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HAPLOIDY IN RICE (ORYZA SATIVA L.) MUTATION BREEDING FOR STRIGA RESISTANCE

The parasitic weeds Striga asiatica and S. hermonthica cause a significant reduction in the yield of rice. Identification of resistant hosts by application of mutation breeding and doubled haploidy is one of the most viable control options. The aim of this research was to develop androgenesis technology for production of mutant doubled haploid population in rice. Different inductive pre-treatments including cold shock (4-7℃ for 7 – 21 days), heat shock (30-33℃ for 1-10 days), and starvation stress (B medium/ mannitol 0.3 M) were applied on four Iranian rice cultivars. Anthers containing microspores at the mid to late-uninucleate stage were excised from the central part of the panicles. Different induction media including AT3, NLN-13, B5, N6 and MS were applied in one-layer and two-layer culture media for shed/anther cultures. In shed-microspore culture, embryos were formed when anthers excised from pre-treated panicles (4ºC for 10-12 days) and cultured in the two-layer culture media (B5 medium with 6% sucrose as the below and B5 medium with 3% sucrose + glutamine as the above). Cultures incubated at 33℃/4d or 30℃/10d resulted in shedding of microspores and then embryos were formed after 20 days. In anther culture, calli were formed in induction L8 medium from pre-treated panicles (4ºC for 8-10 days). Calli (2-3 mm) were transferred to the regeneration MS medium supplemented with 2 mg/L Kinetin and 5 mg/L NAA led to the highest rate of shoot regeneration. The haploid induction was proven through flowcytometry and seed setting methods. The protocol developed was successfully led to haploid rice plants. Chromosome doubling methods are being developed. Doubled haploid lines will be produced on irradiated seeds for screening of striga resistant mutants.

Country or International Organization

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