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SCREENING SOME LOCAL AND INTRODUCED PUMPKIN (*Cucurbita moschata*) GENOTYPES FOR EARLINESS AND FRUIT YIELD TRAITS

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ABSTRACT

Fifteen genotypes of pumpkin (*Cucurbita moschata* Duchesne) were screened for earliness and fruit yield at the Experimental Farm, Faculty of Agriculture, Sohag University during the two successive seasons; 2007 and 2008. There were significant differences among genotypes for all studied characters. Etamp cultivar had the longest vine length and leaves number per plant, while Butternut cultivar had the shortest vine length in both seasons. Butternut cultivar gave the highest value of sex ratio, while the lowest one was recorded by El-Mansoura cv. Butternut cultivar was the earliest in both male and female flowers, while genotype Khartoum (Sudan) accession was the latest in male and female flowers in both seasons. Etamp cultivar bore the first male and female flowers on the highest node number, while Butternut cultivar produced the 1st male and female flowers on the lowest node number in both seasons. Pepa (Beni Suef) accession had the highest number of nodes between the 1st male and 1st female flowers while; Butternut cultivar had the lowest number of nodes between the 1st male and the 1st female flowers in both seasons. Desuk (Kafr El-Sheikh) accession gave the largest number of days between the 1st male and the 1st female flowers anthesis, while Butternut cultivar gave the lowest number of days between the 1st male and the 1st female flowers anthesis. Butternut cultivar gave the highest sex ratio, while El-Mansoura accession gave the lowest sex ratio in both seasons. Etamp cultivar fruits were longest, while those of accession Omdurman (Sudan) were shortest in both seasons. Etamp cultivar was greatest in fruit diameter, while Butternut accession was smallest in fruit diameter in both seasons. Etamp cultivar was heaviest fruit weight, while Butternut cultivar was lowest in fruit weight in both seasons. Etamp cultivar gave the highest value for flesh thickness while, Butternut cultivar showed the lowest value for this character in both seasons. Etamp cultivar exceeded all other genotypes in total fruit yield, while Butternut cultivar produced the lowest fruit yield in both seasons. Butternut cultivar gave the highest value for total soluble solids%, while Bardis (Sohag) accession showed the lowest value for this character, in both seasons. Thus, the results of this study could be useful in breeding programs for improving local pumpkin genotypes under Upper Egypt conditions.

Keywords: Earliness, Yield, Flesh thickness, Landraces and Total soluble solids.

INTRODUCTION

Local pumpkin (*Cucurbita moschata* Duchesne) landraces spread over a wide range of environments in Egypt and many of other countries and they are utilized in many local dishes and food industries. In Egypt, local pumpkin has been grown widely for many decades and can be considered one of the major vegetable crops. It is consumed in different local dishes and some food industries such as jams, purees and cakes. In Egypt, about 91816 feddan (Ministry of Agriculture and Land Reclamation, Egypt, 2005). are cultivated annually with *Cucurbita*. The seeds of several *Cucurbita* species are relatively rich in lipids and proteins and make a nutritious snack when roasted and salted. In some African countries shoot tips of cucurbits, are cooked and eaten as vegetable. In America, the majority of pumpkin is grown for the Halloween sales and is for ornament only, not for human consumption. Its popularity is increasing to day and the demand for pumpkin is being increased. It is a tasty dish and contains relatively high amount of biologically active compounds which is essential for health protection. In human nutrition, β carotene, enzymatically converted into vitamin A, is of a great biochemical and physiological importance and is believed to impede some forms of cancer.

Many investigators studied the vegetative and yield variations traits among cucurbit species (Doijode *et al.*, 1982; Rana *et al.*, 1985; Doijode and Sulladmath, 1986; Mondal *et al.*, 1989; Bost *et al.*, 1991; Swamy and Dutta, 1991; Prasad and Singh, 1992; Damarany *et al.*, 1995; Olson *et al.*, 1995; Mohanty and Mishra, 1999; Vallejo *et al.*, 1999 a&b; Keinath and DuBose, 2000; Mohanty, 2000; Alsadon *et al.*, 2002; White, 2002 and Mostafa, 2006).

As a market demand for pumpkin has recently increased in Egypt because of their prices are becoming high and more growers are attempting to produce the crop. In an effort to maximize profitability; growers are exploring ways to increase yield per unit area.

