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VARIATION AND INTERRELATIONSHIPS OF SOME EGYPTIAN MOLOUKHYIA GENOTYPES JEW,S MALLOW (*Corchorus olitorius* L.)

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ABSTRACT

This investigation was carried out at the Sabahyia Horticultural Research Station, Alexandria, during 2004 and 2005 summer seasons. Plant materials of this study consisted of eight ecotypes of moloukhyia, which were collected from different regions of Egypt in addition to eskandarany variety. Siwi ecotype gave the highest mean values of plant weight, leaves weight / plant, number of leaves / plant, and seed yield/plant. The balady sohag ecotype recorded the largest number of branches/ plant. The largest number of seeds / pod was obtained by the balady sharkeia ecotype. Balady sohag ecotype recorded the largest fresh leafy yield/fed. Concerning the later trait, balady sohag ecotype did not significantly different between siwi and saidy sohag ecotypes in the first cut, and eskandarany variety in the second cut, while eskandarany variety and fallahy sharkeia and saidy sohag ecotypes were not significantly different in the total leafy yield. The results revealed significant differences among moloukhyia ge.1otypes for all studied traits indicating wide genetic variation. Broad–sense heritability was high in all studied characters. Plant weight, net leaves weight, plant height, number of seeds /pod, and number of pods/plant may be improved by selecting the top 5% of the studied genotypes, because they had the highest values of heritability, which were associated with high values of genetic coefficient of variability and genetic advance. Path-coefficient analysis indicated that number of pods/plant had a clear positive direct path, followed by plant height. As the correlation coefficient between both of number of branches/plant and number of seeds/pod with seed yield was positive and the direct effect of this factor was negligible, it seems that indirect effect appeared to be the cause of correlation. Hence, these factors may be used, simultaneously, with plant height, and number of pods, in improving seed yield in moloukhyia.

INTRODUCTION

The family tiliaceae comprises about 40 genera and 400 species of trees, shrubs, and herbs largely distributed in warm and tropical regions. The genus *Corchorus* includes 50-60 species, which are extremely variable, but all species are apparently highly fibrous of which two species; *corchorus capsularis* L. (Jute & white Jute) and *C. olitorius,* L. (nalta Jute, tossa jute, tussa jute & Jew's mallow) are of major world economic fiber crops. A secondary but extensive use of some of the herbaceous annual *Corchorus* species, particularly *C. olitorius,* is their cultivation as a local leaf spinach-type vegetable both in the jute (fiber) producing countries and in tropical and subtropical countries (Edmonds, 1990).

Moloukhyia is one of the leafy vegetables in West Africa and is often stored dry. It is also commonly used in Malaysia, the Philippines, and parts of Latin America, and it is consider food and medicine plant, newly exported it to Japanese. It is the most important leafy vegetable in Egypt, which is cultivated in Egypt, Japan, Korea, and China from March to Nov. (Oomen and Grubben 1978).

There are numerous local types varying among each other in height, stem, pubescence, and leaf production. These ecotypes do not consider as registered cultivars. Moreover, previous work on growth and yield of *Corchorus olitorius* used as a vegetable is not enough. Therefore, the present investigation was designed to; 1) evaluate performance and yield potential of nine genotypes of moloukhyia; 2) get information about genotype by environment interaction, and some genetic parameters necessary for moloukhyia improvement; and 3) estimate the direct and indirect effects of some characters related to seed production, which would be helpful to plan an appropriate selection program.

MATERIALS AND METHODS

This investigation was carried out at the Sabahia Horticultural Research Station, Alexandria, during 2004 and 2005 summer seasons. Plant materials of this study consisted of eight ecotypes of moloukhyia, which were collected from different regions of Egypt in addition to eskandarany variety. These genotypes and sources from which they were obtained are presented in Table 1.

A randomized complete block with three replicates was used. Seeds were sown in rows about 20 cm apart and then irrigated. As seedling were established, plants were thinned to 5 or 20 cm between plants for leafy yield or seed yield, respectively. Each experimental unite consisted of 10 rows, each of 4 m in length and 0.20 m apart, i.e., the unit area was 8 m^2. The sowing date was taken place on 15 and 14 May in 2004 and 2005 summer seasons, respectively. The cultural practices were carried out as recommended for the conventional moloukhyia planting.

