Basudha Data Paper No. 8

An Evaluation of Biochemical Characteristics of Rice (*Oryza sativa*) Landraces from Eastern India

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Introduction

Rice (*Oryza sativa*) is a major staple for half of the population worldwide. Different morphological and agronomic traits enable an easy and quick discrimination between varietal phenotypes. These characteristics are generally highly heritable, can be easily seen by the eye and are equally expressed in all environments. Therefore, these traits are assessed to distinguish a landrace population, and the durability, uniformity and stability (DUS) of these traits ensures the genetic purity of the landrace. Evaluation of these characteristics can be carried out by any farmer or researcher without institutional training and technical support. A compilation of these characteristics would be of great value to the farmers to ascertain the genetic purity and stability of the cultivars. Deb's (2005) pioneering compilation of 36 morphological and agronomic characteristics of 417 *indica* rice landraces is an example.

In addition to the morphological descriptors, biochemical descriptors are also important for characterization of rice landraces. Although a few of these biochemical characterization can be carried out by ordinary farmers, they are ideally performed in a laboratory. These biochemical descriptors are useful to curators for the management and maintenance of germplasm collection and to all users of rice genetic resources. We present here the first compilation of 6 biochemical descriptors of 872 rice landraces from eastern India.

Materials

We examined a total of 872 rice varieties from Basudha's accession from four states of eastern India, namely, Bihar, Jharkhand, Odisha and West Bengal (**Fig. 1** and **Table 1**).

Table 1: The number of Rice Landraces from Four East Indian States Selected for Chemical Tests.

States	Number of Varieties
Bihar	7
Jharkhand	55
Odisha	306
West Bengal	504
Total	872



Fig. 1: Map Showing the States of Origin of the Rice Accessions from Eastern India (in green).

Methods

For biochemical characterization of the selected rice landraces, we evaluated the following descriptors: endosperm type based on amylose content; aroma, based on the presence of 2-acetyl 1-pyrroline (2AP); alkali digestion; gel consistency; gel coloration upon alkalization; and phenol reaction of the rice hull.

(a) Endosperm Type:

By visual observation, two types of endosperms of polished rice kernels are distinguishable. In glutinous rice, which does not have amylose, the endosperm appears a waxy white. In non-glutinous rice, which contains amylose, the endosperm appears cloudy and translucent (Bioversity International 2007). The standard classification is given in **Table 2**.

Table 2: Visual Classification of Endosperm Type

Visual Description	Endosperm type
Translucent	Non-glutinous
Cloudy	Intermediate
Waxy	Glutinous

(b) Aroma:

Basmati-like aroma in fragrant rice landrades is detected when the rice kernel contains 2AP. As there is no transducer for chemical senses, the only reliable method of detection of aroma is by employing the human nose to smell the samples. For smelling, we relied on at least two trained persons to detect the aroma.

Alkali is known to enhance the release of 2AP, and acidification inhibits the release of 2AP. The characteristic smell of 2AP disappears after acid treatment and reappears upon re-alkalization. Accordingly, we used the method described by Brahmachary and Poddar-Sarkar (2015). We took 4 - 5 grains of unpolished rice kernels in a Petri dish, added 3 drops of 2% (w/v) KOH on the kernels, and left the sample under glass cover for 20 minutes. After 20 minutes the cover was removed for smelling the sample. Regardless of detection of any basmati-like aroma, we subsequently added 4 drops of 2% (w/v) HCl to acidify the sample, upon which the aroma disappeared. After this we added 5-6 drops of 2% (w/v) KOH to re-alkalize the kernels, and cover the Petri dish. After 20 minutes we smelled the sample again, and the presence or absene of Basmati-like aroma was recorded. The strength of the aroma was recorded according to the standard code (**Table 3**):

Table 3: Standard Code for the Strength of Aroma due to Presence of 2AP

Strength of Aroma	Code
No aroma	0
Mild	1
Strong	2

(c) Alkali Digestion:

Alkali digestion was measured by using methods of Little et al. (1958) and Chemutai et al. (2016),

with slight modification. We placed 3 - 4 unpolished kernels of each rice landrace in a petri-dish. 3 to 4 drops of 2% (w/v) KOH were added onto the kernels, submerging them in the solution. The petri dishes were then covered and placed at room temperature for 16 hours. After 16 hours the degree of disintegration of the kernels was rated visually according to standard evaluation system for rice by Bioversity International (**Table 4**).

Table 4: Standards of the Degree of Alkali Digestion.

Degree of Alkali Digestion	Classification
Grain not affected but chalky	Low
Grain swollen	Low
Grain swollen with collar incomplete	Intermediate
Grain collar complete and wide	Intermediate
Grain split with wide collar	Intermediate
Grain dispersed merging with collar	High
Grain fully dispersed	High

(d) Gel Consistency:

Gel consistency in rice genotypes is measured through the protocols by and Cagampang et al. (1973) and Sattari et al. (2015) with slight modification. For each landrace, 100 mg ground kernels was weighed and placed in a 13 mm X 125 mm test tube, to which 0.2 ml of 95% ethanol containing 0.025% thymol blue was added. 2 ml of 0.2N KOH was added and stirred gently for 30 seconds on an electrical vortex. Subsequently, the test tubes with samples were placed in a boiling water bath at 102 °C for 10 minutes. The test tubes were then kept at room temperature for 5 minutes and then kept in ice bath for 30 minutes. Finally, the tubes were taken out and placed horizontally on a graph paper on a flat surface. After 1 hour, the distance traveled by the gel was measured. From the distance travelled by the gel, the consistency was inferred from the standard classification (**Table 5**).

Table 5: Gel Consistency Standards

Gel Distance (mm)	Gel Consistency
>60 mm	Soft
40 - 60 mm	Intermediate
< 40 mm	Hard

(e) Gel Coloration:

For each landrace, 100 mg ground kernels was weighed and placed in a 13 mm X 125 mm test tube, to which 0.2 ml of 95% ethanol containing 0.025% thymol blue was added. 2 ml of 0.2N KOH was added and stirred gently for 30 seconds on an electrical vortex. Subsequently, the test tubes with samples were placed in a boiling water bath at 102 °C for 10 minutes. The test tubes were then kept at room temperature for 5 minutes and then kept in ice bath for 30 minutes. Finally, the tubes were taken out and the color of the gel was recorded. The different colour of the rice gel after alkali treatment is likely indicative of different anthocyanin contents of the rice kernels, but the link between the colours and the inherent anthocyanin content has not yet been explored in available literature.

(f) Phenol Reaction:

Phenol reaction was measured by using the method described in Chang and Bardenas (1965), with slight modification. We took a clean Petri dish (90mm diameter) and marked 4 zones for 4 samples in the Petri dish by writing the sample codes in their respective zones in the dish. We placed 3 rice grains (with husk) of each landrace on its demarcated position, onto which we added 3 drops of 2% phenol solution and kept each Petri dish for 48 hours in a dark place at room temperature. After 48 hours of soaking in phenol, each Petri dishes were taken out one by one and the color change on the grains of each sample was recorded, following the standard classification (**Table 6**). Most of the *indica* varieties and wild *Oryza* species take on a dark brown or black coloration as a result of polyphenol oxidase activity whereas *japonica* varieties show no color change.

Table 6: Standard Codes of Color Change in Reaction to Phenol.

Reaction	Code
No color change	1
Mild color change	2
Purple or black color	3

Results

The results of our assessment are given in **Table 8**. Our data presented here are the first quantitative assessment of biochemical characteristics of 872 rice landraces from eastern India, and reveal that 126 landraces (14.5%) are aromatic. Furthermore, 60 landraces (6.8%) are glutinous, and 117 landraces (13.4%) are non-reactive to phenol, plausibly indicating the introgression of these traits from *japonica* ancestral lines. The range of rice gel distance and gel colours is presented in **Fig. 2**, showing 6 selected rice samples.



Fig. 2: A Range of Rice Gel Consistency and Colours Upon Alkalization.

Table 7: Evaluation of Biochemical Characteristics of 874 Landraces from East India

