Response of two okra cultivars Abelmoschus esculents L. Cultivated in greenhouses for the process of pinching the apical dominance and spraying with roselle extract.

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Abstract:
The field experiment was conducted in the winter season 2023-2024 at the Agricultural Research Station - Karma Ali site - College of Agriculture - University of Basra . The study aimed to know the response of two local okra varieties (Khanisriya and Batrah) grown in plastic houses to the process of pinching the apical dominace and spraying with roselle extract . The treatments included for both varieties (without pinching, pinching after 45 days and 60 days of planting) and spraying with roselle extract at a concentration of (5 and 10) g/L in some growth and yield characteristics of okra plants. A complete randomized block design was used, Split split design, with a factorial experiment and three replicates. The results were analyzed using the GeneStat program, and the means were compared according to the Lsd test at a probability level of 0.05 [7. [
The results of the experiment showed that the variety and the carotene did not significantly affect the leaf content of total chlorophyll and carotene, while spraying with the extract of the carotene caused a significant difference for both concentrations (5 and 10) g/l, and the effect increased significantly with increasing concentration.
The plants that were pruned after 45 days and sprayed with a concentration of 10 g/l gave the highest percentage of TSS.

Keywords:
Okra ,roselle , extract, total chlorophyll pinching ,extract.
the introductio

Okra is an important vegetable crop belonging to the Malvaceae family . It is an important crop grown in all regions of the world with temperate and warm climates [13] In tropical and subtropical regions . It reproduces sexually using seeds that are planted directly in the soil. It is grown for the purpose of obtaining its green pods , which are eaten after cooking. It has a high nutritional value because it contains carbohydrates, fiber, fats, protein, and minerals such as calcium, iron, and vitamins such as vitamins A, B1, B2, B6,

ISSN 2072-3857

C. [5] Okra is important in human nutrition, as every 100 grams of green pods contain 81.6 water, 36 calories, 2.10 grams of protein, 0.20 grams of fat, 8.20 grams of carbohydrates, 185 micrograms of carotene, 1.70 grams of fiber, 48 mg of calcium, 90 mg of phosphorus, 1.20 mg of iron, 47 mg of ascorbic acid , and 0.08 mg of riboflavin. Flavin , 0.04 mg Thiamine and 0.60 mg Niacin [10] .. Okra is described as

Plants with long leaves ranging in length from (10-20 cm) and five to seven lobes, their flowers are axillary and range in size from (4-8) cm3 and their diameter is (1.5-3 cm) [2].One of the important means of increasing crop productivity is the process of pinching the apical dominace [6]showed that pinching the apical dominace of the okra plant 35 days after planting led to a significant increase in vegetative growth and early and total yie noted [19] Pruning the apical dominace of okra after (83,93,111) days of planting caused a significant increase in vegetative growth represented in the diameter of the stem, the

Materials and methods

The experiment was conducted in the winter agricultural season 2023/2024 in one of the plastic houses. The unheated soil of the Agricultural Research and Experimental Station - College of Agriculture - University of Basra, Karma Ali site, shows some of the components of the extract. The greenhouse land was plowed twice, smoothed, leveled and sterilized by solar sterilization on. The land was divided into six rows , the distant between rows was 120 cm, . Decomposed animal manure was added to the rows before planting at a rate of 5 m3 for the greenhouse .NPK chemical fertilizer (20:20;20) was also added at a rate of 1.5 kg for each row and a total of 9 kg for the greenhouse. To prevent fungal diseases, Potassium permanganate was added number of leaves, branches, fruits and the total yield. Also , the use of natural plant extracts as foliar fertilizers is one of the most appropriate modern scientific methods that are safe for human health and the environment, including the use of the extract of the guarat plant. Hibiscus sabdoriffa is rich in vitamins, minerals and amino acids [4] , as it stimulates vital processes in the plant such as photosynthesis , respiration , chlorophyll formation, encouraging cell division, tissue growth, and regulating and activating plant hormones [14] and [12] noted that when spraying fava beans, Vicia Fava with different concentrations of the extract of the plant (0, 5 and 10) g.L. A concentration of 10 g.L. led to a significant increase in vegetative growth indicators. Due to the lack of previous studies, we decided to conduct this study to determine the response of two varieties of okra Khneisari and Batrah planted in greenhouses are subjected to the process of pinching the apical dominace and spraying with extract of the roselle plant.

