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Program Based Research Grant (PBRG)

Sub-Project Completion Report on Collection, Conservation and Characterization of Important Plant Genetic Resources

Sub-Project Duration
February 2018 to February 2022

Coordinating Organization
Crops Division
Bangladesh Agricultural Research Council



Project Implementation Unit
National Agricultural Technology Program-Phase II Project
BANGLADESH AGRICULTURAL RESEARCH COUNCIL

New Airport Road, Farmgate, Dhaka-1215, Bangladesh

www.barc.gov.bd

Program Based Research Grant (PBRG)

Sub-project Completion Report

on

Collection, Conservation and Characterization of Important Plant Genetic Resources

Implementing Organization

1. Plant Genetic Resources Centre, Bangladesh Agricultural Research Institute
2. Genetic Resources and Seed Division, Bangladesh Rice Research Institute
3. Genetic Resources and Seed Division, Bangladesh Jute Research Institute
4. Breeding Division, Bangladesh Sugarcrop Research Institute
5. Plant Breeding Division, Bangladesh Institute of Nuclear Agriculture
6. Cotton Development Board
7. Bangladesh Sericulture Research and Training Institute
8. Department of Horticulture, Bangladesh Agricultural University



Project Implementation Unit

National Agricultural Technology Program-Phase II Project

Bangladesh Agricultural Research Council

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Abbreviation and Acronyms

ANOVA	: Analysis of Variance
BARC	: Bangladesh Agricultural Research Council
BARI	: Bangladesh Agricultural Research Institute
BAU	: Bangladesh Agricultural University
BI	: Bioversity International
BINA	: Bangladesh Institute of Nuclear Agriculture
BJRI	: Bangladesh Jute Research Institute
BRRRI	: Bangladesh Rice Research Institute
BSRI	: Bangladesh Sugarcrop Research Institute
BSRTI	: Bangladesh Sericulture Research and Training Institute
CBD	: Convention on Biological Diversity
CDB	: Cotton Development Board
CGIAR	: Consultative Group on International Agricultural Research
Co-PI	: Co-Principal Investigator
CRG	: Competitive Research Grant
CV	: Coefficient of Variation
DAE	: Department of Agricultural Extension
DNA	: Deoxyribonucleic Acid
EC	: Executive Chairman
GI	: Geographical Indication
GIS	: Geographic Information System
GO	: Government Organization
GoB	: Government of Bangladesh
GPC	: Germplasm Centre
GPS	: Geographical Positioning System
GRSD	: Genetic Resources and Seed Division
HRC	: Horticulture Research Centre
HYV	: High Yielding Variety
IFAD	: International Fund for Agricultural Development
IPGRI	: International Plant Genetic Resources Institute
IPR	: Intellectual Property Rights
KGF	: Krishi Goveshona Foundation
LoA	: Letter of Agreement
MEGA	: Molecular Evolutionary Genetic Analysis
NARS	: National Agricultural Research System
NATP	: National Agricultural Technology Program
NBPGR	: National Bureau of Plant Genetic Resources
NGO	: Non-Government Organization
PBD	: Plant Breeding Division
PBRG	: Program Based Research Grant

PCR	:	Project Completion Report
PCR	:	Polymerase Chain Reaction
PGR	:	Plant Genetic Resources
PGRC	:	Plant Genetic Resources Centre
PGRFA	:	Plant Genetic Resources for Food and Agriculture
PI	:	Principal Investigator
PIC	:	Polymorphism information Content
PIU	:	Project Implementation Unit
PMU	:	Project Management Unit
PRA	:	Participatory Resource Appraisal
SAU	:	Sher-e-Bangla Agricultural University
SD	:	Standard Deviation
SDG	:	Sustainable Development Goal
SoE	:	Statement of Expenditure
SSR	:	Single Sequence Repeat
UPGMA	:	Unweighted Pair Group Method with Arithmetic Mean
USA	:	United States of America
WB	:	World Bank

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Executive Summary

Plant genetic resources are the most valuable and essential basic raw materials for crop improvement providing biological basis for world food security supporting livelihoods. Cultivated varieties, obsolete varieties, primitive cultivars (landraces), wild and weedy species, near relatives of cultivated species etc. are considered as component plant genetic resources. Bangladesh is characterized by a mixture of tropical and sub-tropical environments offering congenial growing condition for numerous agri-horticultural crops. It is bestowed with immense agro-biodiversity and rich diversity of landraces, traditional/farmers' varieties in several agri-horticultural crops with a good number of timber and medicinal plants which are indigenous to the country. The diverse 30 agro-ecological regions of the country have sustained rich genetic resources of crop plants. Collection and conservation of the plant genetic diversity is essential for present and future human well-being. Adoption of modern agriculture, destruction of habitat, aggression of local and overseas private seed companies and other reasons have caused high genetic erosion in the country. With a view to collect, characterize (morphological and molecular), conserve and documentation of important plant genetic resources including Geographical Indication (GI) crops, landraces and released varieties for establishing 'Intellectual Property Rights (IPR)' a coordinated sub-project titled "Collection, Conservation and Characterization of Important Plant Genetic Resources" (ID: 128) has been implemented by seven NARS institutes viz. BARI, BRRI, BJRI, BSRI, BINA, CDB, BSRTI and one University viz. BAU. As coordinating organization, BARC arranged meeting, inception, training and review workshops. It also monitored and evaluated technical activities at field and laboratory levels as well as edited and compiled reports (half yearly, annual and sub-project completion reports) submitted by implementing organizations. Participating organizations collected germplasm from target areas following appropriate procedures and the germplasm were conserved preliminary in active/short term storage and were characterized following standard descriptors for respective crops.

In total 1184 germplasm of different crops were collected by implementing institutes where BARI collected 600 (Cereals -14, Pulses-39, Oilseeds-26, Vegetables-455, Spices-36, Fruits-14, Medicinal plants-12 and Other crops - 4), BRRI collected 247 rice, BJRI collected 35 (*Corchorus capsularis*-23, *Corchorus olitorius*-9 and *Hibiscus sabdariffa*-3), BSRI collected 68 sugarcane, BINA collected 199 (Rice-151, Chilli-5, Turmeric-2, Ginger-2, Bitter gourd-3, Brinjal-9, White gourd-3, Sweet gourd-3, Bottle gourd-1, Sponge gourd-1, Okra -3, Bean -8, Groundnut-4, Mustard-1, Sesame-2 and Black gram -1) and BAU collected 35 Yam germplasm during sub-project tenure.

In total 1936 germplasm were characterized morphologically under the sub-project among which BARI has characterized 844 (Pumkin-64, Cucmber-26, Brinjal-284, Bitter gourd-48, Mungbean-97, Bottle gourd-223, Amaranthus-80 and Guava -22), BRRI characterized 264 rice (T. aman-120, Boro-96, Aus -48), BJRI characterized 97 jute (Deshi jute-62 and Tossa jute-35), BSRI characterized 51 sugarcane, BINA characterized 141 (Rice-73, Sesame-30, Groundnut-33 and Chilli-5), CDB characterized 343 cotton, BSRTI characterized 60 mulberry and BAU characterized 136 (Banana-60, Aroids-45 and 31 Yam) germplasm during the project period.

Molecular characterization of 526 germplasm of different crops has been completed by the implementing organizations. Twenty five mustard germplasm were characterized by BARI, whereas 216 rice (T. Aman-120; Boro-48 and Aus-48) and 66 jute germplasm were characterized by BRRI and BJRI, respectively. Likewise, BINA and BAU characterized 83 rice and 136 (Banana-60, Aroids-45 and Yam-31) germplasm, respectively.

All the germplasm comprised of orthodox seeds collected by BARI, BRRI, BINA and BJRI have been conserved in short term storage/active collection in the respective institutes. After completion of necessary procedures the seeds will be conserved in the base collection/long term preservation units. Recalcitrant seed germplasm collected by BARI, BSRI and BAU have been conserved in field gene bank of corresponding organizations.

An outstanding achievement of the sub-project came out with the release of 15 varieties (Banana-5, Aroids-4 and Yam-5 and chewing type sugarcane variety-1) by BAU and BSRI, respectively. All the released varieties are supposed to bring a positive impact in nutrition improvement of the farming community as the varieties are known as potent source of various health promoting stuffs. However previously collected germplasm were also been evaluated under the sub-project. Five research articles (BAU-4; BARI-1) are published and six are under process (BRRI-2, BJRI-1, BINA-2 and BSRI-1) from the results of this research.

PBRG Sub-project Completion Report (PCR)

A. Sub-project Description

1. Title of the PBRG sub-project: Collection, Conservation and Characterization of Important Plant Genetic Resources

2. Implementing organization(s):

- 2.1. GRSD, Bangladesh Rice Research Institute (BRRI)
- 2.2. PGRC, Bangladesh Agricultural Research Institute (BARI)
- 2.3. GRSD, Bangladesh Jute Research Institute (BJRI)
- 2.4. Breeding Division, Bangladesh Sugarcrop Research Institute (BSRI)
- 2.5. Plant Breeding Division, Bangladesh Institute of Nuclear Agriculture (BINA)
- 2.6. Cotton Development Board (CDB)
- 2.7. Bangladesh Sericulture Research and Training Institute (BSRTI) and
- 2.8. Department of Horticulture, Bangladesh Agricultural University (BAU).

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4. Sub-project budget (Tk.):

4.1 Total: (in Tk. as approved): 3,79,94,220.00

4.2 Latest Revised (if any): 3,79,94,220.00

5. Duration of the sub-project:

5.1 Start date (based on LoA signed) : 20 February 2018

5.2 End date : 19 February 2022

6. Background of the sub-project:

Genetic resources means the genetic materials of actual potential value. They are the most valuable and essential basic raw materials or tools to meet the current and future needs of crop improvement programs that support sustainable development. Plant genetic resources for food and agriculture (PGRFA) are vital components of biodiversity; they meet human needs for food, feed, fiber, shelter and medicines, and contribute to trade and cultural traditions. Collection and conservation of the plant genetic diversity is essential for present and future human well-being, since the success of any crop improvement program depends on diversity of PGR. Genetic diversity is the foundation of crop improvement programs. There is a pressing need for more genetic diversity to work upon, to cater to varied kind of problems and needs. Genetic diversity gives species the ability to adapt to the changing climates and environments, and to new pests. Plant genetic resources comprise only a very small part of the natural plant resources. Fortunately Bangladesh is blessed with innumerable plant genetic materials. It is the primary and secondary center of origin/diversity of many agri-horticultural crops. It is the abode of about 5,000 species of vascular plants (Razzaque and Hossain, 2007). Adoption of modern agriculture, introduction of modern varieties, destruction of habitat, natural calamities like flood and drought, river erosion, massive deforestation, increasing population and man's development activities, aggression of local and overseas private seed companies, remarkable socio-economic changes in the country etc. are causing severe threat of extinction to PGR of different crops and their wild relatives. Many species are also threatened by over exploitation; illegal trade and competition with introduced alien species. A total of 226 (106 + 120) plant species have been enlisted in two volumes of Red Data Book (Khan, *et al.*, 2001). Twenty two agri-horticultural crops have been enlisted as endangered. Cultivated varieties (Breeders' varieties), obsolete varieties, primitive cultivars (landraces), wild and weedy species, near relatives of cultivated species and special genetic stocks are considered as plant genetic resources (PGR).

BARI genebank has Active collection (mid-term: temperature 5-6⁰C) and Base collection (long-term: temperature -22⁰C) storage facilities having capacity of conserving 100,000 germplasm in each unit, and the germplasm may be conserved safely for 50 to 100 years. Until now, 11405 germplasm of 148 crop species have been registered and conserved in the PGRC, BARI Genebank, where around 1772 cereals, 3553 pulses, 616 oilseeds, 487 spices, 4637 vegetables, 283 fruits and 57 other plants are being conserved in *ex-situ* conservation units (10845) and field genebank (560). Moreover, all of the germplasm are rejuvenated regularly following appropriate procedure to make a fresh stock.

BRRRI genebank has short, mid, and long-term storage facilities and the germplasm may be conserved safely for 50 to 100 years. Until now, 8630 germplasm have been registered and conserved in the Genebank, where around 5300 local landraces, 1400 pure lines, 1600 exotic indica, 100 japonica, and 46 wild species are available for utilization. Moreover, 90

wild rice samples are being conserved in *ex-situ* type field conservation at BIRRI net house. All of the germplasm were rejuvenated by every three years in a cyclic pattern (around 3000 accessions per year) to make a fresh stock.

The genebank of BJRI are being conserved 6012 germplasm comprising 2407 accessions of deshi jute (*Corchorus capsularis*), 1503 accessions of tossa jute (*C. olitorius*), 679 accessions of kenaf (*Hibiscus cannabinus*), 478 accessions of mesta (*Hibiscus sabdariffa*), 270 accessions of wild *Corchorus* species, 304 accessions of wild *Hibiscus* species, 252 accessions of allied genera and 119 accessions of interspecific hybrids. A total 2829 accessions have been characterized morphologically comprising 648 accessions of deshi jute, 1264 accessions of tossa jute, 516 accessions of kenaf, 340 accessions of mesta, 43 accessions of wild *Corchorus*, 18 accessions of wild *Hibiscus* species.

BSRI are being conserved 1159 sugarcane germplasm and maintained through plantation in field genebank. Out of them, 340 have been characterized morphologically.

Germplasm collection and conservation program has been initiated at BINA very recently and only mid-term conservation facility has been created. A total of 2173 germplasm of 69 crops are being conserved in BINA genebank out of which 1143 are cereals, 204 oilseeds, 104 spices, 470 pulses, 140 vegetables and 11 jute. Moreover, 101 germplasm of 10 fruit species are being conserved in field genebank.

CDB genebank has short, mid, and long-term storage facilities. A total of 520 cotton accessions have been conserved in CDB genebank in mid-term storage facility at Cotton Research Centre, Mahiganj, Rangpur. Moreover, all of the genotypes are rejuvenated by every five years in a cyclic pattern to make a fresh stock. Out of them, 200 germplasm have been characterized morphologically.

A total of 83 mulberry germplasm are being conserved in the field genebank of BSRTI, Rajshahi with high bush plantation system. The unit plot size is 4 m ×5 m and each plot consists of 20 plants per genotype.

At BAU-GPC a total of 779 germplasm of 15 crop species are being conserved out of which 347 are mango, 83 jackfruit, 08 litchi, 55 guava, 07 wax jumbo, 09 lime, 05 pummelo, 05 sweet orange, 04 sapota, 07 ber, 03 dragon fruit, 65 banana, 30 aroids, 31 yam and 120 medicinal plants. So far 286 germplasm of 12 crops have been characterized morphologically and 166 germplasm of four crops (mango: 45, banana: 60, aroids: 30 and yam: 31) have been characterized at molecular level.

In NATP: Phase-1 (2011-2014), 893 genotypes of 31 different mandate crops of NARS institutes and University have been characterized. Mono-crop research institute like BIRRI, BJRI, BSRI and CDB characterized rice, jute, sugarcane and cotton respectively. Multi-crop research organizations like BARI, BINA and BAU characterized 11, 12 and 5 different crops, respectively.

A total of 54 genotypes (30 GIs, 4 germplasm, 2 parental line and 18 released varieties of nine BARI mandate crops (Mango, Litchi, Banana, Citrus, Wild Orange, Burmese Grape, Golden Apple, Bael and Betel leaf) were characterized at morphological level (Hossain *et al.*, 2014). Among them 17 mango genotypes including 8 GI crops (Fazli, Langra, Gopalbhog, Khirsapat, Ashwina, Laxmanbhog, Surjapuri and Haribhanga), 8 released

varieties & 1 germplasm; 7 litchi genotypes including 4 GI crops (Kadmi, Mongalbari, Rajshahi local/deshi/ati and Bedana) & 3 released varieties; 6 GIs of betel leaf, 4 banana genotypes including 3 GI crops (Champa kola, Kabri/Bangla kola and Anaji kola & 1 released variety; 8 citrus genotypes including 6 GI crops (Elachi lebu, Kagzi lime, Kagza lime, Gootee jara, Gol jara and Pani jara) & 2 released varieties; 2 satkara genotypes including 1 GI crops (Jaintia satkara) and 1 released variety; 5 bael germplasm, 3 golden apple genotypes including 1 GI crop (Barishali amra) & 2 released varieties and 2 Burmese grape including 1 GI crop (Narsingdi Lotkan) & 1 released variety were characterized at morphological level. Molecular characterization done on 42 mungbean genotypes (01 GI, 06 released varieties and 35 advanced lines) has been completed (Hossain *et. al.*, 2014).

During the first phase of NATP (2011 to 2014), GRS Division, BRRI characterized 266 rice germplasm of Aus, Aman and Boro seasons including 20 Geographical Indication (GI) rice genotypes morphologically based on 53 morpho-agronomic traits. Out of 266 germplasm, 260 genotypes were characterized at the molecular level using 100 SSR markers (Khalequzzaman and Siddique, 2014).

BJRI characterized 48 germplasm of deshi jute including 2 GIs (Suti pat & Ashman Tara) & 7 released varieties and 47 germplasm of tossa jute including one GI (Deo Naila) & 5 released varieties, 3 varieties of kenaf and 2 varieties of mesta. Molecular characterization was done in 10 germplasm including 3 GIs, 2 released varieties of tossa jute and 5 germplasm of deshi jute (Ali and Hossain 2014).

BSRI characterized 100 sugarcane germplasm (2 GIs, 29 varieties and 69 germplasm) and molecular characterization of 37 accession including 2 GIs and 20 released varieties has been done in the laboratory through DNA fingerprinting (Karim and Hossain, 2014). CDB characterized 200 germplasm of cotton during first phase of NATP.

BINA has done morphological characterization of 57 varieties and 173 germplasm of 12 crops viz. Rice, Mustard, Sesame, Soybean, Groundnut, Mung bean, Chickpea, Lentil, Black gram, Grass pea, Tomato and Jute; 3 GI crops (‘Kalikolai’ of black gram, ‘Sonamoog’ of mung bean and ‘Local til’ of sesame). Molecular characterization of 31 varieties has been done and 102 germplasm and 3 GI crops by SSR and RAPD markers (Begum and Islam, 2014).

BAU characterized morphologically 51 germplasm including 4 GIs of Guava (Swarupkathi piyara, Kanchan Nagar piyara, Mukundapuri piyara and Sayedi piyara), 6 GIs of ber (Apple kul, Khacchar kul, Shabjee kul, Zahazi kul, Narekeli kul and Kachua kul) and 10 GIs of Aroids (Maan kachu, Ol kachu, Panchamukhi kachu, Poidnyl kachu, Salad kachu, Dud kachu, Surma kachu, Pani kachu, Shahebi kachu and Mukhi kachu), 17 mango varieties and 14 banana germplasm. Besides, molecular characterization of 10 genotypes have also done on 2 GI fruits of guava and ber (Rahim *et.al.*, 2014).

As Bangladesh is the signatory of Convention on Biological Diversity (CBD), it has legal bindings to protect her biodiversity through sustainable use and to ensure their best utilization and fair and equitable sharing of benefits out of the use of it. For minimizing genetic erosion, stoppage of piracy of PGR and establishment of Intellectual Property Rights (IPR) on potential landraces (geographical indication), mission oriented collection

(following GIS map), conservation, characterization and documentation program on existing PGRs in a systematic manner is essential.

Considering the above facts, a coordinated PBRG sub-project entitled “**Collection, Conservation and Characterization of Important Plant Genetic Resources**” has been undertaken involving seven NARS institutes and one university with the coordination of Crops Division, Bangladesh Agricultural Research Council (BARC).

7. Sub-project general objective(s):

- to characterize genetic resources including Geographical Indication (GI) crops and released varieties at morphological and molecular level;
- to characterize genetic resources for identification of desirable traits for varietal development and
- to document genetic resources and to protect from piracy as well as for facilitating establishment of property rights.

8. Sub-project specific objectives (component wise):

Bangladesh Rice Research Institute (BRRI)

- to collect rice landraces from unexplored areas especially from hilly, coastal and haor areas;
- to characterize important local germplasm both phenotypically and at molecular level;
- to analyze the genetic diversity of Bangladeshi rice germplasm in comparison to global rice varieties and
- to document and develop database of germplasm for establishing varietal rights and IPR Issues.

Bangladesh Agricultural Research Institute (BARI)

- to collect and characterize Geographical Indications (GIs), landraces of important crops;
- to conserve collected germplasm and BARI released varieties and
- to develop database of germplasm conserving at PGRC/BARI.

Bangladesh Jute Research Institute (BJRI)

- to collect and conserve germplasm of jute, kenaf, mesta and GI cultivars;
- to characterize germplasm for morpho-agronomic attributes and
- to characterize germplasm at molecular level using SSR and RAPD markers.

Bangladesh Sugarcrop Research Institute (BSRI)

- to enrich sugarcane germplasm bank with new accessions of cultivated and wild genotypes;
- to characterize selected sugarcane germplasm using morphological and molecular markers for identification of the genotypes on the basis of morphology and DNA fingerprinting and
- to investigate the extent of genetic diversity among sugarcane germplasm in order to provide more information to facilitate breeding program.

Bangladesh Institute of Nuclear Agriculture (BINA)

- to collect local germplasm of rice, oilseeds, pulses, spices and vegetables and
- to characterize selected crop germplasm.

Cotton Development Board (CDB)

- to characterize 320 cotton genotypes from CDB germplasm;
- to facilitate future use of the available germplasm and
- to facilitate establishing IP rights on cotton germplasm.

Bangladesh Sericulture Research and Training Institute (BSRTI)

- to characterize mulberry genotypes maintaining in germplasm bank and
- to document the varietal information of mulberry germplasm.

Bangladesh Agricultural University (BAU)

- to collect and characterize morphological features of indigenous banana, aroids and yam;
- to characterize indigenous banana, aroids and yam at molecular level;
- to document the characters of indigenous banana, aroids and yam and to utilize them for variety development using the desirable traits and
- to protect GI varieties of banana, aroids and yams from piracy.

9. Implementing location(s):

According to sub-project proposal (PP) implementing locations of sub-project activities of component organizations were as follows:

- BARC:** Bangladesh Agricultural Research Council, Farmgate, Dhaka and all over Bangladesh (implementing locations of component organizations).
- BRRI:** Genetic Resources and Seed Division, Bangladesh Rice Research Institute, Gazipur.
- BARI:** Plant Genetic Resources Centre (PGRC), Bangladesh Agricultural Research Institute, Gazipur and all over Bangladesh (five collection sites were selected near each regional station of BARI).
- BJRI:** Genetic Resources and Seed Division, Bangladesh Jute Research Institute, Dhaka, Jute Agriculture Experimental Station, Jagir, Manikganj and Regional Stations of BJRI (Rangpur and Cumilla).
- BSRI:** Breeding Division, Bangladesh Sugarcrop Research Institute, Ishurdi, Pabna and hill and coastal areas of the country.
- BINA:** Plant Breeding Division, Bangladesh Institute of Nuclear Agriculture, Mymensingh and Mymensingh (including Tangail) and Sylhet regions.
- CDB:** Central Cotton Research, Training & Seed Multiplication Farm, Sreepur, Gazipur and Cotton Research Farm, Jagadishpur, Jashore.
- BSRTI:** Bangladesh Sericulture Research and Training Institute, Rajshahi.
- BAU:** Bangladesh Agricultural University-Germplasm Center (BAU-GPC), Mymensingh.

10. Methodology in brief:

10.1. Bangladesh Agricultural Research Council

BARC acted as the coordinating organization of the implementing units i.e. BRRI, BARI, BJRI, BSRI, BINA, CDB, BSRTI and BAU. As coordinating body of the sub-project, Crops Division of BARC performed several activities with a view to maintaining the pace of sub-project activities of the implementing institutes in right track. The following activities were performed by the coordinating component:

- i. Organizing inception workshop to finalize work plan of implementing organizations;
- ii. Organizing training workshop for judicious running of sub-project activities;
- iii. Arranging coordination meeting periodically with all component institutes;
- iv. Performing monitoring and evaluation of technical activities of the implementing organizations at field and laboratories;
- v. Organizing Annual Review Workshop;
- vi. Compiling and editing coordinated yearly reports of the sub-project and
- vii. Compiling, editing and printing coordinated Sub-project Completion Reports (PCR)
 - Renowned scientists and teachers of different institutes and universities having experience on PGR management participated as expert members in the Inception and Review Workshops and gave valuable opinions for successful execution of the sub-project activities;
 - Coordination meeting was organized by BARC at regular interval with implementing institutes of the sub-project to gather updated information about progress of the sub-project activities and
 - Monitoring and Evaluation report, half yearly report, coordinated annual report and sub-project completion report were prepared following reporting formats supplied by NATP-2, PIU- BARC.

10.2. Bangladesh Rice Research Institute

10.2.1 Rice Germplasm Collection

Local germplasm were collected from different districts of Bangladesh. The collection program was mission oriented, targeting season and location specific and involving different GO, NGO and private sector personnel. Both fields as well as store/harvested collection approaches were followed. For collection, especial emphasis was given on remote areas like hilly, coastal and beel/haor areas. Five (5) collecting mission were made for collection of rice germplasm. Five teams such as ZN, KH, BF, KF and KFS were formed comprising 2-3 scientists in each team. Each expedition was conducted 2 to 5 days. At least 2-4 sites in each region were sampled for collecting rice germplasm. Some rice germplasm also collected personally by scientists without forming any team. Rice germplasm were collected from 29 upazilas of 14 districts. The teams were equipped with GPS apps, compass apps, digital camera, envelop, knife, scissors, ball pen, pencil, stapler etc. Targeted farmers for collection of germplasm were located with the help of field level workers of Department of Agricultural Extension (DAE) and other research personnel of different research institutes. Collector's name, number and date were recorded during collection. Name of crop species along with English, Bengali, local and cultivar name were recorded. Name of donor with ethnic group, village, union, upazila, district, latitude and longitude were noted. A 'Passport Data Form' having passport information was filled up during germplasm collection. Planned areas for collection are shown in Fig. 1.

10.2.2. Conservation and multiplication of collected rice germplasm

The collected germplasm were cleaned, dried, processed, and preliminarily conserved in short term storage of BRRI genebank. The collected rice germplasm have been conserved as an active collection. The samples were registered in conservation book immediately after collection. Collecting each sample is being assigned a registration number according to the source of acquisition and passport information. The collected rice germplasm were multiplied at the GRSD experimental field, BRRI, Gazipur in respective season and multiplied seeds were cleaned, processed, dried and conserved as new collection.

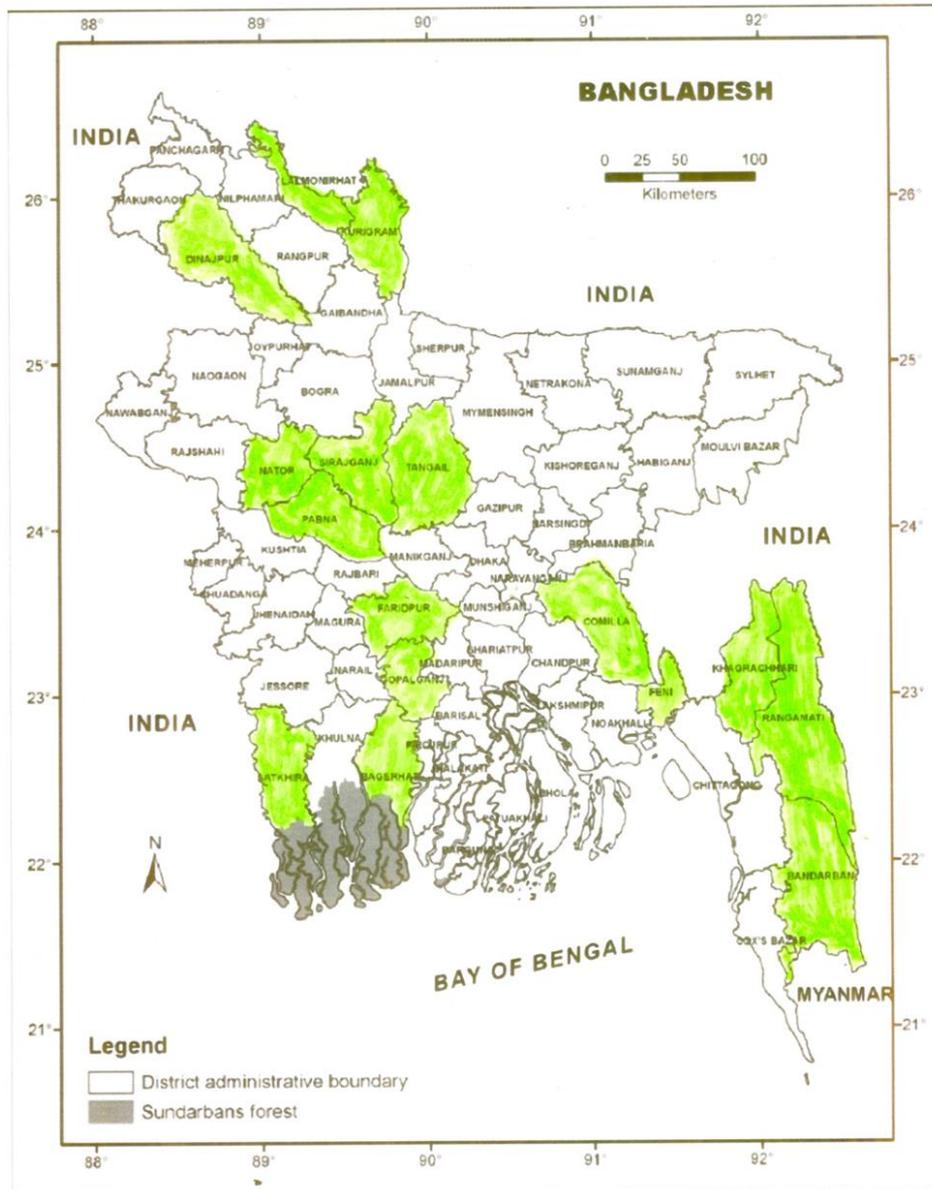


Fig. 1. GIS map showing planned areas (green color) for rice germplasm collection

10.2.3. Morphological characterization of plant material

Rice germplasm were characterized using the standard 'Rice Germplasm Descriptors and Evaluation Form' (BRRRI 2018). The germplasm were agro-morphologically characterized on the basis of 21 quantitative and 31 qualitative traits of rice. Single seedling (25-40 days aged) per hill with a spacing of 20 × 20 cm between rows and plants, respectively was planted where single row of 5.4 m long per entry/accession were used. Fertilizers were applied @ 60:20:40 kg NPK/ha. All of the fertilizers except urea were applied at the time of final land preparation. Urea was applied in three equal splits at 10, 25 and 35 days after transplanting. Appropriate control measures were taken for insect pests, diseases and weeds as and when necessary. Data on 31 qualitative characters and 21 quantitative characters were recorded.

A. Qualitative descriptor (31)

1. **Blade pubescence :** 1 = glabrous, 2 = Intermediate and 3= pubescent.
2. **Blade colour :** 1 = pale green, 2 = green, 3 = dark green, 4 = purple tips, 5 = purple margins, 6 = purple blotch and 7 = purple
3. **Leaf sheath:** anthocyanin colour: 1 = absent and 9 = Present.
4. **Basal leaf sheath colour:** 1 = green, 2 = purple lines 3 = light purple and 4 = purple.
5. **Leaf angle:** 1 = erect, 5 = horizontal, and 9 = drooping
6. **Flag leaf angle:** 1 = erect, 3 = semi erect, 5 = horizontal and 7 = descending.
7. **Ligule colour:** 1 = white, 2 = purple line and 3 = purple.
8. **Ligule shape:** 1 = acute to acuminate, 2 = 2-cleft and 3 = truncate
9. **Collar colour:** 1 = pale green, 2 = green and 3 = purple.
10. **Auricle colour:** 1 = pale green and 2 = purple.
11. **Culm anthocyanin colour:** 1 = absent and 9 = present.
12. **Culm angle:** 1 = erect, 3 = intermediate, 5 = open, 7 = spreading and 9 = procumbent.
13. **Internode colour:** 1 = green, 2 = light gold, 3 = purple lines and 4 = purple.
14. **Culm: strength:** 1 = strong, 3 = moderately strong, 5 = intermediate, 7 = weak and 9 = very weak.
15. **Panicle type:** 1 = compact, 5 = intermediate and 9 = open
16. **Secondary branching:** 0 = absent, 1 = light, 2 = heavy and 3 = clustered.
17. **Panicle exertion:** 1 = enclosed, 3 = partly exerted, 5 = just exerted, 7 = moderately well exerted and 9 = well exerted.
18. **Panicle axis:** 1 = straight and 2 = droopy.
19. **Shattering:** 1 = very low 3 = low, 5 = moderate, 7 = high and 9 = very high.
20. **Thresh ability:** 1 = difficult, 3 = moderately difficult, 5 = intermediate, 7 = loose and 9 = easy.
21. **Awn distribution:** 0 = none (awnless), 1 = tip only, 2 = upper quarter only, 3 = upper half only, 4 = upper three-quarters only and 5 = whole length.

22. **Awn color:** 1 = straw, 2 = gold, 3 = brown (tawny), 4 = red, 5 = purple and 6 = black.
23. **Apiculus colour:** 1 = white, 2 = straw, 3 = brown (tawny), 4 = green, 5 = red, 6 = red apex, 7 = purple, 8 = purple apex and 9 = black.
24. **Stigma colour:** 1 = white, 2 = light green, 3 = yellow, 4 = light purple and 5 = purple.
25. **Lemma and palea colour:** 0 = straw, 1 = gold and gold furrows on straw background, 2 = brown spots on straw, 3 = brown furrows on straw, 4 = brown (tawny), 5 = reddish to light purple, 6 = purple spots on straw, 7 = purple furrows on straw, 8 = purple, 9 = black and 10 = white.
26. **Lemma and palea pubescence:** 1 = glabrous, 2 = hairs on lemma keel, 3 = hairs on upper portion, 4 = short hairs and 5 = long hairs (velvety).
27. **Sterile lemma colour:** 1 = straw, 2 = gold, 3 = red and 4 = purple.
28. **Seed coat (bran) colour:** 1 = white, 2 = light brown, 3 = speckled brown, 4 = brown, 5 = red, 6 = variable purple and 7 = purple.
29. **Endosperm type:** 1 = non-glutinous (non-waxy), 2 = glutinous (waxy) and 3 = indeterminate.
30. **Decorticated grain scent (aroma):** 0 = non-scented, 1 = lightly scented and 2 = scented.
31. **Leaf senescence:** 1 = very early, 3 = early, 5 = intermediate (one leaf still green at harvest), 7 = late and slow and 9 = very late.

B. Quantitative descriptor (21)

1. **Seedling height (cm):** Mean length of 15 randomly selected seedlings was measured at 5- leaf stage, approximately 20-25 days after seeding.
2. **Ligule length (mm):** Mean length of 15 randomly selected ligules was measured after anthesis.
3. **Leaf blade length (cm):** Mean length of 15 randomly selected leaf blades was measured at early reproductive stage.
4. **Leaf blade width (cm):** Mean width of 15 randomly selected leaf blades was measured at early reproductive stage.
5. **Culm diameter (mm):** Mean diameter of 15 randomly selected culms (from mother tillers in the lowest internode) was measured at reproductive stage.
6. **Total tiller number:** Mean tiller number of 15 randomly selected hills was measured after flowering.
7. **Effective tiller number:** Mean number of effective tiller was measured on 15 randomly selected hills at early ripening stage.
8. **Culm length (cm):** Mean length of 15 randomly selected culms was measured after flowering.
9. **Panicle length (cm):** Mean length of 15 randomly selected Panicles was measured at dough stage.
10. **Plant height (cm):** Addition of the mean of culm length and panicle length.

11. **Days to 50% flowering:** Number of days required from seeding to 50% opening of the flowers.
12. **Days to maturity:** Number of days required from seeding to 80% panicle matured.
13. **Number of filled grain per panicle:** Mean number of filled grains/panicle was measured on 15 panicles.
14. **Number of unfilled grain per panicle:** Mean number of unfilled grains/panicle was measured on 15 panicles.
15. **1000 grains weight (g):** Mean weight of 1000 randomly selected seeds (grains) was measured after sun drying.
16. **Grain length (mm):** Mean length of 15 randomly selected grains was measured after sun drying.
17. **Grain width (mm):** Mean width of 15 randomly selected grains was measured after sun drying.
18. **Decorticated grain length (mm):** Mean length of 15 randomly selected dehulling grains was measured before milling.
19. **Decorticated grain width (mm):** Mean width of 15 randomly selected dehulling grains was measured before milling.
20. **Decorticated grain L/W ratio:** Mean length and width ratio of 15 randomly selected de-hulled grains.
21. **Yield (g/hill):** Mean weight of grains of 10 randomly selected hills after threshing and drying (at 14% moisture content).

10.2.4. Molecular characterization

Total genomic DNA was extracted from young leaves of three week old plants following the quick DNA extraction protocol of Ferdous *et al.*, 2012. PCR analysis was performed in 10 μ l reaction sample containing 3 μ l of DNA template, 4.5 μ l of GoTaq G2 Green Master Mix (Promega), 1.5 μ l of Nuclease-Free Water, 0.5 μ l each of 10 μ M forward and reverse primers using a Gene Atlas G (Astec, Japan) 96-well thermal cycler. The mixture was overlaid with 10 μ l of mineral oil to prevent evaporation. After initial denaturation for five minutes at 94°C, each cycle comprised 30 sec denaturation at 95°C, 30 sec annealing at 55°C, and 25 sec extension with a final extension for 5 min at 72°C at the end of 32 cycles. The PCR products were analyzed by electrophoresis on 8% polyacrylamide gel with a 1 Kb/50 bp DNA ladder (Thermo Scientific, USA) using mini vertical polyacrylamide gels for high throughput manual genotyping (CBS Scientific Co. Inc., CA, USA). 2.5 μ l of amplification products were resolved by running gel in 0.5X TBE buffer for 1.5-2.5 hrs depending upon the allele size at around 100volts and 500 mA current. The gels were stained in 5 μ l SYBR Safe DNA gel stain (10,000X concentration in DMSO, USA) with 200 ml 0.5X TBE buffer for 15 min and exposed to UV light using a molecular imager gel documentation unit (XR System, Uvitec Cambridge, France) for visualization. We used well-distributed SSRs for the diversity analysis; position (cM), repeat motifs, and chromosomal positions for the SSR markers can be found in the rice genome database (Gramene Portals, 2017). Most of these markers were obtained from a panel of fifty standard SSR markers, which has been proposed by CGIAR for rice diversity analysis (Islam *et al.*, 2018).

10.2.5. Documentation of rice germplasm

Documentation of every individual rice germplasm was done by taking photographs of the different stages of plant and using ‘Bangladesh Rice Research Institute Germplasm Descriptor & Evaluation Form (2018) (Descriptor for cultivated rice (*Oryza sativa* L.)’ published by Genetic Resources and Seed (GRS) Division, BRRI, Gazipur-1701, Bangladesh. Table 1 presents the data recorded on 52 morpho-agronomic characters for photo-documentation.

Table 1. Morphological characters for photo-documentation as per standard rice descriptors

1. Seedling height	7. Grain (spikelet)
2. LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:
3. Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	
4. Days after 50% heading	
5. Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	
6. Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exsertion f. Axis g. Shattering h. Thresh ability	8. Maturity a. Days to maturity from seedling 9. Yield

Data analysis

Data were analyzed for diversity, principal component analysis, PIC etc., using Statistic 10, Alpha Ease FC 4.0, Power Marker version 3.25, Past software, MEGA software and Microsoft Office Excel 2007.

11. Results and Discussion

11.1. Bangladesh Agricultural Research Council

Bangladesh Agricultural Research Council (BARC) was the coordinating component of the sub-project. It was not involved in any technical activities. Rather it provided technical and managerial support for judicious implementation of sub-project activities by the component institutes. It was involved in organizing inception workshop, organizing training workshop, arranging coordination meeting, performing monitoring and evaluation, organizing Annual Review Workshop, and compiling, editing and printing coordinated yearly and Sub-project Completion Reports (PCR).

11.1.1. Organizing Inception Workshop

To finalize work program of the implementing organizations a day long inception workshop of the sub-project “Collection, Conservation and Characterization of Important Plant Genetic Resources” was organized by coordinating component on 21 May 2018 at the Conference Room-1 of BARC. In total 53 participants from all component institutes including PIs and Co-PIs, working scientists, invited expert members, experienced scientists of component institutes and BARC personnel attended the workshop (Fig. 2). The workshop was aimed to inform the objective and the component wise work plan of the sub-project and receive feedback from the participants and the experts to improve the activity plan and methodology based on the national priority. The inaugural session of the workshop was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director, Crops Division, BARC and the Coordinator of the sub-project. Dr. Md. Kabir Ikramul Haque, the Executive Chairman of BARC was present as the Chief Guest. Dr. Mian Sayeed Hasan, Director, PIU-BARC was present as special guest. The invited expert members in the workshop were Dr. M. Matiur Rahman, Former Director General, BARI; Prof. Dr. Md. Shahidur Rashid Bhuiyan, Department of Genetics and Plant Breeding, Sher-e-Bangla Agricultural University (SAU); Dr. M. Khairul Bashar, Former Director (Research), BRRI; Dr. M. Mamtazul Haque, Former CSO, BARI and Dr. M. Shamsher Ali, Former Director General, BINA. The Principal investigators (PIs) or Co-principal investigators (Co-PIs) of eight NARS institutes viz. BARC, BARI, BRRI, BJRI, BSRI, BINA, CDB and BSRTI, and one university viz. BAU presented their proposed research programs. After thorough discussion, research program was finalized for each component institute, and crops were distributed among the component institutes.

In the inaugural session Dr. Md. Abdus Salam, Principal Scientific Officer, Crops Division, BARC and the PI of BARC component welcomed the participants and presented the overview of the sub-project. The Chairman of the inaugural session Dr. Md. Aziz Zilani Chowdhury commented that the inception workshop creates opportunity to visualize the planned activities and the proposed methodology to the valued participants and experts and make scope for improving the sub-project activities. He also invited opinion/suggestions from the scientists and expert members for the improvement of the proposed activities. There were two technical sessions which were chaired by Prof. Dr. Md. Shahidur Rashid Bhuiyan, Dept. of Genetics and Plant Breeding, SAU and Dr. Md. Aziz Zilani Chowdhury, Member Director, Crops Division, BARC. After

threadbare discussion, the following expert opinions /recommendations were made for the improvement of the research program for each component institute of the sub-project. Crops were also distributed among the component institutes. Proceedings of the inception workshop with list of participants are shown below.

Suggestions/recommendations made in the inception workshop

a. General recommendations and suggestions

- Standard Passport data protocol for a particular crop is to be followed and to be used for data collection by concerned personnel.
- Internationally accepted descriptors are to be followed for characterization of specific crop.
- It would be wise to list the crops for germplasm collection first and then prioritize and distribute the listed crops among the particular institutes for collection, characterization and conservation. Thus the expertise would be developed in plant genetic resources management in respective organizations.
- Comprehensive mapping to be done reviewing the NATP phase 1 work and then cataloguing with new crops and species.
- The duplication of the germplasm collection of same crop is to be avoided following standard method. Before collection of any germplasm, the previous collection record is to be reviewed and the personnel involved in the sub-project activities are to be trained on that for avoiding duplication.
- It should be cleared which germplasm would be collected newly and which previous collected germplasm would be characterized and conserved.
- Some GI crops should be identified and to be collected from the specific region and data to be captured as per needs for GI registration.
- GI crop, cultivar and landraces of important crops are to be collected.
- In documentation of the germplasm, the software modules prepared during NATP phase 1 might be explored and could be used.
- Software to be used for Gene Bank management.
- Collected germplasm to be conserved in duplicate for ensuring safety.

b. Suggestions and recommendations for specific component organization

BIRRI

- BIRRI should use the internationally accepted descriptor not the BIRRI descriptor for characterization of rice germplasm.

BARI

- As BARI has planned to collect, characterize and conserve mostly vegetables, they need to take initiatives from the scientist of Horticulture Research Centre (HRC).
- Chuijhal might be included for germplasm collection as it has a greater value. Chuijhal of Satkhira may be considered for GI registration.
- Minor fruits such as local mango are to be included.
- Yard long bean and cowpea germplasm are to be collected from specific area.

- The local brinjal cultivar ‘Jhumka begun’ and ‘Kanta begun’ are to be included in the program. Nakla of Sherpur may be considered for Jhumka begun collection.
- Yam is included both at BARI and BAU. It may be excluded from BARI.
- Original Sonamug is to be identified. It may be considered for GI and might be explored in Kishoregonj and Patuakhali.
- Cauliflower is to be excluded from the list of GI germplasm collection.

BINA

- BINA should use the same descriptors those BRRI use for characterization of rice and BARI use for agri-horticultural crops other than rice.
- Capsicum and soybean should be excluded as the cultivars of capsicum available are hybrids.
- BARI proposed for brinjal, therefore BINA may exclude it from their program.
- BINA should collect their mandate crop.

BSRTI

- Should explore the internationally accepted descriptors for their proposed germplasm characterization.

BAU

- Should give emphasis on characterization of collected germplasm of banana and aroids.
- Minor fruits such as Lalgota and Kaufal may be considered.

11.1.2. Organizing Training workshop

One Training Workshop on 'Collection and Documentation of Plant Genetic Resources' was organized by BARC during 19-20 November 2018 for the personnel involved in management and implementation of sub-project for judicious running of the sub-project activities. Forty scientists from component organizations viz. BARC, BARI, BRRI, BJRI, BSRI, BINA, CDB, BSRTI and BAU participated in the training workshop. The inaugural session of workshop was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC and Coordinator of the sub-project. Dr. Md. Kabir Ikramul Haque, Executive Chairman, BARC was present as chief guest in the session (Fig. 3).



Fig. 2. Participants and expert members attending ‘Inception Workshop’



Fig. 3. Session chairperson, chief guest and participants attending inaugural session of Training Workshop, 19-20 November 2019

a. Training module

SL. No.	Title of Training module
1	Scope and prospect of Plant genetic Resources
2	Role of Biodiversity in Food Security
3	Plant Genetic Resources and its National and International Perspective
4	Exploration and Collection of Plant Genetic Resources
5	Passport Data Recording and Description of Different Crops
6	Characterization and Evaluation of Genetic Resources
7	Geographical Indication its scope, limitations, benefits and registration
8	Conservation and Utilization of Plant Genetic resources
9	Descriptor of Crop variety
10	Plant genetic Resources-Legal Issues

11.1.3. Arranging coordination meeting with all component institutes

From the commencement of sub-project activities eight coordination meetings with component organizations were organized periodically by BARC on 20 September 2018, 23 January 2019, 01 April 2019, 13 June 2019, 21 October 2019, 03 February 2020, 09 March 2020 and 08 October 2020. Component wise progress, constraints and future plan of sub-project activities of each institute were discussed thoroughly in coordination meeting and comprehensive decision were made for overcoming constraints and expediting sub-project activities with a view to ensuring smooth running of the sub-project activities in right track. Proceedings of each coordination meeting are shown below.

a. Proceedings of 1st Coordination Meeting held on 20 September 2018

Chair : Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC
Date of Meeting : 20 September 2018
Time : 10.30 AM
Venue : Conference Room-2, BARC

First Coordination meeting of the sub-project “Collection, Conservation and Characterization of Important Plant Genetic Resources (ID-128)” was held on 20 September 2018 at Conference Room-2 of Bangladesh Agricultural Research Council (BARC). Chairperson of the meeting welcomed all the participants. He discussed about created crop wise passport data form of respective organization, sub-project activities report, progress of assigned activities and procurement plan. Then PIs/Co-PIs of all component organizations presented their prepared Passport data form. Passport data form for each institute was finalized with necessary correction. Following decisions were accepted based on detail discussion of PIs/Co-PIs of respective organization of the sub-project.

Decisions:

1. First part of Passport data form should be common for all crops during the collection of information. In order to germplasm collection the finalized Passport data form will be sent to PIs of respective organization by BARC.
2. Constraints should be mentioned in the report in case of germplasm collection from hilly areas by BRRI. Collection activity should be continued from other areas according to work plan of the sub-project.
3. GI crops’ name should be mentioned and molecular characterization of GI crops should be added in the report by BARI. Work plan for next 6 months should be prepared based on month and included in the report.
4. BJRI should emphasize on germplasm collection, characterization and regeneration activity from October 2018 and detail descriptor should be mentioned in report.
5. Progress report with photographs should be prepared according to reporting format and submitted to PIU and Crops Division by BSRI. Progress should be mentioned in tabular form in the report.
6. BAU should submit procurement plan within next 3 days. PI of BARC should inform regarding issue PI of BAU component.
7. Training on germplasm collection must be arranged by BARC.
8. The duration of half yearly report was from 20 February to 20 September 2018, so all organizations should submit half yearly report to Coordinator of the sub-project within 30 September 2018.

b. Proceedings of 2nd Coordination Meeting held on 23 January 2019

Chair : Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops)BARC
Date of Meeting : 23 January 2019
Time : 10.00 AM
Venue : Conference Room-2, BARC

Second Coordination Meeting of the PBRG sub-project “Collection, Conservation and Characterization of Important Plant Genetic Resources (ID-128)” was held on 23 January 2019 at Conference Room-2 of Bangladesh Agricultural Research Council (BARC). The Coordination meeting was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director,

Crops Division, BARC and the Coordinator of the sub-project. Chairperson of the meeting welcomed all participants including PIs of 09 component organizations of the sub-project. Then he requested all PIs to discuss progress regarding technical, financial, procurement, manpower recruitment and other activities of the sub-project. Then PIs/Co-PIs of all component organizations presented their reports. Following decisions were made based on detail discussion of technical and financial progress of the sub-project.

Sl. #	Organization	Decision
01	Bangladesh Rice Research Institute (BRRI)	<ul style="list-style-type: none"> Report should be prepared according to reporting format. Including farmer name in Passport data form of all collected germplasm should be mentioned in report. Describe identity of each variety & photograph of each variety should be included during morphological characterization.
02	Bangladesh Agricultural Research Institute (BARI)	<ul style="list-style-type: none"> Report should be prepared according to reporting format supplied by PIU-BARC. Passport data (Name, Place & Area etc.) with photograph of collected new GIs & Landraces germplasm should be included in report. Describe identity of each entry & photograph of each entry should be included during morphological characterization. Detail results of research experiment should be included in Annexure section of the report.
03	Bangladesh Institute of Nuclear Agriculture (BINA)	<ul style="list-style-type: none"> Information of reporting period should be included during preparation executive summary of the report. Molecular data including photograph should be included in report.
04	Bangladesh Jute Research Institute (BJRI)	<ul style="list-style-type: none"> Executive summary should be short and information of reporting period should be included during preparation of executive summary of the report. Passport data with photograph of collected 20 jute & allied fibers should be included in report. Detail data-information (including name & scientific name) of regenerated samples should be included in report.
05	Bangladesh Sugarcrop Research Institute (BSRI)	<ul style="list-style-type: none"> Report should be prepared according to reporting format. Farmer's name & address of collected 10 germplasm should be added in Passport data form and should be included in report. Describe identity of each entry & photograph of each entry should be included during morphological characterization.
06	Cotton Development Board (CDB)	<ul style="list-style-type: none"> Report should be prepared according to reporting format. Data should be presented in section 11 of the reporting format.
07	Bangladesh Sericulture Research and Training Institute (BSRTI)	<ul style="list-style-type: none"> Report should be prepared according to PCR format of NATP-2. Data should be recorded as per standard descriptors of mulberry and should be added in section 11 of the report.
08	Bangladesh Agricultural University (BAU)	<ul style="list-style-type: none"> Passport data of collected 30 yam germplasm should be included in report. Morphological data of yam should be recorded and presented in report with photograph.

All Organization must follow:

Half yearly report for the period of August 2018 to January 2019 and yearly report for the period of February 2018 to January 2019 must send to Member Director (Crops) & Coordinator (PBRG-PGR, ID:128) within 07 February 2019 and 14 February 2019, respectively.

c. Proceedings of 3rd Coordination Meeting held on 01 April 2019

Chair : Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC
Date of Meeting : 01 April 2019
Time : 10.30 AM
Venue : Conference Room-2, BARC

Third coordination meeting of PBRG-PGR sub-project entitled “Collection, Conservation and Characterization of Important Plant Genetic Resources (ID-128)” was held on 01 April 2019 at Conference Room-2 of Bangladesh Agricultural Research Council (BARC). The coordination meeting was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director, Crops Division, BARC and the Coordinator of the sub-project. Chairperson of the meeting welcomed all participants including PIs of 09 component organization of the sub-project. He emphasized photographs of different stages of sub-project activities should be recorded. Then he requested all PIs to discuss the technical progress and financial progress of the sub-project. In the meantime, Dr. Md. Kabir Iqramul Haque, Executive Chairman, BARC attended in the meeting. He mentioned that Government has taken plan to achieve the targets of SDG-2 within 2030. He also mentioned that according to target of SDG, the activity regarding collection and conservation of Plant Genetic Resources (PGR) available in the country must be completed within 2020. Then PIs/Co-PIs of all component organizations presented their reports. Finally, reports were reviewed organization wise and the following decisions are made based on presentation of respective PIs of component organizations.

Decisions:

1. Passport data form having 24 section (attachment 1) should be filled up during germplasm collection and maintained properly, and all passport information are to be included in the report.
2. Internationally recognized descriptors should be followed for characterization of newly collected and/or conserved germplasm of selected crop.
3. Passport data forms are to be filled up properly, and descriptor list and descriptor states are to be included in each article on characterization. Complete yearly report including all progress of activities is to be prepared and sent to Member Director (Crops) & Coordinator (PBRG-PGR, ID:128) within 7 working days.
4. All component organizations should follow the same reporting format during report preparation.

d. Proceedings of 4th Coordination Meeting held on 13 June 2019

Chair : Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC
Date of Meeting : 13 June 2019
Time : 10.30 AM
Venue : Conference Room-1, BARC

Fourth coordination meeting of the sub-project entitled “Collection, Conservation and Characterization of Important Plant Genetic Resources (ID-128)” was held on 13 June 2019 at the Conference Room-1 of BARC. The meeting was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC and the Coordinator of the sub-project. Chairperson of the meeting welcomed all participants including PIs of 09 component organizations of the sub-project. Then he requested all PIs to discuss the progress regarding technical, financial and procurement activities of the sub-project. Dr. Md. Abdus Salam, Principal Scientific Officer, Crops Division, BARC and the PI of BARC component of the

sub-project presented the summary of yearly report of all component organizations. Then PI of BARI, BRRI, BJRI, BSRI, BINA, CDB, BSTRI and BAU component presented their yearly report (for the period from February 2018 to January 2019) and work plan of next six months (August 2019-January 2020) one by one.

