CATALOGUE OF PROMISING RICE LANDRACES FOR HIGH-YIELDING VARIETY DEVELOPMENT

Prepared by

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The ICAR-Central Rice Research Institute (ICAR-CRRI), Cuttack, stands as a premier institution in India dedicated to rice research, conservation, and genetic improvement. The institute plays a pivotal role in safeguarding rice diversity and harnessing genetic variability for the development of high-yielding, climate-resilient, and nutritionally enriched rice varieties, thereby contributing to national food and nutritional security. ICAR-CRRI maintains a well-established gene bank that functions as a National Active Germplasm Site, conserving approximately 50,000 rice accessions. This extensive collection comprises traditional landraces, wild and weedy rice species, breeding lines, mutant stocks, farmers' varieties, and improved cultivars. Systematic characterization and evaluation of these genetic resources enable their effective utilization in rice improvement programmes.

Rice landraces represent invaluable genetic resources, having evolved through generations of natural selection and farmer-led management under diverse agro-ecological conditions. These traditional varieties exhibit high genetic diversity and adaptability, with inherent tolerance to major abiotic stresses such as drought, salinity, submergence, and iron toxicity, along with resistance to important pests and diseases. In addition, many landraces are rich in essential micronutrients, particularly iron and zinc, and are known for their superior grain quality, aroma, and cooking attributes. Beyond their agronomic value, they also embody indigenous knowledge systems and cultural heritage.

Several landraces conserved at the ICAR-CRRI gene bank have been identified as promising donors for stress tolerance and nutritional traits. Notably, Mahipal, Dhusura, Kusuma, Dhabalabhuta, Champa, and Sunapani have demonstrated tolerance to iron toxicity, a major constraint in rainfed lowland ecosystems. Likewise, Gangasuili, Khoda, Kalaputia, Kusuma, and Ravana exhibit strong submergence tolerance, making them highly valuable for breeding programmes targeting flood-prone environments. The effective utilization of these landraces has significantly contributed to the development of improved rice varieties with enhanced resilience and productivity. List of such promising rice landraces conserved at ICAR-CRRI, highlighting their key traits and potential applications in crop improvement programmes are presented.

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PROMISING LANDRACES USED IN DEVELOPMENT OF IMPROVED VARIETIES

Sl. No.	Landrace/ Indigenous variety	Breeding method used	Parentage	Variety developed	Trait
1	Dunghansali	Hybridization	Dunghansali/IR8	Kalinga I  Kalinga II 	• Duration 100-105 days • Long Bold grain • **Suitable for irrigated ecology**
2	Jikkoku & Serup kichel	Hybridization	Jikkoku/Serup kichel	Pallavi 	• Duration 125 days • Medium slender grain • **Suitable for irrigated ecology** • Resistant to bacterial blight disease

3	Belle patna	Hybridization	Belle patna X IR 8	Narendra I 	• Maturity Duration 110days • Long bold grain • **Suitable for irrigated ecology** • Tolerance to bacterial blight
4	Bulk 1	Hybridization	Bulk1/ CR 115	Khitish 	• Maturity duration 120 days • Long slender grain • **Suitable for dry season and irrigated ecology** • Yield 5.5 t/ha
5	Rahaspanjar (Salinity tolerance) 	Hybridization	IR 42/ Rahaspanjar	CR Dhan 301 (Hue) 	• Maturity duration 135 days • Long slender grain • **Suitable for irrigated ecology** • Resistant to gull midge. • Moderate resistant to sheath rot • Yield 4.5-5.5 t/ha

6	Dandi	Hybridization	Dandi/ Naveen// Dandi	CR Dhan 307 (Maudamani) 	• Maturity duration 135 days, • Short bold grain.105 cm tall. • **Suitable for irrigated ecology** • Moderate resistant to blast, neck blast, brown spot, stem borer, leaf folder, green leaf hopper, gull midge 5& 6, WBPH, Hispa and thrips
7	ARC 10075 (High Protein cotent) 	Hybridization	Swarna/ ARC 10075	CR Dhan 331 	• Maturity duration 140 days • short bold grain. • **Suitable for irrigated late ecology** • Tolerant to neck blast and moderately tolerant to bacterial blight, leaf blast and sheath rot and resistant to leaf folder and moderately resistant to stem borer
8	Leaung 152 	Hybridization	Leaung 152 X IR8	Samalei 	• Maturity duration 150 days, • Long slender • **Suitable for shallow low land** • Plant height 130 cm • Yields 4.0-5.0t/ha • Grain with resistant to Gull midge and blast disease