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
State: BIHAR							
Dhansiri	Intermediate	0	Intermediate	117	Soft	Brown	1
Ghoi bir	Non-glutinous	0	Intermediate	112	Soft	Blue	1
Hati dhan	Intermediate	0	Intermediate	50	Intermediate	Orange	1
Lal sita	Intermediate	0	Intermediate	85	Soft	Orange	1
Pitti dhiri	Non-glutinous	0	Intermediate	118	Soft	Orange	1
Sada chenga	Intermediate	0	Intermediate	40	Hard	Pink	1
Sonasari	Intermediate	1	Intermediate	110	Soft	Pink	2
State: JHARKHA	AND						
Ara baihar	Intermediate	0	Intermediate	120	Soft	Blue	2
Badh	Non-glutinous	0	Intermediate	85	Soft	Blue	1
Badowan	Non-glutinous	0	Intermediate	95	Soft	Orange	2
Bhuri-sal	Intermediate	0	Intermediate	92	Soft	Orange	2
Chamarmoni	Non-glutinous	2	Intermediate	104	Soft	Blue	2
Cheng-sal	Intermediate	0	Low	115	Soft	Orange	2
Chhota jhulpo	Non-glutinous	0	Intermediate	112	Soft	Orange	2
Choura goda	Non-glutinous	0	Intermediate	115	Soft	Blue	1
Dani gorah	Intermediate	0	Intermediate	115	Soft	Pink	1
Gangabaru	Non-glutinous	0	Intermediate	80	Soft	Blue	0
Garia	Non-glutinous	0	Intermediate	102	Soft	Brown	2
Ghasraiz	Non-glutinous	0	Intermediate	100	Soft	Brown	2
Hansguji	Non-glutinous	0	Intermediate	97	Soft	Pink	2
Hende baba	Non-glutinous	0	Intermediate	120	Soft	Black	0
Hende baihar	Non-glutinous	0	Intermediate	108	Soft	Black	2
Hende bhadoi	Non-glutinous	0	Intermediate	102	Soft	Black	2
Jarhan baihar	Non-glutinous	0	High	70	Soft	Blue	1
Jhulpo	Intermediate	0	Intermediate	105	Soft	Blue	2
Joga dhan	Non-glutinous	0	Low	80	Soft	Orange	1
Jubri dhan	Non-glutinous	0	Intermediate	50	Intermediate	Blue	0
Kalam dani	Non-glutinous	0	Intermediate	2	Hard	Blue	1
Kalo gorah	Non-glutinous	0	Intermediate	65	Soft	Brown	1
Kalo nuniya	Non-glutinous	2	Intermediate	105	Soft	Blue	1
Karheni	Non-glutinous	0	Intermediate	102	Soft	Brown	2
Kartik-sal	Non-glutinous	0	Intermediate	56	Intermediate	Brown	1
Kashi phul	Non-glutinous	0	Intermediate	100	Soft	Brown	1
Katarni	Non-glutinous	2	Intermediate	115	Soft	Blue	2
Lal dhan (c)	Non-glutinous	0	Intermediate	7	Hard	Blue	2
Lal dhepa	Non-glutinous	0	Intermediate	111	Soft	Violet	2
Lal dhusuri	Intermediate	0	Intermediate	115	Soft	Brown	1
Lohna	Non-glutinous	0	Low	80	Soft	Blue	1
Mala	Non-glutinous	0	Intermediate	98	Soft	Blue	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Mota baihar	Non-glutinous	0	Intermediate	90	Soft	Brown	2
Mukta	Intermediate	0	Intermediate	90	Soft	Blue	2
Nalpai	Non-glutinous	0	Intermediate	25	Hard	Pink	0
Parbal	Non-glutinous	0	Intermediate	70	Soft	Brown	1
Pun baihar	Non-glutinous	0	Intermediate	90	Soft	Brown	1
Pusa badh	Non-glutinous	0	Intermediate	92	Soft	Blue	1
Raban-sal	Glutinous	0	Intermediate	67	Soft	Blue	0
Ramjira	Non-glutinous	2	Intermediate	47	Intermediate	Blue	0
Rangala dhan	Non-glutinous	0	Intermediate	117	Soft	Orange	2
Rangi dhan	Intermediate	0	Intermediate	58	Intermediate	Blue	2
Rangi ras	Non-glutinous	0	Intermediate	101	Soft	Blue	2
Rani kajal	Non-glutinous	2	Intermediate	110	Soft	Blue	2
Raschora	Non-glutinous	0	Intermediate	70	Soft	Blue	1
Rassi	Non-glutinous	0	Intermediate	110	Soft	Blue	1
Sada dumra	Non-glutinous	0	Low	100	Soft	Blue	2
Sada payjam	Non-glutinous	0	Intermediate	107	Soft	Blue	0
Safed ras	Intermediate	0	Intermediate	102	Soft	Brown	1
Sathi	Non-glutinous	0	Intermediate	87	Soft	Brown	2
Sawania	Non-glutinous	0	Intermediate	5	Hard	Blue	2
Shatia bhadoi	Non-glutinous	0	Intermediate	90	Soft	Pink	2
Sonam	Non-glutinous	0	Intermediate	56	Intermediate	Blue	1
Tatu dhan	Non-glutinous	0	Intermediate	115	Soft	Blue	0
Tupru	Non-glutinous	0	Intermediate	114	Soft	Blue	1
State: ODISHA							
Agni-sal	Non-glutinous	0	Intermediate	110	Soft	Blue	2
Asanchuri	Non-glutinous	0	Intermediate	115	Soft	Blue	2
Asha goti	Non-glutinous	0	Intermediate	60	Intermediate	Blue	1
Ashabali	Non-glutinous	0	Low	60	Intermediate	Blue	1
Atiya	Non-glutinous	0	Low	70	Soft	Brown	1
Atma sitala	Non-glutinous	0	Intermediate	115	Soft	Blue	0
Bada dhan	Non-glutinous	0	Intermediate	86	Soft	Brown	2
Badili mami	Non-glutinous	0	Intermediate	95	Soft	Orange	1
Badli dhan	Intermediate	0	Intermediate	115	Soft	Brown	1
Badna	Non-glutinous	0	Intermediate	97	Soft	Blue	2
Bagh budi	Non-glutinous	0	Intermediate	75	Soft	Blue	2
Baigana manjia	Intermediate	0	Intermediate	110	Soft	Blue	1
Baji dhan	Intermediate	0	Intermediate	10	Hard	Blue	1
Bako	Non-glutinous	0	Intermediate	87	Soft	Blue	1
Bangla dhan	Non-glutinous	0	Intermediate	118	Soft	Blue	2
Bareng	Non-glutinous	0	Low	82	Soft	Brown	2
Baringi bed	Non-glutinous	0	Intermediate	102	Soft	Blue	1
Baro moipal	Glutinous	0	Low	87	Soft	Blue	1
Baromasi	Non-glutinous	0	Intermediate	75	Soft	Brown	2
Basan ker	Non-glutinous	0	Intermediate	80	Soft	Blue	2
Basanti churi	Intermediate	0	Low	56	Intermediate	Blue	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Basha bhog	Non-glutinous	1	Low	77	Soft	Blue	2
Basmati nagni	Glutinous	0	Intermediate	80	Soft	Blue	1
Basni mundi	Non-glutinous	1	Intermediate	75	Soft	Blue	2
Bastar	Intermediate	0	Intermediate	90	Soft	Pink	0
Basumati	Non-glutinous	2	Intermediate	110	Soft	Blue	1
Bata	Intermediate	0	Intermediate	118	Soft	Blue	2
Bausha boro	Non-glutinous	0	Intermediate	80	Soft	Blue	2
Bausha dubraj	Non-glutinous	0	Intermediate	112	Soft	Blue	2
Baya gunda	Non-glutinous	0	Intermediate	82	Soft	Blue	1
Baya hundar	Non-glutinous	0	Low	105	Soft	Blue	1
Bhainsa-sal	Non-glutinous	0	Low	90	Soft	Grey	2
Bhalu	Non-glutinous	0	Intermediate	107	Soft	Brown	2
Bhalu dubraj	Non-glutinous	1	Intermediate	55	Intermediate	Blue	2
Bhata kuji	Non-glutinous	0	Intermediate	50	Intermediate	Brown	2
Bhata magada	Non-glutinous	0	Intermediate	82	Soft	Brown	1
Bhata masuri	Intermediate	0	Intermediate	105	Soft	Blue	1
Bhata sopuri	Intermediate	0	Intermediate	62	Soft	Brown	1
Bhatta churi	Intermediate	0	Intermediate	20	Hard	Blue	0
Bhatta ganthia	Non-glutinous	0	Intermediate	97	Soft	Brown	1
Bhatta mali	Non-glutinous	0	Intermediate	50	Intermediate	Blue	1
Bhoda manji	Non-glutinous	0	Intermediate	105	Soft	Brown	0
Bhoglaya	Non-glutinous	2	Intermediate	80	Soft	Brown	2
Bhonda dhan	Glutinous	0	Intermediate	80	Soft	Blue	2
Bhugunisar	Non-glutinous	0	Intermediate	115	Soft	Blue	2
Bhuikena	Intermediate	0	Intermediate	106	Soft	Brown	2
Bhuli ker	Non-glutinous	0	Intermediate	110	Soft	Blue	0
Bhurkundi	Non-glutinous	0	Intermediate	42	Intermediate	Blue	2
Bhutai ker	Non-glutinous	0	Intermediate	75	Soft	Blue	0
Bhutta churi	Glutinous	0	Intermediate	5	Hard	Blue	2
Bidi	Non-glutinous	0	Intermediate	67	Soft	Blue	2
Bishnubhog	Non-glutinous	2	Intermediate	89	Soft	Blue	0
Bita kaberi	Non-glutinous	0	Intermediate	90	Soft	Pink	1
Bodi kaberi	Non-glutinous	0	Intermediate	85	Soft	Blue	2
Bodi kaberi-2	Intermediate	0	Low	72	Soft	Blue	2
Boisri pat	Non-glutinous	0	Intermediate	105	Soft	Blue	2
Budhi kakudia	Non-glutinous	0	Intermediate	75	Soft	Blue	2
Burkundi	Non-glutinous	0	Intermediate	62	Soft	Blue	1
Buro jari	Non-glutinous	0	Intermediate	70	Soft	Blue	0
Buta ker	Non-glutinous	0	Intermediate	100	Soft	Pink	0
Chaina goda	Non-glutinous	0	Intermediate	86	Soft	Violet	1
Chakra goda	Non-glutinous	0	Intermediate	50	Intermediate	Blue	1
Chari nakhi	Non-glutinous	0	Intermediate	100	Soft	Blue	1
Cheri gadi	Non-glutinous	0	Intermediate	90	Soft	Orange	2
Chikla koli	Non-glutinous	0	Intermediate	94	Soft	Blue	1
Chinger	Intermediate	1	Intermediate	115	Soft	Brown	2
Chipti dhan	Non-glutinous	0	Intermediate	100	Soft	Brown	1

