**Abstract**

**Wheat is one of the most important cereal crops for food security and rust diseases continually pose a threat to wheat production at national and international level. Resistant cultivars are the economical, most reliable, environmentally safest and sustainable way to manage the rust diseases. Most of the rust resistance genes are all stage resistance (ASR) and therefore succumb to new variants of the respective pathogen soon after their deployment. Deployment of ASR genes does not often provide durable resistance, whereas adult plant resistance (APR) genes have small to intermediate effects when present alone. Same time, high and durable rust resistance could be achieved by combining the APR and ASR genes together. Selection of two or more genes in a single genotype can be difficult using conventional selection system. In such a scenario, phenotype neutral selection based on marker-trait association becomes inevitable. Stem rust has been a major threat to wheat production in the recent days. Sr2, a minor stem rust resistance gene was introgressed together with a major stem rust resistance gene Sr36 in the background of two popular wheat varieties, ‘Lok-1’ and ‘Raj 4083’. As the minor gene Sr2 alone cannot provide adequate resistance to stem rusts, major gene Sr36 was pyramided along with it. Marker assisted selection using microsatellite markers gwm533 and stm773-2 linked to Sr2 and Sr36 were performed in the BC1F1, BC1F2 and BC1F3 generations for the successful pyramiding of these genes. The microsatellite markers eased the process of identification of lines carrying the introgressed genes. Both phenotype and genotype data confirmed the co-presence of Sr2 and Sr36 genes. These lines with the two highly effective genes should be more useful for developing durable stem rust resistant wheat cultivars.**