

RESPONSE OF FLAME SEEDLESS GRAPEVINES GROWN UNDER SANDY SOIL TO FOLIAR SPRAYING OF SOME PLANT EXTRACTS

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SUMMARY

This study was carried out during 2020 and 2021 seasons for examining the effect of single and combined applications of three plant extracts namely green tea extract, turmeric extract and garlic extract each at 0.05, 0.1 and 0.2% on yield and quality of Flame seedless grapes. Single and combined applications of the three plant extracts was very effective in improving some vegetative growth characteristics, vine nutritional status, yield and berry quality over the check treatment. The best plant extract in this respect was garlic extract followed by turmeric extract and green tea extract occupied the last position. Combined applications of these three plant extracts was materially favorable than using each plant extract alone in promoting these characteristics as well as the stimulation was proportional to increase in concentrations from 0.05 to 0.2% for promoting yield and berry quality of Flame seedless grapevines grown under sandy soil, it is advised to spray the grapevines three times at growth start, just after berry setting and one month later with a mixture of green tea extract, turmeric extract and garlic extract each at 0.1%.

Keywords: plant extracts, garlic, green tea, turmeric, yield, quality, flame seedless.

INTRODUCTION

In Upper Egypt, plantation of the grapevines cv. Flame faces some problems. The decline on the yield and the inferior of quality aspects due to uneven colouration of the berry in the clusters are considered the main drawbacks.

The change for using plant extract against chemicals was performed because pathogens resistance to the fungicides has developed as well as for protecting our environment from pollution. The higher own content of these plant extracts from plant pigments, phenolic compounds and essential oils seem to have synergistic effects on yield of grapevines. (Kirtikare and Basu, 1984; Haggerty, 1999; Maia *et al.*, 2014 and Dhekney, 2016)

The beneficial effects of garlic extract on promoting the growth and yield of grapevines might be attributed to its higher content of sulfur containing compounds, amino acids and various volatiles- sulfur in constitute of the three amino acids methionene, cysteine and cysteine and hence proteins.

They play definite roles in enhancing the biosynthesis of GA₃, indoles, total carbohydrates free water and most organic foods and reducing total phenols and ABA (Kubta *et al.*, 1999 and Kubta *et al.*, 2000).

Using plant extracts especially turmeric extract had beneficial effects on growth and fruiting of different fruit crops and this is attributed to the higher own content of antioxidant from phenolic compounds, plant pigments and other organic compounds (Ammon and Wehl, 1991; Osawa, 1994; Bruneton,

2011; Prakash and Majeed, 2003; Pons, 2003; Chowdhury *et al.* 2007; Bhadwaj *et al.*, 2010 and Hanafy *et al.*, 2012).

The target of this study was testing the effect of some plant extracts on growth, nutritional status and fruiting of Flame seedless grapevines.

MATERIALS AND METHODS

The present study was carried out through two seasons 2020 and 2021 on thirteen years old Flame seedless grapevines grown in a private vineyard situated west Esna district, Luxor Governorate, Egypt. Soil of the vineyard is sandy texture and well drained and water table is not less than two meters deep. Vines are spaced at 3.0 x 2.0 meters apart. (700 vines per Feddan). The selected vines (78 vines) were chosen as uniform in vigour as possible and devoted to achieve this study. The chosen vines were pruned during the last week of December in both seasons.

Spur pruning system using gable shape supporting method was followed. Vine load for all the selected vines was adjusted to 72 eyes on the basis of (15 fruiting spurs x four eyes plus 6 replacement spurs x two eyes). Drip irrigation system was followed using well water. Containing 660 ppm salinity, all fertilizers was added with irrigation water (fertilization).

Mechanical, physical and chemical analysis of the tested soil at 0.0- 90.0 cm. depth were carried out at the start of the experiment according to the procedures of (Chapman and v Pratt, 1965).