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Chipti gurmatia	Non-glutinous	0	Intermediate	85	Soft	Blue	0
Chipti masuri	Non-glutinous	0	Intermediate	104	Soft	Blue	2
Chudi dhana	Non-glutinous	0	Intermediate	106	Soft	Brown	1
Churi dhan	Non-glutinous	0	Intermediate	60	Intermediate	Blue	2
Dahan prasad	Glutinous	1	Low	77	Soft	Blue	0
Dashahara jhuti	Non-glutinous	1	Intermediate	84	Soft	Blue	2
Dashra mathiya	Non-glutinous	0	Intermediate	100	Soft	Pink	2
Deulabhog	Non-glutinous	2	Intermediate	98	Soft	Blue	2
Dhabli mami	Non-glutinous	0	Intermediate	90	Soft	Brown	2
Dhala lau	Non-glutinous	0	Intermediate	65	Soft	Blue	2
Dhala saroo	Intermediate	0	Intermediate	78	Soft	Blue	0
Dhania bija	Non-glutinous	0	Intermediate	78	Soft	Brown	1
Dhankadi deepa	Non-glutinous	0	Low	87	Soft	Blue	0
Dokra mesa	Intermediate	0	Intermediate	97	Soft	Brown	1
Dondaloor	Non-glutinous	0	High	106	Soft	Blue	1
Dongar churi	Intermediate	0	Intermediate	45	Intermediate	Blue	0
Dongar dhan	Intermediate	0	Intermediate	115	Soft	Pink	2
Doubli	Glutinous	2	Intermediate	29	Hard	Blue	2
Dudha moni	Non-glutinous	1	Intermediate	90	Soft	Blue	1
Dular	Intermediate	0	Intermediate	45	Intermediate	Blue	2
Eripi suna	Non-glutinous	0	Low	50	Intermediate	Blue	0
Fandeh	Non-glutinous	0	Low	42	Intermediate	Brown	1
Firik	Non-glutinous	0	Intermediate	110	Soft	Brown	2
Gaada dhan	Non-glutinous	0	Intermediate	82	Soft	Brown	1
Gada khuta	Non-glutinous	0	Intermediate	100	Soft	Brown	1
Gadaba	Intermediate	0	Low	41	Intermediate	Brown	2
Gadha	Non-glutinous	0	Intermediate	50	Intermediate	Blue	2
Gadi chari	Non-glutinous	0	Intermediate	72	Soft	Blue	2
Gangabali	Intermediate	2	Intermediate	84	Soft	Blue	1
Gangabalu	Non-glutinous	0	Intermediate	70	Soft	Blue	0
Gangabhalu	Non-glutinous	0	Intermediate	22	Hard	Blue	0
Ganjei lata	Non-glutinous	0	Intermediate	115	Soft	Blue	2
Genthu nadia	Non-glutinous	0	Intermediate	110	Soft	Blue	1
Ghotia	Intermediate	0	Intermediate	67	Soft	Pink	2
Gidhan dhan	Intermediate	0	Intermediate	70	Soft	Brown	1
Gite ker	Non-glutinous	0	Intermediate	110	Soft	Blue	2
Gobinda	Non-glutinous	0	Intermediate	100	Soft	Blue	0
Gonadaru	Non-glutinous	0	Intermediate	79	Soft	Brown	1
Goti saina	Non-glutinous	0	Intermediate	52	Intermediate	Blue	2
Gotia	Non-glutinous	0	Intermediate	55	Intermediate	Blue	0
Gouri suna	Non-glutinous	0	Intermediate	58	Intermediate	Blue	0
Government churi	Non-glutinous	0	Intermediate	65	Soft	Blue	1
Gudmal	Non-glutinous	0	Intermediate	40	Hard	Orange	2
Gumudi	Non-glutinous	0	Intermediate	95	Soft	Orange	1
Guruji	Non-glutinous	0	High	102	Soft	Brown	2
Gurumukhi	Intermediate	0	Intermediate	92	Soft	Orange	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Haldi	Non-glutinous	0	Intermediate	85	Soft	Brown	2
Haldi churi	Non-glutinous	0	Intermediate	112	Soft	Black	2
Haldi ganthi	Non-glutinous	0	Intermediate	78	Soft	Pink	1
Haldi ropa	Non-glutinous	0	Low	105	Soft	Orange	0
Haldi sari	Intermediate	0	Intermediate	75	Soft	Brown	1
Hari shankar	Intermediate	0	Intermediate	47	Intermediate	Blue	2
Hati gada khuta	Non-glutinous	0	Low	92	Soft	Violet	2
Heera khandi	Non-glutinous	1	Low	62	Soft	Blue	1
Huggi bhutta	Glutinous	2	Intermediate	95	Soft	Brown	2
Ikle koteh	Non-glutinous	0	Intermediate	54	Intermediate	Brown	1
Ilika	Intermediate	0	Intermediate	55	Intermediate	Brown	1
Jani jari	Non-glutinous	0	Low	62	Soft	Blue	1
Jara bhog	Non-glutinous	2	Intermediate	105	Soft	Blue	1
Jeera	Non-glutinous	0	Intermediate	112	Soft	Blue	1
Jhari konchi	Non-glutinous	0	Intermediate	80	Soft	Blue	1
Jhi goda	Non-glutinous	0	Intermediate	28	Hard	Grey	2
Jhitrikoni	Non-glutinous	0	Intermediate	70	Soft	Orange	2
Jhuli (o)	Intermediate	0	Intermediate	115	Soft	Black	1
Jhuluki suna	Non-glutinous	0	Intermediate	76	Soft	Blue	2
Jhumpachuri	Intermediate	0	Intermediate	42	Intermediate	Blue	1
Jhumpuri	Non-glutinous	0	Intermediate	86	Soft	Pink	2
Jhupa mali	Non-glutinous	0	Intermediate	82	Soft	Blue	0
Juhi goda	Non-glutinous	0	Intermediate	98	Soft	Blue	2
Jungli chopa	Non-glutinous	0	Intermediate	45	Intermediate	Grey	2
Kaba gori	Non-glutinous	0	Intermediate	90	Soft	Blue	2
Kaberi	Non-glutinous	0	Low	80	Soft	Blue	0
Kaberi gandha	Non-glutinous	0	Intermediate	60	Intermediate	Brown	1
Kala churi	Non-glutinous	0	Intermediate	80	Soft	Blue	2
Kala dubraj	Non-glutinous	0	Low	50	Intermediate	Blue	1
Kala jira	Non-glutinous	1	Low	55	Intermediate	Blue	2
Kala keshto	Non-glutinous	2	Low	45	Intermediate	Blue	2
Kala kolli	Non-glutinous	0	Intermediate	55	Intermediate	Blue	2
Kala krushna	Non-glutinous	2	Intermediate	55	Intermediate	Blue	1
Kala malli	Non-glutinous	0	Low	107	Soft	Blue	1
Kala mohara	Non-glutinous	0	Low	91	Soft	Pink	2
Kala namak	Non-glutinous	2	Intermediate	72	Soft	Blue	2
Kalabati	Glutinous	0	Intermediate	70	Soft	Black	2
Kalabhat (0)	Non-glutinous	1	Intermediate	72	Soft	Blue	2
Kalandia churi	Non-glutinous	0	Intermediate	7	Hard	Brown	1
Kalari kuji	Non-glutinous	0	Intermediate	76	Soft	Brown	2
Kalasu	Non-glutinous	0	Intermediate	108	Soft	Brown	2
Kaleswar	Non-glutinous	0	Intermediate	117	Soft	Blue	0
Kali churi	Non-glutinous	0	Intermediate	110	Soft	Blue	2
Kalia chipti-1	Non-glutinous	0	Intermediate	108	Soft	Orange	2
Kalia chipti-2	Non-glutinous	0	Intermediate	108	Soft	Orange	0
Kalia ganthi	Intermediate	0	Low	91	Soft	Brown	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Kalia ker	Intermediate	0	Low	10	Hard	Blue	0
Kalia palsi	Non-glutinous	0	Intermediate	84	Soft	Brown	1
Kalia para	Non-glutinous	0	Intermediate	105	Soft	Brown	2
Kanakchampa	Non-glutinous	1	Low	40	Hard	Blue	1
Kandula kathi	Non-glutinous	0	Intermediate	88	Soft	Brown	2
Kankuri manji	Non-glutinous	0	Low	52	Intermediate	Blue	1
Kanta churi	Intermediate	0	Intermediate	49	Intermediate	Brown	1
Karanga goda	Non-glutinous	0	Intermediate	110	Soft	Brown	2
Karga	Non-glutinous	0	Intermediate	42	Intermediate	Brown	2
Kari kuji	Non-glutinous	0	Intermediate	26	Hard	Blue	2
Karna-sal	Intermediate	0	Intermediate	88	Soft	Brown	2
Kasam jhanti	Non-glutinous	0	Intermediate	71	Soft	Blue	1
Kasam juba	Non-glutinous	0	Intermediate	46	Intermediate	Blue	2
Kendu mundi	Intermediate	0	Intermediate	110	Soft	Brown	2
Kerandi	Intermediate	0	Low	42	Intermediate	Brown	1
Kharah	Intermediate	0	Low	115	Soft	Orange	2
Khejur jhopa	Intermediate	0	Intermediate	110	Soft	Blue	1
Kolamali	Non-glutinous	2	Intermediate	100	Soft	Black	1
Koliya lengri	Intermediate	0	Intermediate	107	Soft	Blue	1
Kolkati	Non-glutinous	0	Intermediate	81	Soft	Blue	2
Kolpi late	Non-glutinous	0	Intermediate	78	Soft	Blue	1
Kompini kuji	Non-glutinous	0	Intermediate	92	Soft	Violet	2
Kondho dhan	Non-glutinous	0	Intermediate	65	Soft	Grey	2
Koro koyeli	Non-glutinous	0	Intermediate	50	Intermediate	Blue	2
Koshi kamon	Non-glutinous	0	Intermediate	115	Soft	Brown	1
Koylaraj	Non-glutinous	2	Low	75	Soft	Blue	2
Kuda khama kada	Non-glutinous	0	Intermediate	22	Hard	Blue	1
Kuja dhan	Non-glutinous	0	Intermediate	70	Soft	Blue	1
Kurai	Intermediate	1	Intermediate	105	Soft	Blue	0
Kuru churi	Intermediate	0	Intermediate	24	Hard	Blue	1
Kusumgenda	Non-glutinous	0	Intermediate	54	Intermediate	Blue	2
Kuyer kuling	Non-glutinous	2	Intermediate	70	Soft	Blue	0
Lagam ker (syn. Lagam churi)	Intermediate	0	Intermediate	27	Hard	Blue	1
Laha raja	Non-glutinous	1	Intermediate	105	Soft	Blue	0
Lakdi	Non-glutinous	0	Intermediate	22	Hard	Blue	1
Lal dhan	Non-glutinous	0	Intermediate	75	Soft	Blue	0
Lalu dhan	Non-glutinous	2	Intermediate	80	Soft	Blue	1
Lalu dubraj	Intermediate	0	Intermediate	85	Soft	Blue	2
Lankeswari	Non-glutinous	0	Low	104	Soft	Blue	2
Laser	Non-glutinous	0	Intermediate	87	Soft	Blue	1
Lim churi	Intermediate	0	Intermediate	105	Soft	Brown	2
Lochhai	Non-glutinous	0	Intermediate	112	Soft	Blue	1
Lohri	Non-glutinous	0	Intermediate	117	Soft	Blue	2
Lokti kuji	Non-glutinous	0	Intermediate	70	Soft	Blue	2
Lokti mochi	Non-glutinous	1	Intermediate	65	Soft	Blue	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Lompop ker	Non-glutinous	0	Intermediate	105	Soft	Blue	1
Ludari	Non-glutinous	0	Intermediate	108	Soft	Blue	2
Lusaw	Intermediate	0	Intermediate	114	Soft	Brown	0
Maccha kanta	Non-glutinous	1	Low	27	Hard	Blue	2
Maharaji	Intermediate	2	Low	92	Soft	Blue	1
Mahula khushi	Non-glutinous	0	Intermediate	102	Soft	Blue	2
Mal bhutka	Intermediate	0	Intermediate	85	Soft	Blue	2
Mal goyendi	Non-glutinous	0	Intermediate	102	Soft	Brown	1
Malifuljhuli	Non-glutinous	0	Intermediate	58	Intermediate	Blue	1
Mami dhan	Non-glutinous	0	Intermediate	90	Soft	Pink	2
Mangu gadi	Non-glutinous	0	Intermediate	60	Intermediate	Blue	2
Mati dhan	Intermediate	0	Intermediate	70	Soft	Orange	2
Mati gandha	Intermediate	0	Intermediate	110	Soft	Brown	2
Mayer	Intermediate	0	Low	28	Hard	Brown	2
Mayurkantha	Non-glutinous	0	Intermediate	95	Soft	Orange	2
Megha dambaru	Non-glutinous	0	Intermediate	101	Soft	Orange	2
Mehadi	Non-glutinous	0	Intermediate	112	Soft	Blue	2
Melia patti	Non-glutinous	0	Intermediate	45	Intermediate	Blue	2
Melia peti	Non-glutinous	0	Intermediate	90	Soft	Blue	2
Mesha	Non-glutinous	0	Low	98	Soft	Blue	1
Minchiri	Non-glutinous	0	Intermediate	82	Soft	Grey	2
Mirlo	Non-glutinous	2	Intermediate	70	Soft	Blue	0
Mohul kuchi	Non-glutinous	0	Intermediate	122	Soft	Blue	1
Moti madi	Glutinous	0	Intermediate	5	Hard	Brown	1
Motichur	Non-glutinous	0	Intermediate	80	Soft	Blue	0
Moyna tundi	Intermediate	0	Intermediate	60	Intermediate	Blue	2
Muah	Intermediate	0	Intermediate	98	Soft	Blue	2
Mukta bali	Non-glutinous	0	Intermediate	100	Soft	Blue	1
Muktamali	Non-glutinous	0	Intermediate	65	Soft	Blue	1
Muktamani	Intermediate	0	Low	107	Soft	Blue	1
Nababi	Glutinous	0	Intermediate	65	Soft	Blue	1
Nada saria	Non-glutinous	0	Intermediate	72	Soft	Blue	0
Nali pankhia	Non-glutinous	0	Intermediate	100	Soft	Brown	1
Nanji	Non-glutinous	0	Intermediate	85	Soft	Blue	1
Narej dhan	Non-glutinous	0	Intermediate	22	Hard	Blue	2
Niyali godi	Intermediate	0	Intermediate	52	Intermediate	Pink	1
Osha gondial	Non-glutinous	0	Intermediate	42	Intermediate	Blue	1
Padiaraja	Non-glutinous	0	Intermediate	112	Soft	Blue	0
Pandaka gura	Intermediate	0	Low	25	Hard	Brown	1
Para	Non-glutinous	0	Low	108	Soft	Black	2
Paranga	Non-glutinous	0	Intermediate	110	Soft	Pink	1
Pathala (syn. Pathara)	Non-glutinous	0	Intermediate	15	Hard	Blue	2
Paton gada	Intermediate	0	Intermediate	87	Soft	Grey	1
Patta hiudi	Non-glutinous	0	Low	95	Soft	Blue	0
Pirim	Non-glutinous	0	Intermediate	85	Soft	Blue	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Pora dhan	Intermediate	0	Intermediate	80	Soft	Pink	2
Posika	Intermediate	0	Intermediate	107	Soft	Blue	1
Posro churi	Non-glutinous	0	Low	120	Soft	Black	1
Poto	Glutinous	0	Low	10	Hard	Blue	0
Radha dhan	Non-glutinous	0	Intermediate	15	Hard	Blue	1
Radha jugal	Non-glutinous	0	Low	82	Soft	Blue	2
Radha kajal	Non-glutinous	0	Intermediate	72	Soft	Orange	2
Raghuse	Glutinous	1	Intermediate	2	Hard	Blue	1
Raja bhog	Non-glutinous	0	Intermediate	90	Soft	Blue	2
Raja rani	Non-glutinous	0	Intermediate	68	Soft	Blue	1
Raji	Non-glutinous	0	Low	92	Soft	Brown	1
Ranga dhan	Non-glutinous	0	Intermediate	72	Soft	Orange	0
Ranga hazari	Non-glutinous	0	Intermediate	78	Soft	Blue	2
Rani kanda	Non-glutinous	1	Intermediate	107	Soft	Blue	2
Rani ketaki	Non-glutinous	1	Low	60	Intermediate	Blue	2
Rani siyali	Glutinous	0	Intermediate	55	Intermediate	Orange	1
Rata dhan	Intermediate	0	Intermediate	45	Intermediate	Orange	1
Ratanchuri	Non-glutinous	0	Intermediate	80	Soft	Blue	2
Reldo	Glutinous	0	Intermediate	78	Soft	Blue	2
Sada jhinga-sal	Non-glutinous	0	Intermediate	110	Soft	Blue	2
Sahina	Non-glutinous	0	High	101	Soft	Blue	1
Sal jhati	Intermediate	0	Intermediate	105	Soft	Blue	1
Salekanthi	Intermediate	0	Intermediate	5	Hard	Blue	0
Sama	Non-glutinous	0	Intermediate	102	Soft	Blue	2
Samudra bali	Non-glutinous	2	Intermediate	102	Soft	Blue	0
Sana moipal	Intermediate	0	Low	112	Soft	Blue	2
Sarasbhog	Intermediate	2	Intermediate	109	Soft	Blue	1
Saroo kalamalli	Glutinous	0	Intermediate	100	Soft	Blue	2
Sataka	Intermediate	0	Intermediate	2	Hard	Blue	2
Sekara	Glutinous	0	Intermediate	65	Soft	Pink	2
Sendoor	Intermediate	0	Intermediate	107	Soft	Blue	1
Setaka	Intermediate	0	Intermediate	2	Hard	Pink	2
Shamla	Non-glutinous	0	Intermediate	68	Soft	Blue	2
Shankar jira	Glutinous	0	Intermediate	90	Soft	Blue	0
Sikala kali	Intermediate	0	Intermediate	88	Soft	Blue	2
Siki musuri	Glutinous	0	Low	95	Soft	Blue	1
Sitai	Intermediate	0	Intermediate	104	Soft	Blue	1
Sopur dhan	Intermediate	0	Intermediate	48	Intermediate	Blue	1
Sopur ker	Intermediate	0	Intermediate	105	Soft	Blue	1
Sopuri	Non-glutinous	0	Low	90	Soft	Blue	1
Sopuri padi	Non-glutinous	0	Intermediate	92	Soft	Blue	1
Suna khadi	Non-glutinous	0	Low	104	Soft	Blue	1
Suna khadika	Non-glutinous	0	Intermediate	100	Soft	Blue	1
Suna sob	Intermediate	0	Intermediate	20	Hard	Blue	1
Sunamukhi	Non-glutinous	0	Intermediate	50	Intermediate	Blue	0
Sunasari	Non-glutinous	0	Intermediate	118	Soft	Blue	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Supari	Intermediate	0	Intermediate	98	Soft	Blue	1
Tarmanga	Non-glutinous	0	Intermediate	50	Intermediate	Blue	$\overline{2}$
Temuru churi	Non-glutinous	0	Intermediate	111	Soft	Black	$\frac{}{2}$
Thakurbhog	Non-glutinous	$^{\circ}$	Intermediate	80	Soft	Blue	0
Tike churi	Intermediate	0	Intermediate	110	Soft	Brown	1
Tulasi	Non-glutinous	1	Intermediate	109	Soft	Blue	$\frac{1}{2}$
Tulasibas	Glutinous	$\overline{2}$	Low	67	Soft	Blue	0
Tulsi ganthi	Non-glutinous	0	Intermediate	96	Soft	Blue	1
Umuri	Non-glutinous	0	Intermediate	95	Soft	Orange	1
Umuria churi	Intermediate	0	Intermediate	106	Soft	Blue	$\overline{2}$
Utkal prabha	Intermediate	0	Intermediate	95	Soft	Blue	2
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Aash	Non-glutinous	0	Intermediate	62	Soft	Blue	1
Abirban	Intermediate	0	Intermediate	115	Soft	Brown	2
Addey	Intermediate	0	Low	20	Hard	Blue	0
Agniban	Intermediate	0	Intermediate	104	Soft	Orange	1
Ahana	Non-glutinous	0	Intermediate	98	Soft	Blue	0
Ajirman	Intermediate	0	Intermediate	106	Soft	Brown	1
Akshay rani	Intermediate	0	Intermediate	10	Hard	Brown	1
Alsanga	Non-glutinous	0	Intermediate	71	Soft	Blue	2
Alta pati	Intermediate	0	Intermediate	112	Soft	Blue	2
Amar-sal	Non-glutinous	0	Intermediate	70	Soft	Blue	2
Amit	Non-glutinous	0	Intermediate	74	Soft	Blue	1
Annapurna	Non-glutinous	0	Intermediate	110	Soft	Blue	0
Anshphal	Non-glutinous	0	Low	76	Soft	Blue	0
Asanleya	Non-glutinous	0	Low	45	Intermediate	Blue	1
Ashu	Intermediate	0	Low	100	Soft	Brown	2
Ashwin dhulia	Non-glutinous	0	Intermediate	82	Soft	Blue	1
Ashwin jharia-1	Non-glutinous	0	Low	85	Soft	Blue	1
Ashwin jharia-2	Intermediate	0	Intermediate	55	Intermediate	Blue	2
Asit kalma	Non-glutinous	0	Low	109	Soft	Blue	2
Assam aush	Non-glutinous	0	Intermediate	96	Soft	Blue	1
Asuripak	Non-glutinous	0	Intermediate	100	Soft	Blue	0
Ausha bonkata	Non-glutinous	0	Intermediate	115	Soft	Blue	1
Babuilata	Non-glutinous	0	Intermediate	112	Soft	Brown	1
Badabona	Non-glutinous	0	Low	88	Soft	Brown	2
Badam phool	Non-glutinous	0	Low	46	Intermediate	Brown	2
Bagh jhapta	Non-glutinous	0	Intermediate	65	Soft	Blue	0
Baghilal patnai	Non-glutinous	0	Intermediate	55	Intermediate	Blue	1
Bahurupi	Non-glutinous	0	Intermediate	85	Soft	Blue	0
Baid dhusuri	Intermediate	0	Intermediate	90	Soft	Pink	2
Baid dulah	Non-glutinous	0	Intermediate	91	Soft	Orange	2
Baid kalamkathi	Intermediate	0	Intermediate	108	Soft	Blue	2
Baidras	Intermediate	0	Low	110	Soft	Blue	2
Baish nagina	Intermediate	0	Intermediate	50	Intermediate	Blue	0

