

## Rice genetic resources indigenous to Bay Islands - a profile

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Accepted 17th September 2001

### ABSTRACT

To pursue collection and cataloguing of rice germplasm indigenous to Bay Islands, recurrent exploratory surveys were made in south, middle and north Andamans, during the rice growing season. Bay Island is a union territory of India, located 1200 km east of mainland India in Bay of Bengal. The unique species *Oryza indandamanica* Ellis available only in Bay Islands has been profiled in detail. The germplasms collected were analysed in respect of agro-botanical traits and stress tolerance profile. Grain quality parameters were analysed to assess consumer acceptance. C14-8 was found to be the most adapted cultivar and it could be used to breed lines for areas with low input management. Similarly Red Burma and Ranchi dhan emerged as drought tolerant sources and Khusbaya, Black and White Jeera rice are useful for breeding scented rice. For nutritional quality improvement, Red and Black Burma provide ample scope.

**Key words:** Rice, Andaman and Nicobar Islands, wild species, indigenous cultivars

### INTRODUCTION

Andaman and Nicobar Islands represent one of the richest repositories of plant biodiversity in south and south-east Asia. However, the agro-biodiversity, which occupies a unique place within the overall ambit of biodiversity, is extremely limited in this union territory. Agriculture in these islands is barely 140 years old. In true sense the varieties, which we designate as local, are the cultivars introduced from elsewhere. They are truly the adapted genotypes, which have endured many years' of selection pressure in these wet humid tropical islands. Majority of the alien intruders have been wiped out due to monoculture, habitat degradation or shifting of land use pattern that is a fact gleaned from folk knowledge of farmers. A few cultivars could sustain and perpetuate. Many have become farmers' hot favourite as they grow virtually under zero management, which is a desired trait in these islands with labor scarcity.

Wild species are extremely limited in these islands except for the discovery of a new species, *Oryza indandamanica* Ellis in the recent past from Rutland, which was further located in Saddle peak area of Diglipur, North Andamans. If it has originated independently, then occurrence of the same species simultaneously in north and south Andamans, which are approximately 500 km apart, cannot be explained with the present state of knowledge. Most of the alien varieties have been introduced either from Bangladesh or Myanmar by the refugee settlers. However, introduction from the other parts of the country and elsewhere cannot be

ruled out as these islands hosted diverse people including British, Dutch and Japanese colonials. Christian missionaries and tourists from many countries.

Indigenous cultivars often harbour many unique genes governing important agro-botanical traits. Such reservoirs have played seminal role in modulation of crop genetic architecture carrying batteries of desirable genes for improved crop productivity *en route* recombination breeding. Furthermore, local cultivars possess better adaptability to specific agro-niches and impart genetic plasticity, which they acquire due to their origin and domestication. Thus blending the adaptability with high yield trait is now a conceivable concept in modern crop breeding by exploiting trans-accessible inter-varietal gene pools. The need for survey, inventorization collection, evaluation, safe documentation and conservation of natural PGR in agricultural crops was felt since long time back before it is eroded for ever. This may form the mainstay of agriculture and associated economic growth of these islands as well as the country as a whole. In the study we attempt to describe rice genetic resources of Bay Islands.

### MATERIALS AND METHODS

Through exploratory survey during rice growing season of 1999 and 2000, across south, middle and north Andamans (11°41' and 13°42' North latitude; 92°14' and 94°16' East longitude) 12 unique rice genotypes were collected. One cultivar, namely, C14-8 was found to be grown extensively in about

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60% of rice growing area in these wet humid tropics. This cultivar is popular among farmers because of its ability to produce subsistence yield under zero management. Remaining lines/cultivars are being cultivated sporadically. Majority of the cultivars possess broad-spectrum tolerance to prevailing biotic and abiotic stresses, perhaps, due to their long sustenance under the inclement agro-ecological condition since human settlement in these remote islands. In the present article information about samples collected from farmers' field in respect of major agro-botanical traits inclusive of field tolerance to major disease and insect pests is profiled in brief.