Table (1): Analysis of the tested soil

Constituent	Values
Sand %	80.0
Silt %	11.0
Clay %	9.0
Texture	Sandy
O.M. %	0.1
pH (1: 2.5 extract)	8.0
EC (1:2.5 extract) ppm	1.66
CaCO ₃ %	3.00
Total N%	0.009
Available P (ppm)	101
Available K (ppm)	29.0

This experiment included the following thirteen treatments from various some plant extracts concentrations:

- 1- Control (vines sprayed with water).
- 2- Spraying garlic extract at 0.05% (0.5 g / L water).
- 3- Spraying garlic extract at 0.1% (1.0 g / L water).
- 4- Spraying garlic extract at 0.2% (2.0 g / L water).
- 5- Spraying green tea extract at 0.05% (0.5 g / L water).
- 6- Spraying green tea extract at 0.1% (1.0 g / L water).
- 7- Spraying green tea extract at 0.2% (2.0 g / L water).
- 8- Spraying turmeric extract at 0.05% (0.5 g / L water).
- 9- Spraying turmeric extract at 0.1% (1.0 g / L water).
- 10- Spraying turmeric extract at 0.2% (2.0 g / L water).
- 11- Spraying the three extracts in low concentration.

12- Spraying the three extracts in medium concentration.

13- Spraying the three extracts in high concentration.

Each treatment was replicated three times with two vines per each.

Plant extracts were sprayed three times at growth start (first week of March), just after berry setting (first week of April) and at one month later (first week of May).

Triton B as a wetting was added to all plant extracts solutions at 0.1% spraying was done till run off.

Randomized complete block design (RCBD) was adopted where the thirteen treatment were included replicated three times with two vines per each (Rangaswamy, 1995).

Chemical analysis of the investigated plant extracts are shown in Tables (2 to 4) according to (Shiyou et al., 2011 and Dhekney , 2016).

Table (2): Chemical analysis of green tea

Constituent	Values /100 g . D.W.)	Constituent	Values /100 g . D.W.)
Total carbohydrates	11.0 g	Zn	41.0 ppm
Total fats	0.4 g	Fe	51.0 ppm
Favonoides	0.3 g	Mn	60.0 ppm
Tannins	2.9 g	Coneshin	0.7 g
Flour	20.0 mg	Thiamine	110.0 mg
N	1.19 g	Vitamin A	90.0 mg
P	0.24 g	Vitamin B	74.1 mg
K	1.0 g	Vitamin C	120.0 mg
Mg	0.5 g	Coffeic acid	315.0 mg

Table (3): Chemical composition of turmeric (according to Shiyou et al., 2011)

Compounds	Values /100 g . D.W.)	Compounds	Values /100 g . D.W.)
β- bisabalene %	1.3	α- pinene %	0.1
1, 8 – cineol %	2.4	Terpinolene %	0.3
p- cyemen %	3.0	Tr- turmerone %	31.1
p- cyemen -8-ol %	0.3	Turmerone %	10.0
Tr- curcumin %	6.3	Ascorbic acid (mg)	50.0
Curhone %	10.6	ASH (g)	6.8
Dehydrocurcumin %	2.2	Calcium (g)	0.2
Myrecen %	0.1	Carbohydrate (g)	69.9
α- phellanmdrene %	0.1	Fat (g)	8.9

Table (4): chemical composition of garlic extracts (according to Dhekney, 2016)

Compounds	Values (mg/ 100 g D.W.)	Compounds	Values (mg/ 100 g D.W.)
Dipropyl disulfide	0.25	Bis- (1- propenyl)- sulfide	0.08
Diallyl disulfide	37.90	Diallyl sulfide	6.59
Dimethyl trisulfide	0.33	Dimethyl disulfide	0.15
Dimethyl thiophene	0.08	Allyl methyl tetrosulfide	1.07
Allyl methyl disulfide	3.69	Allyl propyl trisulfide	0.23
Methyl propyl disulfide	0.25	Diallyltusulfide	28.06
Methyl 1- propenyl disulfide	0.46	Eugenol	0.23
Allylpripyl sulfide	0.09		

During both seasons the following measurements were recorded:

1-Some vegetative growth characteristic namely shoot length (cm), number of leaves/ shoot, leaf area (cm)² was calculated as a result of measuring the diameter of twenty mature leaves from those opposite to the basal clusters on the main shoots. Ahmed and Morsy, 1999)

2-chlorophyll a, chlorophyll b and total carotenoids (mg/ 1.0 g F.W.) (Von –Wettstein , 1957).

3-Percentages of N, P, and K (as %) on dry weight basis (Summer, 1985 and Wilde *et al.*, 1985).

