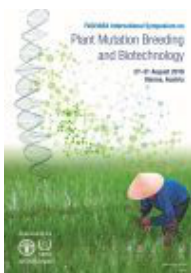


# FAO/IAEA International Symposium on Plant Mutation Breeding and Biotechnology



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## DEVELOPING MUTANT RICE GERMPLASM COMBINING GAMMA RAY MUTAGENESIS WITH DOUBLED HAPLOIDY IN NATIONAL AND INTERNATIONAL RICE BREEDING PROGRAMMES

Rice (*Oryza sativa* L.) is one of the most important food crops in the world, feeding more than 50% of the world's population. However, an exponential growth in the world's population, particularly in developing countries where rice is the major staple food resource, demands increased rice production. Moreover, recent abrupt climate changes make crop production more difficult. This situation has compelled plant breeders to produce climate change-resilient crops, which can withstand broad-spectrum biotic and abiotic stresses. Breeders urgently need to develop new genetic variation in accelerating crop improvement and achieving sustainable yield increases. Induced mutation through physical or chemical mutagenesis is a useful approach to produce novel variation. This is particularly powerful when combined with enabling biotechnologies such as doubled haploidy. Doubled haploidy is the fastest way of achieving completely homozygous plants (in one generation). After determining optimal irradiation dose treatments through radio-sensitivity analysis, dry seeds from two commercial rice cultivars and one candidate line were exposed to three different gamma ray doses to obtain M1 mutant populations. During booting stage, panicles were collected for anther and microspore culture to obtain double haploids in vitro. Androgenic calli were obtained using three different culture media. The rate of albino plants obtained from cultured androgenic calli from M1 plants was higher than in controls (M0). Gamma irradiations increased the rates of albinism in rice haploid/doubled haploid plants depending on the damage caused by the plant genome.

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