The collected germplasms were grown in cement pots filled with garden soil, sand and farm yard manure in 1:1:1 ratio in the farm of Central Agricultural Research Institute, Port Blair (Lat. 11°41'13.04"; Long. 92°43'30.16"E). The experiment was set up in a completely randomized

block design and replicated three times. The agromorphological characters were recorded (Table 1) following Anon. (1987) and analysed statistically following Panse and Shukatme (1995). Two varieties namely IR 13851-6-6-3-3-2 and IR 18350-229-3 from IRRI, were employed as check varieties for the experiment. Biochemical characterization of the grains (Table 2) was performed following Anon. (1988) with a view to assess the grain quality and from the standpoint of consumer acceptance. Stress tolerance of the cultivars was profiled (Table 3) in respect of bacterial leaf blight, sheath blight, bacterial leaf spot, sheath rot, *helminthosporium* leaf spot, blast, stem borer, gundhi bug, leaf folder, salinity, drought, P deficiency, Fe and Al toxicities by following Anon. (1988). It is well known that traditional tropical rice varieties have excellent cooking and eating qualities but give low grain yields (Khush and Juliano 1985). Many of the lines showed prospect for genetic improvement especially for

Table 1. Agronomic performances of cultivated rice germplasm indigenous to Bay Islands

Cultivar	Days to 50% flowering	Durati on (d)	Plant height (cm)	No. of panicles/plant	Panicle length (cm)	Panicle weight (g)	Test weight (g)	No. of grains/panicle	Grain weight/panicle (g)	Grain yield/plant (g)	Harvest index (%)	Grain yield (ton/ha)
C14-8	150	180	190.00	12.00	29.80	2.58	33.0	160.0	1.85	20.40	29.60	2.2
Khusbaya	95	125	117.63	4.88	22.06	2.40	30.0	70.2	2.28	11.05	32.14	2.5
Black Burma	150	180	111.50	4.71	21.93	3.68	29.0	102.8	3.46	16.00	26.90	2.1
Red Burma	110	145	121.25	8.75	24.50	4.66	33.0	117.4	4.30	28.17	41.32	1.5
White Burma	140	170	114.17	10.29	26.33	3.94	23.0	137.6	3.66	25.88	39.28	2.4
Gol Burma	120	150	69.14	6.00	15.93	3.96	24.0	135.0	3.78	27.14	45.12	2.8
Ameta	100	135	106.43	7.57	23.51	2.80	23.0	96.0	2.62	13.75	40.74	1.8
Kho-chi	95	135	96.43	9.57	21.63	1.86	20.0	103.6	1.66	15.20	37.81	1.9
Mushley	140	170	98.00	5.88	22.44	2.50	21.0	190.8	2.34	8.60	36.44	2.5
Jeera Black	105	135	127.63	7.0	23.56	2.14	13.0	125.2	1.94	6.85	32.27	1.1
Jeera White	105	135	106.75	12.00	22.25	2.98	12.6	100.0	2.80	22.60	28.21	1.2
Ranchi Dhan	80	115	99.78	10.50	22.85	3.06	16.0	185.6	2.84	26.48	49.06	1.7
IR 13851-6-6-3-3-2*	80	110	113.13	5.80	24.90	3.12	18.0	102.6	1.47	17.62	42.86	3.3
IR 18350-229-3*	80	110	111.53	6.33	24.87	3.10	17.5	100.2	1.23	19.39	43.00	4.6
S Ed	3.478	4.036	2.069	0.350	0.230	0.132	1.300	12.618	0.095	0.290	5.308	0.092
CD at 5%	7.124	8.267	4.239	0.716	0.472	0.270	2.663	25.847	0.194	0.595	10.873	0.189

\* - Check varieties. S Ed - Standard error Difference. CD- Critical Difference

Table 2. Grain quality parameters of cultivated rice germplasm indigenous to Bay Islands