Table 1. Sources and local names of moloukhyia genotypes

Genotype	Local names	Source
Check variety	**Eskandarany**	**Horticultural Research Institute**
Ecotype 1	Siwi	Siwa
Ecotype 2	Balady, sharkeia	Sharkeia
Ecotype 3	Fallahy, sharkeia	Sharkeia
Ecotype 4	Balady, sohag	Sohag
Ecotype 5	Saidy, sohag	Sohag
Ecotype 6	Balady, minia	Minia
Ecotype 7	Balady, bani sweef	Bani sweef
Ecotype 8	Balady, el-esma'aellyia	El-Esma'aellyia

Two cuts were taken from each genotype of moloukhyia. The first cut was done at 45 days after sowing, meanwhile the second cut were taken 30 days later.

Recorded data:

1- Vegetative growth characters, fresh leafy yield and its components.

In each cut, vegetative measurements were recorded as a mean of 20 randomly taken plants per entry. These characters were plant weight (stems and leaves), leaves weight, and number of leaves per plant. Fresh leafy yield was recorded in Kg/plot as the total weight of plants for each cut in each entry and the total yield in ton/fed was calculated for the two cuts taken from each entry. Average fresh leafy yield/fed was calculated basis on the plot area. Net leaves weight percentage was calculated as: leaves weight of 20 plants / total weight of these plants × 100.

2- Seed yield and its components.

At the end of the season, the following traits were recorded as an average of 20 randomly plants. There were plant height (cm), number of branches/plant, number of pods/pant, number of seeds/pod, weight of 1000 seeds in gram, and total seed yield (g/plant).

Statistical procedures:

Data for the two experiments were subjected to a combined analysis of variance to examine genotype × environment effects, and Duncan's multiple range at 5% level of probability was calculated to compare varietals means, as shown by Dospekhov (1984). The components of variance indicated in the expected mean squares were estimated according to Allard (1960). Heritability in the broad- sense and expected genetic advance were estimated as shown by Falconer (1989). Genetic coefficient of variation was calculated according to Burton (1952).

Simple correlation coefficients (r) were calculated for different pairs of the studied characters as shown by Dospekhove (1984). Path-coefficient was calculated as described by Dewey and Lu (1959). In the path diagram (Figure 1), the doubled-arrowed lines indicate mutual association as measured by correlation coefficients r_{ij} the single arrowed lines represent direct influence as measured by path-coefficient Pix, and h represents residual factors.

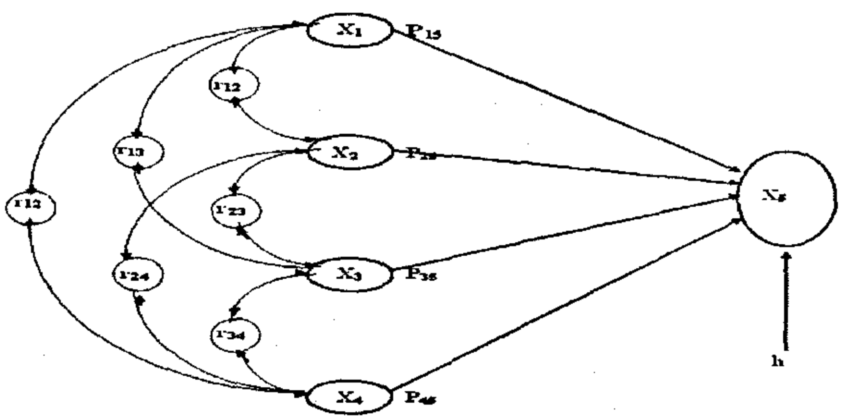

Fig. 1: Path diagram with 4 predictor variables "X_1" to "X_4" and the response variable X_5. The variable "h" is the remainder portion or residual. $(1-R^2)^{½}$

RESULTS AND DISCUSSION

Ecotype 1 (siwi) gave the highest mean values of plant weight (1st and 2nd cuts) and leaves weight / plant (1st and 2nd cuts) (Table 2). On the other hand, plant weight of the other ecotypes was similar and less than siwi.