Researchers and farmers have noticed unstable fruit characteristics of local pumpkin genotypes grown in Egypt may be due to the cross pollination that occur in cucurbits crops. In general, there has been a limited work on the improvement of cucurbits in Egypt. Ibrahim and co-workers were among the pioneers to initiate the cucurbitaceae improvement program. They have released two sour-sweet melon (Ibrahim and Al-Zeir, 1992) and two desert-adapted winter squash (Ibrahim *et al.*, 1996) cultivars. The objective of this study was to evaluate the performance of fifteen local and introduced pumpkin genotypes for earliness and fruit yield

MATERIALS AND METHODS

Plant materials.

Fruits of fifteen locally and introduced grown pumpkin accessions were collected from October 2005 to November 2006 from different regions of Egypt where they have been commonly grown for several decades. Out of fifteen accessions, 11 were collected from various provinces of Egypt extending from El-Mansoura in middle Delta to Qus, Qena, south in upper Egypt, and from Ismailia east to Desuk (Kafr El-Sheikh) northwest of Delta. The fifteen accessions, also, included two imported U.S.A cvs. (Etamp and Butternut) and two accessions from Sudan (Khartoum and Omdurman). The locally and introduced grown pumpkin accessions exhibit various in fruit skin color, fruit flesh color, fruit size, fruit shape and fruit shell (Figure 1). These 15 pumpkin accessions are presented in Table (1).

Table (1): Name, source and fruit characteristics of fifteen pumpkin genotypes grown at Faculty of Agriculture, Sohag University, ElKawser, Sohag.

Name	Source	Skin color	Flesh color	Fruit size	Fruit shape	Shell
El-Kola (Sohag)	Local Egypt	Light Yellow	Yellow	Large (> 4kg)	Pyriform-globular	Semi-grooved
Abu Tisht (Qena)	Local Egypt	Light Orange	Yellow	Large (> 4kg)	Pyriform-globular	Semi-grooved
Bardis (Sohag)	Local Egypt	Green Yellow	Light yellow	Large (> 4kg)	Pyriform	Smooth
Ismailia	Local Egypt	Yellow	Orange	Large (> 4kg)	Pyriform-globular	Semi-grooved
Omdurman (Sudan)	Local Sudan	Dark Green	Deep Orange	Medium (2-4kg)	Globular	Grooved
Khartoum (Sudan)	Local Sudan	Light Green	Light yellow	Medium (2-4kg)	Globular	Semi-grooved
Kom Badar (Sohag)	Local Egypt	Dark Copper	Deep Orange	Medium (2-4kg)	Globular	Grooved
El-Edua (El-Minia)	Local Egypt	Yellow	Light yellow	Medium (2-4kg)	Globular	Grooved
Etamp	USA cv*	Yellow	Light yellow	Large (> 4kg)	Pyriform	Semi-grooved
El-Mansoura	Local Egypt	Light Copper	Orange	Large (> 4kg)	Pyriform	Grooved
El-Kanater (Kalubia)	Local Egypt	Light Yellow	Light yellow	Large (> 4kg)	Pyriform	Smooth
Butternut	USA cv**	Copper	Yellow	Small (< 2kg)	Pyriform	Smooth
Qus (Qena)	Local Egypt	Copper	Light orange	Small (< 2kg)	Pyriform	Semi-grooved
Pepa (Beni Suef)	Local Egypt	Copper	Light orange	Medium (2-4kg)	Pyriform	Semi-grooved
Desuk (Kafr El-Sheikh)	Local Egypt	Copper	Light orange	Large (> 4kg)	Pyriform	Grooved