to the soil at a rate of 100 grams per row. A drip irrigation system was installed and the rows were covered with black polyethelene plastic (malching). The seeds were planted directly in the soil for two local okra varieties, Khnaisriya. V1 and Batrah V2 plots on both sides of the planting holes are opposite each other, the distance between the holes is 30 cm. 4 seeds were placed in the hole, which were thinned to 2 plants after germination (after 40 days of planting) .The length of unit experiment 4.5m ,the era of evry unit experiment 5.4m2 ,the number of plant in very unit 60 plants therefore plants .m2The experiment was implemented as a factorial experiment split split design and according to the randomized complete block design

ISSN 2072-3857

(RCBD) with three replications*3*3*3 2 = 54 experimental units .

Table (1) Content of every 100g of calyx petals of the hyacinth [14[

T	Component	Content	Unit of measure
1	Protein	3.5	gm
2	Total fat	0.30	gm
3	carbohydrate	8.7	gm
4	VitaminA	20	0/0
5	VitaminC	5	0/0
6	Thiamine	4	0/0
7	Riboflavin	0.4	mg
8	Niacin	1.4	mg
9	Calcium	240	mg
10	iron	5.0	mg
11	nitrogen	2.6	mg
12	Phosphorus	2.3	mg

The factors of the experiment are three :
The main plot included two varieties of okra Okra, one variety
Al-Khanisriya v1 and v2 amputation class.
Second factor Sub plot pinching of the apical dominace without earring C1 pinching after 45 days of planting C2 pinching after 60 days of planting C3
The third fact (sub- sub plot) is spraying with roselle extract with three concentrations (0, 5 and 10) g.l , including without spraying a concentration of 0 g.l S1 , spraying at a concentration of 5 g.l S2 and spraying at a concentration of 10 g.l S3 , with three sprays , the first after 60 days of planting and the second after 15 days. One day after the first spray and the third after 15 days after the second spray. All agricultural service operations were carried out in a similar manner for all units. Experimental fertilization, weeding and pest control. The plastic house was covered with a polyethylene (plastic) cover on 12/5/2023 and finally removed on 4/15/2024. Harvesting began on 2/15/2024 and continued until 4/30/2024. The following measurements were read by taking a random sample of (6 plants) for each experimental unit at the end of the season. The extract was prepared according to the method

of (Harbor, 1984) by taking 50 g of powdered angiosperm leaves of the plant and dissolving them in 500 ml of distilled water and placing them on a shaker for an hour and leaving them for 30 minutes to settle. Then, the solution was filtered using gauze and then filter paper to remove suspended particles. It was placed in a centrifuge at 3000 rpm for 15 minutes. Then, the filtrate was taken and concentrated using a rotary evaporator. (5 and 10) g/l were taken from it for treatment purposes. A few drops of (Al-Zahi) washing powder were added to the extract during spraying as a dispersant. The studied characteristics included the leaf content of (total chlorophyll, carotene , total soluble carbohydrates and NPK elements), the pod content of vitamin C and the percentage of total soluble solids (TSS.(

Results and discussion

Table (2) shows that the variety and the roselle did not significantly affect the leaf content of total chlorophyll and carotene , while spraying with the extract of roselle caused a significant difference, as spraying with both concentrations (5 and 10) g/l caused a significant increase in both characteristics and an increase rate of (18.10 and 40.87) 0/0 in total chlorophyll and (16.66 and 38.59) 0/0 for the leaf content of carotene , respectively. The effect increased significantly with increasing concentration, and this may be attributed to the role of the extract rich in essential vitamins and minerals such as Fe, Ca , Zn , Mn) and others, which regulate plant growth and various vital processes [17] Which was positively reflected in the photosynthetic pigments of the plant, and this result is consistent with whwas found.ther [9] and [3. [

The binary and ternary interactions between the study factors had no significant effect , except for the binary interaction between the scouring and the extract on the chlorophyll content of the leaves, as the unscouring plants sprayed with the extract at a concentration of 10 g/l gave the highest chlorophyll content, reaching (59.34) mg/100 g fresh weight.

