

LANDRACES OF RICE (*ORYZA SATIVA* L.) IN BIHAR

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The paper highlights the richness of genetic diversity in landraces in Bihar. Progress of work done on exploration, collection, maintenance, evaluation, utilization, seed supply and storage of rice landraces in the state and their current status have been presented.

Key words : Landrace, *Oryza*, diversity, ecosystem, genotype

Bihar is the reservoir of landraces of rice with rich genetic diversity. The landraces are spread all over the state, having three geo-morphological cum agro-climatic regions namely (i) North Bihar Gangetic Plain (ii) Central Bihar Gangetic Plain and (iii) Chotanagpur Plateau (Verma and Saran, 1974) (Fig. 1). Each of the regions has specific macro and micro environments with high level of variability and presence of genes for adaptation to different situations.

Systematic approach in respect of collection, evaluation and cataloging of germplasm from various rice ecosystems of Bihar would help substantially in the rice improvement programme of the state and the country.

MATERIALS AND METHODS

During 1920's and 1930's 250 genotypes were collected from North Bihar and 5000 collections from all over Bihar and Orissa. In recent past 2000 landraces were collected from the plains that included 1250 from North Bihar and 750 from Central Bihar. More than 1000 collections were made from Chotanagpur.

During 80's and early 90's NBPGR undertook explorations in Chotanagpur and parts of north-east Bihar and collected 452 landraces (Chandel *et al.*, 1989, Gupta and Tomar, 1994).

Maintenance and evaluation has remained an important activity of the rice germplasm. Duplicates were discarded. Samples were maintained and