4-Berry setting %, yield (kg.) and cluster weight (g.)
Berry setting %: It was calculated by caging five clusters per vine in perforated white paper bags before blooming stage. At the end of berry setting stage, the bags were removed for counting the

following : a)The Number of attached berries , b) The number of dropped berries, c) The number of dropped flowers, d) The number of total flowers (a + b+ c) per cluster. Harvesting took place when TSS % / acid in the berries of the check treatment reached at least 25: 1. The yield per vine expressed in weight (kg.) and number of cluster per vine was recorded.

5-Percentage of berry colouration.

6-Some physical and chemical characteristics of the berry included berry weight (g.), dimensions (length and diameter) (cm) TSS%, reducing sugars % (Lane and Eynon, 1965) total acidity %, expressed as tartaric acid / 100 ml juice (A.O.A.C, 2000) and TSS/ acid ratio

Statistical analysis was done using New L.S.D. at 5% parameters (Mead *et al.*, 1993) and treatment means were compared using New L.S.D. at 5%.

RESULTS AND DISCUSSION

1- Some vegetative growth aspects:

It is clear from the obtained data (Table 5) that single and combined applications of garlic extract, green tea extract and turmeric extract each at 0.05 to 0.2% significantly were accompanied with stimulating shoot length, number of leaves /shoot and leaf area, rather than non –application . The promotion on these growth characteristics was significantly associated with using green tea extract, turmeric extract and garlic extract in ascending order. Increasing concentrations of each plant extract from 0.1 to 0.2% failed to show significant promotion on these growth aspects. Combined application of these plant extracts were significantly favourable than using each alone in this respect.

The maximum values of shoot length (128.0 : 129.0 cm) , number of leaves / shoot (27.0, 28.0 leaf) and leaf area (128.0 , 128.5 cm²) were recorded on the vines that treated with of a mixture of garlic extract at 0.2% , green tea extract at 0.2% and turmeric extract at 0.2% . The minimum values were observed on the control treatment. These results were true during both seasons.

The promoting effect of plant extracts on growth aspects might be attributed to their higher content of organosulphur compounds, nutrients, tannins, proteins, vitamins aminoacids, plant pigments, fats, flavonoids sugars nigellone, capsaicin and Fatty acids that are responsible for enhancing cell divisions as well as the biosynthesis of hormones (Omeh and Mazza 1998 and Kamra *et al.*, 2012).

The effect of these plant extract on supplying the plants with their requirements from all mineral and organic nutrients as well as enhancing the tolerance of the trees to different disorders as well as biotic and abiotic stresses give another explanation (Kirtikar and Basu, 1984 and Koch and Lowsott , 1996).

These results are in agreement with those obtained by (Hassan 2008; Irasema *et al.*, 2008; El- Helw- Hanaa *et al.*, 2011; Gad El Kareem and Abd El- Rarman, (2013); Abdelaal and Aly, (2013) on Ruby seedless grapevines; Abada, 2014; Ahmed *et al.*,(2014) on Superiorgrapevines;Uwakiem, (2014) on Thompson seedless grapevines, Maia *et al.*, 2014; Ebrahiem, 2017 and Gadalla- Fatma, (2018)on Flame seedless grapevines.

Table (5): Effect of spraying some plant extracts on some vegetative growth characteristics of Flame seedless grapevines during 2020 and 2021 seasons

Treatments	Shoot length (cm.)		Number of leaves /shoot		Leaf area (cm)²	
	2020	2021	2020	2021	2020	2021
Control	107.0	108.5	16.0	17.0	110.3	111.5
Spraying garlic extract at 0.05 %	119.0	119.5	21.5	22.0	120.0	121.2
Spraying garlic extract at 0.1 %	121.5	122.0	23.0	23.5	123.2	123.5
Spraying garlic extract at 0.2 %	122.5	123.0	24.0	25.0	124.0	124.4
Spraying green tea extract at 0.05 %	110.0	111.0	17.5	18.0	111.0	112.0
Spraying green tea extract at 0.1 %	113.5	114.0	19.0	19.0	113.4	114.6
Spraying green tea extract at 0.2 %	115.0	116.0	19.5	19.5	114.5	115.8
Spraying turmeric extract at 0.05 %	115.5	116.0	19.5	20.0	116.2	117.0
Spraying turmeric extract at 0.1 %	117.5	118.0	20.5	21.0	117.9	118.3
Spraying turmeric extract at 0.2 %	118.5	119.0	21.0	21.5	118.5	119.6
Spraying the three extracts in low conc.	123.0	124.0	24.0	25.0	124.1	124.5
Spraying the three extracts in mid conc.	126.5	127.5	26.0	27.0	126.0	127.2
Spraying the three extracts in high conc.	128.0	129.0	27.0	28.0	128.0	128.5
New L.S.D. at 5%	1.1	1.0	1.0	1.0	1.4	1.3