Cultivar	Endosperm type	Endosperm chalkiness		Elongation on cooking across length (%)	Volume expansion on cooking (times)	Alkali digestion (ALKD)	Gelatinization temp.	Scent (SCT)	Gel consistency (GELC)
		Translucence	Chalkiness						
C14-8	1	T	WB (1)	53.33	5.50	5. I	1	0	5. M
Khusbaya	1	T	WB (9)	25.93	2.89	6. H	L	2	3. S
Black Burma	2	O	Nil	6.67	2.22	6. H	L	0	3. S
Red Burma	2	O	WC (2)	42.86	2.00	6. H	L	0	1. S
White Burma	2	O	Nil	40.00	2.50	6. H	L	0	3. S
Gol Burma	2	O	WC (1)	55.56	5.00	7. H	L	0	1. S
Ameta	1	T	WC	16.13	2.10	3. I	I	0	5. M
Kho-chi	2	O	WC (9)	66.67	2.75	6. H	L	0	3. S
Mushley	1	T	WB (5)	57.14	2.40	2. L	H	0	7. H
Jeera Black	1	T	WC (5)	55.56	7.00	2. L	H	2	3. S
Jeera White	1	T	Nil	44.44	2.77	2. L	H	1	9. H
Ranchi Dhan	1	O	WC (1)	38.46	4.61	7. H	L	0	1. S
IR 13851-6-6-3-3-2*	1	T	Nil	55.00	4.15	3. I	I	0	3. S
IR 18350-229-3*	1	T	Nil	56.00	4.46	7. H	L	0	7. H

T - Translucent, O - Opaque, WB - White belly, WC - White center, WB - White back, H - High, I - Intermediate, L - Low, Hd - Hard, M - Medium, S - Soft. \* -check varieties (Data scored following SES, IRTP, IRRI 1998; figures within parentheses indicate actual scale)

Table 3. Biotic and abiotic stress tolerance profiles of cultivated rice germplasm indigenous to Bay Island

Cultivar	Stress															
	Biotic stress										Abiotic stress					
	BLB	ShB	BLS	Sh. Rot	Hel	Leaf blast	Neck blast	Stem borer	Gundi bug	Leaf folder	Salinity	Drought	P deficiency	Fe toxicity	Al toxicity	Lodging
C14-8	2	4	3	1	2	3	2	3	7	6	4	2	6	2	3	9
Khusbaya	3	2	3	1	6	5	3	2	3	2	3	6	7	6	5	6
Black Burma	3	1	1	1	1	1	1	2	1	1	3	4	5	4	2	7
Red Burma	2	6	4	3	2	2	2	2	2	1	4	4	3	6	6	9
White Burma	2	3	1	1	1	2	7	6	3	1	4	3	3	2	4	5
Gol Burma	3	6	3	2	5	4	3	3	3	1	7	2	3	5	6	2
Ameta	2	4	2	2	2	4	3	4	2	2	3	5	6	2	2	7
Kho-chi	2	5	4	4	2	2	2	2	2	1	4	5	6	5	5	7
Mushley	2	2	1	1	2	2	2	2	3	1	5	6	5	4	5	7
Jeera Black	2	2	2	2	2	4	4	5	3	3	4	5	5	3	6	8
Jeera White	1	2	1	2	2	4	4	6	2	3	4	5	5	3	6	8
Ranchi Dhan	6	3	5	4	1	5	6	2	2	4	6	2	2	3	3	8
IR 13851-6-6-6-3-3-2*	3	6	3	3	3	3	3	6	5	4	6	6	5	5	5	3
IR 18350-229-3*	3	5	3	2	2	4	4	2	5	4	6	6	5	5	5	3

BLB - Bacterial leaf blight, ShB - Sheath blight, BLS - Bacterial leaf spot, Sh. Rot - Sheath Rot, Hel - *Helminthosporium* leaf spot. \* - check varieties (Data scored in 1-9 scale followin SES, IRTIP, IRRRI 1988)

increased biotic and abiotic stress tolerance and grain quality. Twelve different lines/cultivars of *Oryza sativa* collected so far are described along with one indigenous wild species *Oryza indandamanica* Ellis.