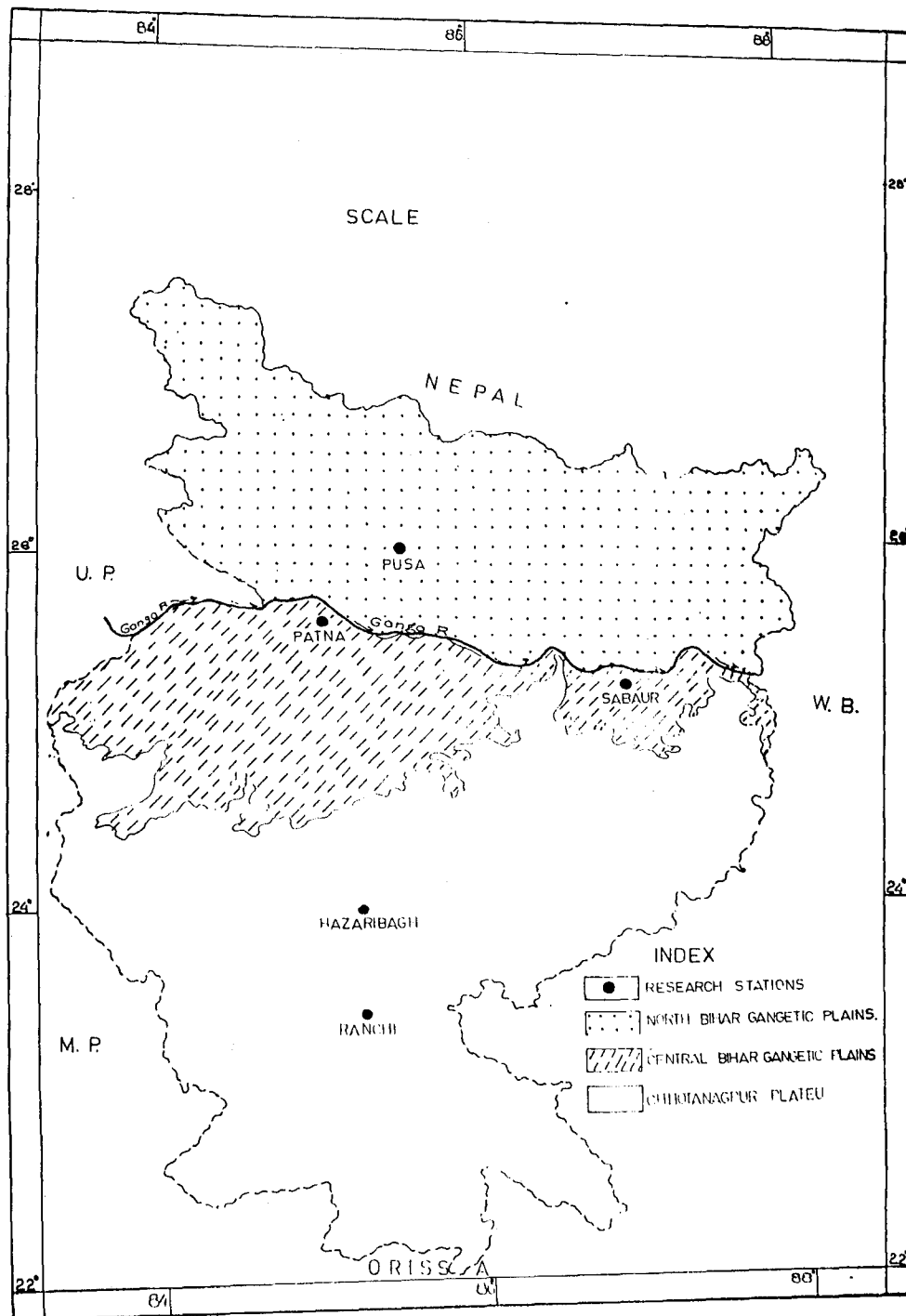


Fig. 1. Geomorphological divisions of Bihar and the research centres associated with the rice germplasm conservation

evaluated for their qualitative and quantitative characters and the accessions from Bihar were designated using prefixes BK, Br and RAU.

RESULTS AND DISCUSSION

The important landraces have been presented in Table 1 for central Bihar plains, and Table 2 for north Bihar plains.

Table 1. Important landraces of central Bihar Gangetic plains

District	Landrace	Area of adaptability	Important characteristic
1	2	3	4
1. Patna	Laljori, Basmati 3, Rajmahali, Karibank-2, Dhura, Laldaiya, Mahin dhan, Sagarbhog, Lalka Bawag, Baranti, Baitarni, Sahdeyia, Gajpati	Rainfed medium lands/ lowlands	Tall, photoperiod sensitive, late duration.
2. Bhojpur	Sirhanti, Backoia, Jhulan, kalamdan, Mohan katiki, Basmati, Jhulanwa Gajmukta, Laldaiya, Kapsa, Karibank, Mohan, Bakoria, Moti, Pandey, Bir Bahadur, Bangla Katika, Kanakjeera, Ghilanwa, Badshahbhog, Sonachur, Ramoal.	Rainfed medium land/lowlands	Tall, photosensitive, late duration, Sonachur, Karibank, Basmati, Badshah bhog and Kanakjeera are aromatic rice with fine grain.
	Kamani, Sairha	Rainfed upland or medium lands.	Early maturing tall, photoperiod insensitive.
3. Rohtas	Lalkatika, Ghorbahra, Mohan katika, Madanwa, Korangi, Katarni, Awaria, Katika, Sahdaiya, Sahanhkatika.	Rainfed medium lowland	Tall, photoperiod sensitive, late duration.
	Kuari, Sairha and Ashbharan	Rainfed upland/ medium land.	Early maturing tall photoperiod insensitive.
	Sonachur, Shyamjeera, Basmati-3, Shahpasand.	Rainfed medium/ lowland.	Tall, late duration, fine grained, aromatic.

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1	2	3	4
4. Gaya	Kalamdan, Bajratwa, Olwa, Kanehonehur, basmati.	Rainfed medium/lowland.	Tall, late duration, photoperiod sensitive. Kanehonehur and Basmati are aromatic with fine grain.
5. Aurangabad.	Batasi, Keshoria, Silhat, Shyamjeera, Poreya, Olawa, Dukh harni	Rainfed medium/lowland.	Tall, late maturing photoperiod sensitive. Shyamjeera is fine grained aromatic.
6. Bhagalpur.	Kesore, Dahia, Kalamdan, Delongi, Tulsimanjari, Badshah bhog, katarni bhog.	Rainfed medium lowland.	Tall, photoperiod sensitive, late duration. Tulsimanjari, Katarnibhog are fine grained scented varieties.
7. Munger	Dolongi, Kalamda, Karibank, Tulsimanjari, Badshah bhog, Shyamjira, Kesore, Dahia.	Rainfed medium/lowland	Tall, Photoperiod sensitive, Tulsimanjari, Shyamjira, Karibank are fine grained aromatic.