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Bakul phul	Non-glutinous	0	Intermediate	105	Soft	Blue	2
Balam	Non-glutinous	0	Intermediate	102	Soft	Blue	2
Balaram-sal	Intermediate	0	Intermediate	85	Soft	Pink	1
Bali bhajna	Non-glutinous	0	Low	112	Soft	Orange	2
Balir pinda	Non-glutinous	2	Intermediate	82	Soft	Blue	1
Bangla patnai	Intermediate	0	Intermediate	102	Soft	Blue	2
Bank chur	Intermediate	0	Intermediate	108	Soft	Blue	0
Bankrah	Intermediate	0	Intermediate	62	Soft	Blue	2
Bankui	Non-glutinous	0	Intermediate	105	Soft	Grey	2
Bankuli	Non-glutinous	0	High	70	Soft	Blue	2
Banmae jo	Non-glutinous	0	Low	52	Intermediate	Blue	1
Bansh gajal	Non-glutinous	0	Intermediate	108	Soft	Orange	1
Bansh kanta	Intermediate	0	Intermediate	77	Soft	Brown	1
Bansh kathi	Intermediate	0	Low	65	Soft	Orange	2
Bansh mugur	Glutinous	0	Intermediate	5	Hard	Blue	2
Bansh mukhi	Non-glutinous	0	Intermediate	85	Soft	Blue	1
Bansh pata	Non-glutinous	0	Intermediate	115	Soft	Brown	2
Bansh pati	Non-glutinous	0	Low	100	Soft	Pink	2
Bansh pati	Intermediate	0	Intermediate	115	Soft	Blue	1
Bansh tara	Non-glutinous	0	High	94	Soft	Blue	2
Banya-sal	Non-glutinous	0	Intermediate	92	Soft	Pink	2
Bardhaman nagra	Non-glutinous	0	Intermediate	85	Soft	Blue	2
Bardhaman panloi	Non-glutinous	0	Low	85	Soft	Blue	1
Basan kayal	Intermediate	0	Intermediate	109	Soft	Grey	1
Batasa bhog	Non-glutinous	2	Intermediate	109	Soft	Blue	1
Begun bichi	Non-glutinous	0	Intermediate	108	Soft	Blue	0
Benajhuri	Non-glutinous	0	Intermediate	72	Soft	Blue	2
Benaphool	Intermediate	1	Intermediate	98	Soft	Blue	2
Benga dhan	Glutinous	0	Intermediate	22	Hard	Blue	0
Bhalki	Non-glutinous	0	Intermediate	100	Soft	Brown	2
Bhaluki	Intermediate	0	Intermediate	70	Soft	Orange	1
Bharat patnai-1	Intermediate	0	Low	56	Intermediate	Blue	2
Bharat patnai-2	Non-glutinous	0	Intermediate	100	Soft	Blue	1
Bhasa kalmi	Glutinous	0	Intermediate	1	Hard	Brown	1
Bhasa kathi	Non-glutinous	0	Intermediate	85	Soft	Blue	0
Bhasamanik	Non-glutinous	0	Low	85	Soft	Pink	1
Bheral	Intermediate	0	Intermediate	60	Intermediate	Brown	2
Bhim-sal	Intermediate	2	Intermediate	60	Intermediate	Blue	2
Bhog dhan	Non-glutinous	2	Intermediate	64	Soft	Blue	1
Bhuri	Intermediate	0	Intermediate	70	Soft	Orange	2
Bhuri shulah	Non-glutinous	0	Intermediate	88	Soft	Orange	2
Bhut moori	Intermediate	0	Intermediate	58	Intermediate	Brown	2
Birala	Non-glutinous	0	Low	65	Soft	Blue	1
Biroi	Non-glutinous	0	Intermediate	118	Soft	Brown	2
Birpana	Non-glutinous	0	Intermediate	92	Soft	Pink	2
Bish nagina	Non-glutinous	0	Low	77	Soft	Brown	1