#### A. *Oryza indandamanica* Ellis. sp. Nov.

A new species discovered from Rutland of south Andaman (Ellis 1985). It was also simultaneously reported from the Saddle peak of north Andaman. It is a perennial herb of 45 cm height, bearing profuse tillers and it usually grows in places amidst rocky slopes exposed to bright sunshine. It is normally found in sparse population or in complete isolation. The plants are characterized with broad glabrous leaf blades bearing comparatively small ligules. Absence of awn and un-branched inflorescence are unique characters. The culms are heavily polished having wax like coating to prevent moisture loss from the stem surface. Root system is of adventitious nature and is found to be distributed in the soil in diffused form. They are densely fibrous and have abundant xylem strands (7-8), which are deemed to provide considerable drought resistance. The flag leaf area is 2.27 cm<sup>2</sup>. The inflorescence or panicle is about 5 cm long, terminal, unbranched or rarely branched at the base. Spikes bear about 10-12 spikelets. The spikelet sterility is about 25%. The whole grains are straw coloured but remain blue green at immature stage. The length of grain is 5 mm and breadth is 2 mm with L:B ratio of 2.5. The species possesses resistance to bacterial leaf blight and blast.

**Prospects:** Since this wild species possess drought resistant characters like abundant xylem strands and leaf rolling in response to moisture stress, which may

be used in breeding programmes aimed at imparting drought tolerance to high yielding varieties.

#### B. *Oryza sativa* L.

##### 1. C 14-8

It is locally known as Aat Number Dhan and assumed to have been introduced from Myanmar by the convicts in the neonatal stage of agricultural development into these islands more than hundred years back. It is a very tall (190 cm), profusely tillering (16) and extremely long duration (180 days) crop taking almost 150 days to flower. It is stringently photosensitive, highly lodging susceptible traditional cultivar. The flag leaf area is 69.23 cm<sup>2</sup>. The plants possess open tillers with very long and weak internodes. However, plants bear long panicles (29.8 cm) with a spikelet sterility of 14.0%. The number of grains per panicle is around 153 and the test weight of grains is 33 g. The grains are bold with straw yellow coloured husk. The grain length is 8.6 mm while the breadth is 3.6 mm with L:B ratio of 2.39. The dehusked rice is of creamy white colour with L:B ratio of 2.0. The plant bears poor harvest index of 29.6% owing to its excessive vegetative growth. It produces 2-2.4 tons of brown rice per hectare and found to be well adapted across south, middle and north Andamans. The variety is grown under zero management, which is the major reason for being preferred by the local farmers. High amounts of straw recovered from repeated lopping is used as cattle fodder.

**Prospects:** The cultivar can be used as a donor to impart wide adaptability to HYV background as well as to breed lines for low input agriculture.

## 2. Khusbaya

Locally known as Khusbaya, a tall (140 cm) traditional *indica* variety largely grown in Mayabunder area of north Andaman. The variety flowers after 95 days and matures within 125 days. The variety has moderately weak and greenish white stem without any pigmentation. The flag leaf area is 59.80 cm<sup>2</sup>. Each plant possesses large number of tillers (11.0) with an average of 6.67 panicles indicating abundance of nonproductive tillers. Panicles are small (23.87 cm) with spikelet sterility of 12.47%. The test weight is 23.5 g. Average yield is around 2.5 tons/ha. The grains are medium bold with straw yellow coloured husk. The grain length is 8.73 mm while the breadth is 3.48 mm with a L:B ratio of 2.51. The dehusked rice is of creamy white colour producing bright white fluffy rice. The variety provides moderately scented fluffy cooked rice.

**Prospects:** Superior quality of the cooked rice makes it useful in breeding programmes aimed at quality improvement.

## 3. Black Burma

Black Burma is a very tall (174.4 cm), traditional, *indica* cultivar grown in middle and south Andamans. The variety flowers after 150 days and matures within another 40 days. The flag leaf area is 38.25 cm<sup>2</sup>. Violet coloured ligules with pink margin are present on leaf base. Each plant possesses low number of tillers (6.8) with an average of 5 panicles indicating moderate productive tillers. Panicles are small (25.9 cm) with spikelet sterility of 25.35%. The test weight is 24.1 g. Average yield is 2.1 tons/ha. The grains are bold, violet coloured with thin yellow stripes. The grain length is 9.70 mm while the breadth is 3.85 mm with L:B ratio of 2.52. The dehusked rice is creamy white in colour with L:B ratio of 2.22. It is specially suited for breakfast dishes and used for lasa, a special preparation of rice in conjunction with milk and coconut by the local people of Burmese origin.