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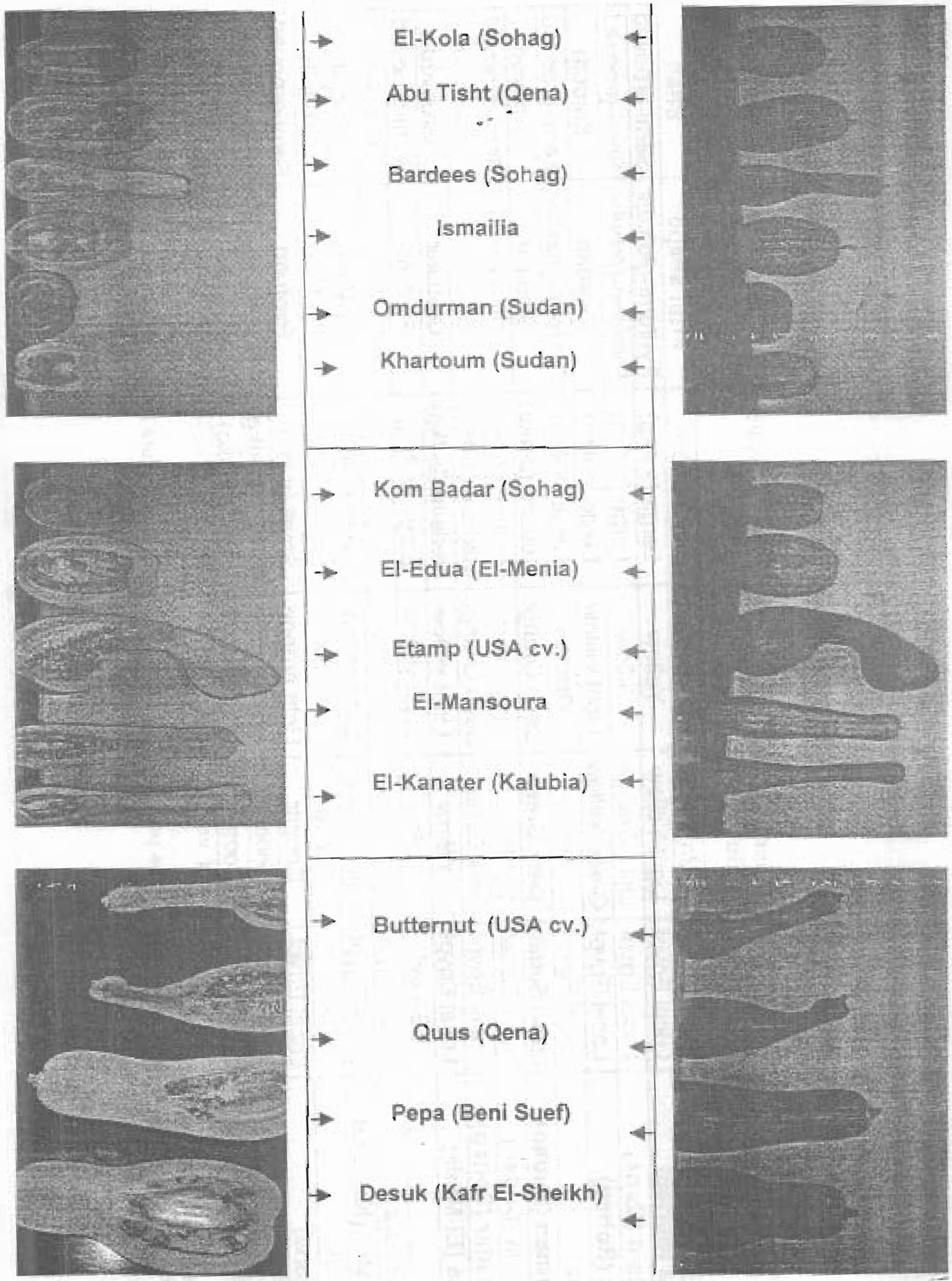

Figure (1): Fruit characteristics of fifteen pumpkin accessions grown at Faculty of Agriculture, Sohag University, El-Kawser, Sohag

Seeds were collected, washed with water, air-dried and kept at room temperature until the time of planting. Seed for all traits were obtained from the same seed lots during the present study.

Field layout.

Two years field trials (2007 and 2008) were executed at the Experimental Farm of Faculty of Agriculture, Sohag University, El-Kawser, Sohag, Egypt, to evaluate the 15 selected pumpkin accessions for earliness, fruit output and fruit components.

The experimental design was a randomized complete block with three replications. Each experimental unit (plot) consisted of two raised beds, each 3 meter long and 4 m apart (width), with plants 0.70 cm apart in the bed. Thus, each plot contained 8 plants occupying 24 m^2.

Seeds were directly in the open field planted in both seasons. The sowing date was August 25^{th} in 2007 and 2008 in both seasons. At planting date, 2-4 seeds were sown in every hill on one side of the bed. Thinning of hills was carried out twice, the first at the two leaf stage and the second one at the 4-5 true leaf stage, where finally one plant was left per each hill. Fertilization, furrow irrigation and other cultural practices were carried out as recommended for commercial production of pumpkin.

Characteristics measurements.

Vegetative growth.

Vegetative growth data were taken at 90 days from sowing and the following characters were measured; vine length (m) and number of leaves per plant.

Reproductive growth.

Sex ratio percentage of opened flowers (male and female) that opened during the period from the start of first anthesis to 90 days old and sex ratio was estimated as (total number of females / total number of males) x 100.

Earliness of flowering.

Earliness of flowering was estimated by: number of days from sowing to the first male flower anthesis, node number at which the first male flower opened, number of days to the first female flower anthesis, node number at which the 1^{st} pistillate flower opened, number of nodes between the appearance of the first open male to the first open pistillate flower and number of days elapsed between the first male and the first female flower anthesis.