Based on yearly report and presentation of PIs of component organizations the following institute wise decisions were made.

Sl.#	Organization	Decision
01	Bangladesh Rice Research Institute (BRRI)	<ul style="list-style-type: none"> • Reporting format should be followed accordingly during report preparation. • All Information regarding collection, conservation and characterization must be included in report. • Photographs of all collected germplasm must be included in report. • Photographs of qualitative traits regarding plant, leaf, panicle, fruits, seeds etc. of all entries included in morphological characterization experiment must be shown in the report. • Necessary step must be taken for registration of local cultivar of rice (Kataribhog, Kalijira and Chinigura etc.) as GI crop. • Date of next germplasm collection expedition and monitoring visit would be fixed through discussion over telephone.
02	Bangladesh Agricultural Research Institute (BARI)	<ul style="list-style-type: none"> • All reports (yearly & half yearly) should be prepared following reporting format strictly. • All information regarding collection, conservation and characterization must be included in report. • All technical reports are to be placed under point 10 of reporting format. Passport data form may be shown in Annexure. • Tentative dates of germplasm collection exploration might be fixed through discussion. • Several local potato cultivars like Hagrai, Sheelbilati, Lalsheel, Indurkani, Jaam alu etc. may be considered as GI crop. Necessary action should be taken to generate required information and submission of application for establishment of Intellectual Property Rights (IPR) on some of these local potato cultivars. • Date monitoring visit would be fixed through discussion over telephone.
03	Bangladesh Institute of Nuclear Agriculture (BINA)	<ul style="list-style-type: none"> • Germplasm collection expedition should be mission oriented. All available mandate crops' germplasm must be collected from target areas during each visit. • Photographs of all collected germplasm must be included in report. • In morphological characterization report photographs of all qualitative traits must be included. • Necessary step must be taken for registration of Biroi as GI crop of rice. • Date of monitoring visit will be fixed through discussion over telephone.
04	Bangladesh Jute Research Institute (BJRI)	<ul style="list-style-type: none"> • Cover page of report should be corrected and reporting format must be followed accordingly during report preparation. • Collection, conservation and characterization target of germplasm must be fixed. • All Information regarding collection, conservation, regeneration and

Sl.#	Organization	Decision
		<p>characterization must be included in the report.</p> <ul style="list-style-type: none"> • Photographs of all collected germplasm must be included in report. • Appropriate date of monitoring visit would be fixed through telephonic conversation. • Released fund of sub-project should be expend within stipulated time.
05	Bangladesh Sugarcrop Research Institute (BSRI)	<ul style="list-style-type: none"> • All Information regarding collection, conservation and characterization must be included in the report. • Photographs of only collected germplasm excluding collectors and owner should be included in report. • During Morphological characterization photograph must be included traits basis. • Necessary step must be taken registration of potential cultivar of chewing type sugarcane as GI crop. • Appropriate date of monitoring visit would be fixed through telephonic conversation.
06	Cotton Development Board (CDB)	<ul style="list-style-type: none"> • Reporting format must be followed accordingly during yearly and half yearly report preparation. • Characterization, regeneration and conservation target must be fixed. • All Information regarding regeneration, conservation and characterization must be included in the report. • Photograph of germplasm should be arranged trait wise in characterization report. • Necessary step must be taken for registration of Hill Cotton-1 and Hill Cotton-2 as GI crop. • Monitoring visit date will be fixed through telephone conversation.
07	Bangladesh Sericulture Research and Training Institute (BSRTI)	<ul style="list-style-type: none"> • Cover page of the report should be corrected and reporting format must be followed accordingly during report preparation. • Executive summary of the annual report should be precise. • During morphological characterization photograph must be included traits basis. • Output of the sub-project should be presented in tabular form and mentioned in specific numerical value. • Morphological characterization of mulberry plants must be done following standard descriptors. Emphasis should be paid on collection of information regarding qualitative traits. • Appropriate date for monitoring visit is to be conveyed through telephone.
08	Bangladesh Agricultural University (BAU)	<ul style="list-style-type: none"> • Collection, conservation and characterization target must be fixed. • All information regarding collection, conservation and characterization must be included in report. • Photographs of all qualitative traits must be included in reports on morphological characterization. • Appropriate date of monitoring visit would be fixed through telephonic conversation.

All Organizations must follow:

1. Passport data form should be filled up during germplasm collection.
2. Collector's no. should be included instead of Collection no. in Passport Data Form.
3. Collector's no. of a germplasm should be given during collection following the rules of IPGRI/BI (Bioversity International). (**Collector's number:** Original number assigned by collector of the sample normally composed of the name or initials of the collector(s) followed by a number. This item is essential for identifying duplicates in different collections.
4. Characterization of germplasm should be completed according to Descriptor of IPGRI/BI. Annual report (February 2018-January 2019) and technical & financial progress during the period from February-June 2019 should be sent to Member Director (Crops) & Coordinator (PBRG-PGR, ID:128) within 13 July 2019.
5. Information of each activity (collection, conservation, characterization and regeneration) should be described in details and mentioned in methodology section of the report.
6. Photographs of germplasm should be clear and map should be included in annual report.
7. All kinds of report must be book bound instead of spiral binding and send to Coordinator (PBRG-PGR, ID:128).

e. Proceedings of 5th Coordination Meeting

Chair : Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC
Date of Meeting : 21 October 2019
Time : 10.00 AM
Venue : Conference Room-1, BARC

Fifth coordination meeting of the sub-project "Collection, Conservation and Characterization of Important Plant Genetic Resources (ID-128)" was held on 21 October 2019 at Conference Room-1 of Bangladesh Agricultural Research Council (BARC). The Coordination meeting was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director, Crops Division, BARC and the Coordinator of the sub-project. Chairperson of the meeting welcomed all participants including PIs of 09 component organizations of the sub-project. He mentioned that according to the target of SDG, the activity regarding collection and conservation of PGRs still available in different less accessible areas of the country must be completed within 2020. So we have to cooperate each other in this aspect. Then he requested all PIs to discuss about progress in respect of technical, financial, procurement and other activities of the sub-project. Firstly, Dr. Md. Amjad Hossain, Consultant, PBRG-PGR Sub-project, BARC component of the sub-project presented the review of half yearly reports of all component organization. According to the presented review and summary of half yearly reports (February-July 2019), PIs of BARI, BRRI, BJRI, BSRI, BINA, CDB, BSTRI and BAU components discussed in detail. Then Chairperson requested all PIs to discuss the technical and financial progress of the sub-project. Then PIs of all component organizations presented technical and financial progress of the sub-project achieved during last half year (August 2019-January 2020).

After threadbare discussion the following organization wise decisions were accepted.

Sl.#	Organization	Decision
01	Bangladesh Rice Research Institute (BRRI)	<ul style="list-style-type: none"> • Third half yearly report must be written including the brief description of methodology and results. • The reporting format of NATP-2 must be followed during the preparation of Yearly report, Half-Yearly report and others report. • Upazilas of different target districts explored for germplasm collection are to be marked with specific colour other than that colour used for marking target districts in black and white map. • Data on pest and disease incidence should be recorded.
02	Bangladesh Agricultural Research Institute (BARI)	<ul style="list-style-type: none"> • Third half yearly report is to be prepared including detail description of methodology and results supported by data tables, graphs and photographs. • The reporting format of NATP-2 must be followed during preparation of yearly report, half-yearly report and other reports. • Target areas of germplasm collection must be shown in methodology section providing shade in GIS map of Bangladesh. • Morphological characterization of selected crops is to be done following Minimal Descriptors of Agri-Horticultural Crops of NBPGR, New Delhi, India. • Discard the column with crop name from passport information data table. Divide the table into different subsection for each crop. Show common name and scientific name of the crop in a row and then provide passport information of each germplasm as per sample report on germplasm collection supplied. • According to the sub-project work plan collection, conservation, characterization and documentation should be presented including data table. • Upazilas of different target districts explored for germplasm collection are to be marked with specific colour other than that colour used for marking target districts in black and white map. • According to the sub-project work plan, molecular characterization has to be completed and should be presented in the report.
03	Bangladesh Institute of Nuclear Agriculture (BINA)	<ul style="list-style-type: none"> • Executive Summary should be placed in separate page(s). Project information should be started from new page. • The reporting format of NATP-2 must follow during preparation of Yearly report, Half-Yearly report and other reports. • Results of technical activities supported by tables and graphs are to be included in section 11 of reporting format. • Upazilas of different target districts explored for germplasm collection are to be marked with specific colour other than that colour used for marking target districts in black and white map. • Morphological characterization of selected crops is to be done following Minimal Descriptors of Agri-Horticultural Crops of NBPGR, New Delhi, India except Rice. • Data on pest and disease incidence should be recorded.

Sl.#	Organization	Decision
04	Bangladesh Jute Research Institute (BJRI)	<ul style="list-style-type: none"> • Executive summary of third half yearly report must be rewritten including the brief description of methodology and results. • The reporting format of NATP-2 must be followed during the preparation of Yearly report, Half-Yearly report and other reports. • Specific area of Germplasm Collection should be presented in methodology section of report including black & white map. • According to the sub-project work plan collection, conservation, characterization and documentation should be presented including data table. • Target areas for germplasm collection are to be shown in GIS map of Bangladesh. • Data on pest and disease incidence should be recorded.
05	Bangladesh Sugarcrop Research Institute (BSRI)	<ul style="list-style-type: none"> • Executive summary of third half yearly report must be rewritten including the brief description of methodology and results. • The reporting format of NATP-2 must be followed during the preparation of Yearly report, Half-Yearly report and other reports. • Upazilas of different target districts explored for germplasm collection are to be marked with specific colour other than that colour used for marking target districts in black and white map. • According to the sub-project work plan collection, conservation, characterization and documentation should be presented including data table. • Data on pest and disease incidence should be recorded.
06	Cotton Development Board (CDB)	<ul style="list-style-type: none"> • Executive summary of third half yearly report must be rewritten including the brief description of methodology and results. • The reporting format of NATP-2 must be followed during the preparation of yearly report, half-yearly and other reports. • Only numerical number should be included in major outputs of the reports regarding target & achievement of technical activity. • Data on pest and disease incidence should be recorded.
07	Bangladesh Sericulture Research and Training Institute (BSRTI)	<ul style="list-style-type: none"> • The reporting format of NATP-2 must be followed during the preparation of yearly report, half-yearly and other reports. • Executive summary of third half yearly report must be rewritten including the brief description of methodology and results. • Morphological characterization should be done following standard descriptors of mulberry and should emphasize on collection of information regarding qualitative traits. • Data on pest and disease incidence should be recorded.
08	Bangladesh Agricultural University (BAU)	<ul style="list-style-type: none"> • The reporting format of NATP-2 must be followed during the preparation of yearly report, half-yearly and other reports. • Target areas of germplasm collection must be shown in methodology section through GIS map of Bangladesh. • Upazilas of different target districts explored for germplasm collection are to be marked with specific colour other than that colour used for marking target districts in black and white map. • Passport information of yam germplasm should be presented in tabular form. • Data on pest and disease incidence should be recorded.

All Organization must follow:

1. Passport data should be recorded as per passport data form.
2. Morphological characterization should be done following standard Descriptors for respective crops published by IPGRI, BI, AVRDC, NBPGR or other institutes recognized by FAO.
3. Reporting format of NATP-2 should be followed during report preparation for Annual review workshop and sent to Member Director (Crops) within 06 November 2019.

f. Proceedings of 6th Coordination Meeting held on 03 February 2020

Chair : Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops) BARC
Date of Meeting : 03 February 2020
Time : 10.00 AM
Venue : Conference Room-2, BARC

Sixth coordination meeting of the sub-project “Collection, Conservation and Characterization of Important Plant Genetic Resources (ID-128)” was held on 03 February 2020 at Conference Room-2 of Bangladesh Agricultural Research Council (BARC). The meeting was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC and the Coordinator of the sub-project. Chairperson of the meeting welcomed all participants including PIs of 09 component organizations. He mentioned that this is the last year of the sub-project. All remaining activities of the sub-project must be completed within duration of the sub-project and Sub-project Completion Report (PCR) has to be submitted within duration of the sub-project. So we have to work for each other. Then he requested all PIs to cooperate each other for successful completion of sub-project activities within stipulated time. At the beginning of the meeting, Dr. Md. Amjad Hossain, Consultant, BARC component of the sub-project presented the brief summary of annual reports of all component organizations and progress of the sub-project. Then Chairperson requested all PIs to discuss the technical progress and financial progress of the sub-project. Then PIs/Co-PIs of component organizations presented technical and financial progress and half yearly work plan (February 2020- July 2020) of the sub-project.

Reports were reviewed organization wise and the following decisions were made.

Sl.#	Organization	Decision
01	Bangladesh Rice Research Institute (BRRI)	<ul style="list-style-type: none">• Cultural practices such as season, cultural techniques (Jhum, transplanted, broadcasted, irrigated, rainfed etc.) should be included in data table of Passport Information of the report.• Detail report of all completed activities (Collection, Conservation and Characterization) should be included in 2nd year annual report.• Germplasm collection table must be prepared again according to the format which has already been sent through email and should be included in the report.
02	Bangladesh Agricultural Research Institute (BARI)	<ul style="list-style-type: none">• Cultural practices such as season, cultural techniques (Jhum, floating bed, transplanted, broadcasted, irrigated, rainfed etc.) should included in the passport information data table.• Detail report of all completed activities (Collection, Conservation and Characterization) should be included in 2nd year annual report.• Genetic analysis of Brinjal must be discarded from the report.• Characterization of Bitter gourd & Ucche germplasm should complete in different season and presented in yearly report.

Sl.#	Organization	Decision
		<ul style="list-style-type: none"> According to the sub-project work plan, molecular characterization of germplasm should be completed within stipulated time and included in the report.
03	Bangladesh Institute of Nuclear Agriculture (BINA)	<ul style="list-style-type: none"> Cultural practices such as season, cultural techniques (Jhum, floating bed, transplanted, broadcasted, irrigated, rainfed etc.) should include in data table of Passport Information of the report. Detail report of all completed activities (Collection, Conservation and Characterization) should be included in 2nd year annual report. Characterization of the crops having few number of collected germplasm should be completed in collaboration with BARI.
04	Bangladesh Jute Research Institute (BJRI)	<ul style="list-style-type: none"> The reporting format of NATP-2 must be followed during the preparation of Yearly, half-yearly and other reports. Cultural practices such as production season, cultural techniques (Jhum, floating bed, transplanted, broadcasted, irrigated, rainfed etc.) should included in the Passport Information data table. According to the work plan, detail report of all completed activities (Collection, Conservation, Characterization and Regeneration) should be included in 2nd year annual report. Germplasm collection expedition should be increased in order to achieve the target.
05	Bangladesh Sugarcrop Research Institute (BSRI)	<ul style="list-style-type: none"> Germplasm collection expedition should be increased in order to achieve the target. Detail report of all completed activities (Collection, Conservation and Characterization) should be included in 2nd year annual report. Target areas of germplasm collection must be shown in methodology section through GIS map of Bangladesh. According to the sub-project work plan, molecular characterization of collected germplasm should be completed.
06	Cotton Development Board (CDB)	<ul style="list-style-type: none"> Characterization report must be prepared again according to the format which has already been sent through Email and should be included in the report. Picture of qualitative traits should be taken in right way and presented in the report.
07	Bangladesh Sericulture Research and Training Institute (BSRTI)	<ul style="list-style-type: none"> The reporting format of NATP-2 must be followed during the preparation of yearly report, half-yearly report and other reports. Characterization report must be prepared again according to the format which has already sent through email and should be included in the report. Characterization of germplasm should be done according to the standard descriptors and emphasis should be given on recording qualitative traits.
08	Bangladesh Agricultural University (BAU)	<ul style="list-style-type: none"> Detail report of all activities (Collection and Characterization) should be prepared according to the format which has already sent through email and should be included in the 2nd year report. The reporting format of NATP-2 must be followed during the preparation of yearly report, half-yearly report and other reports. Target areas of germplasm collection must be shown in methodology section through GIS map of Bangladesh.

All organizations must follow:

1. Descriptor list (Descriptor state, when & how information have been collected) should be included in Materials and Methods section of the report on morphological characterization of germplasm.
2. Organizations those have germplasm collection activity should explore enclave areas for germplasm collection.
3. Desired genotype(s) and desirable/distinctive character have to be identified and mentioned in the report.
4. Organizations those have germplasm collection activity should show two maps (one in methodology section for marking target areas and another in information analysis section for marking explored areas of germplasm collection) and presented in report.
5. In order to preparation of coordinated annual report for February 2018 to January 2020 session all completed activities should be included and send to Member Director (Crops) & Coordinator (PBRG-PGR, ID:128) within 15 February 2020.
6. At least two scientific articles should be published by each institute in reputed national or international journals.

g. Proceedings of 7th Coordination Meeting held on 09 March 2020

Chair : Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC
Date : 09 March 2020
Time : 11.00 AM
Venue : Conference Room-2, BARC

Seventh coordination meeting of the sub-project “Collection, Conservation and Characterization of Important Plant Genetic Resources (ID-128)” was held on 09 March 2020 at Conference Room-2 of Bangladesh Agricultural Research Council (BARC) including two component organizations (BARI and BJRI). The meeting was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director, Crops Division, BARC and the Coordinator of the sub-project. Chairperson of the meeting welcomed all participants including PIs and Co-PIs of participating organization. He mentioned that BARI and BJRI is lagging behind in respect of technical activities like germplasm collection, morphological and molecular characterization, input procurement and report writing. He reminded that it is the last year of the project duration, all remaining activities of the sub-project must be completed within stipulated time and Sub-project Completion Report (PCR) has to be submitted in due time. He expected that this two reputed institute will succeed in this respect. Then he requested both PIs to discuss the updated progress of technical, financial and procurement activities. Then PIs/Co-PIs of BARI and BJRI components presented progress regarding technical, financial, procurement and other sub-project activities, and half yearly work plan (February 2020- July 2020) of the sub-project.

The following decisions were made for expediting the sub-project activities of BARI and BJRI:

Sl. no.	Organization	Decision
01	Bangladesh Agricultural Research Institute (BARI)	<ul style="list-style-type: none"> • Cultural practices such as production season, cultural techniques (Jhum, floating bed, transplanted, broadcasted, irrigated, rainfed etc.) should included in the Passport Information data table. • Information and data should be collected to fulfill the terms and conditions of GI registration. • Detail report of all completed activities (Collection, Conservation and Characterization) should be included in 2nd year annual report. • In work plan for next six months, Rangamati hill district and newly owned Enclave should be included as target areas of germplasm collection and tentative collection expedition schedule is to be sent to BARC within 31 March 2020. • According to the sub-project work plan, molecular characterization of germplasm should be completed in fixed time and included in the report. • Details report on all activities should be prepared according to sample report. • Take support from Director (Res.) for expediting sub-project activities involving both Co-PIs.
02	Bangladesh Jute Research Institute (BJRI)	<ul style="list-style-type: none"> • Germplasm collection schedule with target areas should be mentioned in work plan of next six months (February 2020-July 2020) and send to BARC within 31 March 2020. • According to the work plan, detail report of all completed activities (Collection, Conservation, Characterization and Regeneration) should be included in 2nd year annual report. • Morphological and molecular characterization should be completed to achieve the targeted output. • Number of expedition for germplasm collection should be increased to achieve the target in this respect. • Details report of all activities should be prepared according to sample report.

Both the organizations must follow:

1. Newly owned Enclave area should be explored and germplasm should be collected from those areas on priority basis.
2. Desired genotypes and desirable/distinctive character have to be identified and mentioned in report.
3. The reporting format of NATP-2 must be followed and all information as per format need to be provided in order to preparation of coordinated annual report for the duration of February 2018-January 2020 and send to Member Director (Crops) & Coordinator (PBRG-PGR, ID: 128) within 25 February 2020.

h. Proceedings of 8th Coordination Meeting held on 08 December 2020

Chair : Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC
Date of Meeting : 08 October 2020
Time : 10.00 AM
Venue : Conference Room-2, BARC

Eighth coordination meeting of the sub-project entitled “Collection, Conservation and Characterization of Important Plant Genetic Resources (ID-128)” was held on 08 October 2020 at Conference Room-2 of Bangladesh Agricultural Research Council (BARC). The meeting was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director, Crops Division, BARC and the Coordinator of the sub-project. Chairperson of the meeting welcomed all participants including PIs of all component organizations of the sub-project. He again reminded that the sub-project would be ended by December 2020. All the planned activities of the sub-project including submission of Sub-project Completion Report (PCR) as per format of NATP-2 must be completed within this time. He also asked the PIs to describe hindrance of sub-project activities due to COVID-19 pandemic. Then he requested all PIs to discuss the progress regarding technical, financial and other activities, status of completed activities towards preparation of PCR. Dr. Md. Amjad Hossain, Consultant, BARC component of the sub-project presented the Sub-project Completion Report (PCR) format of NATP-2. PIs and Co-PIs of component organizations discussed in details and asked questions to be clear about some of the points of PCR format. Component wise presentation was delivered by PIs/Co-PIs one by one as follows:

Bangladesh Rice Research Institute (BRRI)

Dr. Mohammad Khalequzzaman, Chief Scientific Officer and Head, Genetic Resources and Seed Division (GRSD) and PI of BRRI component presented progress of sub-project activities. He mentioned that under the sub-project two scientific articles entitled “Genetic Diversity and Population Structure of Boro Rice Germplasm of Bangladesh” and “Molecular Characterization and Genetic Diversity in T. Aman Rice (*Oryza sativa* L.) germplasm using SSR Markers” have been submitted to Journal of Rice Research and SABRAO Journal of Breeding and Genetics, respectively for publication. Sub-project activities were not much affected by COVID-19 pandemic. They did not have any plan for germplasm collection exploration.

Bangladesh Agricultural Research Institute (BARI)

Dr. Mst. Shamsunnahar, Chief Scientific Officer & Head, Plant Genetic Resources Centre (PGRC), BARI and PI of BARI component presented progress of sub-project activities. She informed the house that one scientific article entitled “Morphological Diversity in Indigenous Cucumber Genotypes of Bangladesh” has been published in Global Journal of Science

Frontier Research: Agriculture and Veterinary, Vol., 18, Issue, 2018 under the sub-project. Due to COVID-19 pandemic, sub-project related activities were not much hampered except germplasm collection. According to sub-project work plan, we have planned to collect germplasm in the month of November 2020.

Bangladesh Jute Research Institute (BJRI)

Mr. Md. Rafiqul Islam, Chief Scientific Officer Genetic Resources and Seed Division (GRSD) and PI of BJRI component presented progress of sub-project activities. He mentioned that under the sub-project one scientific article entitled Molecular Characterization of Some Jute Germplasm Using SSR Primers is under process of publication. He stated that 2nd week of October preferably 17 October 2020 would be the appropriate time for monitoring visit. In order to germplasm collection, different areas of Chattogram and Noaklali will be visited during October-November 2020. Germplasm collection was affected by COVID-19 pandemic and morphological characterization program was affected by repeated flood.

Bangladesh Sugarcrop Research Institute (BSRI)

Mr. Md. Mostake Ahmed, Senior Scientific Officer, Breeding Division and Co-PI of BSRI component presented progress of sub-project activities. He said that under the sub-project one chewing type variety of sugarcane has been released as BSRI Akh47. He also mentioned that under the sub-project one scientific article entitled Morphological Diversity of Locally Collected Germplasm of Sugarcane was under processing for publication. Last week of October 2020 would be appropriate time for monitoring/filed visit. Germplasm collection was affected by COVID-19 pandemic, he informed. Morphological and molecular characterization program was not hampered.

Bangladesh Institute of Nuclear Agriculture (BINA)

Dr. Fahmina Yasmine, Senior Scientific Officer, Plant Breeding Division and Co-PI of BINA component presented progress of sub-project activities. She stated that two scientific articles entitled 1. Morphological characterization of local rice landraces (*Oryza sativa* L.) of Mymensingh region and 2. Molecular characterization of rice landraces (*Oryza sativa* L.) of Mymensingh region using SSR markers were under processing for publication. Except germplasm collection, sub-project activities were not much hampered by COVID-19 pandemic.

Cotton Development Board (CDB)

M. M. Abed Ali, Senior Scientific Officer and Co-PI of CDB component presented progress of sub-project activities. He said initiative would be taken for publishing scientific article under the sub-project. Sub-project activities were not much hampered by COVID-19 pandemic in both the locations.

Bangladesh Agricultural University (BAU)

Prof. Dr. M. A. Rahim, Dean, Faculty of Agriculture and PI of BAU component presented progress of sub-project activities. He informed the house that two varieties of indigenous banana and 05 varieties of yam have been released under the sub-project. He also mentioned that two scientific paper entitled (1) Potentiality of Underutilized Crop *Dioscorea spp.*: A Source of Nutraceutical; SAARC J. Agric., 17(2): 1-13; 2019 and (2) Assessment of Quality Characteristics of Boiled Yam Tubers Available in Bangladesh; SAARC J. Agric., 18(1): 173-182; 2020 have published. A program for seed distribution of newly released variety among farmers will be arranged on 28 November 2020.

After having detail discussion, following decisions were made in the meeting:

1. Potential genotypes and desirable/distinctive character have to be identified and mentioned in report.
2. In case of germplasm characterization (Morphological and Molecular), name & no. of collected and conserved germplasm should be mentioned in report specifically.
3. In order to develop new variety from collected germplasm, potential genotypes are the handed over to respective crop research centre of BARI by PGRC.
4. Bangladesh Institute of Nuclear Agriculture (BINA) should take activity for selection of variety from the collected germplasm.
5. CDB should take initiative for collection muslin cotton germplasm, and male and female parents should be selected for developing hybrid variety of cotton.
6. Progress report for the period from February 2018 to October 2020 should be prepared following Sub-project Completion Report (PCR) format and should be submitted to Member Director (Crops) & Coordinator of PBRG-PGR sub-project within 05 November 2020.
7. For annual review workshop, power point presentation (PPT) should be prepared following PCR format and sent to Member Director (Crops) & Coordinator of PBRG-PGR sub-project within 15 November 2020.
8. Date of annual review workshop will be fixed during last week November or first week of December 2020.

11.1.4. Performing monitoring and evaluation of technical activities

A total of 18 field monitoring and evaluation expeditions to implementing organizations (BARI- 3 times, BRRI- 3 times, BJRI- 1 time, BSRI- 1 time, BINA- 3 times, CDB- 3 times, BSRTI- 1 time and BAU-3 times) have been performed. Sub-project activities of BINA and BAU at field and laboratories were visited on 08 April 2019, 08 November 2019, and 28-29 November 2020. BARI and BRRI were visited on 25 June 2019, 04 November 2019 and 09 March 2020. Cotton Research Farm of CDB at Sreepur, Gazipur and Jagadishpur, Jashore were visited on 23 March 2019, 08 November, 2019 and 17 January, 2020. BSRTI was visited on 18-19 March 2020. Agriculture Experimentation Centre of BJRI, Jagir Manikganj was visited on 17 October 2020 and BSRI was visited on 07-08 November 2020.

Technical information like methodology and its appropriateness, adherence to original plan, status of field/laboratory experimentation, technology generation, internal monitoring, knowledge management, financial, procurement & reporting status, and problems/constraints facing by the component in implementing the sub-project activities were monitored as per Field Monitoring Format for CRG and PBRG Sub-projects of NATP-2. Implementer's opinion was noted about evolving problems/constraints. Possible suggestions were provided for instant solution of the problems/constraints. Some of the problems were noted and conveyed to project management. Field monitoring report was submitted to coordinator of the sub-project following each monitoring expedition. Field monitoring reports of all expeditions are shown in annexure 1 of volume III.

11.1.5. Organizing Annual Review Workshop

Day long Annual Review Workshop was organized twice with all the component institutes; first one on 06 January 2020 at BARC Conference Room-1 and second one on 07 December 2020 at BARC Auditorium. All PIs and Co-PIs of component institutes, coordinator, invited expert members and experienced personnel from BARC and National Agricultural Research System (NARS) institutes attended the workshops. Sub-project progress, constraints and future plan of sub-project activities of each institute were presented by PIs in the technical sessions of the review workshop as per defined format supplied by coordinating component. Session Chairman, expert members and participants made valuable comments and suggestions on each report presented by respective PI. After threadbare discussion comprehensive decisions were made in the review workshops for keeping the sub-project activities in right track and producing a remarkable Sub-project Completion Report (PCR). Proceedings of annual review workshops are shown below.

i. Proceedings of first Annual Review Workshop held on 06 January 2020

A day long review workshop on PBRG Sub-Project “Collection, Conservation and Characterization of Important Plant Genetic Resources (ID-128)” was held on 06 January, 2020 at BARC Conference room-1 (Fig. 4). Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC chaired the inaugural session and Dr. Mian Sayeed Hasan, Director, PIU-BARC, NATP-2 was present as Special guest. Dr. Md. Abdus Salam, Chief Scientific Officer (Crops), BARC delivered welcome address and presented the progress of sub-project activities. Dr. Mian Sayeed Hasan suggested highlighting the potential germplasm and useful traits, which could be exploited in crop improvement program. He emphasized on the germplasm which can be directly released as variety. He also suggested for enlisting those germplasm which have already been released as variety or in the process of releasing as variety. He pointed out that timely submission of SoE and reports are essential for disbursing fund. He expected more participants from other divisions and institutes in the workshop. The chairperson of the session Dr. Md. Aziz Zilani Chowdhury responded that participants from other divisions and institutes would be invited in the next annual workshop. He mentioned that in SDGs and 7th Five Years Plan, utmost importance has been paid to collect and conserve germplasm of landraces and GI crops within 2020. He expected that new varieties could be released at least from the BAU component.



Fig. 4. Annual Review Workshop, 06 January 2020

The PIs, Co-PIs and scientists from BARI, BRRI, BJRI, BSRI, BINA, CDB, BSRTI and BAU participated in the technical sessions of the workshop. Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops) chaired the technical sessions. Dr. Md. Abdul Jalil Bhuyan, Research Management Specialist, NATP-2, PIU-BARC; Dr. Md. Mamtazul Haque, Research Management Specialist, Krishi Goveshona Foundation (KGF) and Dr. Md. Amjad Hossain, Consultant, PBRG-PGR sub-project, BARC were present as expert members.

The PIs of eight component organizations presented the progress of sub-project activities for the period of February, 2018 to 15 December, 2019 and research programs of next year. The expert members discussed the research progress presented by the component organizations and were impressed with the progress of sub-project. However, the following comments and suggestions were made by the experts and participants.

Expert Opinions/Recommendations

Bangladesh Agricultural Research Institute (BARI)

- In characterization, all data should be recorded following ‘Minimal Descriptors of Agri-Horticultural Crops’ published by NBPGR, India.
- For germplasm identification and conducting PRA, DAE personnel at district and upazila level are to be involved.
- Detailed results of all the research activities performed during the reporting period should be included in the report. At least one detailed report of each activity (as a sample) should be presented.
- Present status of molecular characterization should be included in the report.
- Common name and scientific name of the crop should be mentioned in presentation.
- Salient features of collected germplasm should be included in PGRC database.

Bangladesh Rice Research Institute (BRRI)

- Emphasis should be given on collection of short duration and cold tolerant Boro rice germplasm, and identification of gene(s) for those traits.
- Research on improvement of fine rice should be strengthened using local rice.
- One column should be added showing growing season of rice (Aus, Aman and Boro) in the table of passport data information.

Bangladesh Agricultural University (BAU)

- Data table should be rearranged in the report according to PGR management.
- Variability of bulbil and tuber of yam should be shown in photograph.
- Promising line of banana and yam should be highlighted in the report and necessary steps are to be taken to release those lines within sub-project period.
- The species of yam and indigenous banana should be mentioned in the report.
- Complete report should be submitted according to format of NATP-2.
- Necessary steps are to be taken to establish IPR on GI crops e.g. Banana.

Bangladesh Sericulture Research and Training Institute (BSRTI)

- Emphasis should be given on qualitative traits according to Mulberry Descriptors.
- Photographs of all qualitative characters (e.g. color, shape, nature, arrangement, texture etc.) of each part (plant, shoot, leaf, bud, flower, fruit, seed etc.) should be taken and presented in the report.
- Major output should be in measurable form in the report.
- The target of morphological characterization is to be mentioned in the report.

Bangladesh Institute of Nuclear Agriculture (BINA)

- Efforts have to be given to collect the germplasm of mandated crops covering a district or a grid or an upazila.
- Target of germplasm collection should be emphasized on ‘Capture total gene’
- “Tridana” germplasm of groundnut is to be checked with BARI varieties for avoiding duplication.

Bangladesh Sugarcrop Research Institute (BSRI)

- In Passport data form, collectors’ number should be revised. Collector’s number should be started from 1 for each collection team and to be continued for that team.
- Local name or cultivar name of any crop should not be modified in passport information data (the name provided by the donor to be same in passport information).
- In the passport information table, representative photographs of the collected materials should be included. Photographs of the germplasm with collectors and donors should be placed in the report.

Bangladesh Jute Research Institute (BJRI)

- Report is to be prepared in consultation with sub-project specialist/expert of BARC Part.
- BJRI is lagging far behind of the plan which should be geared up.
- Report is to be prepared following the reporting format of NATP-2.

Cotton Development Board (CDB)

- For data recording and preparing report, the reporting style of PGR management as reported by BARI or BRRI could be followed.
- Representative and distinct pictures are to be included in the report.
- Precautionary measures should be undertaken to avoid cross pollination during regeneration of cotton germplasm.

General Recommendations

- Component organizations could follow the style of BARI or BIRRI reporting style especially the table formation for morphological characterization.
- Promising germplasm and desirable traits should be identified and highlighted with photographs in the report.
- Diversity analysis and clustering should be done among the collected germplasm and to be included in the report.
- Each organization should take initiative for establishment of IPR on respective GI crops and progress of IPR establishment should be mentioned in the report.
- Emphasis should be given for avoiding duplication during germplasm collection.

ii. Proceedings of second annual review workshop held on 07 December 2020

A day long progress review workshop on PBRG sub-project “Collection, Conservation and Characterization of Important Plant Genetic Resources” (ID: 128) was held on 07 December, 2020 at BARC, Dhaka. Dr. Shaikh Mohammad Bokhtiar, Executive Chairman, BARC graced the inaugural session as chief guest and the session was chaired by Dr. Md. Aziz Zilani Chowdhury, Member Director, Crops Division. Dr. Md. Harunur Rashid, Director, PIU-BARC was present as special guest. Dr. Shah Md. Monir Hossain, Principal Scientific Officer (Crops) and PI of BARC component welcomed the participants and briefed the objectives of the sub-project. Coordinator of PBRG sub-project Dr. Md. Aziz Zilani Chowdhury presented the updated progress. He thanked BAU and BSRI component for their great achievement regarding variety development. Dr. Md. Harunur Rashid highlighted the potential germplasm with useful traits, which could be exploited in crop improvement program. He mentioned that released varieties under this sub-project have value adding aspect and emphasized to prepare leaflet of released technologies. The chief guest Dr. Shaikh Mohammad Bokhtiar, EC, BARC emphasized importance of nutrient rich and biotic and abiotic stress tolerant germplasm towards food security. He also mentioned that PGRs are important raw materials for varietal improvement efforts and other research purposes. He suggested for taking initiatives to develop bio-fortified crop variety towards nutrition sensitive agriculture. He urged that all the collected germplasm should be well documented, otherwise would surely be lost. He requested the sub-project management to encourage and appreciate relevant personnel for making publication in reputed journals. He expected that in order to prepare a good PCR, all concerned should work together. The chairperson of the session stressed on the importance of germplasm mentioning their value to combat challenges posed by climate change.



Fig. 5. Progress Review Workshop, 07 December 2020

The PIs, Co-PIs and relevant personnel from BARC, BARI, BRRI, BJRI, BSRI, BINA, CDB, BSRTI and BAU participated in the technical sessions of the workshop. Dr. Md. Aziz Zilani Chowdhury chaired the technical sessions while Dr. Md. Abdur Razzaque, Sector Coordinator Extension, PMU, NATP-2; Dr. Md. Abdul Jalil Bhuyan, Research Management Specialist, NATP-2, PIU-BARC and Dr. Md. Khairul Bashar, Country Manager, HarvestPlus were present as Expert Members (Fig. 5).

The PIs of eight organizations presented component wise progress of sub-project as per PCR format supplied by NATP-2, PIU-BARC for the period from February 2018 to November, 2020. The expert members made comments on research progress provide valuable suggestions towards improvement of PCR. The following comments and suggestions were made by the experts.

Expert Opinions/Recommendations

Bangladesh Rice Research Institute (BRRI)

- Methodology of collection, conservation and characterization should be described separately and to be added in PCR.
- Information/knowledge generation section should be filled up.
- In PCR format, lesson learned should be mentioned clearly.
- All photographs should be clear and self-informative.
- MI-pajang (local rice cultivar having highest yield/plant) can be advanced for further evaluation towards variety release.
- A summary table of desired materials with salient features should be added in report.
- Emphasis should be given on GI crop registration and take initiative for submission of application for establishment of IPR and to be reported in PCR.
- Provide information regarding future research program, endangered germplasm with location and unexplored areas.
- Need to take initiative for collection of GI rice germplasm.

Bangladesh Agricultural Research Institute (BARI)

- Total number of collected and conserved germplasm should be mentioned separately.
- Methodology of collection, conservation and characterization should be described separately and added in report.
- During characterization of germplasm, important traits like biotic and abiotic stress tolerance, color and flavor, duration etc. along with yield should be recorded.
- Knowledge, information and technology generation should be included in PCR.
- Collected germplasm should be cross checked with already conserved materials to avoided duplication.
- GI crops should be included for germplasm characterization on priority basis.
- Molecular characterization should be reported in PCR.
- In PCR format, lesson learned should be mentioned clearly.
- Genetic distance analysis should be carried out.

- A summary table of desired materials with salient features should be added in report.
- Descriptor states of all traits recorded should be mentioned in materials and methods (M & M) section.
- Show targeted areas in case of collection in GIS map (black and white) in M & M section and mark the explored areas by variable color in R & D section.
- All photographs should be clear and informative.
- Provide information regarding future research program, endangered germplasm with location and unexplored areas.
- GI crops should be considered for registration for establishment of IPR and to be reported in PCR.
- Need to take initiative to release important landraces as variety.

Bangladesh Sericulture Research and Training Institute (BSRTI)

- Dry matter content of mulberry leaf must be considered during morphological characterization.
- In morphological characterization of mulberry plant, descriptors and descriptor states are to be mentioned in M & M section.
- Information/ knowledge generation section of PCR should be filled up.
- In PCR format, lesson learned should be mentioned clearly
- An ANOVA table with mean, range, SD and CV are to be shown in R & D section and discussed accordingly for quantitative characters.
- For qualitative characters, make a table showing number of germplasm under each state.
- Genetic distance analysis should be carried out.
- A summary table of desired materials with salient features should be added in report.
- Undertake initiative to release potential germplasm as variety.

Bangladesh Institute of Nuclear Agriculture (BINA)

- Methodology of collection, conservation and characterization should be described separately and added in report.
- In germplasm collection report, geographical location should be mentioned clearly.
- Summary of result and finding need to be added in report.
- Report should be prepared according to PCR format of NATP-2, PIU-BARC.
- During morphological characterization of germplasm, data on high yield of germplasm need to be added in measurable form (eg. t/ha, g/plant).
- Information/knowledge generation section of PCR should be filled up.
- In PCR format, lesson learned should be mentioned clearly.
- Add a table showing mean, range, SD and CV (%) for quantitative characters and discuss accordingly.
- Emphasis should be given on GI crop registration and take initiative for submission of application for establishment of IPR and to be reported in PCR.
- Provide information regarding future research program, endangered germplasm with location and unexplored areas.
- One set of collected rice germplasm could to be conserved in BIRRI gene bank.

Bangladesh Agricultural University (BAU)

- In methodology section, germplasm exploration area should be mentioned.
- Methodology of collection, conservation and characterization should be described separately and added in report.
- Necessary steps are to be undertaken to establish mixed banana garden at field level.
- Report should be prepared following PCR format.
- Characterization report of mango should be discarded from the report.
- In PCR format, lesson learned should be mentioned clearly.
- Emphasis should be given on GI crop registration and take initiative for submission of application for establishment of IPR and to be reported in PCR.
- Prepare leaflets/folders/factsheets on varieties released under the sub-project and send the same to PIU-BARC for printing in large scale.
- Provide information regarding future research program, endangered germplasm with location and unexplored areas.
- All collected germplasm should be conserved.

Bangladesh Sugarcrop Research Institute (BSRI)

- In morphological characterization of sugarcane germplasm, report should be prepared following descriptor.
- Methodology of collection, conservation and characterization should be described separately and added in report.
- Report should be prepared according to PCR format of NATP-2, PIU-BARC.
- Germplasm collection target need to be mentioned together with characterization of those germplasm both at morphological and molecular level.
- In PCR lesson learned should be mentioned clearly.
- Emphasis should be given on GI crop (if any) registration and take initiative for submission of application for establishment of IPR and to be included in PCR.
- Provide information regarding future research program, endangered germplasm with location and unexplored areas.
- Collected germplasm need to be conserved duly.

Bangladesh Jute Research Institute (BJRI)

- Regeneration and seed production should not be included in report.
- New collection should be checked with the old collection to avoid duplication.
- Methodology of collection, conservation and characterization should be described separately and added in report.
- Report is to be prepared following the PCR format provided by NATP-2, PIU-BARC.
- Information/knowledge generation section of PCR should be completed.
- In PCR format, lesson learned should be mentioned clearly
- Provide information regarding future research program, endangered germplasm with location and unexplored areas.

Cotton Development Board (CDB)

- Qualitative and quantitative data table should be provided separately in report.
- Information/knowledge generation section of PCR should be filled up.
- In PCR format, lesson learned should be mentioned clearly
- Emphasis should be given on GI crop registration and take initiative for submission of application for establishment of IPR and to be reported in PCR.
- An ANOVA table with mean, range, SD and CV are to be shown in R & D section discussed accordingly as for quantitative characters.
- For qualitative characters, make a table showing number of germplasm under each state.
- Genetic distance analysis should be carried out.
- A summary table of suitable/desired materials (including salient features) should be added in report.
- Provide clear photographs of variability of each character.

General Recommendations

- Report should be prepared following the PCR format provided by NATP-2, PIU-BARC (need to be filled up each point of PCR format).
 - Executive summary and research highlights should be included in report.
 - Factsheet/leaflet/folder of released technology(ies) should be prepared (both in Bengali and English version) and sent to NATP-2, PIU-BARC by 21 December 2020.
 - In case of publication, all components should acknowledge NATP-2, PIU-BARC and a hard copy should be sent to PIU-BARC.
 - Diversity analysis and clustering should be carried out for collected germplasm and to be included in report.
 - Every organization should undertake initiative for establishing IPR on respective GI crops and any such progress should be mentioned in the report.
 - The PCR should be submitted to coordinator, PBRG-PGR sub-project (ID-128) by 20 December 2020.
- vi. **Compiling and editing coordinated yearly reports of the sub-project:** Half yearly and yearly reports submitted by component institutes were reviewed and necessary corrections and modifications were done before submission to NATP-2, PIU-BARC. Two coordinated annual reports on the basis of progress achieved by component organizations during first year and second year were prepared and submitted to NATP-2, PIU-BARC on 18 September 2019 and 23 August 2020, respectively.
- vii. **Compiling, editing and printing of coordinated Sub-project Completion Report (PCR):** Sub-project Completion Reports (PCR) submitted by implementing components was reviewed and necessary corrections and modifications were made, and sent back to respective institutes for revision. Component institutes revised their reports and resubmitted to the Coordinator. On the basis of individual reports of component organizations, coordinated PCR have been prepared and submitted to NATP-2, PIU-BARC.

11.2. Bangladesh Rice Research Institute

11.2.1. Collection of rice germplasm

Two hundred and forty-seven rice germplasm were collected from February, 2018 to December, 2020 (Table 2). During germplasm collection, passport data form was used for recording preliminary data of the collected germplasm. Areas explored for collection are shown in Fig. 6.

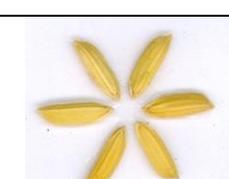
In 2018, one exploration was conducted to the targeted hilly areas and one hundred three (103) germplasm were collected from Bandarban district. Apart from this, three (03) germplasm were received from BRRRI Regional Station, Cumilla and two (02) from Jashore (Table 3).

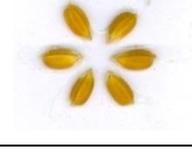
From February 2019 to December, 2020, total 132 rice germplasm were collected (Table 4) from four districts of Bangladesh. Sixty-five (65) germplasm were collected from Kurigram, Tangail, Sirajganj and Pabna districts. Besides, eleven (11) germplasm were collected from Narail, Chuadanga, Dinajpur districts and fifty-seven (57) germplasm were collected from different locations of Khagrachari and Rangamati districts. In 2020, only six (6) germplasm were collected from Cumilla district (Table 5) (Fig. 7).

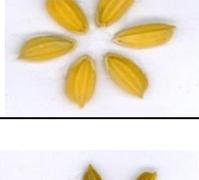
Table 2. List of rice germplasm collected from different districts of Bangladesh, 2018-2020

District	No. of upazilas explored	No. of rice germplasm collected				Total
		Aus	Aman	Boro	Jhum	
1. Bandarban	7	03			100	103
2. Cumilla	1		09			09
3. Jashore	1		02			02
4. Dinajpur	2		03			03
5. Chuadanga	1		01			01
6. Narail	1		03			03
7. Sylhet	1	01	01			02
8. Kushtia	1		01	01		02
9. Kurigram	2		12			12
10. Tangail	1		01			01
11. Sirajganj	4		29			29
12. Pabna	3		21	02		23
13. Rangamati	1		01		16	17
14. Khagrachari	3		34		6	40
Total	29	04	118	03	122	247

Table 3. Passport information of collected rice (*Oryza sativa*) germplasm under PBRG-PGR sub-project, 2018

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
1.	ZN-1	Pidi Jhum	Subas Tripura Upazila: Thanchi District: Bandarban	13 Dec, 2018 N-21°47' E-92° 25'	
2.	ZN-2	Mongbui Jhum	Usingmong Marma Upazila: Thanchi District: Bandarban	13 Dec, 2018 N-21°47' E-92° 25'	
3.	ZN-3	Langmolo Jhum	Yongnong Mro Upazila: Thanchi District: Bandarban	13 Dec, 2018 N-21°47' E-92° 25'	
4.	ZN-4	Mumui naing Jhum	Ching Ching Mro Upazila: Thanchi District: Bandarban	13 Dec, 2018 N-21°47' E-92° 25'	
5.	ZN-5	Kokroning Jhum	Jewel Borma Upazila: Thanchi District: Bandarban	13 Dec, 2018 N-21°47' E-92° 25'	
6.	ZN-6	Mongthong Jhum	Rening Mro Upazila: Thanchi District: Bandarban	13 Dec, 2018 N-21°47' E-92° 25'	
7.	ZN-7	Sinar Jhum	Medu Marma Upazila: Thanchi District: Bandarban	13 Dec, 2018 N-21°47' E-92° 25'	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
8.	ZN-8	Gokra Jhum	Aonglung Pro Upazila: Thanchi District: Bandarban	13 Dec, 2018 N-21°47' E-92° 25'	
9.	ZN-9	Gungda Jhum	Mang Chong Mro Upazila: Thanchi District: Bandarban	13 Dec, 2018 N-21°47' E-92° 25'	
10.	ZN-10	Bor dhan Jhum	Prehvak Murong Upazila: Alikadam District: Bandarban	11 Dec, 2018 N- 21° 40' E-92° 18'	
11.	ZN-11	Kalo binni Jhum	Sagarbasa Chakma Upazila: Alikadam District: Bandarban	11 Dec, 2018 N- 21° 40' E-92° 18'	
12.	ZN-12	Oloy binni Jhum	Mangchar Mro Upazila: Alikadam District: Bandarban	11 Dec, 2018 N- 21° 40' E-92° 18'	
13.	ZN-13	Kokrok Jhum	Waisai Murong Upazila: Alikadam District: Bandarban	11 Dec, 2018 N- 21° 40' E-92° 18'	
14.	ZN-14	Shada binni Jhum	Mang Ing Mro Upazila: Alikadam District: Bandarban	11 Dec, 2018 N- 21° 40' E-92° 18'	
15.	ZN-15	Chakma chikon Jhum	Fupaing Murong Upazila: Alikadam District: Bandarban	11 Dec, 2018 N- 21° 40' E-92° 18'	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
16.	ZN-16	Gelon (sada) Jhum	Loli Murong Upazila: Alikadam District: Bandarban	11 Dec, 2018 N- 21° 40′ E-92° 18′	
17.	ZN-17	Shada binni Jhum	Amit Murong Upazila: Alikadam District: Bandarban	11 Dec, 2018 N- 21° 40′ E-92° 18′	
18.	ZN-18	Chibiningshe dhan Jhum	Sudarshan Sikdar Upazila: Rowangchhari District: Bandarban	13 Dec, 2018 N- 22° 10′ E-92° 20′	
19.	ZN-19	Gunda dhan Jhum	Sudarshan Sikdar Upazila: Rowangchhari District: Bandarban	13 Dec, 2018 N- 22° 10′ E-92° 20′	
20.	ZN-20	Mongthong dhan Jhum	Sudarshan Sikdar Upazila: Rowangchhari District: Bandarban	13 Dec, 2018 N- 22° 10′ E-92° 20′	
21.	ZN-21	Binni dhan(white) Jhum	Sudarshan Sikdar Upazila: Rowangchhari District: Bandarban	13 Dec, 2018 N- 22° 10′ E-92° 20′	
22.	ZN-22	PD (dhan) Jhum	Sudarshan Sikdar Upazila: Rowangchhari District: Bandarban	13 Dec, 2018 N- 22° 10′ E-92° 20′	
23.	ZN-23	Gelong Jhum	Sudarshan Sikdar Upazila: Rowangchhari District: Bandarban	13 Dec, 2018 N- 22° 10′ E-92° 20′	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
24.	ZN-24	Amei dhan Jhum	Sudarshan Sikdar Upazila: Rowangchhari District: Bandarban	13 Dec, 2018 N- 22° 10' E-92° 20'	
25.	ZN-25	Barmese dhan Jhum	Sudarshan Sikdar Upazila: Rowangchhari District: Bandarban	13 Dec, 2018 N- 22° 10' E-92° 20'	
26.	ZN-26	Kobrok dhan Jhum	Nure Alam Upazila: Lama District: Bandarban	11 Dec, 2018 N- 21° 46' E-92° 12'	
27.	ZN-27	Bor dhan Jhum	Nure Alam Upazila: Lama District: Bandarban	11 Dec, 2018 N- 21° 46' E-92° 12'	
28.	ZN-28	Chaina(deshi) Jhum	Nure Alam Upazila: Lama District: Bandarban	11 Dec, 2018 N- 21° 46' E-92° 12'	
29.	ZN-29	Fangmey Jhum	Mawaiching Marma Upazila: Lama District: Bandarban	11 Dec, 2018 N- 21° 46' E-92° 12'	
30.	ZN-30	Chabaning Jhum	Nure Alam Upazila: Lama District: Bandarban	11 Dec, 2018 N- 21° 46' E-92° 12'	
31.	ZN-31	Buda Jhum	Mangshoi marma Upazila: Lama District: Bandarban	11 Dec, 2018 N- 21° 46' E-92° 12'	

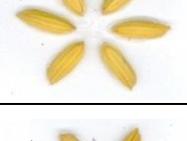
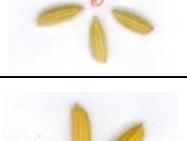
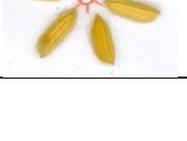
Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
32.	ZN-32	Binni(kalo) Jhum	Nure Alam Upazila: Lama District: Bandarban	11 Dec, 2018 N- 21° 46' E-92° 12'	
33.	ZN-33	Kokro Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
34.	ZN-34	Kalo binni Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
35.	ZN-35	Totey dhan Jhum	Reyong Babu Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
36.	ZN-36	Mili dhan Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
37.	ZN-37	Bili dhan Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
38.	ZN-38	Lal binni Jhum	Reng Lay Mro Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
39.	ZN-39	Totey dhan Jhum	Reng Lay Mro Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
40.	ZN-40	Choma dhan Jhum	Menu Mro Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14´ E- 92° 11´	
41.	ZN-41	Tulshimala Aus	Umoching Marma Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14´ E- 92° 11´	
42.	ZN-42	Shada binni Jhum	Reng Ton Mro Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14´ E- 92° 11´	
43.	ZN-43	Raisong dhan Jhum	Mentang Mro Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14´ E- 92° 11´	
44.	ZN-44	Kongbui Jhum	Mentang Mro Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14´ E- 92° 11´	
45.	ZN-45	Gunda dhan Jhum	Mentang Mro Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14´ E- 92° 11´	
46.	ZN-46	Maymansingh Jhum	Reng Ton Mro Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14´ E- 92° 11´	
47.	ZN-47	Bashabo (chiniguri) Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14´ E- 92° 11´	

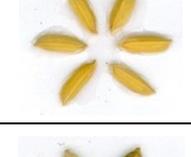
Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
48.	ZN-48	Shada binni Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
49.	ZN-49	Unknown Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
50.	ZN-50	Shumon dhan Jhum	Ucha Pro Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
51.	ZN-51	Unknown Aus	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
52.	ZN-52	Unknown Aus	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
53.	ZN-53	Uki dhan Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
54.	ZN-54	Shada pini Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
55.	ZN-55	Khunda dhan Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
56.	ZN-56	Kalo binni Jhum	Md. Omar Faruk Upazila: Bandarban Sadar District: Bandarban	11 Dec, 2018 N- 22° 14' E- 92° 11'	
57.	ZN-57	Baro dhan Jhum	Chhing Ongjai Marma Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25' E- 92° 11'	
58.	ZN-58	Binni dhan Jhum	Mong Tori Marma Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25' E- 92° 11'	
59.	ZN-59	Kokor dhan Jhum	Thoai Ching Chak Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25' E- 92° 11'	
60.	ZN-60	Binni dhan Jhum	Lavey Dri Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25' E- 92° 11'	
61.	ZN-61	Mala chikon Jhum	Biaswamoni Dri Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25' E- 92° 11'	
62.	ZN-62	Kalo binni Jhum	Ajit Chak Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25' E- 92° 11'	
63.	ZN-63	Kokor dhan Jhum	Ajit Chak Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25' E- 92° 11'	
64.	ZN-64	Kotmoni Jhum	Ajit Chak Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25' E- 92° 11'	
65.	ZN-65	Kalo binni Jhum	Biaswamoni Dri Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25' E- 92° 11'	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
66.	ZN-66	Kotmoni Jhum	Ong Thrapu Chak Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25′ E- 92° 11′	
67.	ZN-67	Baro dhan Jhum	Akhoai Chak Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25′ E- 92° 11′	
68.	ZN-68	Hori dhan Jhum	Angko Goching Marma Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25′ E- 92° 11′	
69.	ZN-69	Kalo binni Jhum	Purokkha Tong Chonga Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25′ E- 92° 11′	
70.	ZN-70	Unknown Jhum	Mahainu Marma Upazila: Naikhongchhari District: Bandarban	12 Dec, 2018 N- 21° 25′ E- 92° 11′	
71.	ZN-71	Chakma dhan(1) Jhum	Biyak Khon Boss Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
72.	ZN-72	Chakma dhan(2) Jhum	Lolkhon Boss Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
73.	ZN-73	Shada binni Jhum	Mongsaching Marma Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
74.	ZN-74	Guda Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
75.	ZN-75	Pedi Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
76.	ZN-76	Dham gunda Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
77.	ZN-77	Chakma dhan Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
78.	ZN-78	Lal binni(1) Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
79.	ZN-79	Lal binni(2) Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
80.	ZN-80	Kilong Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
81.	ZN-81	Sevesi Jhum	Mong Shoima Marma Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
82.	ZN-82	Ren quit Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
83.	ZN-83	Ghumra(1) Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
84.	ZN-84	Fangmentey kodi Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
85.	ZN-85	Ghumra(2) Jhum	Pru Sangcro Marma Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
86.	ZN-86	Pedi Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
87.	ZN-87	Raikei Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
88.	ZN-88	Chakma chikon Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
89.	ZN-89	Mongtob dhan Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
90.	ZN-90	Totei dhan Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
91.	ZN-91	Kalo binni Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
92.	ZN-92	Thoklo binni Jhum	Thong Clear Mro Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
93.	ZN-93	Gunda Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
94.	ZN-94	Kalo binni Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
95.	ZN-95	Kokro Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
96.	ZN-96	Botab dhan Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
97.	ZN-97	Nerica Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
98.	ZN-98	Rospui Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
99.	ZN-99	Unknown Jhum	Md. Mustafijur Rahman Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
100.	ZN-100	Pedi Jhum	Welaching Marma Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
101.	ZN-101	Kamlong Jhum	Mong Sinu Marma Upazila: Ruma District: Bandarban	13 Dec, 2018 N- 22° 02′ E- 92° 24′	
102.	ZN-102	Asham rice (Black) T. Aman	Md. Manjur Hossen Upazila: Cumilla Sadar District: Cumilla	14 Dec, 2018 N-23°27′ E-91°11′	
103.	ZN-103	Japanese rice (Black) T. Aman	Md. Manjur Hossen Upazila: Cumilla Sadar District: Cumilla	14 Dec, 2018 N-23°27′ E-91°11′	
104.	ZN-104	Indonesia rice (Black) T. Aman	Md. Manjur Hossen Upazila: Cumilla Sadar District: Cumilla	14 Dec, 2018 N-23°27′ E-91°11′	
105.	*H-1	Monthong Jhum	Mongre Chakma Upazila: Bandarban Sadar District: Bandarban	12 Sep, 2018 N- 22° 14′ E- 92° 11′	

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
106.	H-2	Monthong Jhum	Sukiron chakma Upazila: Bandarban Sadar District: Bandarban	12 Sep, 2018 N- 22° 14' E- 92° 11'	
107.	*Z-1	Unknown T. Aman	Abul kashem Upazila: Jashore Sadar District:Jashore	18 Nov, 2018 N-23°10' E-89°12'	
108.	Z-2	Unknown T.Aman	Abul kashem Upazila: Jashore Sadar District: Jashore	18 Nov, 2018 N-23°10' E-89°12'	

Collection Team: *ZN = Dr. Mohammad Zahidul Islam and Nadia Akter; *H = Dr. Ebna Syod Md. Harunur Rashid; *Z =Dr. Mohammad Zahidul Islam.