While the plants that were sprayed after 45 days of planting and were not sprayed gave the lowest chlorophyll content, which amounted to (39.07) mg/100 g fresh weight, the interaction between the variety and the extract showed a significant effect on the carotene content of the leaves, as the leaves of the Khnaisriya variety sprayed at a concentration of 10 g gave . The highest carotene content was (0.168) mg/100 g fresh weight. The unsprayed Khneisriya cultivar plants gave the lowest carotene content, which was (0.108) mg/100 g fresh weight. The triple interaction showed a significant effect on total chlorophyll, as the unsprayed Khneisriya cultivar plants sprayed with 10 g/l roselle extract gave the highest chlorophyll content, which was (61.03) mg/100 g fresh weight. While the Khneisriya cultivar plants gave The lowest chlorophyll content in the unsprayed maqrouta after 45 days was (38.09) mg/100 g fresh weight.

ISSN 2072-3857

Table(2) shows effect of variety, pinching and spraying with Roselle extract and intraction between them on the leaves content of total chlorophyll and carotene mg .100g fresh weight.

variety	Pinching Apical dominance	Chlorophyll mg .100g fresh weight			Interaction Veriety x pinching	Carotene mg .100g fresh weight			Interaction Veriety x Pinching
		Roselle extract g.L				Roselle extract g.L			
		0	5	10		0	5	10	
khnesryah	With out	40.22	46.21	61.03	49.15	0.104	0.139	0.167	0.137
	After 45 day	38.09	49.52	56.66	48.09	0.099	0.129	0.185	0.138
	After 60 day	44.53	50.5	58.66	51.23	0.12	0.139	0.152	0.137
btrah	With out	42.38	49.12	57.64	49.71	0.117	0.128	0.144	0.129
	After 45 day	40.06	48.88	60.12	49.68	0.119	0.128	0.146	0.131
	After 60 day	42.23	48.11	54.53	48.29	0.122	0.133	0.154	0.136
lsd		4.14			NS	NS			NS
					Main effect var.				Main effect var.
Intraction Var. x extract	khnesryah	40.95	48.74	58.78	49.49	0.108	0.136	0.168	0.137
	Btrah	41.56	48.7	57.43	49.23	0.119	0.129	0.148	0.132
lsd		NS			NS	0.127			NS
					Main effecT. Pinching.				Main effect pinching
Intraction Pinching x extract	With out	41.3	47.67	59.34	49.43	0.111	0.133	0.155	0.133
	After 45 day	39.07	49.2	58.39	48.89	0.109	0.129	0.166	0.134
	After 60 day	43.38	49.31	56.59	49.76	0.121	0.136	0.153	0.137
Lsd		3.21			NS	NS			NS
Main effect extract		41.25	48.72	58.11		0.114	0.133	0.158	
lsd		1.06				0.008			

ISSN 2072-3857

Table (3) shows that the three study factors, variety, roselle and extract, had a significant effect on the leaf content of total soluble carbohydrates, while the extract had a significant effect only on the leaf content of nitrogen, as the variety outperformed significantly in the leaf content of total soluble carbohydrates with an increase rate of (19.22) 0/0. This increase may be attributed to the genetic factors specific to the variety and its suitability to the environmental conditions inside the plastic house [8] and [15] and this result is consistent with what was obtained.] 1[

