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Yield and Morphological İnvestıgatıon of Different Tigger Melon (Cucumis Melo Dudaim) Genotypes Belongıng to Sirnak/Turkey Region

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Abstract
This study was performed in 18 different tigger melon (*CUCUMİS MELO DUDAİM*) genotypes which were collected from the various villages of İdil/Sirnak. In the study, measurements of brix in fruit, SPAD, dry matter in fruit, total yield, seed weight, seed weight per fruit, seed length, number of seeds per fruit, fruit weight, fruit length, fruit width, fruit wall thickness, main stem diameter, main stem length, the main number of nodes in the stem, nod in the main stem were carried out. In addition, the experiment was performed with 4 replications including 10 plants per every replicate. The experiment was made according to the random design of the trial blocks. The data obtained at the end of the experiment statistical analyzes were made by evaluating with JMP8 program and the means were compared according to LSD test. In addition, cluster analysis was also performed in terms of similarity between genotypes in the experiment. As a result, when the fruit measurements are examined; total fruit yield was recorded with high amount in the tigger melon genotype, on the other hand, genotype number 13 of the tigger melon was recorded as the low. According to the obtained results, morphological and pomological measurements demonstrated difference from each other in 18 tigger melon melon plants and fruits.
Keywords: Tigger melon, Seed, *CUCUMİS MELO DUDAİM,* SPAD, Brix.
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1. Introductıon

Latin name of this plant which is from Cucurbitaceae Family is Cucumis melo dudaim and it is also called tigger melon. It is an annual plant, can climb with the help of branches. The plant is sometimes grown in tropical regions rather than warm temperate zones. The small size of this fruit is seen in the market as a melon that can be purchased for individual consumption and as ornament (Lorenzı, at al., 2006). These melons also provide an edible oil and have a variety of traditional medical applications. These melons can be grown in tropical zones from a warm temperate zone to a height of 1000 meters. They grow best in regions where the annual daytime temperatures range from 18 to 30 °C. They can tolerate 9-35 °C and prefer an average annual rainfall of 1.000 - 1.300 mm, however, they tolerate rainfall of 900 - 2,500 mm and prefer a pH in the range of 6 - 7.5, with a tolerance of 5 to 8.7 (418). They grow best in areas where there is not much rainfall or humidity, because these conditions reduce fertilization and lead to diseases of the leaves. It takes 3-4 months to produce the crop from the seed which was killed by frost (Tindall, 1983). Fruit weights are usually less than 200 grams, but in some genotypes fruit weights are seen in excess. Fruit flesh is a white and slightly sweet flavor, but a nice aroma and fragrance has been determined as high quantity (Lorenzı at al, 2006). Seed - crude (Tanaka, T., and Nakao, S. 1976). Hazelnut oil is a rich oil, but it is very small because the seed is small and covered with a fibrous sheet. The seed contains 12.5% - 39.1% fat (Duke, J. A., and Ayensu, E. S. 1985). An edible oil is obtained from the seed (105, 183). Melon (Cucumis melo L.) is an important vegetable both in Turkey and in Worldwide and has 24 million and 1.61 million tons production respectively with an area of 1,07 million and 95 thousand hectares (Anonymous, 2010). In addition, Turkey located in secondary genetic diversity center, from Asia to Japan (Pitrat M., et al, 1999; Jeffrey 2001; Sensoy S., et al, 2007). 15 melon genotypes collected by Şensoy et al, (2008) were cultivated in 100th year University Horticulture Application Land and their phenotypic characterizations were examined. They have done some phenological and morphological measurements in melon genotypes and examined their properties. In the investigation in 31 different melon genotypes performed by Soltani et al, (2010), differences were seen in terms of morphological characterization in some melon genotypes. According to the results obtained from the studies, differences and similarities between genotypes were shown by cluster analysis (Karaagac and Baklaya 2009).

2.Materials and Methods

The research was conducted in 2018 in the experiment area of the Department of Horticulture, Faculty of Agriculture, Sirnak University. 18 different Tigger melon genotypes were used in the experiment (Figure 1). The materials were collected from different villages of İdil region and from different locations (Table 1). The experiment was carried out with 4 repetations and 10 plants totally, seeds were planted at each repetation. The experiment was conducted according to the randomized block pattern and the data obtained at the end of the

experiment were subjected to JMP program and statistical analyzes were made and the means were compared according to LSD test. The experiment was conducted according to the randomized block pattern by subjecting to JMP package program. Besides the average data were compared to LSD test. In addition, cluster analysis was conducted in our study. Tigger melon seed was planted directly in the soil. Besides, seeds were planted without giving water. In experiment, seeds were planted as 60cm intervals on line and 120cm intervals between lines. The seed planting was performed on date of May 15, 2018 and the harvested on dates of 2, 7, 12 August 2018 and the yield of each harvest was recorded. After planting, on June 28, 2018, chlorophyll content (SPAD), number of main trunk knuckles, trunk length, main trunk diameter, main arm length were measured with digital caliper and meter. On each repetation, average fruit weight (g), average fruit length (cm), average fruit diameter (cm), average fruit thickness (mm), amount of water soluble dry matter (WSDM %), the number of seeds per fruit (pieces / fruit), seed weight per fruit (g / fruit), seed diameter (mm), seed length (mm) measurements were made.