9	NSJ 200	Hybridization	NSJ 200 X Padma	Sattari 	• Maturity duration 70 days, • Short bold grain • Dwarf plant (65-70 cm) • Yield 2.5t/ha • **Suitable for Upland ecology** • Resistant to disease
10	AC 540 (Cold tolerant)	Hybridization	AC 540 X Ratna	Kalinga III (Cold tolerance) 	• Maturity duration 80 days, • Long slender grain • **Suitable for Upland ecology** • Yield 2.75-3.0 t/ha • Cold tolerance • Resistant to brown spot
11	ARC 6650 (Cold tolerance)	Hybridization	ARC 6650/ CR 94-721	Chandrama (Cold tolerant) 	• Maturity duration 130 days • Short bold grain • **Suitable for irrigated/Boro ecology**

12	Waikyaku (Dark green leaves with strong pubescence,deep water rice)	Hybridization	Waikyaku X CR 1014	Utkalprabha (Medium deep- water rice) 	• Maturity duration 155days • Medium slender grain • **Suitable for medium deep ecology** • Field tolerance to major pest and diseases • Yield 4.0 t/ha
13	Urang Urangan (Medium deep-water rice)	Hybridization	T 90/ Urang Urangan	CR 1014 (Medium deep water rice variety) 	• Maturity duration 155days • Medium slender grain • **Suitable for medium deep-water ecology** • Tall plant. Moderate resistant to sheath blight Field tolerance to all other pest and diseases • Yield- 3.5-4.0 t/ha
14	AC 38599(Deep water rice)	Hybridization	Gayatri/ AC 38599	CR Dhan 512 (Semi deep-water rice) 	• Maturity duration 150 days • Short bold grain • **Suitable for semi deep-water ecology** • **Semi deep-water Rice**. It is resistant to whorl maggot and rice thrips while moderately resistant to stem borer (dead heart & white ear head

15	Mahsuri (Deep water tolerance) 	Hybridization	Ravana / Mahsuri	CR Dhan 500 (Deep water rice) 	• Maturity duration 160days • Medium slender grain • **Suitable for deep water ecology** • Moderate resistant to blast, neck blast, brown spot, gull midge 1&5, stem borer • Resistant to leaf folder • Yield 3.5 t/ha
16	PaniKekoa (Deep water rice) 	Hybridization	Panikekoa/ Ambika	Jalamani (CR Dhan 503) (Deep water rice) 	• Maturity duration 160days • Medium slender grain • **Suitable for deep-water ecology** • Moderate resistant to blast, neck blast, leaf folder, green leaf hopper, brown spot, stem borer and gull midge • Yield 4.6 t/ha

17	Jalanidhi (suitable for deep water Coastal condition) 	Hybridization	Samson Polo/ Jalanidhi	Jayantidhan (Deep water rice variety) 	• Maturity duration 160days • Medium slender grain • **Suitable for deep water ecology** • Moderate resistant to blast, neck blast, sheath blight, sheath rot, Rice Tungro Virus and gull midge 1,Resistant to stem borer and leaf folder • Yield 4.6 t/ha
18	Getu (salt tolerant) 		CR Dhan 310/ Getu	CR Dhan 416 (salinity tolerance variety) 	• Moderately resistant neck blast, brown spot, sheath rot, Glume discoloration and rice tungro virus • **Suitable for Coastal saline ecology**

