Physiological studies on papaya transplants

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The present investigation was undertaken throughout the two successive seasons of 2008 and 2009 at the greenhouse of the Experimental Farm of Faculty of Agriculture, Moshtohor, Benha university, Egypt. Consequently, this investigation included three main parts as follows :Part I: Effect of seed soaking of two papaya cvs. (Solo and Betty) in some chemical substances at different concentrations on germination parameters, some growth measurements and nutritional status of the emerged papaya seedlings.Part II: Effect of seed treating of two papaya cvs. (Solo and Betty) with various doses of gamma irradiation on seed germination parameters, some growth measurements and nutritional status of the emerged papaya seedlings.Part III:Cytological study of the papaya seedlings which resulted from germinated seeds and treated with both colchicine and EMS solutions to throw some light on their chromosomal behaviour .In this regard , mature papaya seeds cvs. " Solo " and " Betty " were extracted from ripe fruits of trees grown at the Experimental Farm of (El — Kanater Horticultural Research Station), Kalybeia Governorate, Egypt The seeds were collected and planted in March of 2008 and 2009 seasons These seeds were subjected to one of the following treatments :1 -Seeds were soaked in tap water for 24 hours (control) .2 -Seeds were soaked in gibberellic acid (GA3) at 20, 100 or 150ppm3 -Seeds were soaked in naphthalene acetic acid (NAA) at 25, 50 or 75 ppm.4 -Seeds were soaked in yeast extract at 50 , 100 or 150 ml/L.5 -Seeds were soaked in colchicine at 20 , 30 or 40 mg / L .or , 0.4 %) .With respect to study the effect of gamma irradiation at the different doses on some germination and growth parameters of papaya , the previously collected seeds were subjected to one of the following treatments :1 -Control treatment (untreated seeds).2 - Seeds soaked in water and irradiated with gamma rays at 10Kr.3 - Seeds soaked in water and irradiated with gamma rays at 20Kr.4 - Seeds soaked in water and irradiated with gamma rays at 40Kr.Moreover , in both 2008 and 2009 seasons of study , seeds soaked in different solutions of chemical substances and those irradiated with gamma rays as well as untreated seeds which represent the control treatment were sown in March , 25th in plastic pots (30 cm . indiameter) filled with a mixture of sand and clay soil (1 : 1 by volume), then these plastic pots were kept under greenhouse conditions .The randomized complete block design was used for arranging the abovementioned treatments with three replications,Summary-122 -whereas each replicate was represented by one plastic pot sown with (50) seeds . The effect of tested chemical substances on seed germination was evaluated through the following germination parameters: germination percentage and germination rate. The obtained results could be summarized as follows:A.I.1. Effect of seed soaking of two papaya cvs. (Solo andBetty) in some chemical substances at different concentrations on seed germination parameters.A.I.1.1. Germination percentage:All tested treatments except colchicine and EMS enhanced germination percentage as compared with the control . Briefly the most effective treatments in this respect were 100 ppm GA3 , 50 ml/L yeast extract and 25 ppm NAA treatmentsA.I.1.2.Germination rate:All tested treatments except colchicine and EMS enhanced germination rate as compared with the control . Briefly the most effective treatments in this respect were 100 ppm GA3 , 50 ml/L yeast extract and 25 ppm NAA treatments.