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ISOLATION AND CHARACTERISATION OF YELLOW RUST RESISTANT MUTATION IN WHEAT

Stripe rust caused by Puccinia striiformis. f.sp tritici is major threat to wheat production leading to yield loss up to 84%. New races of stripe rust are being observed for which no durable source of resistance has been determined in the current high-yielding varieties. Mutation breeding programme was initiated in two popular varieties namely, PBW343 & HD2967 using gamma ray and electron beam irradiation. The gamma ray doses of 250, 300, and 350Gy and electron beam doses of 150, 200, and 250Gy were used for irradiating seeds of PBW343 and HD2967. Six M2 populations consisting of 75,000 plants of each variety were screened in the field from seedling to adult plant stage by spraying a mixture of urediniospores of Pt pathotypes (77-2, 77-5 and 104-2) and Pst pathotypes (78S84 and 46S119). Disease severity was recorded as the percentage of leaf area covered by rust pathogen following a modified Cobb's scale. A total of 52 putative rust resistant mutant plants in M2 population of HD2967 and 63 putative resistant mutants in M2 of PBW343 were identified. The Number of mutants was higher in the population derived from electron beam irradiation (EBM) as compared to gamma rays. The absence of sporulation and spore production of rust pathogen on mutants indicated resistance. Mutant plants showing seedling resistance also showed hypersensitive response in adult plant. Yield component characters of mutants were comparatively better than in the parents. The mutations responsible for the altered infection phenotypes appear to involve plant resistance genes that interact with the pathogen at later stages of the pathogen development. These rust resistant mutants could be a novel source of stripe rust resistance. The plant to row progenies of these mutants have been raised in M3 generation and are being characterized.

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