Fruit characteristics.

Fruits were harvested at full maturity, transferred to the laboratory and kept at room temperature until they were evaluated. Four fruits were randomly assigned in each plot in the main field trial and the following descriptions were recorded: fruit weight (kg), Fruit length (cm) for the longitudinal axis starting from the peduncle junction to the blossom end, Fruit diameter (cm) at the maximum fruit diameter, Flesh thickness of fruit (cm), average of three measures, at the beginning of the fruit cavity, at the maximum fruit diameter, and at the blossom end and percent of total soluble solids (TSS%) were measured using a hand heldle refractometer (HRN- 32, Kruss, Germany). Flesh samples were taken from three different parts of fruit.

Crop fruit yield.

All fruits produced in each plot were counted and weighed and then the total fruit output per feddan was estimated as (Fruit yield in tones per feddan).

Statistical analysis

All recorded data were tabulated and statistically analyzed according to Snedecor and Cochran (1967), using Duncan (1958) for comparing various treatment means.

RESULTS AND DISCUSSION

Vegetative characteristics

1- Vine length.

Vine length of the 15 pumpkin accessions over two seasons is presented in Table (2). Significant differences in vine length were found among pumpkin accessions in both seasons. Etamp cultivar had the longest (5.66 and 5.67) vine length in the first and second seasons, respectively. While, Butternut cultivar had the shortest (3.35) vine length in both seasons. These results are in accordance with those found by Carle *et al.* (2000); Alsadon *et al.* (2002); Mukunda *et al.* (2003) and Mostafa (2006).

2- Number of leaves per plant.

Leaf production per plant recorded after 90 days from sowing for the 15 accessions of pumpkin over two successive seasons is shown in Table (2). There were significant differences in this character among different accessions in both seasons. The fewest (128 and 127) number of leaves/plant was recorded for Butternut cultivar in the first and second seasons, respectively. Etamp cultivar gave the highest value (221) for this character in both seasons. These results were in line with those found by Mukunda, *et al.* (2003) and Mostafa (2006).

Reproductive characteristics.

Sex ratio percentage.

Number of female to male flower percent (sex ratio) was recorded till 90 days from sowing for the 15 pumpkin accessions is presented in Table (2). Significant differences in sex ratio were found among pumpkin accessions in both seasons. Butternut cultivar gave the highest (9.70 and 9.41%) sex ratio in the first and second seasons, respectively. The lowest sex ratio values (6.54 and 6.79%) were obtained from El-Mansoura accession in the first and second seasons, respectively. These results were in line with these found by Mukunda, *et al.* (2003) and Mostafa (2006).

Earliness characteristics.

1- Number of days from sowing to the first male flower anthesis.

The results in Table (2) clearly explain that number of days to the first male flower opening for the 15 pumpkin genotypes significantly differed in both seasons.

Table (2): Vine length, Number of leaves/plant, Sex ratio, Number of days to 1st male flower and number of nods to get the 1st male flower for the fifteen pumpkin genotypes sown during 2007 and 2008 seasons.

Genotypes	Vine length (m)		Number of leaves/plant		Sex ratio (%)		No. of days to first male flower		No. of nods to get the first male flower	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
El-Kola (Sohag)	4.69 h	4.68 i	169.0 hi	168.0 hi	6.73 ef	7.05 ef	54.00 cde	53.67 cd	5.33 de	5.67 bc
Abu Tisht (Qena)	4.45 i	4.46 j	185.0 e	184.0 e	8.08 cd	7.82 bcde	53.00 def	52.67 de	6.33 abc	6.00 bc
Bardis (Sohag)	5.51 b	5.52 b	191.0 d	190.0 d	8.99 ab	8.61 ab	52.67 efg	52.33 ef	5.67 cde	6.00 bc
Ismailia	4.83 f	4.82 f	182.0 f	181.0 f	6.81 ef	7.17 def	56.00 b	55.67 b	5.67 cde	5.33 c
Omdurman (Sudan)	4.19 l	4.18 n	133.0 k	134.0 k	8.51 bc	8.08 bcd	57.67 a	57.33 a	5.67 cde	5.33 c
Khartoum (Sudan)	4.26 k	4.25 m	135.0 k	135.0 k	7.92 cd	7.52 cdef	58.00 a	57.67 a	6.33 abc	6.00 bc
Kom Badar (Sohag)	4.27 k	4.28 l	168.0 i	167.0 ij	7.64 d	7.90 bcde	51.67 fg	51.33 f	6.67 ab	6.33 b
El-Edua (El-Minia)	4.70 h	4.71 h	176.0 g	177.0 g	7.61 d	7.32 cdef	54.33 cd	53.67 cd	5.67 cde	5.67 bc
Etamp	5.66 a	5.67 a	221.0 a	221.0 a	8.11 cd	7.76 bcde	51.33 g	51.67 ef	7.00 a	7.33 a
El-Mansoura	4.88 e	4.88 e	199.0 c	200.0 c	6.54 f	6.79 f	52.33 fg	52.00 ef	5.67 cde	5.33 c
El-Kanater (Kalubia)	4.76 g	4.75 g	165.0 j	165.0 j	7.88 cd	7.53 cdef	54.00 cde	53.67 cd	6.00 bcd	5.33 c
Butternut	3.35 m	3.35 o	128.0 l	127.0 l	9.70 a	9.41 a	45.33 h	45.00 g	4.33 f	4.00 d
Qus (Qena)	4.99 d	5.00 d	205.0 b	206.0 b	7.88 cd	7.65 cdef	52.33 fg	52.67 de	5.33 de	5.33 c
Pepa (Beni Suef)	4.36 j	4.37 k	171.0 h	170.0 h	8.52 bc	8.15 bc	54.67 c	54.33 c	5.00 ef	5.33 c
Desuk (Kafr El-Sheikh)	5.36 c	5.36 c	167.0 ij	166.0 ij	7.45 de	7.09 ef	52.00 fg	51.33 f	5.67 cde	5.33 c