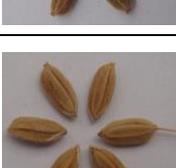
Table 4. Passport information of collected rice (*Oryza sativa*) germplasm under PBRG-PGR sub-project, 2019

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
1.	*K-1	Katari Bhog T. Aman	Khetro Mohon Roy Upazila: Dinajpur Sadar District: Dinajpur	2 May, 2019 N-25 ° 63' E-88 ° 65'	
2.	K-2	34 Katari Bhog T. Aman	Khetro Mohon Roy Upazila: Dinajpur Sadar District: Dinajpur	2 May, 2019 N-25 ° 63' E-88 ° 65'	
3.	*Z-1	Khato Indian Babu T. Aman	Sentu Mia Upazila: Damurhuda District: Chuadanga	18 April, 2019 N-23 ° 37' E-88 ° 47'	
4.	*H-1	Damini T. Aman	Shanto Upazila: Narail Sadar District: Narail	18 April, 2019 N-23 ° 13' E-89 ° 50'	
5.	H-2	Basmati T. Aman	Shanto Upazila: Narail Sadar District: Narail	18 April, 2019 N-23 ° 13' E-89 ° 50'	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
6.	H-3	Maansuri T. Aman	Shanto Upazila: Narail Sadar District: Narail	18 April, 2019 N-23 ° 13' E-89 ° 50'	
7.	H-4	Katari Bhog T. Aman	Sohel Niyazi Upazila: Chirirbandar District: Dinajpur	16 April, 2019 N-25 ° 39' E-88 ° 47'	
8.	Z-2	Charali Dhan T. Aman	Ruhul Amin Upazila: Sylhet Sadar District: Sylhet	04 April, 2019 N-24 ° 54' E-91 ° 52'	
9.	Z-3	Subol Lota Boro	Jashim Uddin Upazila: Kushtia Sadar District: Kushtia	25 March, 2019 N-23° 55' E-89° 13'	
10.	Z-4	Guti Swarna T. Aman	Jashim Uddin Upazila: Kushtia Sadar District: Kushtia	25 March, 2019 N-23° 55' E-89° 13'	
11.	Z-5	Jamai Binni Dhan Aus/Jhum	Ruhul Amin Upazila: Sylhet Sadar District: Sylhet	26 Feb, 2019 N-24 ° 54' E-91 ° 52'	
12.	*KH-1	Gonga T. Aman	Azahar Ali Village: Damiyar Chhora Upazila: Fulbari District: Kurigram	11 Dec, 2019 N-25° 57'06'' E-89° 34'22''	
13.	KH-2	Pat Jak T. Aman	Badsha Mia Upazila: Kalihati District: Tangail	11 Dec, 2019 N-28 °18'31'' E-89 ° 55'14''	
14.	KH-3	Gainja T. Aman	Md. Sohel Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'54'' E-89 ° 42'23''	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
15.	KH-4	Kalojira T. Aman	Ramesh Das Village: Bamondanga Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'44'' E-89 ° 42'13''	
16.	KH-5	Kalijira T. Aman	Md. Taijul Islam Vil: Vitorbondar Bazar Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'24'' E-89 ° 42'03''	
17.	KH-6	Kalojira T. Aman	Md. Saiful Vil: Vitorbondar Bazar Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'24'' E-89 ° 42'03''	
18.	KH-7	Gainja T. Aman	Ataur Rahman Village: Bamondanga Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'44'' E-89 ° 42'13''	
19.	KH-8	Bhog Dhan T. Aman	Md. Taijul Islam Vil: Vitorbondar Bazar Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'24'' E-89 ° 42'03''	
20.	KH-9	09 (Noy) T. Aman	Ramzan Ali Khondokar Village: Damiyar Chhora Upazila: Fulbari District: Kurigram	12 Dec, 2019 N-25° 57'06'' E-89° 34'22''	
21.	KH-10	Bhog Dhan T. Aman	Md. Saiful Vil: Vitorbondar Bazar Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'24'' E-89 ° 42'03''	
22.	KH-11	Malshira T. Aman	Md. Saiful Vil: Vitorbondar Bazar Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'24'' E-89 ° 42'03''	
23.	KH-12	Katari Bhog T. Aman	Ataur Rahman Village: Bamondanga Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'44'' E-89 ° 42'13''	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
24.	KH-13	Malshira T. Aman	Ataur Rahman Village: Bamondanga Upazila: Nageshwari District: Kurigram	12 Dec, 2019 N-25 ° 58'44'' E-89 ° 42'13''	
25.	*BF-1	Nashta Shaingla T. Aman	Md. Abdul Jalil Village: Bepura Upazila: Kamarkhanda District: Sirajganj	11 Dec, 2019 N-24 ° 22'21'' E-89 ° 38'52''	
26.	BF-2	Guti Swarna T. Aman	Nurul islam Village: Bepura Upazila: Kamarkhanda District: Sirajganj	11 Dec, 2019 N-24 ° 22'21'' E-89 ° 38'52''	
27.	BF-3	Kalo Shaingla T. Aman	Abu Yeaheya Village: Bepura Upazila: Kamarkhanda District: Sirajganj	11 Dec, 2019 N-24 ° 22'21'' E-89 ° 38'52''	
28.	BF-4	Sada Shaingla T. Aman	Abu Yeaheya Village: Bepura Upazila: Kamarkhanda District: Sirajganj	11 Dec, 2019 N-24 ° 22'21'' E-89 ° 38'52''	
29.	BF-5	Pat Jag T. Aman	Shahidul Islam Mondal Village: Balukol Upazila: Kamarkhanda District: Sirajganj	11 Dec, 2019 N-24 ° 23'53'' E-89 ° 39'33''	
30.	BF-6	Najir Shail T. Aman	Ashfaque Habib Village: Balukol Upazila: Kamarkhanda District: Sirajganj	11 Dec, 2019 N-24 ° 23'53'' E-89 ° 39'33''	
31.	BF-7	Sorsori T. Aman	Md. Abdul Latif Molla Village: Tiyarbondo Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'03'' E-89 ° 38'42''	
32.	BF-8	Digha T. Aman	Hafijur Village: Dheetpur Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'13'' E-89 ° 38'62''	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
33.	BF-9	Bolenga T. Aman	Md. Abdul Latif Molla Village: Tiyaarbondo Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'03'' E-89 ° 38'42''	
34.	BF-10	Laldepa T. Aman	Hafijur Village: Dheetpur Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'13'' E-89 ° 38'62''	
35.	BF-11	Sada Bhaoaila T. Aman	Shamsul Village: Dheetpur Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'13'' E-89 ° 38'62''	
36.	BF-12	Jol Digha T. Aman	Md. Abdul Latif Molla Village: Tiyaarbondo Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'03'' E-89 ° 38'42''	
37.	BF-13	Bogjul T. Aman	Abdul Kader Village: Kurshi Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'43'' E-89 ° 38'32''	
38.	BF-14	Narikel Badhi T. Aman	Abdul Kader Village: Kurshi Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'43'' E-89 ° 38'32''	
39.	BF-15	Sada depa T. Aman	Shamsul Village: Dheetpur Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'13'' E-89 ° 38'62''	
40.	BF-16	Lal Bhaoaila T. Aman	Abdul Kader Village: Kurshi Upazila: Shahjadpur District: Sirajganj	11 Dec, 2019 N-24 ° 09'43'' E-89 ° 38'32''	
41.	BF-17	Shaswari T. Aman	Md. Rezaul Karim Village: Islam Nagar Upazila: Faridpur District: Pabna	12 Dec, 2019 N-24 ° 07'22'' E-89 ° 21'48''	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
42.	BF-18	Bashiraj T. Aman	Md. Majibar Village: Islam Nagar Upazila: Faridpur District: Pabna	12 Dec, 2019 N-24 ° 07'22'' E-89 ° 21'48''	
43.	BF-19	Ajol Digha T. Aman	Md. Rahim Village: Islam Nagar Upazila: Faridpur District: Pabna	12 Dec, 2019 N-24 ° 07'22'' E-89 ° 21'48''	
44.	BF-20	Swarshoria T. Aman	Hazi Abdul Molla Village: Khetabakha Upazila: Faridpur District: Pabna	12 Dec, 2019 N-24 ° 07'12'' E-89 ° 21'38''	
45.	BF-21	Bhaowaley T. Aman	Abdul Matin Village: Moud Upazila: Faridpur District: Pabna	12 Dec, 2019 N-24 ° 07'55'' E-89 ° 21'26''	
46.	BF-22	Ajoldighi T. Aman	Md. Saiful Islam Village: Balughata Upazila: Faridpur District: Pabna	12 Dec, 2019 N-24 ° 07'88'' E-89 ° 21'67''	
47.	BF-23	Bashiraj T. Aman	Md. Abdul Latif Village: Khetabakha Upazila: Faridpur District: Pabna	12 Dec, 2019 N-24 ° 07'12'' E-89 ° 21'38''	
48.	BF-24	Saitey Boro T. Aman	Ramzan Ali Village/Union: Hadol Upazila: Faridpur District: Pabna	12 Dec, 2019 N-24 ° 07'22'' E-89 ° 21'48''	
49.	BF-25	Boro Boro	Yeanabi Village: Uttarmenda Upazila: Bhangura District: Pabna	12 Dec, 2019 N-24 ° 12'50'' E-89 ° 22'43''	
50.	BF-26	Banshiraj T. Aman	Nurul Islam Village: Sardar Para Upazila: Bhangura District: Pabna	12 Dec, 2019 N-24 ° 12'81'' E-89 ° 22'23''	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
51.	BF-27	Ajoldigha T. Aman	Sabedul Village: Sardar Para Upazila: Bhangura District: Pabna	12 Dec, 2019 N-24 ° 12'81'' E-89 ° 22'23''	
52.	BF-28	Shosria T. Aman	Mostafa Village: Sardar Para Upazila: Bhangura District: Pabna	12 Dec, 2019 N-24 ° 12'81'' E-89 ° 22'23''	
53.	BF-29	Jota Bhaula T. Aman	Md, Nazrul Islam Village: Boailmari Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'33'' E-89 ° 17'33''	
54.	BF-30	Bashiraj T. Aman	Md, Nazrul Islam Village: Boailmari Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'33'' E-89 ° 17'33''	
55.	BF-31	Janok Ray T. Aman	Md, Nazrul Islam Village: Boailmari Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'33'' E-89 ° 17'33''	
56.	BF-32	Ajol Digha T. Aman	Md, Nazrul Islam Village: Boailmari Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'33'' E-89 ° 17'33''	
57.	BF-33	Dudh Shail/Modhu Shail T. Aman	Abdus Samad Village: Uttarpara Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'23'' E-89 ° 17'21''	
58.	BF-34	Dhepa Dhan T. Aman	Md. Shafiqul Islam Village: Uttarpara Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'23'' E-89 ° 17'21''	
59.	BF-35	Jota Bhaula T. Aman	Md, Nazrul Islam Village: Boailmari Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'33'' E-89 ° 17'33''	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
60.	BF-36	Digha Dhan T. Aman	Md, Rezaul Karim Village: Sabujpara Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'12'' E-89 ° 17'08''	
61.	BF-37	Ajol Digha T. Aman	Abdus Salam Manju Village: Boailmari Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'33'' E-89 ° 17'33''	
62.	BF-38	Janok Ray T. Aman	Md, Mozammel Haque Village: Sabujpara Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'12'' E-89 ° 17'08''	
63.	BF-39	Sor Saria T. Aman	Md, Mozammel Haque Village: Sabujpara Upazila: Chatmohar District: Pabna	12 Dec, 2019 N-24 °13'12'' E-89 ° 17'08''	
64.	BF-40	Pat Jat T. Aman	Sohrab Ali Village: Sattikori Upazila: Ullapara District: Sirajganj	13 Dec, 2019 N-24 ° 18'53'' E-89 ° 34'10''	
65.	BF-41	Pat Jag T. Aman	Sohrab Ali Village: Hasanpur Upazila: Ullapara District: Sirajganj	13 Dec, 2019 N-24 ° 18'33'' E-89 ° 34'05''	
66.	BF-43	Sada Bhaula T. Aman	Md. Shahadat Ali Razman Village: Sattikori Upazila: Ullapara District: Sirajganj	13 Dec, 2019 N-24 ° 18'53'' E-89 ° 34'10''	
67.	BF-44	Lal Bhaula T. Aman	Md. Asad Ali Village: Anondabera Upazila: Ullapara District: Sirajganj	13 Dec, 2019 N-24 ° 18'43'' E-89 ° 34'13''	
68.	BF-45	Sada Digha T. Aman	Md. Bablu Mia Village: Choto Koaliber Upazila: Ullapara District: Sirajganj	13 Dec, 2019 N-24 ° 18'38'' E-89 ° 34'18''	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
69.	BF-46	Pat Jag T. Aman	Md. Jalal Village: Choto Koaliber Upazila: Ullapara District: Sirajganj	13 Dec, 2019 N-24 ° 18'38'' E-89 ° 34'18''	
70.	BF-47	Ashwina Digha T. Aman	Md. Moynul Haque Village: Choto Koaliber Upazila: Ullapara District: Sirajganj	13 Dec, 2019 N-24 ° 18'38'' E-89 ° 34'18''	
71.	BF-48	Swarna-5 T. Aman	Md. Shariful Village: Betkandi Upazila: Ullapara District: Sirajganj	13 Dec, 2019 N-24 ° 18'28'' E-89 ° 34'22''	
72.	BF-49	Digha T. Aman	Md. Asab Sarkar Village: Betkandi Upazila: Ullapara District: Sirajganj	13 Dec, 2019 N-24 ° 18'28'' E-89 ° 34'22''	
73.	BF-50	Baula T. Aman	Md. Anowar Village: Kalur Para Upazila: Tarash District: Sirajganj	13 Dec, 2019 N-24 ° 22'56'' E-89 ° 25'10''	
74.	BF-51	Maita Gorol T. Aman	Anowara Begum Village: Kalur Para Upazila: Tarash District: Sirajganj	13 Dec, 2019 N-24 ° 22'56'' E-89 ° 25'10''	
75.	BF-52	Kaiha Dhan T. Aman	Md. Ali Ashraf Village: Kalur Para Upazila: Tarash District: Sirajganj	13 Dec, 2019 N-24 ° 22'56'' E-89 ° 25'10''	
76.	*KF-1	Galong Jhum	David Lusai Village: Konglak Hill Union: Sajek Upazila: Bagaichari District: Rangamati	22 December 2019 N-23°29'19" E-92°16'46"	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
77.	KF-2	Boushakhi Jhum	Sanga Pangkhua Village: Konglak Hill Union: Sajek Upazila: Bagaichari District: Rangamati	22 Dec. 2019 N-23°29'19" E-92°16'46"	
78.	KF-3	Sherey Jhum	Alindra Tripura Village: Konglak Hill Union: Sajek Upazila: Bagaichari District: Rangamati	22 Dec. 2019 N-23°29'19" E-92°16'46"	
79.	KF-4	Guri Gilong Jhum	Binoma Tripura Village: Konglak Hill Union: Sajek Upazila: Bagaichari District: Rangamati	22 Dec. 2019 N-23°29'19" E-92°16'46"	
80.	KF-5	Binni Jhum	Binoma Tripura Village: Konglak Hill Union: Sajek Upazila: Bagaichari District: Rangamati	22 Dec. 2019 N-23°29'19" E-92°16'46"	
81.	KF-6	Galong Dhan Jhum	Minto Chakma Village: ShikojBridgepara Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'19" E-92°16'51"	
82.	KF-7	Binni Dhan Jhum	Nareshwar Tripura Village: Debchara Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'24" E-92°16'38"	
83.	KF-8	Galongk Fu Jhum	Paruli Tripura Village: Debchara Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'24" E-92°16'38"	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
84.	KF-9	Kamarang Jhum	Buddhalekha Sangma Village: 6 no. Sajek Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'31" E-92°13'28"	
85.	KF-10	Turki Dhan Jhum	Buddhalekha Sangma Village: 6 no. Sajek Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'31" E-92°13'28"	
86.	KF-11	Sada Galong Jhum	Buddhalekha Sangma Village: 6 no. Sajek Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'31" E-92°13'28"	
87.	KF-12	Khamarang Jhum	Buddhalekha Sangma Village: 6 no. Sajek Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'31" E-92°13'28"	
88.	KF-13	Bojha Dhan Jhum	Rangasiji Sangma Village: 6 no. Sajek Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'31" E-92°13'28"	
89.	KF-14	Hamarong Dhan Jhum	Lothimala Chakma Village: 6 no. Sajek Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'31" E-92°13'28"	
90.	KF-15	Amei Dhan Jhum	Chikon Chakma Village: Akuicchachhari, 6 no. Sajek Union: Sajek Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23°22'31" E-92°13'28"	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
91.	KF-16	Bharat Panja T. Aman	Abu Mohammad Village: Nursarypara Union: Baghaihat Upazila: Bagaichari District: Rangamati	23 Dec. 2019 N-23 ⁰ 17'01" E-92 ⁰ 09'21"	
92.	KF-17	Sileti Pajam T. Aman	Badi Chakma Village: Rashknagar Union: Merung Upazila: Dighinala District: Khagrachari	23 Dec. 2019 N-23 ⁰ 12'11" E-92 ⁰ 04'01"	
93.	KF-18	Binni Jhum	Badi Chakma Village: Rashknagar Union: Merung Upazila: Dighinala District: Khagrachari	23 Dec. 2019 N-23 ⁰ 12'11" E-92 ⁰ 04'01"	
94.	KF-19	20 Nombor Dhan Jhum	Sadhon Chakma Village: Rashknagar Union: Merung Upazila: Dighinala District: Khagrachari	23 Dec. 2019 N-23 ⁰ 12'11" E-92 ⁰ 04'01"	
95.	KF-20	20 Nombor Jhum	Lokeshwar Tripura Village: Aatmail Upazila: Khagrachari District: Khagrachari	23 Dec. 2019 N-23 ⁰ 11'07" E-92 ⁰ 01'56"	
96.	KF-21	Galon Jhum	Charankishor Tripura Village: Chhoymail Upazila: Khagrachari District: Khagrachari	23 Dec. 2019 N-23 ⁰ 10'34" E-92 ⁰ 01'38"	
97.	KF-22	My Wachha Jhum	Ranjika Tripura Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 08'10" E-92 ⁰ 00'00"	
98.	KF-23	Bishnombor Jhum	Shashimohon Tripura Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 08'10" E-92 ⁰ 00'00"	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
99.	KF-24	My Wachha Jhum	Patiranjana Tripura Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°08'10" E-92°00'00"	
100.	KF-25	Bish Nombor Jhum	Bikram Tripura Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°08'10" E-92°00'00"	
101.	KF-26	Gur Badeye Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
102.	KF-27	Baro Badeye Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
103.	KF-28	Chong gelong Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
104.	KF-29	Gu-hala Bini Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
105.	KF-30	Chitto Paijam Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
106.	KF-31	Kamarang Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
107.	KF-32	Guhala Bini Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
108.	KF-33	Baro Bodhoi Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
109.	KF-34	Pattiye Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
110.	KF-35	Company Dhan Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
111.	KF-36	Ranga Gelong Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
112.	KF-37	Aus Bini Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
113.	KF-38	Reng Gui Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 06'27" E-91 ⁰ 59'23"	
114.	KF-39	Jesmine Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 06'27" E-91 ⁰ 59'23"	
115.	KF-40	Uttose Bini Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 06'27" E-91 ⁰ 59'23"	
116.	KF-41	Khama Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 06'27" E-91 ⁰ 59'23"	
117.	KF-42	Bandor Nok Bini Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 06'27" E-91 ⁰ 59'23"	
118.	KF-43	Tumbaz Patti Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 06'27" E-91 ⁰ 59'23"	
119.	KF-44	Patti Dhan	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 06'27" E-91 ⁰ 59'23"	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
120.	KF-45	Ranga Pattiyo Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
121.	KF-46	Wan tu Bini Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
122.	KF-47	Rangamoni Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
123.	KF-48	Hoba Bini Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
124.	KF-49	Kokborok Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
125.	KF-50	Bodakusum Jhum	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	
126.	KF-51	Subas T.Aman	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23°06'27" E-91°59'23"	

Sl.#	Collector's No.	Cultivar/local name/cultural practice	Donor's name and address	Collection date & geographical position	Photograph
127.	KF-52	Banshphul T.Aman	Trinomul Unnayon Songstha (NGO) Village: Milonpur Upazila: Khagrachari Sadar District: Khagrachari	24 Dec. 2019 N-23 ⁰ 06'27" E-91 ⁰ 59'23"	
128.	KF-53	Longka Pura Binni Jhum	Kala Baggye Chakma Village: 6 no. Sajek Union: Sajek Upazila: Bagaichari District: Rangamati	24 Dec. 2019 N-23 ⁰ 22'31" E-92 ⁰ 13'28"	
129.	KF-54	Gomoti Dhan T.Aman	Kandiya Marma Upazila: Ramgarh District: Khagrachari	25 Dec. 2019 N-22 ⁰ 58'12" E-91 ⁰ 42'02"	
130.	KF-55	Sada Binni Jhum	Kandiya Marma Upazila: Ramgarh District: Khagrachari	25 Dec. 2019 N-22 ⁰ 58'12" E-91 ⁰ 42'02"	
131.	KF-56	Hazari Dhan T.Aman	Kandiya Marma Upazila: Ramgarh District: Khagrachari	25 Dec. 2019 N-22 ⁰ 58'12" E-91 ⁰ 42'02"	
132.	KF-57	Chhokka Dhan T.Aman	Kamrul Hasan Upazila: Ramgarh District: Khagrachari	25 Dec. 2019 N-22 ⁰ 58'12" E-91 ⁰ 42'02"	

Collection Team: *K = Dr. Mohammad Khalequzzaman; *H = Dr. Ebna Syod Md. Harunur Rashid; *Z = Dr. Mohammad Zahidul Islam; *KH = Dr. Mohammad Khalequzzaman and Dr. Ebna Syod Md. Harunur Rashid; *BF = Md. Humayun Kabir Baktiar and Md. Ferdous Rezwan Khan Prince; *KF = Dr. Mohammad Khalequzzaman and Md. Ferdous Rezwan Khan Prince.

Table 5. Passport information of collected rice (*Oryza sativa*) germplasm under PBRG-PGR sub-project, 2020

Sl.#	Collector's No.	Cultivar /local name /cultural practice	Donor's name and address	Collection date & geographical position	Photograph
1.	*KFS-1	Black Rice T.Aman	Md. Manjur Hossain Village: Monagram Upazila: Adarsha Sadar District: Cumilla	20 Nov, 2020 N-23°26'44'' E-91 °23'26''	
2.	KFS-2	Black Rice T.Aman	Md. Manjur Hossain Village: Monagram Upazila: Adarsha Sadar District: Cumilla	20 Nov, 2020 N-23°26'44'' E-91 °23'26''	
3.	KFS-3	Black Rice T.Aman	Md. Manjur Hossain Village: Monagram Upazila: Adarsha Sadar District: Cumilla	20 Nov, 2020 N-23°26'44'' E-91 °23'26''	
4.	KFS-4	Black Rice T.Aman	Md. Manjur Hossain Village: Monagram Upazila: Adarsha Sadar District: Cumilla	20 Nov, 2020 N-23°26'44'' E-91 °23'26''	
5.	KFS-5	Asam Black Rice T.Aman	Md. Faruk Hossain Khan Upazila: Adarsha Sadar District: Cumilla	21 Nov, 2020 N-23°26'44'' E-91 °23'26''	
6.	KFS-6	Indian T.Aman	Faruk Hossain Khan Upazila: Adarsha Sadar District: Cumilla	21 Nov, 2020 N-23°26'44'' E-91 °23'26''	

Collection Team: *KFS = Dr. Mohammad Khalequzzaman, Faruk Hossain Khan and A. K. M. Shalahuddin.

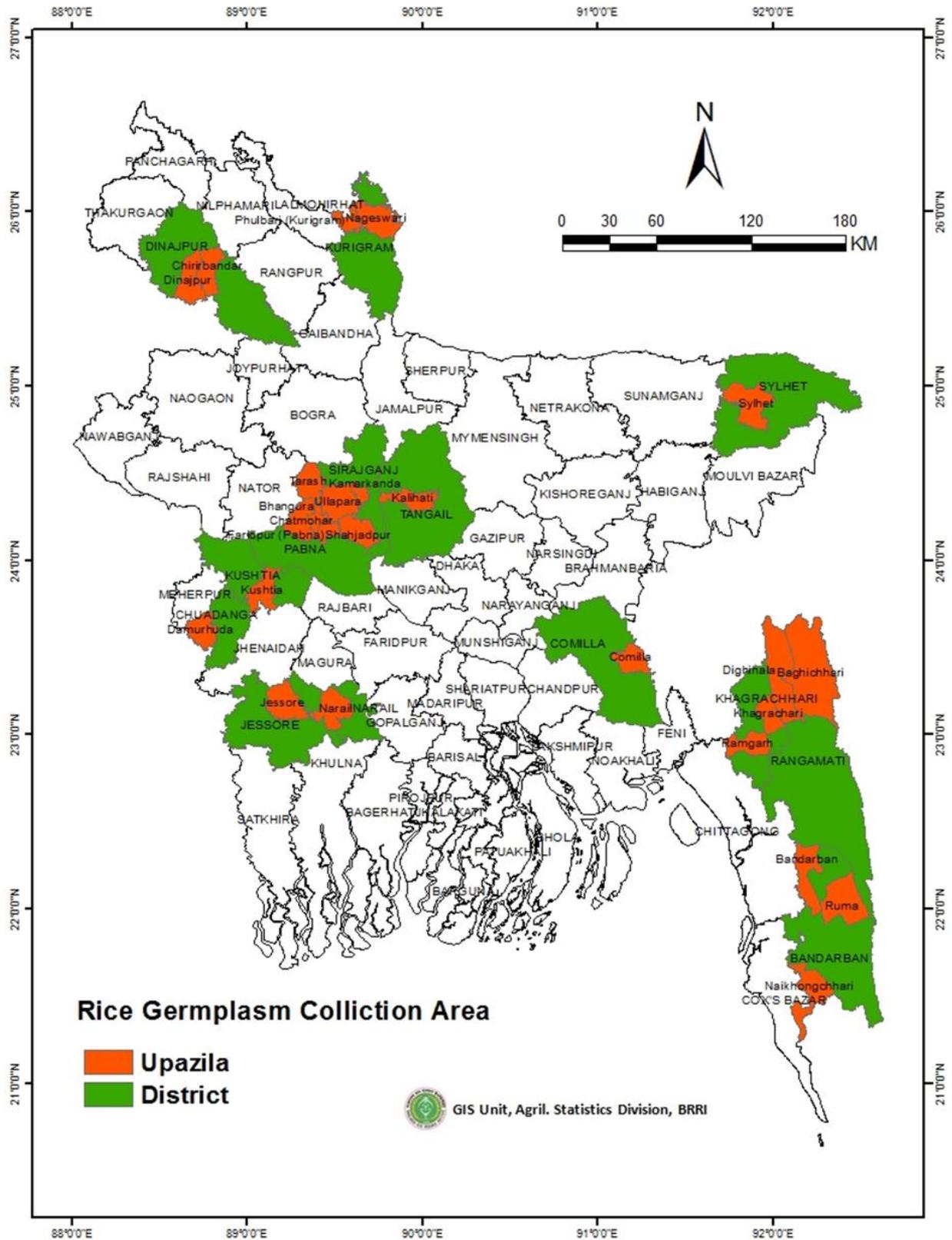


Fig. 6. Germplasm collection sites



Fig.7. Rice germplasm collection from different locations of Bangladesh

11.2.2. Conservation and multiplication of collected rice germplasm

Collected all germplasm (247) were cleaned and dried upto 10-12% moisture content and conserved in short term storage of BRRRI Genebank at 20⁰ C and >60% relative humidity. Also, all collected materials were multiplied at BRRRI experimental Field, Gazipur in respective season and conserved as new collection (Fig. 8).



Fig. 8. Conservation of collected rice germplasm

11.2.3. Morphological characterization

A total of 264 local rice germplasm from BRRRI genebank have been characterized on the bases of morpho-agronomical characters. In T. Aman, 2018, forty eight (48) germplasm were characterized (Table 6). Data on 31 qualitative and 21 quantitative characters are shown in Table 7 and Table 8. Morphological characterization of forty eight (48) Boro rice germplasm has been accomplished during 2018-19 (Table 9). Data on 31 qualitative characters are shown in Table 10 and data on 21 quantitative characters are shown in Table 11. Besides, characterization of forty eight (48) Aus (2019) rice germplasm was completed (Table 12). Data on 31 qualitative characters of 48 germplasm are shown in Table 13 and 21 quantitative characters are shown in Table 14. In Aman (2019) characterization of seventy two T. Aman rice germplasm has been completed (Table 15). Data on 31 qualitative characters of 72 germplasm are shown in Table 16 and data on 21 quantitative characters are shown in Table 17. Similarly, morphological characterization of forty eight (48) Boro rice germplasm during 2019-20 has been completed (Table 18). Data on 31 qualitative characters are shown in Table 19 and data on 21 quantitative characters are shown in Table 20.

11.2.3.1. Morphological characterization of 48 T. Aman rice germplasm (2018)

Table 6. List of rice germplasm characterized, T. Aman, 2018

Sl. no.	Germplasm Name	Acc. no.	Upazila	District	Season
1	Bad Kalamkati	2	-	Dhaka	T. Aman
2	Baisbis	4	-	Dhaka	T. Aman
3	Bhasha Manik	5	-	Dhaka	T. Aman
4	Bansfol	6	-	Barisal	T. Aman
5	Blue Stick	8	-	Dhaka	T. Aman
6	Chinri Gushi	12	-	Barisal	T. Aman
7	Chitraj	13	-	Dhaka	T. Aman
8	Daudkhani	15	-	Dhaka	T. Aman
9	Dhola Amon	19	-	Sylhet	T. Aman
10	Dudhlaki	20	-	Sylhet	T. Aman
11	Indrasail	32	-	Dhaka	T. Aman

Table 6. Cont'd

Sl. no.	Germplasm Name	Acc. no.	Upazila	District	Season
12	Jesso Balam	34	-	Dhaka	T. Aman
13	Jhingashail	36	-	Dhaka	T. Aman
14	Kumari	42	-	Dhaka	T. Aman
15	Nagra	48	-	Dhaka	T. Aman
16	Rupsail	58	-	Dhaka	T. Aman
17	Bashful	72	Shibalaya	Dhaka	T. Aman
18	Apchaya	84	Ghior	Dhaka	T. Aman
19	Dhalkatia	89	Manikganj	Dhaka	T. Aman
20	Boron	91	Saturia	Dhaka	T. Aman
21	Dhal Data	92	-	Dhaka	T. Aman
22	Sechi Amon	94	-	Dhaka	T. Aman
23	Laksmidiga	98	Munshiganj	Dhaka	T. Aman
24	Dal Katra	99	Manikganj	Dhaka	T. Aman
25	Chota Bhawalia	100	Manikgonj	Dhaka	T. Aman
26	Bhora Bhawlia	101	Manikganj	Dhaka	T. Aman
27	Digha	103	Hariranpur	Dhaka	T. Aman
28	Manik Digha	104	Hariranpur	Dhaka	T. Aman
29	Bhawal Motuk	106	Manikganj	Dhaka	T. Aman
30	Jatra Motuk	107	Manikganj	Dhaka	T. Aman
31	Bora Diga	108	Manikganj	Dhaka	T. Aman
32	Rangi Khama	109	Manikganj	Dhaka	T. Aman
33	Dudh Bhawalia	110	Manikganj	Dhaka	T. Aman
34	Goirol	111	Manikganj	Dhaka	T. Aman
35	Bhawalia Amon	112	Manikganj	Dhaka	T. Aman
36	Hashfol	113	Saturia	Dhaka	T. Aman
37	Raj Mondal	114	Saturia	Dhaka	T. Aman
38	Gonak Ray	115	Saturia	Dhaka	T. Aman
39	Kala Mona	116	Saturia	Dhaka	T. Aman
40	Belon Dhan	117	Saturia	Dhaka	T. Aman
41	Shor Soria	118	Saturia	Dhaka	T. Aman
42	Gorcha	119	Munshiganj	Dhaka	T. Aman
43	Luta	120	Tongibari	Dhaka	T. Aman
44	Sunadiga	122	Saturia	Dhaka	T. Aman
45	Gabura	123	Gajaria	Dhaka	T. Aman
46	Khoiamotor	125	Gajaria	Dhaka	T. Aman
47	Sunadigha	126	Manikganj	Dhaka	T. Aman
48	Raj Bhawalia	130	Manikganj	Dhaka	T. Aman

Table 7. Characterization of rice germplasm based on qualitative traits, T. Aman, 2018

Sl. no.	Character	State of characters	No. of germplasm	Germplasm (Serial number in Table 6)	Frequency (%)
1.	Blade pubescence	01. Glabrous			
		02. Intermediate	48	All	100
		03. Pubescent			
2.	Blade colour	02. Green	41	1,2,3,5,6,7,8,9,10,11,12,13,14,15,17,18,20,21,22,23,25,27,28,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47.	85.42
		03. Dark green	1	24	2.08
		04. Purple tips	3	4,16,19	6.25
		05. Purple margins	3	26,29,48	6.25
3.	Leaf sheath: anthocyanin colour	01. Absent	31	1,2,3,5,6,7,8,9,11,12,13,14,15,17,18,20,21,23,25,27,28,31,32,33,35,37,38,40,42,43,47	64.58
		09. Present	17	4,10,16,19,22,24,26,29,30,34,36,39,41,44,45,46,48.	35.42
4.	Basal leaf sheath colour	01. Green	31	1,2,3,5,6,7,8,9,11,12,13,14,15,17,18,20,21,23,25,27,28,31,32,33,35,37,38,40,42,43,47	64.58
		02. Purple lines	1	45,	2.08
		03. Light purple	7	10,16,24,34,36,39,41	14.58
		04. Purple	9	4,19,22,26,29,30,44,46,48	18.75
5.	Leaf angle	01. Erect	11	2,5,6,8,17,22,31,35,38,41,47	22.92
		05. Horizontal	20	1,3,4,9,10,13,14,15,16,18,21,30,32,36,37,40,42,44,46,48	41.67
		09. Drooping	17	7,11,12,19,20,23,24,25,26,27,28,29,33,34,39,43,45	35.42
6.	Flag leaf angle	01. Erect(<30 ⁰)	6	2,5,8,22,31,41	12.5
		3.Semi erect(<30-45 ⁰)	3	6,17,47	6.25
		05.Horizaontal (<46-90 ⁰)	18	1,4,10,13,14,15,18,21,23,24,30,32,36,37,40,42,44,48	37.5
		7.Descending (>90 ⁰)	21	3,7,9,11,12,16,19,20,25,26,27,28,29,33,34,35,38,39,43,45,46	43.75
7.	Ligule colour	01. White	37	1,2,3,5,6,7,8,9,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,27,28,31,32,33,35,37,38,39,40,42,43,44,47	77.08
		02. Purple lines	10	4,10,26,29,30,34,36,41,45,46	20.83
		03. Purple	1	48	2.08
8.	Ligule shape	02. 2- cleft	48	All	100
9.	Collar colour	01. Pale green	11	9,16,17,18,19,21,22,23,40,44,47	22.92
		02. Green	25	1,2,3,5,6,7,8,11,12,13,14,15,20,25,27,28,31,32,33,35,37,38,39,42,43	52.08
		03. Purple	12	4,10,24,26,29,30,34,36,41,45,46,48	25
10.	Auricle colour	01. Pale green	36	1,2,3,5,6,7,8,9,11,12,13,14,15,16,17,18,19,20,21,22,23,25,27,28,31,32,33,35,37,38,39,40,42,43,44,47.	75
		02. Purple	12	4,10,24,26,29,30,34,36,41,45,46,48	25
11.	Culm anthocyanin colour	01. Absent	44	1,2,3,5,6,7,8,9,10,11,12,13,14,15,17,18,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,45,46,47,48	91.67
		09. Present	4	4,16,19,44	8.33
12.	Culm angle	01. Erect(<30 ⁰)	2	16,18	4.17
		03. Intermediate	21	2,3,6,7,13,14,15,17,19,21,32,34,35,36,37,38,40,41,42,44,48	43.75
		05. Open	15	1,4,5,8,11,12,20,24,27,31,33,39,43,46,47	31.25
		07. Spreading	9	9,10,22,25,26,28,29,30,45.	18.75
		09. Procumbent	1	23	2.08
13.	Internode colour	01. Green	43	1,2,5,6,7,8,9,10,11,12,13,14,15,17,18,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,45,46,47,48	89.58
		02. Light gold	1	3	2.08
		03. Purple lines	2	19,44	4.17
		04. Purple	2	4,16	4.17
14.	Culm strength (lodging resistance)	01. Strong	11	1,2,7,8,11,12,17,20,43,44,46	22.92
		03. Moderately strong			

Table 7. Cont'd

Sl. no.	Character	State of characters	No. of germplasm	Germplasm (Serial number in Table 6)	Frequency (%)
		05. Intermediate	11	3,11,16,24,33,34,35,36,37,38,39	22.92
		07. Weak	17	4,5,6,10,13,14,15,18,19,21,25,27,31,32,40,42,47,48	35.41
		09. Very weak	9	9,22,23,26,28,29,30,41,45	18.75
15.	Panicle type	01. Compact	7	5,18,21,32,38,40,43	14.58
		05. Intermediate	18	4,6,8,11,13,14,16,19,22,30,33,34,35,36,37,41,47,48.	37.5
		09. Open	23	1,2,3,7,9,10,12,15,17,20,23,24,25,26,27,28,29,31,39,42,44,45,46,	47.92
16.	Secondary branching	0. Absent			
		01. Light			
		02. Heavy	48	All	100
		03. Clustered			
17.	Panicle exertion	03. Partly exerted	6	23,26,29,30,31,45.	12.5
		05. Just exerted	14	2,13,19,22,25,27,28,32,35,36,39,41,43,48.	29.17
		07. Moderately well exerted	14	1,6,7,8,11,14,15,16,17,21,24,38,40,42.	29.17
		09. Well exerted	14	3,4,5,9,10,12,18,20,33,34,37,44,46,47	29.17
18.	Axis	01. Straight	1	43	2.08
		02. Droopy	47	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,44,45,46,47,48	97.92
19	Shattering	01. Very low (<1%)	21	3,7,8,23,25,27,28,30,31,32,33,35,36,38,40,41,42,43,46,47,48	43.75
		03. Low (~3%)	21	1,2,4,5,6,10,11,14,16,17,19,20,21,24,26,29,34,37,39,44,45	43.75
		05. Moderate (≈15%)	6	9,12,13,15,18,22	12.5
20.	Threshability	3. Moderately difficult (1-5%)	1	2	2.08
		5. Intermediate	1	38	2.08
		7. Loose (26-50%)	16	3,7,11,23,25,27,31,32,36,40,41,42,43,46,47,48	33.33
		9. Easy (51-100%)	30	1,4,5,6,7,8,9,10,12,13,14,15,16,17,18,19,20,21,22,24,26,28,29,30,33,34,35,37,39,44,45	62.5
21.	Awn: distribution	0. None (awnless)	18	2,6,9,10,11,12,15,18,20,21,34,37,38,40,42,43,47,48	37.5
		01. Tip only	10	3,5,7,8,14,16,17,19,36,41.	20.83
		02. Upper quarter only	3	1,28,33.	6.25
		05. Whole length	17	4,13,22,23,24,25,26,27,29,30,31,32,35,39,44,45,46.	35.42
22.	Awn colour	01. Straw	23	1,5,7,8,13,14,17,23,24,25,27,28,29,30,31,32,33,34,35,39,44,45,46.	76.67
		02. Gold	1	3.	3.33
		05. Purple	6	4,16,19,22,26,41.	20.0
23.	Apiculus colour	02. Straw	30	1,2,5,6,7,8,9,10,11,12,13,14,15,18,20,21,23,24,25,27,28,31,32,33,35,37,38,40,42,43.	62.5
		03. Brown	3	3,17,47.	6.25
		05. Red apex	1	39.	2.08
		06. Purple	14	4,16,19,22,26,29,30,34,36,41,44,45,45,48.	29.16
24.	Stigma colour	01. White	33	1,2,3,5,6,7,8,9,10,11,12,13,14,15,17,18,20,21,23,24,25,27,28,31,32,33,35,37,38,40,42,43,47.	68.75
		04. Light purple	1	39,	2.08
		05. Purple	14	4,16,19,22,26,29,30,34,36,41,44,45,46,48.	29.17
25.	Lemma and palea colour	0. Straw	31	1,2,5,6,9,10,12,14,15,18,19,20,21,23,24,25,28,29,30,31,33,34,35,36,37,38,42,43,44,45,46,48	64.58
		01. Gold and gold furrows on straw	8	8,11,13,16,27,31,40,47	16.67

Sl. no.	Character	State of characters	No. of germplasm	Germplasm (Serial number in Table 6)	Frequency (%)
		03. Brown furrows on straw	4	17,22,26,32	8.33
		04. Brown	2	3,7	4.17
		06. Purple spots on straw	1	4	2.08
		08. Purple	2	39,41	4.17
		09. Black			
26.	Lemma and palea pubescence	03. hairs on upper portion	30	1,2,5,7,8,9,11,13,14,15,16,17,24,25,26,28,29,30,32,33,34,36,37,38,40,42,45,46,47,48.	62.5
		04. Short hairs	18	3,4,6,10,12,18,19,20,21,22,23,27,31,35,39,41,43,44.	37.5
27.	Sterile lemma color	01. Straw	44	1,2,3,5,6,8,9,11,12,13,15,17,18,19,20,21,22,23,24,25,27,28,29,30,31,32,33,34,35,36,37,38,39,41,42,43,44,45,46,47,48	91.67
		02. Gold	2	26,40	4.17
		03. Red	1	16	2.08
		04. Purple	1	4	2.08
28.	Seed coat (bran) colour	01. White	17	1,2,3,5,6,7,8,10,11,12,14,17,20,21,25,35,36	35.42
		02. Light brown	9	13,23,26,30,34,38,39,40,47	18.75
		03. Speckled brown	5	29,32,41,45,46	10.42
		04. brown	2	4,31	4.17
		05. Red	15	9,15,16,18,19,22,24,27,28,33,37,42,43,44,48	31.25
		06. variable purple			
29.	Endosperm type	01. Non-glutinous	6	12,17,24,26,30,38	12.5
		02. Glutinous	6	10,21,25,36,37,44	12.5
		03. Indeterminate	36	1,2,3,4,5,6,7,8,9,11,13,14,15,16,18,19,20,22,23,27,28,29,31,32,33,34,35,39,40,41,42,43,45,46,47,48	75
30.	Decorticated grain: Scent (aroma)	0. Non scented	47	1,2,3,4,5,6,7,8,9,10,12,13,14,15,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	97.92
		02. Scented	1	16	2.08
31.	Leaf senescence	01. Very early	2	29,30	4.17
		03. Early	1	16	2.08
		05. Intermediate	44	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,17,18,19,20,21,22,23,24,25,26,27,28,31,32,33,34,35,36,37,38,39,40,42,43,44,45,46,47,48	91.67
		07. Late and slow	1	41	2.08

Qualitative traits characterization

The present study was aimed at identifying qualitative traits variation among the tested 48 T. Aman (2018) rice germplasm. Polymorphism was found in 28 of the 31 qualitative traits studied; the non-polymorphic traits were the leaf blade pubescence, ligule shape, and secondary branching of panicle (Table 7).

Most of the characterized rice germplasm (85.42%) of the evaluated rice germplasm exhibited a blade colour green while the remaining germplasm exhibited dark green (2.08%), purple tips (6.25%) and purple (6.25%). Data in Table 7 also demonstrate variation in flag leaf angle where the percentage rice germplasm with erect, semi erect, horizontal and descending flag leaf were 12.5%, 6.25%, 37.5% and 43.75%, respectively. The qualitative characters showing higher variability were culm angle (4.17% erect, 43.75% intermediate, 31.25% open, 18.75% spreading and 2.08% procumbent), internode colour (89.58% green, 2.08% light gold, 4.17% purple lines and 4.17% purple), culm strength (22.92% strong, 22.92% intermediate, 35.41% weak and 18.75% very weak), panicle type (14.58% compact, 37.5% intermediate and 47.92% open), panicle exertion (29.17% well exerted, 29.17%

moderately well exerted, 29.17% just exerted and 12.5% partly exerted), awn distribution in the spikelets (37.5% awnless, 20.83% tip only, 6.25% upper quarter only and 35.42% whole length), awn colour (76.67% straw, 3.33% gold and 20.0% purple).

In the present study, it was also found that most of the tested germplasm possessed straw apiculus colour (52.5%), straw lemma and palea colour (64.58%), hairs on upper portion in lemma and palea pubescence (62.5%), white (35.42%) and red (31.25%) seed coat colour, intermediate type leaf senescence (91.67%). The present study exhibited high variability in most of the observed qualitative traits of 48 T. Aman (2018) rice germplasm.

Table 8. Variability of 48 rice germplasm considering 21 quantitative characters, T. Aman, 2018

Character	Range	Mean	SD	CV (%)
Seedling height (cm)	30.00-59.60	48.08	5.87	12.20
Ligule length (mm)	9.20-16.60	13.95	1.91	13.70
Leaf length (cm)	42.60-65.80	55.67	4.86	8.73
Leaf width (cm)	0.79-1.63	1.23	0.17	14.02
Culm diameter (mm)	2.71-5.92	4.69	0.64	13.68
Total tiller number	7-15	9	1.44	15.53
Effective tiller number	6-14	8	1.33	16.11
Culm length (cm)	94.80-159.20	133.46	14.22	10.65
Panicle length (cm)	21.10-30.80	25.90	1.91	7.36
Plant height (cm)	121.10-180.30	159.36	13.88	8.71
Days to 50% flowering	85-129	107	10.53	9.80
Days to maturity	107-154	134	11.50	8.55
Filled grains per panicle	44-157	107	20.83	19.48
Unfilled grains panicle	6-59	23	10.34	34.32
1000 grain weight (g)	16.40-30.55	24.24	3.76	15.53
Grain length (mm)	7.57-9.83	8.28	0.58	6.95
Grain breadth (mm)	2.24-3.23	2.76	0.25	9.00
Decorticated grain length (mm)	5.25-7.14	5.89	0.40	6.72
Decorticated grain breadth (mm)	1.93-2.81	2.43	0.21	8.68
Decorticated grain L/B ratio	1.99-3.32	2.45	0.31	12.86
Yield per hill (g)	5.01-16.17	8.85	2.75	25.05

Quantitative traits characterization

Range, mean, standard deviation (SD) and coefficient of variation (CV) of different quantitative characters of 48 T. Aman (2018) rice germplasm have been shown in Table 8. The range of seedling height was found 30cm (Baisbis) to 59.60cm (Digha) and average number of effective tiller was eight. On an average, days to 50% flowering were 107 days and range was found as 85 days (Goirol) to 129 days (Chinri Gushi). The average plant height and panicle length were found 159.36cm and 25.90cm, respectively. The maximum filled grains per panicle were found 157 (Jesso Balam). The range of decorticated grain length- breadth ratio was observed 1.99 (Hashfol) to 3.32 (Badkalamkati). The highest grain length and breadth was found 9.83mm (Badkalamkati) and 3.23mm (Raj Mondal), respectively. Sunadiga had the highest (30.55 g) and Daudkhani had the lowest (16.4 g) thousand-grain weight (TGW). The highest yield per hill was found 16.17g (Blue Stick) and average yield per hill was 8.85g.