Concerning number of leaves / plant, siwi ecotype had the highest mean value followed by ecotype 3 (fallahy sharkeia) in the first cut. Meanwhile, in the second cut, plants of ecotype 3 produced the largest number of leaves/plant followed by ecotype 2 (balady sharkeia). Regarding net leaves weight percentage, ecotypes 1, 3, and 7 gave the highest mean values in the first cut, but there were no significant differences between them and ecotypes 2, 4, 5, and 6. However, in the second cut, ecotype 3 had the highest mean value followed by ecotypes 6 and 7. Ecotype 4 (balady sohag) recorded the largest fresh foliage yield. Concerning the later trait, ecotype 4 did not significantly differ from ecotypes 1 and 5 in first cut, from eskandarany in second cut, and from eskandarany, ecotypes 3, and 5 in total yield. In this regard, it is known that shoot removal stimulates branching and new shoot growth, which leads to yield increase (Vincent and Yamaguchi, 1997). Talukder (1990) reported that yield of fiber in *Corchorus olitorius* increased linearly with the duration of the jute crop in the field. Responses to harvest stage of yield have also reported (Islam *et al.* 1995; Weng *et al.* 1990).

Concerning seed yield and its components (Table 3), eskandarany variety and ecotype 3 had the tallest plants. There were no significant differences between them and other ecotypes except of ecotype 8, which gave the shortest plants. Ecotype 4 produced the highest number of branches/plant. On the contrary, ecotype 8 gave the lowest number of branches /plant. The highest number of seeds/pod was obtained by ecotype 2. Meanwhile, both ecotypes 5 and 6 gave the lowest number of seeds/pod. Ecotype 1 recorded the highest mean values of number of pods/plant and seed yield/plant. On the contrary, both ecotypes 6 and 8 had the lowest number of pods/plant. Eskandarany and ecotypes 2 and 6 gave the lowest seed yield/plant. All genotypes were similar regarding weight of 1000 seeds. These results indicated that these moloukhyia genotypes differed in their genetic potential with respect to these characters. In this regard, Akoroda and Akintobi (1983) evaluated sixteen *Corchorus olitorius* accessions to provide basic information on seed production. They found that dry seed yield per plant ranged from 9.8g to 235.0 g.

Among the eight moloukhyia ecotypes, ecotypes 1, 3 and 4 ranked first comparing with eskandarany variety (Table 4). In this concern, siwi (ecotype 1) had the best values for plant weight, leaves weight / plant, number of pods / plant, and seed yield / plant. However, ecotype 3 (fallahy sharkeia) exhibited the highest percentage of increase over eskandarany for number of leaves / plant and net leaves weight. In addition, ecotype 4 (balady sohag) gave the best values for leafy yield and number of branches/plant.

The combined analysis in Table 5 revealed highly significant differences among moloukhyia genotypes for all studied traits, except of weight of 1000 seeds. This result indicates wide genetic variation among moloukhyia genotypes.

The partitioning of variance into its various components (Table 6) revealed that a large portion of variance for all characters would be attributed to genotypes.

Table 2: Means performance of fresh yield and its components of the nine-moloukhyia genotypes, calculated from the combined data over two seasons.

Genotype	Plant weight (g)		Leaves weight / pant (g)		No. leaves/plant		Net leaves weight (%)		Fresh foliage yield (tons/fed)		
	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	Total yield
Eskandarany	68.4 c*	116.2 b	23.6 cd	34.6 d	7.4 e	11.9 cd	35.07 c	37.41 bc	1.852 bc	4.100 a	5.952 ab
Eco. 1	121.4 a	227.9 a	60.4 a	75.5 a	12.5 a	12.7 c	44.74 a	34.77 bcd	1.992 ab	3.134 c	5.130 bc
Eco. 2	96.4 b	150.5 b	37.9 b	47.8 bc	9.7 bcd	15.0 ab	43.23 ab	32.07 d	1.525 d	3.563 b	5.088 bc
Eco. 3	75.6 c	143.4 b	34.3 b	51.0 b	11.3 ab	16.1 a	46.54 a	41.42 a	1.817 bc	3.817 b	5.634 abc
Eco. 4	70.2 c	130.2 b	28.2 c	39.8 cd	8.2 de	10.5 d	41.05 abc	34.23 cd	2.150 a	4.200 a	6.350 a
Eco. 5	68.9 c	153.8 b	26.5 cd	41.5 bcd	10.5 bc	13.0 c	38.96 abc	34.87 bcd	2.050 ab	3.650 b	5.700 abc
Eco. 6	70.3 c	108.6 b	27.5 c	32.7 d	8.8 cde	13.5 bc	40.67 abc	38.85 ab	1.629 cd	2.967 c	4.596 c
Eco. 7	81.7 c	132.9 b	28.4 c	40.4 cd	9.3 cde	13.3 bc	44.54 a	38.81 ab	1.625 cd	2.938 c	4.563 c
Eco. 8	60.5 c	112.5 b	21.6 d	35.5 d	8.6 cde	10.7 d	35.86 bc	31.32 d	1.434 d	1.975 d	2.709 d
Mean	79.3	141.8	32.0	44.31	9.6	13.0	41.18	35.97	1.786	3.371	5.080