Bihar has four mega rice growing environments namely (i) rainfed upland (ii) rainfed medium land, (iii) rainfed lowland and (iv) deepwater land. There is a lot of variability within each situations at macro and micro levels. The landraces of these environments possess genetic variability in respect of forms, quality characters and adaptation. However, the landraces belonging to rainfed lowlands/medium lands are spread all over Bihar; deepwater rices are confined to north Bihar while rices of rainfed uplands are concentrated in Chotanagpur plateau (Fig. 2).

Major part of rice cultivated area (70-80 per cent) in the central Bihar plains is covered by high yielding varieties which has pushed the landraces to the stage of extinction. Consequently priority should be given to the collection of the surviving traditional rices of this area.

North Bihar Gangetic plains having rainfed lowland and deepwater ecosystems, possesses enormous genetic variability which is the gift of the complex environments in which they have been growing for hundreds of years.

Table 2. Important landraces of north Bihar Gangetic plains

Landrace	Area of adaptability	Important characteristics
Gambhari, Gadari, Bachi gadari, Rani gadari, Punjabi gadari Jalli Bhada, Asini, Ranghi, Satoria, Chalisa, Vadia Gadar, Baharni, Hathi Jhulan, Harnomia, Gajgaur, Sataria, Rangiva Gadar, Malbhog, Satari.	Rainfed upland/ medium land.	Tall, 120-125 days duration, photoperiod insensitive.
Bokol, Baster, Lakshman, Sugapankhi, Ammaghaur, Maldie, Ramjavairi, kalamkhora, Kalamsori, Chapis number, Jhulan sari, Katika, Dolongi, Samar, Jaiwa, Dudhia, Bangala, Deobhog, Lakhisar, Pakhari, Kasauri, Kesharbachhi, Purbapankhi, Delan, Harinker, kamod, Tulsi, Marudangi, Bhat, Umtha, Punjhali, Ashwani, Kanyal, Meghnad, Bakai, Kahigaul, Morongia Pakhar, Aman, Laxman Dahia, Kakargar, Ramdulari, Parwa- Pankhi, Khora, Lalsar, Mujapur, Aman- Saded, Malbhogir, Sonbarsa, Jaswa, Picher, Kasounjh, Sidhat, Saribarsa Barogur, Malida, Ashwani, Kali Rai, Anuroopa, Ghurna, Motisair, Ghengule, Bijali Batti, Dhusari, Lal Kasaanjha, Satras, Baster Bakol, Ujla Kasaunjh, Harinkel, Bakol Raskushwa, Shai Kumar, Kusum-Katika, Duthari, Malida Sonbarsa, Sakaidhan, Sonasar, Parwa Pankh, Pakhar, Karuna, Soluka Saundh, Ratan Bakol, Karia Kamod.	Rainfed, medium lands/ lowlands.	Tall, photoperiod sensitive, late duration.
Gaipati, Bajra, Singhra, Darmi, Jagar, Desaria, Morgangia, Dorma, Desaria, Lodora, Dessaria, Jharmasdhan-dessari, Jessaria, Chenab.	Deepwater	Photoperiod sensitive, Tall, with elongation capacity, tolerance to flooding, drought and complete submergence.
Kanak jeera, Tulsiphoool, Shyamjeera, Malbhog, Kesarbani, Badshahpasand	Rainfed medium	Photoperiod sensitive, tall, short fine grain with aroma.