2-The leaf chemical components:

It is clear from the obtained data (Table 6) that treating the vines three times with garlic extract, green tea extract and turmeric extract each at 0.05 to 0.2% either alone or in combinations significantly

was accompanied by enhancing the leaf chemical components namely chlorophyll a, chlorophyll b, total carotenoids, N, P and K in the leaves rather than non- application.

Table (6): Effect of spraying some plant extracts on on chlorophyll a, chlorophyll b, total carotenoids (mg/ 1.0 g F.W.), N, P and K (as %) in the leaves of Flame seedless grapevines during 2020 and 2021 seasons

Treatments	Chlorophyll a (mg/ 1.0 g F.W.)		Chlorophyll b (mg/ 1.0 g F.W.)		Total carotenoids (mg/ 1.0 g F.W.)		Leaf N %		Leaf P %		Leaf K %	
	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Control	1.51	1.50	1.00	1.00	1.10	1.11	1.61	1.60	0.13	0.13	1.13	1.15
Spraying garlic extract at 0.05 %	1.67	1.68	1.18	1.19	1.28	1.29	1.78	1.80	0.29	0.30	1.30	1.30
Spraying garlic extract at 0.1 %	1.71	1.72	1.22	1.23	1.32	1.34	1.83	1.85	0.33	0.33	1.35	1.36
Spraying garlic extract at 0.2 %	1.73	1.74	1.25	1.25	1.35	1.36	1.84	1.86	0.34	0.35	1.36	1.37
Spraying green tea extract at 0.05 %	1.53	1.54	1.05	1.06	1.15	1.16	1.65	1.65	0.16	0.16	1.17	1.18
Spraying green tea extract at 0.1 %	1.59	1.60	1.09	1.10	1.20	1.21	1.69	1.70	0.19	0.20	1.21	1.22
Spraying green tea extract at 0.2 %	1.61	1.62	1.11	1.12	1.21	1.22	1.71	1.72	0.21	0.22	1.23	1.25
Spraying turmeric extract at 0.05 %	1.60	1.62	1.11	1.12	1.22	1.23	1.70	1.72	0.21	0.23	1.24	1.26
Spraying turmeric extract at 0.1 %	1.66	1.67	1.16	1.17	1.26	1.27	1.76	1.77	0.26	0.28	1.28	1.29
Spraying turmeric extract at 0.2 %	1.68	1.69	1.18	1.19	1.28	1.29	1.78	1.79	0.28	0.29	1.30	1.31
Spraying the three extracts in low conc.	1.72	1.74	1.24	1.25	1.35	1.35	1.85	1.86	0.35	0.35	1.35	1.36
Spraying the three extracts in mid conc.	1.81	1.82	1.31	1.32	1.41	1.42	1.92	1.93	0.39	0.40	1.40	1.41
Spraying the three extracts in high conc.	1.82	1.83	1.32	1.33	1.42	1.43	1.94	1.95	0.41	0.42	1.42	1.43
New L.S.D. at 5%	0.03	0.02	0.02	0.02	0.02	0.03	0.06	0.07	0.03	0.03	0.05	0.04

Using green tea extract, turmeric extract and garlic extract in ascending order was significantly followed by enhancing these pigments and nutrients in the leaves. A progressive promotion on these pigments and nutrients was observed with increasing concentrations from 0.05 to 0.2%. Increasing concentrations of all plant extracts from 0.1 to 0.2% had no significant promotion on these pigments and nutrients.