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Bishmoni	Intermediate	0	Intermediate	50	Intermediate	Blue	1
Bochi	Intermediate	0	Low	114	Soft	Brown	2
Bochi gondri	Non-glutinous	0	Intermediate	70	Soft	Blue	0
Bodresh	Non-glutinous	0	Intermediate	65	Soft	Blue	2
Bokra	Non-glutinous	0	Intermediate	62	Soft	Blue	2
Boloi genti	Intermediate	0	Intermediate	90	Soft	Blue	1
Bombai mugi	Glutinous	0	Intermediate	96	Soft	Blue	2
Boubhog	Non-glutinous	2	Low	80	Soft	Blue	0
Bourani	Intermediate	0	Intermediate	50	Intermediate	Blue	0
Brimphul	Non-glutinous	2	Intermediate	115	Soft	Blue	2
Burma black	Intermediate	2	Intermediate	65	Soft	Brown	2
Chakramala	Non-glutinous	0	Intermediate	112	Soft	Blue	1
Champa	Non-glutinous	0	Intermediate	120	Soft	Orange	1
Chandrakanta	Non-glutinous	0	Intermediate	115	Soft	Brown	1
Chapa khusi	Intermediate	0	Intermediate	87	Soft	Pink	2
Chatui mukhi	Non-glutinous	2	Intermediate	52	Intermediate	Blue	0
Cheena kamini	Non-glutinous	2	Intermediate	85	Soft	Blue	0
Cheena pakri	Glutinous	0	Intermediate	90	Soft	Blue	0
Chenga	Intermediate	0	Intermediate	101	Soft	Brown	2
Chenga rangi	Intermediate	0	Low	82	Soft	Blue	2
Cherki jhuloor	Intermediate	0	Intermediate	62	Soft	Blue	2
Chhoto nuniya	Non-glutinous	1	Intermediate	82	Soft	Blue	1
Chila meteh	Intermediate	0	Intermediate	110	Soft	Pink	1
Chila patnai	Glutinous	0	Intermediate	91	Soft	Blue	2
Churnokathi	Intermediate	0	Intermediate	105	Soft	Blue	2
Dadkhani	Non-glutinous	0	Low	118	Soft	Blue	2
Dad-sal	Non-glutinous	2	Intermediate	107	Soft	Blue	1
Dahar nagra	Non-glutinous	0	Low	54	Intermediate	Blue	2
Dakshina laghu	Glutinous	0	Intermediate	85	Soft	Blue	2
Danaguri	Intermediate	2	Low	80	Soft	Pink	1
Danger baruah	Non-glutinous	0	Intermediate	100	Soft	Brown	2
Darka-sal	Non-glutinous	0	Intermediate	116	Soft	Orange	1
Dar-sal	Intermediate	1	Intermediate	58	Intermediate	Blue	2
Dayal madina	Non-glutinous	0	Intermediate	85	Soft	Blue	2
Debdulali	Non-glutinous	2	High	110	Soft	Blue	2
Dehradun	Non-glutinous	0	Intermediate	5	Hard	Blue	1
Dehradun gandheswari	Non-glutinous	2	Low	50	Intermediate	Blue	1
Dehradun-bas	Glutinous	2	Intermediate	72	Soft	Blue	1
Deputy-sal	Non-glutinous	0	Low	110	Soft	Brown	2
Deshi patnai	Non-glutinous	0	Intermediate	101	Soft	Blue	2
Dhanashree	Non-glutinous	0	Intermediate	99	Soft	Orange	1
Dhepa	Non-glutinous	0	Intermediate	85	Soft	Blue	1
Dhowa-sal	Glutinous	0	Low	110	Soft	Blue	1
Dhula dhusuri	Glutinous	0	Intermediate	40	Hard	Blue	1
Dhula-sal	Non-glutinous	0	Intermediate	102	Soft	Orange	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Dhusuri	Non-glutinous	0	Intermediate	115	Soft	Blue	2
Dolle kartike	Glutinous	2	Intermediate	115	Soft	Blue	2
Dorangi	Intermediate	0	Intermediate	92	Soft	Orange	0
Dudh kalam	Non-glutinous	0	Low	90	Soft	Blue	2
Dudh kalma	Non-glutinous	0	Intermediate	25	Hard	Blue	2
Dudhe bolta	Non-glutinous	0	Intermediate	92	Soft	Blue	1
Dudhe mator	Non-glutinous	0	Intermediate	88	Soft	Brown	2
Dudheswar	Non-glutinous	0	Intermediate	85	Soft	Orange	2
Dukhi darbar	Non-glutinous	0	Intermediate	87	Soft	Blue	1
Dumra	Intermediate	0	Low	115	Soft	Blue	0
Dumur-sal	Non-glutinous	0	Low	82	Soft	Blue	1
Durga	Non-glutinous	2	Intermediate	105	Soft	Blue	1
Durga sundari	Non-glutinous	2	Intermediate	112	Soft	Blue	0
Durga-sal	Glutinous	0	Intermediate	80	Soft	Blue	0
Fr-12a	Intermediate	0	Low	110	Soft	Orange	2
Gandha malati	Non-glutinous	2	Intermediate	45	Intermediate	Blue	2
Gandheswari	Non-glutinous	2	Intermediate	108	Soft	Blue	1
Gandhi biroin	Glutinous	0	Intermediate	60	Intermediate	Blue	2
Ganga -sal	Intermediate	0	Intermediate	102	Soft	Orange	2
Ganthiya	Intermediate	0	Intermediate	92	Soft	Blue	2
Garib-sal	Intermediate	0	Intermediate	49	Intermediate	Blue	2
Gayasur	Non-glutinous	2	Intermediate	111	Soft	Brown	2
Gayerbot	Intermediate	1	Intermediate	105	Soft	Blue	2
Gendi	Intermediate	0	Intermediate	41	Intermediate	Blue	2
Genti-sal	Non-glutinous	0	Intermediate	84	Soft	Blue	2
Gentu	Intermediate	0	Intermediate	115	Soft	Blue	2
Getoi	Non-glutinous	0	Intermediate	112	Soft	Blue	2
Ghaiya	Non-glutinous	0	Intermediate	96	Soft	Grey	1
Ghasraji	Non-glutinous	0	Intermediate	50	Intermediate	Blue	2
Gheos	Non-glutinous	0	Intermediate	50	Intermediate	Blue	0
Ghora-sal	Non-glutinous	0	Intermediate	25	Hard	Blue	1
Ghunsi	Non-glutinous	1	Intermediate	45	Intermediate	Blue	2
Ghusuri	Non-glutinous	0	Intermediate	100	Soft	Blue	0
Gita	Non-glutinous	0	Intermediate	120	Soft	Blue	1
Gitanjali	Intermediate	0	Intermediate	92	Soft	Blue	2
Gitashree	Intermediate	0	Intermediate	104	Soft	Blue	2
Gobinda bhog	Non-glutinous	2	Intermediate	96	Soft	Blue	0
Gochari patnai	Intermediate	0	Intermediate	40	Hard	Blue	1
Godi khajrah	Intermediate	0	Intermediate	45	Intermediate	Blue	1
Gopalbhog	Non-glutinous	2	Low	90	Soft	Blue	0
Gorah	Intermediate	0	Intermediate	42	Intermediate	Brown	2
Gouri sundari	Non-glutinous	0	Intermediate	82	Soft	Pink	2
Gouri sunna	Non-glutinous	2	Intermediate	75	Soft	Blue	1
Gour-nitai	Intermediate	0	Intermediate	115	Soft	Pink	1
Government nagra	Intermediate	0	Intermediate	47	Intermediate	Blue	1
Haijam	Non-glutinous	0	Intermediate	107	Soft	Blue	0