Figure 1. An image of 18 different Tigger melon genotypes.

Table 1. Tigger melon (*CUCUMİS MELO DUDAİM*)) genotypes used in the experiment.

Genotype	Origin
şemamok1	İdil 1
şemamok3	İdil3
şemamok4	İdil4
şemamok5	Tepe köyü1
şemamok6	Tepe köyü2
şemamok7	Tepe köyü3
şemamok8	Teke köyü1
şemamok9	Teke köyü2
şemamok10	Yar başı1
şemamok11	Yar başı2
şemamok12	Yar başı3
şemamok13	Dirsekli köyü1
şemamok14	Dirsekli köyü2
şemamok15	Midyat1
şemamok16	Midyat-Arabi-Ağustos2
şemamok17	Midyat3
şemamok18	C Bostan gülü
şemamok19	Sulak köyü

3.Result and Dıscussıon

The highest total Tigger melon fruit yield were obtained as 15 (9740 g / plant), 17 (8437 g /plant), 19 (3234 g / plant), 1 (2807 g / plant). Besides, the lowest Tigger melon yield were obtained as 13 (1164 g / plant), 9 (1172 g / plant), 19 (1172 g / plant) respectively. In addition, the highest fruit weight rose 15 (611 g / fruit), 17 (558 g / fruit), and the lowest Tigger melon yield 8 (85 g / plant), 10 (86 g / fruit) were obtained respectively (Table 1). The highest Tigger melon fruit lengths were obtained as 15, 17 (184, 152 mm respectively) and the lowest Tigger melon fruit lenghts 9 and 13 (46, 51 mm, respectively). There is a significant correlation between fruit weight and fruit length on different melon genotypes (Taha, et al., 2003). The number of fruits on the plant and the average fruit weight are related to the total fruit yield (Feher T. 1993). When we look at the parameters of Table 2 and 3, the highest chlorophyll content was observed in Tigger melon 17 (64.46%), 19 (55.94%), and the highest plant main arm length 19 (68.42 cm), 17 (65.98 cm), and accordingly chlorophyll content was found to have a relationship with the main arm length of the plant. It was observed that the main arm length was more developed as the chlorophyll content in the plants increased. Parameters of number of seeds per 18 Tigger fruit (number / fruit), seed weight per fruit (gr / fruit), seed diameter (mm), seed length (mm), are given in Table 3. The maximum number of seeds per fruit was seen on Tigger melon 1, 15 and 17 (524.25, 485.75 and 426.50, respectively). In the different pumpkin investigations made by Berenji and Papp (2000), it was seen that there is an significant relationship between number of seed per fruit and seed weight per fruit. There was no significant difference between the seed diameter (mm), seed length (mm) of the Tigger 18 melon. Among genotypes, a difference in seed weight (g / fruit) per fruit was observed. The seed weight per fruit was seen as Tigger melon 1, 15 and 17 (12.02, 13.54 and 10.45 g / fruit, respectively). The relationship between the number of seeds per fruit and fruit weight and seed weight per fruit were determined. In addition, as the number of seeds per fruit increased, fruit weight and seed weight per fruit increased. The highest dry matter content was determined in Tigger melon 16, 15 and 1 genotypes (10.15, 9.75 and 9.58%, respectively), while the lowest dry matter content was determined as Tigger melon 3 and 7 genotypes (6.50, 6.73%, respectively). Highest water soluble dry matter content (WSDM) was determined in Tigger melon 16, 15 and 1 genotypes (8.60, 8.18 and 7.68% respectively), while lowest soluable dry matter content was determined in Tigger melon 3 and 7 genotypes (5.18, 6.01%, respectively) (Table 2). Accordingly, there is a parallel between the genotypes in both measurements (dry matter and water soluble dry matter). The water-soluble dry matter in different fruits and vegetables consists of fructose, glucose and sucrose and sugars and different acids, respectively (Cemeroglu,1992).

Table 2. Characteristics of 18 different tigger melon genotypes in brix in fruit, SPAD, dry matter in fruit, total yield, fruit weight, fruit length, fruit width, fruit wall thickness.