**Prospects:** It may be used in breeding programmes aimed at nutritional quality improvement as well as for increased abiotic stress tolerance with special reference to excess salt and aluminium toxicities.

## 4. Red Burma

Red Burma, an upland rice, is a tall (158.33 cm), traditional, *indica* cultivar grown around Mayabunder, north Andaman. The variety flowers at 110 days and matures within 145 days. The variety possesses violet pigmentation at stem base and

inside the leaf sheath. The flag leaf area is 56.42 cm<sup>2</sup>. Each plant possesses moderate number of tillers (10.00) with an average of 8 panicles indicating abundance of productive tillers. Panicles are medium in length (26.2 cm) with spikelet sterility of 13.47%. The test weight is 31.3g. Average yield is 1.5 tons/ha. The grains are bold with stripped husk with deep-violet colour. The grain length is 9.78 mm while the breadth is 3.83 mm with L:B ratio of 2.53. The dehusked rice is of violet colour with L:B ratio of 2.33. It is also used for lasa preparation.

**Prospects:** The cultivar may be used to breed lines for sticky rice with high amylose content.

## 5. White Burma

Presumably it must have been introduced from Myanmar years' back and it has become adaptive to the humid tropics of Andaman. It is locally known as White Burma, a semi-tall (127.8 cm), traditional, *indica* cultivar grown in north, middle and south Andamans. The variety flowers after 140 days and matures within another 35 days. The flag leaf area is 52.96 cm<sup>2</sup>. Each plant possesses moderate number of tillers (8.2) with an average of 6 panicles indicating moderate number of productive tillers. Panicles are small (24.5 cm) with spikelet sterility of 10.62%. The test weight is 34 g. Average yield is 2.4 tons/ha. The grains are very bold and straw yellow in colour. The grain length is 10.75 mm while the breadth is 3.95 mm with L:B ratio of 2.72. The dehusked rice is of creamy white colour with L:B ratio of 2.5. The cooked rice is preferred as the breakfast dish by the rural folks especially of Burmese origin. They are found to be palatable in conjunction with coconut and milk in steam boiled form.

**Prospects:** It may be used in breeding programme for nutritional improvement and the development of varieties tolerant to bacterial leaf blight and *Helminthosporium* leaf spot.

## 6. Gol Burma

Gol Burma, an upland rice, is a semi-tall (90.33 cm), traditional *indica* cultivar grown in Rampur area of Mayabunder, north Andaman. The variety flowers after 120 days and matures within 150 days. The variety possesses sturdy stem with no pigmentation except red apiculus of the spikelet. The flag leaf area is 38.3 cm<sup>2</sup>. Each plant possesses low number of tillers (6.00) but with an average of 5.33 panicles indicating abundance of productive tillers. Small cigar type panicle with round shaped grains is the distinctive feature of this cultivar. The spikelet sterility is 49.3% and the test weight is about 13.0 g.

Average yield is 2.8 tons/ha. The grains are medium bold with straw yellow coloured husk. The grain length is 7.00 mm while the breadth is 4.17 mm with L:B ratio of 1.68. The dehusked rice is whitish green with L:B ratio of 1.29. It shows leaf rolling in response to moisture stress, which is a unique character of drought tolerant varieties.

**Prospects:** The cultivar may be used as donor in breeding rice with enhanced drought tolerance and good plant type for upland conditions.