The pinching also showed a significant effect in increasing the content of total soluble carbohydrates in the leaves for both treatments after (45 and 60) days of planting, with an increase rate of (6.90 and 7.21) 0/0, respectively. The increase may be attributed to the role of the pinching process in increasing the vegetative growth of plants, which led to the efficiency of the photosynthesis process and the accumulation of manufactured nutrients in the leaves, including carbohydrates. This result is consistent with what was found. [19.[

Spraying with the extract caused a significant increase in the carbohydrate content of the leaves for both concentrations (5 and 10) g/L, with an increase rate of (23.57 and 56.79) 0/0. The effect increased significantly with increasing the concentration of the extract. As for the nitrogen content of the leaves, increasing the concentration by 10 g/L caused a significant decrease in the nitrogen content of the leaves compared to the control treatment and the spraying treatment at a concentration of 5 g/L, with a decrease rate of (16.01 and 16.28) 0/0, respectively. The decrease in the nitrogen content of the leaves when the concentration increases may be attributed to its transfer to a large number of fruits and its low percentage in the leaves.

As for the interactions, the binary interaction between the cultivar and the roselle caused a significant effect on the leaf content of total soluble carbohydrates and nitrogen, as the plants of the cultivar Bitrah al-Maqrouta gave the highest carbohydrate content after 45 days of planting, reaching (299.8) mg.100 g dry weight, while the plants of the cultivar Khneisriya without roselle gave the lowest carbohydrate content, reaching (228.4) mg.100 g dry weight. The plants of the cultivar Bitrah without roselle also gave the highest percentage of nitrogen in the leaves, reaching (3.459) 0/0, while the plants of the cultivar Khneisriya without roselle gave the lowest percentage of nitrogen, reaching (2.106) 0/0. The interaction between the cultivar and the extract also showed a significant effect on the total soluble carbohydrates, as the plants of the cultivar Bitrah sprayed at a concentration of 10 g/l gave the highest carbohydrate content, reaching (344.2) mg.100 g dry weight, while the unsprayed Khneisriya variety plants gave the lowest content of (183.3) mg.100 g dry weight. The interaction between the roselle and the extract had a significant effect on them, as the roselle plants after 60 days and sprayed with a concentration of 10 g/l gave the highest carbohydrate content of (346.1) mg.100 g dry weight, while the unsprayed and unsprayed plants gave the lowest content of (200.5) mg.100 g dry weight, while the roselle plants after 45 days and sprayed with a concentration of 5 g/l gave the highest percentage of nitrogen of (3.53) 0/0, while the roselle plants after 45 days of planting and sprayed with the extract at a concentration of 10 g/l gave (2.546) 0/0. As for the triple interaction, It had a significant effect on the nitrogen content of the leaves, as the unpruned

and unsprayed Batrah variety plants gave the highest percentage of nitrogen in the leaves, reaching (4.156) 0/0, while the unpruned and sprayed Khneisriya variety plants at a concentration of 5 g/l gave the lowest percentage of nitroge n, reaching (1.855) 0/0

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Table (3) shows the variety's effect , the apical dominace pruning, and spraying with the extract of the kernels , and the interaction between them in the leaf content of total soluble carbohydrates, mg/100 gm dry weight, and N 0/0.

variety	Pinching Apical dominance	Carbohydrates mg.100g dry weight			Interaction Veriety x pinching	0/0 N			Interaction Veriety x Pinching
		Roselle extract g.L				Roselle extract g.L			
		0	5	10		0	5	10	
khnesryah	With out	179.8	219	286.6	228.4	2.152	1.855	2.31	2.106
	After 45 day	188.6	228.3	300.6	239.2	3.185	3.771	2.345	3.1
	After 60 day	181.6	244.6	338	254.7	3.692	4.025	2.327	3.348
btrah	With out	221.3	272.6	333.3	275.7	4.165	3.325	2.887	3.459
	After 45 day	258.6	296	345	299.8	2.782	3.29	2.747	2.94
	After 60 day	219	284.3	354.3	285.8	2.94	2.712	3.272	2.975
lsd		NS			19.8	1.094			1.053
					Main effect variety.				Main effect variety
Intraction Var. x extract	khnesryah	183.3	230.6	308.4	240.8	3.01	3.217	2.327	2.851
	Btrah	233	284.3	344.2	287.1	3.29	3.109	2.969	3.125
lsd		19.5			25.7	NS			NS
					Main effecT. Pinching.				Main effect pinching
Intraction Pinching x extract	With out	200.5	245.8	310	252.1	3.159	2.59	2.599	2.782
	After 45 day	223.6	262.1	322.8	269.5	2.984	3.53	2.546	3.02
	After 60 day	200.3	264.5	346.1	270.3	3.316	3.369	2.8	3.162