*Duncan's multiple range tests was used to detect the significant differences between treatment means at 5% levels of probability.

Table 3: Means performance of seed yield and its components of the nine- moloukhyia genotypes, calculated from the combined data over two seasons.

Genotype	Plant height (cm)	No. branches / plant	No. of seeds /pod	No. of pods/plant	Weight of 1000 seeds (g)	Seed yield /Plant (g)
Eskandarany	71.4 a*	6.6 b	180.6 c	11.0 f	1.660 a	3.29 e
Eco. 1	65.5 ab	5.7 c	186.8 bc	24.0 a	1.600 a	7.40 a
Eco. 2	71.1 a	5.6 c	200.4 a	10.2 g	1.650 a	3.38 e
Eco. 3	65.7 ab	6.2 b	184.3 c	7.5 h	1.660 a	2.28 f
Eco. 4	67.0 ab	7.0 a	192.4 b	17.8 c	1.655 a	5.65 b
Eco. 5	61.0 ab	6.3 b	155.0 e	16.4 d	1.675 a	4.18 c
Eco. 6	63.8 ab	5.1 d	160.0 e	13.3 e	1.640 a	3.50 e
Eco. 7	62.3 ab	5.0 d	167.7 d	21.0 b	1.640 a	5.80 b
Eco. 8	60.5 b	3.8 e	183.0 c	13.0 e	1.650 a	3.91 d
Mean	65.4	5.7	178.9	14.9	1.650	4.38

*Duncan's multiple range tests was used to detect the significant differences between treatment means at 5% levels of probability.

Table 4: Relative performance (%) for the moloukhyia ecotypes characters as compared with eskandarany variety, calculated from the combined data over two seasons.

Genotype	Fresh yield and its components											
	Plant weight		Leaves weight/pant		No. leaves/plant		Net leaves weight		Fresh leafy yield		
	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	Total yield
Eco. 1	177.49	196.13	255.93	218.21	168.92	106.72	127.57	92.94	107.56	76.43	86.20
Eco. 2	140.94	129.52	160.59	138.15	131.08	126.05	123.27	85.73	82.37	86.89	85.48
Eco. 3	110.53	123.41	145.34	147.40	152.70	135.29	132.71	110.72	98.11	93.09	94.66
Eco. 4	102.63	112.05	119.49	115.03	110.81	88.24	117.05	91.50	116.12	102.44	106.70
Eco. 5	100.73	132.36	112.29	119.94	141.89	109.24	111.09	93.21	110.72	89.02	95.77
Eco. 6	102.78	93.46	116.53	94.51	118.92	113.45	115.97	103.85	87.98	72.35	77.22
Eco. 7	119.44	114.37	120.34	116.76	125.68	111.76	127.00	103.74	87.77	71.65	76.66
Eco. 8	88.45	96.82	91.53	102.60	116.22	89.92	102.25	83.72	77.42	48.17	45.51

Genotype	Seed yield and its components					
	Plant height	No. branches/ plant	No. of seeds /pod	No. of pods /plant	Weight of 1000 seeds	Seed yield /plant
Eco. 1	91.74	86.36	103.43	218.18	95.78	325.99
Eco. 2	99.58	84.85	110.96	92.73	99.40	148.90
Eco. 3	92.02	93.94	102.05	68.18	100.00	100.44
Eco. 4	93.84	106.06	106.53	161.82	99.70	248.90
Eco. 5	85.43	95.45	85.83	149.09	100.90	184.14
Eco. 6	89.36	77.27	88.59	120.91	98.80	154.19
Eco. 7	87.25	75.76	92.86	190.91	98.80	255.51
Eco. 8	84.73	57.58	101.33	118.18	99.40	172.25

Table 5: Combined analysis for the studied characters of the nine-moloukhyia genotypes, calculated from the combined data over two seasons.