The maximum values of chlorophyll a (1.82, 1.83 mg/ 1 g F.W.), chlorophyll b (1.32, 1.33 mg/ 1 g F.W.), total carotenoids (1.42, 1.43 mg/ 1 g F.W.), N (1.94, 1.95 %), P (0.41, 0.42 %) and K (1.42, 1.43 %) were recorded on the vines that received all plant extracts (garlic extract, green tea extract and turmeric extract) each at 0.2 % during both seasons,

3- Berry setting %, yield and cluster characteristics:

It is obvious from the obtained data in Table (7) that single and combined applications of the plant extracts namely garlic extract, green tea extract and turmeric extract each at 0.05 to 0.2 % significantly improved berry setting %, yield, number of clusters/vine (only in the 2nd season) as well as weight, length and width of cluster over the check treatment. The promotion was significantly associated with using green tea, turmeric and garlic extracts in ascending order. Combined application of these all plants extracts was significantly superior than using each plant extract alone in improving berry setting, yield and cluster characteristics. Increasing concentrations from 0.05 to 0.2% caused a gradual promotion on the parameters.

The best results with respect to the yield were attributed to using all plants extracts together (garlic

respectively. The untreated vines produced the lowest values similar results were announced during both seasons.

The beneficial effects of plant extracts on activating the biosynthesis of plant pigments as well as the uptake of nutrients especially N and Mg could result in enhancing plant pigments (Haggerty, 1999 and Giovanni *et al.*, 2012).

Their higher content from vitamins, amino acids as well as pigment and different nutrients give another explanation. These results are in harmony with those obtained by (Abdelaal and Aly, (2013) on Ruby seedless grapevines; Abada (2014); Uwakiem, (2014) on Thompson seedless grapevines; Ebrahiem, (2017); Gadalla- Fatma, (2018) on Flame seedless grapevines and Ibrahiem (2021) on Crimson seedless. extract, green tea extract and turmeric extract) each at 0.2%.

Under such promised treatment, yield per vine reached 11.39 and 14.55 kg compared to the yield of the control vines that reached 8.05 and 8.40 kg during both seasons, respectively.

The percentage of increase in the yield due to using the promised treatment over the check treatment reached 41.49 and 73.21 % during both seasons, respectively. The plant extracts treatments had no significant effect on the number of clusters per vine in the first season of the study. These results were true during both seasons.

The higher content of these plant extracts from amino acids, nutrients, vitamins and hormones in balanced rate (Kamra *et al.*, 2012). These results are accordance with those obtained by (Abdelaal and Aly (2013) on Ruby seedless, Gad El- Kareem and Abd El-Rahman (2013) on Ruby seedless grapevines, and Abada (2014) on Thompson seedless grapevines.

Table (7): Effect of spraying some plant extracts on percentage of berry setting, yield expressed in weight (kg.) and number of cluster per vine as well as weight of cluster (width) of Flame seedless grapevines during 2020 and 2021 seasons

Treatments	Berry setting %		No. of clusters / vine		Yield/ vine (kg.)		Cluster weight (g.)	
	2020	2021	2020	2021	2020	2021	2020	2021
Control	9.6	9.7	23.0	24.0	8.05	8.40	350.0	350.0
Spraying garlic extract at 0.05 %	11.8	11.9	26.0	30.0	10.40	12.15	400.0	405.0
Spraying garlic extract at 0.1 %	12.3	12.5	26.0	32.0	10.66	13.18	410.0	412.0
Spraying garlic extract at 0.2 %	12.6	12.7	27.0	33.0	11.20	13.79	415.0	418.0
Spraying green tea extract at 0.05 %	10.1	10.2	24.0	25.0	8.64	9.13	360.0	365.0
Spraying green tea extract at 0.1 %	10.6	10.8	24.0	26.0	9.24	10.09	385.0	388.0
Spraying green tea extract at 0.2 %	10.9	10.9	25.0	27.0	9.73	10.58	389.0	392.0
Spraying turmeric extract at 0.05 %	11.0	11.1	25.0	28.0	9.63	10.92	385.0	390.0
Spraying turmeric extract at 0.1 %	11.6	11.7	25.0	29.0	9.75	11.60	390.0	400.0
Spraying turmeric extract at 0.2 %	11.9	12.0	25.0	29.0	10.00	11.89	400.0	410.0
Spraying the three extracts in low conc.	12.8	13.0	26.0	33.0	10.79	13.79	415.0	418.0
Spraying the three extracts in mid conc.	14.0	14.1	26.0	34.0	10.92	14.28	420.0	425.0
Spraying the three extracts in high conc.	14.2	14.4	27.0	34.0	11.39	14.55	422.0	428.0
New L.S.D. at 5%	0.5	0.5	NS	1.0	0.4	0.7	8.3	8.0

4- The percentage of berry colouration:

It is evident from the obtained data in Table (8) that subjecting the vines with using single and combined

applications of some plant extracts namely garlic extract, green tea extract and turmeric extract each at

0.05 to 0.2% succeeded significantly in enhancing berry colouration % rather than non- application. The advancement in berry colouration % was related to the increase in concentrations from 0.05 to 0.2% of all plant extracts.