ISSN 2072-3857

Lsd		13.3			8.6	0.596			NS
Main effect extract		208.1	257.5	326.3		3.153	3.163	2.684	
lsd		7.8				0.317			

It is clear from Table (4) that the variety had a significant effect on the leaf content of phosphorus only, as the Khneisriya variety was significantly superior in giving the highest percentage of leaf content of phosphorus, reaching (0.275) 0/0, compared to the Batrah variety, which gave (0.202) 0/0. This may be attributed to the genetic factors specific to the variety and its suitability to the environmental conditions inside the plastic house, which are considered among the most important factors determining the growth and productivity of the variety. Matloub (1984) [15] This result is consistent with what was found. [1] As it appears from the tabl pinching process had a significant effect on the leaf content of phosphorus and potassium, as the pinching treatment after 60 days of planting was significantly superior in giving the highest percentage of phosphorus content , reaching (0.259) 0/0, compared to the pinching treatment after 45 days of planting, which gave (0.208) 0/0. The pinching treatment after 60 days of planting did not differ significantly compared to the comparison treatment, which gave (0.249) 0/0, which in turn was significantly superior compared to the pinching treatment after 45 days of planting.

The pricking treatment after (45 and 60) days of planting caused a significant increase in the content of potassium in the leaves, reaching (1.725 and 1.719) 0/0, respectively, compared to the comparison treatment, which gave (1.586) 0/0. This may be attributed to the role of the pricking process in stimulating the plant to form a large root system capable of absorbing mineral elements from the soil. This result is consistent with what was found. 2[11] . As for spraying with the extract, it had no significant effect on the leaf content of both elements (phosphorus and potassium.(

interactions showed a significant effect , as the binary interaction between the cultivar and the roselle caused a significant effect on the potassium content of the leaves, as the plants of the Khneisriya cultivar gave After 60 days of planting, the highest potassium content was (1.875) 0/0, while the non- maqrotted Khneisriya variety plants gave the lowest percentage, (1.413) 0/0.

The interaction between the variety and the extract also showed a significant effect on the potassium content of the leaves, as the unsprayed Khneisriya variety plants gave the highest percentage, reaching (1.758) 0/0, while the sprayed Batra variety plants at a concentration of 10 g/l gave the lowest percentage, reaching (1.565) 0/0.

The interaction between the spray and the extract showed a significant effect on both traits (phosphorus and potassium), as the sprayed plants after 60 days of planting and not sprayed gave the highest values in the leaf content of phosphorus and potassium, reaching (0.306 and 2.077) 0/0, respectively, while the sprayed plants after 45 days of planting and sprayed with the extract at a concentration of 5 g/L gave a lower percentage of phosphorus, reaching (0.170) 0/0, while the unsprayed and unsprayed plants

gave the lowest percentage of potassium, reaching (1.317) 0/0.