11.2.3.2. Morphological characterization of 48 Boro rice germplasm (2018-19)

Table 9. List of rice germplasm characterized, Boro, 2018-19

Sl. no.	Name	Acc. no.	Upazila/Division	District	Season
1	Mi-Pajang	149	Tangail Sadar	Tangail	Boro
2	Dholi Boro	180	Kalihati	Tangail	Boro
3	Kumri Boro	257	Trishal	Mymensingh	Boro
4	Bairagi Sail	261	Gafargaon	Mymensingh	Boro
5	Tepi Khorch	931	Nabigonj	Sylhet	Boro
6	Pankaich	937	Biswanath	Sylhet	Boro
7	Boro Deshi	938	Biswanath	Sylhet	Boro
8	Gopal Beshi	939	Bariaghon	Sylhet	Boro
9	Borail	940	Bariaghon	Sylhet	Boro
10	Boro 6/2	2206	Plant Breeding, BRRI	Gazipur	Boro
11	Kali Boro	1049	Mollahat	Khulna	Boro
12	Sonar Geye	1050	Mollahat	Khulna	Boro
13	Joya Boro	1051	Daulatpur	Khulna	Boro
14	Amboro 2 (Golden)	1473	-	Dhaka	Boro
15	Batti Boro	1477	Mirpur	Dhaka	Boro
16	Madhabsail	1651	Savar	Dhaka	Boro
17	Jagli	1704	-	Faridpur	Boro
18	Jagli	1705	-	Faridpur	Boro
19	Local Boro	1753	-	Khulna	Boro
20	Saita	1794	Kuliarchar	Kishorganj	Boro
21	Dud Saita	1795	Kuliarchar	Kishorganj	Boro
22	Bogra Boro	1804	Kishorganj Sadar	Kishorganj	Boro
23	Deshi Boro	1805	Kalmakanda	Kishorganj	Boro
24	Jagli (Deshi Boro)	1806	Kahajuri	Kishorganj	Boro
25	Boro Dhan	1808	Barhatta/Karimganj	Kishorganj	Boro
26	Boro Jagli	1809	Netrakona	Kishorganj	Boro
27	Jagli	1810	Barhatta/Itna	Kishorganj	Boro
28	Deshi Boro	1815	Barhatta	Kishorganj	Boro
29	Boro Dhan	1816	Barhatta	Kishorganj	Boro
30	Boro (Sunga)	1861	-	Dinajpur	Boro
31	Jala Boro	1866	-	Dinajpur	Boro
32	Kali Boro 2/2	2189	PBD, BRRI	Gazipur	Boro
33	Kali Boro 4/1	2190	PBD, BRRI	Gazipur	Boro
34	Kali Boro 26	2191	PBD, BRRI	Gazipur	Boro
35	Kali Boro 41/1	2192	PBD, BRRI	Gazipur	Boro
36	Kali Boro 48/1	2193	PBD, BRRI	Gazipur	Boro
37	Kali Boro 80/3	2194	PBD, BRRI	Gazipur	Boro
38	Kali Boro 80/5	2195	PBD, BRRI	Gazipur	Boro
39	Kali Boro 109/4	2196	PBD, BRRI	Gazipur	Boro
40	Kali Boro 138/2	2197	PBD, BRRI	Gazipur	Boro
41	Kali Boro 139/2	2198	PBD, BRRI	Gazipur	Boro
42	Kali Boro 200	2199	PBD, BRRI	Gazipur	Boro
43	Kali Boro 208	2200	PBD, BRRI	Gazipur	Boro
44	Kali Boro 259	2201	PBD, BRRI	Gazipur	Boro
45	Kali Boro 266	2202	PBD, BRRI	Gazipur	Boro
46	Kali Boro 576	2203	PBD, BRRI	Gazipur	Boro
47	Kali Boro 600	2204	PBD, BRRI	Gazipur	Boro
48	Kali Boro 704	2205	PBD, BRRI	Gazipur	Boro

Table 10. Characterization of rice germplasm based on qualitative characters, Boro, 2018-19

Sl. no.	Characters	State of characters	No. of germplasm	Germplasm (Serial number in Table 9)	Frequency %
1.	Blade pubescence	01. Glabrous			
		02. Intermediate	48	All	100
		03. Pubescent			
2.	Blade colour	02. Green	32	1,3,5,6,8,9,10,12,13,15,16,17,18,20,22,23,24,25,26,27,29,30,34,35,36,38,42,43,45,46,47,48.	66.67
		03. Dark green	2	4,31.	4.17
		04. Purple tips	7	28,33,37,39,40,41,44.	14.58
		05. Purple margins	7	2,7,11,14,19,21,32.	14.58
3.	Leaf sheath: anthocyanin colour	01. Absent	18	1,4,5,6,8,9,10,13,15,16,17,18,20,22,24,30,31,35.	37.5
		09. Present	30	2,3,7,11,12,14,19,21,23,25,26,27,28,29,32,33,34,36,37,38,39,40,41,42,43,44,45,46,47,48.	62.5
4.	Basal leaf sheath colour	01. Green	18	1,4,5,6,8,9,10,13,15,16,17,18,20,22,24,30,31,35.	37.5
		02. Purple lines			0
		03. Light purple	26	3,12,14,18,21,23,25,26,27,28,29,33,34,36,37,38,39,40,41,42,43,44,45,46,47,48.	54.17
		04. Purple	4	2,7,11,32.	8.33
5.	Leaf angle	01. Erect	41	1,2,3,4,5,6,7,9,10,11,12,13,14,16,17,18,19,20,21,22,23,24,25,26,27,28,30,31,32,33,34,35,36,37,38,39,43,44,45,46,47.	85.42
		05. Horizontal	5	8,40,41,42,48.	10.42
		09. Drooping	2	15,29.	4.17
6.	Flag leaf angle	01. Erect(<30 ⁰)	16	1,2,6,7,11,12,14,16,24,31,32,33,34,38,45,47.	33.33
		3. Semi erect(<30-45 ⁰)	20	4,9,13,18,19,20,21,22,23,25,26,27,28,35,37,39,43,44,46.	41.67
		05. Horizontal (<46-90 ⁰)	11	3,5,8,10,29,30,36,40,41,42,48.	22.92
		07. Descending (>90 ⁰)	1	15.	2.08
7.	Ligule colour	01. White	42	1,3,4,5,6,8,9,10,12,13,14,15,16,17,18,20,21,22,23,24,25,26,27,29,30,31,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48.	87.5
		02. Purple lines	4	2,7,19,28.	8.33
		03. Purple	2	11,32.	4.17
8.	Ligule shape	02. 2- cleft	48	All	100
9.	Collar colour	01. Pale green	37	1,3,4,8,9,10,13,15,16,17,18,20,21,22,23,24,25,26,27,29,30,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48.	77.08
		02. Green	3	5,6,31.	6.25
		03. Purple	8	2,7,11,12,14,19,28,32.	16.67
10.	Auricle colour	01. Pale green	39	1,4,5,6,8,9,10,13,15,16,17,18,20,21,22,23,24,25,26,27,29,30,31,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48.	81.25
		02. Purple	9	2,3,7,11,12,14,19,28,32.	18.75
11.	Culm anthocyanin colour	01. Absent	21	1,2,4,5,6,7,8,9,11,12,13,15,16,17,18,19,20,25,30,31,35.	43.75
		09. Present	27	3,10,14,21,22,23,24,26,27,28,29,32,33,34,36,37,38,39,40,41,42,43,44,45,46,47,48.	56.25
12.	Culm angle	01. Erect(<30 ⁰)	7	6,7,13,16,20,31,47.	14.58
		03. Intermediate	18	1,2,4,8,9,10,15,22,27,30,32,34,37,39,41,43,45,46.	37.5
		05. Open	23	3,5,11,12,14,1,17,18,19,21,23,24,25,26,28,29,33,35,36,38,40,42,44,48.	47.92
		07. Spreading			
		09. Procumbent			
13.	Internode colour	01. Green	19	1,4,5,6,8,9,11,12,13,15,16,17,18,19,20,25,30,31,35.	39.58
		02. Light gold	1	2.	2.08
		03. Purple lines	27	3,10,14,21,22,23,24,26,27,28,29,32,33,34,36,37,38,39,40,41,42,43,44,45,46,47,48.	56.25
		04. Purple	1	7.	2.08
14.	Culm strength (lodging resistance)	01. Strong	46	1,2,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48.	95.83

Table 10. Cont'd

Sl. no.	Characters	State of characters	No. of germplasm	Germplasm (Serial number in Table 9)	Frequency %
		3. Moderately strong	2	3,4.	4.17
		05. Intermediate			
		07. Weak			
		09. Very weak			
15.	Panicle type	01. Compact	30	2,4,5,7,10,11,12,16,17,19,21,22,23,24,25,26,27,28,32,33,34,36,39,40,41,42,43,44,45,48	62.5
		05. Intermediate	15	1,3,8,9,13,14,15,18,29,30,35,37,38,46,47,	31.25
		09. Open	3	6,20,31,	6.25
16.	Secondary branching	01. Light	9	7,12,17,18,21,22,28,32,33,	
		02. Heavy	39	1,2,3,5,6,8,9,10,11,13,14,15,16,19,20,23,24,25,26,27,29,30,31,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	81.25
17.	Panicle exertion	03. Partly exerted			
		05. Just exerted	3	4,13,31,	6.25
		07. Moderately well exerted	10	1,7,9,12,15,16,18,20,21,22,	20.83
		09. Well exerted	35	2,3,5,6,8,10,11,14,17,19,23,24,25,26,27,28,29,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	72.92
18.	Axis	01. Straight			
		02. Droopy	48	All	100
19.	Shattering	01. Very low (<1%)	3	1,2,3,	6.25
		03. Low (~3%)	29	5,6,8,9,10,12,16,17,19,22,23,24,25,26,27,29,33,35,36,37,38,39,40,41,43,44,45,46,48	60.42
		5. Moderate (~15%)	14	4,7,11,13,14,15,18,28,30,31,32,34,42,47,	29.17
		09. High (>35%)	2	20,21,	4.17
20.	Threshability	3. Moderately difficult (1-5%)	4	2,3,10,40,	8.33
		5. Intermediate (6-25%)	21	1,5,6,8,9,16,24,25,26,27,29,30,33,35,36,37,39,41,43,46,48	43.75
		7. Loose (26-50%)	11	12,22,23,31,32,34,38,42,44,45,47,	22.92
		9. Easy (51-100%)	12	4,7,11,13,14,15,17,18,19,20,21,28,	25
21.	Awn: distribution	0. None (awnless)	10	1,4,5,6,8,9,13,16,20,31,	20.83
		01. Tip only	1	14,	2.08
		2. Upper quarter only	1	30,	2.08
		05. Whole length	36	2,3,7,10,11,12,15,17,18,19,21,22,23,24,25,26,27,28,29,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	75
22.	Awn colour	01. Straw	6	2,11,15,17,18,30,	15.79
		02. Gold			
		04. Red			
		05. Purple	32	3,7,10,12,14,19,21,22,23,24,25,26,27,28,29,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	84.21
		06. Black			
23.	Apiculus colour	01. White			
		02. Straw	16	1,4,5,6,8,9,13,15,16,17,18,20,25,30,31,35,	33.33
		03. Brown			
		04. Red			
		05. Red apex			
		07. Purple	30	2,3,7,10,11,12,14,19,22,24,26,27,28,29,32,33,34,36,37,38,39,40,41,42,43,44,45,46,47,48	62.5
		08. Purple apex	2	21,23,	4.17
24.	Stigma colour	01. White	40	1,4,5,6,8,9,10,13,15,16,17,18,20,21,22,23,24,25,26,27,28,29,30,31,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	83.33
		04. Light purple			
		05. Purple	8	2,3,7,11,12,14,19,32,	16.67
25.	Lemma and palea colour	0. Straw	8	2,4,9,17,20,22,23,30,	16.67

Table 10. Cont'd

Sl. no.	Characters	State of characters	No. of germplasm	Germplasm (Serial number in Table 9)	Frequency %
		01. Gold and gold furrows on straw	16	1,3,5,6,8,13,15,16,18,19,24,25,26,27,29,31,	33.33
		02. Brown spots on straw			
		03. Brown furrows on straw	2	12,38,	4.17
		04. Brown			
		6. Purple spots on straw	3	7,21,28,	6.25
		07. Purple furrows on straw	2	10,14,	4.17
		08. Purple			
		09. Black	17	11,32,33,34,35,36,37,39,40,41,42,43,44,45,46,47,48	35.42
26.	Lemma and palea pubescence	2. hairs on lemma keel			
		03. hairs on upper portion	38	4,5,7,8,9,10,11,12,13,15,16,18,20,21,22,23,24,25,26,27,28,30,31,33,34,35,36,38,39,40,41,42,43,44,45,46,47,48	79.17
		04. Short hairs	10	1,2,3,6,14,17,19,29,32,37,	20.83
27.	Sterile lemma color	01. Straw	46	2,3,4,5,6,7,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	95.83
		02. Gold	2	1,8,	4.17
		03. Red			
		04. Purple			
28.	Seed coat (bran) colour	01. White	7	1,8,9,13,16,30,31,	14.58
		02. Light brown	7	28,32,34,36,43,44,45,	14.58
		03. Speckled brown	14	5,6,11,14,18,21,22,33,35,37,40,42,46,47,	29.17
		04. brown	18	2,3,4,7,12,15,17,19,20,23,24,26,27,29,38,39,41,48	37.5
		05. Red	2	10,25,	4.17
		06. variable purple			
29.	Endosperm type	01. Non-glutinous	36	5,6,7,8,9,10,15,16,17,19,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36,37,38,40,41,42,43,44,45,46,47,48	75
		02. Glutinous			
		03. Indeterminate	12	1,2,3,4,11,12,13,14,18,20,24,39,	25
30.	Decorticated grain: Scent (aroma)	0. Non scented	45	1,2,3,4,5,6,7,8,10,11,12,13,14,15,17,18,19,20,21,22,23,24,25,26,27,28,29,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	93.75
		01. Lighty scented	3	9,16,30	6.25
		02. Scented			
31.	Leaf senescence	01. Very early			
		03. Early			
		05. Intermediate	27	1,2,3,4,5,6,8,12,13,14,15,17,18,19,20,21,22,23,24,25,26,28,29,30,32,33,46,	56.25
		07. Late and slow	20	7,9,10,11,16,27,31,34,35,36,37,38,39,40,41,42,43,44,45,47,	41.67
		09. Very late	1	48	2.08

Qualitative traits characterization

The present study was aimed at identifying qualitative traits variation among the tested 48 Boro (2018-19) rice germplasm. Polymorphism was found in 28 of the 31 qualitative traits under studied; the non-polymorphic traits were the leaf blade pubescence, ligule shape, and panicle axis (Table 10).

Most of the characterized rice germplasm (66.67%) of the evaluated rice germplasm exhibited a blade colour green while the remaining germplasm exhibited dark green (4.17%), purple tips (14.58%) and purple margins (14.58%). Table 10 also demonstrates variation in flag leaf angle where the percentage rice germplasm with erect, semi erect, horizontal and descending flagleaf are 33.33%, 41.67%, 22.92% and 2.08%, respectively. The qualitative

characters showing higher variability were culm angle (14.58% erect, 37.5% intermediate and 47.92% open), internode colour (39.58% green, 2.08% light gold, 56.26% purple lines and 2.08% purple), culm strength (95.83% strong and 4.17% moderately strong), panicle type (62.5% compact, 31.25% intermediate and 6.25% open), panicle exertion (72.92% well exerted, 20.83% moderately well exerted and 6.25% just exerted), awn distribution in the spikelets (20.84% awnless, 2.08% tip only, 2.08% upper quarter only and 75.0% whole length), awn colour (15.79% straw and 84.21% purple).

In the present study, it was also found that most of the tested germplasm possessed purple apiculus colour (62.5%), black lemma and palea colour (35.42%), hairs on upper portion in lemma and palea pubescence (79.17%), brown seed coat colour (37.5%), intermediate type leaf senescence (56.25%). The present study exhibited higher variability in most of the observed qualitative traits of 48 Boro (2018-19) rice germplasm.

Table 11. Variability of 48 rice germplasm considering 21 quantitative characters, Boro, 2018-19

Character(s)	Range	Mean	SD	CV (%)
Seedling height (cm)	10.8-35.8	24.39	5.94	24.34
Ligule length (mm)	9.9-23.3	13.73	2.76	20.08
Leaf length (cm)	25-58.6	39.81	5.86	14.73
Leaf width (cm)	0.54-1.45	1.03	0.14	13.49
Culm diameter (mm)	2-5.15	3.82	0.52	13.68
Total tiller number	8-27	13	3.23	24.77
Effective tiller number	7-24	11	2.91	26.00
Culm length (cm)	57.9-120.6	101.08	14.02	13.87
Panicle length (cm)	18.1-26.6	23.08	1.83	7.94
Plant height (cm)	82.3-146.1	124.15	14.55	11.72
Days to 50% flowering	114-143	122	7.16	5.88
Days to maturity	140-168	149	6.71	4.50
Filled grains per panicle	54-236	101	26.15	25.91
Unfilled grains panicle	4-30	10	6.93	67.35
1000 grain weight (g)	16.86-33.28	23.93	2.86	11.94
Grain length (mm)	7.17-9.03	7.91	0.51	6.39
Grain breadth (mm)	2.42-3.83	2.99	0.22	7.39
Decorticated grain length (mm)	4.88-6.54	5.56	0.42	7.56
Decorticated grain breadth (mm)	2.03-3.05	2.56	0.15	5.98
Decorticated grain L/B Ratio	1.76-2.77	2.18	0.21	9.76
Yield per hill (g)	6.45-23.51	15.95	3.29	20.64

Quantitative traits characterization

Range, mean, standard deviation (SD) and coefficient of variation (CV) of different quantitative characters of 48 Boro (2018-19) rice germplasm have been shown in Table 11. The range of seedling height was found 10.8 cm (Jala Boro) to 35.8 cm (Boro Dhan) and average number of effective tiller was 11. On an average, days to 50% flowering were 122 days and range was found between 114 days (Kali Boro 80/3 and Kali Boro 200) to 143 days (Mi-Pajang and Pankaich). The average plant height and panicle length were found as 124.15 cm and 23.08 cm, respectively. The maximum filled grains per panicle were found in Mi-Pajang (263). The range of decorticated grain length-breadth ratio was observed 1.76 (Borail and Madhabsail) to 2.77 (Pankaich). The highest grain length and breadth was 9.03 mm (Jala Boro) and 3.83 mm (Dud Saita), respectively. Dud Saita had the highest (33.28 g) and Mi-

Pajang had the lowest (16.86 g) thousand-grain weight (TGW). The highest yield per hill was found 23.51 g (Mi-Pajang) and average yield per hill was 15.95 g.

11.2.3.3. Morphological characterization of 48 Aus rice germplasm (2019)

Table 12. List of rice germplasm characterized, Aus, 2019

Sl. no.	Name	Acc. no.	Upazila/Division	District	Season
1	Atlai	1	-	Dhaka	Aus
2	Charnock	11	-	Dhaka	Aus
3	Dhala Saita	16	-	Dhaka	Aus
4	Dhala Saita	17	-	Dhaka	Aus
5	Harinmuda	29	-	Dhaka	Aus
6	Kali Atia	744	Rangunia	Chattogram	Aus
7	Kataktara	39	-	Dhaka	Aus
8	Patuakhali	53	-	Dhaka	Aus
9	Parang	801	Sarail	Cumilla	Aus
10	Mi-Timbra	151	Tangail Sadar	Tangail	Aus
11	Kachilon-1	184	Fulbaria	Mymensingh	Aus
12	Kachilon- 2	185	Fulbaria	Mymensingh	Aus
13	Bowalia	186	Fulbaria	Mymensingh	Aus
14	Bowalia	187	Trishal	Mymensingh	Aus
15	Juma	274	Mithapukur	Rangpur	Aus
16	Kasia Panja	377	Paba	Rajshahi	Aus
17	Bokri Joli	378	Dhamuirhat	Naogaon	Aus
18	Balam	809	Balaganj	Sylhet	Aus
19	Rawnok	505	Patnitala	Naogaon	Aus
20	Gojal Gorja	506	Patnitala	Naogaon	Aus
21	Joli	509	Patnitala	Naogaon	Aus
22	Rangouri (Sada)	510	Patnitala	Naogaon	Aus
23	Shoni	511	Domer	Nilphamari	Aus
24	Kumri	563	Panchbibi	Joypurhat	Aus
25	Dal Kaisha	564	Panchbibi	Joypurhat	Aus
26	Boumail	565	Panchbibi	Joypurhat	Aus
27	Achar Bhog	566	Panchbibi	Joypurhat	Aus
28	Bari Bhog	567	Panchbibi	Joypurhat	Aus
29	Jaba Hulu	568	Panchbibi	Joypurhat	Aus
30	Garia	569	Panchbibi	Joypurhat	Aus
31	Gungur Bali	814	Jaganthapur	Sylhet	Aus
32	Hijolee	571	Panchbibi	Joypurhat	Aus
33	Shoni	575	Panchbibi	Joypurhat	Aus
34	Jabar Sail	576	Panchbibi	Joypurhat	Aus
35	Laksmi Dia	580	Raiganj	Noakhali	Aus
36	Madida	581	Ranganj	Noakhali	Aus
37	Ashini	647	Chandina	Cumilla	Aus
38	Mi-Cochu	648	Chandina	Cumilla	Aus
39	Dharial	649	Chandina	Cumilla	Aus
40	Lema	650	B. Baria	B. Baria	Aus

Table 12. Cont'd

Sl. no.	Name	Acc. no.	Upazila/Division	District	Season
41	Porang	652	B. Baria	B. Baria	Aus
42	Kali Haitya	653	B. Baria	B. Baria	Aus
43	Hirgal	655	B. Baria	B. Baria	Aus
44	Ingra	656	B. Baria	B. Baria	Aus
45	Mati Char	657	Hajiganj	Cumilla	Aus
46	Boilam	658	Chandina	Cumilla	Aus
47	Boteswar(2)	660	Faridganj	Cumilla	Aus
48	Laxmi Bini	736	Raugunia	Chattogram	Jhum

Table 13. Characterization of rice germplasm based on qualitative traits, Aus, 2019

Sl. no.	Character	State of characters	No. of germplasm	Germplasm (Serial number in Table 12)	Frequency%
1.	Blade pubescence	01. Glabrous	48	All	100
		02. Intermediate			
		03. Pubescent			
2.	Blade colour	02. Green	33	2,4,5,6,10,11,12,13,15,16,17,22, 23, 24, 25, 26, 28, 29, 30, 31, 34, 35, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 48	68.75
		03. Dark green			
		04. Purple tips	6	9,18,19,21,27,39,	12.5
		05. Purple margins	7	1,3,7,8,20,33,36,	14.58
		06. Purple blotch	2	14, 32,	4.17
3.	Leaf sheath: anthocyanin colour	01. Absent	34	2,4,5,6,10,11,12,13,15,16,17,19,22, 23, 24, 25, 26, 27, 28, 29,30, 31, 34, 35, 37, 38, 40, 41, 43, 44, 45, 46, 47, 48	70.83
		09. Present	14	1,3,7,8,9,14,18,20,21, 32, 33, 36, 39, 42,	29.17
4.	Basal leaf sheath colour	01. Green	34	2,4,5,6,10,11,12,13,15,16,17,19,22, 23, 24, 25, 26, 27, 28, 29,30, 31, 34, 35, 37, 38, 40, 41, 43, 44, 45, 46, 47, 48	70.83
		02. Purple lines			
		03. Light purple	3	9,18, 39,	6.25
		04. Purple	11	1,3,7,8,14,20,21,32, 33,36,42,	22.92
5.	Leaf angle	01. Erect	35	1,2,4,5,7,9,10,11,12,13,15,16,17,18,19,20, 23, 25, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 43, 45, 46, 47,	72.92
		05. Horizontal			
		09. Drooping	13	3,6,8,14,21,22,24,26,27,36,42,44,48	27.08
6.	Flag leaf angle	01. Erect(<30 ⁰)	8	15,20, 32,39,40,45,46,47,	16.67
		03. Semi erect(<30-45 ⁰)	29	1,2,4,5,7,8,9,10,11,12,13,16,17,18,19, 23, 25, 28, 29, 30, 31, 33, 34, 35, 37, 38, 41, 43, 44,	60.41
		5. Horizontal (<46-90 ⁰)	3	6,14,24,	6.25
		07. Descending (>90 ⁰)	8	3,21,22,26,27,36,42,48	16.67
7.	Ligule colour	01. White	39	1,2,3,4,5,6,7,10,11,12,13,15,16,17,19,22,23,24,25,26, 27,28,29, 30, 31, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48	81.25
		02. Purple lines	7	9,14,18,20,32,33,36	14.58
		03. Purple	2	8,21	4.17
8.	Ligule shape	02. 2- cleft	48	All	100
9.	Collar colour	01. Pale green	32	1,2,3,6,7,10,15,16,19,22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 37, 39, 40, 41, 42, 43, 44, 45, 47, 48	66.66
		02. Green	8	4,5,11,12,13,17,38,46,	16.67
		03. Purple	8	8,9,14,18,20,21,33,36,	16.67
10.	Auricle colour	01. Pale green	39	1,2,3,4,5,6,7,10,11,12,13,15,16,17,19,22, 23, 24, 25, 26, 27, 28,29,30,31,34,35,37,38,39,40,41, 42, 43, 44, 45, 46, 47, 48	81.25
		02. Purple	9	8,9,14,18,20,21,32,33,36,	18.75
11.	Culm anthocyanin colour	01. Absent	40	2,3,4,5,6,8,9,10,11,12,13,15,16,17,18,19,22,23,24,25,26,27, 28,29,30,31,33,34,35,37,38,39,40, 41, 42, 43, 44, 45, 46, 47	83.33
		09. Present	8	1,7,14,20,21,32,36,48	16.67
12.	Culm angle	01. Erect(<30 ⁰)	13	8,16,17,21, 23, 25, 26, 32, 33, 35, 40, 41, 45,	27.09

Table 13. Cont'd

Sl. no.	Character	State of characters	No. of germplasm	Germplasm (Serial number in Table 12)	Frequency %
		03. Intermediate	28	1,2,4,6,7,9,10,11,12,15,18,19,20,22, 27, 28, 29, 30, 31, 34, 36, 37,38, 39,43,44,46,47	58.33
		05. Open	7	3,5,13,14,24,42,48	14.58
		07. Spreading			
		09. Procumbent			
13.	Internode colour	01. Green	41	2,3,4,5,6,8,9,10,11,12,13,15,16,17,18,19,22,23,24,25,26,27,28, 29, 30,31,32,33,34,35,37,38,39,40,41,42, 43,44,45,46,47	85.42
		02. Light gold	1	48	2.08
		03. Purple lines	6	1,7,14,20,21,36,	12.5
		04. Purple			
14.	Culm strength (lodging resistance)	01. Strong	37	1,2,3,4,5,7,8,9,13,14,15,16,17,19,20,21,22, 23, 25, 26, 27, 28,29,30, 32,33,34,35,36,37,38,40,41,43,44, 45,48	77.08
		03. Moderately strong	10	6,10,11,12,18,24,39,42,46,47	20.84
		05. Intermediate			
		07. Weak	1	31,	2.08
		09. Very weak			
15.	Panicle type	01. Compact	2	19,44,	4.16
		05. Intermediate	15	1,2,4,7,9,15,18,21,31,32,34,35,39,40,48	31.26
		09. Open	31	3,5,6,8,10,11,12,13,14,16,17,20,22,23,24,25,26,27,28, 29,30,33,36,37,38,41,42,43,45,46,47,	64.58
16.	Secondary branching	02. Heavy	48	All	100
17.	Panicle exertion	03. Partly exerted			
		05. Just exerted	9	1,2,12,13,14,15,19,31,34,	18.75
		07. Moderately well exerted	7	7,10,11,16,17,45,47,	14.58
		09. Well exerted	32	3,4,5,6,8,9,18,20,21,22,23,24,25,26,27,28,29,30,32, 33,35,36,37,38,39,40,41,42,43,44,46,48	66.67
18.	Axis	01. Straight			
		02. Droopy	48	All	100
19	Shattering	01. Very low (<1%)	3	9,24,25,	6.25
		03. Low (~3%)	15	1,3,5,6,7,17,18,19,21,23,35,36,41,45,48	31.25
		05. Moderate (~15%)	20	2,4,8,10,11,16,20,26,27,29,30,31,32,33,34,37,40,43,46,47,	41.67
		07. High (~35%)	10	12,13,14,15,22,28,38,39,42,44,	20.83
20.	Threshablity	3. Moderately difficult (1-5%)			
		5. Intermediate			
		7. Loose (26-50%)	19	1,5,6,9,18,21,24,25,32,34,35,36,37,38,39,41,42,45,48	39.58
		9. Easy (51-100%)	29	2,3,4,7,8,10,11,12,13,14,15,16,17,19,20,22,23,26,27, 28,29,30,31,33,40,43,44,46,47,	60.42
21.	Awn: distribution	0. None (awnless)	32	4,5,8,10,11,12,13,14,16,17,18,20,21,22,25,26,28, 29, 30,32,33,35,36,39,40,41,42,43,45,46,47,48	66.66
		01. Tip only	14	1,2,3,6,7,9,15,23,24,31,34,37,38,44,	29.17
		02. Upper quarter only			
		05. Whole length	2	19, 27,	4.17
22.	Awn colour	01. Straw	12	2,3,6,15,23,24,27,31,34,37,38,44,	75.0
		02. Gold	1	7,	6.25
		05. Purple	3	1,9,19,	18.75
23.	Apiculus colour	02. Straw	32	2,3,4,5,6,10,11,12,13,15,16,17,23,24,25,26,28,29, 30,31,34,35,37,38,40,41,43,44, 45,46,47,48	66.67
		03. Brown			
		06. Red apex	1	7,	2.08
		07. Purple	11	8,9,14,18,19,20,27,32,33,39,42,	22.92
		08. purple apex	3	1,21,36,	6.25
		09. black	1	22,	2.08

Table 13. Cont'd

Sl. no.	Character	State of characters	No. of germplasm	Germplasm (Serial number in Table 12)	Frequency %
24.	Stigma colour	01. White	33	2,4,5,6,10,11,12,13,15,16,17,18,19,22,23,24,25,26,27,30,31,34,35,37,38,40,41,43,44,45,46,47,48	68.75
		04. Light purple	2	28, 29,	4.17
		05. Purple	13	1,3,7,8,9,14,20,21,32,33,36,39,42,	27.08
25.	Lemma and palea colour	0. Straw	29	2,3,4,9,10,11,12,13,14,16,17,18,21,23,24,25,26,27,29,31,32,33,35,36,38,40,43,44,45,	60.42
		01. Gold and gold furrows on straw	7	6,15,19,34,37,41,48	14.58
		03. Brown furrows on straw			
		04. Brown	3	1,5,7,	6.25
		6. Purple spots on straw	2	20,42,	4.17
		07. Purple furrows on straw	3	30,39,46,	6.25
		08. Purple			
		09. Black	4	8,22,28,47,	8.33
		26.	Lemma and palea pubescence	03. hairs on upper portion	27
04. Short hairs	21			3,5,6,8,15,19,21,30,34,35,36,37,38,39,40,41,42,43,44,46,48	43.75
27.	Sterile lemma color	01. Straw	43	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,23,24,25,26,27,29,30,31,32,33,34,35,37,38,39,40,41,42,43,44,45,47,48	89.58
		02. Gold	2	1,36	4.17
		03. Red			
		04. Purple	3	22,28,46,	6.25
28.	Seed coat (bran) colour	01. White	5	4,6,9,24,25,	10.42
		02. Light brown	7	2,7,19,21,32,47,48	14.58
		03. Speckled brown	24	3,5,8,10,11,12,13,14,15,16,17,20,22,26,27,29,30,33,37,38,39,42,44,46,	50.0
		04. brown	11	1,18,23,28,31,34,36,40,41,43,45,	22.92
		05. Red	1	35	2.08
		06. variable purple			
29.	Endosperm type	01. Non-glutinous	21	2,5,10,15,17,18,19,20,23,27,29,32,34,35,36,38,40,42,43,45,47	43.75
		02. Glutinous			
		03. Indeterminate	27	1,3,4,6,7,8,9,11,12,13,14,16,21,22, 24, 25, 26, 28, 30, 31, 33,37,39,41 44,46,48	56.25
30.	Decorticated grain: Scent (aroma)	0. Non scented	47	1,2,3,4,5,6,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	97.92
		01. Lightly scented	1	7	2.08
		02. Scented			
31.	Leaf senescence	01. Very early	8	4,7,10,11,12,31,33,48	16.67
		03. Early	7	1,2,5,21,24,27,32	14.58
		05. Intermediate	32	3,6,8,9,13,14,15,16,17,18,19,20,22,23,25,26,28,29,30,34,35,37,38,39,40,41,42,43,44,45,46,47	66.67
		07. Late and slow	1	36	2.08

Qualitative traits characterization

The present study was aimed at identifying qualitative traits variation among the tested 48 Aus (2019) rice germplasm. Polymorphism was found in 27 of the 31 qualitative traits under studied; the non-polymorphic traits were the leaf blade pubescence, ligule shape, secondary branching of panicle and axis of panicle (Table 13).

Most of the characterized rice germplasm (68.75%) exhibited a blade colour green while the remaining germplasm exhibited purpletips (12.5%), purple (14.58%) and purple blotch (4.17%). Table 13 demonstrates variation in flag leaf angle where the percent of rice germplasm with erect, semi-erect, horizontal and descending flagleaf are 16.67%, 60.41%, 6.25% and 16.67%, respectively. The qualitative characters showing higher variability were culm angle (27.09% erect, 58.33% intermediate, and 14.58% open), internode colour (85.42% green, 2.08% light gold and 12.5% purple lines), culm strength (77.08% strong, 22.92% moderately strong and 2.08% weak), panicle type (4.16% compact, 31.26% intermediate and 64.58% open), panicle exertion (66.67% well exerted, 14.58% moderately well exerted and 18.75% just exerted), awn distribution in the spikelets (66.66% awnless, 29.17% tip only and 4.17% whole length), awn colour (75.0% straw, 6.25% gold and 18.75% purple).

In the present study, it was also found that most of the tested germplasm possessed straw apiculus colour (66.67%), straw lemma and palea colour (60.42%), hairs on upper portion in lemma and palea pubescence (56.25%), speckled brown (50.0%) seed coat colour, intermediate type leaf senescence (66.67%). The present study exhibited higher variability in most of the observed qualitative traits of 48 Aus (2019) rice germplasm.

Table 14. Variability in 48 Aus germplasm considering 21 different quantitative characters, 2019

Character(s)	Range	Mean	SD	CV (%)
Seedling height (cm)	17.6-31.8	24.03	3.58	14.91
Ligule length (mm)	7.8-17.8	14.05	2.41	17.16
Leaf length (cm)	37-78	49.90	7.20	14.44
Leaf width (cm)	0.76-1.6	1.09	0.18	16.21
Culm diameter (mm)	2.77-4.24	3.32	0.26	7.74
Total tiller number	7-16	11.56	2.44	21.10
Effective tiller number	3-13	9.02	2.42	26.81
Culm length (cm)	76-115.6	98.40	8.30	8.44
Panicle length (cm)	22.6-31.6	27.15	2.38	8.78
Plant height (cm)	107.6-143.4	125.55	8.52	6.79
Days to 50% flowering	75-93	83	4.04	4.88
Days to maturity	102-120	108	4.94	4.56
Filled grains per panicle	43-145	85	21.03	24.83
Unfilled grains panicle	8-72	31	15.88	51.58
1000 grain weight (g)	18.2-31.2	23.21	3.22	13.89
Grain length (mm)	7.08-9.52	8.35	0.51	6.07
Grain breadth (mm)	2.36-3.98	2.98	0.33	10.93
Decorticated grain length (mm)	4.98-6.7	5.88	0.37	6.38
Decorticated grain breadth (mm)	1.96-3.19	2.52	0.24	9.38
Decorticated grain L/B Ratio	1.71-3.42	2.36	0.31	13.15
Yield per hill (g)	2.85-8.8	3.50	1.43	40.70

Quantitative traits characterization

Range, mean, standard deviation (SD) and coefficient of variation (CV) of different quantitative characters of 48 Aus (2019) rice germplasm have been shown in Table 14. The range of seedling height was found 17.6 cm (Atlai) to 31.8 cm (Boilam) and average number of effective tiller was 9.02. On an average, days to 50% flowering were 83 and range was found 75 days (Gojal Gorja) to 93 days (Atlai, Charnock and Harinmuda). The average plant

height and panicle length were found 125.55 cm and 27.15 cm, respectively. The maximum filled grains per panicle were found as 145 (Parang). The range of decorticated grain length-breadth ratio was observed 1.71 (Hijolee) to 3.42 (Charnock). The highest grain length and breadth was found 9.52 mm (Charnock) and 3.98 mm (Hijolee), respectively. Achar Bhog had the highest (31.2 g) and Dhala Saita had the lowest (18.2 g) thousand-grain weight (TGW). The highest yield per hill was found 8.8 g (Atlai) and average yield per hill was 3.50 g.

11.2.3.4. Morphological characterization of 72 T. Aman rice germplasm (2019)

Table 15. List of rice germplasm characterized, T. Aman, 2019

Sl. No.	Name	Acc. No.	Upazila/Division	District	Season
1	Abchaya	102	-	Dhaka	T. Aman
2	Manikdiga	105	Ghior	Manikganj	T. Aman
3	Luta	121	Tongibari	Manikganj	T. Aman
4	Gabura	124	Gajaria	Manikganj	T. Aman
5	Bhawaliala Diga	127	Manikgonj	Manikganj	T. Aman
6	Digha(2)	128	Ghior	Manikganj	T. Aman
7	Diga	129	Saturia	Manikganj	T. Aman
8	Rajbhawalia	131	Daulatpur	Manikganj	T. Aman
9	Molla Diga	132	Manikgonj	Manikganj	T. Aman
10	Molla Digha	133	Shibaloy	Manikganj	T. Aman
11	Bhawaliala	134	Saturia	Manikganj	T. Aman
12	Bhawaliala	135	Saturia	Manikganj	T. Aman
13	Bhawaliala	136	Saturia	Manikganj	T. Aman
14	Bhawla	137	Saturia	Manikganj	T. Aman
15	Netpasha	138	Tongibal	Manikganj	T. Aman
16	Netpasha	139	Tongibal	Manikganj	T. Aman
17	Ijol Diga(1)	140	Luhajang	Munshiganj	T. Aman
18	Ijol Diga(2)	141	Shibaloy	Manikganj	T. Aman
19	Ijol Diga(3)	142	Manikgonj	Manikganj	T. Aman
20	Bawoi Jhak(3)	143	Ghior	Manikganj	T. Aman
21	Bawoi Jhak(4)	144	Ghior	Manikganj	T. Aman
22	Bawoi Jhak(5)	145	Ghior	Manikganj	T. Aman
23	Bawoi Jhak(6)	146	Luhajang	Munshiganj	T. Aman
24	Bawoi Jhak(2)	147	Munshiganj	Munshiganj	T. Aman
25	Lema	153	Kotwali	Tangail	T. Aman
26	Chinisagar	157	Kotwali	Tangail	T. Aman
27	Bansha Pur	158	Kotwali	Tangail	T. Aman
28	Roshonbok	159	Kotwali	Tangail	T. Aman
29	Loiatag	194	Muktagacha	Mymensingh	T. Aman
30	Subulkua	195	Muktagacha	Mymensingh	T. Aman
31	Khorma	196	Muktagacha	Mymensingh	T. Aman
32	Fulgainda	198	Muktagacha	Mymensingh	T. Aman
33	Baish Binni	199	Muktagacha	Mymensingh	T. Aman
34	Fulkadi	200	Muktagacha	Mymensingh	T. Aman
35	Kumri	201	Muktagacha	Mymensingh	T. Aman
36	Kaisha Binni	205	Trishal	Mymensingh	T. Aman
37	Kaisha Binni	206	Kotwali	Mymensingh	T. Aman
38	Kaisha Binni	207	Fulbaria	Mymensingh	T. Aman
39	Lal Binni	209	Muktagacha	Mymensingh	T. Aman
40	Lakxmi Bilash	211	Kotwali	Mymensingh	T. Aman
41	Bashiraj	231	Fulbaria	Mymensingh	T. Aman
42	Paharishail	293	Sundarganj	Gaibandha	T. Aman
43	Indrasail	238	Trishal	Mymensingh	T. Aman

Table 15. Cont'd

Sl. No.	Name	Acc. No.	Upazila/Division	District	Season
44	Lal Kumari	239	Trishal	Mymensingh	T. Aman
45	Purabinni(3)	242	Fulbaria	Mymensingh	T. Aman
46	Kashia Binni(2)	243	Trishal	Mymensingh	T. Aman
47	Kashia Binni(2)	244	Trishal	Mymensingh	T. Aman
48	Gurdoi(2)	246	Trishal	Mymensingh	T. Aman
49	Kalijira(3)	247	Fulbaria	Mymensingh	T. Aman
50	Telot	248	Muktagacha	Mymensingh	T. Aman
51	Bazail	249	Muktagacha	Mymensingh	T. Aman
52	Joli Amon	250	Muktagacha	Mymensingh	T. Aman
53	Bazail	251	Muktagacha	Mymensingh	T. Aman
54	Bazail	252	Muktagacha	Mymensingh	T. Aman
55	Kancha Noni	270	Mithapukur	Rangpur	T. Aman
56	Naria Bochi	275	Kotwali	Rangpur	T. Aman
57	Khirshabhog	276	Kotwali	Rangpur	T. Aman
58	Shamrush	277	Pirgacha	Rangpur	T. Aman
59	Dudh Kalam	278	Sundarganj	Gaibandha	T. Aman
60	Dudh Kalam	279	Pirgacha	Rangpur	T. Aman
61	Bora Dudh Kalam	280	Pirgacha	Rangpur	T. Aman
62	Lal Soru	281	Hatibandha	Lalmonirhat	T. Aman
63	Gojol Gorja	282	Hatibandha	Lalmonirhat	T. Aman
64	Sojoni	283	Hatibandha	Lalmonirhat	T. Aman
65	Ganjia	284	Hatibandha	Lalmonirhat	T. Aman
66	Bindi Pakri	285	Sundarganj	Gaibandha	T. Aman
67	Jhoshua	286	Sundarganj	Gaibandha	T. Aman
68	Akand Sail	287	Sundarganj	Gaibandha	T. Aman
69	Lal Dupa	289	Sundarganj	Gaibandha	T. Aman
70	Jigashail	290	Sundarganj	Gaibandha	T. Aman
71	Cheng Sail	291	Sundarganj	Gaibandha	T. Aman
72	Shul Kumor	292	Sundarganj	Gaibandha	T. Aman

Table 16. Characterization of rice germplasm based on qualitative traits, T. Aman, 2019

Sl. no.	Characters	State of characters	No. of germplasm	Germplasm (Serial number in Table 15)	Frequency %
1.	Blade pubescence	01. Glabrous			
		02. Intermediate	72	All	100
		03. Pubscent			
2.	Blade colour	02. Green	64	1,2,3,4,5,6,7,9,10,11,12,13,15,17,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,55,56,59,60,61,62,63,64,65,66,67,68,69,70,71,	88.89
		03. Dark green	2	8,16,	2.78
		04. Purple tips	5	24,54,57,58,72	6.95
		05. Purple margins	1	14,	1.38
		06. Purple blotch			
3.	Leaf sheath: anthocyanin colour	01. Absent	53	1,2,8,12,13,16,18,19,21,22,23,25,26,27,27,28,29,30,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,55,56,60,61,62,63,64,65,66,67,68,69,70,71	73.61
		09. Present	19	3,4,5,6,7,9,10,11,14,15,17,20,24,53,54,57,58,59,72	26.39
4.	Basal leaf sheath colour	01. Green	53	1,2,8,12,13,16,18,19,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,55,56,60,61,62,63,64,65,66,67,68,69,70,71,	73.61
		02. Purple lines			

Table 16. Cont'd

Sl. no.	Characters	State of characters	No. of germplasm	Germplasm (Serial number in Table 15)	Frequency %
		03. Light purple	18	3,4,5,6,7,9,10,11,14,15,17,20,53,54,57,58,59,72,	25
		04. Purple	1	24,	1.39
5.	Leaf angle	01. Erect	13	7,16,18,19,20,22,28,31,51,52,64,65,71,	18.05
		05. Horizontal	21	2,10,11,13,14,15,17,24,25,35,36,37,38,42,45,46,48,49,53,58,70	29.17
		09. Drooping	38	1,3,4,5,6,8,9,12,21,23,26,27,29,30,32,33,34,39,40,41,43,44,47,50,54,55,56,57,59,60,61,62,63,66,67,68,69,72,	52.78
6.	Flag leaf angle	01. Erect(<30 ⁰)	4	16,19,20,51,	5.56
		03. Semi erect(<30-45 ⁰)	13	6,7,9,18,22,28,31,52,56,64,65,70,71,	18.05
		05. Horizontal (<46-90 ⁰)	25	2,10,11,13,15,17,24,25,32,35,36,37,38,42,45,48,49,53,54,57,58,62,63,69,72,	34.72
		07. Descending (>90 ⁰)	30	1,3,4,5,8,12,14,21,23,26,27,29,30,33,34,39,40,41,43,44,46,47,50,55,59,60,61,66,67,68,	41.67
7.	Ligule colour	01. White	70	1,2,3,4,5,6,7,8,10,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,	97.22
		02. Purple lines	2	9,11,	2.78
		03. Purple			
8.	Ligule shape	02. 2- cleft	72	All	100
9.	Collar colour	01. Pale green	50	1,2,3,6,12,13,18,19,20,21,22,23,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,55,56,60,61,62,64,65,66,67,68,71,	69.45
		02. Green	6	8,16,25,63,69,70,	8.33
		03. Purple	16	4,5,7,9,10,11,14,15,17,24,53,54,57,58,59,72,	22.22
10.	Auricle colour	01. Pale green	56	1,2,3,6,8,12,13,16,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,55,56,60,61,62,63,64,65,66,67,68,69,70,71,	77.78
		02. Purple	16	4,5,7,9,10,11,14,15,17,24,53,54,57,58,59,72,	22.22
11.	Culm anthocyanin colour	01. Absent	64	1,2,3,4,6,8,11,12,13,14,15,16,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,59,60,61,63,64,65,66,67,68,69,70,71	88.89
		09. Present	8	5,7,9,10,17,58,62,72,	11.11
12.	Culm angle	01. Erect(<30 ⁰)	17	27,29,30,42,49,51,53,54,56,57,58,60,63,67,68,70,71,	23.61
		03. Intermediate	37	2,4,5,7,16,17,19,20,21,22,25,26,28,33,34,35,36,37,38,40,41,43,44,45,46,47,48,50,55,59,61,62,64,65,66,69,72,	51.39
		05. Open	13	1,3,6,8,9,12,15,18,23,31,32,39,52,	18.06
		07. Spreading	4	10,11,13,14,	5.56
		09. Procumbent	1	24,	1.39
13.	Internode colour	01. Green	64	1,2,3,4,6,8,11,12,13,14,15,16,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,59,60,61,63,64,65,66,67,68,69,70,71	88.89
		02. Light gold	1	62,	1.39
		03. Purple lines	7	5,7,9,10,17,58,72,	9.72
		04. Purple			
14.	Culm strength (lodging resistance)	01. Strong	26	1,3,4,5,6,7,8,10,16,19,20,28,42,46,50,51,56,60,61,62,63,64,65,67,68,71,	36.11
		03. Moderately strong	7	13,22,26,36,43,44,69,	9.72
		05. Intermediate	9	2,21,23,25,27,34,39,52,55,	12.5
		07. Weak	11	9,11,12,14,18,29,32,40,48,57,70,	15.28
		09. Very weak	19	15,17,24,30,31,33,35,37,38,41,45,47,49,53,54,58,59,66,72	26.39
15.	Panicle type	01. Compact	6	19,22,28,44,51,55,	8.33
		05. Intermediate	19	2,3,4,8,16,20,25,35,39,46,47,48,49,54,57,59,61,67,71,	26.39
		09. Open	47	1,5,6,7,9,10,11,12,13,14,15,17,18,21,23,24,26,27,29,30,31,32,33,34,36,37,38,40,41,42,43,45,50,52,53,56,58,60,62,63,64,65,66,68,69,70,72	65.28

Table 16. Cont'd

Sl. no.	Characters	State of characters	No. of germplasm	Germplasm (Serial number in Table 15)	Frequency %
16.	Secondary branching	02. Heavy	72	All	100
17.	Panicle exertion	03. Partly exerted	1	47,	1.39
		05. Just exerted	23	7,10,11,12,14,16,18,20,22,24,27,34,35,39,42,50,51,54,59,64,65,67,70	31.94
		07. Moderately well exerted	13	2,3,4,6,17,25,26,29,37,38,41,52,68,	18.06
		09. Well exerted	35	1,5,8,9,13,15,19,21,23,28,30,31,32,33,36,40,43,44,45,46,48,49,53,55,56,57,58,60,61,62,63,66,69,71,72	48.61
18.	Axis	01. Straight			
		02. Droopy	72	All	100
19	Shattering	01. Very low (<1%)	11	5,6,7,8,10,12,13,23,42,44,62,	15.28
		03. Low (~3%)	51	1,2,4,9,11,14,15,16,17,18,19,20,21,22,24,26,27,28,29,30,31,32,33,34,36,37,39,40,41,43,45,47,48,49,50,52,53,54,55,56,57,58,59,60,63,66,67,68,69,70,71	70.83
		05. Moderate (~15%)	10	3,25,35,38,46,51,61,64,65,72,	13.89
20.	Threshability	3. Moderately difficult (1-5%)			
		5. Intermediate	4	8,42,44,62	5.56
		7. Loose (26-50%)	12	7,9,10,11,12,13,14,16,19,22,23,39,	16.67
		9. Easy (51-100%)	56	1,2,3,4,5,6,15,17,18,20,21,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,40,41,43,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,63,64,65,66,67,68,69,70,71,72	77.77
21.	Awn: distribution	0. None (awnless)	38	1,3,8,9,19,20,22,23,25,26,27,29,30,32,33,34,37,39,41,42,44,45,47,48,49,51,52,53,60,62,64,65,66,68,69,70,71,72,	52.78
		01. Tip only	15	21,28,35,36,40,43,46,50,55,57,58,59,61,63,67,	20.83
		02. Upper quarter only	2	38,54,	2.78
		03. Upper half only	1	56	1.39
		05. Whole length	16	2,4,5,6,7,10,11,12,13,14,15,16,17,18,24,31,	22.22
22.	Awn colour	01. Straw	21	2,4,5,12,13,16,17,21,24,28,31,36,38,43,46,50,55,57,58, 61,67,	61.76
		02. Gold	2	40,63,	5.88
		03. Brown (tawny)	6	10,11,15,18,35,56,	17.65
		05. Purple	5	6,7,14,54,59,	14.71
23.	Apiculus colour	02. Straw	54	1,2,3,4,8,12,13,16,19,20,21,22,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,55,59,60,61,63,64,65,66,67,68,70,71	75
		03. Brown (tawny)	5	15,18,56,69,62,	6.94
		06. Red apex	1	10,	1.39
		07. Purple	11	5,6,7,9,11,14,17,23,54,57,58,	15.28
		08. purple apex	1	72	1.39
24.	Stigma colour	01. White	56	1,2,4,8,12,13,15,16,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,49,50,51,52,55,60,61,62,63,64,65,66,67,68,69,70,71	77.78
		04. Light purple	1	72	1.39
		05. Purple	15	3,5,6,7,9,10,11,14,17,24,53,54,57,58,59,	20.83
25.	Lemma and palea colour	0. Straw	38	1,2,3,4,5,7,8,10,11,12,15,19,20,21,23,24,25,26,28,34,39,41,42,43,50,51,53,54,57,58,59,60,61,64,65,68,71	52.78
		01. Gold and gold furrows on straw	20	6,9,13,14,16,17,22,27,29,33,35,36,37,46,47,49,52,55,67,70,	27.78
		2. Brown spots on straw	1	66,	1.39
		03. Brown furrows on straw	2	18,38,	2.78
		04. Brown	5	32,40,44,62,69,	6.94
		5. Reddish to light purple	3	30,45,56,	4.16
		6. Purple spots on straw	1	48,	1.39
		07. Purple furrows on straw			

Table 16. Cont'd

Sl. no.	Characters	State of characters	No. of germplasm	Germplasm (Serial number in Table 15)	Frequency %
		08. Purple	2	63,72	2.78
		09. Black			
26.	Lemma and palea pubescence	03. hairs on upper portion	31	3,9,20,22,23,25,26,27,28,30,39,41,42,49,50,51,52,53,54,56,57,59,60,61,62,63,66,67,68,69,71	43.06
		04. Short hairs	41	1,2,4,5,6,7,8,10,11,12,13,14,15,16,17,18,19,21,24,29,31,32,33,34,35,36,37,38,40,43,44,45,46,47,48,55,58,64,65,70,72	56.94
27.	Sterile lemma color	01. Straw	70	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,49,50,51,52,53,54,55,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72	97.22
		02. Gold			
		03. Red	2	48,56,	2.78
		04. Purple			
28.	Seed coat (bran) colour	01. White	26	3,21,22,26,27,28,30,33,40,42,43,44,45,48,56,57,58,61,62,63,64,65,66,70,71,72	36.11
		02. Light brown			
		03. Speckled brown	7	4,7,8,50,51,55,68	9.72
		04. brown	12	9,11,12,13,14,23,31,32,34,46,60,67	16.67
		05. Red	27	1,2,5,6,10,15,16,17,18,19,20,24,25,29,35,36,37,38,39,41,47,49,52,53,54,59,69	37.5
		06. variable purple			
29.	Endosperm type	01. Non-glutinous	46	1,2,3,4,5,6,7,11,12,13,15,18,19,20,21,22,23,24,25,26,27,28,30,32,33,34,36,37,38,39,49,50,51,52,54,55,57,58,59,60,61,62,65,67,68,70,	63.89
		02. Glutinous	2	53,64,	2.78
		03. Indeterminate	24	8,9,10,14,16,17,29,31,35,40,41,42,43,44,45,46,47,48,56,63,66,69,71,72	3.33
30.	Decorticated grain: Scent (aroma)	0. Non scented	72	All	100
		01. Lightly scented			
		02. Scented			
31.	Leaf senescence	01. Very early			
		03. Early	1	5,	1.39
		05. Intermediate	57	1,2,3,4,6,7,8,9,10,11,12,13,14,15,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,39,40,41,42,43,44,45,46,50,52,53,55,57,58,59,61,62,63,68,69,70,71,	79.17
		07. Late and slow	12	16,38,47,48,51,54,56,60,64,65,66,67,	16.66
		09. Very late	2	49,72	2.78

Qualitative traits characterization

The present study was aimed at identifying qualitative traits variation among the tested 72 T Aman (2019) rice germplasm. Polymorphism was found in 26 of the 31 qualitative traits under studied; the non-polymorphic traits were the leaf blade pubescence, ligule shape, secondary branching of panicle, axis of panicle and scent of decorticated grain (Table 16).

Most of the characterized rice germplasm (88.89%) exhibited a blade colour green while the remaining germplasm exhibited dark green (2.78%), purple tips (6.95%) and purple (1.38%). Table 16 demonstrates variation in flag leaf angle where the percent of rice germplasm with erect, semi erect, horizontal and descending flagleaf are 5.56%, 18.05%, 34.72% and 41.67%, respectively. The qualitative characters showing higher variability were culm angle (23.61% erect, 51.39% intermediate, 18.06% open, 5.56% spreading and 1.39% procumbent), internode colour (88.89% green, 1.39% light gold and 9.72% purple lines), culm strength (36.11% strong, 9.72% moderately strong, 12.5% intermediate, 15.28% weak and 26.39% very weak), panicle type (8.33% compact, 26.39% intermediate and 65.28% open), panicle exertion

(48.61% well exerted, 18.06% moderately well exerted, 13.94% just exerted and 1.39% partly exerted), awn distribution in the spikelets (52.78% awnless, 20.83% tip only, 2.78% upper quarter only, 1.39% upper half only and 22.22% whole length), awn colour (61.76% straw, 5.88% gold, 17.65% brown and 14.71% purple).

