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Development of new submergence tolerant rice variety for Bangladesh using marker-assisted backcrossing

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Submergence tolerant high yielding rice variety was developed using BR11 as a recipient parent applying foreground, phenotypic and background selection approaches. Recombinant selection was found essential to minimize linkage drag by BC2F2 generation. Without recombinant selection, the introgression size in the Backcross Recombinant Lines (BRLs) was approximately 15 Mb on the carrier chromosome. The BRLs were found submergence tolerance compared to the check varieties under complete submergence for two weeks at Bangladesh Rice Research Institute and produced higher yield compared to the isogenic Sub1-line under controlled submerged condition. The BRL IR85260-66-654-Gaz2 was released as BRRI dhan52 in 2010 which was the first high yielding submergence tolerant variety in Bangladesh. BRRI dhan52 produced grain yield ranging from 4.2-5.2 t/hm2 under different flash flood prone areas of Bangladesh in three consecutive seasons. The study demonstrated the efficiency of recombinant selection and better adaptability of the newly released submergence tolerant high yielding variety in flash flood prone different areas of the country with respect to submergence tolerance and yield potential.

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The Geropathology Research Network. Connecting molecular markers of aging with physiological and pathological phenotypes

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The Geropathology Research Network (GPRN) has established a Molecular Pathology Working Group to help define sets of sentinel biomarkers that can be incorporated into preclinical and clinical aging studies to increase the relevance, productivity, efficiency, and economy of these studies. Extensive physiological and pathological data are available and can readily be generated in preclinical aging studies in mice. The data can be correlated with molecules associated with aging. In order to have translational value, molecular markers must be present in tissues readily accessible in both mice and humans. Since blood can easily be collected in both species, serum is an ideal medium. The GPRN is focusing on secretory proteins and other molecules in the serum of mice that exhibit declining physiological function and increased organ pathology with increasing age. A prototype secretory protein is SPARC (secreted protein acidic and rich in cysteine, also known as osteonectin), a highly conserved 43 kilodalton serum protein secreted into the extracellular matrix to regulate homeostatic signaling pathways. Serum SPARC decreases with increasing age with evidence to suggest a decline in such conditions as sarcopenia. Preliminary data in aging mice suggest that serum SPARC levels are correlated with performance in grip strength, walking and running assessment tests, echocardiography and cardiac lesion grade. With these types of data, it is possible to begin assembling a comprehensive panel of secretory molecules to serve as surrogate markers of lifespan, health span, and other conditions of aging such as frailty and cognitive decline.

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