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DEVELOPMENT OF LEAFHOPPER AND WILT RESISTANT PISTILLATE LINE IN CASTOR THROUGH MUTATION BREEDING

DPC-9, a popular pistillate line of castor bean (*Ricinus communis*) is highly susceptible to leafhopper which is tightly linked to a monogenic trait absence or zero bloom (no waxy bloom) on different plant parts. Seeds of DPC-9 were treated with 550 Gy r-rays at BARC, Mumbai. Generations of M1 to M10 were raised in winter, at optimal nutrition and irrigation every year and the plants received fundus inoculum. Some plants wilted in M3, due to high inoculum (2×10^3 CFU/g soil) load. Segregation for bloom varying from triple (all parts waxy) to zero bloom was observed in M5 and continuous selection pressure for bloom in pistillate background, led to the selection of 9 DPC-9 mutants with green stem, triple or double bloom, spiny capsules and pistillate expression up to sixth order that of spikes. Among the nine mutant DPC-9 selections, IPC-23, a pistillate line with green stem, triple bloom trait, low node number (7-8), short plant height (40-50 cm) to the primary spike, early flowering (30-40 days to 50% flowering) and good branching (10-12) was stabilized. Screening for leafhopper resistance using infester row technique, indicated that IPC-23 is highly resistant to leafhopper (grade 0) compared to checks, DPC-9 and DCH-177 (grade 4). It is also resistant to wilt (8.5%), compared to check, JI-35 (97%) in a wilt infested plot. Genetic similarity coefficient between DPC-9 and IPC-23 was 58% in a genotypic data from 130 SNP loci representing all linkage group of castor beans. Pistillate behaviour is similar to DPC-9, with environmentally sensitive ISF and revertants. IPC-23, a physiologically efficient line with good HI (31.3%) is good combiner for early flowering and maturity. Several hybrids based on IPC-23 yielded 34-134% standard heterosis in preliminary yield trials.

Country or International Organization

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