19	Ourmundakan (Salinity tolerance)	Hybridization	Mahsuri / Ourmundakan	Luna Suvarna (Salinity tolerance) 	• Maturity duration 150days • Medium slender grain • Suitable for Coastal saline ecology • Plant height 135 cm. Resistant to blast. Tolerant to stem borer, BPH and leaf folder. • Yield 3.5-4.0t/ha
20	ARC 12422 & ARC 12751	Hybridization	ARC 12422/ ARC 12751	Vanaprabha (Drought tolerance rice) 	• Maturity duration 90 days • Long slender grain • **Suitable for Upland ecology** • Yield 3.0-3.5t/ha
21	Kalakeri (Drought tolerance) 	Hybridization	C 22/ Kalakeri	Vandana (Drought tolerant) 	• Maturity duration 95days. • Long bold grain • **Suitable for upland ecology** • Moderate resistance to blast and brown spot • Yield 3.1 t/ha

22	Way Rarem (Drought tolerant)	Hybridization	IR 55419-04*2/ Way Rarem	Sahbhagidhan (Drought tolerant) 	• Maturity duration 105days • Long bold grain • **Suitable for Rainfed Upland drought prone ecology** • Tolerant to drought • Resistant to leaf blast • Moderate resistant to brown spot, sheath rot, stem borer and leaf folder • Yield 3.5-4.0t/ha • QTL content: QDTY 12.1 and PSTOL 1
23	Brahmananakhi (Drought tolerant) 	Hybridization	Brahmananakhi/ NDR 9930077	CR Dhan206 (Gopinath) (Aerobic rice/Drought tolerant) 	• Aerobic rice • Maturity duration 15 days • Plant height 105 cm • Short bold grain • Moderate resistant to leaf blight, brown spot, sheath rot, stem borer, leaf folder • Yield 3.95 t/ha
24	Aday Sel (Drought tolerant) 	Hybridization	Aday Sel/ IR 64	IR 64 Drt 1(Drought tolerant)	• Maturity duration 120days • Long slender grain • **Suitable for rainfed drought prone ecology** • Drought tolerance • QTL/gene content- qDTY2.2 & qDTY4.1

25	Brown gora (Drought tolerant)	Hybridization	ET 22729 / Brown gora	CRDhan337 (Drought tolerant) 	• Maturity duration 113-118 days • Long slender grain • **Suitable for early transplanted ecology** • Moderately resistant to neck blast, leaf blast, BLB, sheath rot, RTD and grain discolouration; Highly tolerant to leaf folder, stem borer (dead heart) and whorl maggot insect pests
26	Badshabhog (Scented rice) 	Hybridization	Savitri/ Badshabhog	Ketkijoha (Aromatic) 	• Maturity duration 145days • Medium slender grain • **Suitable for shallow low land ecology** • Moderate resistant to Bacterial leaf blight, Sheath blight, Stem borer and gull midge. • Yield 3.5 t/ha

27	Dubraj (Scented rice) 	Hybridization	Dubraj X usa 44	CR Sugandha Dhan 907 (Aromatic rice) 	• Maturity duration 150 days. • Medium slender grain • Suitable for irrigated late ecology • Resistant to neck blast, gull midge and moderate resistant to sheath rot and stem borer • Yield 4.0-4.5 t/ha
28	Podumoni (Aromatic)	Hybridization	Pankaj/ Podumoni	CR Sugandhadhan 909 (Aromatic rice) 	• Maturity duration 140days, • Medium slender grain. • Suitable for irrigated ecology. • Aromatic rice • Moderately tolerant to Leaf blast, Neck Blast, Bacterial Leaf Blight, Brown Spot, Stem Borer, Leaf folder and WBPH and • Grain yield capacity of 5.0 t/ha
29	ARC 10075 (High protein content) 	Hybridization	ARC 10075/ Naveen	CR Dhan 310 (High protein rice) 	• Maturity duration 125 days • Medium slender grain • Suitable for irrigated ecology • High protein rice (10.5%). • Plant height 110 cm • Biofortified variety. • Yield 5.0 t/ha