S. O. V.	Fresh yield and its components										
	Plant weight		Leaves weight / pant		No. leaves/plant		Net leaves weight		Fresh leafy yield		
	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	Total yield
Year (Y)	0.86	2.22	0.73	0.30	1.52	0.75	61.17**	30.99**	23.50**	16.51**	32.38**
Repl./Y	0.23	0.28	0.03	0.11	0.45	0.15	0.10	0.05	0.25	0.73	0.07
Genotype (G)	14.14**	52.01**	5.45**	6.86**	10.17**	13.60**	69.95**	45.33**	24.63**	184.55**	308.74**
G × Y	0.06	0.28	0.03	0.11	0.11	0.11	0.11	0.09	0.25	0.18	0.04
Error	0.26	2.40	0.06	0.13	1.48	1.92	3.40	1.20	0.94	1.21	2.00

S. O. V.	Seed yield and its components					
	Plant height	No. branches / plant	No. of seeds /pod	No. of pods /plant	Weight of 1000 seeds	Seed yield /plant
Year (Y)	52.80**	3.40**	7.11	1.96	0.423	9.04**
Repl./Y	0.25	0.28	0.28	0.11	0.003	0.19
Genotype (G)	64.53**	3.88**	897.60**	94.71**	0.813	9.90**
G × Y	0.13	0.09	0.28	0.16	0.002	0.05
Error	5.62	0.28	5.55	0.59	0.017	0.10

** Significant differences at 1% levels of probability.

Table 6: Genotypic (δ^2_g), genotypic × year (δ^2_{gy}), environmental (δ^2_e) variances, heritability (H%), genetic coefficient of variability (GCV), genetic advance (CA) and genetic advance in mean for the studied characters of the nine moloukhyia genotypes, calculated from the combined data over two seasons.

	Fresh yield and its components										
	Plant weight		Leaves weight / pant		No. leaves/plant		Net leaves weight		Fresh leafy yield		
	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	Total yield
δ^2_g	3.52	12.93	1.35	1.69	2.52	3.37	17.46	11.31	3.02	23.02	38.58
δ^2_{gy}	0.10	1.06	0.02	0.01	0.69	0.91	1.64	0.56	2.12	17.94	29.89
δ^2_e	0.26	2.40	0.06	0.13	1.48	1.92	3.40	1.20	0.94	1.21	2.00
H	96.79	91.97	98.23	97.90	77.88	78.31	91.27	95.13	69.98	71.29	71.41
GCV	148.68	509.88	37.29	57.54	15.21	23.81	172.08	120.97	0.10	0.14	0.12
GA	7.25	26.64	2.79	3.47	5.18	6.94	35.96	23.30	6.21	47.43	79.48
GA/M	0.09	0.19	0.09	0.08	0.5	0.5	0.87	0.65	0.348	1.407	1.565

	Seed yield and its components					
	Plant height	No. branches / plant	No. of seeds /pod	No. of pods /plant	Weight of 1000 seeds	Seed yield /plant
δ^2_g	16.10	0.95	224.33	23.64	0.20	1.22
δ^2_{gy}	2.75	0.09	2.64	0.21	0.01	0.97
δ^2_e	5.62	0.28	5.55	0.59	0.02	0.10
H	85.28	89.00	98.81	98.94	96.17	70.65
GCV	262.30	5.55	2679.67	72.50	0.74	0.25
GA	33.17	1.95	462.12	48.69	0.42	2.52
GA/M	0.5	0.3	2.6	3.3	0.3	0.576

It should be mentioned here that genetic variance would be biased upward since it contains non-partitioned genotypic × location source of variance (Comstock and Robinson 1952), so, these results could be accepted under the designed conditions of this investigation and any wider implications warrant further research.