* Means for accessions followed by the same letters are not significantly different at 5% level.

Butternut cultivar was the earliest (45.33 and 45.00 days) in first male flower appearance in the first and second seasons, respectively. While, Khartoum (Sudan) accession was the latest (58.00 and 57.67 days) for this character in the first and second seasons, respectively. These results are in accordance with those found by Carle *et al.* (2000), Mukunda *et al.* (2003) and Mostafa (2006).

2- Node number of the first male flower.

The results in Table (2) demonstrate the number of node at which the 1st male flower was borne for the 15 pumpkin genotypes during the two seasons. The results revealed significant differences in this character among the genotypes. The lowest node number (4.33 and 4.00) at which the 1st male flower appeared was shown by Butternut cultivar in the first and second seasons, respectively. While, the highest node number (7.00 and 7.33) at which the 1st male flower appeared was shown by Etamp cultivar in the first and second seasons, respectively. These results were in line with these found by Mukunda, *et al.* (2003) and Mostafa (2006).

3- Number of days to the first female flower anthesis.

The result in Table (3) clearly shows that that number of days to the first female flower opening for the 15 pumpkin genotypes significantly differed in both seasons. Butternut cultivar was the earliest (43.00 and 42.67 days) in first female flower appearance in the first and second seasons, respectively. While, Khartoum (Sudan) accession was the latest (63.00 and 63.67 days) for this character in the first and second seasons, respectively. Same general trends were reported by Mukunda, *et al.* (2003) and Mostafa (2006).

4- Node number of the first female flower.

Result in Table (3) clearly demonstrates the number of node bearing the first female flower of the 15 pumpkin genotypes in two successive seasons. There were significant differences concerning this character among the genotypes in both seasons. Etamp cultivar had the highest value (18.67 and 18.33) in node number bearing the 1st female flower in the first and second seasons, respectively. While, Butternut cultivar had the lowest value (7.00 and 6.67) in node number bearing the 1st female flower in the first and second seasons, respectively. These results were in line with these found by Mukunda, *et al.* (2003) and Mostafa (2006).

5- Number of nodes between the 1st male and the 1st female flowers.

Table (3) presents the number of nodes between the 1st male and 1st female flowers for the 15 pumpkin accessions in two successive seasons. Results showed significant differences concerning this character among the accessions in both seasons. The lowest (2.67) node number between the 1st male and the 1st female flowers appearance was shown by Butternut cultivar in the first and second seasons, respectively. The highest (12.33 and 11.67) number of nodes between the 1st male and the 1st female flower was demonstrated by Pepa (Beni Suef) accession. Similar trend results were reported by Mostata (2006).

6- Number of days between the 1st male and female flowers anthesis.

Significant differences were found in number of days between the 1st male and the 1st female flower opening for the 15 accessions in the two seasons (Table 3). The lowest (2.33) number of days were found in Butternut cultivar in both seasons. The greatest (7.00 and 7.33) number of days between the 1st male and the 1st female flowers anthesis was recorded for Desuk (Kafr El-Sheikh) accession in the first and second seasons, respectively. Same trend results were obtained by Mosfafa (2006).