The advancement in berry colouration % was significantly associated with using green tea extract, turmeric extract and garlic extract in ascending order. The highest percentage of berry colouration (88.0, 89.2 %) was recorded on the vines that received three sprays a mixture of garlic extract; green tea extract

and turmeric extract each at 0.2% during both seasons, respectively.

The lowest percentage of berry colouration % reached 70.0, 71.0 % was found on the untreated vines during 2020 and 2021 seasons, respectively. These results were true during both seasons.

The higher content of these plant extracts from amino acids, vitamins, boron, proteins, nutrients, tannins and antioxidants (Peter (1999)). The results are concordance with those obtained by (Abd El-Hafiz, (2017) on Flame seedless grapevines and Ibrahiem, (2021) on Crimson seedless.

Table (8): Effect of spraying some plant extracts on the percentage of berries colouration as well as berry weight, length and diameter of berry of Flame seedless grapevines during 2020 and 2021 seasons

<u>Treatments</u>	<u>Berry colouration %</u>		<u>Berry weight (g.)</u>		<u>Berry length (cm)</u>		<u>Berry diameter (cm)</u>	
	<u>2020</u>	<u>2021</u>	<u>2020</u>	<u>2021</u>	<u>2020</u>	<u>2021</u>	<u>2020</u>	<u>2021</u>
Control	70.0	71.0	3.10	3.12	2.08	2.10	1.78	1.77
Spraying garlic extract at 0.05 %	81.2	81.7	3.43	3.45	2.32	2.34	1.94	1.95
Spraying garlic extract at 0.1 %	83.5	83.9	3.55	3.60	2.36	2.38	1.99	2.00
Spraying garlic extract at 0.2 %	84.0	84.3	3.60	3.65	2.37	2.39	2.01	2.04
Spraying green tea extract at 0.05 %	73.2	74.0	3.15	3.18	2.11	2.12	1.80	1.81
Spraying green tea extract at 0.1 %	76.5	77.1	3.23	3.25	2.18	2.20	1.86	1.87
Spraying green tea extract at 0.2 %	77.4	77.9	3.29	3.30	2.22	2.24	1.87	1.89
Spraying turmeric extract at 0.05 %	77.5	78.0	3.28	3.29	2.22	2.23	1.90	1.91
Spraying turmeric extract at 0.1 %	79.6	79.9	3.38	3.40	2.31	2.31	1.93	1.94
Spraying turmeric extract at 0.2 %	81.0	81.6	3.40	3.42	2.33	2.34	1.94	1.95
Spraying the three extracts in low conc.	84.2	84.8	3.62	3.68	2.35	2.38	2.00	2.01
Spraying the three extracts in mid conc.	86.8	87.6	3.77	3.80	2.41	2.42	2.06	2.07
Spraying the three extracts in high conc.	88.0	89.2	3.80	3.84	2.44	2.45	2.11	2.12
New L.S.D. at 5%	0.6	0.5	0.04	0.03	0.06	0.05	0.03	0.03

5- Physical and chemical characteristics of the berry:

It is clear from the obtained data in Table (8, 9) that treating the vines three times with plant extracts namely garlic extract, green tea extract and turmeric extract each from 0.05 to 0.2% either alone or in combinations was significantly accompanied by improving berry quality characteristics in terms of increasing berry weight and dimensions, the percentage of total soluble solids (TSS%), TSS./ acid ratio and percentage of Reducing sugars and at the same time decreasing the percentage of total acidity % compared to the control treatment. The promotion on quality of the berry was significantly associated with using green tea extract, turmeric extract and garlic extract in ascending order.

The promotion on quality of the berry was associated with increasing concentrations from 0.05 to 0.2% of all used plant extracts. Increasing concentrations of plant extracts from 0.1 to 0.2% showed significant promotion on fruit quality characteristic.

