



## 'Remanika': A short duration rice for Kuttanad, Kerala

R. Devika\*, N. Rema Bai and S. Leena Kumary

Rice Research Station, Moncompu, Thekkkara P.O., Alappuzha 688503, Kerala

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### Abstract

A traditional rice variety (MO 1) and three popular high yielding varieties of Kuttanad (MO 4, MO 5 and MO 6) were subjected to varying doses of gamma irradiation (10, 20 and 30 KR) in 1984 to induce mutagenesis. Our objective was to evolve mutants with high yield potential and quality, besides possessing better plant type; and selections were made accordingly. In particular, the advanced cultures were evaluated for yield, after the M<sub>6</sub> generation. Culture M 20-19-4 (a mutant of MO 1, IET 13980) was found to be promising and it was released as 'Remanika' (MO 15) in 1998.

**Key words:** high yielding, induced mutation, plant type

### Introduction

Use of exotic dwarfing genes in the rice improvement programmes although increased the yield potential of the new varieties, concomitantly resulted in susceptibility of these varieties to pests, diseases and other abiotic stresses (Kawai and Sato, 1965). Furthermore, many of the dwarf varieties show a tendency to become semi-tall in Kuttanad and lodge, causing difficulty in harvesting and consequent yield losses. Induced mutation is widely accepted as a breeding strategy for changing the plant type and quality attributes (Yoshida, 1962). Hence, a study was undertaken at the Rice Research Station, Moncompu in 1984 to evolve rice varieties with good plant type, higher yield potential and tolerance to pests, diseases and other stresses.

### Materials and methods

The materials consisted of varieties released from Moncompu viz., MO 1, MO 4, MO 5 and MO 6. These varieties were subjected to varying doses of gamma irradiation i.e., 10, 20 and 30 KR and the progenies were evaluated. Initial evaluation trial (IET) was conducted for two seasons (*khari*f 87 and *rabi* 88) with 30 cultures and two check varieties. Based on the performance in

IET, 22 cultures were carried forward to the preliminary yield trials (PYT). PYT was conducted for two seasons during 1988-89 (*khari*f 88 and *rabi* 89) with four check varieties. From PYT, 12 cultures were selected for comparative yield trial (CYT), which was conducted for three seasons during 1989-90 (*khari*f 89, *rabi* 90 and *khari*f 90) with three check varieties in randomized block design with three replications (plot size : 20 m<sup>2</sup>). Four cultures found to be superior were further advanced to the multi-locational trial (MLT) with 'Jyothy' as the check variety. This was conducted in five cultivators' fields during *rabi* 92 and in four cultivators' fields during *khari*f 92 at various locations in Kuttanad. In addition, this trial was repeated at the Rice Research Station, Moncompu for four seasons in randomized block design. Pest and disease incidence was scored based on the Standard Evaluation System for rice (IRRI, 1980). Farm trials were conducted in Kottayam and Alappuzha districts (four locations each) during *rabi* 96 with the check variety 'Jyothy'. Furthermore, the culture M 20-19-4 was included in the initial variety trial (irrigated mid-early; IVT-IME) of the Directorate of Rice Research for *khari*f 93 and it was tried at 17 locations along with 64 entries including the check varieties 'Retna' and 'Vikas' (DRR, 1993).

\*Author for correspondence: Phone 91-477-2702245; E-mail : riceresearch@sancharnet.in

Table 1. Grain yield of mutant cultures in IET, PYT and CYT

<sup>1</sup> Culture/variety	<sup>2</sup> IET	<sup>3</sup> PYT (kg ha <sup>-1</sup> )	<sup>4</sup> CYT
M 10-4-1	4861	4558	3938
M 10-5-3	4639	3808	-
M 10-8-1	5056	4858	3928
M 10-8-2	4639	4975	3844
M 10-10-1	5222	4692	3544
M 10-10-2	4833	-	-
M 10-12-3	4111	4500	4044
M 10-16-2	3917	4025	3311
M 10-16-3	3778	3442	-
M 20-1-1	4194	-	-
M 20-1-3	4056	3942	-
M 20-1-4	3972	-	-
M 20-2-3	4139	3475	-
M 20-3-1	4861	4692	4294
M 20-4-1	3778	4892	-
M 20-6-1	4417	-	3994
M 20-6-4	4111	4392	-
M 20-8-1	4417	4525	-
M 20-8-2	4694	3250	-
M 20-10-1	3944	-	-
M 20-13-3	3639	-	-
M 20-14-4	3611	-	-
M 20-16-2	4694	3892	-
M 20-18-1	4583	4225	-
M 20-18-2	4444	3833	-
M 20-19-1	5222	4083	3572
M 20-19-2	4361	-	-
M 20-19-4	5139	4975	4183
M 10-2-2	4167	4750	3906
M 20-1-1	5778	5250	4033
MO 1	2750	3583	3544
MO 5 ('Asha')	4472	4083	4006
MO 6 ('Pavizham')	-	3750	-
(Pavizham)	-	3600	3650
'Jyothy'	-	3600	3650
CD (0.05)	314	NS	420