Broad sense heritability estimates (Table 6) gave information on the magnitude of genetic variation (Dully and Moll, 1969). However, Herbert *et al.* (1955) pointed out that heritability give no indication of the amount of progress expected from selection. However, it seems to be most meaningful when accompanied by the estimates of genetic coefficient of variability (Burton, 1952). On the other hand, Herbert et al (1955) stated that heritability estimates, when related to the expected genetic advance, a considerable progress in modifying some characters by selection could be expected. Depending on these points of view, when the relatively high or moderate estimates of heritability related to relatively high or moderate estimates of genetic coefficient of variability and expected genetic advance, it would resulted In noticeable gain from selection. Therefore, plant weight, net leaves weight, plant height, number of seeds /pod, and number of pods/plant may be improved by selecting the top 5% of the studied genotypes of moloukhyia.

Correlation coefficient between yield and studied traits are shown in Table 7. Fresh foliage yield, i.e., first and second cuts and total, showed positive correlation with number of leaves/ plant, leaves weight, plant weight, number of branches / plant, and plant height. On the other hand, seed yield / plant exhibited positive correlation with number of pods/plant, leaves weight/plant at first and second cut, and plant weight at first and second cut. These findings may suggest that the mentioned traits showed to be concern for improving fresh yield of moloukhyia.

Table 7: Simple correlation coefficients between yield (fresh foliage and seed) and some studied characters, calculated from the combined data over two seasons.

Character	Fresh foliage yield			Seed yield /Plant
	1st cut	2nd cut	Total	
No. of leaves/plant				
1st cut	0.560 *	0.486 *	0.578 *	0.290
2nd cut	0.442	0.583 *	0.556 *	-0.425
Leaves weight/pant				
1st cut	0.460	0.561 *	0.660 **	0.046
2nd cut	0.459	0.569 *	0.693 **	-0.175
Plant weight				
1st cut	0.501 *	0.531 *	0.546 *	-0.139
2nd cut	0.426	0.623 **	0.797 **	-0.003
Plant height	0.044	0.517 *	0.508 *	0.534 *
No. of branches/ plant	0.828 **	0.976 **	0.957 **	0.591 **
No. of seeds /pod	-0.045	0.211	0.102	0.552 *
No. of pods/plant	0.352	-0.191	-0.008	0.971 **

*,** Significant differences at 5% and 1% levels of probability, respectively

On the other side, number of seeds/pods, number of pods/plant, number of branches/pant, and plant height showed to be the first concern for improving seed yield of moloukhyia. In this regard, in Tossa Jute (*Corchorus olitorius* L.), Timpo and Boateng (1982) reported that positive linear correlation was established between marketable yield and plant height; edible yield and marketable yield and number of side shoots. Paul and Eunus (1976) reported that base diameter, plant height, leaf angle and leaf area contribute most to fiber yield and selection for theses characters would be worth while.

Table 8: Direct effects (Diagonal) and indirect effects of yield components on seed yield of the nine moloukhyia ecotypes, calculated from the combined data over two seasons.

Character	Plant height	No. of branches/ plant	No. of seeds/pod	No. of pods/plant	Total effect
Plant height	0.566	-0.500	0.090	0.378	0.534
No. of branches / plant	0.011	-0.054	0.181	0.453	0.591
No. of seeds/pod	0.483	-0.960	0.198	0.830	0.551
No. of pods/plant	0.465	-0.551	0.190	0.866	0.970

1- R = 0.321

Direct and indirect effects of yield components on seed yield of the nine moloukhyia genotypes are tabulated in Table 8. The direct effect of number of pods/plant (0.866), followed by plant height was positive (0.566). In addition, it could be noted that the genotypic correlation between plant height and seed yield (0.534) seemed to be close to the estimated value of its direct effect, so, it may indicate a true relationship and direct selection through this trait may be effective for improving seed yield of moloukhyia. As the correlation coefficient between number of branches / plant and seed yield was positive (0.591) and the direct effect of this factor was negligible, it seems that indirect effect appeared to be the cause of correlation. Hence, this factor may be used, simultaneously, with plant height, and number of pods. In this respect, Ali *et al.*, (2002) suggested that plant height had been used for selection of jute plants (*Corchorus capsularis* and *C. olitorius*) with higher fiber yield. Also, these results were obtained by Ali (1994), Islam *et al.* (1995), and Shaikh *et al.* (1980) on jute plants. However, Saha *et al.* (2002) reported that selection on plant height did not reflect a corresponding response in jute yield. Concerning the traits affect directly or indirectly their total fresh leafy yield of moloukhyia, Rawhia (2004) reported that number of leaves/plant was detected to have direct effect on total yield, while plant height, number of branches/plant and leaf area/plant seemed to have an indirect effect through their associations with net leaves weight /plant and number of leaves/plant.

