

Swarna × *Oryza nivara* introgression lines: a resource for seedling vigour traits in rice

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Abstract

Seedling vigour is an important indicator of crop establishment, subsequent crop growth and yield. Initial seedling vigour is most vital in case of water-limited conditions and in environments where the crop is exposed to different stresses at the early growth stage. Wild and weedy species are well known for their vigour and survival in adverse environmental conditions. Seedling vigour traits of backcross introgression lines (BILs) derived from Swarna × *Oryza nivara* IRGC81848(S) (accession from Uttar Pradesh, India) and IRGC81832 (K) (accession from Bihar, India) were studied in wet (*Kharif*) and dry (*Rabi*) seasons. Seedling vigour was estimated in terms of plant height and tiller number at 30 and 60 d after transplanting under field conditions. In both the seasons, 148S showed highest seedling vigour for plant height. The highest number of tillers were produced by 7K in *Kharif* and 248S in *Rabi* season. 75S showed the highest percentage increase in tiller number consistently. High yielding BILs 166S, 14S and 148S showed higher seedling vigour indices compared with checks Tulasi and Sahbhagidhan. Seedling vigour was also evaluated using paper roll method and shoot length, root length and dry weight were used to estimate vigour index. Season-wise association studies were conducted to determine the relative contribution of seedling vigour to yield traits. Seedling vigour was significantly correlated with yield traits. Markers RM217 and RM253 on chromosome 6 differentiated lines with high seedling vigour from those with low seedling vigour and have the potential for use in marker-assisted breeding.

Keywords: backcross introgression lines, seedling vigour index, SSRs, yield, wild