Short Communication

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Influence of Different Packaging Materials on Fruit Quality of Two Date Cultivars Grown in Faisalabad

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Exquisite taste and nutritious value of the date *(Phoenix dactylifera* L.) is recognized from biblical times. The date fruit undergoes a number of physiological and chemical changes during the course of its ripening and storage. Important changes take place in its colour and texture and thus its quality and marketing can be affected. The problem of its post -harvest handling is, therefore, more delicate as compared to other agricultural produce. It is estimated that more than 25% of all the fruits are perished in tropical countries due to improper storage, transport and packing procedures [1]. For high market value, various lining materials like newsprint, cellophane and polyethylene of various thicknesses have been used for persimmon, citrus, etc. [2,5,6], The experiment was carried out to examine the impact of different packaging materials on some physical characteristics of date cultivars grown in Faisalabad. Date fruits of two varieties, Khudrawi (V_1) and Zaidi (V_2) were harvested at *"Doka"* or *"Khalal"* stage, washed, dried, clean with muslin cloth and then divided into five equal lots per cultivar. Each lot contained 50 fruits of similar size. Weight of one lot was 1 kg ± 5 gm. Both varieties were subjected to the treatments (i) control, fruit were placed in open trays, i.e. no packaging, (ii) no lining material was used and the fruits were packed in cardboard boxes, (iii) fruit packed in newsprint and then in cardboard boxes, (iv) fruit packed in un-perforated polyethylene (PE) bags, and (v) fruit packed in perforated PE bags. The size and thickness of different packaging materials used were:

Packaging materials	Size (cm)	Thickness (mm)
Cardboard boxes	12x18x3	0.465
Newsprint paper	24x24	0.093
PE bags	23x18	0.030

Temperature of 28±2°was maintained. Readings for moisture contents, weight loss, fruit firmness and ripening percentage were taken after 12 days of storage. The A.O.A.C. [2] methods were employed for determining moisture contents and weight loss. Fruit firmness in psi was determined by using Maturometer. Data obtained was fed into a computer for ANOVA by MSTAT-C package as factorial experiment with two cultivars. DMR test was used for comparing means.

All treatments differed significantly from each other. Unperforated PE bags had the least moisture loss due to a complete air tight atmosphere. Another factor for the retention of moisture could be the element of humidity. It is known that if there is lesser loss of humidity, the fruit will have greater weight and lesser weight loss. Prevention of moisture is itself a characteristic of a variety which reflect the response of genotype of different treatments. In the instant case Zaidi (58.93%) contained more moisture than Khudrawi, 55.48% (Table 1).Rehman and Sadiq [4] observed the similar findings in their experiment that Zaidi date contained higher moisture than Brehmi and Hillawi.

Fruit firmness is likewise a varietal characteristic and every genotype possesses certain inheritance for the purpose. Fruits of Zaidi were firmer than Khudrawi, and similarly packed in PE bags were firmer than the cardboard boxes. Zaidi

TABLE 1. INFLUENCE OF PACKING MATERIALS ON DATE-FRUIT.

Treatment	Mositure percentage (%)			Weight loss (%)			Fruit firmness (%)			Fruit ripening (%)		
	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean	V_1	V_2	Mean
T0	48.03 e	51.26 d	49.64 e	16.84 a	12.29 a	14.56 a	15.97 d	17.66 c	16.81 c	47.11 a	42.41 a	44.71 a
T1	50.22 d	54.96 c	52.59 d	14.01 b	11.60 a	12.81 b	16.23 cd	17.73 c	16.98 c	40.70 b	31.14 b	35.92 b
T2	57.33 c	60.42 c	58.87 c	12.95 c	9.21 b	11.08 c	17.28 b	18.14 c	17.71 b	39.04 c	29.02 c	34.03 c
T3	62.23 a	64.89 a	63.56 a	6.37 e	5.35 d	5.86 e	16.63 c	20.05 a	18.34 a	30.15 e	22.18 e	26.17 e
T4	59.61 b	63.14 b	61.38 b	9.92 d	6.72 c	7.87 d	17.86 a	19.01 b	18.44 a	32.05 d	25.23 d	28.69 d
Mean	55.48	58.93	-	11.84	9.04	-	16.79	18.52	-	37.81	30.02	-

psi = Pounds per square inch; T0 = Control (no packing material); T1 = Fruit packed in unlined cardboard boxes; T2 = Fruit packed in lined (newsprint) cardboard boxes; T3 = Fruit packed in un-perforated polyethylene bags; T4 = Fruit packed in perforated polyethylene bags.

Note: In a column, means followed by the same letter do not differ significantly at $p<0.05$ according to DMR test.

packed in un-perforated PE bags had fruit firmness of 20.05 psi, while in case of Khadrawi perforated PE bags excelled the other treatments with the reading of 17.86 psi. Meligi *et al.* [7] demonstrated that Bruhi fruit firmness was the hghest (17-18 psi) followed by Samini (15-16 psi).

More moisture contents, higher humidity levels, and limited weight loss in the fruit packed in PE bags resulted in firmer fruits and thus, withheld ripening changes. The maximum ripening occurred in control in both the varieties. While better results were obtained for cardboard boxes (unlined or lined, respectively) with the best in case of PE bags packed fruits. Respiration may also be responsible for enhancing the rate of ripening in case of control and unlined cardboard boxes packed fruit. The results are congruent with Ben-Yehashu *et al.* [5], who reported that seal-packing of citrus cultivars with high density PE films 0.01 mm in thickness delayed the softening (ripening) process and inhibited the deformation of the fruit. Thus it can be concluded that by packing the date fruits in unperforated PE bags, their shelf-life can be increased because air-tight packing withholds the ripening process.

Key words: *Pheonix dactylifera,* Packaging materials, Polyethylene bags, Fruit firmness, Genotype.

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