The landraces were utilised for (i) breeding varieties (ii) genetical studies (iii) incorporating special traits e.g. disease, insect resistance, tolerance to physiological stress such as drought, flood etc. (Table 4). Some of the landraces having stable performance were recommended for cultivation as improved

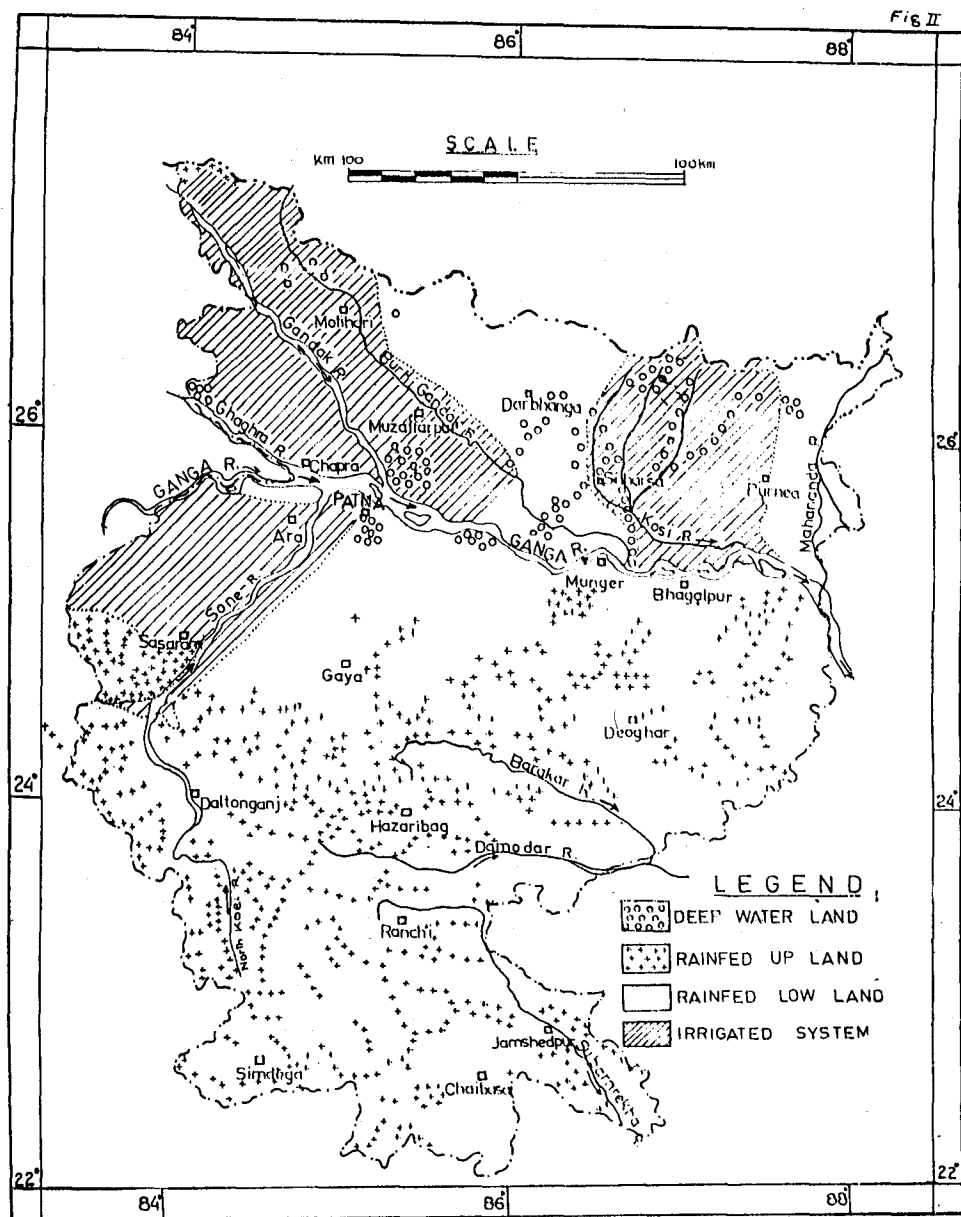


Fig. 2. Map showing major agro-eco-systems and distribution of land races in Bihar

variety particularly in adverse ecosystems such as rainfed upland, lowland or deep water rice ecosystem. The improved rice varieties recommended earlier have been developed, exercising pure line selection (Table 3). Some of these varieties like BR 34, BR 8, Brown Gora 23-19, *Janki* etc. are the very popular among the farmers.