In the present study, it was also found that most of the tested germplasm possessed straw apiculus colour (75.0%), straw lemma and palea colour (52.78%), short hairs in lemma and palea pubescence (56.94%), red (37.5%) and white (36.11%) seed coat colour, intermediate type leaf senescence (79.17%). The present study exhibited higher variability in most of the observed qualitative traits of 72 T. aman (2019) rice germplasm.

Table 17. Variability of 72 rice germplasm considering 21 quantitative characters, T. Aman, 2019

Character(s)	Range	Mean	SD	CV (%)
Seedling height (cm)	24.6-51.8	38.16	4.94	12.96
Ligule length (mm)	8.6-25	14.37	2.38	16.59
Leaf length (cm)	43.8-78	58.61	6.77	11.55
Leaf width (cm)	0.82-1.8	1.16	0.18	15.85
Culm diameter (mm)	2.94-5.91	4.31	0.67	15.59
Total tiller number	7-22	11	2.47	21.86
Effective tiller number	6-19	10	2.11	22.06
Culm length (cm)	75.8-160.6	125.34	14.69	11.72
Panicle length (cm)	23-33.8	28.17	2.49	8.84
Plant height (cm)	102-190.2	153.55	15.29	9.96
Days to 50% flowering	86-118	106	8.28	7.81
Days to maturity	118-150	135	8.34	6.17
Filled grains per panicle	68-188	115	27.00	23.55
Unfilled grains panicle	9-79	28	14.14	50.80
1000 grain weight (g)	12.30-36.31	22.65	4.12	18.17
Grain length (mm)	6.06-12.23	8.20	0.82	10.03
Grain breadth (mm)	1.9-3.41	2.78	0.31	11.28
Decorticated grain length (mm)	4.29-8.31	5.86	0.60	10.15
Decorticated grain breadth (mm)	1.72-2.9	2.48	0.26	10.42
Decorticated grain L/B Ratio	1.63-4.35	2.40	0.41	17.8
Yield per hill (g)	2.05-19.6	9.10	3.65	40.11

Quantitative traits characterization

Range, mean, standard deviation (SD) and coefficient of variation (CV) of different quantitative characters of 72 T. Aman rice germplasm have been shown in Table 17. The range of seedling height was found 24.6 cm (Cheng Sail) to 51.8 cm (Bawoi Jhak) and average number of effective tiller was 10. On an average, days to 50% flowering were 106 and range was found 86 days (Diga (2) and Diga) to 118 days (Bawoi Jhak (5) and Bansha Pur). The average plant height and panicle length were found 153.55 cm and 28.17 cm, respectively. The maximum filled grains per panicle were found 188 (Chini Sagar). The range of decorticated grain length-breadth ratio was observed 1.63 (Raj Bhawalia) to 4.35 (Lal Binni). The highest grain length and breadth was found 12.23mm (Lal Binni) and 3.41 mm (Telot), respectively. Bora Dudh Kalam had the highest (36.31 g) and Kalijira (3) had the lowest (12.3 g) thousand grain weight (TGW). The highest yield per hill was found 19.6 g (Abchaya) and average yield per hill was 9.10 g.

11.2.3.5. Morphological characterization of 48 Boro rice germplasm (2019-20)

Table 18. List of rice germplasm characterized, Boro, 2019-20

Sl.	Name	Acc. no.	Upazila/Division	District	Season
1	Boro 9/2	2207	Plant Breeding	Gazipur	Boro
2	Boro 10/3	2208	PBD	Gazipur	Boro
3	Boro 13/2	2209	PBD	Gazipur	Boro
4	Boro 15/1	2210	PBD	Gazipur	Boro
5	Boro 16/1	2211	PBD	Gazipur	Boro
6	Boro 19/1	2212	PBD	Gazipur	Boro
7	Boro 34/1	2213	PBD	Gazipur	Boro
8	Boro 40/1	2214	PBD	Gazipur	Boro
9	Boro 40/2	2215	PBD	Gazipur	Boro
10	Boro 65/2	2216	PBD	Gazipur	Boro
11	Boro 66/1	2217	PBD	Gazipur	Boro
12	Boro 67	2218	PBD	Gazipur	Boro
13	Boro 69/2	2219	PBD	Gazipur	Boro
14	Boro 70/2	2220	PBD	Gazipur	Boro
15	Boro 74/1	2221	PBD	Gazipur	Boro
16	Boro 102/3	2222	PBD	Gazipur	Boro
17	Boro 109/2	2223	PBD	Gazipur	Boro
18	Boro 134/1	2224	PBD	Gazipur	Boro
19	Boro 135/1	2225	PBD	Gazipur	Boro
20	Boro 194	2226	PBD	Gazipur	Boro
21	Boro 209	2227	PBD	Gazipur	Boro
22	Boro 354	2228	PBD	Gazipur	Boro
23	Boro 391	2229	PBD	Gazipur	Boro
24	Boro 397	2230	PBD	Gazipur	Boro
25	Boro 398	2231	PBD	Gazipur	Boro
26	Boro 465	2232	PBD	Gazipur	Boro
27	Boro 471	2233	PBD	Gazipur	Boro
28	Boro 475	2234	PBD	Gazipur	Boro
29	Boro 477	2235	PBD	Gazipur	Boro
30	Boro 507	2236	PBD	Gazipur	Boro
31	Boro 522	2237	PBD	Gazipur	Boro
32	Boro 734	2238	PBD	Gazipur	Boro
33	Boro 99	2239	PBD	Gazipur	Boro
34	Boro 120	2240	PBD	Gazipur	Boro
35	Boro 259	2241	PBD	Gazipur	Boro
36	Boro 275	2242	PBD	Gazipur	Boro
37	Dhali Boro	2243	PBD	Gazipur	Boro
38	Dhali Boro	2244	PBD	Gazipur	Boro
39	Dhali Boro	2245	PBD	Gazipur	Boro
40	Dhali Boro	2246	PBD	Gazipur	Boro
41	Dhali Boro	2247	PBD	Gazipur	Boro
42	Dhali Boro	2248	PBD	Gazipur	Boro
43	Dhali Boro	2249	PBD	Gazipur	Boro
44	Dhali	2250	PBD	Gazipur	Boro
45	Jagli	2253	Kishoreganj	Kishoreganj	Boro
46	Deshi Boro	2254	Kishoreganj	Kishoreganj	Boro
47	Deshi Boro	2255	Kishoreganj	Kishoreganj	Boro
48	Goa Bish	2261	Kishoreganj	Kishoreganj	Boro

Table 19. Characterization of rice germplasm based on qualitative traits, Boro, 2019 - 2020

Sl. no.	Character	State of characters	No. of germplasm	Germplasm (Serial number in Table 18)	Frequency (%)
1.	Blade pubescence	02. Intermediate	48	All	100
2.	Blade colour	02. Green	48	All	100
		03. Dark green			
		04. Purple tips			
		05. Purple margins			
3.	Leaf sheath: anthocyanin colour	01. Absent	5	8, 9, 10, 14, 18	10.42
		09. Present	43	1,2,3,4,5,6,7,11,12,13,15,16,17,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	89.58
4.	Basal leaf sheath colour	01. Green	5	8, 9, 10, 14, 18	10.42
		02. Purple lines			
		03. Light purple	43	1,2,3,4,5,6,7,11,12,13,15,16,17,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48	89.58
		04. Purple			
5.	Leaf angle	01. Erect	44	1,2,3,4,5,6,7,8,11,12,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,44,45,46,47,48	91.67
		05. Horizontal			
		09. Drooping	4	9, 10, 13, 43	8.33
6.	Flag leaf angle	01. Erect(<30 ⁰)	15	28, 29, 33, 34, 35, 36, 38, 39, 40, 41, 42, 45, 46, 47, 48	31.25
		03. Semi erect(<30-45 ⁰)	28	1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 37, 44	58.33
		5. Horizontal (<46-90 ⁰)	2	32, 43	4.17
		07. Descending (>90 ⁰)	3	9, 10, 13	6.25
7.	Ligule colour	01. White	48	All	100
		02. Purple lines			
		03. Purple			
8.	Ligule shape	02. 2- cleft	48	All	100
9.	Collar colour	01. Pale green	48	All	100
		02. Green			
		03. Purple			
10.	Auricle colour	01. Pale green	48	All	100
		02. Purple			
11.	Culm anthocyanin colour	01. Absent	10	23, 24, 33, 34, 35, 36, 37, 43, 45, 48	20.83
		09. Present	38	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32, 38, 39, 40, 41, 42, 44, 46, 47	79.17
12.	Culm angle	01. Erect(<30 ⁰)	3	30, 42, 43	6.25
		03. Intermediate	27	4, 5, 6, 8, 10, 12, 13, 14, 15, 16, 17, 20, 23, 24, 25, 27, 28, 29, 31, 32, 35, 36, 37, 38, 39, 40, 46	56.25
		05. Open	18	1, 2, 3, 7, 9, 11, 18, 19,21, 22, 26, 33, 34, 41, 44, 45, 47, 48	37.5
		07. Spreading			
		09. Procumbent			
13.	Internode colour	01. Green	11	9, 23, 24, 33, 34, 35, 36, 37, 43, 45, 48	22.92
		02. Light gold			
		03. Purple lines	37	1,2,3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32, 38, 39, 40, 41, 42, 44, 46, 47	77.08
		04. Purple			
14.	Culm strength (lodging resistance)	01. Strong	48	All	100
		03. Moderately strong			
		05. Intermediate			
		07. Weak			
		09. Very weak			
15.	Panicle type	01. Compact	11	6, 8, 13, 19, 25, 27, 31, 39, 40, 42, 46	22.92
		05. Intermediate	35	1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 14, 15, 17, 18, 20, 21, 23, 24, 26, 28, 29, 30, 32, 33, 34, 35, 36, 37, 38, 41, 43, 44, 45, 47, 48	72.91
		09. Open	2	16, 22	4.17

Table 19. Cont'd

Sl. no.	Character	State of characters	No. of germplasm	Germplasm (Serial number in Table 18)	Frequency (%)
16.	Secondary branching	01. Light			
		02. Heavy	48	All	100
17.	Panicle exertion	03. Partly exerted			
		05. Just exerted			
		07. Moderately well exerted	1	46	2.08
		09. Well exerted	47	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,47,48	97.92
18.	Axis	01. Straight			
		02. Droopy	48	All	100
19	Shattering	01. Very low (<1%)	27	3, 7, 8, 9, 12, 13, 15, 18, 22, 23, 25, 27, 28, 30, 31, 32, 33, 35, 36, 38, 40, 41, 42, 43, 46, 47, 48	56.25
		03. Low (~3%)	21	1,2,4,5,6,10,11,14,16,17,19,20,21,24, 26, 29, 34, 37, 39, 44, 45	43.75
		05. Moderate (~15%)			
		07. High (~35%)			
20.	Threshability	3. Moderately difficult (1-5%)			
		5. Intermediate			
		7. Loose (26-50%)	16	3, 7, 11, 23, 25, 27, 31, 32, 36, 40, 41, 42, 43, 46, 47, 48	33.33
		9. Easy (51-100%)	32	1, 2, 4, 5, 6, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 26, 28, 29, 30, 33, 34, 35, 37, 38, 39, 44, 45	66.67
21.	Awn: distribution	0. None (awnless)			
		01. Tip only	3	34, 35, 37	6.25
		02. Upper quarter only	2	36, 48	4.17
		05. Whole length	43	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47	89.58
22.	Awn colour	01. Straw	4	37, 43, 45, 48	8.33
		02. Gold			
		03. Brown (tawny)	3	34, 35, 36	6.25
		05. Purple	41	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19, 20, 21, 22, 23, 24,25,26,27,28,29,30,31,32, 33, 38, 39, 40, 41 42,44,46,47	85.42
23.	Apiculus colour	02. Straw	4	37, 43, 45, 48	8.34
		03. Brown	1	36	2.08
		06. Red apex	1	35	2.08
		07. Purple	39	1,2,3,4,5,6,7,8,9,10,11,12, 13, 14, 16, 17, 18, 19, 20, 21, 22,23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 38, 39, 40, 41, 42, 44, 46, 47	81.25
		08. purple apex	3	15, 33, 34	6.25
		09. black			
24.	Stigma colour	01. White	46	1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48	95.83
		04. Light purple			
		05. Purple	2	6, 11	4.17
25.	Lemma and palea colour	0. Straw	13	33, 34, 35, 36, 37, 38, 42, 43, 44, 45, 46, 47, 48	27.08
		01. Gold and gold furrows on straw	3	39, 40, 41	3.25
		03. Brown furrows on straw	9	8, 11, 12, 21, 22, 26, 27, 28, 31	18.75
		04. Brown			
		5. Reddish to light purple	3	3, 6, 9	6.25
		6. Purple spots on straw	1	2	2.08
		07. Purple furrows on straw	19	1,4,5,7, 10, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24, 25, 29, 30, 32	39.58
		08. Purple			
		09. Black			

Table 19. Cont'd

Sl. no.	Character	State of characters	No. of germplasm	Germplasm (Serial number in Table 18)	Frequency (%)
26.	Lemma and palea pubescence	2. Hairs on lemma keel	4	3, 4, 35, 41	8.33
		03. hairs on upper portion	29	1, 2, 5, 6, 7, 10, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 26, 27, 29, 30, 32, 33, 34, 36, 37, 39, 42, 48	60.42
		04. Short hairs	15	8, 9, 11, 12, 21, 25, 28, 31, 38, 40, 43, 44, 45, 46, 47	31.25
27.	Sterile lemma color	01. Straw	48	All	100
		02. Gold			
		03. Red			
		04. Purple			
28.	Seed coat (bran) colour	01. White			
		02. Light brown			
		03. Speckled brown			
		04. brown			
		05. Red	48	All	100
		06. variable purple			
29.	Endosperm type	01. Non-glutinous	39	1,2,3,4,5,6,7,9,10,13,14,15,16,17,20,22,25,26,27,28,29,30,31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48	81.25
		02. Glutinous			
		03. Indeterminate	9	8, 11, 12, 18, 19, 21, 23, 24, 47	18.75
30.	Decorticated grain: Scent (aroma)	0. Non scented	48	All	100
		01. Lightly scented			
		02. Scented			
31.	Leaf senescence	01. Very early			
		03. Early			
		05. Intermediate	44	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24, 25,26,27,28,29,30,31,33,34,35,36,37,38,39,40,41,42,45,46,47	91.67
		07. Late and slow		32, 43, 44, 48	8.33

Qualitative traits characterization

The present study was aimed at identifying qualitative traits variation among the tested 48 Boro (2019-20) rice germplasm. Polymorphism was found in 19 of the 31 qualitative traits under studied; the non-polymorphic traits were the leaf blade pubescence, leaf blade colour, ligule colour, ligule shape, collar colour, auricle colour, culm strength, secondary branching of panicle, axis of panicle, sterile lemma colour, seed coat colour and decorticated grain scent (Table 19).

The variation in flag leaf angle where the percentage rice germplasm with erect, semi erect, horizontal and descending flag leaf are 31.25%, 58.33%, 4.17% and 6.25%, respectively. The qualitative characters showing higher variability in culm angle (6.25% erect, 56.25% intermediate and 37.5% open), internode colour (22.92% green and 77.08% purple lines), panicle type (22.92% compact, 72.91% intermediate and 4.17% open), panicle exertion (97.92% well exerted and 2.08% moderately well exerted), awn distribution in the spikelets (6.25% tip only, 4.17% upper quarter only and 89.58% whole length), awn colour (8.33% straw, 6.25% brown and 85.42% purple).

In the present study, it was also found that most of the tested germplasm possessed purple apiculus colour (81.25%), purple furrows on straw lemma and palea colour (39.58%), hairson upper portion in lemma and palea pubescence (60.42%), intermediate type leaf senescence (91.67%). The present study exhibited high variability in most of the observed qualitative traits of 48 Boro (2019-20) rice germplasm.

Table 20. Variability of 48 Boro rice germplasm considering 21 quantitative characters, 2019-20

Character	Range	Mean	SD	CV (%)
Seedling height (cm)	17.2-22.8	19.45	1.23	6.32
Ligule length (mm)	9.8-18.2	12.85	1.73	13.51
Leaf length (cm)	35.8-59	45.30	5.61	12.39
Leaf width (cm)	0.45-1.07	0.94	0.14	14.50
Culm diameter (mm)	2.95-4.7	3.93	0.44	11.15
Total tiller number	11-27	16	3.44	22.06
Effective tiller number	9-24	13	3.20	24.19
Culm length (cm)	90.2-118.6	100.88	5.71	5.66
Panicle length (cm)	20.4-28.6	23.70	1.38	5.83
Plant height (cm)	112.4-142.4	124.57	6.45	5.18
Days to 50% flowering	113-128	119	3.32	2.80
Days to maturity	140-156	148	4.04	2.73
Filled grains per panicle	75-145	99	16.37	16.55
Unfilled grains panicle	03-42	8	6.18	78.66
1000 grain weight (g)	18.37-25.31	22.13	1.53	6.93
Grain length (mm)	6.87-7.94	7.52	0.24	3.13
Grain breadth (mm)	2.62-3.2	2.9	0.14	4.87
Decorticated grain length (mm)	4.48-5.66	5.28	0.20	3.75
Decorticated grain breadth (mm)	2.13-2.63	2.49	0.09	3.99
Decorticated grain L/B Ratio	1.78-2.47	2.12	0.11	5.02
Yield per hill (g)	7.94-26.88	18.51	3.86	20.86

Qualitative traits characterization

Range, mean, standard deviation (SD) and coefficient of variation (CV) of different quantitative characters of rice germplasm have been given in Table 20. The range of seedling height was found 17.2 cm (Boro 120 and Boro 259) to 22.8 cm (Boro 40/2) and average number of effective tiller was 13. On an average, days to 50% flowering were 119 and range was found 113 days (Boro 734) to 128 days (Boro 120 and Boro 259). The average plant height and panicle length were found 124.57 cm and 23.7 cm, respectively. The maximum filled grains per panicle were found 145 (Boro 65/2). The range of decorticated grain length-breadth ratio was observed 1.78 (Boro 134/1) to 2.47 (Boro 10/3). The highest grain length and breadth was found 7.94 mm (Dhali Boro 104/1) and 3.2 mm (Boro 734), respectively. The highest yield per hill was found 26.88 (Boro 40/2) and average yield per hill was 18.51 g (Table 20).



Fig. 9. Data collection for morphological characterization of rice germplasm

11.2.4. Molecular Characterization

A total of 216 local rice germplasm from BRRRI genebank have been characterized at molecular level. In T. Aman, 2018 season, fifty seven (57) SSR markers were used for molecular characterization of 48 rice germplasm (Table 6) where 54 markers were found to be polymorphic for diversity analysis (Table 21). In Boro, 2018-19 season 48 germplasm (Table 9) were characterized at molecular level using fifty eight (58) markers where 55 were found to be polymorphic for diversity analysis (Table 22). In Aus, 2019 season 48 germplasm (Table 12) were characterized at molecular level using sixty (60) markers where all markers were found to be polymorphic for diversity analysis (Table 23). In T. Aman, 2019 season 72 germplasm (Table 15) were characterized at molecular level using sixty one (61) markers where all markers were found to be polymorphic for diversity analysis (Table 24).

Based on polymorphism, SSR markers with clear amplifications were used for genetic diversity analysis and the position (cM), repeat motifs and chromosomal positions for these markers can be found in the rice genome database (<http://www.gramene.org>).

The DNA profile of 48 T. Aman (2018) rice germplasm with SSR marker RM253 is shown in Figure 10, the DNA profile of 48 Boro (2018-19) rice germplasm with SSR marker RM536 is shown in Figure 12, the DNA profile of 48 Aus (2019) rice germplasm with SSR marker RM447 is shown in Figure 14 and the DNA profile of 72 T. Aman (2019) rice germplasm with SSR marker RM411 is shown in Fig. 16.

11.2.4.1. Molecular Characterization of 48 T. Aman rice germplasm (2018)

Table 21. Number of alleles, allele size range, frequency, gene diversity and polymorphism information content (PIC) among 48 T. Aman germplasm against microsatellite markers, 2018

SL. No.	Marker	Chro. No.	Position (cM)	Motif*	Allele No.	Unique allele	Size range (bp)	Size (bp)	Freq (%)	Gene diversity	PIC
1	RM 1	1	29.7	(GA)26	5	1	75-128	128	47.92	0.69	0.65
2	RM 5	1	94.9	GA)14	3	-	107-119	119	47.92	0.62	0.54
3	RM 16	3	131.5	(TCG)5(GA)16	5	1	184-219	184	87.50	0.23	0.22
4	RM 7	3	64	(GA)19	3	2	166-195	180	66.67	0.48	0.41
5	RM 19	12	20.9	(ATC)10	4	-	218-242	218	60.42	0.58	0.54
6	RM 26	5	118.8	(GA)15	3	-	105-115	115	81.25	0.32	0.29
7	RM 124	4	150.1	(TC)10	2	-	249-258	258	93.75	0.12	0.11
8	RM 133	6	0	(CT)8	2	-	225-230	230	89.50	0.19	0.17
9	RM 144	11	123.2	(ATT)11	5	2	213-257	257	64.58	0.53	0.49
10	RM 145	2	49.8	-	2	-	184-192	184	68.75	0.43	0.34
11	RM 162	6	108.3	(AC)20	2	-	222-241	222	85.42	0.25	0.22
12	RM 170	6	2.2-7.4	(CCT)7	4	-	110-127	127	64.58	0.54	0.50
13	RM 190	6	7.4	(CT)11	2	-	107-113	113	91.67	0.15	0.14
14	RM 201	9	81.2	(CT)17	2	-	164-169	164	62.50	0.47	0.36
15	RM 202	11	54	(CT)30	3	-	153-171	171	58.33	0.56	0.49
16	RM 205	9	114.7	(CT)25	5	2	116-151	116	83.33	0.30	0.28
17	RM 206	11	102.9	(CT)21	5	-	132-175	132	54.17	0.65	0.61
18	RM 207	2	191.2	(CT)25	6	-	72-161	161	29.17	0.79	0.76
19	RM 208	2	186.4	(CT)17	3	-	158-173	173	60.42	0.53	0.45
20	RM 209	11	73.9	(CT)18	5	1	132-168	132	62.50	0.53	0.47
21	RM 212	1	148.7	(CT)24	4	1	107-130	130	70.83	0.46	0.41
22	RM 213	2	186.4	(CT)17	3	1	132-145	145	91.67	0.16	0.15
23	RM 223	8	80.5	(CT)25	4	-	149-168	168	58.33	0.59	0.55
24	RM 224	11	120.1	(AAG)8(AG)13	3	-	128-151	151	45.83	0.59	0.50

Table 21. Cont'd

SL. No.	Marker	Chro. No.	Position (cM)	Motif*	Allele No.	Unique allele	Size range (bp)	Size (bp)	Freq (%)	Gene diversity	PIC
25	RM 228	10	130.3	(CA) ₆ (GA) ₃₆	4	-	107-138	138	85.42	0.26	0.25
26	RM 252	4	99	(CT) ₁₉	5	-	204-241	204	68.75	0.50	0.48
27	RM 253	6	37	(GA) ₂₅	6	-	108-141	141	47.92	0.67	0.62
28	RM 262	2	103.3	(CT) ₁₆	3	1	144-159	159	64.58	0.47	0.38
29	RM 263	2	127.5	(CT) ₃₄	3	-	186-202	202	72.92	0.43	0.39
30	RM 273	4	94.4	(GA) ₁₁	2	-	207-215	207	89.58	0.19	0.17
31	RM 277	12	57.2	(GA) ₁₁	2	-	122-129	122	93.75	0.12	0.11
32	RM 283	1	31.4	(GA) ₁₈	3	1	144-158	158	89.58	0.19	0.19
33	RM 289	5	56.7	G ₁₁ (GA) ₁₆	4	-	91-141	91	87.50	0.23	0.22
34	RM 302	1	147.8	(GT) ₃₀ (AT) ₈	7	-	127-285	127	58.33	0.62	0.60
35	RM 303	4	116.9	[AC(AT) ₂₁₀] ₉ (GT) ₇ (A TGT) ₆	3	-	179-211	211	87.50	0.23	0.21
36	RM 304	10	73	(GT) ₂ (AT) ₁₀ GT ₃₃	4	1	136-167	167	60.42	0.56	0.50
37	RM 316	9	1.8	(GT) ₈ (TG) ₉ (TTTG) ₄ (TG) ₄	2	-	192-203	192	87.50	0.22	0.19
38	RM 320	7	62.4	(AT) ₁₁ GTAT (GT) ₁₃	2	-	209-228	209	89.58	0.19	0.17
39	RM 338	3	108.4	(CTT) ₆	2	-	172-177	177	93.75	0.12	0.11
40	RM 342	8	78.4	(CAT) ₁₂	4	-	126-148	148	60.42	0.58	0.54
41	RM 411	3	127.9	(GTT) ₇	2	-	103-110	110	54.17	0.50	0.37
42	RM 413	5	26.7	(AG) ₁₁	6	-	67-115	67	27.08	0.79	0.75
43	RM 447	8	124.6	(CTT) ₈	4	2	105-140	105	68.75	0.45	0.38
44	RM 452	2	58.4	(GTC) ₉	2	-	192-201	201	66.67	0.44	0.35
45	RM 455	7	65.7	(TTCT) ₅	2	1	131-137	131	97.92	0.04	0.04
46	RM 472	1	171.6	(GA) ₂₁	3	1	258-281	281	66.67	0.46	0.37
47	RM 484	10	97.3	(AT) ₉	2	-	270-276	276	95.83	0.08	0.08
48	RM 515	8	80.5	(GA) ₁₁	2	-	207-215	215	52.08	0.50	0.37
49	RM 520	3	191.6	(AG) ₁₀	3	-	223-247	247	56.25	0.59	0.52
50	RM 536	11	55.1	(CT) ₁₆	3	1	221-237	237	89.58	0.19	0.18
51	RM 566	9	47.7	(AG) ₁₅	5	-	231-253	231	41.00	0.72	0.68
52	RM 591	10	118.3	(AC) ₁₀	5	-	241-280	241	67.00	0.67	0.61
53	RM 1337	12	0	(AG) ₂₁	6	2	180-227	227	35.42	0.71	0.65
54	RM 3646	3	6.32	(GA) ₁₄	4	-	141-159	141	47.92	0.64	0.58
	Max.				7			281	97.92	0.79	0.76
	Min.				2			67	27.08	0.04	0.04
	Total				190			9341	3730.85	23.12	20.71
	Mean				3.56			172.91	69.09	0.43	0.38

SSR Diversity

In total 190 alleles were detected at 54 SSR (simple sequence repeats) markers (Table 21.) across 48 T. Aman rice germplasm (Table 6). The highest amplicon size was produced by RM472 (281 bp) and the lowest by RM413 (67bp). The number of alleles per locus ranged from 2 to 7 alleles, with an average of 3.56 alleles across the 54 loci. The PIC values ranged from 0.04 (RM455) to 0.76 (RM207) with an average of 0.38. Lower PIC value indicates that the genotypes under study are closely related, while the higher value of PIC indicates higher diversity of materials which is better for development of new superior varieties. Primer RM 207 had the highest PIC value (0.76) and this primer is detected as the highest level of polymorphism. Therefore, it is confirmed that RM207 was the best marker for characterizing the studied T. Aman rice genotypes. The frequency of the most common allele at each locus ranged from 27.08% to 97.92%. On average, 69.09% of the 48 T. Aman rice germplasm shared a common major allele at any given locus. The DNA profile of 48 T. Aman rice germplasm with SSR marker RM253 is shown in Fig.10.

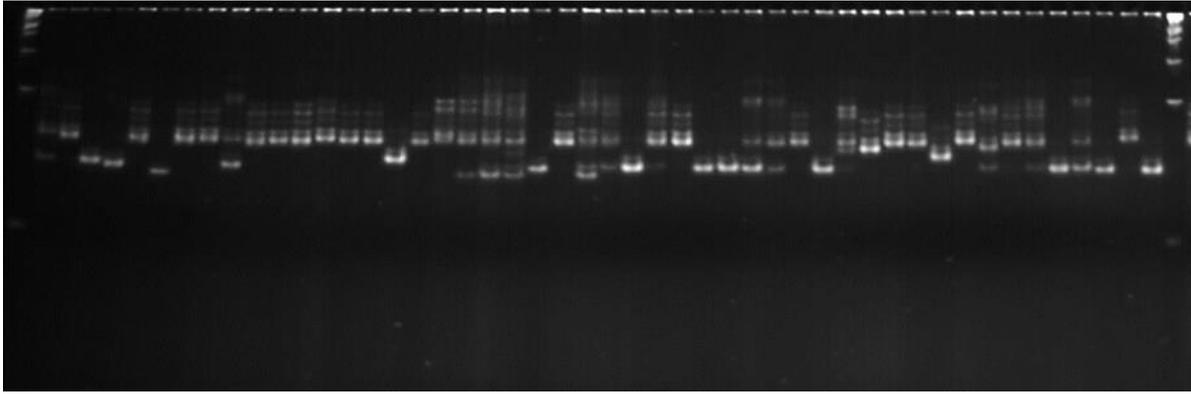


Fig. 10. DNA profile of 48 T. Aman (2018) rice germplasm with SSR marker, RM253

Legend: 1.Badkalamkati, 2. Baisbis, 3. Bhasha Manik, 4. Bansfol, 5. Blue Stik, 6. Chinri Gushi, 7. Chitraj, 8. Daudkhani, 9. Dhola Amon, 10. Dudhlaki, 11. Indra Sail, 12. Jesso Balam, 13. Jhinga Sail, 14. Kumari, 15. Nagra, 16. Rupsail, 17. Bashpul, 18. Apchaya, 19. Dhal Katia, 20. Boron, 21. Dhaldata, 22. Sechi Amon, 23. Laksmidiga, 24. Dal Katra, 25. Chota Bhawalia, 26. Bhora Bhawlia, 27. Diga, 8. Manikdiga, 29. Bhawal Motuk, 30. Jatra Motuk, 31. Bora Diga, 32. Rangi Khama, 33. Dudh Bhawalia, 34. Goirol, 35. Bhawalia Amon, 36. Hash Fol, 37. Rajmondal, 38. Gonakray, 39. Kala Mona, 40. Belon Dhan, 41. Shor Soria, 42. Gorcha, 43. Luta, 44. Sunadiga, 45. Gabura, 46. Khoia Motor, 47. Suna Digha, 48. Raj Bhawalia

Genetic distance-based analysis

The genetic distance-based results seen in the unweighted pair of group method with arithmetic mean (UPGMA) clustering system revealed that the 48 T. Aman rice germplasm were grouped into four major clusters using MEGA software. The highest number of germplasm (35) was found in cluster I followed by cluster II (10), IV (2) and the lowest in cluster III (1) (Fig. 11).

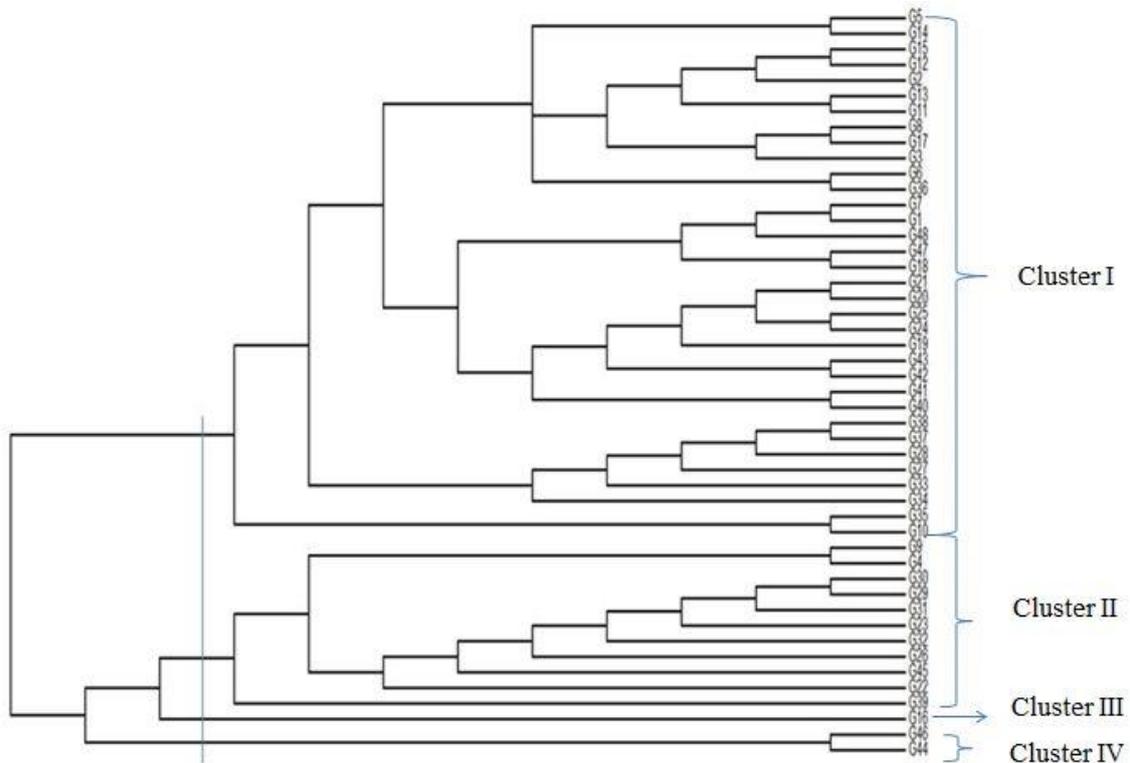


Fig. 11. Cluster analysis of 48 rice germplasm using 54 SSR markers, T. Aman 2018

11.2.4.2. Molecular Characterization of 48 Boro rice germplasm (2018-19)

Table 22. Number of alleles, allele size range, frequency, gene diversity and polymorphism information content (PIC) among 48 Boro germplasm, against microsatellite markers, 2018-19

SL. No.	Marker	Chro. No.	Position (cM)	Motif*	Allele No.	Unique allele	Size range (bp)	Size (bp)	Freq (%)	Gene diversity	PIC
1	RM1	1	29.7	(GA)26	4	-	80-112	112	54.17	0.36	0.34
2	RM5	1	94.9	GA)14	4	-	111-127	111	43.75	0.63	0.56
3	RM16	3	131.5	(TCG)5(GA)16	4	1	184-240	184	85.42	0.26	0.25
4	RM12	12	109.1	(GA)21	6	2	150-215	150	72.92	0.45	0.43
5	RM19	12	20.9	(ATC)10	7	2	204-239	239	77.08	0.39	0.38
6	RM26	5	118.8	(GA)15	3	-	105-119	119	89.58	0.19	0.18
7	RM133	6	0	(CT)8	2	-	225-234	234	93.75	0.12	0.11
8	RM144	11	123.2	(ATT)11	5	-	220-247	247	54.17	0.63	0.58
9	RM145	2	49.8	-	2	1	181-192	181	95.83	0.08	0.08
10	RM170	6	2.2-7.4	(CCT)7	5	-	98-127	127	60.42	0.58	0.54
11	RM190	6	7.4	(CT)11	3	-	107-127	127	85.42	0.26	0.24
12	RM201	9	81.2	(CT)17	5	1	161-188	161	68.75	0.50	0.47
13	RM202	11	54	(CT)30	4	-	165-186	186	64.58	0.54	0.50
14	RM205	9	114.7	(CT)25	5	1	117-156	117	64.58	0.54	0.51
15	RM206	11	102.9	(CT)21	10	4	135-198	135	29.17	0.81	0.78
16	RM207	2	191.2	(CT)25	4	1	72-148	148	79.17	0.36	0.33
17	RM208	2	186.4	(CT)17	3	-	170-187	170	72.92	0.43	0.38
18	RM209	11	73.9	(CT)18	7	2	125-170	125	60.42	0.60	0.58
19	RM212	1	148.7	(CT)24	2	-	125-132	132	87.50	0.22	0.19
20	RM213	2	186.4	(CT)17	3	-	143-166	143	85.42	0.26	0.24
21	RM223	8	80.5	(CT)25	4	-	144-172	172	72.92	0.44	0.40
22	RM224	11	120.1	(AAG)8(AG)13	6	2	138-172	172	56.25	0.60	0.55
23	RM228	10	130.3	(CA)6(GA)36	4	-	108-145	145	77.08	0.38	0.36
24	RM252	4	99	(CT)19	5	1	206-230	206	75.00	0.42	0.39
25	RM253	6	37	(GA)25	5	1	125-160	160	72.92	0.44	0.41
26	RM262	2	103.3	(CT)16	6	2	145-167	145	70.83	0.47	0.44
27	RM263	2	127.5	(CT)34	4	-	192-217	199	85.42	0.26	0.25
28	RM273	4	94.4	(GA)11	3	-	127-222	222	89.58	0.19	0.18
29	RM277	12	57.2	(GA)11	3	1	124-138	124	89.58	0.19	0.18
30	RM283	1	31.4	(GA)18	3	-	159-174	159	66.67	0.49	0.43
31	RM289	5	56.7	G11(GA)16	5	-	88-146	88	39.58	0.70	0.65
32	RM304	10	73	(GT)2(AT)10(GT)33	4	-	157-174	157	45.83	0.63	0.57
33	RM316	9	1.8	(GT)8(TG)9(TTTG)4(TG)4	2	-	205-212	212	89.58	0.19	0.17
34	RM320	7	62.4	(AT)11GTAT(GT)13	2	-	225-233	233	95.83	0.08	0.08
35	RM338	3	108.4	(CT)6	2	-	191-198	191	95.83	0.08	0.08
36	RM342	8	78.4	(CAT)12	5	3	130-169	130	81.25	0.32	0.30
37	RM411	3	127.9	(GT)7	2	-	108-115	108	85.42	0.25	0.22
38	RM413	5	26.7	(AG)11	4	-	170-198	170	58.33	0.59	0.54
39	RM447	8	124.6	(CT)8	5	2	106-145	106	83.33	0.30	0.28
40	RM452	2	58.4	(GTC)9	2	-	197-206	206	79.17	0.33	0.28
41	RM455	7	65.7	(TTCT)5	2	-	125-131	131	97.92	0.04	0.04
42	RM484	10	97.3	(AT)9	2	-	289-296	296	91.67	0.15	0.14
43	RM495	2	2.8	(CTG)7	3	-	159-0173	159	83.33	0.29	0.26
44	RM515	8	80.5	(GA)11	6	1	211-252	211	72.92	0.45	0.43
45	RM520	3	191.6	(AG)10	3	1	244-264	244	70.83	0.45	0.40
46	RM536	11	55.1	(CT)16	3	-	236-249	249	72.92	0.41	0.36
47	RM591	10	118.3	(AC)10	5	1	247-279	247	62.50	0.56	0.53
48	RM1337	12	57.2	(GA)11	5	-	194-225	194	75.00	0.42	0.39
49	RM3646	3	6.32	(GA)14	3	-	145-158	145	85.42	0.26	0.24
50	RM303	4	116.9	[AC(AT)210]9 (GT)7(ATGT)6]	8	1	107-198	198	54.17	0.67	0.64
51	RM307	2	191.2	(CT)25	7	2	125-264	125	77.08	0.40	0.38
52	RM334	5	141.8	(CT)48	7	1	156-218	156	45.83	0.72	0.68
53	RM472	1	171.6	(GA)21	3	-	286-306	286	58.33	0.57	0.50
54	RM125	7	24.8	(GCT)8	4	1	127-152	127	85.42	0.26	0.25
55	RM510	6	20.8	(GA)15	3	1	113-127	127	91.67	0.16	0.15
	Max.				10.00			296	97.92	0.81	0.78
	Min.				2.00			88	29.17	0.04	0.04
	Total				228.00			4060.42	21.35	19.82	
	Mean				4.15			73.83	0.39	0.36	

SSR Diversity

In this study, fifty-five (55) SSR markers distributed over all 12 chromosomes of rice were genotyped in 48 Boro rice germplasm (Table 9) of Bangladesh. The summary statistics of the 55 SSR markers and the markers showing 228 polymorphic alleles were identified (Table 22). The average number of alleles per locus was 4.15, ranged from 2 (RM133, RM145, RM212, RM316, RM320, RM338, RM411, RM452, RM455 and RM484) to 10 (RM206). The gene diversity ranged from 0.04 to 0.81 with an average of 0.39. The polymorphism information content (PIC) for the SSR loci ranged from 0.04 (RM455) to 0.78 (RM206). Primer RM206 had the highest PIC value (0.78) and the highest number of alleles (10). Therefore, RM206 was detected as the highest level of polymorphism and RM206 is supposed to be the best marker for characterizing the 48 Boro rice germplasm. The frequency of the most common allele at each locus ranged from 29.17% (RM206) to 97.92% (RM455). On average, 73.83% of the 48 rice germplasm shared a common major allele at any given locus. The DNA profiles of 48 Boro rice germplasm with RM536 are shown in Fig.12.

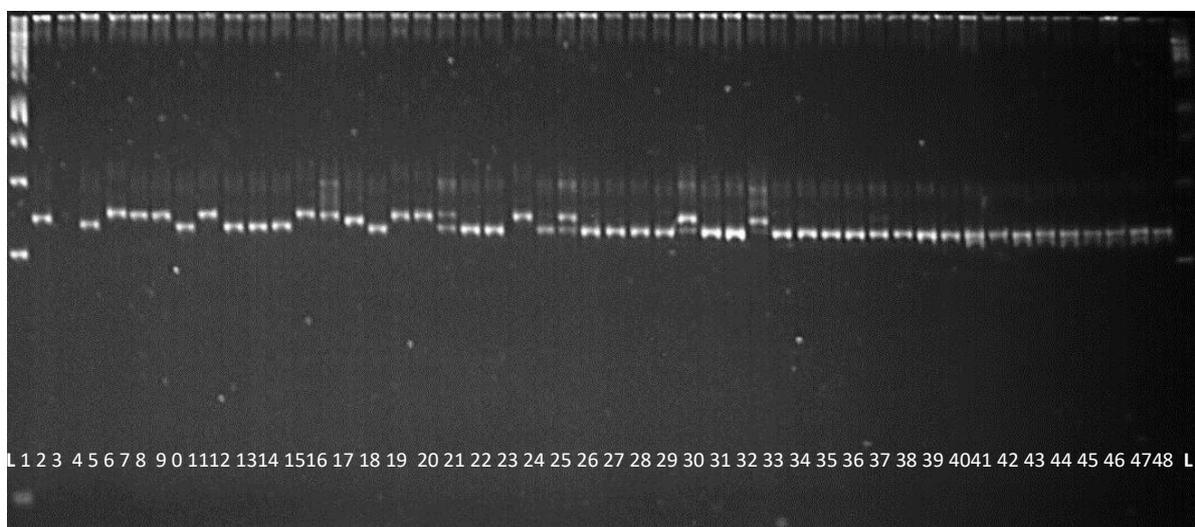


Fig. 12. DNA profile of 48 Boro rice with SSR marker, RM536

Legend: 1. Mi-Pajang, 2. Dholi Boro, 3. Kumri Boro, 4. Bairagi Sail 5. Tepi Khorch 6. Pan Kaich 7. Boro Deshi, 8. Gopal Beshi, 9. Borail, 10. Boro 6/2, 11. Kali Boro, 12. Sonar Geye, 13. Joya Boro, 14. Amboro 2 (Golden), 15. Batti Boro, 16. Madhabsail, 17. Jagli, 18. Jagli, 19. Local Boro, 20. Saita, 21. Dud Saita, 22. Bogra Boro, 23. Deshi Boro, 24. Jagli (Deshi Boro), 25. Boro Dhan, 26. Boro Jagli, 27. Jagli, 28. Deshi Boro 29. Boro Dhan, 30. Boro (Sunga), 31. Jala Boro, 32. Kali Boro 2/2, 33. Kali Boro 4/1, 34. Kali Boro 26, 35. Kali Boro 41/1, 36. Kali Boro 48/1, 37. Kaliboro 80/3, 38. Kali Boro 80/5, 39. Kali Boro 109/4, 40. Kali Boro 138/2, 41. Kali Boro 139/2, 42. Kali Boro 200, 43. Kali Boro 208, 44. Kali Boro 259, 45. Kali Boro 266, 46. Kali Boro 576, 47. Kali Boro 600, 48. Kali Boro 704.

Genetic distance-based analysis

The genetic distance-based results seen in the unrooted neighbor-joining tree revealed that the 48 Boro rice germplasm were grouped into four major clusters (Fig. 13). The highest numbers of germplasm (37) were found in cluster I followed by clusters II (4), III (4) and the lowest in cluster IV (3).

Table 23. Cont'd

SL. No.	Marker	Chro. No.	Position (cM)	Motif*	Allele No.	Unique allele	Size range (bp)	Size (bp)	Freq (%)	Gene diversity	PIC
23	RM228	10	130.3	(CA) ₆ (GA) ₃₆	4	1	104-121	104	66.67	0.50	0.44
24	RM252	4	99	(CT) ₁₉	3	-	187-200	187	70.83	0.45	0.41
25	RM253	6	37	(GA) ₂₅	6	1	120-150	120	60.42	0.60	0.57
26	RM262	2	103.3	(CT) ₁₆	4	-	136-159	159	66.67	0.52	0.49
27	RM263	2	127.5	(CT) ₃₄	3	-	186-199	199	72.92	0.43	0.39
28	RM273	4	94.4	(GA) ₁₁	6	-	191-223	191	60.42	0.60	0.57
29	RM277	12	57.2	(GA) ₁₁	3	-	131-146	131	72.92	0.43	0.39
30	RM283	1	31.4	(GA) ₁₈	3	-	151-165	165	70.83	0.45	0.41
31	RM303	4	116.9	[AC(AT) ₂₁₀] ₉ (GT) ₇ (ATGT) ₆	5	-	148-225	148	62.50	0.57	0.53
32	RM304	10	73	(GT) ₂ (AT) ₁₀ (GT) ₃₃	4	-	151-202	151	56.25	0.62	0.58
33	RM316	9	1.8	(GT) ₈ (TG) ₉ (TTTG) ₄ (TG) ₄	3	-	179-192	192	77.08	0.38	0.35
34	RM320	7	62.4	(AT) ₁₁ GTAT(GT) ₁₃	2	-	203-211	203	89.58	0.19	0.17
35	RM338	3	108.4	(CTT) ₆	3	-	183-194	194	89.58	0.19	0.18
36	RM342	8	78.4	(CAT) ₁₂	4	1	137-155	137	66.67	0.51	0.47
37	RM411	3	127.9	(GTT) ₇	3	-	108-119	108	77.08	0.37	0.34
38	RM413	5	26.7	(AG) ₁₁	5	1	71-94	94	72.92	0.45	0.42
39	RM447	8	124.6	(CTT) ₈	5	-	111-148	111	52.08	0.65	0.60
40	RM452	2	58.4	(GTC) ₉	3	-	180-194	194	50.0	0.59	0.51
41	RM455	7	65.7	(TTCT) ₅	2	-	125-131	131	93.75	0.12	0.11
42	RM484	10	97.3	(AT) ₉	2	-	288-296	288	85.42	0.25	0.22
43	RM495	2	2.8	(CTG) ₇	3	-	150-165	165	70.83	0.44	0.38
44	RM515	8	80.5	(GA) ₁₁	3	1	194-211	211	81.25	0.31	0.27
45	RM520	3	191.6	(AG) ₁₀	4	-	235-263	263	52.08	0.63	0.57
46	RM536	11	55.1	(CT) ₁₆	3	1	236-251	251	91.67	0.16	0.15
47	RM566	9	47.7	(AG) ₁₅	4	1	223-266	266	81.25	0.32	.30
48	RM591	10	118.3	(AC) ₁₀	4	-	229-249	229	35.42	0.70	0.64
49	RM1337	12	57.2	(GA) ₁₁	3	1	195-210	195	58.33	0.50	0.40
50	RM3646	3	6.32	(GA) ₁₄	3	-	131-143	131	64.58	0.52	0.46
51	RM307	2	191.2	(CT) ₂₅	2	-	166-173	173	79.17	0.33	0.28
52	RM334	5	141.8	(CTT) ₄₈	6	1	177-214	214	25.0	0.81	0.78
53	RM472	1	171.6	(GA) ₂₁	3	-	272-296	272	62.50	0.54	0.48
54	RM125	7	24.8	(GCT) ₈	3	-	120-134	134	83.33	0.29	0.26
55	RM510	6	20.8	(GA) ₁₅	2	-	112-118	118	85.42	0.25	0.22
56	RM454	6	99.3	(GCT) ₈	2	-	268-275	268	91.67	0.15	0.14
57	RM134	7	99.6	(CCA) ₇	2	-	80-89	89	75.0	0.38	0.30
58	RM214	7	34.7	(CT) ₁₄	4	1	108-140	140	45.83	0.59	0.50
59	RM124	4	150.1	(TC) ₁₀	2	-	261-271	261	79.17	0.33	0.28
60	RM162	6	108.3	(AC) ₂₀	2	-	213-220	213	95.83	0.08	0.08
	Max.				8			288	95.83	0.81	0.78
	Min.				2			75	25	0.08	0.08
	Total				219	33			4260.42	25.24	22.84
	Mean				3.65				71.01	0.42	0.38

SSR Diversity

In total 219 alleles were detected at 60 SSR (simple sequence repeats) markers (Table 23) across 48 Aus rice germplasm (Table 12). The highest amplicon size was produced by RM484 (288 bp) and the lowest by RM207 (75 bp). The number of alleles per locus ranged from 2 alleles to 8 alleles, with an average of 3.65 alleles across the 60 loci. The PIC values ranged from 0.08 (RM201, RM162) to 0.78 (RM334) with an average of 0.38. Lower PIC value indicates that the genotypes under study are closely related, while the higher value of PIC indicates higher diversity of materials which is better for development of new superior varieties. Primer RM334 had the highest PIC value (0.78) and this primer is detected as the highest level of polymorphism. Therefore, it is confirmed that RM334 was the best marker for characterizing the studied Aus rice genotypes. The frequency of the most common allele at each locus ranged from 25.0% to 95.83%. On average, 71.01% of the 48 Aus rice germplasm shared a common major allele at any given locus (Table 23). The DNA profile of 48 Aus rice germplasm with SSR marker RM447 is shown in Fig.14.

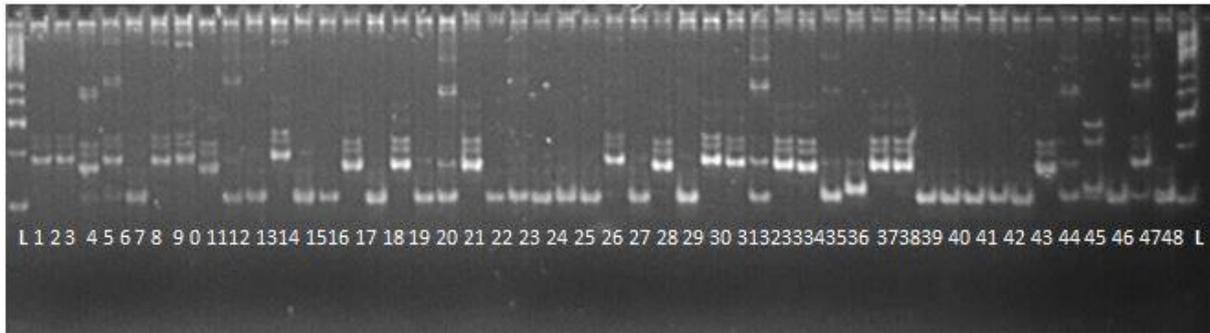


Fig. 14. DNA profile of 48 Aus (2019) rice germplasm with SSR marker, RM447

Legend: 1. Atlal, 2. Charnak, 3. Dhala Saita, 4. Dhala Saita, 5. Harinmuda, 6. Kali Atia, 7. Katakara, 8. Patuakhali, 9. Parang, 10. Mi-Timbra, 11. Kachilon-1, 12. Kachilon- 2, 13. Bowalia, 14. Bowalia, 15. Juma, 16. Kasia Panja, 17. Bokri Joli, 18. Balam, 19. Rawnok, 20. Gojal Gorla, 21. Joli, 22. Rangouri (Sada), 23. Shoni, 24. Kumri, 25. Dal Kaisha, 26. Boumail, 27. Achar Bhog, 28. Bari Bhog, 29. Jaba Hulu, 30. Garia, 31. Gungur Bali, 32. Hijolee, 33. Shoni, 34. Jabar Sail, 35. Laksmi Dia, 36. Madida, 37. Ashini, 38. Mi-Cochu, 39. Dhariyal, 40. Lema, 41. Porang, 42. Kali Haitya, 43. Hirgal, 44. Ingra, 45. Mati Char, 46. Boilam, 47. Boteswar(2), 48. Laxmi Bini

Genetic distance-based analysis

The genetic distance-based results seen in the unrooted neighbor-joining tree revealed that the 48 Aus rice germplasm (2019) were grouped into three (3) major clusters using MEGA software (Fig. 15). All the clusters contain same number (16) of Aus rice germplasm [cluster I(16), cluster II (16), and cluster III (16)].

