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TRADITIONAL AROMATIC VARIETIES OF LATERITIC REGION OF WEST BENGAL- AGROMORPHIC CHARACTERIZATION AND YIELD ATTRIBUTE STUDY IN COMPARISON WITH SHORT GRAIN LEADING RICE VARIETIES

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Abstract: **Rice diversity of West Bengal is getting depleted day by day due to cultivation of elite rice varieties into the farmers field. West Bengal is a homeland of thousands of traditional varieties in recent past. Unfortunately most of the traditional varieties are vanished from the agricultural field and this place was occupied by the high yielding varieties. Aromatic varieties of rice are considered as best in quality of rice, are also decreasing vary fast. Farmers are not giving interest on cultivation of aromatic varieties only for their lower yield in comparison to the elite varieties. Present investigation shows the present status of aromatic varieties of West Bengal and their yield performance. It was observed that some aromatic varieties like Danarguri, Badhasbhg, Gobindabhog were capable to give high yield as elite varieties and these varieties have high market value and demand.**

Keywords *– Aromatic variety, lateritic region, West Bengal, elite variety, yield potentiality.*

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I INTRODUCTION

Aromatic rice varieties are an important group of rice (mostly *Oryza sativa*indica) which are considered as best in quality due to presence of fine aroma both in cooked and uncooked conditions. Most of the aromatic rice varieties had been evolved due to natural selection and it is very difficult to develope high yielding aromatic varieties through hybridization process because of its highly volatile aromatic properties. The aroma of a scented rice is depends upon the level of 2-acetyl-1-pyrroline (2AP) and it is somehow popcorn or pandan (*Pandanus amaryllifolius*) like fragrance. After the introduction of elite varieties of rice into the farmers field aromatic varieties of rice are simultaneously getting depleted very fast as discussed by Sinha and Mishra [1] [2] [3]. But now a day the situation is changing, marginal farmers giving importance to the cultivation of traditional aromatic varieties once again due to its increasing market value and some scented varieties also possess high yield in comparison to the elite varieties as reported by Sinha and Mishra [4] [5]. Various workers currently working in the conservation and importance of traditional scented varieties in India. Sadhukhan& Chattopadhyay [6] had worked on grain characters and yield attribute of aromatic rice varieties; Bisne&Sarawgi [7] worked on aromatic rice of Badshabhog group; Parikh *et al* [8] studied 71 aromatic traditional rice varieties of tribal community of Madhya Pradesh and Chhattisgarh, India. Sarangi [9] hade reported 46 traditional rice varieties of Dubraj group; Chaudhary &Motiramani [10], Krishanmurthy*et al* [11] worked on variability present among the 54 and 67 aromatic rice varieties respectively, etc. Mishra &Verma [12], Hasib*et al* [13], Kole*et al* [14] worked on yield attribute study of aromatic traditional rice varieties and pointed out that some of the aromatic varieties are capable to give same production in comparison to the elite lines of aromatic varieties. The main aim of the present investigation is to study the current status of traditional varieties of lateritic region of West Bengal and yield potentiality of the traditional aromatic rice cultivars in

comparison with the other short grain elite varieties which are widely cultivated in major part of the agricultural land of West Bengal.

II MATERIALS AND METHOD

Extensive study was conducted to the various districts of lateritic region of West Bengal for the collection of aromatic rice varieties. There are 15 different aromatic traditional rice varieties were collected from the different agricultural pockets of this region during kharif season of 2016. The In-Situ cultivation of collected landraces of traditional rice varieties was conducted at the test farm of ARSW Society (an indigenous farmers group) situated at village of Ranbahal (22˚38´N latitude and 86˚36´E-87º47˙E longitude with an altitude of 78 meters above sea level).Aromatic short grain elite rice cultivars collected from Rice research station, Bankura, West Bengal, and 21 such varieties were collected for the comparison of yield study with traditional aromatic varieties. The soil reaction of study field gives a slightly acidic pH of 5.2, with low soluble salts (EC of 0.0.06dS m-1), medium organic carbon content (0.49%), Total N (0.051%), medium in available P (45 kg ha-1) and K (210 kg ha-1).

The materials were grown using completely randomized block design with three replications. Each variety was transplanted (45 day's old seedling) in a plot of $6m^2$ with a spacing of 20cm. between rows and 15cm. between plants in a row [Fig 1.]. A random sample of five competitive plants ware used for observations on different grain characters under study. Various morphological characters of grains was taken as per the guideline of DUS test, reported by Shobarani [15].

Figure 1. Cultivation of traditional and elite rice varieties in in field condition (Vegetative stage).

