

Abstract

Hori dhan: Genetic variation of BR11?

M. S. Rahman¹, R. Begum² and Z. I. Seraj²

Land races are derived with the knowledge, experience and continuous efforts of our farmers, despite the fact that they do not have any formal scientific training. One such cultivar named Hori dhan was developed by Horipada Kapali, an agrarian farmer of Asannagar, Jhinedah district. This variety was selected from a field, where BR11 and other HYVs were normally cultivated. The publicity regarding this discovery that was created by the print and electronic media raised many questions in the minds of rice growers and scientists. Hori dhan's similarity to the most popular Bangladeshi rice variety BR11 (Mukta) resulted in a debate on its origin. This work describes a comparative evaluation of the morphogenetic variations between Hori dhan and BR11.

The study was conducted at the Bangladesh Rice Research Institute (BRRI) and Department of Biochemistry and Molecular Biology, University of Dhaka during June 2006-February 2007. Thirty days old seedlings of both varieties were transplanted in well prepared puddle field of 3x3m plot for comparisons of morphological features, and molecular characterization were done using the leaf samples of the seedlings. Randomized Completely Block Design with 3 replications was used to conduct the field trial. Fertilizers and other cultural practices were followed by the recommendation of BRRI for growing the crop up to maturity. Ten randomly selected hills were labeled to characterize the morphological features and the rest were used to measure the yield. DNeasy plant mini kits (QIAGEN) were used to extract genomic DNA and 70 microsatellite markers distributed over the 12 rice chromosomes were used for characterization.

Considerable variations were found both in morphology and at molecular level. Hori dhan has a taller stature and is around 9.0 cm taller than BR11. Flag leaf, 2nd leaf and ligule were found to be 2.5cm, 2.4 cm and 2.0 mm longer in Hori dhan compared to BR11. Flag leaf angle of Hori dhan is erect while that of BR11 is intermediate. Hori dhan was found to have longer panicles, more filled grains, and larger grain size (26.20cm, 779.00/hill and 2.49g/100 grain, respectively). This contributed to slightly higher yield (4.94 t/ha) in Hori dhan compared to BR11 (4.39 t/ha). Interestingly Hori dhan can be characterized by the presence of awn in its 1st spikelet in the panicle. Hori dhan also has longer growth duration of around 9 days compared to BR11. Using molecular markers, variations were found in several loci of chromosome number 2, 8, 11 and 12, but not in other chromosomes. This confirms that Hori dhan is genotypically different from BR11. Due to its tall stature it may however be under risk of lodging.

Key words: Hori dhan; BR11; Genetic Variation; BRRI

¹*Plant Physiology Division, BRRI, Gazipur-1701, Bangladesh*

²*Department of Biochemistry and Molecular Biology, University of Dhaka, Dhaka-1000, Bangladesh*

Name of corresponding author: Md. Sazzadur Rahman

Email: sazzad_73@yahoo.com Cell Phone: 01722210429