Genotype	Chlorophyll (SPAD)	Brix in fruit (%)	Dry matter in fruit (%)	Total yield (g/plant)	Fruit weight (g/ fruit)	Fruit length (mm)	fruit width (mm)	fruit wall thickness (mm)
semamok1	52.69 c	7.68 c	9.58 ab	2807 d	123 d	62 d	64.66 d	11.58 g
semamok3	34.01 k	5.18 ı	6.50 f	1567 g	102 ef	56 gh	54.35 j	8.72 g
semamok4	42.10 h	6.79 d	8.61 c	1355 h	87 fg	52 ı	49.78 m	11.54 c
semamok5	36.39 j	6.50 ef	7.75 d	1574 fg	105 e	56 gh	57.79 h	9.59 f
semamok6	31.18 l	6.43 fg	6.94 ef	1592 fg	107 de	62 d	55.77 ı	10.19 e
semamok7	36.41 j	6.01 h	6.73 ef	1679 ef	117 de	56 gh	57.92 h	9.26 f
semamok8	39.15 ı	6.63 d-f	6.79 ef	1278 hı	85 g	58 e-g	53.64 j	8.33 h
semamok9	36.40 j	6.75 de	7.88 d	1172 ıj	78 g	46 j	51.81 k	9.35 f
semamok10	43.58 g	6.44 fg	9.30 b	1263 h-j	86 fg	57 f-h	55.31 ı	8.68 gh
semamok11	43.68 g	6.48 f	9.45 b	1172 ıj	109 de	64 d	47.95 n	7.44 ı
semamok12	38.86 ı	6.38 fg	6.94 ef	1575 fg	111 de	67 c	67.50 c	10.56 d
semamok13	44.93 f	6.45 fg	7.25 de	1164 j	80 g	51 ı	61.75 f	8.64 gh
semamok14	46.73 e	6.03 h	7.35 de	1350 h	87 fg	59 e	50.87 l	8.64 gh
semamok15	47.83 d	8.18 b	9.75 ab	9740 a	611 a	184 a	73.32 b	16.24 a
semamok16	49.22 c	8.60 a	10.15 a	1738 e	117 de	58 ef	58.10 h	11.71 c
semamok17	64,46 a	6.20 gh	9.53 ab	8437 b	558 b	152 b	63.35 e	14.48 b
semamok18	38.80 ı	7.50 c	7.24 de	1283 hı	88 fg	55 h	98.20 a	8.53 gh
semamok19	55.94 b	6.48 f	7.60 d	3234 c	246 c	64 d	60.10 g	10.54 de
$LSD_{0.05}$	0.81	0.27	0.64	111.33	17.04	2.08	29.55	0.35

18 Tigger melon Number of knuckles on main trunk (number), knuckle length (cm) in main trunk, main trunk diameter (mm), parameters are given in Table 3. Significant differences were found between the lines in terms of main trunk length. The maximum knuckle number on main trunk was seen on 18 Tigger melon 1 (11.82), while minimum knuckle number was seen on 10 and 6 genotypes (6.58 and 6.60, respectively). The diameter of the main trunk was determined as 7.16 mm in the Tigger melon 5 and 10.32 mm in the Tigger melon 18 (Table 3). Besides, these parameters were not found in a relationship with total fruit yield. Accordingly, Feizian A. 2004 is consistent with his findings in his study on melon.

Table 3. Characteristics of 18 different tigger melon genotypes in main stem diameter, main stem length, the main number of nodes in the stem, nod in the main stem.

Genotype	Number of seeds per fruit (number/fruit)	Seed weight (g/fruit)	Seed weight (mm)	Seed length (mm)	Main number of nodes (number)	Nod in the main stem (cm)	Main stem diameter (mm)	Main stem length (cm)
semamok1	524.25 a	12.02 b	3.77	8.71 ı-j	11.82 a	4.32 a	8.42 c	67.91 a
semamok3	324.75 f	6.31 f	3.39	8.65 ı-k	8.83 b	3.69 b	7.41 d	44.27 hı
semamok4	186.00 o	4.42 h	3.82	9.39 fg	6.95 e	1.44 d-f	7.30 d	48.33 de
semamok5	256.75 l	5.47 g	3.72	8.77 ı	11.62 a	1.53 d-f	7.16 d	49.56 d
semamok6	217.00 mn	4.50 h	3.48	9.53 e-g	6.60 e	1.51 d-f	6.34 e	40.95 j
semamok7	315.75 g	6.14 f	3.17	7.07 l	11.27 a	1.24 ef	8.27 c	43.87 ı
semamok8	213.50 n	4.37 h	3.58	8.56 jk	9.04 b	1.55 d-f	7.27 d	40.51 j
semamok9	281.75 j	7.14 e	3.65	9.61 e	11.62 a	1.38 d-f	7.52 d	47.54 ef
semamok10	285.50 ıj	5.36 g	3.31	9.18 h	6.58 e	1.14 f	6.59 e	49.63 d
semamok11	216.75 mn	4.45 h	3.57	9.36 gh	7.49 c-e	2.29 c	7.57 d	47.41 ef
semamok12	369.50 e	8.62 d	3.31	8.51 k	8.22 b-d	1.62 de	8.35 c	43.98 ı
semamok13	418.00 d	8.94 d	3.65	9.56 ef	7.32 c-e	1.67 d	8.62 c	43.67 ı
semamok14	286.50 ı	5.28 g	3.34	8.06 l	8.59 b	1.59 de	9.44 b	47.21 e-g
semamok15	485.75 b	13.54 a	4.21	10.59 b	7.45 c-e	1.47 d-f	6.40 e	45.46g-ı
semamok16	218.75 m	10.40 c	4.58	12.27 a	8.16 b-d	1.63 de	9.30 b	58.02 c
semamok17	426.50 c	10.45 c	4.25	10.24 c	6.58 e	1.24 ef	8.49 c	65.98 b
semamok18	261.50 k	5.06 g	3.26	9.85 d	7.32 c-e	1.65 de	10.32 a	45.95 f-h
semamok19	294.25 h	8.95 d	4.50	9.53 eg	7.19 de	2.37 c	7.46 d	68.42 a
$LSD_{0.05}$	4.19	0.48	Öd	0.18	4.27	1.71	1.70	1.81