<sup>1</sup>Parentage: All cultures/varieties except M 10-2-2, M 20-1-1, MO 1, MO 5, MO 6 and 'Jyothy' are mutants of MO 1; MO 10-2-2 is a mutant of MO 5 and MO 20-1-1—a mutant of MO 6'; MO 1 is a pure-line selection from 'Chettivirippu', MO 5 is derived from IR11/'Kochuvithu', MO 6 from IR8/'Karivennel' and 'Jyothy' from PTB 10/IR8

<sup>2</sup>IET= initial evaluation trial with 30 cultures and 2 checks (pooled values for *kharif* 87 and *rabi* 88)

<sup>3</sup>PYT= preliminary yield trial with 22 cultures and 4 checks (pooled over *kharif* 88 and *rabi* 89) <sup>4</sup>CYT= Comparative yield trial with 12 cultures and 3 checks (pooled values *kharif* 89, *rabi* 90 and *kharif* 90)



Figure 1. A general view of 'Remanika'

Table 2. Yield data of multi-locational trials at Rice Research Station, Moncompu and in the cultivators' fields

Culture/variety	<sup>1</sup> Moncompu	Cultivators' fields	
		<sup>2</sup> <i>rabi</i> 97	<sup>3</sup> <i>kharif</i> 92
Grain yield (kg ha <sup>-1</sup> )			
M 10-4-1	3997	4353	5463
M 10-8-1	3619	4558	5212
M 20-3-1	3944	4495	5828
M 20-19-4	4425	4805	5559
'Jyothy'	3678	4215	5093
CD (0.05)	NS	370	464

<sup>1</sup>Pooled over four seasons—*kharif* 91 to *rabi* 93

<sup>2</sup>Pooled over five locations

<sup>3</sup>Pooled over four locations

Table 3. Grain yield data of farm trials in Kottayam and Alappuzha districts during *rabi* '96 and initial variety trial (irrigated mid-early) during *kharif* 1993

Culture/variety	<sup>1</sup> Kottayam district	<sup>1</sup> Alappuzha district	<sup>2</sup> DRR
M 20-19-4	5745	5310	4844
'Jyothy'	3472	4425	na
'Retna'	na	na	4042
'Vikas'	na	na	4303

<sup>1</sup>Mean of four locations

<sup>2</sup>Pooled over 17 locations with 65 entries in initial variety trial (irrigated mid-early) under the All India Coordinated Rice Improvement Project (source: DRR, 1993)

na : not available

Table 4. Pest and disease tolerance and plant characters

Culture/variety	Plant height (cm)	Days to 50% flowering	Productive tillers per hill (no.)	Gall midge (% silver shoot)	Stem borer (% WEH)	Brown plant hopper		
						(score: 0 to 9 scale)		
M 20-19-4	90.7	75	7.0	3.15	10.5	1.5	0.9	2.3
MO 5	89.6	95	6.0	3.2	10.8	1.6	3.0	2.7
TN 1	75.2	80	5.8	5.0	35.0	5.0	5.0	7.0

WEH= white earhead

## Results and discussion

The yield data of IET, PYT and CYT are presented in Table 1. In all these trials, M 20-19-4 (a mutant of MO 1) was found to be promising. Pooled analyses of the MLTs in the cultivators' fields showed that culture M 20-19-4 was significantly superior to the check variety 'Jyothy' (Table 2). In the farm trials also, it emerged as the first in yield (Table 3). Moreover, in the IVT-IME of All India co-ordinated trials (DRR, 1993), it was ranked fifth in mean yield when tried at 17 locations. The mean score of the culture against pests and diseases at Rice Research Station, Moncompu and the expression of plant characters are given in Table 4. Overall, M 20-19-4 is a short duration (100 to 105 days) high yielding, dwarf variety (90.7 cm) with tolerance to pests and diseases. In particular, it is tolerant to brown plant hopper, sheath blight and sheath rot. It has medium bold, red

kernelled grains, which is preferred by the local consumers, and possesses good cooking quality. Its milling recovery is 76.5%. M 20-19-4 is suitable for cultivation for all the three seasons of Kerala. Considering these attributes, the State Seed Subcommittee released this culture as 'Remanika' (MO 15) in 1998.

## References

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