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DOSE OPTIMISATION FOR POLLEN AND EMBRYOS IRRADIATION MUTATION INDUCTION IN OIL PALM

Mutation induction has a great potential to create genetic variability in plant populations for subsequent selection of novel characteristics for human and other needs. In oil palm, the exploitation of this technology is still rudimentary. In this study, oil palm propagules and pollen were irradiated with gamma radiation to determine the optimal irradiation doses for mutation induction in oil palm mutation breeding programme. Lyophilized pollen from dura, pisifera and tenera varieties of oil palm were irradiated at varying doses of gamma radiation ranging from 0-5 kGy. The irradiated pollen grains were then cultured on a sucrose medium containing 5 % boric acid and incubated in the dark at 33^{0}C. Eight hundred (800µl) of the medium was plated for light microscopic studies. The irradiation dose conferring 50 % lethality (LD50) determined on pollen germinability ranged from 2.4 kGy to 3.2 kGy indicating that oil palm pollen grains are highly radio-resistant, with pisifera being the most sensitive. Pollen obtained from Tenera variety was however, least susceptible to the radiation treatment. The optimal dose for embryos under in vitro culture conditions was 18 Gy while in vivo, optimized dose for whole non-germinated nuts was 15 kGy. Developing plantlets and/or seedlings showed varied morphological variation depending on the dose of irradiation. This study provides the very critical information for mutation induction in oil palm using oil palm embryos, pollen and whole non-germinated nuts.

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