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Investigating quantitative trait loci (QTL) for improving rice (*Oryza sativa* L.) yield under drought stress conditions in Nepal

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Abstract

Drought stress is one of the most important abiotic stress hampering rice productivity in the rainfed rice growing areas. Severe drought spells in the rainfed areas occurring due to the ongoing trends in climate change severely affects rice production. The impact of green revolution to increased rice production has been limited in rain fed ecosystems. To identify consistent effect of QTL for grain yield under drought was conducted with the objective to improve grain yield under drought. Development of mapping populations in the background of popular high yielding varieties, screening at the target environments and identification of QTLs with consistent effect in different environments can be a suitable alternative marker assisted breeding strategies. An IR74371-46-1-1 × Sabitri back cross inbred line (BIL) population was screened for reproductive stage drought stress at IRRI, Philippines and RARS, Nepalgunj, Nepal in dry and wet seasons of 2011 respectively. Genotyping was carried via bulk segregant analysis and a consistent QTL, $qDTY_{12.1}$ was identified for grain yield under reproductive stage drought stress on chromosome 12. This QTL explained phenotypic variance of 24.6% and contributed additive effect of 47.7% for grain yield under drought. The identified QTL can be immediately introgressed to improve the grain yield of popular rice variety Sabitri following marker assisted backcross approach, Based on previous reports and results of the present study it could be concluded that this QTL is consistent across backgrounds, environments as well as ecosystems. This QTL is worth suitable for yield enhancement of rice varieties under reproductive stage drought stress.

Biography

Krishna Kumar Mishra has completed his Ph.D in Genetics and Plant Breeding from Sam Higginbottom Institute Of Agriculture Technology and Sciences(FormallyAgricultural Institute) Deemed to be University Allahabad-211007 (U.P.), India. He is the Senior Scientist in Nepal Agricultural Research Council (NARC) Nepal He has published more than 30 papers in reputed National and International journals and Proceeding.

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