III RESULTS AND DISCUSSION

Different quantitative morphological (Plant height), physiological (50% flowering) and agronomic (Panicles/plant, Yield (Kg. /ha) characters of traditional aromatic varieties has been studied and are given at Table 1. and various quantitative morphological (Plant height), physiological (50% flowering) and agronomic (Panicles/plant, Yield (Kg./ha) characters of elite varieties has been given at Table 2. Highest plant height has been recorded in traditional variety Radhatilak (146 cm) followed by Tulsibhogvariety (145 cm)and lowest plant height has been recorded in traditional variety Badshabhog (91 cm) followed by Gandhasala (93 cm); Highest plant height has been recorded inelite variety KJT-4-4-36-12-13-29 (146 cm)and lowest plant height has been recorded inelite variety CR 2615-1 (92cm).

Highest day for 50% flowering was observed on traditional variety Jeerakasala (144 days) followed by Danarguri(123 days) and lowest duration was observed in Radhatilak variety (82 days) and in case of elite variety highest day for 50% flowering observed on NDR-6242 variety (122 days) and lowest duration was followed in two varieties i.e. CR 2615-1 and RNR 2465 (115 days).

In agronomic characters, highest Panicle/sq.m has been recorded on two elite varieties namely RNR 2465-1 and NDR-6235 (390 panicles /sq.M both) and lowest data has been recorded on elite variety CR 2613-1-1-1-5-1 (only 195panicles/sq.M.). Highest number of panicle/plant was observed on Radhatilak variety (28) and lowest data was observed on Lal badshabhog variety (13).

Yield performance study of elite aromatic varieties shows that highest yield was recorded on elite variety IET 21055 (2480kg/ha) and lowest yield was observed on elite variety NDR-8428-1-2 (1150 Kg/ha). Yield performance study of traditional varieties clearly indicate that, traditional variety Danarguri gave maximum yield (2455 Kg/ha) and lowest yield was observed on Lalbadshabhog variety. Yield attribute study was clearly indicate that some the traditional rice varieties are capable to give good yield in comparison to the elite varieties and this varieties possess huge possibilities in agricultural market due to their good market value.

Table No 1. Agronomic and yield performance of traditional aromatic rice varieties lateritic region of West Bengal.

Sl. no	Designation	Days to 50% flowering	Panicle/ plant	Plant Height/cm	Yield (kg/ha)
1.	Jeerakasala	144	15	128	1400
2.	Gandhasala	120	17	93	950
3.	Gobindhbhog	117	18	125	1680
4.	Tulsibhog	118	15	145	560
5.	Radhatilak	82	28	146	1350
6.	Joha	122	14	128	675
7.	Sughandha	114	15	124	630
8.	Lal badshabhog	117	13	123	524
9.	Paramananda	122	14	120	670
10.	Narendra Lalmoti	118	21	119	1120
11.	Kanakchur	120	16	120	743
12.	Kalojira	116	17	143	760
13.	Badshabhog	122	19	91	1650
14.	Kalonunia	118	18	102	1120
15.	Danagguri	123	14	142	2455

Exp. Mean= 1692. C.D. (0.05)= 450, C.V. (%)= 12.9

Table No 2. Agronomic and yield performance of elite short grain aromatic rice varieties.

Sr. No	Designation	Days to 50% flowering	Panicle/sq.M	Plant Height	Yield (kg/ha)
1.	CR 2626-3-3-3-1	117	337	125	1680
2.	RNR 2465-1	115	390	114	1710
3.	KJT-4-4-36-12-13-29	118	384	146	1700
4.	JGL-15281	122	323	128	1500
5.	JGL-15336	114	290	124	1340
6.	NDR-6235	117	390	123	2350
7.	NDR-6242	122	365	120	2350
8.	NDR-8018	120	324	120	1970
9.	NDR-9542	116	376	143	2150
10.	NDR-8428-1-2	118	247	109	1150
11.	NDR-9539	116	387	117	2480
12.	HUR-SG-GR-32-875	117	297	141	1680
13.	HUR-ASG-KN-235	120	271	105	1630
14.	CR 2300	119	270	140	1580
15.	CR 2603	121	357	115	2450
16.	CR 2613-1-1-1-5-1	117	195	108	1270
17.	CR2615-1	115	211	92	1470
18.	CR 2613-1-5-2-5-1	119	207	132	1480

Exp. Mean= 1692. C.D. (0.05)= 450, C.V. (%)= 12.9

IV CONCLUSION

Farmers are discontinuing cultivation of traditional rice varieties because of their low yield. But present investigation clearly indicated that some of traditional rice varieties are still have potentiality to give higher yield in comparison with the elite varieties. Elite rice cultivars needs higher input for the requisite yield output. On the other hand traditional rice varieties needs lower input in comparison with the improved varieties. So traditional rice cultivars may be better choice for the marginal farmers for sustainable agriculture. Another important factor is yield sustainability, as the traditional varieties are evolved through the natural

selection these varieties are capable to withstand various environmental stress; thus farmers may able to get certain amount of yield even in aberrant climatic condition where elite varieties are fail to perform their best.

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