Fruit characteristics.

1- Fruit weight.

The results in Table (3) show that fruit weight for the 15 pumpkin genotypes significantly differed in both seasons. The heaviest fruit weight (9.80 and 9.90 kg) was exhibited by Etamp cultivar in the first and second seasons, respectively. Butternut cultivar was the lowest in fruit weight (1.08 and 1.12 kg) in the first and second seasons, respectively. Similar trends were reported by Damarany *et al.* (1995); Danilchenko *et al.* (2000); Carle *et al.* (2000); Alsadon *et al.* (2002) and Mostafa (2006).

2- Fruit length.

The results in Table (4) show that fruit length for the 15 pumpkin genotypes differed significantly in both seasons. The longest (51.25 and 51.14 cm) fruits were found in Etamp cultivar in the first and second seasons, respectively. The shortest (13.16 and 13.10 cm) fruits were produced by Omdurman (Sudan) accession in the first and second seasons, respectively. Similar results were reported by Damarany *et al.* (1995); Alsadon *et al.* (2002) and Mostata (2006). On the other hand, this result was disagreed with Mukunda, *et al.* (2003).

3- Fruit diameter.

Fruit diameter significantly differed in the 15 pumpkin genotypes in both seasons (Table 4). The highest fruit diameter (28.23 and 28.20 cm) was produced by Etamp cultivar in the first and second seasons, respectively. The lowest fruit diameter (12.09 and 12.14 cm) was shown by Butternut cultivar in the first and second seasons, respectively. Same trend results were obtained by by Damarany *et al.* (1995); Alsadon *et al.* (2002) and Mostata (2006). On the other hand, this result was disagreeing with Danilchenko *et al.* (2000) and Mukunda, *et al.* (2003).

4- Flesh thickness of the fruit.

Fruit flesh thickness of the 15 pumpkin genotypes is illustrated in Table (4). There were significant differences in flesh thickness among the genotypes in both years. Etamp cultivar had the highest values (4.15 and 4.17 cm) of fruit thickness in the first and second seasons respectively. The lowest flesh thickness (1.95 and 1.94 cm) of fruit was given by Butternut cultivar in the first and second seasons, respectively. These results were in line with those found by Mukunda, *et al.* (2003); Alsadon *et al.* (2002) and Mostafa (2006).

5- Total soluble solids (TSS%).

Data for this character are presented in Table (4). Significant differences were found among the 15 pumpkin accessions during two seasons. Butternut cultivar gave the highest values (6.68 and 6.67%) for TSS% in the first and second seasons, respectively. The lowest (4.51and 4.49 %) TSS% of fruit was given by Bardis (Sohag) accession in the first and second seasons, respectively. These results were similar with those obtained by Carle *et al.* (2000); Alsadon *et al.* (2002) and Mostafa (2006).

Table (3): Number of days to 1st female flower, Number of nods to get the 1st female flower, Number of nods between 1st male and 1st female flower, Number of days between 1st male and 1st female flower and fruit weight for the fifteen pumpkin genotypes sown during 2007 and 2008 seasonss.