As for the triple interaction, it had a significant effect on the phosphorus content of the leaves only, as the plants of the Khneisriya variety gave The highest percentage of unsprayed maqrouta after 60 days of planting was (0.376) 0/0, while the plants of the Khnaisriya variety gave After 45 days , the lowest percentage was (0.151) 0/0

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Table (4) shows the effect of the variety, pinching of the apical dominace , spraying with the extract of the kernels and the interaction between them on the leaf content of P and K 0/0.

variety	Pinching Apical dominance	P 0/0			Interaction Veriety x pinching	K 0/0			Interaction Veriety x Pinching
		Roselle extract g.L				Roselle extract g.L			
		0	5	10		0	5	10	
khnesr yah	With out	0.287	0.287	0.295	0.29	1.085	1.435	1.72	1.413
	After 45 day	0.248	0.151	0.312	0.237	1.9	1.625	1.9	1.808
	After 60 day	0.376	0.334	0.188	0.299	2.29	1.705	1.63	1.875
btrah	With out	0.19	0.236	0.202	0.209	1.55	2.055	1.67	1.758
	After 45 day	0.171	0.189	0.178	0.179	1.55	1.705	1.67	1.642
	After 60 day	0.236	0.172	0.248	0.218	1.863	1.473	1.355	1.564
lsd		0.055			NS	NS			0.279
					Main effect variety				Main effect variety
Intraction Var. x extract	khnesryah	0.304	0.257	0.265	0.275	1.758	1.588	1.75	1.699
	Btrah	0.199	0.199	0.209	0.178	1.654	1.744	1.565	1.655
lsd		NS			0.037	0.275			NS
					Main effecT. Pinching.				Main effect pinching
Intraction Pinching x extract	With out	0.239	0.261	0.248	0.243	1.317	1.745	1.695	1.586
	After 45 day	0.209	0.170	0.245	0.178	1.725	1.665	1.785	1.725
	After 60 day	0.306	0.253	0.218	0.259	2.077	1.589	1.492	1.719
Lsd		0.038			0.017	0.185			0.12

ISSN 2072-3857

Main effect extract	0.251	0.228	0.237		1.706	1.666	1.657	
lsd	NS				NS			

Table (5) shows that the variety and spraying with the extract significantly affected the content of the pods of vitamin C and TSS 0/0. While the pod had a significant effect only in TSS 0/0, as the pods of the Khneisriya variety gave the highest content of vitamin C compared to the Batrah variety, with an increase rate of (33.14) 0/0, while the opposite occurred in TSS 0/0, as the pods of the Batrah variety were significantly superior compared to the pods of the Khneisriya variety , with an increase rate of (5.80) 0/0. The difference between the two varieties is attribut ed to geneticac. [15] This result is consistent with what was obtained by . [17 [

Plucking the apical dominace after (45 and 60) days of planting led to a significant increase in TSS 0/0 by an increase rate of (8.93 and 5.05) 0/0, respectively.

In turn, the roselle treatment after 45 days of planting was significantly superior compared to the roselle treatment after 60 days, with an increase rate of (3.69) 0/0. This may be attributed to the effect of roselle in increasing the growth of the plant's vegetative group and thus increasing the efficiency of the photosynthesis process, which leads to the accumulation of manufactured nutrients in the pods, including soluble sugars. This result is consistent with what was obtained by . [16 [

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As for spraying with the extract, spraying with both concentrations (5 and 10) g/l caused a significant increase compared to the comparison treatment, with an increase rate for both of them reaching (43.42 and 13.8.26) 0/0 in Vitamin C , and also in TSS 0/0, the increase rate reached (25.49 and 45.61) 0/0, respectively. The effect increased significantly with an increase in the spray concentration for both of them.

The increase may be attributed to the role of the extract in encouraging vegetative growth and the result , which is reflected in the increase in the compounds and nutrients stored in it. This result is consistent with what was found. [17. [

As for the interactions, the interaction between the variety and the pod showed a significant effect , as the plants of the Maqrouta variety gave the highest percentage of TSS 0/0 in the pods after 45 days of planting, reaching (6.68) 0/0, while the plants of the non- Maqrouta Khneisriya variety gave (5.79) 0/0.