ÖD: Önemsiz Değer

18 Tigger melon has been divided into two main groups ; First group contains 1, 15, 8, 14 and 16, second

group contains 17, 8, 4, 5, 10, 9, 7, 3, 12, 13, 11, 6. And number 2 genotypes are t he most similar genotypes. And it was found that number 2 genotypes are the most similar genotypes. It was determined that the most similar genotypes are 4, 8 genotype pairs, while the most different genotype pairs were 1, 17, 2, 5 and 12. The most significant of all genotypes evaluated are 1, 17, 2, while the least significant ones are 13, 8. In addition, the most remote genotype was determined as 1 (Figure 2).

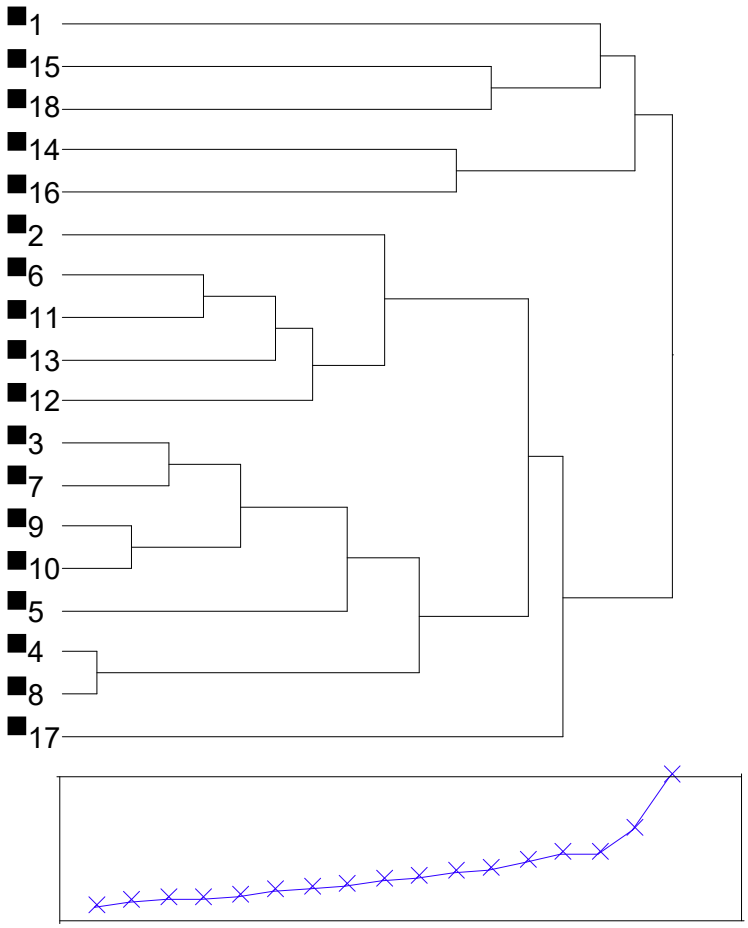

Figure 2. Cluster analysis of some morphological characteristics of 18 different Tigger melon genotypes of Idil / Sirnak region.

4.Conclusion

Conservation and preservation of gene resources in plants, their utilization in breeding studies, determining and keeping under the records the differences between genotypes by examining the physiological, morphological and pomological characteristics will be useful to our study. In addition, in the following stages, it is aimed to make use of aroma analysis in the fruit of 18 tigger melon to use the prominent genotypes of the best genotypes in our breeding studies.

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