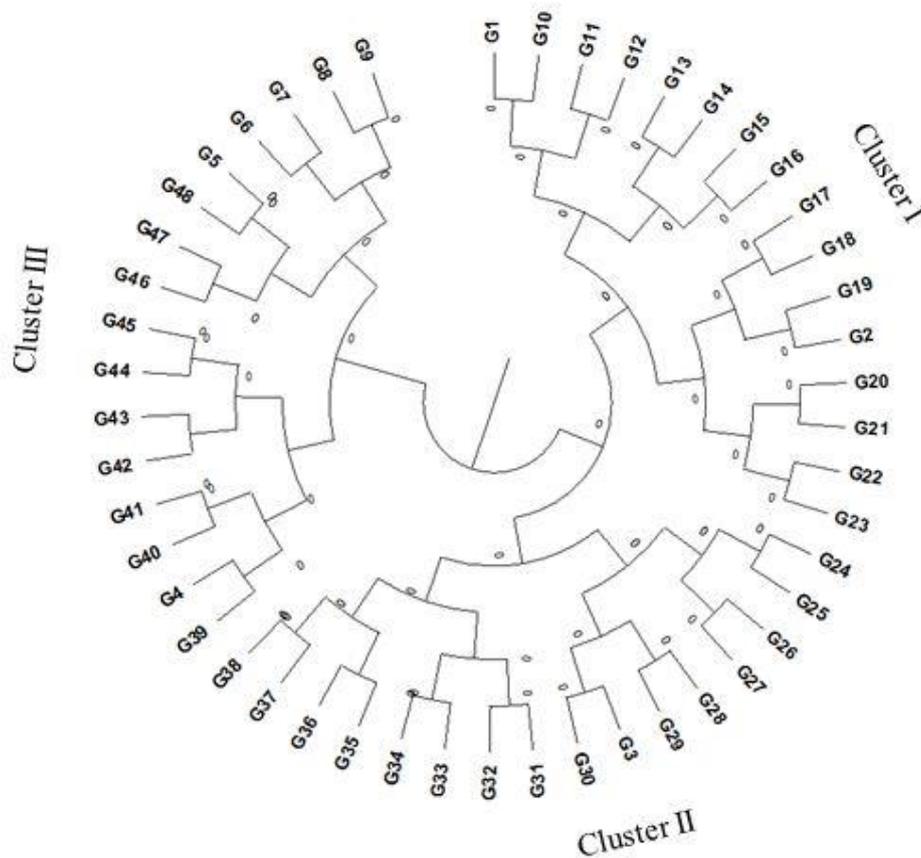


Fig. 15. An unrooted neighbor-joining tree showing genetic relationships among 48 Aus rice germplasm, 2019

11.2.4.4. Molecular Characterization of 72 T. Aman Rice Germplasm (2019)

Table 24. Number of alleles, allele size range, frequency, gene diversity and polymorphism information content (PIC) among 72 T. Aman rice germplasm against SSR markers, 2019

SL. no.	Marker	Chro. no.	Position (cM)	Motif*	Allele no.	Unique allele	Size range (bp)	Size (bp)	Freq (%)	Gene diversity	PIC
1	RM1	1	29.7	(GA)26	7	2	83-133	83	48.61	0.70	0.66
2	RM5	1	94.9	GA)14	3	-	101-113	113	69.44	0.47	0.42
3	RM16	3	131.5	(TCG)5(GA)16	5	-	165-236	165	84.72	0.28	0.27
4	RM19	12	20.9	(ATC)10	3	-	222-257	257	70.83	0.46	0.41
5	RM25	8	52.2	(GA)18	3	-	132-151	151	56.94	0.58	0.52
6	RM26	5	118.8	(GA)15	2	-	104-112	112	80.56	0.31	0.26
7	RM133	6	0	(CT)8	2	-	216-225	216	80.56	0.31	0.26
8	RM144	11	123.2	(ATT)11	7	-	211-275	211	27.78	0.80	0.77
9	RM145	2	49.8	-	4	1	174-198	174	84.72	0.27	0.25
10	RM170	6	2.2-7.4	(CCT)7	4	-	102-121	121	69.44	0.47	0.42
11	RM190	6	7.4	(CT)11	4	-	100-124	100	81.94	0.32	0.30
12	RM201	9	81.2	(CT)17	4	1	130-153	153	61.11	0.56	0.50
13	RM202	11	54	(CT)30	5	-	154-183	183	45.83	0.70	0.66
14	RM205	9	114.7	(CT)25	4	-	117-157	117	77.78	0.37	0.35
15	RM206	11	102.9	(CT)21	8	-	143-194	143	44.44	0.74	0.72
16	RM207	2	191.2	(CT)25	3	-	134-153	153	65.28	0.51	0.46
17	RM208	2	186.4	(CT)17	5	1	153-176	176	77.78	0.38	0.35
18	RM209	11	73.9	(CT)18	6	1	118-156	118	41.67	0.68	0.63
19	RM212	1	148.7	(CT)24	3	-	113-125	125	80.56	0.33	0.30
20	RM213	2	186.4	(CT)17	4	-	130-152	136	69.44	0.48	0.44
21	RM223	8	80.5	(CT)25	4	-	140-159	159	59.72	0.57	0.52
22	RM224	11	120.1	(AAG)8(AG)13	4	-	138-163	138	54.17	0.60	0.54
23	RM228	10	130.3	(CA)6(GA)36	6	2	112-164	112	63.89	0.54	0.50
24	RM252	4	99	(CT)19	7	-	192-233	192	38.89	0.77	0.75
25	RM253	6	37	(GA)25	4	-	117-141	141	51.39	0.65	0.60
26	RM262	2	103.3	(CT)16	3	-	140-152	152	63.89	0.52	0.46
27	RM263	2	127.5	(CT)34	3	-	189-205	205	59.72	0.56	0.50
28	RM273	4	94.4	(GA)11	2	-	201-209	201	90.28	0.18	0.16
29	RM277	12	57.2	(GA)11	3	-	117-130	117	91.67	0.16	0.15
30	RM282	3	100.6	(GA)15	3	-	127-145	145	90.28	0.18	0.17
31	RM283	1	31.4	(GA)18	2	-	151-158	151	94.44	0.10	0.10
32	RM289	5	56.7	G11(GA)16	5	3	88-137	88	93.06	0.13	0.13
33	RM303	4	116.9	[AC(AT)210]9 (GT)7(ATGT)6]	2	-	200-210	210	94.44	0.10	0.10
34	RM304	10	73	(GT)2(AT)10GT)33	5	1	132-172	172	60.87	0.58	0.55
35	RM316	9	1.8	(GT)8(TG)9(TTTG)4(TG)4	3	-	179-207	207	73.61	0.42	0.37
36	RM338	3	108.4	(CTT)6	3	1	167-183	167	95.83	0.08	0.08
37	RM342	8	78.4	(CAT)12	4	-	128-150	128	37.50	0.70	0.65
38	RM411	3	127.9	(GTT)7	3	-	103-116	103	51.39	0.54	0.43
39	RM413	5	26.7	(AG)11	6	1	67-110	67	44.44	0.67	0.61

Table 24. Cont'd

SL. no.	Marker	Chro. no.	Position (cM)	Motif*	Allele no.	Unique allele	Size range (bp)	Size (bp)	Freq (%)	Gene diversity	PIC
40	RM447	8	124.6	(CTT)8	4	-	100-122	100	76.39	0.39	0.36
41	RM452	2	58.4	(GTC)9	4	-	189-209	209	75.00	0.41	0.39
42	RM455	7	65.7	(TTCT)5	2	-	124-131	124	94.44	0.10	0.10
43	RM484	10	97.3	(AT)9	4	1	280-318	280	65.22	0.52	0.47
44	RM495	2	2.8	(CTG)7	2	-	145-154	154	77.78	0.35	0.29
45	RM515	8	80.5	(GA)11	5	1	200-237	200	43.06	0.68	0.62
46	RM520	3	191.6	(AG)10	6	-	213-247	247	50.00	0.66	0.61
47	RM536	11	55.1	(CT)16	3	-	223-243	223	80.56	0.33	0.30
48	RM566	9	47.7	(AG)15	5	1	210-260	260	68.06	0.49	0.45
49	RM591	10	118.3	(AC)10	2	-	229-240	240	88.89	0.20	0.18
50	RM1337	12	57.2	(GA)11	4	-	187-220	187	47.22	0.60	0.51
51	RM3646	3	6.32	(GA)14	9	2	68-148	148	38.89	0.78	0.75
52	RM307	4	191.2	(CT)25	5	1	128-197	128	58.33	0.57	0.52
53	RM334	5	141.8	(CTT)48	5	-	165-189	165	55.07	0.62	0.57
54	RM472	1	171.6	(GA)21	3	-	267-296	296	47.22	0.63	0.56
55	RM125	7	24.8	(GCT)8	3	1	122-141	122	95.83	0.08	0.08
56	RM510	6	20.8	(GA)15	3	1	106-120	106	90.28	0.18	0.17
57	RM454	6	99.3	(GCT)8	2	-	256-274	256	95.83	0.08	0.08
58	RM134	7	99.6	(CCA)7	2	-	86-93	93	97.22	0.05	0.05
59	RM214	7	34.7	(CT)14	3	-	119-136	119	80.56	0.33	0.30
60	RM124	4	150.1	(TC)10	2	-	271-282	271	90.28	0.18	0.16
61	RM162	6	108.3	(AC)20	3	-	213-232	213	94.44	0.11	0.10
Max.					9	22		296	97.22	0.80	0.77
Min.					2			67	27.78	0.05	0.05
Total					239					26.10	23.91
Mean					3.92			69.5	69.50	0.43	0.39

SSR Diversity

In total 190 alleles were detected at 61 SSR (Simple Sequence Repeats) markers (Table 24) across 72 T. Aman rice germplasm (Table 15). The highest amplicon size was produced by RM472 (296 bp) and the lowest by RM413 (67 bp). The number of alleles per locus ranged from 2 to 9 alleles, with an average of 3.92 alleles across the 61 loci. The PIC values ranged from 0.05 (RM134) to 0.77 (RM144) with an average of 0.39. Lower PIC value indicates that the genotypes under study are closely related, while the higher value of PIC indicates higher diversity of materials which is better for development of new superior varieties. Primer RM 144 had the highest PIC value (0.77) and this primer is detected as the highest level of polymorphism. Therefore, it is confirmed that RM144 was the best marker for characterizing the studied 72 T. Aman rice genotypes. The frequency of the most common allele at each locus ranged from 27.78% to 97.22%. On average, 69.50% of the 72 T. Aman rice germplasm shared a common major allele at any given locus. The DNA profile of 72 T. Aman rice germplasm with SSR marker RM411 is shown in Fig. 16.

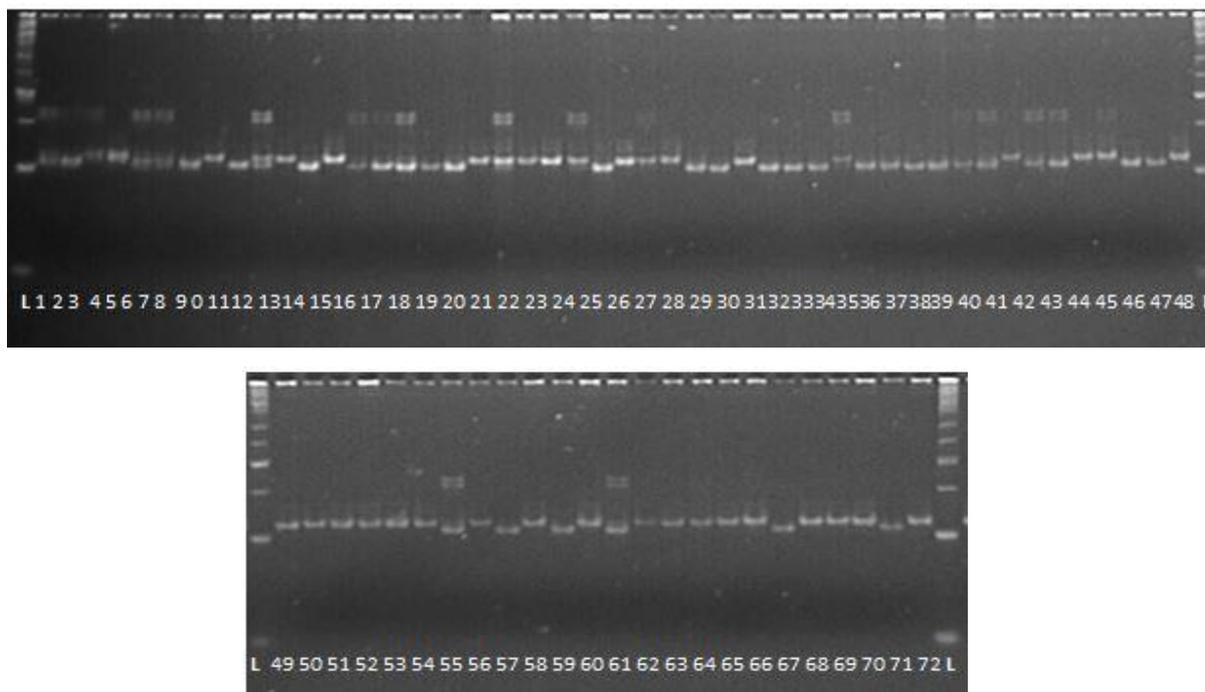


Fig. 16. DNA profile of 72 T. Aman (2019) rice germplasm with SSR marker, RM411

Legend: 1. Abchaya 2. Manikdiga 3. Luta 4. Gabura 5. Bhawalia Diga 6. Diga(2) 7. Diga 8. Raj Bhawalia 9. Molla Diga 10. Molla Digha 11. Bhawalia 12. Bhawalia 13. Bhawalia 14. Bhawla 15. Netpasha 16. Netpasha 17. Ijol Diga(1) 18. Ijol Diga(2) 19. Ijol Diga(3) 20. Bawoi Jhak(3) 21. Bawoi Jhak(4) 22. Bawoi Jhak(5) 23. Bawoi Jhak(6) 24. Bawoi jhak(2) 25. Lema 26.Chini Sagar 27. Bansha Pur 28. Roshon Bok 29. Loiatag 30. Subulkua 31. Khorma 32. Fulginda 33. Baish Binni 34. Fulkadi 35. Kumri 36. Kaisha Binni 37. Kaisha Binni 38. Kaisha Binni 39. Lal Binni 40. Laksmi Bilash 41. Bashi Raj 42. Pahari Sail 43. Indra Sail 44.Lal Kumara 45. Purabinni(3) 46. Kashiabinni(2) 47. Kashia Binni(2) 48. Gurdoi(2) 49. Kalijira(3) 50. Telot 51. Bazail 52. Joli Amon 53. Bazail 54. Bazail 55. Kancha Noni 56. Naria Bochi 57.Khirsha Bhog 58. Sham Rush 59. Dudh Kalam 60. Dudh Kalam 61. Bora Dudh Kalam 62. Lal Soru 63. Gojol Gorla 64. Sojoni 65. Ganjia 66. Bindi Pakri 67. Jhoshua 68. Akand Sail 69. Lal Dupa 70. Jiga Sail 71. Cheng Sail 72. Shul Kumor

Genetic distance-based analysis

The genetic distance-based results seen in the unrooted neighbor-joining tree revealed that the 72 T. Aman rice germplasm were grouped into four (4) major clusters (Fig.17). The highest number of germplasm (24) was grouped in cluster I followed by clusters II (21), IV (18) and the lowest in cluster III (9).

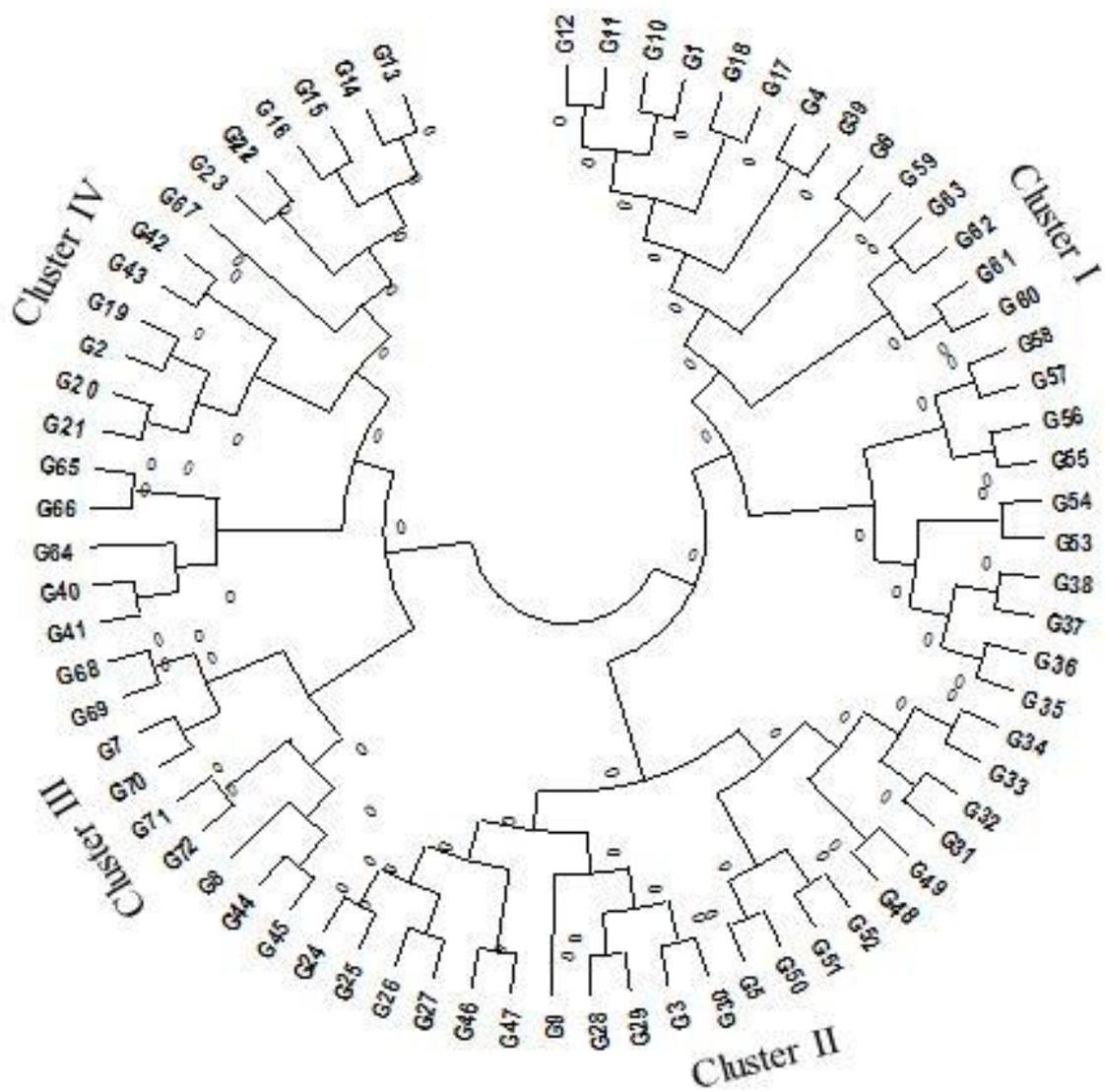


Fig. 17. An unrooted neighbor-joining tree showing genetic relationships among 72 T. Aman rice germplasm.



Fig. 18. Molecular characterization of rice germplasm

11.2.5. Documentation

Fifty two morpho-agronomic characters of 144 rice germplasm (T. Aman, 2018:48, Boro, 2018/19:48 and Aus, 2019:48) (Appendix 1, 2 and 3) using 'Bangladesh Rice Research Institute Germplasm Descriptors and Evaluation Form (BRRRI 2018).

12. Research highlight:

Title: Collection, Conservation and Characterization of Important Rice Germplasm of Bangladesh

Background: Bangladesh possessed the abundance of indigenous rice varieties. To conserve these valuable genetic resources, systematic and mission oriented collection programs of the rice varieties had been started since 1970. Rice germplasm have been collected so far from every easily accessible area. Several remote areas have not yet been explored enough in many upazilas of several districts like Hilly areas, coastal districts, haors etc. Characterization and quantification of genetic diversity has long been a major goal in evolutionary biology. Information on the genetic diversity within and among closely related crop varieties is essential for a rational use of genetic resources. The analysis of genetic variation both within and among the landraces is of fundamental interest to plant breeders. It contributes in monitoring germplasm and can also be used to predict potential genetic gains. This will also help in protecting biopiracy and geographical indications and issues related IPR etc.

Objectives:

- i. to collect rice landraces from unexplored areas specially from hilly, coastal and haor/beel areas;
- ii. to characterize important local rice germplasm both phenotypically and at molecular levels;
- iii. to analyze the genetic diversity of Bangladeshi rice germplasm and to identify promising genotypes and desirable traits and
- iv. documentation of rice germplasm with their important traits for establishing Intellectual Property Rights (IPR) to protect from any biopiracy

Methodology:

Local germplasm were collected from different districts of Bangladesh. The collection programs were mission oriented, target season and location basis involving different GO, NGO and private sector personnel. Both fields as well as store/harvested collection approaches were followed. For collection, especial emphasis was given on remote areas like hilly, coastal and beel/haor areas. During germplasm collection, passport data forms were used for documentation.

All rice germplasm were characterized using the standard 'Rice Germplasm Descriptors and Evaluation Form'. The germplasm were agro-morphologically characterized on the basis of 21 quantitative and 31 qualitative traits of rice. Single seedling (25-40 days aged) per hill with a spacing of 20 × 20 cm between rows and plants was maintained where single row of 5.4 m long per entry/accession were used. Fertilizers were applied @ 60:20:40 kg NPK/ha. All the fertilizers except urea were applied at the time of final land preparation. Urea was applied in three equal splits at 10, 25 and 35 days after transplanting. Appropriate control measures were taken for insect pests, diseases and weeds as and when necessary.

Total genomic DNA was extracted from young leaves of three-week-old plants following the quick DNA extraction protocol of Ferdous *et al.*, 2012. PCR analysis was performed in 10µl reaction sample containing 3µl of DNA template, 4.5µl of GoTaq G2 Green Master Mix (Promega), 1.5 µl of Nuclease-Free Water, 0.5µl each of 10 µM forward and reverse primers

using a Gene Atlas G (Astec, Japan) 96-well thermal cycler. The mixture was overlaid with 10 µl of mineral oil to prevent evaporation. After initial denaturation for five minutes at 94°C, each cycle comprised 30 sec denaturation at 95°C, 30 sec annealing at 55°C, and 25 sec extension with a final extension for 5 min at 72°C at the end of 32 cycles. The PCR products were analyzed by electrophoresis on 8% polyacrylamide gel with a 1 Kb/50 bp DNA ladder (Thermo Scientific, USA) using mini vertical polyacrylamide gels for high throughput manual genotyping (CBS Scientific Co. Inc., CA, USA). 2.5 µl of amplification products were resolved by running gel in 0.5X TBE buffer for 1.5-2.5 hrs depending upon the allele size at around 100volts and 500 mA current. The gels were stained in 5 µl SYBR Safe DNA gel stain (10,000X concentration in DMSO, USA) with 200 ml 0.5X TBE buffer for 15 min and exposed to UV light using a molecular imager gel documentation unit (XR System, Uvitec Cambridge, France) for visualization. Well-distributed SSRs were used for the diversity analysis; position (cM), repeat motifs, and chromosomal positions for the SSR markers can be found in the rice genome database (Gramene Portals, 2017). Most of these markers were obtained from a panel of fifty standard SSR markers, which has been proposed by CGIAR for rice diversity analysis (Islam *et al.*, 2018).

Key findings:

- In total 264 local rice germplasm (120 T. Aman germplasm, 96 Boro germplasm and 48 Aus germplasm) of BIRRI genebank have been morpho-agronomically characterized (31 qualitative and 21 quantitative characters) (Table nos. 6/15; 9/18; 12).
- Among the 264 germplasm, Boro 40/2 (accession no. 2215) was highest yielder (26.88 g/hill). Boro rice germplasm namely Mi-Pajang (accession no. 149) was another potential accession with 23.51 g/hill yield and good phenotypic acceptability. Also Boro entries with accession nos. 2242, 2233, 2214 and 2234 produced medium grain yield more than 23 g per hill. Among all T. Aman germplasm, Abchaya (accession no. 102) gave highest yield (19.6 g/hill) followed by Bawoi Jhak(5) (accession no. 145), Laksmi Bilash (accession no. 211), Indra Sail (accession no. 238) and Blue Stick (accession no. 08).
- Sixteen entries (accession nos. 6, 58, 106, 107, 109, 102, 128, 129, 135, 136, 137, 138, 141, 147, 159 and 291) among the test T. Aman germplasm exhibited short growth duration (<120 days). While a single entry from each of Boro (accession no. 2238) and Aus (Gojal Gorja; Accession no. 506) appeared to be early maturing entries, with growth duration of 113 and 102 days, respectively.
- Among 264 germplasm, highest leaf blade length (78 cm) was found in Aus germplasm Harinmuda (accession no. 29) and T. Aman germplasm Bhawalia Diga (Accession no. 127) and the lowest leaf blade length (25 cm) was found in a Boro germplasm, Borodeshi (accession no. 938).
- Boro accession nos. 938 and 2216 produced highest (24) while one Aus germplasm, Balam (accession no. 809) lowest number of effective tiller (03). Accession number 251 (Bazail) was noticed as tallest (190.2 cm) and accession number 1051 (Joyaboro) as the shortest (82.3 cm). The highest panicle length (33.8 cm) was found in Kancha Noni (accession no. 270) and the lowest panicle length (18.1) was noticed in Boro Deshi (accession no. 938).

- Among the 264 germplasm, the highest of filled grain (236) was recorded in Mi-Pajang (accession no. 149). The highest grain length (12.23 mm) measure in Lal Binni (accession no. 209) and the lowest (6.06 mm) in Kalijira(3) (accession no. 247). Accession number 571 (Hijolee) showed the highest grain width (3.98 mm) and the accession number 281 (Lal Soru) showed the lowest grain width (1.9 mm). The smallest seed size (TGW; 12.3 g) was recorded in Kalijira (3) (accession no. 247) while that one was highest (36.31 g) in Bora Dudh Kalam (accession no. 280).
- The most slender type grain (Length-width ratio 4.35) was observed in a red rice germplasm ‘Lalbinni’ (accession no. 209) and the most bold type grain (Length-width ratio 1.63) was observed in Raj Bhawalia (accession no. 131) among the 264 test germplasm.
- Five germplasm was found with aroma (scented) among 216 characterized germplasm. T. Aman rice germplasm Rupsail (accession no.58) found as scented rice with red pericarp having short growth duration (108 days). Borail (accession no. 940), Madhabsail (accession no. 1651) and Boro (Sunga) (accession no.1861) identified as poorly scented rice germplasm in Boro season. Among Aus rice germplasm, Kataktara (accession no. 39) found as very poorly scented.
- Molecular analysis revealed that RM207 was the best marker for characterizing the test 48 T. Aman rice germplasm (2018) whereas RM206 was appeared to be the best marker for characterizing the 48 Boro rice germplasm (2018-19). Similarly, RM334 supposed to be the best marker for characterizing Aus rice germplasm (2019) and RM144 appeared to be the best marker for characterizing the studied 72 T. Aman rice germplasm (2019).

Key words: Germplasm, Conservation, Characterization, Genetic diversity, Rice

Appendix-1: Fifty two morpho-agronomic characters of 48 T. Aman rice germplasm, 2018

Sl. no. 1 Accession no. 02, Name: Badkalamkati, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	47.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	60.1 cm, long (~70 cm) 1.22 cm, Intermediate intermediate green absent green horizontal horizontal (46-90°)	7 5 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.90 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	112 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	129.3 cm, very long, (>110 cm) absent 9 open (~60°) 4.19 mm, small (<5 mm) green strong	9 1 9 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.3 cm, medium (~25 cm) 08, intermediate (6-10) open heavy moderately well exerted droopy low (~3%) easy (51-100%)	5 5 9 2 7 2 3 9	

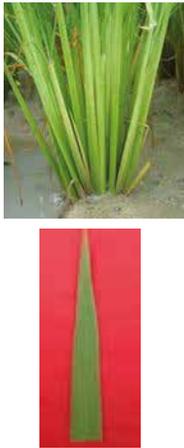
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	upper quarter only intermediate (~15 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5 mm) highly fertile (>90%) 27.40 9.87 2.4 7.14, long (6.6-7.5 mm) 2.15 3.33, slender (L:W= >3.0) white indeterminate non-scented intermediate	 2 5 1 2 1 0 3 1 3 5 3 1 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	10.62 g/hill		

Sl. no. 2 Accession no. 04, Name: Baisbis, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	30.0 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	54.1 cm, intermediate (~50 cm) 1.17 cm, Intermediate intermediate green absent green erect erect (< 30°)	5 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	10.30 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	116 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	95.70 cm, long, (81-110 cm) absent 9 intermediate (~45°) 4.74 mm, small (<5 mm) green strong	7 1 9 3 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.80 cm, medium (~25 cm) 08, intermediate (6-10) open heavy just exerted droopy low (~3%) moderately difficult (1-5%)	5 5 9 2 5 2 3 3	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw short (< 1.5 mm) fertile (75-90%) 19.50 7.75 2.49 5.49, short (5.5 mm or less) 2.20 2.5, medium (L:W= 2.1-3.0) white indeterminate non-scented intermediate	0 2 1 0 3 1 1 4 7 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	150 days		
09	Yield	12.39 g/hill		

Sl. no. 3 Accession no. 05, Name: Bhasha Manik, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	48.60 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	57.70 cm, intermediate (~50 cm) 1.11 cm, intermediate intermediate green absent green horizontal descending (>90°)	5 5 2 2 1 1 5 7	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.00 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	116 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	119.10 cm, very long, (>110 cm) absent 10 intermediate (~45°) 4.74 mm, small (<5 mm) light gold intermediate	9 1 3 1 2 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	28.3 cm, medium (~25 cm) 08, intermediate (6-10) open heavy well exerted droopy very low (< 1%) loose (26-50%)	5 5 9 2 9 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only very short (< 5 mm) gold brawn (tawny) white brown (tawny) short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 26.80 8.36 2.90 5.77, medium (5.51-6.6 mm) 2.58 2.24, medium (L:W= 2.1-3.0) white indeterminate non-scented intermediate	1 1 2 3 1 4 4 1 3 4 5 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	12.01 g/hill		

Sl. no. 4 Accession no. 06, Name: Bansfol, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	52.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	49.2 cm, intermediate (~50 cm) 0.79 cm, narrow (< 1 cm) intermediate purple tips present purple horizontal horizontal (46-90°)	5 3 2 4 9 4 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.80 mm Purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	85 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	120.8 cm, very long, (>110 cm) present 15 open (~60°) 2.71 mm, small (<5 mm) purple weak	9 9 5 1 4 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.40 cm, medium (~25 cm) 14, high (>10) intermediate heavy well exerted droopy low (~3%) easy (51-100%)	5 7 5 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) purple purple purple purple spots on straw short hairs purple medium (1.5-2.5 mm) partly sterile (50-74%) 20.3 7.73 2.56 5.45, short (5.5 mm or less) 2.28 2.39, medium (L:W= 2.1-3.0) brown indeterminate non-scented intermediate	5 9 5 7 5 6 4 4 3 3 7 1 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	107 days		
09	Yield	7.66 g/hill		

Sl. no. 5 Accession no. 08, Name: Blue Stick, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	47.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	53.6 cm, intermediate (~50 cm) 1.07 cm, intermediate intermediate green absent green erect erect (< 30°)	5 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.5 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	120 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	132.8 cm, very long, (>110 cm) absent 11 open (~60°) 4.06 mm, small (<5 mm) green week	9 1 5 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.3 cm, medium (~25 cm) 9, intermediate (6-10) compact heavy well exerted droopy low (~3%) easy (51-100%)	5 5 1 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only very short (< 5 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 29.2 9.55 2.63 6.96, long (6.6-7.5 mm) 2.36 2.95, medium (L:W= 2.1-3.0) white indeterminate non-scented intermediate	1 1 1 2 1 0 3 1 3 4 3 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	16.17 g/hill		

Sl. no. 6 Accession no. 12, Name: Chinri Gushi, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	50.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	60.7 cm, long (~70 cm) 1.06 cm, Intermediate intermediate green absent green erect semi erect (45°)	7 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.6 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	129 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	112.6 cm, very long, (>110 cm) absent 9 intermediate (~45°) 5.54 mm, medium (5.1-6.0 mm) green weak	9 1 3 3 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.7 cm, medium (~25 cm) 8, intermediate (6-10) intermediate heavy moderately well exerted droopy low (~3%) easy (51-60%)	5 5 5 2 7 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 21.45 9.39 2.28 6.6, long (6.6-7.5 mm) 1.99 3.32, slender (L:W >3.0) white indeterminate non-scented intermediate	0 2 1 0 4 1 3 4 3 1 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	154 days		
09	Yield	12.57 g/hill		

Sl. no. 7 Accession no. 13, Name: Chitraj, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	43.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	55.1 cm, intermediate (~50 cm) 1.07 cm, intermediate intermediate green absent green drooping descending (>90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	10.5 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	116 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	113.2 cm, very long, (>110 cm) absent 12 intermediate (~45°) 4.44 mm, small (<5 mm) green strong	9 1 3 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.4 cm, medium (~25 cm) 11, high (>10) open heavy moderately well exerted droopy very low (< 1%) easy (51-100%)	5 7 9 2 7 2 1 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) straw straw white brown (tawny) hairs on upper portion straw medium (1.5-2.5 mm) highly fertile (>90%) 18.85 8.01 2.56 5.52, medium (5.51-6.6 mm) 2.27 2.43, medium (L:W= 2.1-3.0) white indeterminate non-scented intermediate	1 3 1 2 1 4 3 1 3 5 5 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	7.41 g/hill		

Sl. no. 8 Accession no. 15, Name: Daudkhani, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	38.8 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	60.6 cm, long (~70 cm) 1.05 cm, intermediate intermediate green absent green erect erect (< 30°)	7 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	10.0 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	110 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	133.7 cm, very long, (>110 cm) absent 9 open (~60°) 4.0 mm, small (<5 mm) green strong	9 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.8 cm, medium (~25 cm) 8, intermediate (6-10) intermediate heavy moderately well exerted droopy very low (< 1%) easy (51-100%)	5 5 5 2 7 2 1 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) straw straw white gold hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 16.4 8.81 2.24 6.08, medium (5.51-6.6 mm) 1.93 3.16, slender (L:W >3.0) white indeterminate non-scented intermediate	1 3 1 2 1 1 3 1 3 4 5 5	  
08	Maturity a. Days to maturity from seedling	135 days		
09	Yield	11.07 g/hill		

Sl. no. 9 Accession no. 19, Name: Dhola Amon, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	39.8 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.9 cm, intermediate (~50 cm) 1.08 cm, intermediate intermediate green absent green horizontal descending (>90°)	5 5 2 2 1 1 5 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	10.5 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	105 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	150.9 cm, very long, (>110 cm) absent 12 spreading (>60°) 4.13 mm, small (<5 mm) green very weak	9 1 7 1 1 9	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.1 cm, medium (~25 cm) 11, high (>10) open heavy well exerted droopy moderate (~15%) easy (51-100%)	5 7 9 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 23.3 8.08 2.78 5.77, medium (5.51-6.6 mm) 2.33 2.48, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	0 2 1 0 3 1 3 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	134 days		
09	Yield	7.42 g/hill		

Sl. no. 10 Accession no. 20, Name: Dudhlaki, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	50.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	51.75 cm, intermediate (~50 cm) 1.07 cm, intermediate intermediate green present light purple horizontal horizontal (46-90°)	5 5 2 2 9 3 5 5	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.3 mm purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	107 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	142.3 cm, very long, (>110 cm) absent 10 spreading (>60°) 4.06 mm, small (<5 mm) green weak	9 1 7 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.95 cm, medium (~25 cm) 9, intermediate (6-10) open heavy well exerted droopy low (~3%) easy (51-100%)	5 5 9 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 19.85 8.44 2.51 5.93, medium (5.51-6.6 mm) 2.13 2.79, medium (L:W= 2.1-3.0) red glutinous (waxy) non-scented intermediate	 0 2 1 0 4 1 3 4 5 3 5 2 0 5	  
08	Maturity a. Days to maturity from seedling	135 days		
09	Yield	8.75 g/hill		

Sl. no. 11 Accession no. 32, Name: Indra Sail, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	41.20 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	55.3 cm, intermediate (~50 cm) 1.03 cm, intermediate intermediate green absent green drooping descending (>90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.2 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	113 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	125.1 cm, very long, (>110 cm) absent 10 open (~60°) 4.65 mm, small (<5 mm) green strong	9 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.7 cm, medium (~25 cm) 9, intermediate (6-10) intermediate heavy moderately well exerted droopy low (~3%) loose (26-50%)	5 5 5 2 7 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 20.4 7.92 2.51 5.57, medium (5.51-6.6 mm) 2.26 2.46, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	0 2 1 1 3 1 3 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	137 days		
09	Yield	10.84 g/hill		

Sl. no. 12 Accession no. 34, Name: Jesso Balam, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	42.8 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	62.3 cm, long (~70 cm) 1.1 cm, intermediate intermediate green absent green drooping descending (>90°)	7 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.6 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	115 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	125.7 cm, very long, (>110 cm) absent 11 open (~60°) 4.26 mm, small (<5 mm) green strong	9 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.4 cm, medium (~25 cm) 10, intermediate (6-10) open heavy well exerted droopy moderate (~15%) easy (51-100%)	5 5 9 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw short hairs straw short (< 1.5 mm) highly fertile (>90%) 18.3 7.75 2.39 5.45, short (5.5 mm or less) 2.09 2.61, medium (L:W= 2.1-3.0) white non-glutinous (non-waxy) non-scented intermediate	0 2 1 0 4 1 1 5 7 3 1 1 0 5	  
08	Maturity a. Days to maturity from seedling	139 days		
09	Yield	13.41 g/hill		

Sl. no. 13 Accession no. 36, Name: Jhinga Sail, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	50.0 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	57.6 cm, intermediate (~50 cm) 1.05 cm, intermediate intermediate green absent green horizontal horizontal (46-90°)	5 5 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.6 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	115 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	128.3 cm, very long, (>110 cm) absent 10 intermediate (~45°) 4.65 mm, small (<5 mm) green weak	9 1 10 3 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.7 cm, medium (~25 cm) 9, intermediate (6-10) intermediate heavy just exerted droopy moderate (~15%) easy (51-100%)	5 5 5 2 5 2 5 9	

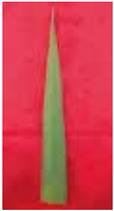
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length long (~30 mm) straw straw white gold hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 25.35 8.48 2.66 6.06, medium (5.51-6.6 mm) 2.31 2.63, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	 5 7 1 2 1 1 3 1 3 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	144 days		
09	Yield	10.44 g/hill		

Sl. no. 14 Accession no. 42, Name: Kumari, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	50 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	52.9 cm, intermediate (~50 cm) 1.11 cm, intermediate intermediate green absent green horizontal horizontal (46-90°)	5 5 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.5 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	120 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	134.7 cm, very long, (>110 cm) absent 11 intermediate (~45°) 3.82 mm, small (<5 mm) green week	9 1 3 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.7 cm, medium (~25 cm) 10, intermediate (6-10) intermediate heavy moderately well exerted droopy low (~3%) easy (51-100%)	5 5 5 2 7 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only very short (< 5 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5 mm) highly fertile (>90%) 27.45 9.36 2.63 6.71, long (6.6-7.5 mm) 2.36 2.84, medium (L:W= 2.1-3.0) white indeterminate non-scented intermediate	1 1 1 2 1 0 3 1 3 5 3 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	149 days		
09	Yield	12.79 g/hill		

Sl. no. 15 Accession no. 48, Name: Nagra, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	43 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	52.1 cm, intermediate (~50 cm) 0.96 cm, narrow (< 1) intermediate green absent green horizontal horizontal (46-90°)	5 3 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.1 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	116 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	109.3 cm, long, (81-110 cm) absent 10 intermediate (~45°) 3.84 mm, small (<5 mm) green weak	7 1 10 3 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.9 cm, medium (~25 cm) 9, intermediate (6-10) open heavy moderately well exerted droopy moderate (~15%) easy (51-100%)	5 5 9 2 7 2 5 9	

Sl. no. 16 Accession no. 58, Name: Rupsail, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	33.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	52.4 cm, intermediate (~50 cm) 1.32 cm, intermediate intermediate purple tips present light purple horizontal descending (>90°)	5 5 2 4 9 3 5 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.7 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	86 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.8 cm, long, (81-110 cm) present 7 erect (< 30°) 4.02 mm, small (<5 mm) purple intermediate	7 9 1 1 4 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.3 cm, medium (~25 cm) 6, intermediate (6-10) intermediate heavy moderately well exerted droopy low (~3%) easy (51-100%)	5 5 5 2 7 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) purple purple apex purple gold hairs on upper portion red short (< 1.5 mm) fertile (75-90%) 17.15 8.64 2.39 6.03, medium (5.51-6.6 mm) 2.17 2.79, medium (L:W= 2.1-3.0) red indeterminate scented early	1 3 5 8 5 1 3 3 1 4 5 3 5 3 2 3	  
08	Maturity a. Days to maturity from seedling	108 days		
09	Yield	7.0 g/hill		

Sl. no. 17 Accession no. 72, Name: Bashful, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	49.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	60 cm, intermediate (~50 cm) 1.16 cm, intermediate intermediate green absent green erect semi erect (45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	110 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	125.3 cm, very long, (>110 cm) absent 8 intermediate (~45°) 4.13 mm, small (<5 mm) green strong	9 1 3 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	28 cm, medium (~25 cm) 8, intermediate (6-10) open heavy moderately well exerted droopy low (~3%) easy (51-100%)	5 5 9 2 7 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) straw brown (tawny) white brown furrows on straw hairs on upper portion straw short (< 1.5 mm) fertile (75-90%) 22.35 9.29 2.46 6.2, medium (5.51-6.6 mm) 2.16 2.87, medium (L:W= 2.1-3.0) white non-glutinous (non-waxy) non-scented intermediate	1 3 1 3 1 3 3 1 1 4 5 3 1 1 0 5	  
08	Maturity a. Days to maturity from seedling	140 days		
09	Yield	13.3 g/hill		

Sl. no. 18 Accession no. 84, Name: Apchaya, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	51 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	56.2 cm, intermediate (~50 cm) 1.24 cm, intermediate intermediate green absent green horizontal horizontal (46-90°)	5 5 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.55 mm white 2-cleft pale green pale green	 1 2 1 1	
04	Days after 50% heading	100 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	110.05 cm, very long, (>110 cm) absent 8 erect (< 30°) 4.07 mm, small (<5 mm) green weak	9 1 8 1 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.15 cm, medium (~25 cm) 7, intermediate (6-10) compact heavy well exerted droopy moderate (~15%) easy (51-100%)	5 5 1 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 19.75 8.97 2.42 6.12, medium (5.51- 6.6 mm) 2.16 2.83, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	0 2 1 0 4 1 3 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	129 days		
09	Yield	10.15 g/hill		

Sl. no. 19 Accession no. 89, Name: Dhal Katia, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	50.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	55.3 cm, intermediate (~50 cm) 1.28 cm, intermediate intermediate purple tips present purple drooping descending (>90°)	5 5 2 4 9 4 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	116 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	142.8 cm, very long, (>110 cm) present 8 intermediate (~45°) 5.16 mm, medium (5.1-6.0 mm) Purple lines weak	9 9 8 3 3 3 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	28.5 cm, medium (~25 cm) 8, intermediate (6-10) intermediate heavy just exerted droopy low (~3%) easy (51-100%)	5 5 5 2 5 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only very short (< 5 mm) purple purple purple straw short hairs straw medium (1.5-2.5 mm) partly sterile (50-74%) 26.2 8.13 2.96 5.73, medium (5.51-6.6 mm) 2.6 2.2, medium (L:W= 2.1-3.0) white indeterminate non-scented intermediate	1 1 5 7 5 0 4 1 3 3 5 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	146 days		
09	Yield	5.01 g/hill		

Sl. no. 20 Accession no. 91, Name: Boron, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	52 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	65.2 cm, long (~70 cm) 1.14 cm, intermediate intermediate green absent green drooping descending (> 90°)	7 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.6 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	111 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	148.7 cm, very long, (>110 cm) absent 9 open (~60°) 5.4 mm, medium (5.1-6.0 mm) green strong	9 1 9 5 3 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.7 cm, medium (~25 cm) 8, intermediate (6-10) open heavy well exerted droopy low (~3%) easy (51-100%)	5 5 9 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 20.12 7.85 2.57 5.67, medium (5.51- 6.6 mm) 2.31 2.46, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	0 2 1 0 4 1 3 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	135 days		
09	Yield	6.45 g/hill		

Sl. no. 21 Accession no. 92, Name: Dhal Data, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	49.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	65.8 cm, long (~70 cm) 1.11 cm, intermediate intermediate green absent green horizontal horizontal (46- 90°)	7 5 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.8 mm white 2-cleft pale green pale green	 1 2 1 1	
04	Days after 50% heading	100 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	140.3 cm, very long, (>110 cm) absent 9 intermediate (~45°) 3.99 mm, small (< 5.0 mm) purple weak	9 1 9 3 1 4 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.0 cm, medium (~25 cm) 8, intermediate (6-10) compact heavy moderately well exerted droopy low (~3%) easy (51-100%)	5 5 1 2 7 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw purple straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 22.6 8.63 2.85 6.12, medium (5.51- 6.6 mm) 2.46 2.49, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	0 2 5 0 4 1 3 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	129 days		
09	Yield	6.57 g/hill		

Sl. no. 22 Accession no. 94, Name: Sechi Amon, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	51.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	55 cm, intermediate (~50 cm) 1.25 cm, intermediate intermediate green present purple erect erect (< 30°)	5 5 2 2 9 4 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	104 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	140.9 cm, very long, (>110 cm) absent 7 spreading (>60°) 4.7 mm, small (<5 mm) green very weak	9 1 7 1 1 9	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.0 cm, medium (~25 cm) 6, intermediate (6-10) intermediate heavy just exerted droopy moderate (~15%) easy (51-100%)	5 5 5 2 5 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length long (~30 mm) purple purple purple brown furrows on straw short hairs straw medium (1.5-2.5 mm) partly sterile (50-74%) 21.6 7.75 3.11 5.62, medium (5.51-6.6 mm) 2.75 2.04, bold (L:W= 1.1-2.0) red indeterminate non-scented intermediate	 5 7 5 7 5 3 4 1 3 3 5 5 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	128 days		
09	Yield	6.63 g/hill		

Sl. no. 23 Accession no. 98, Name: Laksmi Diga, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	55.0 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	55.4 cm, intermediate (~50 cm) 1.32 cm, intermediate intermediate green absent green drooping horizontal (46-90°)	5 5 2 2 1 1 9 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.1 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	94 days, medium (86-105days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	140.5 cm, very long, (>110 cm) absent 8 Procumbent (the culm or its lower part rest on ground surface) 4.09 mm, small (<5 mm) green very weak	9 1 9 1 1 9	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.7 cm, medium (~25 cm) 7, intermediate (6-10) open heavy partly exerted droopy very low (< 1%) loose (26-50%)	5 5 9 2 3 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) straw straw white straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 24.4 7.87 2.77 5.76, medium (5.51-6.6 mm) 2.45 2.35, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	5 9 1 2 1 0 4 1 3 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	122 days		
09	Yield	7.21 g/hill		

Sl. no. 24 Accession no. 99, Name: Dal Katra, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	53.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	55.0 cm, intermediate (~50 cm) 1.32 cm, intermediate intermediate dark green present light purple drooping horizontal (46-90°)	5 5 2 3 9 3 9 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.6 mm white 2-cleft purple purple	1 2 3 2	
04	Days after 50% heading	119 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	150.6 cm, very long, (>110 cm) absent 10 Open (~60°) 4.83 mm, small (<5 mm) green intermediate	9 1 5 1 1 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.8 cm, medium (~25 cm) 9, intermediate (6-10) open heavy moderately well exerted droopy low (~3%) easy (51-100%)	5 5 9 2 7 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 27.85 8.51 2.9 6.08, medium (5.51-6.6 mm) 2.56 2.38, medium (L:W= 2.1-3.0) red non-glutinous non-scented intermediate	5 9 1 2 1 0 3 1 3 3 5 3 5 1 0 5	  
08	Maturity a. Days to maturity from seedling	149 days		
09	Yield	6.0 g/hill		

Sl. no. 25 Accession no. 100, Name: Chota Bhawalia, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	55.8 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	51.9 cm, intermediate (~50 cm) 1.32 cm, intermediate intermediate green absent green drooping descending (> 90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.2 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	108 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	134.2 cm, very long, (>110 cm) absent 8 Spreading (< 60°) 5.54 mm, medium (5.1-6.0 mm) green weak	9 1 8 7 3 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.5 cm, medium (~25 cm) 8, intermediate (6-10) open heavy just exerted droopy very low (< 1%) loose (26-50%)	5 5 9 2 5 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 25.6 7.9 2.84 5.65, medium (5.51-6.6 mm) 2.55 2.21, medium (L:W= 2.1-3.0) white glutinous (waxy) non-scented intermediate	5 9 1 2 1 0 3 1 3 4 5 3 1 2 0 5	  
08	Maturity a. Days to maturity from seedling	134 days		
09	Yield	6.46 g/hill		

Sl. no. 26 Accession no. 101, Name: Bhora Bhawlia, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	54.6 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	56 cm, intermediate (~50 cm) 1.36 cm, intermediate intermediate purple margins present purple drooping descending (>90°)	5 5 2 5 9 4 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.9 mm Purple lines 2-cleft purple purple	 2 2 3 2	
04	Days after 50% heading	104 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	150.1 cm, very long, (>110 cm) absent 8 spreading (>60°) 5.62 mm, medium (5.1-6.0 mm) green very weak	9 1 8 7 3 1 9	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.7 cm, medium (~25 cm) 7, intermediate (6-10) open heavy partly exerted droopy low (~3%) easy (51-100%)	5 5 9 2 3 2 3 9	

Sl. no. 27 Accession no. 103, Name: Digha, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	59.6 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	57.5 cm, intermediate (~50 cm) 1.26 cm, intermediate intermediate green absent green drooping descending (> 90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.4 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	108 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	138.1 cm, very long, (>110 cm) absent 8 open (~ 60°) 4.65 mm, small (< 5.0 mm) green weak	9 1 8 5 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.1 cm, medium (~25 cm) 7, intermediate (6-10) open heavy just exerted droopy very low (< 1%) loose (26-50%)	5 5 9 2 5 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) straw straw white gold short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 23.9 8.0 2.93 5.56, medium (5.51-6.6 mm) 2.55 2.18, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	5 9 1 2 1 1 4 1 3 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	134 days		
09	Yield	6.26 g/hill		

Sl. no. 28 Accession no. 104, Name: Manik Diga, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	53.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.6 cm, intermediate (~50 cm) 1.63 cm, intermediate intermediate green absent green drooping descending (> 90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.6 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	110 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	133.7 cm, very long, (>110 cm) absent 10 spreading (< 60°) 5.16 mm, medium (5.1-6.0 mm) green very weak	9 1 7 3 1 9	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.9 cm, medium (~25 cm) 9, intermediate (6-10) open heavy just exerted droopy very low (< 1%) easy (51-100%)	5 5 9 2 5 2 1 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	upper quarter only long (~30 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 24.3 7.92 3.04 5.64, medium (5.51-6.6 mm) 2.64 2.14, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	2 7 1 2 1 0 3 1 3 3 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	135 days		
09	Yield	8.48 g/hill		

Sl. no. 29 Accession no. 106, Name: Bhawal Motuk, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	50.0 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	54.2 cm, intermediate (~50 cm) 1.4 cm, intermediate intermediate purple margins present purple drooping descending (>90°)	5 5 2 5 9 4 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.1 mm Purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	92 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	139.3 cm, very long, (>110 cm) absent 9 spreading (>60°) 3.85 mm, small (< 5.0 mm) green very weak	9 1 7 1 1 9	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.4 cm, medium (~25 cm) 8, intermediate (6-10) open heavy partly exerted droopy low (~3%) easy (51-100%)	5 5 9 2 3 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) straw purple purple straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 23.55 7.85 2.97 5.76, medium (5.51-6.6 mm) 2.64 2.19, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented very early	 5 9 1 7 5 0 3 1 3 4 5 3 3 3 0 1	  
08	Maturity a. Days to maturity from seedling	116 days		
09	Yield	6.61 g/hill		

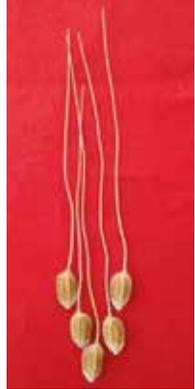
Sl. no. 30 Accession no. 107, Name: Jatra Motuk, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	46.6 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	54.8 cm, intermediate (~50 cm) 1.43 cm, intermediate intermediate green present purple horizontal horizontal (46-90°)	5 5 2 2 9 4 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.6 mm Purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	92 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	152.1 cm, very long, (>110 cm) absent 10 spreading (>60°) 4.74 mm, small (< 5.0 mm) green very weak	9 1 7 1 1 9	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.0 cm, medium (~25 cm) 8, intermediate (6-10) intermediate heavy partly exerted droopy very low (< 1%) easy (51-100%)	5 5 5 2 3 2 1 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) straw purple purple straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 27.4 8.22 2.94 6.02, medium (5.51-6.6 mm) 2.51 2.4, medium (L:W= 2.1-3.0) light brown non-glutinous (non-waxy) non-scented very early	5 9 1 7 5 0 3 1 3 3 5 3 2 1 0 1	  
08	Maturity a. Days to maturity from seedling	116 days		
09	Yield	7.25 g/hill		

Sl. no. 31 Accession no. 108, Name: Bora Diga, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	46 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	56.2 cm, intermediate (~50 cm) 1.48 cm, intermediate intermediate green absent green erect erect (< 30°)	5 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.8 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	94 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	131.9 cm, very long, (>110 cm) absent 10 open (~ 60°) 4.86 mm, small (< 5.0 mm) green weak	9 1 5 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.3 cm, medium (~25 cm) 8, intermediate (6-10) open heavy partly exerted droopy very low (< 1%) loose (26-50%)	5 5 9 2 3 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) straw straw white gold short hairs straw medium (1.5-2.5 mm) partly sterile (50-74%) 28.2 7.63 3.13 5.6, medium (5.51-6.6 mm) 2.78 2.02, bold (L:W= 1.1-2.0) brown indeterminate non-scented intermediate	5 9 1 2 1 1 4 1 3 3 5 5	  
08	Maturity a. Days to maturity from seedling	124 days		
09	Yield	6.81 g/hill		

Sl. no. 32 Accession no. 109, Name: Rangi Khama, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	44.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	57.8 cm, intermediate (~50 cm) 1.41 cm, intermediate intermediate green absent green horizontal horizontal (46-90°)	5 5 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.2 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	92 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	134.5 cm, very long, (>110 cm) absent 9 intermediate (~ 45°) 5.55 mm, medium (5.1-6.0 mm) green weak	9 1 3 3 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.0 cm, medium (~25 cm) 8, intermediate (6-10) compact heavy just exerted droopy very low (< 1%) loose (26-50%)	5 5 1 2 5 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) straw straw white brown furrows on straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 24.45 8.05 2.97 5.80, medium (5.51-6.6 mm) 2.59 2.24, medium (L:W= 2.1-3.0) Speckled brown indeterminate non-scented intermediate	5 9 1 2 1 3 3 1 3 4 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	116 days		
09	Yield	7.39 g/hill		

