	80.1 <sup>bcd</sup>	2408 <sup>cd</sup>	2792 <sup>bcd</sup>	165
IET-13554	96.7 <sup>bc</sup>	7.2 <sup>d</sup>	23.7 <sup>b</sup>	83.6 <sup>bc</sup>	2265 <sup>def</sup>	2943 <sup>bc</sup>	165
IET-13158	71.7 <sup>e</sup>	8.5 <sup>abc</sup>	21.5 <sup>b</sup>	62.8 <sup>c</sup>	2116 <sup>f</sup>	1660 <sup>f</sup>	165
F test	**	**	**	**	**	**	

Means with the same superscripts do not differ significantly; \*\* significant at 1% probability level

Table 2. Quality characteristics of 12 aromatic rice varieties

Varieties	Milling %	Head rice recovery %	Kernel length (mm)	Kernel breadth (mm)	L/B ratio	Grain Type <sup>1</sup>	Aroma <sup>2</sup>
‘Basmati-370’	68	58	6.34	1.92	3.30	LS	2
‘Pusa Basmati-1’	68	48	6.67	1.78	3.74	LS	2
‘Kasturi’	71	63	5.93	1.83	3.24	SS	1
JJ-92	68	55	6.87	1.84	3.73	LS	1
IET-10650	70	55	6.30	1.72	3.66	LS	1
‘Jeerakasala’	71	61	4.74	2.16	2.19	SB	1
‘Gandhakasala’	72	59	4.07	2.25	1.80	SB	1
IET-12606	70	60	6.60	1.93	3.42	LS	2
IET-13552	70	61	6.36	1.84	3.45	LS	1
IET-13553	69	33	5.90	1.81	3.26	SS	1
IET-13554	69	58	6.97	1.85	3.76	LS	1
IET-13158	68	52	6.46	1.67	3.86	LS	2

L/B: length/breadth; <sup>1</sup>LS – long slender, SS – short slender, SB – short bold; <sup>2</sup>Code 1=lightly scented, 2=scented (as per IRRI, 1988)

scented'. The fine grain, pleasant aroma, soft texture and extra elongation with least breadth-wise swelling on cooking endow 'basmati' rice a special place in the domestic and international markets (Siddiq, 1990). Arumugachami et al. (1992) also reported a general superiority of 'Pusa Basmati-1' under Tamil Nadu conditions.

In summary, medium duration scented varieties such as 'Pusa Basmati-1' and IET-12606, besides the traditional cultivar—'Jeerakasala', hold promise for *kharif* cultivation in Wayanad. There is already a large untapped potential for aromatic rice production in this region, and the present findings will, in all probability, help the farmers of Wayanad to increase aromatic rice

coverage, with concomitant improvements in productivity.

## References

- Arumugachami, S., Vairavan, S., Vivekanandan, P. and Palanisami, S. 1992. Aromatic and quality rice improvement in Tamil Nadu India. IRRN, 17: 11.
- IRRI 1988. *Standard Evaluation System for Rice*. 3<sup>rd</sup> Edn. *International Rice Testing Programme*. Los Banos, Laguna, Philippines, pp 43.
- Siddiq, E.A. 1990. Export prospects for Indian 'Basmati' rice. *Indian Fmg.*, 40: 45-47.
- Singh, V.P., Khush, G.S. and Dela Cruz, N. 1997. Variability and quality indices in aromatic rice germplasm. IRRN, 22: 22.