Genotypes	No. of days to first female flower		No. of nods to get the first female flower		No. of nods between 1st male and 1st female flower		No. of days between 1st male and 1st female flower		Fruit weight (kg)	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
El-Kola (Sohag)	58.00 cd	58.33 d	15.67 ef	15.33 fg	10.33 cd	9.67 c	4.00 bc	4.67 bcd	5.10 f	5.13 g
Abu Tisht (Qena)	57.33 de	57.00 ef	17.00 bc	16.67 cd	10.67 bcd	10.67 abc	4.33 bc	4.33 cde	7.61 b	7.66 b
Bardis (Sohag)	56.33 efg	56.67 efg	16.00 def	15.67 efg	10.33 cd	9.67 c	3.67 bc	4.33 cde	7.18 c	7.23 c
Ismailia	61.00 b	61.33 b	16.67 bcd	16.33 cde	11.00 bc	11.00 ab	5.00 ab	5.67 bc	4.63 g	4.73 h
Omdurman (Sudan)	61.33 b	61.67 b	15.67 ef	15.33 fg	10.00 cd	10.00 bc	3.67 bc	4.33 cde	2.37 j	2.32 k
Khartoum (Sudan)	63.00 a	63.67 a	17.33 b	17.67 ab	11.00 bc	11.67 a	4.67 bc	6.00 ab	2.73 i	2.85 j
Kom Badar (Sohag)	55.00 g	55.33 i	17.00 bc	16.67 cd	10.33 cd	10.33 bc	3.33 bc	4.00 de	2.90 i	2.92 j
El-Edua (El-Minia)	59.33 c	59.67 c	16.33 cde	16.00 def	10.67 bcd	10.33 bc	5.00ab	6.00 ab	3.76 h	3.72 i
Etamp	55.33 fg	55.67 hi	18.67 a	18.33 a	11.67 ab	11.00 ab	4.00 bc	4.00 de	9.80 a	9.90 a
El-Mansoura	56.33 efg	56.67 efg	16.00 def	15.67 efg	10.33 cd	10.33 bc	4.00 bc	4.67 bcd	6.05 e	6.08 e
El-Kanater (Kalubia)	56.33 efg	56.00 ghi	16.33 cde	16.00 def	10.33 cd	10.67 abc	2.33 c	2.33 f	5.23 f	5.31 f
Butternut	43.00 h	42.67 j	7.00 g	6.67 h	2.67 e	2.67 d	2.33 c	2.33 f	1.08 l	1.12 m
Qus (Qena)	56.67 def	56.33 fgh	16.00 def	16.33 cde	10.67 bcd	11.00 ab	4.33 bc	3.67 def	1.60 k	1.60 l
Pepa (Beni Suef)	57.00 de	57.33 e	17.33 b	17.00 bc	12.33 a	11.67 a	2.33 c	3.00 ef	3.87 h	3.82 i
Desuk (Kafr El-Sheikh)	59.00 c	58.67 d	15.33 f	15.00 g	9.67d	9.67 c	7.00 a	7.33 a	6.55 d	6.57 d

* Means for accessions followed by the same letters are not significantly different at 5% level.

Table (4): Fruit length, Fruit diameter, Flesh thickness, Total soluble solids and Total fruit yield for the fifteen pumpkin genotypes sown during 2007and 2008 seasons.

Genotypes	Fruit length (cm)		Fruit diameter (cm)		Flesh thickness (cm)		TSS (%)		Total fruit yield (Ton/feddan)	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
El-Kola (Sohag)	22.33 j	22.20 k	12.20 m	12.17 l	2.44 f	2.43 g	4.68 l	4.66 l	26.80 e	26.47 e
Abu Tisht (Qena)	34.27 e	34.12 e	20.80 b	20.76 b	2.34 g	2.33 h	5.45 g	5.45 g	29.58 c	29.24 c
Bardis (Sohag)	41.40 b	41.30 b	20.13 c	20.10 c	3.75 c	3.73 d	4.51 m	4.49 m	30.50 b	30.17 bc
Ismailia	22.70 ij	22.89 j	17.10 i	17.00 h	2.41 fg	2.38 g	5.82 f	5.83 f	26.64 e	26.31 e
Omdurman (Sudan)	13.16 m	13.10 n	17.72 h	17.52 g	2.15 i	2.14 j	5.18 j	5.17 j	13.93 k	13.67 k
Khartoum (Sudan)	20.20 k	20.18 l	14.45 l	14.35 k	2.12 i	2.13 j	5.05 k	5.06 k	14.73 j	14.77 j
Kom Badar (Sohag)	19.00 l	18.83 m	15.13 k	15.08 j	2.13 i	2.12 j	5.27 i	5.26 i	20.01 h	19.68 h
El-Edua (El-Minia)	23.36 i	23.30 j	18.11gh	18.11 f	2.25 d	2.24 i	6.42 b	6.42 b	18.11 i	18.44 i
Etamp	51.25 a	51.14 a	28.23 a	28.20 a	4.15 a	4.17 a	4.69 l	4.67 l	39.49 a	39.61 a
El-Mansoura	39.03 d	39.37 d	16.25 j	16.22 i	3.97 b	3.96 c	6.21 c	6.22 c	23.41 f	23.45 f
El-Kanater (Kalubia)	40.20 c	40.13 c	19.36 d	19.30 d	3.35 d	3.34 e	5.18 j	5.19 j	21.74 g	21.41 g
Butternut	24.30 h	24.37 i	12.09 m	12.14 l	1.95 j	1.94 k	6.68 a	6.67 a	5.18 l	4.85 l
Qus (Qena)	25.10 h	25.03 h	18.30 fg	18.27 ef	3.25 e	3.24 f	5.95 e	5.96 e	30.65 b	30.31 b
Pepa (Beni Suef)	31.50 f	31.27 f	18.70 ef	18.67 e	4.12 a	4.13 ab	5.35 h	5.35 h	14.13 jk	13.80 k
Desuk (Kafr El-Sheikh)	29.33 g	29.20 g	19.03 de	19.15 d	4.11 a	4.10 b	6.17 d	6.18 d	28.51 d	28.18 d

* Means for accessions followed by the same letters are not significantly different at 5% level.

