# Effect of gamma rays on fruit storage of some date palm cultivars

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This investigation was conducted on two dategroups: Semi-dry date (Amry cultivar) and dry date(Sackoti and Bartamoda cultivars) dates, at the NationalCenter for Radiation Research and Technology (NCRRT),in Cairo, .during two successive seasons, 1992 and 1993.The aim of this study is to find out the best alternativemethod for improving fruit quality as well as prolongingthe marketable period of date fruits.Semi-dry date (Amry) fruits were obtained from EIKourainregion, Sharkia Governorate. While, dry datefruits were brought from Aswan Governorate. Twohundred and twenty kilograms of fruits from each dategroup were collected to be used for the differentpostharvest experiments.Twenty kilograms of Amry date fruits weresubjected to the heat treatment (40°C for 72 hours) whichis commonly used in EI-Kourain region, while in case ofc. dry dates, fumigation treatment with methyl bromide(MB) was used as common method in Aswan. Anyhow, alldate fruits were transferred to the laboratory then dividedinto samples of 500 g. each. During the first season, Amrydate fruits we e packed in perforated polyethylene bags.In the second season, only one half was packed in nonperforatedpolyethylene, while the others packed in clothbags. Moreover, dry dates were packed in perforated bagsof either paper craft or polyethylene bags during the firstseason, while in the second season three types ofpackages i.e polyethylene, paper craft and cloth wereperforated. iThe obtaineld results can be summarized as follow:7-1- Physi~al characters:7-1-1- Weight loss:1- Weight loss was increased by prolonging storage Iperiod in all treatments and date cultivars under study.!2- rrr~diation treatments succeeded in reducingIweight loss lin both Sackoti and Bartamoda date fruits,while heat treatment was preferred in this respect forAmry semi-dty date fruits.3- The higher doses of irradiation (0.75 and 1.00kGy) reduced weight loss in all studied date fruits.4- Pap1r craft and cloth packages reduced weightloss in relation to polyethylene for both Sackoti andBartarnoda dJte fruits, while polyethylene package was Ipreferred in this respect for Arnry semi-dry date fruits.7-2- Chemical characters:7-2-1- Moisture content:1- Moisture content percentage decreased byprolonging the storage period in all treatments and datecultivars under investigation.2- Heat treatment decreased moisture content ofAmry semi-dry and Sackoti date fruits while, heat plusirradiation treatments decreased moisture content ofBartamoda date fruits.3- Higher doses of irradiation (0.75 and 1.00 kGy)were more effective in this respect in all date cultivarsunder study.4- Cloth package gave the highest decrease Inmoisture conltent of date fruits under investigation.'-7-2-2- PH values:1- PH values in fruits decreased by increasing the storageperiod in all treatments and date cultivars under study.2- Heat plus irradiation treatments succeeded Inpreserving pH values of both Sackoti dry date and Amrydate fruits, while irradiation treatment solely waspreferable in this respect for Bartamoda date fruits moreobviously than other treatments.3- Polyethylene package reduced the change in' pHvalues of Bartamoda date fruits, while cloth package, reduced the DROP in pH values of Amry date fruits.However, no ~ignificancy was obtained between different.packages for Sackoti date fruits.i7-2-3 -Total snluble solids:i1- Tot~l soluble solids percentage increased infruits by prollonging the storage period in all treatments;and date cultivars under study.2- Heat treatment increased fruits total solublesolids percentage of all date fruits under investigation.3- The 'lower doses of irradiation (0.25 and 0.50 kGy)surpassed the higher ones (0.75 and 1.00 kGy) in increasing totalsoluble solids of all date fruits under study.4- polyethylene and cloth packages augmented totalsoluble solids percentage of both

Sackoti and Bartamodadate fruits, while cloth package was promising in thisrespect for Amry date fruits.7-2-4 Total sugars:1- Under all treatments used, total sugars in fruitsdecreased wi~h increasing storage period.2- Irradiation treatments succeeded in preservingtotal sugars !of fruits during storage of both Sackoti and136Bartamoda date fruits, while, heat plus irradiationtreatments were preferred in this respect for Amry datefruits.3- Polyethylene package increased total sugarspercentage of Bartamoda date fruits, while cloth packagewas preferred for Amry date fruits in this respect. On theother hand, no statistical effect was noticed betweenpackages for Sackoti date fruits.7-2-5- Reducing sugars:1- All treatments used decreased reducing sugarspercentage as storage period go by.2- Irradiation as well as irradiation plus heattreatments preserved reducing sugars percentage inSackoti date i fruits, while heat treatment gave a similarieffect for Am y date fruits.3- Pap r craft and cloth packages decreased the lossIn reducing sugars percentage of both Sackoti andBartamoda d te fruits, while, polyethylene package wassuperior in this respect for Amry date fruits.7-2-6- Tann os percentage:Tannin percentage was not affected statistically bythe different reatments used in this study.7-2-7- Amino acids content:1- Total amino acids (essential and non-essential)decreased or increased by increasing storage periodaccording to the treatment used.2- High irradiation treatment (1.0 kGy) succeededin increasing total amino acids content (essential and nonessential)in fruits of all date cultivars under study.7-3- Insect infestation:1- The percentages of date fruits free of infestationdecreased with increasing storage period under alltreatments and packages used in this study.2- Heat plus irradiation treatment succeeded indecreasing insect infestation in all date fruits under study.3- Polyethylene package was generally superior inthis respect in all studied date fruits.