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Haldé batali	Non-glutinous	0	Low	25	Hard	Blue	2
Haldi guri	Non-glutinous	1	Low	67	Soft	Blue	2
Halpuna lal	Non-glutinous	0	Intermediate	115	Soft	Orange	2
Halud ganthi	Non-glutinous	0	High	95	Soft	Blue	2
Hamai	Intermediate	0	Low	22	Hard	Blue	0
Hamilton	Non-glutinous	0	Intermediate	96	Soft	Pink	2
Hanseswari	Non-glutinous	0	Intermediate	42	Intermediate	Orange	1
Harin kajli	Non-glutinous	0	Intermediate	5	Hard	Pink	2
Harir jhinga	Non-glutinous	0	Intermediate	100	Soft	Blue	1
Harma nona	Intermediate	0	Intermediate	90	Soft	Brown	1
Hati champa	Intermediate	0	Intermediate	57	Intermediate	Brown	2
Hati panjar	Non-glutinous	0	Intermediate	10	Hard	Blue	2
Heera moti	Non-glutinous	0	Intermediate	90	Soft	Violet	0
Hinché saroo	Intermediate	0	Intermediate	55	Intermediate	Blue	1
Hinchi lebu	Intermediate	0	Intermediate	112	Soft	Blue	0
Hogla	Non-glutinous	0	Low	15	Hard	Blue	0
Hudar	Non-glutinous	0	Intermediate	95	Soft	Blue	2
Ichhamati	Intermediate	0	Intermediate	80	Soft	Blue	2
Indra-sal	Intermediate	0	Intermediate	70	Soft	Brown	2
Jagannath bhog	Intermediate	0	Low	78	Soft	Blue	2
Jagannath-sal	Intermediate	0	Low	29	Hard	Blue	1
Jal kamini	Intermediate	0	Intermediate	52	Intermediate	Orange	2
Jaldubi	Glutinous	0	Low	60	Intermediate	Blue	2
Jamai nadu	Non-glutinous	0	Intermediate	85	Soft	Blue	2
Jamai-sal	Non-glutinous	0	Low	112	Soft	Blue	1
Japaka	Non-glutinous	2	Intermediate	86	Soft	Blue	2
Jashua	Non-glutinous	0	Intermediate	25	Hard	Blue	2
Jata	Intermediate	0	Intermediate	80	Soft	Orange	2
Jata kalma	Glutinous	0	Intermediate	80	Soft	Pink	2
Jata leta-sal	Intermediate	0	Low	45	Intermediate	Pink	2
Jataki	Intermediate	0	Intermediate	70	Soft	Blue	1
Jhanjhi aush	Intermediate	0	Intermediate	50	Intermediate	Brown	2
Jhanti-1	Intermediate	0	Intermediate	112	Soft	Blue	0
Jhanti-2	Non-glutinous	0	Intermediate	118	Soft	Brown	1
Jhanti-sal	Non-glutinous	0	Intermediate	110	Soft	Blue	1
Jhili	Non-glutinous	0	High	120	Soft	Blue	1
Jhinga	Non-glutinous	0	Intermediate	80	Soft	Brown	2
Jhinga-sal	Non-glutinous	0	Intermediate	115	Soft	Blue	1
Jhiti piti	Intermediate	0	Intermediate	109	Soft	Pink	1
Jhuli-1	Intermediate	0	High	92	Soft	Blue	1
Jhuli-2	Non-glutinous	0	Intermediate	117	Soft	Blue	2
Jhuloor	Intermediate	0	Intermediate	25	Hard	Blue	2
Jhuloor 16	Non-glutinous	0	Intermediate	72	Soft	Blue	2
Jhuluk sundari	Non-glutinous	0	Intermediate	72	Soft	Blue	2
Jhumiya sylhet	Intermediate	0	Low	65	Soft	Brown	2
Jira sari	Non-glutinous	2	Intermediate	70	Soft	Blue	1