Table 3. Landraces utilized as improved variety

Sl. No.	Landrace (local name)	Accession Number	Popular name	Traits for which utilized	Remarks
1	2	3	4	5	6
1.	Gora dhan	Brown gora 23-19	Gora dhan (Br 19)	Improved variety for the uplands of Chotanagpur.	It is still the best variety for rainfed uplands in Chotanagpur.
2.	Dahia	BK 115	BR 3	Improved variety for medium lands of Gangetic plains.	Common landrace of Bhagalpur district.
3.	Jhulansar	BK 114	BK 4	-do-	Common landrace of Munger district.
4.	Motisaul	BK 16	Br 5	Improved variety for medium land of Gangetic plains	Common landrace of old Shahabad district.
5.	Dahia	BK 88	Br 6	-do-	Common landrace of Bhagalpur district.
6.	Kessore	BK 36	Br 7	Improved variety for lowlands of Gangetic plains.	Common landrace of Bhagalpur district.
7.	Kessore	498-2A	Br 8	Improved variety for lowlands of Gangetic plains.	This variety is still popular in rainfed areas.

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1	2	3	4	5	6
8.	Tulsimanjari	818-3	Br 9	Fine grained aromatic rice for Pulao purpose.	-do-
9.	Badshahbhog	300-15	Br 10	Fine grained for Pulao purpose.	-do-
10.	Jessoria	-	Br 14	For cultivation in the deepwater areas of north Bihar.	The variety has the elongation ability & flood tolerance.
11.	Dolongi	2206 B	Br 34	Suitable for medium lands of Chotanagpur.	Collection from Munger district. It is still a very popular variety in the rainfed areas.
12.	Jessaria	-	Br 46	Suitable for deepwater lands of north Bihar.	Collection from Darbhanga district.
13.	Chenab	C-64-117	Janaki	Suitable for deepwater land.	Highly tolerant to flooding and complete submergence.
14.		TCA 48	Vaidehi	Suitable for deepwater land.	-
15.		TCA 72	Sudha	-do-	-
16.	Basmati dhan	-	Sugandha	Fine grained aromatic rice for Pulao purpose.	Introduction from Orissa.
17.	Katarni	RAU SBS-640	Kamini	-do-	Collection from Bhagalpur district.



Fig. 3. Map showing the area/region explored, route followed and collection sites south Bihar

FUTURE PROSPECTS

There is possibility for rice germplasm conservation in Bihar. The work done on the aspect so far has not been properly documented. Therefore, systematic and concerted efforts for exploitation and cataloging are the priorities

to conserve the valuable germplasm of Bihar. Non Govt. Organizations (NGO's) may be encouraged and involved in the rice germplasm conservation programme.

Table 4. Landraces utilized as donor parents in hybridization programme.

Sl. No.	Landrace	Popular name	Traits for which utilized
1.	Gora dhan	Brown gora 23-19	Drought tolerance, earliness.
2.	Kessore	Br 7	Photoperiod sensitivity, tolerance to water-logging. Sustainability under rainfed system.
3.	Kessore	Br 8	-do-
4.	Dolongi	Br 34	Photoperiod sensitivity, tolerance to BPH & sustainability under rainfed system.
5.	Chenab	Janaki	Tolerance to submergence, flooding, drought and adaptability under deepwater condition.
6.	TCA 48	Vaideshi	-do-
7.	TCA 71	Sudha	-do-
8.	Tulsi Manjari	Br 9	Fine grain and aroma.
9.	Katarni	Kamini	-do-
10.	Jessaria	Br 14	Tolerance to flooding, drought, submergence, elongation ability.

The irrigated area need be explored on priority basis so that the remaining landraces of the region may be collected and saved from extinction.

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