#### 7. Ameta

Ameta is a tall (168 cm), traditional, *indica* cultivar grown around Mayabunder, north Andaman. The variety flowers after 100 days and matures within 135 days. The flag leaf area is 65.0 cm<sup>2</sup>. The variety possesses moderately weak stem with moderate number of tillers (7.00) with an average of 6 panicles indicating abundance of productive tillers. Panicles are small (21.46 cm) with spikelet sterility of 15.8%. The test weight is about 28.7 g. Average yield is around 1.8 tons/ha. The grains are bold, reddish brown with yellow stripes. The grain length is 9.40 mm while the breadth is 3.25 mm with L:B ratio of 2.89. The dehusked rice is creamy white with L:B ratio of 2.58.

**Prospects:** May be used to impart wide adaptability into HYVs for their successful culture in the humid tropics.

#### 8. Kho-chi

Kho-chi is a semi-tall (135 cm), traditional, *indica* cultivar grown around Mayabunder, north Andaman. The variety flowers after 95 days and matures within another 40 days. The flag leaf area is 26.2 cm<sup>2</sup>. Each plant possesses moderate number of tillers (6.00) with an average of 6 panicles indicating abundance of productive tillers. Panicles are small (26.3 cm) with spikelet sterility of 12.08%. The test weight is 28.2 g. Average yield is 1.9 tons/ha. The grains are bold and straw yellow coloured. The grain length is 8.45 mm while the breadth is 3.53 mm with L:B ratio of 2.39. The dehusked rice is of creamy white colour with L:B ratio of 2.0. The variety grows under minimum input management.

**Prospects:** The cultivar may be used to develop varieties with low tiller number and low spikelet sterility, which are desirable yield components.

#### 9. Mushley

Locally known as Mushley, a tall (132 cm), traditional, *indica* cultivar grown around

Mayabunder area of north Andaman and Billyground area of middle Andaman. The variety flowers after 140 days and matures within another 30-35 days. The flag leaf area is 24.3 cm<sup>2</sup>. Each plant possesses moderate number of tillers (6) with an average of 4 panicles indicating low productive tillers. Panicles are small (23.26 cm) and partially covered by the sheath of the flag leaf, with low spikelet sterility of 5.66%. The test weight is 27.1g. Average yield is 2.5 tons/ha. The grains are bold and straw yellow coloured. The grain length is 8.75 mm while the breadth is 3.25 mm with L:B ratio of 2.69. The dehusked rice is of creamy white colour with L:B ratio of 2.33. The cooked rice is preferred by the consumers for its fluffy soft nature and superior taste. Market price is almost double in comparison to modern HYVs and C14-8.

**Prospects:** May be used as donor in breeding programmes aimed at quality improvement and wide adaptability.

#### 10. Black Jeera

Black Jeera is a tall (130 cm), traditional, *indica* cultivar grown in north Andamans. The cultivar flowers after 105 days and matures within 30 days. The flag leaf area is 39.5 cm<sup>2</sup>. Each plant possesses moderate number of tillers (8.33) with an average of 7.33 panicles indicating abundance of productive tillers. Panicles are small (21.33 cm) with spikelet sterility of 22.5%. The test weight is 11.0 g. Average yield is 1.2 tons/ha. The grains are small and slender with straw yellow coloured husk. The grain length is 5.5 mm while the breadth is 2.5 mm with L:B ratio of 2.2. The dehusked rice is creamy white with L:B ratio of 2.0. Small slender grains are preferred among many communities especially from south India. They possess scent, which is an additional attribute.

**Prospects:** May be used in breeding programme aimed at quality improvement of rice grains specially targeted to develop small grain scented varieties.

#### 11. White Jeera

White Jeera is a tall (135 cm), traditional, *indica* cultivar grown in north, middle and south Andamans. The cultivar flowers after 105 days and matures within 30 days. The flag leaf area is 35.93 cm<sup>2</sup>. Each plant possesses moderate number of tillers (8.67) with an average of 7.33 panicles indicating abundance of productive tillers. Panicles are small (23.33 cm) with spikelet sterility of 25.2%. The test weight is 12.6 g. Average yield is 1.2 tons/ha. The

grains are small and slender with straw yellow coloured. The grain length is 6.4 mm while the breadth is 3.0 mm with L:B ratio of 2.13. The dehusked rice is creamy white with L:B ratio of 1.8. Similar to Black Jeera, this variety is also preferred among many communities especially from south India. They also possess moderate scent, which is an additional attribute.