Sl. no. 33 Accession no. 110, Name: Dudh Bhawalia, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	57.6 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	59.1 cm, intermediate (~50 cm) 1.56 cm, intermediate intermediate green absent green drooping descending (> 90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.8 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	94 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	154.3 cm, very long, (>110 cm) absent 9 open (~ 60°) 5.92 mm, medium (5.1-6.0 mm) green intermediate	9 1 5 3 1 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.3 cm, medium (~25 cm) 8, intermediate (6-10) intermediate heavy well exerted droopy very low (< 1%) easy (51-100%)	5 5 5 2 9 2 1 9	

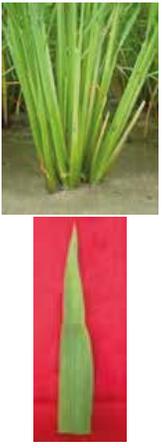
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	upper quarter only very long (> 40 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5 mm) highly fertile (>90%) 29.85 8.85 3.02 6.26, medium (5.51-6.6 mm) 2.59 2.42, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	 2 9 1 2 1 0 3 1 3 5 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	124 days		
09	Yield	11.51 g/hill		

Sl. no. 34 Accession no. 111, Name: Goirol, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	56.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	49.9 cm, intermediate (~50 cm) 1.47 cm, intermediate intermediate green present light purple drooping descending (> 90°)	5 5 2 2 9 3 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.6 mm purple lines 2-cleft purple purple	 2 2 3 2	
04	Days after 50% heading	97 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	159.2 cm, very long, (>110 cm) absent 10 intermediate (~45°) 5.58 mm, medium (5.1-6.0 mm) green intermediate	9 1 3 3 1 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.1 cm, medium (~25 cm) 9, intermediate (6-10) intermediate heavy well exerted droopy low (~3%) easy (51-100%)	5 5 5 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple purple straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 26.55 8.3 2.85 5.92, medium (5.51- 6.6 mm) 2.5 2.37, medium (L:W= 2.1-3.0) light brown indeterminate non-scented intermediate	0 7 5 0 3 1 3 4 5 3 2 3 0 5	  
08	Maturity a. Days to maturity from seedling	124 days		
09	Yield	9.39 g/hill		

Sl. no. 35 Accession no. 112, Name: Bhawalia Amon, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	44.8 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	52.0 cm, intermediate (~50 cm) 1.2 cm, intermediate intermediate green absent green erect descending (>90°)	5 5 2 2 1 1 1 7	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.5 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	99 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	138.9 cm, very long, (>110 cm) absent 9 intermediate (~ 45°) 5.02 mm, medium (5.1-6.0 mm) green intermediate	9 1 3 3 1 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.0 cm, medium (~25 cm) 8, intermediate (6-10) intermediate heavy just exerted droopy very low (< 1%) easy (51-100%)	5 5 5 2 5 2 1 9	

Sl. no. 36 Accession no. 113, Name: Hashfol, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	47.6 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	63.4 cm, long (~70 cm) 1.24 cm, intermediate intermediate green present light purple horizontal horizontal (46-90°)	7 5 2 2 9 3 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.3 mm purple lines 2-cleft purple purple	 2 2 3 2	
04	Days after 50% heading	120 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	129.8 cm, very long, (>110 cm) Absent 8 intermediate (~45°) 5.45 mm, medium (5.1-6.0 mm) purple lines intermediate	9 1 3 3 3 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.3 cm, medium (~25 cm) 7, intermediate (6-10) intermediate heavy just exerted droopy very low (< 1%) loose (26-50%)	5 5 5 2 5 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only very short (< 5 mm) straw purple purple straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 24.25 7.57 3.02 5.25, short (5.5 mm or less) 2.64 1.99, bold (L:W= 1.1-2.0) white glutinous (waxy) non-scented intermediate	1 1 1 7 5 0 3 1 3 4 7 5 1 2 0 5	  
08	Maturity a. Days to maturity from seedling	149 days		
09	Yield	13.61 g/hill		

Sl. no. 37 Accession no. 114, Name: Raj Mondal, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	50.0 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	51.6 cm, intermediate (~50 cm) 1.52 cm, intermediate intermediate green absent green horizontal horizontal (46-90°)	5 5 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.4 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	105 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	131.0 cm, very long, (>110 cm) absent 9 intermediate (~45°) 5.57 mm, medium (5.1-6.0 mm) green intermediate	9 1 9 3 3 1 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.9 cm, medium (~25 cm) 8, intermediate (6-10) intermediate heavy well exerted droopy low (~3%) easy (51-100%)	5 5 5 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 29.55 9.26 3.23 6.37, medium (5.51-6.6 mm) 2.75 2.32, medium (L:W= 2.1-3.0) red glutinous (waxy) non-scented intermediate	0 2 1 0 3 1 3 4 5 3 5 2 0 5	  
08	Maturity a. Days to maturity from seedling	132 days		
09	Yield	6.43 g/hill		

Sl. no. 38 Accession no. 115, Name: Gonak Ray, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	51.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	50.0 cm, intermediate (~50 cm) 1.52 cm, intermediate intermediate green absent green erect descending (>90°)	5 5 2 2 1 1 1 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.7 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	106 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	143.7 cm, very long, (>110 cm) absent 8 intermediate (~45°) 5.14 mm, medium (5.1-6.0 mm) green intermediate	9 1 8 3 3 1 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.3 cm, medium (~25 cm) 7, intermediate (6-10) compact heavy moderately well exerted droopy very low (< 1%) intermediate (6-25%)	5 5 1 2 7 2 1 5	

Sl. no. 39 Accession no. 116, Name: Kala Mona, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	56.0 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	63.4 cm, long (~70 cm) 1.25 cm, intermediate intermediate green present light purple drooping descending (> 90°)	7 5 2 2 9 3 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	9.2 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	93 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	120.4 cm, very long, (>110 cm) absent 10 open (~60°) 4.77 mm, small (< 5.0 mm) green intermediate	9 1 5 1 1 5	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.7 cm, medium (~25 cm) 8, intermediate (6-10) open heavy just exerted droopy low (~3%) easy (51-100%)	5 5 9 2 5 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (>40 mm) straw red apex light purple purple short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 27.95 8.54 2.9 6.18, medium (5.51-6.6 mm) 2.56 2.42, medium (L:W= 2.1-3.0) light brown indeterminate non-scented intermediate	5 9 1 6 4 8 4 1 3 4 5 3 2 3 0 5	  
08	Maturity a. Days to maturity from seedling	123 days		
09	Yield	6.87 g/hill		

Sl. no. 40 Accession no. 117, Name: Belon Dhan, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	47.0 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	52.5 cm, intermediate (~50 cm) 1.45 cm, intermediate intermediate green absent green horizontal horizontal (46-90°)	5 5 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	116 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	140.2 cm, very long, (>110 cm) absent 9 intermediate (~45°) 5.08 mm, medium (5.1-6.0 mm) green weak	9 1 3 3 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.1 cm, medium (~25 cm) 8, intermediate (6-10) compact heavy moderately well exerted droopy very low (< 1%) loose (26-50%)	5 5 1 2 7 2 1 7	

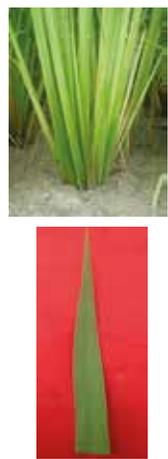
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold furrows on straw hairs on upper portion gold short (<1.5 mm) fertile (75-90%) 21.75 7.77 2.81 5.47, short (5.5 mm or less) 2.47 2.21, medium (L:W= 2.1-3.0) light brown indeterminate non-scented intermediate	0 2 1 1 3 2 1 4 7 3 2 3 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	8.25 g/hill		

Sl. no. 41 Accession no. 118, Name: Shor Soria, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	48.0 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	59.5 cm, intermediate (~50 cm) 1.23 cm, intermediate intermediate green present light purple erect erect (< 30°)	5 5 2 2 9 3 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.5 mm purple lines 2-cleft purple purple	 2 2 3 2	
04	Days after 50% heading	116 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	126.2 cm, very long, (>110 cm) Absent 8 intermediate (~45°) 5.23 mm, medium (5.1-6.0 mm) green very weak	9 1 8 3 3 1 9	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.1 cm, medium (~25 cm) 8, intermediate (6-10) intermediate heavy just exerted droopy very low (< 1%) loose (26-50%)	5 5 5 2 5 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only intermediate (~5 mm) purple purple purple purple short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 28.85 8.02 3.19 5.64, medium (5.51-6.6 mm) 2.81 2.01, bold (L:W= 1.1-2.0) Speckled brown indeterminate non-scented late and slow	1 5 5 7 5 8 4 1 3 4 5 5 3 3 0 7	  
08	Maturity a. Days to maturity from seedling	144 days		
09	Yield	8.41 g/hill		

Sl. no. 42 Accession no. 119, Name: Gorcha, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	49.8 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	57.5 cm, intermediate (~50 cm) 1.2 cm, intermediate intermediate green absent green horizontal horizontal (46-90°)	5 5 2 2 1 1 5 5	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.8 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	117 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	137.6 cm, very long, (>110 cm) absent 8 intermediate (~45°) 4.58 mm, small (< 5.0 mm) green weak	9 1 8 3 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27 cm, medium (~25 cm) 7, intermediate (6-10) open heavy moderately well exerted droopy very low (< 1%) loose (26-50%)	5 5 9 2 7 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw short (<1.5 mm) fertile (75-90%) 27.35 7.92 2.86 5.63, medium (5.51-6.6 mm) 2.51 2.24, medium (L:W= 2.1-3.0) brown indeterminate non-scented intermediate	0 2 1 0 3 1 1 4 5 3 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	149 days		
09	Yield	5.47g/hill		

Sl. no. 43 Accession no. 120, Name: Luta, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	46.8 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	51.6 cm, intermediate (~50 cm) 1.18 cm, intermediate intermediate green absent green drooping descending (> 90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.7 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	115 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	141.8 cm, very long, (>110 cm) absent 8 open (~60°) 5.19 mm, medium (5.1-6.0 mm) green strong	9 1 8 5 3 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.5 cm, medium (~25 cm) 7, intermediate (6-10) compact heavy just exerted straight very low (< 1%) loose (26-50%)	5 5 1 2 5 1 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw short hairs straw short (< 1.5 mm) partly sterile (50-74%) 24.35 7.59 2.68 5.51, medium (5.51-6.6 mm) 2.42 2.28, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	0 2 1 0 4 1 1 3 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	143 days		
09	Yield	5.34 g/hill		

Sl. no. 44 Accession no. 122, Name: Sunadiga, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	47.0 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	59.2 cm, intermediate (~50 cm) 1.24 cm, intermediate intermediate green present purple horizontal horizontal (46-90°)	5 5 2 2 9 4 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.2 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	107 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	144.0 cm, very long, (>110 cm) present 8 intermediate (~45°) 4.17 mm, small (<5 mm) Purple lines strong	9 9 8 3 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	30.8 cm, long (~35 cm) 8, intermediate (6-10) open heavy well exerted droopy low (~3%) easy (51-100%)	7 5 9 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) straw purple purple straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 30.55 8.51 2.96 6.13, medium (5.51-6.6 mm) 2.6 2.36, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	5 9 1 7 5 0 4 1 3 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	135 days		
09	Yield	10.4 g/hill		

Sl. no. 45 Accession no. 123, Name: Gabura, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	46.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	51.5 cm, intermediate (~50 cm) 1.33 cm, intermediate intermediate green present purple lines drooping descending (> 90°)	5 5 2 2 9 2 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.0 mm purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	95 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	135.5 cm, very long, (>110 cm) absent 9 spreading (> 60°) 4.68 mm, small (<5 mm) green very weak	9 1 7 1 1 9	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.6 cm, medium (~25 cm) 8, intermediate (6-10) open heavy partly exerted droopy low (~3%) easy (51-100%)	5 5 9 2 3 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) straw purple purple straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 26.25 8.04 2.82 5.91, medium (5.51-6.6 mm) 2.46 2.41, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	 5 9 1 7 5 0 3 1 3 3 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	124 days		
09	Yield	7.28 g/hill		

Sl. no. 46 Accession no. 125, Name: Khoia Motor, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	41.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	58.7 cm, intermediate (~50 cm) 1.05 cm, intermediate intermediate green present purple horizontal descending (> 90°)	5 5 2 2 9 4 5 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.2 mm purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	106 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	148.1 cm, very long, (>110 cm) absent 9 open (~60°) 4.94 mm, small (<5 mm) green strong	9 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	28.0 cm, medium (~25 cm) 8, intermediate (6-10) open heavy well exerted droopy very low (< 1%) loose (26-50%)	5 5 9 2 9 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) straw purple purple straw hairs on upper portion straw short (< 1.5 mm) partly sterile (50-74%) 29.0 8.37 2.97 6.1, medium (5.51-6.6 mm) 2.62 2.33, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	5 9 1 7 5 0 3 1 1 3 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	129 days		
09	Yield	7.23 g/hill		

Sl. no. 47 Accession no. 126, Name: Sunadigha, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	42.6 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	58.7 cm, intermediate (~50 cm) 1.21 cm, intermediate intermediate green absent green erect semi erect (45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.5 mm white 2-cleft pale green pale green	 1 2 1 1	
04	Days after 50% heading	117 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	127.1 cm, very long, (>110 cm) absent 9 open (~60°) 4.86 mm, small (< 5.0 mm) green weak	9 1 5 1 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.7 cm, medium (~25 cm) 8, intermediate (6-10) intermediate heavy well exerted droopy very low (< 1%) loose (26-50%)	5 5 5 2 9 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) brown (tawny) white gold hairs on upper portion straw medium (1.5-2.5 mm) highly fertile (>90%) 21.75 7.64 2.78 5.58, medium (5.51-6.6 mm) 2.53 2.21, medium (L:W= 2.1-3.0) Light brown indeterminate non-scented intermediate	0 3 1 1 3 1 3 5 5 3 2 3 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	12.39 g/hill		

Sl. no. 48 Accession no. 130, Name: Raj Bhawalia, Variety group: Aman

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	45.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	56.1 cm, intermediate (~50 cm) 1.09 cm, intermediate intermediate purple margins present purple horizontal horizontal (46-90°)	5 5 2 5 9 4 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.4 mm purple 2-cleft purple purple	 3 2 3 2	
04	Days after 50% heading	110 days, late (106-120 days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	146.9 cm, very long, (>110 cm) absent 10 intermediate (~45°) 5.02 mm, medium (5.1-6.0 mm) green weak	9 1 3 3 1 7	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exsertion f. Axis g. Shattering h. Threshability	25.4 cm, medium (~25 cm) 9, intermediate (6-10) intermediate heavy just exserted droopy very low (< 1%) loose (26-50%)	5 5 5 2 5 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple purple straw hairs on upper portion straw short (< 1.5 mm) fertile (75-90%) 22.3 8.06 2.52 5.79, medium (5.51- 6.6 mm) 2.2 2.64, medium (L:W= 2.1-3.0) red indeterminate non-scented intermediate	0 7 5 0 3 1 1 4 5 3 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	135 days		
09	Yield	6.66 g/hill		

Appendix-2: Fifty two morpho-agronomic characters of 48 Boro rice germplasm, 2018-19

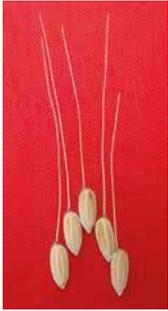
Sl. no. 1. Accession no. 149, Name: Mi-Pajang, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	18.2 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	45.1 cm, intermediate (~50 cm) 1.36 cm, Intermediate intermediate green absent green erect erect(<30°)	5 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	20.3 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	143 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	97.3 cm, long, (81-110 cm) absent 8 intermediate (~45°) 4.36 mm, small (<5 mm) green strong	7 1 8 3 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.9 cm, medium (~25 cm) 07, intermediate (6-10) intermediate heavy moderately well exerted droopy very low (< 1%) intermediate (6-25%)	5 5 5 2 7 2 1 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold short hairs gold short (<1.5 mm) highlyfertile (>90%) 16.90 7.56 2.44 5.24, short (5.5 mm or less) 2.18 2.41, medium (L:W= 2.1-3.0) white indeterminate non-scented intermediate	0 2 1 1 4 2 1 5 7 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	168 days		
09	Yield	23.51 g/hill		

Sl. no. 2. Accession no. 180, Name: Dholi Boro, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	41.7 cm, intermediate (~50 cm) 0.99 cm, narrow intermediate purple margin present purple erect erect(< 30°)	5 3 2 5 9 4 1 1	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.40 mm Purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	116 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	93.8 cm, long, (81-110 cm) absent 12 intermediate (~45°) 3.33 mm, small (<5 mm) Light gold strong	7 1 3 1 2 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.5 cm, medium (~25 cm) 11, high (>10) compact heavy well exerted droopy very low (< 1%) moderately difficult (1-5%)	5 7 1 2 9 2 1 3	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length long (~30 mm) straw purple purple straw short hairs straw medium (1.5-2.5mm) fertile (75-90%) 22.50 7.35 3.04 5.23, short (5.5mm or less) 2.58 2.03, bold (L:W= 1.1-2.0) brown indeterminate non-scented intermediate	5 7 1 7 5 0 4 1 3 4 7 5 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	142 days		
09	Yield	14.83 g/hill		

Sl. no. 3. Accession no. 257, Name: Kumri Boro, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.4 cm, intermediate (~50 cm) 1.09 cm, intermediate intermediate green present light purple erect horizontal (46-90°)	5 5 2 2 9 3 1 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.60 mm white 2-cleft Pale green purple	1 2 1 2	
04	Days after 50% heading	116 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	102.5 cm, long, (81-110 cm) present 9 open (~45°) 3.63 mm, small (<5 mm) purple lines strong	7 9 5 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.9 cm, medium (~25 cm) 08, intermediate (6-10) intermediate heavy well exerted droopy very low (< 1%) moderately difficult (1-5%)	5 5 5 2 9 2 1 3	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple purple gold furrows on straw background short hairs straw medium (1.5-2.5mm) highly fertile (>90%) 23.80 7.43 3.06 5.19, short (5.5 mm or less) 2.7 1.92, bold (L:W= 1.1-2.0) brown indeterminate non-scented intermediate	5 9 5 7 5 1 4 1 3 5 7 5 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	143 days		
09	Yield	14.09 g/hill		

SI no. 4. Accession no. 261, Name: Bairagi Sail, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	14.2 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	32.3 cm, short (~30 cm) 0.96 cm, narrow intermediate dark green absent green erect semi erect(45°)	3 3 2 3 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	17.1 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	114 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	68.3 cm, medium (61-80 cm) absent 20 intermediate (~45°) 3.35 mm, small (<5 mm) green strong	5 1 3 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	19.9 cm, short (~15 cm) 18, high (>10) compact heavy just exerted droopy moderate (~15%) easy (51-100% of grains removed)	3 7 1 2 5 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) highly fertile (>90%) 25.60 8.53 2.99 6.04, medium (5.51-6.6 mm) 2.55 2.37, medium (L:W= 2.1-3.0) brown indeterminate non-scented intermediate	0 2 1 0 3 1 3 5 5 3 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	6.45 g/hill		

Sl. no. 5. Accession no. 931, Name: Tepi Khorch, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	22.6 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	33.4 cm, short (~30 cm) 0.92 cm, narrow intermediate green absent green erect horizontal(46-90°)	3 3 2 2 1 1 1 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	23.3 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	120 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	85.1 cm, long (81-110 cm) absent 14 open (~60°) 4.07 mm, small (<5 mm) green strong	7 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	20.3 cm, short (~15 cm) 12, high (> 10) compact heavy well exerted droopy low(~3 %) intermediate (6-25% of grains removed)	3 7 1 2 9 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold furrows on straw background hairs on upper portion straw short (<1.5 mm) partly sterile (50-74%) 25.37 8.81 3.02 6.11, medium (5.51-6.6 mm) 2.42 2.52, medium (L:W= 2.1-3.0) speckled brown non-glutinous (non-waxy) non-scented intermediate	0 2 1 1 3 1 1 3 5 3 3 1 0 5	  
08	Maturity a. Days to maturity from seedling	149 days		
09	Yield	16.56 g/hill		

Sl. no. 6. Accession no. 937, Name: Pan Kaich, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	21.6 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	53.9 cm, intermediate (~50 cm) 1.00 cm, Intermediate intermediate green absent green erect erect(<30°)	5 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.9 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	143 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.4 cm, long, (81-110 cm) absent 12 erect (< 30°) 3.74 mm, small (<5 mm) green strong	7 1 1 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.4 cm, medium (~25 cm) 11, high (>10) open heavy well exerted droopy low (~ 3%) intermediate (6-25%)	5 7 9 2 9 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold short hairs straw short (<1.5 mm) fertile (75-90%) 23.22 8.80 2.48 6.32, medium (5.51-6.6 mm) 2.29 2.77, medium (L:W= 2.1-3.0) Speckled brown non-glutinous (non-waxy) non-scented intermediate	0 2 1 1 4 1 1 4 5 3 3 1 0 5	  
08	Maturity a. Days to maturity from seedling	168 days		
09	Yield	15.04 g/hill		

Sl. no. 7. Accession no. 938, Name: Boro Deshi, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.6 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	25.0 cm, short (~30 cm) 0.54 cm, narrow intermediate purple margin present purple erect erect(< 30°)	3 3 2 5 9 4 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.3 mm Purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	123 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.1 cm, long, (81-110 cm) absent 27 erect (< 30°) 2.0 mm, small (<5 mm) purple strong	7 1 1 1 4 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	18.1 cm, short (~15 cm) 24, high (> 10) compact light moderately well exerted droopy moderate (~15%) easy (51-100% grains removed)	3 7 1 1 7 2 5 9	

Sl. no. 8. Accession no. 939, Name: Gopal Beshi, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	29.2 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	51.7 cm, intermediate (~50 cm) 1.45 cm, intermediate intermediate green absent green horizontal horizontal(46-90°)	5 5 2 2 1 1 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	18.7 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	140 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	116 cm, very long, (>110 cm) absent 9 intermediate (~ 45°) 4.26 mm, small (<5 mm) green strong	9 1 3 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.1 cm, medium (~25 cm) 8, intermediate (6- 10) intermediate heavy well exerted droopy low (~ 3%) intermediate (6-25%)	5 5 5 2 9 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold hairs on upper portion gold medium (1.5-2.5 mm) highlyfertile (>90%) 23.02 8.01 2.89 5.64, medium (5.51-6.6 mm) 2.46 2.29, medium (L:W= 2.1-3.0) white non-glutinous (non-waxy) non-scented intermediate	0 2 1 1 3 2 3 5 5 3 1 1 0 5	  
08	Maturity a. Days to maturity from seedling	168 days		
09	Yield	15.28 g/hill		

Sl. no. 9. Accession no. 940, Name: Borail, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	37.7 cm, short (~30 cm) 0.95 cm, narrow intermediate green absent green erect semi erect(45°)	3 3 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.7 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	125 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	99.6 cm, long (81-110 cm) absent 12 intermediate (~ 45°) 3.47 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.2 cm, medium (~25 cm) 10, intermediate (6- 10) intermediate heavy moderately well exerted droopy low (~ 3%) intermediate (6-25%)	5 5 5 2 7 2 3 5	

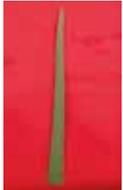
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) highly fertile (> 90%) 24.93 7.34 3.40 4.89, short (5.5 mm or less) 2.78 1.76, bold (L:W= 1.1-2.0) white non-glutinous (non-waxy) lightly scented late and slow	 0 2 1 0 3 1 3 5 7 5 1 1 1 7	  
08	Maturity a. Days to maturity from seedling	153 days		
09	Yield	13.83 g/hill		

Sl. no. 10. Accession no. 2206, Name: Boro 6/2, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	32 cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	41.3 cm, intermediate (~50 cm) 0.95 cm, narrow intermediate green absent green erect horizontal(46-90°)	5 3 2 2 1 1 1 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.1 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	116 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	103.8 cm, long (81-110 cm) Present 12 intermediate (~ 45°) 3.60 mm, small (<5 mm) Purple lines strong	7 9 3 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.7 cm, medium (~25 cm) 10, intermediate (6- 10) compact heavy well exerted droopy low (~3%) moderately difficult (1-5% grains removed)	5 5 1 2 9 2 3 3	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white purple furrows on straw hairs on upper portion straw short (<1.5 mm) highly fertile (> 90%) 22.98 7.43 2.92 5.34, short (5.5 mm or less) 2.52 2.12, medium (L:W= 2.1-3.0) red non-glutinous (non-waxy) non-scented late and slow	5 9 5 7 1 7 3 1 1 5 7 3 5 1 0 7	  
08	Maturity a. Days to maturity from seedling	144 days		
09	Yield	15.39 g/hill		

Sl. no. 11. Accession no. 1049, Name: Kali Boro, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	39.4 cm, short (~30 cm) 1.02 cm, intermediate intermediate purple margin present purple erect erect(< 30°)	3 5 2 5 9 4 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.4 mm Purple 2-cleft purple purple	3 2 3 2	
04	Days after 50% heading	120 days,late (106- 120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.5 cm, long, (81-110 cm) absent 14 open (~ 60°) 3.05 mm, small (<5 mm) green strong	7 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.4 cm, medium (~25 cm) 12, high (> 10) compact heavy well exerted droopy moderate (~15%) easy (51-100% grains removed)	5 7 1 2 9 2 5 9	

Sl. no.12. Accession no. 1050, Name: Sonar Geye, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	33.8 cm, short (~30 cm) 0.66 cm, narrow intermediate green present light purple erect erect(< 30°)	3 3 2 2 9 3 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.5 mm white 2-cleft purple purple	1 2 3 2	
04	Days after 50% heading	123 days, very late (> 120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	89 cm, long, (81-110 cm) absent 19 open (~ 60°) 3.77 mm, small (<5 mm) green strong	7 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	19.1 cm, short (~15 cm) 16, high (> 10) compact light moderately well exerted droopy low (~ 3%) loose (26-50% of grains removed)	3 7 1 1 7 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple purple brown furrows on straw hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 29.77 8.25 2.93 5.92, medium (5.51-6.6mm) 2.76 2.15, medium (L:W= 2.1-3.0) brown indeterminate non-scented intermediate	5 9 5 7 5 3 3 1 3 5 5 3 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	148 days		
09	Yield	16.74 g/hill		

Sl. no.13. Accession no. 1051, Name: Joya Boro, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	13 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	41.8 cm, intermediate (~50 cm) 1.45 cm, intermediate intermediate green absent green erect semi erect(45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	17.9 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	142 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	59.4 cm, short (41-60 cm) absent 13 erect (< 30°) 3.71 mm, small (<5 mm) green strong	3 1 1 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.9 cm, medium (~25 cm) 12, high (> 10) intermediate heavy just exerted droopy moderate (~ 15%) easy (51-100 % of grains removed)	5 7 5 2 5 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 28.40 8.95 3.16 6.54, medium (5.51-6.6 mm) 2.60 2.52, medium (L:W= 2.1-3.0) white indeterminate non-scented intermediate	0 2 1 1 3 1 3 4 5 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	168 days		
09	Yield	13.01 g/hill		

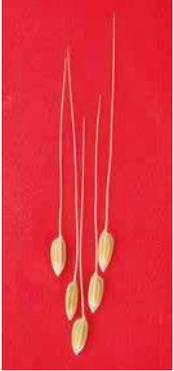
Sl. no.14. Accession no. 1473, Name: Amboro 2 (Golden), Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	34.2 cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	58.6 cm, intermediate (~50 cm) 1.0 cm, intermediate intermediate purple margins present light purple erect erect(< 30°)	5 5 2 5 9 3 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	21.1 mm white 2-cleft purple purple	1 2 3 2	
04	Days after 50% heading	129 days, very late (> 120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	120 cm, very long, (>110 cm) present 11 open (~ 60°) 5.15 mm, medium (5.1-6.0 mm) Purple lines strong	9 9 5 3 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.5 cm, medium (~25 cm) 9, intermediate (6- 10) intermediate heavy well exerted droopy moderate(~ 15%) easy (21-100% of grains removed)	5 5 5 2 9 2 5 9	

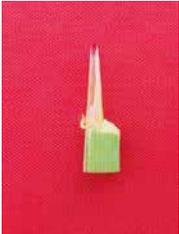
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~ 8 mm) purple purple purple purple furrows on straw short hairs straw medium (1.5-2.5mm) fertile (75- 90%) 25.78 8.31 3.08 5.82, medium (5.51-6.6 mm) 2.65 2.20, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	1 3 5 7 5 7 4 1 3 4 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	156 days		
09	Yield	19.52 g/hill		

Sl. no.15. Accession no. 1477, Name: Batti Boro, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.1 cm, intermediate (~50 cm) 1.04 cm, intermediate intermediate green absent green drooping descending(> 90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.2 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	124 days, very late (> 120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	96.5 cm, long, (81-110 cm) absent 12 intermediate (~ 45°) 3.67 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.1 cm, medium (~25 cm) 11, high (> 10) intermediate heavy moderately well exerted droopy moderate (~15%) easy (51-100% grains removed)	5 7 5 2 7 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length intermediate (~15 mm) straw straw white gold furrows on straw hairs on upper portion straw medium (1.5-2.5mm) fertile (75-90%) 24.08 8.05 2.86 5.76, medium(5.51-6.0mm) 2.48 2.33, medium (L:W= 2.1-3.0) brown non-glutinous (non-waxy) non-scented intermediate	5 5 1 2 1 1 3 1 3 4 5 5 4 1 0 5	  
08	Maturity a. Days to maturity from seedling	153 days		
09	Yield	12.52 g/hill		

Sl. no.16. Accession no. 1651, Name: Madhabsail, Variety group:Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	40.0 cm, short (~ 30 cm) 1.01 cm, intermediate intermediate green absent green erect erect(< 30°)	3 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	125 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	109.7 cm, long (81-110 cm) absent 9 erect (< 30°) 4.71 mm, small (<5 mm) green strong	7 1 1 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.6 cm, medium (~25 cm) 7, intermediate (6-10) compact heavy moderately well exerted droopy low (~ 3%) intermediate (6-25% of grains removed)	5 5 1 2 7 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold hairs on upper portion straw medium (1.5-2.5 mm) highlyfertile (>90%) 24.59 7.25 3.22 4.88, short (5.5mm or less) 2.77 1.76, bold (L:W= 1.1-2.0) white non-glutinous (non-waxy) lightly scented late and slow	0 2 1 1 3 1 3 5 7 5 1 1 1 7	  
08	Maturity a. Days to maturity from seedling	152 days		
09	Yield	17.31 g/hill		

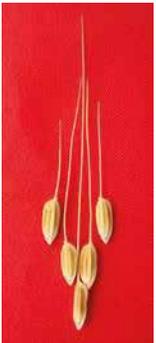
Sl. no.17. Accession no. 1704, Name: Jagli, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	21.4 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	37.3 cm, short (~30 cm) 0.91 cm, narrow intermediate green absent green erect erect(< 30°)	3 3 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.3 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	122 days, very late (> 120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	96.8 cm, long, (81-110 cm) absent 15 open (~ 60°) 3.31 mm, small (<5 mm) green strong	7 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.5 cm, medium (~ 25 cm) 13, high (> 10) compact light well exerted droopy low (~3%) easy (51-100% grains removed)	5 7 1 1 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length long (~30 mm) straw straw white straw short hairs straw short (<1.5mm) highly fertile (> 90%) 20.82 7.17 2.74 5.1, short (5.5 mm or less) 2.39 2.14, medium (L:W= 2.1-3.0) red non-glutinous (non-waxy) non-scented intermediate	5 7 1 2 1 0 4 1 1 5 7 3 5 1 0 5	  
08	Maturity a. Days to maturity from seedling	147 days		
09	Yield	14.78 g/hill		

Sl. no.18. Accession no. 1705, Name: Jagli, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24.4 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	44.0 cm, intermediate (~50 cm) 1.04 cm, intermediate intermediate green absent green erect semi-erect(45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.3 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	122 days, very late (> 120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	95.5 cm, long, (81-110 cm) absent 14 open (~ 60°) 3.64 mm, small (<5 mm) green strong	7 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.9 cm, medium (~ 25 cm) 12, high (> 10) intermediate light moderately well exerted droopy moderate (~15%) easy (51-100% grains removed)	5 7 5 1 7 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) straw straw white gold furrows on straw background hairs on upper portion straw medium (1.5-2.5mm) fertile (75-90%) 25.27 8.44 3.05 5.91, medium (5.51-6.6mm) 2.61 2.26, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	5 9 1 2 1 1 3 1 3 4 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	148 days		
09	Yield	9.58 g/hill		

Sl. no.19. Accession no. 1753, Name: Local Boro, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	22.2cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.6 cm, intermediate (~50 cm) 1.06 cm, intermediate intermediate purple margin present purple erect semi-erect(45°)	5 5 2 5 9 4 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.6 mm purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	117 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	106.6 cm, long, (81-110 cm) absent 15 open (~ 60°) 3.48 mm, small (<5 mm) green strong	7 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.7 cm, medium (~25 cm) 13, high (> 10) compact heavy well exerted droopy low (~ 3%) easy (51-100% of grains removed)	5 7 1 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple purple gold furrows on straw background short hairs straw medium (1.5-2.5mm) highly fertile (> 90%) 27.71 8.79 2.95 6.42, medium (5.51-6.6 mm) 2.51 2.56, medium (L:W= 2.1-3.0) brown non-glutinous (non-waxy) non-scented intermediate	5 9 5 7 5 1 4 1 3 5 5 3 4 1 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	19.19 g/hill		

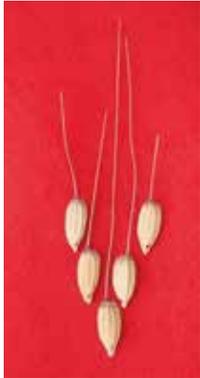
Sl. no.20. Accession no. 1794, Name: Saita, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	14.0 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	35.7 cm, short (~ 30 cm) 1.05 cm, intermediate intermediate green absent green erect semi-erect(45°)	3 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	17.6 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	120 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	81.9 cm, long (81-110 cm) absent 14 erect (< 30°) 3.84 mm, small (<5 mm) green strong	7 1 1 1 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.6 cm, medium (~25 cm) 12, high (>10) open heavy moderately well exerted droopy high (~ 35%) easy (51-100% of grains removed)	5 7 9 2 7 2 7 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75- 90%) 26.88 7.86 3.34 5.56, medium (5.51-6.6mm) 2.86 1.94, bold (L:W= 1.1-2.0) brown indeterminate non-scented intermediate	0 2 1 0 3 1 3 4 5 5 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	8.22 g/hill		

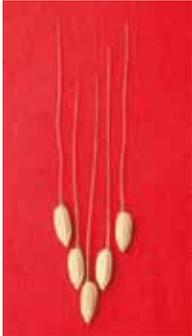
Sl. no.21. Accession no. 1795, Name: Dud Saita, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	14 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	32.9 cm, short (~ 30 cm) 1.14 cm, intermediate intermediate purple margin present light purple erect semi-erect(45°)	3 5 2 5 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.7 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	115 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	75.5 cm, medium (61-80 cm) present 8 open (~ 60°) 4.16 mm, small (<5 mm) purple lines strong	5 9 8 5 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.8 cm, medium (~25 cm) 7, intermediate (6-10) compact light moderately well exerted droopy high (~ 35%) easy (51-100% of grains removed)	5 5 1 1 7 2 7 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length long (~ 30 mm) purple purple apex white purple spots on straw hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 33.28 8.87 3.83 6.17, medium (5.51-6.6 mm) 3.05 2.02, bold (L:W= 1.1-2.0) speckled brown non-glutinous (non-waxy) non-scented intermediate	5 7 5 8 1 6 3 1 3 5 5 3 1 0 5	  
08	Maturity a. Days to maturity from seedling	142 days		
09	Yield	13.93 g/hill		

Sl. no.22. Accession no. 1804, Name: Bogra Boro, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	32.4 cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.2 cm, intermediate (~50 cm) 0.96 cm, narrow intermediate green absent green erect semi-erect(45°)	5 3 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.7 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	122 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	116.1 cm, very long (>110 cm) present 14 intermediate (~ 45°) 3.60 mm, small (<5 mm) Purple lines strong	9 9 14 3 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.7 cm, medium (~25 cm) 12, high (> 10) compact light moderately well exerted droopy low (~ 3%) loose (26-50% of grains removed)	5 7 1 1 7 2 3 7	

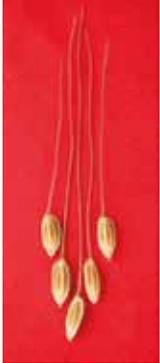
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white straw hairs on upper portion straw medium (1.5-2.5mm) fertile (75-90%) 22.05 7.70 2.91 5.40, short (5.5mm or less) 2.47 2.18, medium(L:W= 2.1-3.0) speckled brown non-glutinous (non-waxy) non-scented intermediate	5 9 5 7 1 0 3 1 3 4 7 3 3 1 0 5	  
08	Maturity a. Days to maturity from seedling	147 days		
09	Yield	17.44 g/hill		

Sl. no.23. Accession no. 1805, Name: Deshi Boro, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	18.0 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	40.2 cm, short (~ 30 cm) 1.03 cm, narrow intermediate green present light purple erect semi-erect(45°)	3 3 2 2 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.8 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	122 days, very late (> 120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	96.7 cm, long (81-110 cm) present 19 open (~ 60°) 3.29 mm, small (<5 mm) Purple lines strong	7 9 5 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.8 cm, medium (~25 cm) 16, high (> 10) compact heavy well exerted droopy low (~ 3%) loose (26-50% of grains removed)	5 7 1 2 9 2 3 7	

Sl. no.24. Accession no. 1806, Name: Jagli (Deshi Boro), Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.0 cm, intermediate (~50 cm) 1.08 cm, intermediate intermediate green absent green erect erect(< 30°)	5 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.3 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	118 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	113.3 cm, very long (>110 cm) present 15 open (~ 60°) 3.75 mm, small (<5 mm) Purple lines strong	9 9 5 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.6 cm, medium (~25 cm) 13, high (> 10) compact heavy well exerted droopy low (~ 3%) intermediate (6-25% of grains removed)	5 7 1 2 9 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white gold furrows on straw hairs on upper portion straw medium (1.5-2.5mm) highly fertile (>90%) 23.68 7.85 3.01 5.45, short (5.5 mm or less) 2.56 2.13, medium (L:W= 2.1-3.0) brown indeterminate non-scented intermediate	5 9 5 7 1 1 3 1 3 5 7 3 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	148 days		
09	Yield	14.16 g/hill		

Sl. no.25. Accession no. 1808, Name: Boro Dhan, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	35.8 cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.7 cm, intermediate (~50 cm) 1.08 cm, intermediate intermediate green present light purple erect semi-erect(45°)	5 5 2 2 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.0 mm white 2-cleft Pale green Pale green	1 2 1 1	
04	Days after 50% heading	120 days, late(106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	111.6cm, very long, (>110 cm) absent 12 open (~ 60°) 3.94 mm, small (<5 mm) green strong	9 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.9 cm, medium (~25 cm) 10, intermediate (6-10) compact heavy well exerted droopy low (~ 3%) intermediate (6-25% of grains removed)	5 5 1 2 9 2 3 5	

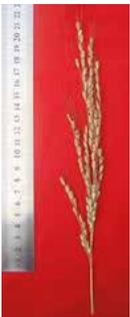
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple straw white gold furrows on straw hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 23.28 7.82 3.04 5.51, medium (5.51-6.6 mm) 2.48 2.22, medium (L:W= 2.1-3.0) red non-glutinous (non-waxy) non-scented intermediate	5 9 5 2 1 1 3 1 3 5 5 3 5 1 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	16.90 g/hill		

Sl. no.26. Accession no. 1809, Name: Boro Jagli, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	22.6 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	47.0 cm, intermediate (~50 cm) 1.14 cm, intermediate intermediate green present light purple erect semi-erect(45°)	5 5 2 2 9 3 1 3	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.8 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	116 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	106.0 cm, long (81-110 cm) present 12 open (~ 60°) 3.51 mm, small (<5 mm) Purple lines strong	7 9 5 1 3 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.9 cm, medium (~25 cm) 10, intermediate (6-10) compact heavy well exerted droopy low (~ 3%) intermediate (6-25% of grains removed)	5 5 1 2 9 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white gold furrows on straw hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 23.93 7.95 3.01 5.65, medium (5.51-6.6mm) 2.59 2.18, medium (L:W= 2.1-3.0) brown non-glutinous (non-waxy) non-scented intermediate	5 9 5 7 1 1 3 1 3 5 5 3 4 1 0 5	  
08	Maturity a. Days to maturity from seedling	152 days		
09	Yield	17.73 g/hill		

Sl. no. 27. Accession no. 1810, Name: Jagli, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	30cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	40.3 cm, short (~ 30 cm) 1.1 cm, intermediate intermediate green present light purple erect semi-erect(45°)	3 5 2 2 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.1 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	115 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	115.1 cm, very long (>110 cm) present 12 open (~ 60°) 3.43 mm, small (<5 mm) Purple lines strong	9 9 5 1 3 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.2 cm, medium (~25 cm) 11, high (>10) compact heavy well exerted droopy low (~ 3%) intermediate (6-25% of grains removed)	5 7 1 2 9 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white gold furrows on straw hairs on upper portion straw short (< 1.5mm) highly fertile (> 90%) 24.0 7.46 3.02 5.22, short (5.5mm or less) 2.65 1.97, bold(L:W= 1.1-2.0) brown non-glutinous (non-waxy) non-scented late and slow	5 9 5 7 1 1 3 1 1 5 7 5 4 1 0 7	  
08	Maturity a. Days to maturity from seedling	144 days		
09	Yield	13.58 g/hill		

Sl. no.28. Accession no. 1815, Name: Deshi Boro, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	22.0 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	35.6 cm, short (~30 cm) 0.92 cm, narrow intermediate Purple tips present light purple erect semi-erect(45°)	3 3 2 4 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.4 mm purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	122 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	95.4 cm, long (81-110 cm) present 14 open (~ 60°) 3.87 mm, small (<5 mm) Purple lines strong	7 9 5 1 3 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.4 cm, medium (~25 cm) 13, high (>10) compact light well exerted droopy moderate (~ 15%) easy (51-100% of grains removed)	5 7 1 1 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white purple spots on straw hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 22.58 7.70 2.89 5.49, short (5.5 mm or less) 2.44 2.25, medium (L:W= 2.1-3.0) light brown non-glutinous (non-waxy) non-scented intermediate	5 9 5 7 1 6 3 1 3 5 7 3 2 1 0 5	  
08	Maturity a. Days to maturity from seedling	148 days		
09	Yield	15.92 g/hill		

Sl. no.29. Accession no. 1816, Name: Boro Dhan, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	25.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	37.7 cm, short (~30 cm) 1.05 cm, intermediate intermediate green present light purple drooping horizontal(46-90°)	3 5 2 2 9 3 9 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.7 mm white 2-cleft Pale green Pale green	1 2 1 1	
04	Days after 50% heading	117 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.9 cm, long, (81-110 cm) present 12 open (~ 60°) 4.04 mm, small (<5 mm) purple lines strong	7 9 5 1 3 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.7 cm, medium (~15 cm) 10, intermediate (6-10) intermediate heavy well exerted droopy low (~ 3%) intermediate (6-25% of grains removed)	5 5 5 2 9 2 3 5	

Sl. no.30. Accession no. 1861, Name: Boro (Sunga), Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	32.6 cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	34.6 cm, short (~30 cm) 0.93 cm, narrow intermediate green absent green erect horizontal(46-90°)	3 3 2 2 1 1 1 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.1 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	125 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	104.7 cm, long (81-110 cm) absent 14 intermediate (~ 45°) 4.49 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.0 cm, medium (~25 cm) 12, high (>10) intermediate heavy well exerted droopy moderate (~15%) intermediate(1-5% grains removed)	5 7 5 2 9 2 5 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	upper quarter only very short (> 5 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5mm) fertile (75- 90%) 24.84 7.51 3.33 5.04, short (5.5 mm or less) 2.80 1.80, bold (L:W= 1.1-2.0) white non-glutinous (non-waxy) lightly scented intermediate	2 1 1 2 1 0 3 1 3 4 7 5 1 1 1 5	  
08	Maturity a. Days to maturity from seedling	152 days		
09	Yield	9.58 g/hill		

Sl no.31. Accession no. 1866, Name: Jala Boro, Variety group:Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	10.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	32.8 cm, short (~ 30 cm) 1.0 cm, intermediate intermediate dark green absent green erect erect(< 30°)	3 5 2 3 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.2 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	129 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	57.9 cm, short (41-60 cm) absent 14 erect (< 30°) 3.67 mm, small (<5 mm) green strong	3 1 1 1 1 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.5 cm, medium (~25 cm) 12, high (> 10) open heavy just exerted droopy moderate (~ 15%) loose (26-50% of grains removed)	5 7 9 2 5 2 5 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold hairs on upper portion straw short (<1.5 mm) fertile (75- 90%) 22.93 9.03 2.59 6.35, medium (5.51-6.6 mm) 2.03 3.13, slender(L:W=>3.0) white non-glutinous (non-waxy) non-scented late and slow	0 2 1 1 3 1 1 4 5 1 1 1 0 7	  
08	Maturity a. Days to maturity from seedling	155 days		
09	Yield	15.62 g/hill		

Sl. no.32. Accession no. 2189, Name: Kali Boro 2/2, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	33.0 cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	43.2 cm, intermediate (~50 cm) 1.04 cm, intermediate intermediate purple margins present purple erect erect(< 30°)	5 5 2 5 9 4 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	9.9 mm purple 2-cleft purple purple	3 2 3 2	
04	Days after 50% heading	120 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	112.7 cm, very long (>110 cm) present 13 intermediate (~ 45°) 3.54 mm, small (<5 mm) Purple lines strong	9 9 3 1 3 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.9 cm, medium (~25 cm) 11, high (> 10) compact light well exerted droopy moderate (~ 15%) loose (26-50 % of grains removed)	5 7 1 1 9 2 5 7	

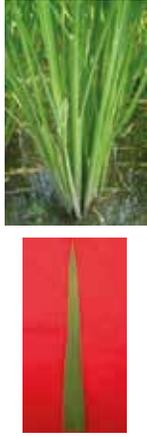
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple purple black short hairs straw medium (1.5-2.5mm) highly fertile (> 90%) 23.91 7.88 2.85 5.62, medium (5.51-6.6mm) 2.49 2.26, medium (L:W= 2.1-3.0) light brown non-glutinous (non-waxy) non-scented intermediate	5 9 5 7 5 9 4 1 3 5 5 3 2 1 0 5	  
08	Maturity a. Days to maturity from seedling	147 days		
09	Yield	18.06 g/hill		

Sl. no. 33. Accession no. 2190, Name: Kali Boro 4/1, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.6 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	39.2 cm, short (~30 cm) 1.08 cm, intermediate intermediate purple tips present light purple erect erect(< 30°)	3 5 2 4 9 3 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.6 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	120 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	115.7 cm, very long (>110 cm) present 10 open (~ 60°) 4.20 mm, small (<5 mm) Purple lines strong	9 9 5 1 3 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.6 cm, medium (~25 cm) 09, intermediate (6-10) compact light well exerted droopy low (~ 3%) intermediate (6-25% of grains removed)	5 5 1 1 9 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white black hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 24.54 7.75 3.08 5.42, short (5.5 mm or less) 2.63 2.06, bold(L:W= 1.1-2.0) speckled brown non-glutinous (non-waxy) non-scented intermediate	5 9 5 7 1 9 3 1 3 5 7 5 3 1 0 5	  
08	Maturity a. Days to maturity from seedling	145 days		
09	Yield	17.73 g/hill		

Sl. no. 34. Accession no. 2191, Name: Kali Boro 26, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	34.2 cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	35.6 cm, short (~30 cm) 0.98 cm, narrow intermediate green present light purple erect erect(< 30°)	3 3 2 2 9 3 1 1	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.8 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	122 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	111.8 cm, very long (>110 cm) present 12 intermediate (~ 45°) 4.00 mm, small (<5 mm) Purple lines strong	9 9 3 1 3 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.3 cm, medium (~25 cm) 10, intermediate (6-10) compact heavy well exerted droopy moderate (~ 15%) loose (26-50% of grains removed)	5 5 1 2 9 2 5 7	

Sl. no. 35. Accession no. 2192, Name: Kali Boro 41/1, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	33.0 cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	35.0 cm, short (~30 cm) 1.09 cm, intermediate intermediate green absent green erect semi erect(45°)	3 5 2 2 1 1 1 3	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	119 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	113.9 cm, very long (>110 cm) absent 15 open (~ 60°) 4.08 mm, small (<5 mm) green strong	9 1 5 1 1 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.5 cm, medium (~25 cm) 13, high (>10) intermediate heavy well exerted droopy low (~ 3%) intermediate (6-25 % of grains removed)	5 7 5 2 9 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple straw white black hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 23.16 7.81 3.06 5.40, short (5.5 mm or less) 2.63 2.05, bold (L:W= 1.1-2.0) speckled brown non-glutinous (non-waxy) non-scented late and slow	5 9 5 2 1 9 3 1 3 5 7 5 3 1 0 7	  
08	Maturity a. Days to maturity from seedling	146 days		
09	Yield	19.03 g/hill		

Sl. no. 36. Accession no. 2193, Name: Kali Boro 48/1, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24.0 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	39.1 cm, short (~30 cm) 1.14 cm, intermediate intermediate green present light purple erect horizontal(46-90°)	3 5 2 2 9 3 1 5	 The photograph shows a rice seedling in a field on the left and a single green leaf against a red background on the right.
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.6 mm white 2-cleft pale green pale green	1 2 1 1	 A close-up photograph of a rice ligule, showing its white, 2-cleft shape against a red background.
04	Days after 50% heading	118 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	114.6 cm, very long (>110 cm) present 13 open (~ 60°) 4.54 mm, small (<5 mm) Purple lines strong	9 9 5 1 3 1	 A photograph of a rice culm, showing its long, green, and slightly curved structure against a red background.
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.6 cm, medium (~25 cm) 11, high (>10) compact heavy well exerted droopy low (~ 3%) intermediate (6-25 % of grains removed)	5 7 1 2 9 2 3 5	 A photograph of a rice panicle, showing its compact, drooping structure against a red background, with a ruler visible on the left for scale.