It worth mentioning that the residual effect for seed yield/plot was relatively low (R = 0.321). Such result indicated that this character may depend on other traits as well, so, it may be needed to investigate more attributes affecting pod yield in moloukhyia.

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دراسة التباين وبعض العلاقات بين صفات بعض التراكيب الوراثية فى الملوخية

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أجرى هذا البحث على ثمانية طرز محلية من الملوخية جمعت من مناطق مختلفة من جمهورية مصر العربية بالإضافة إلى صنف الاسكندراني المستنبط بمعهد بحوث البساتين ؛ حيث زرعت هذه التراكيب الوراثية بمحطة بحوث البساتين بالصبحية خلال موسمين صيفيين ناجحين لعامى ٢٠٠٤ و ٢٠٠٥ بغرض دراسة الاختلافات فيما بينها ، وكذلك تحليل معامل المرور لمعرفة الصفات التى تؤثر تأثيرا مباشرا أو غير مباشر على المحصول والتى قد تفيد فى تخطيط برنامج الانتخاب الملائم.

وكانت أهم النتائج كما يلى:

٢- تفوق الطراز السيوى مورفولوجيا على التراكيب الوراثية الأخرى من الملوخية فى صفات : وزن النبات ، وزن الأوراق / نبات ، وعدد القرون / نبات ، المحصول البذرى / نبات.

٣- أظهر الطراز بلدى سوهاج تفوقا فى صفة عدد الفروع / نبات ، والطراز بلدى شرقية فى صفة عدد البذور / القرن مقارنة بالتراكيب الوراثية الأخرى من الملوخية.

٤- بالنسبة للمحصول الورقى فقد كان الطراز بلدى سوهاج الأعلى إنتاجا – لكل فدان – فى الحشتين الأولى والثانية والمحصول الكلى . هذا .. ولا توجد اختلافات معنوية بين هذا الطراز وبين الطرازين السيوى والصعيدى فى الحشة الأولى ، وبينه وبين صنف الاسكندرانى فى الحشة الثانية ، وبينه وبين الطرازان الفلاحى شرقية والصعيدى فى المحصول الكلى.

٥- كان هناك اختلافات معنوية فيما بين كل التراكيب الوراثية للملوخية فى كل الصفات المدروسة مما يشير إلى وجود تباين وراثى فيما بينها.

٦- أظهرت كل الصفات المدروسة درجة توريث مرتفعة، وقد وجد أنه يمكن تحسين صفات طول ووزن النبات ، والوزن الصافى ،وعدد البذور / القرن ، وعدد القرون/النبات وذلك بانتخاب أفضل ٥ % من الأفراد فى هذه العشيرة؛ لأن القيم المرتفعة لدرجة توريث اقترنت مع القيم المرتفعة لكل من GCV و GA لهذه الصفات.

٧- كان هناك ارتباطا معنويا عاليا بين المحصول الورقى (فى الحشتين الأولى والثانية والمحصول الكلى) وبين عدد الفروع / نبات (عند الحشة الأولى والثانية ونهاية الموسم).

٨- بالنسبة للمحصول البذرى فقد ارتبط ارتباطا معنويا مع كل من عدد البذور / قرن ، وعدد القرون / نبات ، و عدد الفروع / نبات ، وارتفاع النبات

٩- وقد أشار تحليل معامل تحليل المرور للمحصول البذرى إلى أن صفة عدد الفروع / نبات كان لهما تأثيرا مباشرا ايجابيا تلتها صفة ارتفاع النبات. أما صفتى عدد البذور / القرن ، وعدد القرون/ نبات فقد كان لهما تأثيرا غير مباشر على المحصول من خلال الصفتين المذكورتين سابقا.