



Validation of SSR markers associated with drought tolerant QTLs in rice (*Oryza sativa* L.)

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Water stress, one of the devastating abiotic stresses in rain fed rice ecosystems causes huge loss to rice yields. Enhancement of production as well as productivity in rain fed areas requires development of improved varieties for such regions. Slow progress in drought breeding is an impediment in this way. Marker assisted approach is an alternative for fast track improvements of crops for drought. Validation of markers associated with drought related traits across the populations would add value to their application. In the present study, four SSR markers viz., RM 263, RM 3825, RM 212 and RM 22 associated with drought tolerance QTLs, qDTY2.3, MQTL1.1, MQTL1.2 and qDTY 3.2 respectively, were evaluated for their use in marker assisted selection (MAS) in BC₁F₁ individual plants, derived from the cross (HUR 3022 × Nagina 22) × HUR 3022, (HUR 3022 × Birsa Gora) × HUR 3022, (Sarjoo 52 × Nagina 22) × Sarjoo 52 and (Sarjoo 52 × Birsa Gora) × Sarjoo 52. Marker RM 263 (qDTY2.3) and RM 3825 (MQTL1.1) were consistently associated with yield per plant in all the cultivars and their derived backcross populations. Therefore, these two SSR markers RM 263 and RM 3825 were found suitable for selection of drought tolerant rice lines in marker assisted backcross breeding (MAB) programs. Besides, SSR marker RM 212 (MQTL1.2) was reported to validate in BC₁F₁ population of (Sarjoo 52 × Nagina 22) × Sarjoo 52 and (Sarjoo 52 × Birsa Gora) × Sarjoo 52 whereas, SSR marker RM 22 (qDTY3.2) was validated in (HUR 3022 × Nagina 22) × HUR 3022 and (Sarjoo 52 × Nagina 22) × Sarjoo 52. Thus, these SSR markers would also be useful for improvement of drought tolerance in rice through MAS.

Keywords: Rice; Drought tolerance; SSRs; MAS.