The interaction between the variety and the extract also showed a significant effect on the content of pods of vitamin Cand TSS 0/0, as the plants of the variety Khneisriya sprayed with a concentration of 10 g/l gave the highest content of vitamin C , reaching (39.01) mg.100 g fresh weight, while the plants of the variety Petra, not sprayed, gave the lowest content, reaching (11.73) mg.100 g fresh weight, while the plants of the variety Petra sprayed with a concentration of 10 g/l gave the highest percentage of TSS in the pods , reaching (7.5) 0/0, while the pods of the plants of the variety Khneisriya, not sprayed, gave the lowest percentage, reaching (4.77) 0/0.

The interaction between the roselle and the extract showed a significant effect for both of them, as the plants that were qarted after 60 days of planting and sprayed with a

concentration of 10 g/l gave the highest content of vitamin C , reaching (38.67) mg/100 g fresh weight, while the plants that were qarted after 45 days and not sprayed gave the lowest content of vitamin C, reaching (15.73) mg/100 g fresh weight, while the plants that were qarted after 45 days and sprayed with a concentration of 10 g/l gave the highest percentage of TSS 0/0, reaching (7.51) 0/0, while the plants that were not qarted and not sprayed gave the lowest percentage, reaching (4.56) 0/0.

The triple interaction showed a significant effect on TSS only, as the plants of the cultivar "Batrah Al-Maqrouta" after 45 days and sprayed with a concentration of 10 g/l gave the highest percentage of TSS, reaching (7.78) 0/0, while the plants of the cultivar "Khanisriya" gave The not pinching The unsprayed ones had the lowest TSS percentage, which was (4.19) 0/0.

Table(5) shows effect of variety, pinching and spraying with Roselle extract and intraction between them on the content the pods of vitamin C mg . 100 g fresh weight and TSS 0/0.

variety	Pinching Apical dominance	Vitamen C mg.100g Fresh weight			Interaction Veriety x pinching	TSS 0/0			Interaction Veriety x Pinching
		Roselle extract g.L				Roselle extract g.L			
		0	5	10		0	5	10	
khnesryah	With out	20.9	26.4	40.26	29.19	4.19	6.17	7.02	5.79
	After 45 day	18.92	27.5	37.18	27.87	5.19	6.28	7.25	6.24
	After 60 day	16.72	24.86	39.6	27.06	4.92	6.22	7.08	6.07
btrah	With out	11.66	15.62	33.66	20.31	4.93	6.23	7.06	6.07
	After 45 day	12.54	18.26	30.14	20.31	5.67	6.6	7.78	6.68
	After 60 day	11	18.92	37.74	22.55	5.22	6.29	7.65	6.39
lsd		NS			NS	0.06			0.03
					Main effect variety				Main effect variety
Intraction Var. x extract	khnesryah	18.85	26.25	39.1	28.04	4.77	6.22	7.12	6.03
	btrah	11.73	17.6	33.85	21.06	5.27	6.37	7.5	6.38
lsd		2.51			3.29	0.03			0.01
					Main effecT. Pinching.				Main effect pinching

ISSN 2072-3857

Intraction Pinching x extract	With out	16.28	21.01	36.96	24.75	4.56	6.2	7.04	5.93
	After 45 day	15.73	22.88	33.66	24.09	5.43	6.44	7.51	6.46
	After 60 day	13.86	21.89	38.67	24.81	5.07	6.25	7.37	6.23
Lsd		2.09			NS	0.05			0.02
Main effect extract		15.29	21.93	36.43		5.02	6.30	7.31	
lsd		0.95				0.03			

Conclusions and recommen :

In order to increase the leaf content -1 of total chlorophyll, carotene and carbohydrates for the two okra varieties grown in greenhouses (Khanisriya and Batrah), they must be sprayed with 10 g/l of roselle extract .

In order to increase the leaf content of 2- total soluble carbohydrates and potassium, the apical dominace s of the plants must be pinched 60 days after plantin.

In order to increase the leaf content of 3- total soluble carbohydrates, potassium and total soluble solids (TSS), it is necessary to pinch the plants after (45 and 60) days from planting.

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ISSN 2072-3857