30	HP-2	Hybridization	HP-2/ Naveen	CR Dhan 311 (Mukul) **Biofortified variety with high Zn** (20ppm). 	• Plant height 115cm, • Suitable for irrigated ecology • Tol- BL, GD, BS, RTD, BLB, MR-GM, SB, • Protein 10.1%, Zn-20ppm • Yield 5.54t/ha • Biofortified variety with high protein (10.1%) and moderately high Zn (20ppm)
31	Dhobanumberi (BPH resistant) 	Hybridiation	Tapaswini / Dhobanumberi	CR Dhan 317 (BPH Resistant variety) 	• Maturity duration 135-140days • Short bold grain • Suitable for irrigated ecology • Resistant to BPH, tolerant to leaf folder, gundhi bug and WBPH
32	ARC 10075 (High Protein content) 	Hybridization	ARC 10075/ Swarna	CR Dhan 411 (Swarnanjali) (High protein rice variety) 	• Maturity duration 140 days • Short bold grain • **Suitable for shallow low land ecology** • **Biofortified 'high protein Swarna'** with 10% protein content • Moderately tolerance to leaf blast, neck blast, brown spot, RTD and BLB, moderately resistant against stem borer.,

33	ARC 10075 (High protein content) 		Swarna / ARC 10075	CR Dhan 315 (High protein and high Zinc) 	• Maturity duration 130days, • Medium slender grain • **Suitable for irrigated ecology** • **Biofortified variety with high zinc (25 ppm)** • Moderately tolerant to leaf blast, neck blast and brown spot, resistant to leaf folder and moderately resistant to stem borer
34	Pokkali 	Double Haploid technology	Savitri/ Pokkali	CR Dhan 215 (Indumati; IET29446)	• **Aerobic rice** • High Fe (14.1ppm), Moderate Protein (9.23%) Moderate Zn (21.5ppm), moderate GI (56.18); • MR to leaf blast & BPH neck blast, sheath rot and grain decolouration • Resistant to leaf folder, gall midge

35	Kalajeera (Scented rice) 	Pureline selection	Pureline selection from landrace Kalajeera	Nua Kalajeera (Aromatic rice) 	• Maturity duration 150days • Short bold grain • Aromatic with Black husk • **Suitable for shallow low land ecology** • Photosensitive resistant to yellow stem borer. Moderate resistant to Blast, Sheath rot • Yield 2.8t/ha
36	Dhusara (Scented rice) 	Pureline selection	Pureline selection from landrace Dhusara	Nua Dhusara (Aromatic) 	• Maturity duration 150 days, • Medium slender grain. **Aromatic rice.** • **Suitable for shallow low land ecology** • Resistant to neck blast, sheath rot, Rice Tungro Virus. Moderate resistant to gull midge. Photosensitive • Yield 3.0 t/ha

37	Chinikamini (Scented rice) 	Pureline selection	Pureline selection from landrace Chinikamini	Nua Chinikamini (Aromatic) 	• Maturity duration 145-150 days • Short bold grain • Aromatic Suitable for shallow low land ecology • Yield 3.5t/ha
38	Nonasail (Salinity tolerance) 	Mutation	Gamma irradiated mutant of Nonasail	Lunishree (Saliniy tolerance) 	• Maturity duration 145days, • Long slender grain • **Suitable for Coastal saline ecology** • Field tolerance. to major pests and diseases • **Tolerance. to salinity** • Yield 4.75 t/ha
39	Basmati 370 (Scented rice)	Mutation	Mutation of Basmati 370 (Scented rice: Jammu)	Geetanjali (Aromatic rice) 	• Maturity duration 130 days, • Long slender grain, • **Suitable for irrigated ecology** • semi-dwarf variety, • Resistant neck blast, moderate resistant to gull midge • Yield 4.5 t/ha

40	FR13A (Submergence tolerance)	Hybridiation	Swarna X FR13A	Swarna Sub-1 (Submergence tolerance)	• Maturity duration 143 days, • Short bold grain, • **Suitable for irrigated ecology** • Semi-dwarf variety, • Tolerant to complete submergence for two weeks due to incorporation of Sub-1 gene • Yield 5.0-5.5 t/ha

Future Study efforts should focus on using modern genomic tools and marker-assisted breeding to leverage these valuable genetic resources to develop climate-resilient, high-yielding, and nutritionally enriched rice varieties, ensuring sustainable agriculture and long-term food security.

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