Yield characteristics.

Total fruit yield.

Table (4) presents yield in ton/feddan for the 15 pumpkin genotypes during two seasons. Significant differences were found among genotypes in both seasons. The highest yield (39.49 and 39.61 ton) was found in Etamp cultivar in the first and second seasons, respectively. Genotype Butternut cultivar produced the lowest yields (5.18 and 4.85 ton) in the first and second seasons, respectively. Damarany *et al.* (1995) assessed the performance of 24 pumpkin genotypes under Assuit conditions and they found significant differences in their reproductive growth, fruit yield and mean fruit weight. Same general trends were also reported by Carle *et al.* (2000); Alsadon *et al.* (2002) and Mostafa (2006).

CONCLUSION

From the data presented in this study, it could be concluded that: Etamp cultivar gave the longest vine length, highest number of leaves/plant, heaviest fruit weight, longest fruit length, largest fruit diameter, highest flesh thickness and heaviest total fruit yield. Butternut cultivar was the earliest in both male and female flower, gave the highest value for sex ratio and total soluble solids%.

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إنتقاء بعض الطرز الوراثية المحلية والمستقدمة للقرع العسلى لصفات التبكير والمحصول الثمرى

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أجريت هذه التجربة لتقييم وإختبار خمسة عشر تركيبا وراثيا محلى ومستورد من القرع العسلى بالنسبة لصفات التبكير والمحصول الثمرى بالمزرعة البحثية لكلية الزراعة جامعة سوهاج-سوهاج - مصر خلال موسمى ٢٠٠٧، ٢٠٠٨ بهدف إيجاد طراز وراثى من القرع العسلى مبكر النضج وعالى المحصول تحت ظروف جنوب الوادى (منطقة مصر العليا).

ويمكن تلخيص أهم النتائج فيما يلي:

- أظهرت النتائج أن هناك تباينا كبيراً بين هذه الطرز فى معظم الصفات المحصولية المدروسة.
- أعطى الصنف Etamp اعلى القيم بالنسبة لصفة طول النبات وعدد الأوراق على النبات بينما اعطى الصنف Butternut اقل القيم لتلك الصفات.
- أعطى الصنف Butternut اعلى القيم بالنسبة لصفة النسبة الجنسية بينما اعطى الطراز البيئى El-Mansoura اقل القيم لهذه الصفة.
- كان الصنف Butternut أبكر الطرز الوراثية فى خروج الأزهار المذكرة والمؤنثة بينما كان الطرازالبينى Khartoum (Sudan) اكثر الطرز الوراثية تاخراً فى خروج الأزهار المذكرة والمؤنثة.
- أعطى الصنف Etamp اعلى القيم بالنسبة لصفة لصفة عدد العقد حتى خروج اول زهرة مذكرة ومؤنثة بينما اعطى الصنف Butternut اقل القيم لتلك الصفات.
- أعطى الطراز البينى Pepa (Beni Suef) اعلى القيم بالنسبة لصفة عدد العقد بين خروج اول زهرة مذكرة ومؤنثة بينما اعطى الصنف Butternut اقل القيم لهذه الصفة.
- أعطى الطراز البينى Desuk (Kafr El-Sheikh) اعلى القيم بالنسبة لصفة عددالأيام بين خروج اول زهرة مذكرة ومؤنثة بينما اعطى الصنف Butternut اقل القيم لهذه الصفة.
- أعطى الصنف Etamp اعلى القيم بالنسبة لصفات وزن الثمرة , قطر الثمرة، سمك اللحم بينما أعطى الصنف Butternut اقل القيم لتلك الصفات.
- أعطى الصنف Etamp اعلى القيم بالنسبة لصفة طول الثمرة بينما اعطى الطراز البينى Omdurman (Sudan) اقل القيم فى هذه الصفة.
- أعطى الصنف لصنف Butternut أعلى القيم بالنسبة لصفة نسبة المواد الصلبة الذائبة بينما أعطى الطراز البينى Bardis (Sohag) اقل القيم لهذه الصفة.
- أعطى الصنف Etamp أعلى القيم بالنسبة لصفة وزن المحصول الثمرى للفدان بينما أعطى الصنف Butternut أقل القيم لهذه الصفة.

ومن هنا..... فإن نتائج هذة الدراسة تعتبر أداة فعالة فى برامج التربية لتحسين الطرز المحلية للقرع العسلى تحت ظروف منطقة مصر العليا.