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Jira-sal	Non-glutinous	0	Low	72	Soft	Blue	2
Jugal	Glutinous	0	High	15	Hard	Blue	1
Jungli jata	Intermediate	0	Low	95	Soft	Brown	2
Kabiraj-sal	Intermediate	0	Intermediate	94	Soft	Blue	1
Kadalika	Intermediate	0	Intermediate	108	Soft	Grey	2
Kaggey	Intermediate	0	Intermediate	112	Soft	Brown	2
Kaike	Non-glutinous	0	Intermediate	78	Soft	Brown	2
Kajal gouri (syn. Khayer-sal)	Intermediate	0	Intermediate	95	Soft	Orange	2
Kajal kathi	Intermediate	0	Low	106	Soft	Brown	2
Kajli	Non-glutinous	0	Low	92	Soft	Orange	1
Kala mocha	Non-glutinous	0	Intermediate	98	Soft	Pink	2
Kalam kathi	Glutinous	0	Intermediate	57	Intermediate	Orange	1
Kalaturi	Intermediate	2	Intermediate	97	Soft	Blue	0
Kali bhat	Non-glutinous	1	Intermediate	80	Soft	Brown	1
Kali jira	Non-glutinous	2	Low	115	Soft	Blue	2
Kali kamod	Non-glutinous	2	Intermediate	105	Soft	Blue	1
Kaliray	Intermediate	0	Intermediate	102	Soft	Brown	2
Kalishankar	Non-glutinous	0	Intermediate	65	Soft	Blue	1
Kalo boro	Intermediate	0	Intermediate	112	Soft	Brown	2
Kalo dhan	Non-glutinous	0	Intermediate	5	Hard	Grey	2
Kalo dhepa	Non-glutinous	0	Intermediate	97	Soft	Brown	2
Kalo dumra	Non-glutinous	0	Intermediate	82	Soft	Grey	1
Kalo meteh	Intermediate	0	Intermediate	5	Hard	Black	2
Kalo mota	Intermediate	0	Intermediate	50	Intermediate	Brown	2
Kalo moti	Non-glutinous	0	Intermediate	98	Soft	Blue	2
Kalo tulsi	Non-glutinous	0	Intermediate	100	Soft	Black	1
Kamath	Non-glutinous	0	Intermediate	112	Soft	Brown	1
Kamini	Non-glutinous	2	Intermediate	40	Hard	Blue	2
Kaminibhog	Non-glutinous	2	Intermediate	105	Soft	Blue	2
Kamini-sal	Non-glutinous	2	Intermediate	85	Soft	Blue	0
Kanakchur	Non-glutinous	2	Intermediate	112	Soft	Blue	2
Kankhiri	Non-glutinous	0	Intermediate	55	Intermediate	Brown	1
Kankhria	Non-glutinous	0	Intermediate	75	Soft	Blue	1
Kankri	Non-glutinous	0	Intermediate	96	Soft	Brown	2
Kankuria	Non-glutinous	0	Intermediate	80	Soft	Brown	1
Kanta jhinga-sal	Intermediate	0	Intermediate	85	Soft	Blue	2
Kanta rangi	Non-glutinous	0	Intermediate	94	Soft	Brown	2
Kanthali champa	Non-glutinous	2	Intermediate	51	Intermediate	Blue	0
Karni	Glutinous	0	Intermediate	94	Soft	Grey	2
Karpur kranti	Non-glutinous	1	Intermediate	95	Soft	Blue	2
Karpurtul	Non-glutinous	2	Intermediate	58	Intermediate	Blue	0
Kartike patnai	Intermediate	0	Intermediate	86	Soft	Blue	1
Kata raini	Intermediate	2	Intermediate	80	Soft	Orange	2
Kataribhog	Non-glutinous	2	Intermediate	112	Soft	Blue	0
Kati jungli	Non-glutinous	0	Intermediate	116	Soft	Brown	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Katki aush	Non-glutinous	0	Intermediate	40	Hard	Orange	2
Kaya	Non-glutinous	0	Intermediate	108	Soft	Brown	2
Kelas	Intermediate	0	Low	5	Hard	Brown	2
Keleh	Non-glutinous	0	Intermediate	56	Intermediate	Brown	2
Kendu manjia	Intermediate	0	Intermediate	80	Soft	Grey	1
Kerala sundari	Non-glutinous	0	Intermediate	46	Intermediate	Blue	0
Kermal	Intermediate	0	Low	7	Hard	Blue	2
Keshab-sal	Non-glutinous	0	Intermediate	80	Soft	Blue	2
Ketaki	Non-glutinous	0	Low	104	Soft	Brown	2
Kharisha bhog	Non-glutinous	1	Intermediate	107	Soft	Blue	2
Khas dhan	Non-glutinous	1	Intermediate	108	Soft	Blue	0
Khaskani	Non-glutinous	2	Intermediate	104	Soft	Blue	0
Khatia tika	Non-glutinous	0	Intermediate	102	Soft	Brown	2
Khejur chhari	Non-glutinous	0	Intermediate	80	Soft	Orange	1
Kholam kuchi	Non-glutinous	0	Intermediate	71	Soft	Orange	2
Khudi khasa	Non-glutinous	2	Intermediate	116	Soft	Blue	0
Kinari	Non-glutinous	0	Intermediate	25	Hard	Blue	2
Kodaliya	Non-glutinous	0	Intermediate	46	Intermediate	Blue	1
Kokila patnai	Intermediate	0	Intermediate	98	Soft	Brown	1
Koljam	Non-glutinous	0	Intermediate	97	Soft	Blue	1
Krishnabhog	Non-glutinous	2	Intermediate	25	Hard	Blue	1
Krishnamukhi	Non-glutinous	2	Intermediate	70	Soft	Blue	2
Kubja	Intermediate	0	Intermediate	105	Soft	Blue	0
Kuji patli	Non-glutinous	0	Low	86	Soft	Blue	0
Kumrogorh	Non-glutinous	0	Intermediate	77	Soft	Blue	1
Kutti ada	Intermediate	0	Intermediate	120	Soft	Blue	1
Lakkhan-sal	Non-glutinous	1	Low	80	Soft	Blue	1
Lakkhi churah	Non-glutinous	0	Intermediate	45	Intermediate	Blue	2
Lakkhi dighal	Intermediate	0	Intermediate	85	Soft	Pink	2
Lakshmi jata	Intermediate	0	Intermediate	120	Soft	Blue	2
Lakshmi kajal	Non-glutinous	0	Low	95	Soft	Blue	2
Lal aush	Non-glutinous	0	Intermediate	86	Soft	Pink	1
Lal badshabhog	Non-glutinous	2	Intermediate	60	Intermediate	Blue	0
Lal bahal	Non-glutinous	0	Intermediate	116	Soft	Blue	1
Lal boro	Non-glutinous	0	Intermediate	15	Hard	Blue	2
Lal getu	Intermediate	0	Intermediate	77	Soft	Pink	2
Lal gobindabhog	Intermediate	2	Intermediate	85	Soft	Blue	0
Lal jabra	Non-glutinous	0	Intermediate	117	Soft	Orange	1
Lal jhuloor	Intermediate	0	Intermediate	60	Intermediate	Blue	2
Lal kalam	Intermediate	0	Intermediate	46	Intermediate	Blue	1
Lal kamal	Non-glutinous	0	Intermediate	108	Soft	Grey	2
Lal kamini	Non-glutinous	0	Intermediate	75	Soft	Blue	1
Lal kashi phul	Intermediate	0	Intermediate	85	Soft	Orange	2
Lal patnai	Non-glutinous	0	Intermediate	109	Soft	Blue	1
Lal pua	Intermediate	0	Intermediate	98	Soft	Pink	2
Lal saroo	Non-glutinous	0	Intermediate	80	Soft	Blue	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Lalos	Non-glutinous	0	Intermediate	80	Soft	Blue	1
Langal muda	Glutinous	0	Intermediate	118	Soft	Orange	1
Lata-sal	Intermediate	0	Intermediate	50	Intermediate	Blue	2
Lathi-sal	Glutinous	0	Intermediate	5	Hard	Blue	2
Lebu-sal	Non-glutinous	0	Intermediate	5	Hard	Blue	1
Leda-sal	Non-glutinous	0	Intermediate	100	Soft	Blue	2
Leta-sal	Glutinous	0	Intermediate	70	Soft	Pink	1
Lilabati	Non-glutinous	2	Intermediate	70	Soft	Blue	1
Loha gorah	Non-glutinous	0	Intermediate	102	Soft	Blue	1
Lohajangi	Non-glutinous	0	Low	117	Soft	Blue	2
Lugdhi-sal	Non-glutinous	0	Intermediate	100	Soft	Blue	1
Luli-sal	Non-glutinous	0	Intermediate	115	Soft	Violet	2
Maadu	Non-glutinous	0	Low	95	Soft	Blue	2
Madhumita	Non-glutinous	0	Intermediate	112	Soft	Blue	2
Madhuri	Non-glutinous	0	Low	100	Soft	Blue	1
Madraraj	Intermediate	0	Intermediate	20	Hard	Pink	2
Magur-sal	Non-glutinous	0	Intermediate	90	Soft	Orange	2
Maiti	Intermediate	0	High	20	Hard	Blue	2
Majhi jhuloor	Non-glutinous	0	Low	80	Soft	Orange	2
Malabati (syn. Orameteh)	Non-glutinous	0	Intermediate	85	Soft	Orange	2
Mallika	Glutinous	0	Low	42	Intermediate	Blue	1
Mallik-sal	Non-glutinous	0	Intermediate	105	Soft	Orange	2
Marich boot	Non-glutinous	1	High	40	Hard	Blue	2
Marich mukhi	Non-glutinous	0	Intermediate	108	Soft	Blue	1
Marich mukul	Non-glutinous	2	Intermediate	62	Soft	Blue	2
Marich-sal	Non-glutinous	2	Low	82	Soft	Blue	1
Masineh (syn. Kalo tudey)	Intermediate	2	Intermediate	50	Intermediate	Blue	2
Mati sara	Non-glutinous	0	Intermediate	60	Intermediate	Blue	2
Matla	Intermediate	0	Intermediate	102	Soft	Blue	2
Meghna	Non-glutinous	0	Intermediate	115	Soft	Blue	0
Meghnad-sal	Non-glutinous	0	Low	82	Soft	Blue	0
Megi	Intermediate	0	Intermediate	72	Soft	Brown	2
Mehdi	Intermediate	0	Low	57	Intermediate	Blue	2
Mendi	Intermediate	0	Intermediate	65	Soft	Brown	2
Mihi nagra	Non-glutinous	0	Intermediate	108	Soft	Orange	2
Mohanbhog	Non-glutinous	2	Intermediate	80	Soft	Blue	2
Mohanmala	Non-glutinous	2	Low	77	Soft	Blue	0
Mohanras	Non-glutinous	0	Intermediate	110	Soft	Black	2
Mohipal	Intermediate	0	High	10	Hard	Blue	2
Mota dhusuri	Non-glutinous	0	Intermediate	65	Soft	Orange	$\frac{-}{2}$
Moti	Non-glutinous	0	Intermediate	97	Soft	Blue	$\frac{-}{2}$
Moul	Non-glutinous	0	Intermediate	67	Soft	Blue	$\frac{2}{2}$
Moyna	Non-glutinous	0	Intermediate	105	Soft	Orange	$\frac{2}{2}$
Moynaguri	Intermediate	0	Intermediate	108	Soft	Blue	1
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Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Mugai	Non-glutinous	0	Low	60	Intermediate	Brown	1
Mugai-sal	Intermediate	0	Low	90	Soft	Orange	2
Mugi mansara	Glutinous	0	Low	7	Hard	Blue	2
Mukhi balam (syn. Murgi balam	Intermediate	0	Intermediate	85	Soft	Orange	2
Murgi-sal	Intermediate	0	Low	115	Soft	Brown	2
Muri-sal	Non-glutinous	0	Intermediate	106	Soft	Blue	2
Nabanna-sal	Non-glutinous	0	Intermediate	98	Soft	Blue	2
Nagaland kalo	Glutinous	0	Intermediate	15	Hard	Blue	1
Nagaland sada	Glutinous	0	Low	105	Soft	Blue	2
Nageswari	Non-glutinous	0	Intermediate	80	Soft	Pink	2
Nagra	Non-glutinous	0	Intermediate	25	Hard	Blue	0
Nagra patnai	Non-glutinous	0	Intermediate	116	Soft	Blue	1
Nagra-sal	Glutinous	0	Intermediate	50	Intermediate	Grey	1
Najani	Intermediate	0	Intermediate	58	Intermediate	Blue	1
Najirma	Non-glutinous	0	Low	42	Intermediate	Blue	2
Narahasoi	Non-glutinous	0	Intermediate	95	Soft	Blue	0
Narasimha jata	Intermediate	1	Intermediate	90	Soft	Blue	1
Narkel chhari	Non-glutinous	0	Low	40	Hard	Blue	1
Nata	Non-glutinous	0	Intermediate	70	Soft	Pink	1
Neora	Non-glutinous	0	Low	112	Soft	Blue	1
Nicoh	Non-glutinous	0	Intermediate	60	Intermediate	Blue	1
Nikunja	Glutinous	0	Intermediate	102	Soft	Blue	2
Niroja	Non-glutinous	0	Intermediate	20	Hard	Pink	2
Noda mota	Non-glutinous	0	Low	75	Soft	Pink	2
Noichi	Non-glutinous	0	Intermediate	95	Soft	Brown	2
Nona	Non-glutinous	0	Intermediate	85	Soft	Blue	1
Nona bokra	Non-glutinous	0	Low	72	Soft	Brown	2
Nona ketki	Non-glutinous	0	Intermediate	116	Soft	Blue	1
Nona khirish	Non-glutinous	0	Intermediate	85	Soft	Brown	1
Nona-sal	Intermediate	0	Intermediate	82	Soft	Pink	1
Olee	Non-glutinous	2	Intermediate	70	Soft	Blue	2
Orah	Non-glutinous	0	Intermediate	68	Soft	Orange	1
Paadu	Non-glutinous	0	Intermediate	100	Soft	Blue	2
Paan	Intermediate	0	Intermediate	58	Intermediate	Blue	1
Paari	Non-glutinous	0	Low	70	Soft	Blue	1
Padma-sal	Non-glutinous	0	Intermediate	112	Soft	Blue	1
Pakri	Glutinous	0	Low	10	Hard	Blue	0
Palberi	Non-glutinous	0	Intermediate	102	Soft	Brown	0
Paloi	Non-glutinous	0	Intermediate	88	Soft	Orange	2
Paloi thopa	Non-glutinous	2	Low	51	Intermediate	Blue	2
Panati	Non-glutinous	0	Intermediate	58	Intermediate	Orange	2
Pani bhasa	Non-glutinous	0	Low	110	Soft	Orange	1
Pani duba	Glutinous	0	Low	85	Soft	Orange	1
Pani kalam	Non-glutinous	0	Intermediate	82	Soft	Orange	2
Pani kalas	Non-glutinous	0	Intermediate	68	Soft	Blue	1