**Prospects:** May be used as donor for quality improvement of grains targeted to develop small grained varieties with moderate scent.

## 12. Ranchi Dhan

It is locally known as Ranchi Dhan, and might have been introduced from Ranchi of Eastern India long back. This is a semi-tall (112 cm), traditional, *indica* cultivar grown around Kollinpur area of south Andaman. The variety flowers after 80 days and matures within 115 days. The flag leaf area is 39.5 cm<sup>2</sup>. Each plant possesses moderate number of tillers (8.3) with an average of 7.2 panicles indicating abundance of productive tillers. Panicles are small (21 cm) with spikelet sterility of 23.3%. The test weight is 27.5g. Average yield is 1.7 tons/ha. The grains are bold, brown with yellow stripes. The grain length is 8.0 mm while the breadth is 3.0 mm with L:B ratio of 2.67. The dehusked rice is brownish-red in colour with L:B ratio of 2.36. Awns measuring about 2 cm are present on the grains.

**Prospects:** It can be used as donor to breed drought tolerant early lines.

## CONCLUSION

In rice breeding a large number of indigenous germplasm including wild varieties have served as reservoirs of many unique genes. They have been exploited in development of modern high yielding varieties, which have revolutionized productivity worldwide. For example a gene for grassy stunt virus resistance from *O nivara* has been transferred to IR 24 (Khush 1997) and genes for resistance to three biotypes of brown plant hopper from *O officianalis* have been transferred into elite breeding line IR 31917-45-3-2 (Jena and Khush 1990). Genes for blast, bacterial blight and brown plant hopper have also been transferred from other wild species such as *O minuta*, *O latifolia*, *O australiensis* and *O brachyantha*. Many rice varieties have been identified which are various gall midge biotypes (Bentur *et al.* 1994) owing to presence of resistant genes (Mohan *et al.* 1997). Pokkali, Nona Bokra, Dasal possess resistance to excess salt; Utri Merah, Utri Rajapan for tungro resistance; W124H for white

backed plant hopper resistance; Rayada 16-06 for nematode resistance; Dular, N 22 for drought tolerance and FR 13A for submergence tolerance are notable examples.

Though the main constraint for genetic improvement has been the complexity of genetic system itself, yet the utilization of genetic variability has paid rich dividends. The improvement in technological qualities of rice has been studied extensively (Beachel 1967, Khush and Juliano 1985; Srinivas and Bhasyam 1994). Searching new sources of genes thus becomes a continuous activity in plant breeding research. The present study provides basic information of rice genetic resources of Bay Islands for the first time. A few more germplasm entries are yet to be characterized which is under progress in the laboratory. It is interesting to note that among these small number of indigenous germplasm, C14-8 was found to be the most adaptive under the wet humid tropics of Andamans, which is being grown in about 60% of rice growing area in spite of massive efforts of government developmental agencies to introduce HYVs in place of C14-8. The ability of this cultivar to produce around 2.5 tones without any modern agronomic practices is of immense importance, especially to breed wide adaptive lines compatible to the growing agro-eco niches with low input management. Furthermore, few cultivars viz. Black Burma, Red Burma, White Burma, Ranchi Dhan, Mushley, Black Jeera and White Jeera were found to possess unique characters like drought resistance, grains with high nutritive value and superior quality cooked rice, which may be of special use in breeding varieties especially for tropical areas in Indian subcontinent as well as elsewhere with agro climatic conditions similar to island ecosystem of Andamans.

## ACKNOWLEDGEMENTS

We sincerely thank Director, Central Agricultural Research Institute, Port Blair for encouragement and necessary facilities to execute this work. We are indebted to the farmers of Diglipur, Mayabunder and Rangat for their invaluable help in collection of rice germplasms and thankful to Ms Anita, Mr. Jiban Das and Mr. Parimal Bala for their assistance in this work.

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