Sl. no. 37. Accession no. 2194, Name: Kali Boro 80/3, Variety group: Boro

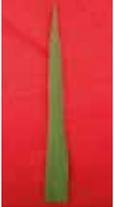
App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	20.0 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	38.5 cm, short (~30 cm) 1.12 cm, intermediate intermediate purple tips present light purple erect semi erect(45°)	3 5 2 4 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.1 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	114 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	110.0 cm, long (81-110 cm) present 14 intermediate (~ 45°) 3.58 mm, small (<5 mm) purple lines strong	7 9 3 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.4 cm, medium (~25 cm) 12, high (> 10) intermediate heavy well exerted droopy low (~ 3%) intermediate (6-25 % of grains removed)	5 7 5 2 9 2 3 5	

Sl. no. 38. Accession no. 2195, Name: Kali Boro 80/5, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	39.2 cm, short (~30 cm) 1.07 cm, intermediate intermediate green present light purple erect erect(< 30°)	3 5 2 2 9 3 1 1	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	116 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	108.6 cm, long (81-110 cm) present 13 open (~ 60°) 4.08 mm, small (<5 mm) purple lines strong	7 9 5 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.7 cm, medium (~25 cm) 11, high (> 10) intermediate heavy well exerted droopy low (~ 3%) loose (26-50% of grains removed)	5 7 5 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white brown furrows on straw hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 22.58 7.43 3.03 5.15, short (5.5 mm or less) 2.56 2.01, bold (L:W= 1.1-2.0) brown non-glutinous (non-waxy) non-scented late and slow	5 9 5 7 1 3 3 1 3 5 7 5 4 1 0 7	  
08	Maturity a. Days to maturity from seedling	141 days		
09	Yield	13.72 g/hill		

Sl. no. 39. Accession no. 2196, Name: Kali Boro 109/4, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24.4 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	33.8 cm, short (~30 cm) 0.97 cm, narrow intermediate purple tips present light purple erect semi erect(45°)	3 3 2 4 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	10.9 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	118 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	106.1 cm, long (81-110 cm) present 12 intermediate (~ 45°) 3.46 mm, small (<5 mm) Purple lines strong	7 9 3 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.4 cm, medium (~25 cm) 10, intermediate (6-10) compact heavy well exerted droopy low (~ 3%) intermediate (6-25 % of grains removed)	5 5 1 2 9 2 3 5	

Sl. no. 40. Accession no. 2197, Name: Kali Boro 138/2, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	20.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	40.6 cm, short (~ 30 cm) 1.09 cm, intermediate intermediate purple tips present light purple horizontal horizontal(46-90°)	3 5 2 4 9 3 5 5	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	119 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	105.3 cm, long (81-110 cm) present 13 open (~ 60°) 3.43 mm, small (<5 mm) Purple lines strong	7 9 5 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.4 cm, medium (~25 cm) 11, high (>10) compact heavy well exerted droopy low (~ 3%) moderately difficult (1-5% of grains removed)	5 7 1 2 9 2 3 3	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white black hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 22.28 8.36 3.09 5.70, medium (5.51-6.6 mm) 2.52 2.27, medium (L:W= 2.1-3.0) speckled brown non-glutinous (non-waxy) non-scented late and slow	5 9 5 7 1 9 3 1 3 5 5 3 3 1 0 7	  
08	Maturity a. Days to maturity from seedling	148 days		
09	Yield	16.10 g/hill		

Sl. no. 41. Accession no. 2198, Name: Kali Boro 139/2, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	32.3 cm, short (~30 cm) 1.0 cm, intermediate intermediate purple tips present light purple horizontal horizontal(46-90°)	3 5 2 4 9 3 5 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.2 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	118 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	107.2 cm, long (81-110 cm) present 12 intermediate (~ 45°) 3.69 mm, small (<5 mm) Purple lines strong	7 9 3 1 3 1	
06	Panicle length a.Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	21.7 cm, medium (~25 cm) 11, high (>10) compact heavy well exerted droopy low (~ 3%) intermediate (6-25 % of grains removed)	5 7 1 2 9 2 3 5	

Sl. no. 42. Accession no. 2199, Name: Kali Boro 200, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	32.2 cm, intermediate (~ 45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	34.2 cm, short (~30 cm) 0.98 cm, narrow intermediate green present light purple horizontal horizontal(46-90°)	3 3 2 2 9 3 5 5	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.2 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	114 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	108.6 cm, long (81-110 cm) present 12 open (~ 60°) 3.46 mm, small (<5 mm) Purple lines strong	7 9 5 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.5 cm, medium (~25 cm) 09, intermediate (6-10) compact heavy well exerted droopy moderate (~ 15%) loose (26-50% of grains removed)	5 5 1 2 9 2 5 7	

Sl. no. 43. Accession no. 2200, Name: Kali Boro 208, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	25.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	40.6 cm, short (~30 cm) 1.1 cm, intermediate intermediate green present light purple erect semi erect(45°)	3 5 2 2 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.7 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	118 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	107.9 cm, long (81-110 cm) present 13 intermediate (~ 45°) 3.87 mm, small (<5 mm) Purple lines Strong	7 9 3 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.9 cm, medium (~25 cm) 11, high (>10) compact heavy well exerted droopy low (~ 3%) intermediate (6-25% of grains removed)	5 7 1 2 9 2 3 5	

Sl. no. 44. Accession no. 2201, Name: Kali Boro 259, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.4 cm, intermediate (~50 cm) 1.08 cm, intermediate intermediate purple tips present light purple erect semi erect(45°)	5 5 2 4 9 3 1 3	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	117 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	107.1cm, long (81-110 cm) present 11 open (~ 60°) 4.52 mm, small (<5 mm) purple lines strong	7 9 5 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.0 cm, medium (~25 cm) 9, intermediate (> 10) compact heavy well exerted droopy low (~ 3%) loose (26-50 % of grains removed)	5 5 1 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white black hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 22.04 7.55 2.85 5.30, short (5.5 mm or less) 2.61 2.03, bold (L:W= 1.1-2.0) light brown non-glutinous (non-waxy) non-scented late and slow	5 9 5 7 1 9 3 1 3 5 7 5 2 1 0 7	  
08	Maturity a. Days to maturity from seedling	144 days		
09	Yield	14.68 g/hill		

Sl. no. 45. Accession no. 2202, Name: Kali Boro 266, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	22.6 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	41.6 cm, intermediate (~50 cm) 0.92 cm, narrow intermediate green present light purple erect erect(< 30°)	5 3 2 2 9 3 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.3 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	121 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	106.8cm, long (81-110 cm) present 10 intermediate (~ 45°) 4.79 mm, small (<5 mm) Purple lines Strong	7 9 3 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.9 cm, medium (~25 cm) 09, intermediate (6-10) compact heavy well exerted droopy low (~ 3%) loose (26-50% of grains removed)	5 5 1 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white black hairs on upper portion straw medium (1.5-2.5mm) fertile (75-90%) 22.50 7.73 2.92 5.41, short (5.5 mm or less) 2.44 2.22, medium (L:W= 2.1-3.0) light brown non-glutinous (non-waxy) non-scented late and slow	5 9 5 7 1 9 3 1 3 4 7 3 2 1 0 7	  
08	Maturity a. Days to maturity from seedling	147 days		
09	Yield	16.94 g/hill		

Sl. no. 46. Accession no. 2203, Name: Kali Boro 576, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	22.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	38.6 cm, short (~30 cm) 1.05 cm, intermediate intermediate green present light purple erect semi erect(45°)	3 5 2 2 9 3 1 3	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.1 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	120 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	105.5 cm, long (81-110 cm) present 10 intermediate (~ 45°) 3.99 mm, small (<5 mm) Purple lines Strong	7 9 3 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.7 cm, medium (~25 cm) 08, intermediate (6-10) intermediate heavy well exerted droopy low (~ 3%) intermediate (6-25 % of grains removed)	5 5 5 2 9 2 3 5	

Sl. no. 47. Accession no. 2204, Name: Kali Boro 600, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	19.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.1 cm, intermediate (~50 cm) 1.04 cm, intermediate intermediate green present light purple erect erect(< 30°)	5 5 2 2 9 3 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	120 days, late (106-120days)	7	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	110.5 cm, very long (>110 cm) present 13 erect (< 30°) 4.10 mm, small (<5 mm) Purple lines Strong	9 9 1 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24 cm, medium (~25 cm) 11, high (>10) intermediate heavy well exerted droopy moderate (~ 15%) loose (26-50% of grains removed)	5 7 5 2 9 2 5 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white black hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 27.79 8.13 3.06 5.87, medium (5.51-6.6mm) 2.69 2.18, medium (L:W= 2.1-3.0) speckled brown non-glutinous (non-waxy) non-scented late and slow	5 9 5 7 1 9 3 1 3 5 5 3 3 1 0 7	  
08	Maturity a. Days to maturity from seedling	146 days		
09	Yield	17.96 g/hill		

Sl. no. 48. Accession no. 2205, Name: Kali Boro 704, Variety group: Boro

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	22.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	47.1 cm, intermediate (~50 cm) 1.05 cm, intermediate intermediate green present light purple horizontal horizontal(46-90°)	5 5 2 2 9 3 5 5	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.6 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	123 days, very late (>120days)	9	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	106.8 cm, long (81-110 cm) present 12 open (~ 60°) 4.25 mm, small (<5 mm) Purple lines Strong	7 9 5 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.5 cm, medium (~25 cm) 10, intermediate (6-10) compact heavy well exerted droopy low (~ 3%) intermediate (6-25% of grains removed)	5 5 1 2 9 2 3 5	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white black hairs on upper portion straw medium (1.5-2.5mm) highly fertile (> 90%) 25.90 8.34 3.16 5.94, medium (5.51-6.6 mm) 2.72 2.19, medium (L:W= 2.1-3.0) brown non-glutinous (non-waxy) non-scented very late	5 9 5 7 1 9 3 1 3 5 5 3 4 1 0 9	  
08	Maturity a. Days to maturity from seedling	151 days		
09	Yield	20.20 g/hill		

Appendix-3: Fifty two morpho-agronomic characters of 48 Aus rice germplasm, 2019

Sl. no. 1. Accession no. 01, Name: Atlai, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	17.6 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	55 cm, intermediate (~50 cm) 1.08 cm, intermediate intermediate purple margins present purple erect semi erect(45°)	5 5 2 5 9 4 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.6 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	93days,medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	100 cm, long, (81-110 cm) present 11 intermediate (~45°) 3.27 mm, small (<5 mm) purple lines strong	7 9 3 1 3 1	
06	Panicle length a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29 cm, medium (~25 cm) 10, intermediate (6-10) intermediate heavy just exerted droopy low (~3%) loose (26-50%)	5 5 5 2 5 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only long (~30 mm) purple purple apex purple brown (tawny) hairs on upper portion gold medium (1.5-2.5mm) partly sterile (50-74%) 20.30 9.25 2.53 6.49, medium (5.51-6.6 mm) 2.18 2.98, medium (L:W=2.1-3.0) brown indeterminate non-scented early	1 7 5 8 5 4 3 2 3 3 5 3 4 3 0 3	  
08	Maturity a. Days to maturity from seedling	119 days		
09	Yield	8.80 g/hill		

Sl. no. 2. Accession no. 11, Name: Charnock, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	57.4 cm, intermediate (~50 cm) 1.04 cm, intermediate intermediate green absent green erect semi erect(45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.80 mm white 2-cleft Pale green Pale green	1 2 1 1	
04	Days after 50% heading	93 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	115.6 cm, very long (>110 cm) absent 14 intermediate (~45°) 3.21 mm, small (<5 mm) green strong	9 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26 cm, medium (~25 cm) 12, high (>10) intermediate heavy well exerted droopy moderate(~15%) easy (51-100% of grains removed)	5 7 5 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5mm) partly sterile (50-74%) 18.90 9.52 2.36 6.7, long (6.6-7.5 mm) 1.96 3.42, slender (L:W=>3.0) Light brown Non-glutinous (non-waxy) non-scented early	1 3 1 2 1 0 3 1 3 3 1 2 1 0 3	  
08	Maturity a. Days to maturity from seedling	119 days		
09	Yield	6.90 g/hill		

Sl. no. 3. Accession no. 16, Name: Dhala Saita, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	21.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	54 cm, intermediate (~50 cm) 0.96 cm, narrow intermediate purple margins present purple drooping descending (>90°)	5 3 2 5 9 4 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13 mm white 2-cleft Pale green Pale green	1 2 1 1	
04	Days after 50% heading	80 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	99.2 cm, long, (81-110 cm) absent 9 open (~60°) 4.24 mm, small (<5 mm) green strong	7 1 9 5 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.2 cm, medium (~25 cm) 07, intermediate (6-10) open heavy well exerted droopy low (~3%) easy (51-100% of grains removed)	5 5 9 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	Tip only very short (<5 mm) straw straw purple straw short hairs straw medium (1.5-2.5mm) fertile (75-90%) 26.60 8.57 3.37 6.08, medium (5.51-6.6mm) 2.91 2.09, bold (L:W= 1.1-2.0) speckled brown indeterminate non-scented intermediate	1 1 1 2 5 0 4 1 3 4 5 5 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	103 days		
09	Yield	4.28 g/hill		

Sl. no. 4. Accession no. 17, Name: Dhala Saita, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	19.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	61.2 cm, long (~70 cm) 1.42 cm, intermediate intermediate green absent green erect semi erect(45°)	7 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	86 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	93.4 cm, long (81-110 cm) absent 10 intermediate (~45°) 3.12 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.8 cm, medium (~25 cm) 7, intermediate (6-10) intermediate heavy well exerted droopy moderate(~15%) easy (51-100% of grains removed)	5 5 5 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 18.20 9.11 2.58 6.62, long (6.6-7.5 mm) 2.20 3.01, medium (L:W= 2.1-3.0) white indeterminate non-scented very early	0 2 1 0 3 1 3 3 3 1 3 0 1	  
08	Maturity a. Days to maturity from seedling	119 days		
09	Yield	3.92 g/hill		

Sl. no. 5. Accession no. 29, Name: Harinmuda, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	26 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	78 cm long (~70 cm) 1.14 cm, intermediate intermediate green absent green erect semi erect (45°)	7 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.2 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	93 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	105 cm, long (81-110 cm) absent 14 open (~60°) 3.30 mm, small (<5 mm) green strong	7 1 5 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	30.4 cm, long (~35 cm) 7, intermediate (6- 10) open heavy well exerted droopy low(~3 %) loose (26-50%)	7 5 9 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white brown (tawny) short hairs straw medium (1.5-2.5 mm) partly sterile (50-74%) 19.20 8.56 2.70 5.99, medium (5.51-6.6 mm) 2.21 2.71, medium (L:W= 2.1-3.0) speckled brown non-glutinous (non-waxy) non-scented early	0 2 1 4 4 1 3 3 5 3 3 1 0 3	  
08	Maturity a. Days to maturity from seedling	120 days		
09	Yield	4.64 g/hill		

Sl. no. 6. Accession no. 744, Name: Kali Atia, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	20 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	46.6 cm, intermediate (~50 cm) 1.42 cm, Intermediate intermediate green absent green drooping horizontal (46-90°)	5 5 2 2 1 1 9 5	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	85 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	93.4 cm, long, (81-110 cm) absent 7 intermediate (~45°) 3.38 mm, small (<5 mm) green moderately strong	7 1 3 1 1 3	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	30.8 cm, long (~35 cm) 6, intermediate (6-10) open heavy well exerted droopy low (~ 3%) loose (26-50%)	7 5 9 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) straw straw white gold short hairs straw medium (1.5-2.5mm) partly sterile (50-74%) 21.20 8.22 2.75 5.87, medium (5.51-6.6 mm) 2.38 2.47, medium (L:W=2.1-3.0) white indeterminate non-scented intermediate	1 3 1 2 1 1 4 1 3 3 5 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	112 days		
09	Yield	5.8 g/hill		

Sl. no. 7. Accession no. 39, Name: Katak Tara, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	19.4 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	52.8 cm, intermediate (~50 cm) 1.6 cm, intermediate intermediate purple margin present purple erect semi erect (45°)	5 5 2 5 9 4 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.6 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	86 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	92.2 cm, long, (81-110 cm) present 12 intermediate (~45°) 3.83 mm, small (<5 mm) Purple lines strong	7 9 3 1 3 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	28.2 cm, medium (~25 cm) 9, intermediate (6-10) intermediate heavy moderately well exerted droopy low (~3%) easy (51-100% grains removed)	5 5 5 2 7 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) gold red apex purple brown (tawny) hairs on upper portion straw medium (1.5-2.5mm) partly sterile (50-74%) 18.60 8.76 2.64 6.02, medium (5.51-6.6mm) 2.23 2.70, medium (L:W= 2.1-3.0) Light brown indeterminate lightly scented very early	1 3 2 6 5 4 3 1 3 3 5 3 2 3 1 1	  
08	Maturity a. Days to maturity from seedling	110 days		
09	Yield	6.88 g/hill		

Sl. no. 8. Accession no. 53, Name: Patuakhali, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	51.2 cm, intermediate (~50 cm) 1.16 cm, intermediate intermediate purple margins present purple drooping semi erect (45°)	5 5 2 5 9 4 9 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.8 mm purple 2-cleft purple purple	3 2 3 2	
04	Days after 50% heading	82 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	99.8 cm, long, (81-110 cm) absent 7 erect (<30°) 3.35 mm, small (<5 mm) green strong	7 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.8 cm, medium (~25 cm) 5, low (<6) open light well exerted droopy moderate (~ 15%) easy (51-100%)	5 3 9 1 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple purple black short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 23.70 7.90 2.98 5.57, medium (5.51-6.6 mm) 2.47 2.26, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	0 7 5 9 4 1 3 4 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	108 days		
09	Yield	7.86 g/hill		

Sl. no. 9. Accession no. 801, Name: Parang, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.0 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	45.8 cm, intermediate (~50 cm) 1.14 cm, intermediate intermediate purple tips present light purple erect semi erect(45°)	5 5 2 4 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.0 mm Purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	84 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	76.0 cm, medium (61-80 cm) absent 11 intermediate (~ 45°) 3.54 mm, small (<5 mm) green strong	5 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	31.6 cm, long (~35 cm) 9, intermediate (6- 10) intermediate heavy well exerted droopy verylow (< 1%) loose (6-25%)	7 5 5 2 9 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) purple purple purple straw hairs on upper portion straw medium (1.5-2.5mm) fertile (75-90%) 21.30 8.29 2.73 6.11, medium (5.51-6.6 mm) 2.48 2.46, medium (L:W=2.1-3.0) white indeterminate non-scented intermediate	1 3 5 7 5 0 3 1 3 4 5 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	112 days		
09	Yield	8.26 g/hill		

Sl no. 10. Accession no. 151, Name: Mi-Timbra, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.2 cm, intermediate (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	48.0 cm, intermediate (~50 cm) 1.02 cm, intermediate intermediate green absent green erect semi erect (45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.6 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	83 days, early (70-5 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	87.4 cm, long (81-110 cm) absent 12 intermediate (~ 45°) 3.13 mm, small (<5 mm) green moderately strong	7 1 3 1 1 3	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.2cm, medium (~25 cm) 9, intermediate (6- 10) open heavy moderately well exerted droopy moderate (~15%) moderately difficult (1-5% grains removed)	5 5 9 2 7 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 22.10 7.67 2.86 5.37, short (5.5 mm or less) 2.44 2.2, medium (L:W= 2.1-3.0) speckled brown non-glutinous (non-waxy) non-scented very early	0 2 1 0 3 1 3 3 7 3 3 1 0 1	  
08	Maturity a. Days to maturity from seedling	119 days		
09	Yield	4.40 g/hill		

Sl. no. 11. Accession no. 184, Name: Kachilon-1, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	21.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	54.0 cm, intermediate (~50 cm) 1.04 cm, intermediate intermediate green absent green erect semi erect (45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.2 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	83 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.0 cm, long, (81-110 cm) absent 12 intermediate (~ 45°) 3.55 mm, small (<5 mm) green moderately strong	7 1 3 1 1 3	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	28.8 cm, medium (~25 cm) 08, intermediate (6-10) open heavy moderately well exerted droopy moderate (~15%) easy (51-100% grains removed)	5 5 9 2 7 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90 %) 21.60 8.75 2.64 6.29, medium (5.51-6.6 mm) 2.28 2.76, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented very early	0 2 1 0 3 1 3 4 5 3 3 3 0 1	  
08	Maturity a. Days to maturity from seedling	110 days		
09	Yield	7.1 g/hill		

Sl. no. 12. Accession no. 185, Name: Kachilon- 2, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	19.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	53.6 cm, intermediate (~50 cm) 1.04 cm, intermediate intermediate green absent green erect semi erect (45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.0 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	82 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	102 cm, long (81-110 cm) absent 11 intermediate (~ 45°) 2.95 mm, small (<5 mm) green moderately strong	7 1 3 1 1 3	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	28.2 cm, medium (~25 cm) 07, intermediate (6-10) open heavy just exerted droopy high (~ 35%) easy (51-100% of grains removed)	5 5 9 2 5 2 7 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 24.60 8.48 2.94 5.89, medium (5.51-6.6 mm) 2.46 2.39, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented very early	0 2 1 0 3 1 3 3 5 3 3 3 0 1	  
08	Maturity a. Days to maturity from seedling	105 days		
09	Yield	5.24 g/hill		

Sl. no. 13. Accession no. 186, Name: Bowalia, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	25.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	58.6 cm, intermediate (~50 cm) 1.06 cm, intermediate intermediate green absent green erect semi erect(45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.6 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	80 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	105.2 cm, long (81-110 cm) absent 14 open (~ 60°) 3.24 mm, small (<5 mm) green strong	7 1 5 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.0 cm, medium (~25 cm) 11, high (> 10) open heavy just exerted droopy high (~ 35%) easy (51-100 % of grains removed)	5 7 9 2 5 2 7 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) fertile (75-90%) 20.60 7.77 2.86 5.49, short (5.5 mm or less) 2.50 2.2, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	0 2 1 0 3 1 3 4 7 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	103 days		
09	Yield	4.50 g/hill		

Sl. no. 14. Accession no. 187, Name: Bowalia, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	50.6 cm, intermediate (~50 cm) 1.46 cm, intermediate intermediate purple blotch present purple drooping horizontal (46-90°)	5 5 2 6 9 4 9 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.0 mm purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	77 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.8 cm, long, (81-110 cm) present 08 open (~ 60°) 3.23 mm, small (<5.0 mm) Purple lines strong	7 9 5 1 3 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.6cm, medium (~25 cm) 6, intermediate (6- 10) open heavy just exerted droopy high(~ 35%) easy (21-100% of grains removed)	5 5 9 2 5 2 7 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple purple straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 24.40 8.78 3.21 6.03, medium (5.51-6.6 mm) 2.71 2.23, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	0 7 5 0 3 1 3 3 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	103 days		
09	Yield	4.20 g/hill		

Sl. no. 15. Accession no. 274, Name: Juma, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	50.4 cm, intermediate (~50 cm) 1.12 cm, intermediate intermediate green absent green erect erect (< 30°)	5 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	82 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	102.4 cm, long, (81-110 cm) absent 08 intermediate (~ 45°) 3.15 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.0 cm, medium (~25 cm) 05, low (< 6) intermediate heavy just exerted droopy high (~35%) easy (51-100% grains removed)	5 3 5 2 5 2 7 9	

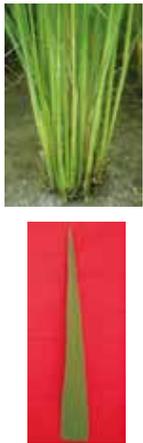
App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) straw straw white gold and gold furrows on straw background short hairs straw medium (1.5-2.5mm) partly sterile (50-74%) 25.30 8.36 3.13 5.90, medium(5.51-6.0mm) 2.68 2.20, medium (L:W= 2.1-3.0) speckled brown non-glutinous (non-waxy) non-scented intermediate	 1 3 1 2 1 1 4 1 3 3 5 3 3 1 0 5	  
08	Maturity a. Days to maturity from seedling	105 days		
09	Yield	2.93 g/hill		

Sl. no.16. Accession no. 377, Name: Kasia Panja, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	44.2 cm, intermediate (~ 50 cm) 0.96 cm, narrow intermediate green absent green erect semi erect(45°)	5 3 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	81 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	97.0 cm, long (81-110 cm) absent 14 erect (< 30°) 3.38 mm, small (<5 mm) green strong	7 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.2 cm, medium (~25 cm) 11, high (>10) open heavy moderately well exerted droopy moderate (~ 15%) easy (51-100 % of grains removed)	5 7 9 2 7 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 21.40 7.74 2.91 5.53, medium (5.51-6.6mm) 2.47 2.24, medium(L:W=2.1-3.0) speckled brown indeterminate non-scented intermediate	0 2 1 0 3 1 3 3 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	104 days		
09	Yield	3.74 g/hill		

Sl. no. 17. Accession no. 378, Name: Bokri Joli, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	44.0 cm, intermediate (~50 cm) 1.06 cm, intermediate intermediate green absent green erect semi erect (45°)	5 5 2 2 1 1 1 3	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.8mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	83 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	93.8 cm, long, (81-110 cm) absent 12 erect (< 30°) 3.37 mm, small (<5 mm) green strong	7 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.0 cm, medium (~ 25 cm) 07, intermediate (6-10) open heavy moderately well exerted droopy low (~3%) easy (51-100% grains removed)	5 5 9 2 7 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 25.30 8.61 3.17 6.09, medium (5.51-6.6mm) 2.66 2.29, medium (L:W= 2.1-3.0) speckled brown non-glutinous (non-waxy) non-scented intermediate	0 2 1 0 3 1 3 3 5 3 3 1 0 5	  
08	Maturity a. Days to maturity from seedling	107 days		
09	Yield	6.40 g/hill		

SI no. 18. Accession no. 809, Name: Balam, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	28.7 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	44.4 cm, intermediate (~50 cm) 1.18 cm, intermediate intermediate purple tips present light purple erect semi-erect(45°)	5 5 2 4 9 3 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.2 mm purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	85 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	82.2 cm, long, (81-110 cm) absent 07 intermediate (~ 45°) 3.39 mm, small (<5 mm) green moderately strong	7 1 3 1 1 3	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.4 cm, medium (~ 25 cm) 03, low (< 6) intermediate heavy well exerted droopy low (~3%) loose (26-50% grains removed)	5 3 5 2 9 2 3 7	

Sl. no. 19. Accession no. 505, Name: Rawnok, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	29.0 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	53.0 cm, intermediate (~50 cm) 1.42 cm, intermediate intermediate purple tips absent green erect semi-erect(45°)	5 5 2 4 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	84 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	92.0 cm, long, (81-110 cm) absent 08 intermediate (~ 45°) 3.41 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.2 cm, medium (~25 cm) 06, intermediate (6-10) compact heavy just exerted droopy low (~ 3%) easy (51-100% of grains removed)	5 5 1 2 5 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white gold furrows on straw background short hairs straw medium (1.5-2.5mm) partly sterile (50-74%) 28.3 8.36 3.49 6.0, medium (5.51-6.6 mm) 2.94 2.04, bold (L:W= 1.1-2.0) light brown non-glutinous (non-waxy) non-scented intermediate	5 9 5 7 1 1 4 1 3 3 5 5 2 1 0 5	  
08	Maturity a. Days to maturity from seedling	108 days		
09	Yield	4.64 g/hill		

Sl. no. 20. Accession no. 506, Name: Gojal Gorla, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	25.6 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	41.0 cm, intermediate (~ 50 cm) 0.92 cm, narrow intermediate purple margins present purple erect erect (<30°)	5 3 2 5 9 4 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.6 mm purple lines 2-cleft purple purple	 2 2 3 2	
04	Days after 50% heading	75 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	84.4 cm, long (81-110 cm) present 14 intermediate (~45°) 3.47 mm, small (<5 mm) purple lines strong	7 9 3 1 3 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.8 cm, medium (~25 cm) 09, intermediate (6-10) open heavy well exerted droopy moderate (~ 15%) easy (51-100% of grains removed)	5 5 9 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple purple purple spots on straw hairs on upper portion straw short (<1.5 mm) partly sterile (50-74%) 20.40 7.95 2.52 5.74, medium (5.51-6.6mm) 2.19 2.62, medium (L:W= 2.1-3.0) speckled brown non-glutinous (non-waxy) non-scented intermediate	0 7 5 6 3 1 1 3 5 3 3 1 0 5	  
08	Maturity a. Days to maturity from seedling	102 days		
09	Yield	5.43 g/hill		

Sl. no. 21. Accession no. 509, Name: Joli, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	28.4 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	52.6 cm, intermediate (~ 50 cm) 1.22 cm, intermediate intermediate purple tips present purple drooping descending (>90°)	5 5 2 4 9 4 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.0 mm purple 2-cleft purple purple	3 2 3 2	
04	Days after 50% heading	87 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	103.4 cm, long (81-110 cm) present 12 erect (<30°) 3.31 mm, small (<5 mm) purple lines strong	7 9 1 1 3 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.8 cm, medium (~25 cm) 9, intermediate (6-10) intermediate heavy well exerted droopy low (~ 3%) loose (26-50% of grains removed)	5 5 5 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) Purple apex purple straw straw short (<1.5 mm) fertile (75-90%) 18.90 7.61 2.74 5.37, short (5.5 mm or less) 2.31 2.32, medium (L:W= 2.1-3.0) Light brown indeterminate non-scented early	0 8 5 0 4 1 1 4 7 3 2 3 0 3	  
08	Maturity a. Days to maturity from seedling	112 days		
09	Yield	5.92 g/hill		

Sl. no. 22. Accession no. 510, Name: Rangouri (Sada), Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	19.4cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	56.4 cm, intermediate (~50 cm) 1.0 cm, intermediate intermediate green absent green drooping descending (>90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.2 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	82 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.0 cm, long (81-110 cm) absent 14 intermediate (~ 45°) 3.14 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.0 cm, medium (~25 cm) 13, high (> 10) open heavy well exerted droopy high (~ 35%) easy (51-100% of grains removed)	5 7 9 2 9 2 7 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) black white black hairs on upper portion purple short (<1.5 mm) fertile (75-90%) 22.8 8.44 2.76 5.8, medium (5.51-6.6 mm) 2.39 2.43, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	0 9 1 9 3 4 1 4 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	106 days		
09	Yield	8.01 g/hill		

Sl. no. 23. Accession no. 511, Name: Shoni, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24.4 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	49.4 cm, intermediate (~50 cm) 1.04 cm, intermediate intermediate green absent green erect semi-erect(45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	17.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	82 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	98.0 cm, long (81-110 cm) absent 12 erect (< 30°) 3.08 mm, small (<5 mm) green strong	7 1 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.0 cm, medium (~25 cm) 09, intermediate (6-10) open heavy well exerted droopy low (~ 3%) easy (51-100% of grains removed)	5 5 9 2 9 2 3 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	Tip only short (~8 mm) straw straw white straw hairs on upper portion straw short (<1.5 mm) fertile (75-90%) 19.1 8.14 3.09 5.64, medium (5.51-6.6 mm) 2.63 2.14, medium (L:W= 2.1-3.0) brown non-glutinous (non-waxy) non-scented intermediate	1 1 1 2 1 0 3 1 1 4 5 3 4 1 0 5	  
08	Maturity a. Days to maturity from seedling	107 days		
09	Yield	4.39 g/hill		

Sl no. 24. Accession no. 563, Name: Kumri, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	54.6 cm, intermediate (~50 cm) 1.48 cm, intermediate intermediate green absent green drooping horizontal (46-90°)	5 5 2 2 1 1 9 5	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	9.6 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	87 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	95.8 cm, long (81-110 cm) absent 12 open (~ 60°) 3.26 mm, small (<5 mm) green moderately strong	7 1 5 1 1 3	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	30.2 cm, long (~35 cm) 9, intermediate (6-10) open heavy well exerted droopy very low (<1%) loose (26-50% of grains removed)	7 5 9 2 9 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	Tip only short (~8 mm) straw straw white straw hairs on upper portion straw medium (1.5-2.5mm) fertile (75-90%) 22.6 8.17 2.69 5.75, medium (5.51-6.6 mm) 2.38 2.42, medium (L:W= 2.1-3.0) white indeterminate non-scented early	1 3 1 2 1 0 3 1 3 4 5 3 1 3 0 3	  
08	Maturity a. Days to maturity from seedling	113 days		
09	Yield	4.25 g/hill		

Sl. no. 25. Accession no. 564, Name: Dal Kaisha, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	19.2 cm, short(<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	55.0 cm, intermediate (~50 cm) 1.1 cm, intermediate intermediate green absent green erect semi-erect(45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.2 mm white 2-cleft Pale green Pale green	1 2 1 1	
04	Days after 50% heading	86 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	102.8 cm, long (81-110 cm) absent 10 erect (<30°) 3.71 mm, small (<5 mm) green strong	7 1 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	30.4 cm, long (~35 cm) 7, intermediate (6-10) open heavy well exerted droopy very low (<1%) loose (26-50% of grains removed)	7 5 9 2 9 2 1 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw short (<1.5 mm) fertile (75-90%) 19.1 8.35 2.45 5.99, medium (5.51-6.6 mm) 2.1 2.85, medium (L:W= 2.1-3.0) white indeterminate non-scented intermediate	0 2 1 0 3 1 1 4 5 3 1 3 0 5	  
08	Maturity a. Days to maturity from seedling	112 days		
09	Yield	4.24 g/hill		

Sl. no. 26. Accession no. 565, Name: Boumail, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	18.0 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	59.6 cm, intermediate (~50 cm) 1.18 cm, intermediate intermediate green absent green drooping descending (>90°)	5 5 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	17.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	81 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.2 cm, long (81-110 cm) absent 9 erect (<30°) 3.34 mm, small (<5 mm) green strong	7 1 9 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.8 cm, medium (~25 cm) 8, intermediate (6-10) open heavy well exerted droopy moderate (~ 15%) easy (51-100 % of grains removed)	5 5 9 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 20.0 8.21 3.07 5.78, medium (5.51-6.6 mm) 2.61 2.21, medium (L:W= 2.1-3.0) Speckled brown indeterminate non-scented intermediate	0 2 1 0 3 1 3 3 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	104 days		
09	Yield	4.88 g/hill		

Sl. no. 27. Accession no. 566, Name: Achar Bhog, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	19.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	46.6 cm, intermediate (~ 50 cm) 1.26 cm, intermediate intermediate purple tips absent green drooping descending (>90°)	5 5 2 4 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	17.8 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	80 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94 cm, long (81-110 cm) absent 8 intermediate (~ 45°) 3.59 mm, small (<5 mm) green strong	7 1 8 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.6 cm, medium (~25 cm) 6, intermediate (6-10) open heavy well exerted droopy moderate (~15%) easy (51-100% of grains removed)	5 5 9 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	whole length very long (> 40 mm) purple purple white straw hairs on upper portion straw medium (1.5-2.5mm) partly sterile (50-74%) 31.2 8.85 3.73 6.12, medium (5.51-6.6mm) 2.95 2.07, bold (L:W= 1.1-2.0) speckled brown non-glutinous (non-waxy) non-scented early	5 9 5 7 1 0 3 1 3 3 5 5 3 1 0 3	  
08	Maturity a. Days to maturity from seedling	103 days		
09	Yield	4.47 g/hill		

Sl. no. 28. Accession no. 567, Name: Bari Bhog, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24.2 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	50.0 cm, intermediate (~50 cm) 1.04 cm, intermediate intermediate green absent green erect semi-erect(45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	77 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	109.6 cm, long (81-110 cm) absent 13 intermediate (~ 45°) 3.15 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.8 cm, medium (~25 cm) 10, intermediate (6-10) open heavy well exerted droopy high (~ 35%) easy (51-100% of grains removed)	5 5 9 2 9 2 7 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw light purple black hairs on upper portion purple medium (1.5-2.5 mm) partly sterile (50-74%) 24.2 8.82 3.26 6.3, medium (5.51-6.6 mm) 2.63 2.4, medium (L:W= 2.1-3.0) brown indeterminate non-scented intermediate	0 2 4 9 3 4 3 3 5 3 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	103 days		
09	Yield	4.69 g/hill		

Sl. no. 29. Accession no. 568, Name: Jaba Hulu, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.8 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	460 cm, intermediate (~50 cm) 1.0 cm, intermediate intermediate green absent green erect semi-erect (45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.4 mm white 2-cleft Pale green Pale green	1 2 1 1	
04	Days after 50% heading	78 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	98.6 cm, long, (81-110 cm) absent 13 intermediate (~ 45°) 3.19 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.8 cm, medium (~25 cm) 11, high (>10) open heavy well exerted droopy moderate (~15%) easy (51-120% of grains removed)	5 7 9 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw light purple straw hairs on upper portion straw short (<1.5 mm) partly sterile (50-74%) 23.4 8.57 3.27 6.11, medium (5.51-6.6 mm) 2.66 2.3, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	0 2 4 0 3 1 1 3 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	104 days		
09	Yield	2.85 g/hill		

SI no. 30. Accession no. 569, Name: Garia, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24.4 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	49.4 cm, intermediate (~50 cm) 1.08 cm, intermediate intermediate green absent green erect semi-erect (45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.2 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	82 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	94.6 cm, long (81-110 cm) absent 14 intermediate (~ 45°) 3.20 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.8 cm, medium (~25 cm) 12, high (>10) open heavy well exerted droopy moderate (~15%) easy (51-100% grains removed)	5 7 9 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white purple furrows on straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 24.4 9.17 3.21 6.34, medium (5.51-6.6 mm) 2.63 2.41, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	0 2 1 7 4 1 3 4 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	106 days		
09	Yield	5.6 g/hill		

Sl no. 31. Accession no. 814, Name: Gungur Bali, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	19.4 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	37.0 cm, short (~ 30 cm) 1.04 cm, intermediate intermediate green absent green erect semi-erect(<45°)	3 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	7.8 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	86 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	105.0 cm, long (81-110 cm) absent 12 intermediate (~45°) 3.27 mm, small (<5 mm) green weak	7 1 3 1 1 7	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.4 cm, medium (~25 cm) 9, intermediate (6-10) intermediate heavy just exerted droopy moderate (~ 15%) easy (51-100% of grains removed)	5 5 5 2 5 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only short (~8 mm) straw straw white straw hairs on upper portion straw short (<1.5 mm) fertile (75-90%) 19.8 7.74 2.81 5.43, short (5.5 mm or less) 2.36 2.30, medium (L:W= 2.1-3.0) brown indeterminate non-scented very early	1 3 1 2 1 0 3 1 1 4 7 3 4 3 0 1	  
08	Maturity a. Days to maturity from seedling	111 days		
09	Yield	6.49 g/hill		

Sl. no. 32. Accession no. 571, Name: Hijolee, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photogragph
01	Seedling height	21.4 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	39.0 cm, short (~30 cm) 0.90 cm, narrow (<1 cm) intermediate purple blotch present purple erect erect (< 30°)	3 3 2 6 9 4 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	10.8 mm Purple lines 2-cleft pale green purple	2 2 1 2	
04	Days after 50% heading	81 days, early (70-85days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	96 cm, long (81-110 cm) present 8 erect (<30°) 3.16 mm, small (<5 mm) green strong	7 9 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	23.6 cm, medium (~25 cm) 5, low (<6) intermediate heavy well exerted droopy moderate (~ 15%) loose (26-50 % of grains removed)	5 3 5 2 9 2 5 7	

App. des. no.	Characteristic	State of character	Code no.	Photogragph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple purple straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 29.7 7.78 3.98 5.45, short (5.5 mm or less) 3.19 1.71, bold (L:W= 1.1-2.0) light brown indeterminate non-scented early	0 7 5 0 3 1 3 3 7 5 2 3 0 3	  
08	Maturity a. Days to maturity from seedling	105 days		
09	Yield	4.1 g/hill		

Sl. no. 33. Accession no. 575, Name: Shoni, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	24.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	54.2 cm, intermediate (~50 cm) 1.08 cm, intermediate intermediate purple margins present purple erect semi-erect (45°)	5 5 2 5 9 4 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.0 mm Purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	87 days, medium (86-120 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	111.0 cm, very long (>110 cm) absent 9 erect (<30°) 3.21 mm, small (<5 mm) green strong	9 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	28.8 cm, medium (~25 cm) 8, intermediate (6-10) open heavy well exerted droopy moderate (~15%) easy (51-100 % of grains removed)	5 5 9 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple purple straw hairs on upper portion straw short (<1.5 mm) partly sterile (50-74%) 20.3 7.45 3.31 4.99, short (5.5 mm or less) 2.79 1.79, bold (L:W= 1.1-2.0) speckled brown indeterminate non-scented very early	0 7 5 0 3 1 1 3 7 5 3 3 0 1	  
08	Maturity a. Days to maturity from seedling	111 days		
09	Yield	5.33 g/hill		

Sl no. 34. Accession no. 576, Name: Jabar Sail 26, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	19.6 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	44.4 cm, intermediate (~50 cm) 0.92 cm, narrow (<1 cm) intermediate green absent green erect semi-erect (45°)	5 3 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	77 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	100.8 cm, long (81-110 cm) absent 13 intermediate (~ 45°) 3.2 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.8 cm, medium (~25 cm) 10, intermediate (6-10) intermediate heavy just exerted droopy moderate (~15%) loose (26-50% of grains removed)	5 5 5 2 5 2 5 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	Tip only Very short (<5 mm) straw straw white gold furrows on straw background short hairs straw medium (1.5-2.5mm) fertile (75-90%) 23.9 7.92 3.03 5.69, medium (5.51-6.6 mm) 2.53 2.25, medium (L:W= 2.1-3.0) brown non-glutinous (non-waxy) non-scented intermediate	1 1 1 2 1 1 4 1 3 4 5 3 4 1 0 5	  
08	Maturity a. Days to maturity from seedling	104 days		
09	Yield	6.12 g/hill		

Sl. no. 35. Accession no. 580, Name: Laksmi Dia, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	21.6 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	52.4 cm, intermediate (~50 cm) 0.8 cm, narrow (<1 cm) intermediate green absent green erect semi-erect (45°)	5 3 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	83 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	100.2 cm, long (81-110 cm) absent 14 erect (<30°) 3.3 mm, small (<5 mm) green strong	7 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	27.2 cm, medium (~25 cm) 12, high (>10) intermediate heavy well exerted droopy low (~3%) loose (26-50% grains removed)	5 7 5 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw short hairs straw short (<1.5 mm) partly sterile (50-74%) 25.1 8.28 3.27 5.68, medium (5.51-6.6 mm) 2.73 2.08, bold (L:W= 1.1-2.0) red indeterminate non-scented intermediate	0 2 1 0 4 1 1 3 5 5 5 3 0 5	  
08	Maturity a. Days to maturity from seedling	108 days		
09	Yield	5.82 g/hill		

Sl. no. 36. Accession no. 581, Name: Madida, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.4 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	46.0 cm, intermediate (~50 cm) 1.16 cm, intermediate intermediate purple margins present purple drooping descending (>90°)	5 5 2 5 9 4 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	14.2 mm Purple lines 2-cleft purple purple	2 2 3 2	
04	Days after 50% heading	82 days, early (70-85days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	97.4 cm, long (81-110 cm) present 12 intermediate (~45°) 4.15 mm, small (<5 mm) purple lines strong	7 9 3 1 3 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.8 cm, medium (~25 cm) 9, intermediate (6-10) open heavy well exerted droopy low (~3%) loose (26-50 % of grains removed)	5 5 9 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple apex purple straw short hairs gold short (<1.5 mm) partly sterile (50-74%) 25.8 8.7 3.09 6.14, medium (5.51-6.6 mm) 2.6 2.36, medium (L:W= 2.1-3.0) brown non-glutinous (non-waxy) non-scented late and slow	0 8 5 0 4 2 1 3 5 3 4 1 0 7	  
08	Maturity a. Days to maturity from seedling	107 days		
09	Yield	5.92 g/hill		

SI no. 37. Accession no. 647, Name: Ashini, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.2 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	40.2 cm, short (~30 cm) 0.84 cm, narrow (<1 cm) intermediate green absent green erect semi-erect (45°)	3 3 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	17.4 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	80 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	96.0 cm, long (81-110 cm) absent 12 intermediate (~45°) 3.27 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	26.2 cm, medium (~25 cm) 10, intermediate (6-10) open heavy well exerted droopy moderate (~15%) loose (26-50% grains removed)	5 5 9 2 9 2 5 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	Tip only very short (<5 mm) straw straw white gold furrows on straw background short hairs straw medium (1.5-2.5mm) fertile (75-90%) 24.1 8.34 2.87 5.96, medium (5.51-6.6 mm) 2.41 2.47, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	1 1 1 2 1 1 4 1 3 4 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	105 days		
09	Yield	4.8 g/hill		

Sl. no. 38. Accession no. 648, Name: Mi-Cochu, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	23.4 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	42.8 cm, intermediate (~50 cm) 0.96 cm, narrow (<1 cm) intermediate green absent green erect semi-erect (45°)	5 3 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	10.8 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	81 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	99.4 cm, long (81-110 cm) absent 13 intermediate (~45°) 3.41 mm, small (<5 mm) green strong	7 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	22.6 cm, medium (~25 cm) 11, high (>10) open heavy well exerted droopy high (~35%) loose (26-50% grains removed)	5 7 9 2 9 2 7 7	

Sl. no. 39. Accession no. 649, Name: Dharial, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	22.4 cm, short (< 30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	39.8 cm, short (~30 cm) 0.76 cm, narrow intermediate purple tips present light purple erect erect (<30°)	3 3 2 4 9 3 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	17.6 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	77 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	95.8 cm, long (81-110 cm) absent 14 intermediate (~ 45°) 3.19 mm, small (<5 mm) green moderately strong	7 1 3 1 1 3	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.8 cm, medium (~25 cm) 12, high (>10) intermediate heavy well exerted droopy high (~ 35%) loose (26-50% of grains removed)	5 7 5 2 9 2 7 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple purple purple furrows on straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 25.5 9.37 3.21 6.45, medium (5.51-6.6 mm) 2.66 2.42, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	0 7 5 7 4 1 3 4 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	103 days		
09	Yield	4.5 g/hill		

Sl no. 40. Accession no. 650, Name: Lema, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photogragph
01	Seedling height	22.6 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	47.2 cm, intermediate (~50 cm) 1.02 cm, intermediate intermediate green absent green erect erect (<30°)	5 5 2 2 1 1 1 1	
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	13.8 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	78 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	98.4 cm, long (81-110 cm) absent 15 erect (<30°) 3.14 mm, small (<5 mm) green strong	7 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	25.0 cm, medium (~25 cm) 13, high (>10) intermediate heavy well exerted droopy moderate (~15%) easy (51-100% grains removed)	5 7 5 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 28.8 8.31 2.85 5.87, medium (5.51-6.6 mm) 2.48 2.37, medium (L:W= 2.1-3.0) brown non-glutinous (non-waxy) non-scented intermediate	0 2 1 0 4 1 3 4 5 3 4 1 0 5	  
08	Maturity a. Days to maturity from seedling	104 days		
09	Yield	5.6 g/hill		

Sl. no. 41. Accession no. 652, Name: Porang, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	25.2 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	52.0 cm, intermediate (~50 cm) 1.12 cm, intermediate intermediate green absent green erect semi-erect (45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.0 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	83 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	107.0 cm, long (81-110 cm) absent 12 erect (<30°) 3.21 mm, small (<5 mm) green strong	7 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.4 cm, medium (~25 cm) 10, intermediate (6-10) open heavy well exerted droopy low (~3%) loose (26-50% grains removed)	5 5 9 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold furrows on straw background short hairs straw medium (1.5-2.5 mm) fertile (75-90%) 22.4 8.02 2.98 5.82, medium (5.51-6.6 mm) 2.57 2.26, medium (L:W= 2.1-3.0) brown indeterminate non-scented intermediate	0 2 1 1 4 1 3 4 5 3 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	110 days		
09	Yield	6.52 g/hill		

Sl. no. 42. Accession no. 653, Name: Kali Haitya, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	30.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	46.8 cm, intermediate (~50 cm) 1.12 cm, intermediate intermediate green present purple drooping descending (>90°)	5 5 2 2 9 4 9 7	 A photograph of a rice seedling in a field, and a separate photograph of a single rice leaf against a red background.
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	9.4 mm white 2-cleft pale green pale green	1 2 1 1	 A photograph of a rice ligule against a red background.
04	Days after 50% heading	87 days, medium (86-105 days)	5	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	115.4 cm, very long (>110 cm) absent 10 open (~60°) 2.77 mm, small (<5 mm) green moderately strong	9 1 5 1 1 3	 A photograph of a rice culm against a red background.
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.6 cm, medium (~25 cm) 9, intermediate (6-10) open heavy well exerted droopy high (~ 35%) loose (26-50% of grains removed)	5 5 9 2 9 2 7 7	 A photograph of a rice panicle next to a ruler for scale, against a red background.

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) purple purple purple spots on straw short hairs straw medium (1.5-2.5 mm) partly sterile (50-74%) 26.0 g 7.97 3.08 5.27, short (5.5 mm or less) 2.54 2.07, bold (L:W= 11-2.0) speckled brown indeterminate non-scented intermediate	0 7 5 6 4 1 3 3 7 5 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	112 days		
09	Yield	3.2 g/hill		

Sl. no. 43. Accession no. 655, Name: Hirgal, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	25.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	57.8 cm, intermediate (~50 cm) 1.02 cm, intermediate intermediate green absent green erect semi-erect (45°)	5 5 2 2 1 1 1 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.8 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	84 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	114.4 cm, very long (>110 cm) absent 14 intermediate (~45°) 3.47 mm, small (<5 mm) green strong	9 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.0 cm, medium (~25 cm) 12, high (>10) open heavy well exerted droopy moderate (~15%) easy (51-100% grains removed)	5 7 9 2 9 2 5 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw short hairs straw medium (1.5-2.5 mm) highly fertile (>90%) 26.2 8.5 2.97 6.06, medium (5.51-6.6 mm) 2.59 2.34, medium (L:W= 2.1-3.0) brown indeterminate non-scented intermediate	0 2 1 0 4 1 3 5 5 3 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	112 days		
09	Yield	6.19 g/hill		

Sl. no. 44. Accession no. 656, Name: Ingra, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	27.4 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	54.2 cm, intermediate (~50 cm) 0.96 cm, narrow (<1 cm) intermediate green absent green drooping semi-erect (45°)	5 3 2 2 1 1 9 3	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	12.2 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	83 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	115.0 cm, very long (>110 cm) absent 12 intermediate (~45°) 3.44 mm, small (<5 mm) green strong	9 1 3 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.8 cm, medium (~25 cm) 10, intermediate (6-10) compact heavy well exerted droopy high (~35%) easy (51-100% grains removed)	5 5 1 2 9 2 7 9	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Length of the longest awn c. Awn colour d. Apiculus colour: e. Stigma colour: f. Lemma and palea colour: g. Lemma and palea pubescence h. Sterile lemma colour: i. Sterile lemma length: j. Spikelet sterility: k. 1000 grain weight: l. Length (mm) (without dehulling): m. Width (mm) (without dehulling): n. Brown rice length (mm) (after dehulling, before milling): o. Brown rice width (mm) (after dehulling, before milling): p. Decorticated grain shape: q. Seed coat (bran) colour: r. Endosperm type: s. Decorticated grain scent: t. Leaf senescence:	tip only very short (<5 mm) straw straw white straw short hairs straw medium (1.5-2.5 mm) partly sterile (50-74%) 27.8 8.59 3.43 5.75, medium (5.51-6.6 mm) 2.68 2.15, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	1 1 1 2 1 0 4 1 3 3 5 3 3 3 0 5	  
08	Maturity a. Days to maturity from seedling	108 days		
09	Yield	3.74 g/hill		

Sl. no. 45. Accession no. 657, Name: Mati Char, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photograph
01	Seedling height	28.8 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	46.6 cm, intermediate (~50 cm) 0.92 cm, narrow (<1 cm) intermediate green absent green erect erect (<30°)	5 3 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.6 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	83 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	96.4 cm, long (81-110 cm) absent 15 erect (<30°) 3.17 mm, small (<5 mm) green strong	7 1 1 1 1 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	30.4 cm, long (~35 cm) 13, high (>10) open heavy moderately well exerted droopy low (~3%) loose (26-50% grains removed)	7 7 9 2 7 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white straw hairs on upper portion straw medium (1.5-2.5 mm) partly sterile (50-74%) 23.4 8.15 2.86 5.77, medium (5.51-6.6 mm) 2.5 2.31, medium (L:W= 2.1-3.0) brown indeterminate non-scented intermediate	0 2 1 0 3 1 3 3 5 3 4 3 0 5	  
08	Maturity a. Days to maturity from seedling	110 days		
09	Yield	7.53 g/hill		

Sl no. 46. Accession no. 658, Name: Boilam, Variety group: Aus

App. des. no.	Characteristics	State of character	Code no.	Photograph
01	Seedling height	31.4 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	44.0 cm, intermediate (~50 cm) 1.08 cm, intermediate (<1 cm) intermediate green absent green erect erect (<30°)	5 5 2 2 1 1 1 1	 

App. des. no.	Characteristic	State of character	Code no.	Photograph
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	11.4 mm white 2-cleft green pale green	1 2 2 1	
04	Days after 50% heading	77 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	96.6 cm, long (81-110 cm) absent 12 intermediate (~45°) 3.27 mm, small (<5 mm) green moderately strong	7 1 3 1 1 3	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.6 cm, medium (~25 cm) 9, intermediate (6-10) open heavy well exerted droopy moderate (~15%) easy (51-100% grains removed)	5 5 9 2 9 2 5 9	
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling):	None (awnless) straw white purple furrows on straw short hairs purple medium (1.5-2.5 mm) fertile (75-90%) 21.8 7.97 2.94	0 2 1 7 4 4 3 4	 

App. des. no.	Characteristic	State of character	Code no.	Photograph
	Grain (spikelet) (Cont'd) l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	5.59, medium (5.51-6.6 mm) 2.51 2.23, medium (L:W= 2.1-3.0) speckled brown indeterminate non-scented intermediate	5 3 3 3 0 5	
08	Maturity a. Days to maturity from seedling	103 days		
09	Yield	4.66 g/hill		

Sl no. 47. Accession no. 660, Name: Boteswar (2), Variety group: Aus

App. no.	Characteristics	State of character	Code no.	Photograph
01	Seedling height	30.2 cm, intermediate (~45 cm)	5	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	39 cm, short (~30 cm) 1.04 cm, intermediate intermediate green absent green erect erect (<30°)	3 5 2 2 1 1 1 1	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	16.2 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	81 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	852 cm, long (81-110 cm) absent 14 intermediate (~45°) 3.25 mm, small (<5 mm) green moderately strong	7 1 3 1 1 3	

App. des. no.	Characteristic	State of character	Code no.	Photograph
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	24.0 cm, medium (~25 cm) 11, high (>10) open heavy moderately well exerted droopy moderate (~15%) easy (51-100% grains removed)	5 7 9 2 7 2 5 9	
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white black hairs on upper portion straw long (>2.5 mm but shorter than lemma) fertile (75-90%) 24.2 8.68 2.97 6.01, medium (5.51-6.6 mm) 2.46 2.44, medium (L:W= 2.1-3.0) light brown indeterminate non-scented intermediate	0 2 1 9 3 1 5 4 5 3 2 3 0 5	  
08	Maturity a. Days to maturity from seedling	107 days		
09	Yield	6.59 g/hill		

Sl. no. 48. Accession no. 736, Name: Laxmi Bini, Variety group: Aus

App. des. no.	Characteristic	State of character	Code no.	Photogragph
01	Seedling height	27.4 cm, short (<30 cm)	3	
02	LEAF (Below the flag leaf) a. Length b. Width c. Blade pubescence d. Blade colour e. Leaf sheath colour anthocyanin f. Basal leaf sheath colour g. Leaf angle h. Flag leaf angle	48.6 cm, intermediate (~50 cm) 0.96 cm, narrow (<1 cm) intermediate green absent green drooping descending (>90°)	5 3 2 2 1 1 9 7	 
03	Ligule a. Length b. Colour c. Shape d. Collar colour e. Auricle colour	15.8 mm white 2-cleft pale green pale green	1 2 1 1	
04	Days after 50% heading	82 days, early (70-85 days)	3	
05	Culm a. Length b. Anthocyanin colour of nodes c. Total tiller no. d. Angle e. Culm diameter f. Internode colour g. Strength	98.2 cm, long (81-110 cm) present 15 open (~60°) 3.17 mm, small (<5 mm) Light gold strong	7 9 5 1 2 1	
06	Panicle a. Length b. No. of effective tiller/plant c. Type d. Secondary branching e. Exertion f. Axis g. Shattering h. Threshability	29.8 cm, medium (~25 cm) 12, high (>10) intermediate heavy well exerted droopy low (~3%) loose (26-50% grains removed)	5 7 5 2 9 2 3 7	

App. des. no.	Characteristic	State of character	Code no.	Photograph
07	Grain (spikelet) a. Spikelet: awn distribution b. Apiculus colour: c. Stigma colour: d. Lemma and palea colour: e. Lemma and palea pubescence f. Sterile lemma colour: g. Sterile lemma length: h. Spikelet sterility: i. 1000 grain weight: j. Length (mm) (without dehulling): k. Width (mm) (without dehulling): l. Brown rice length (mm) (after dehulling, before milling): m. Brown rice width (mm) (after dehulling, before milling): n. Decorticated grain shape: o. Seed coat (bran) colour: p. Endosperm type: q. Decorticated grain scent: r. Leaf senescence:	None (awnless) straw white gold short hairs straw short (<1.5 mm) highly fertile (>90%) 21.2 8.57 2.59 6.17, medium (5.51-6.6 mm) 2.27 2.72, medium (L:W= 2.1-3.0) light brown indeterminate non-scented very early	0 2 1 1 4 1 3 5 5 3 2 3 0 1	  
08	Maturity a. Days to maturity from seedling	107 days		
09	Yield	8.02 g/hill		