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Pani noli dhan	Non-glutinous	0	Intermediate	95	Soft	Orange	1
Panirui	Non-glutinous	0	Intermediate	100	Soft	Blue	2
Panjab-sal	Non-glutinous	0	Intermediate	82	Soft	Blue	0
Para dhan	Non-glutinous	0	Intermediate	98	Soft	Brown	2
Paramita	Non-glutinous	0	Intermediate	111	Soft	Blue	1
Parangi	Non-glutinous	0	Intermediate	67	Soft	Orange	2
Pari	Non-glutinous	0	Intermediate	70	Soft	Blue	2
Parmai-sal	Non-glutinous	1	Intermediate	117	Soft	Blue	2
Pateni	Non-glutinous	0	Intermediate	64	Soft	Blue	1
Patnai	Intermediate	0	Low	110	Soft	Blue	2
Patnai-22	Intermediate	0	Intermediate	102	Soft	Blue	1
Payjam	Non-glutinous	0	Low	115	Soft	Blue	0
Phul mugri	Intermediate	0	Intermediate	115	Soft	Blue	1
Phul pakri	Non-glutinous	0	Low	62	Soft	Blue	2
Priya	Intermediate	0	Intermediate	116	Soft	Blue	1
Putikani	Non-glutinous	0	Intermediate	82	Soft	Brown	2
Radha kalma	Non-glutinous	0	Low	86	Soft	Orange	2
Radhashree	Intermediate	1	Intermediate	60	Intermediate	Blue	1
Radhatilak	Non-glutinous	2	Intermediate	58	Intermediate	Blue	0
Radhuni pagal	Non-glutinous	2	High	99	Soft	Blue	2
Raghu-sal	Intermediate	0	Intermediate	82	Soft	Orange	2
Raj jhinga	Non-glutinous	0	Low	117	Soft	Orange	2
Rajlakshmi	Non-glutinous	0	Intermediate	72	Soft	Blue	1
Rambok	Non-glutinous	2	Low	90	Soft	Blue	1
Ram-sal	Non-glutinous	0	Intermediate	92	Soft	Blue	0
Ranga dhari	Glutinous	0	Low	45	Intermediate	Pink	2
Rangi	Non-glutinous	0	Low	40	Hard	Blue	2
Rani akand	Non-glutinous	0	Intermediate	85	Soft	Blue	2
Rani kajal	Non-glutinous	2	Intermediate	120	Soft	Blue	2
Rani-51	Non-glutinous	0	Intermediate	82	Soft	Blue	2
Rani-sal	Non-glutinous	0	Intermediate	70	Soft	Orange	2
Ras panjor	Non-glutinous	0	Low	75	Soft	Orange	1
Rasaraj	Intermediate	0	Intermediate	88	Soft	Blue	2
Rata-sal	Non-glutinous	0	Intermediate	90	Soft	Blue	1
Rati-sail	Non-glutinous	0	Intermediate	66	Soft	Blue	1
Ratul aush	Non-glutinous	0	Intermediate	20	Hard	Pink	1
Reda dhan	Intermediate	0	Intermediate	81	Soft	Blue	1
Roopsa	Non-glutinous	0	Intermediate	90	Soft	Brown	2
Rup-sal	Intermediate	0	Intermediate	55	Intermediate	Blue	2
Saban-sal	Intermediate	0	Intermediate	2	Hard	Pink	1
Sabita patnai	Non-glutinous	0	Intermediate	58	Intermediate	Blue	1
Sabraj	Non-glutinous	0	Intermediate	105	Soft	Brown	2
Sada dhan	Non-glutinous	0	Low	114	Soft	Blue	2
Sada dhula-sal	Non-glutinous	0	Intermediate	110	Soft	Blue	2
Sada getu	Intermediate	0	Intermediate	105	Soft	Blue	2
Sada jabra	Intermediate	0	Low	116	Soft	Grey	2

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Sada jhinga-sal	Intermediate	0	Intermediate	105	Soft	Blue	2
Sada jhuloor	Glutinous	0	Low	20	Hard	Blue	2
Sada kaya	Intermediate	0	Intermediate	5	Hard	Pink	2
Sada meteh	Intermediate	0	Low	108	Soft	Orange	2
Sada mota	Glutinous	0	Intermediate	85	Soft	Pink	0
Sada nuniya	Non-glutinous	2	Intermediate	40	Hard	Blue	0
Sada parmai-sal	Intermediate	0	Intermediate	105	Soft	Pink	2
Sada patnai	Intermediate	0	Intermediate	102	Soft	Blue	2
Sagarika	Glutinous	0	Intermediate	95	Soft	Blue	2
Samudra phen	Glutinous	0	Intermediate	62	Soft	Blue	1
Saroo ausha	Intermediate	0	Intermediate	62	Soft	Blue	2
Saroo gurguri	Intermediate	0	Low	95	Soft	Blue	1
Saroo nagra	Intermediate	0	High	60	Intermediate	Pink	2
Sateen	Non-glutinous	0	Intermediate	90	Soft	Blue	0
Sesh phal	Non-glutinous	0	Low	101	Soft	Brown	2
Shakti	Non-glutinous	0	Low	108	Soft	Pink	1
Shal keleh	Non-glutinous	0	Low	85	Soft	Pink	2
Shankari komal	Non-glutinous	0	Intermediate	107	Soft	Blue	1
Shati	Non-glutinous	0	Intermediate	87	Soft	Pink	2
Shati jeleh	Non-glutinous	0	Intermediate	62	Soft	Pink	1
Shatia	Non-glutinous	0	Intermediate	82	Soft	Blue	1
Shatia gorah	Non-glutinous	0	Intermediate	80	Soft	Orange	2
Shishaphal	Non-glutinous	0	Intermediate	68	Soft	Brown	1
Shiuli	Non-glutinous	0	Intermediate	92	Soft	Blue	1
Shiuli mukul	Non-glutinous	2	Intermediate	58	Intermediate	Blue	2
Shiyal raj	Non-glutinous	0	Intermediate	72	Soft	Blue	2
Sholeh	Non-glutinous	0	Intermediate	115	Soft	Blue	2
Sholpana	Intermediate	0	Low	110	Soft	Orange	2
Shotput	Intermediate	0	Intermediate	108	Soft	Grey	1
Shua kalma	Non-glutinous	0	Low	105	Soft	Orange	1
Shungo baran	Intermediate	0	Low	92	Soft	Blue	2
Silot	Intermediate	0	Intermediate	28	Hard	Blue	2
Sindoor-sal	Glutinous	0	Low	12	Hard	Blue	2
Sitabhog	Non-glutinous	0	Intermediate	50	Intermediate	Blue	1
Sita-sal	Glutinous	0	Intermediate	90	Soft	Blue	2
Soleri	Intermediate	1	Low	50	Intermediate	Blue	0
Sona dhusuri	Glutinous	0	Intermediate	50	Intermediate	Blue	2
Sonajhuli	Glutinous	0	Intermediate	115	Soft	Blue	2
Sopti	Glutinous	0	Intermediate	7	Hard	Pink	2
Srabanti-sal	Non-glutinous	0	Low	71	Soft	Brown	2
Subal-sal	Glutinous	0	Low	60	Intermediate	Blue	0
Subasita	Intermediate	2	Intermediate	79	Soft	Blue	0
Sumitra	Non-glutinous	0	High	95	Soft	Blue	2
Sundar mukhi	Non-glutinous	0	Intermediate	52	Intermediate	Pink	2
Sundari	Non-glutinous	2	Intermediate	2	Hard	Blue	2
Swarnakanti	Non-glutinous	2	Intermediate	102	Soft	Blue	0

Landrace name	Endosperm Type	Aroma	Alkali Digestion	Gel: Mean Distance (mm)	Gel Consistency	Gel Colour	Phenol Reaction
Talmugur	Intermediate	0	Intermediate	118	Soft	Brown	2
Tengra-sal	Non-glutinous	0	Intermediate	70	Soft	Blue	2
Thakur-sal	Non-glutinous	0	Intermediate	112	Soft	Blue	2
Thuba	Non-glutinous	0	Intermediate	72	Soft	Blue	2
Tikarnadi	Non-glutinous	0	Intermediate	62	Soft	Blue	2
Tikia patnai	Non-glutinous	0	Intermediate	112	Soft	Blue	2
Tilak kacheri	Non-glutinous	0	Low	110	Soft	Blue	1
Tilakpeti	Non-glutinous	0	Intermediate	114	Soft	Blue	2
Titabor	Non-glutinous	0	Intermediate	108	Soft	Blue	1
Tulai panji	Non-glutinous	2	Intermediate	102	Soft	Blue	0
Tulo pajoy	Non-glutinous	0	Intermediate	112	Soft	Blue	1
Tulsi manjari	Non-glutinous	2	Intermediate	115	Soft	Blue	1
Tulsi mukul	Non-glutinous	2	Intermediate	115	Soft	Blue	1
Tulsibhog-B	Non-glutinous	1	Intermediate	60	Intermediate	Blue	0
Tulsibhog-N	Non-glutinous	2	Intermediate	80	Soft	Blue	2
Yesem	Intermediate	0	Intermediate	40	Hard	Blue	1

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Conflict of Interest

Authors declare no conflict of interest.

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