Combined application of the studied the three extracts (garlic, green tea and turmeric) was significantly more effective than using single applications in improving berry quality.

Treating the vines with all plant extracts each at 0.2% gave the maximum values of berry weight (3.80, 3.84 g.), TSS % (21.2, 21.5 %) and Reducing sugars % (19.2, 19.4 %) during both seasons, respectively. The untreated vines produced the lowest values in these aspects. On the other hand, treating Flame seedless grapevines with all plant extract, each at 0.2% resulted in the lowest percentage of total acidity (0.570, 0.565%) in both seasons, respectively, while the untreated vines produced the berry with the highest total acidity vales (0.690 , 0.690 %). Similar results were announced during both seasons.

The beneficial effects of these plant extracts on advancing maturity explained these results. This effect was attributed to containing these plant extracts on amino acids, boron, magnesium, sugars and sulphur (Dhekney, 2016).

These results are in concordance with those obtained by (El- Helw- Hanaa *et al.*, (2011) on Flame seedless grapevines; Abedelaal and Aly, (2013) on Ruby seedless, Gad El- Kareem and Abd El-Rahman, 2013 ; Abada, (2014); Uwakiem, (2014) on Thompson seedless; Ahmed *et al.*,(2014) on Superior grapevines; Hammouda *et al.*, 2014; Sabry- Gehanet al., 2014; Rizkalla 2016; Ahmed *et al.*, 2016; Ebrahiem , 2017 and Ibrahiem, 2021).

Table (9): Effect of spraying some plant extracts on some chemical parameters of the berries of Flame seedless grapevines during 2020 and 2021 seasons

<u>Treatments</u>	<u>TSS %</u>		<u>Total acidity %</u>		<u>Reducing sugars %</u>		<u>TSS/ acid ratio</u>	
	<u>2020</u>	<u>2021</u>	<u>2020</u>	<u>2021</u>	<u>2020</u>	<u>2021</u>	<u>2020</u>	<u>2021</u>
Control	17.7	17.8	0.690	0.690	15.7	15.8	25.6	25.8
Spraying garlic extract at 0.05 %	19.6	19.8	0.630	0.625	17.5	17.8	31.1	31.7
Spraying garlic extract at 0.1 %	20.0	20.2	0.610	0.605	18.0	18.2	32.8	33.4
Spraying garlic extract at 0.2 %	20.4	20.6	0.600	0.595	18.3	18.6	34.0	34.6
Spraying green tea extract at 0.05 %	18.0	18.1	0.675	0.670	16.0	16.1	26.7	27.0
Spraying green tea extract at 0.1 %	18.6	18.8	0.660	0.655	16.6	16.8	28.2	28.7
Spraying green tea extract at 0.2 %	18.8	18.9	0.655	0.650	16.9	16.9	28.8	29.1
Spraying turmeric extract at 0.05 %	18.9	18.9	0.655	0.650	17.0	16.8	28.9	29.1
Spraying turmeric extract at 0.1 %	19.4	19.5	0.640	0.635	17.4	17.4	30.3	30.7
Spraying turmeric extract at 0.2 %	19.6	19.7	0.635	0.630	17.6	17.7	30.9	31.3
Spraying the three extracts in low conc.	20.5	20.6	0.600	0.600	18.5	18.6	34.2	34.3
Spraying the three extracts in mid conc.	20.9	21.0	0.580	0.575	18.9	19.0	36.0	36.5
Spraying the three extracts in high conc.	21.2	21.5	0.570	0.565	19.2	19.4	37.2	38.1
New L.S.D. at 5%	0.3	0.4	0.16	0.014	0.2	0.2	1.1	1.0

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الملخص العربي

استجابة كرمات العنب الفليم سيدلس النامية في التربة الرملية للرش الورقي ببعض المستخلصات النباتية

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أجريت هذه الدراسة خلال موسمي ٢٠٢٠ و ٢٠٢١ لاختبار تأثير الاستخدام الفردي والمشارك لثلاثة مستخلصات نباتية هي مستخلص الشاي الأخضر ومستخلص الكركم ومستخلص الثوم بتركيز من ٠.٠٥ و ٠.١ و ٠.٢ % لكلا منهما على كمية المحصول وخصائص الجودة للحبات في كرمات العنب الفليم سيدلس .
الاستخدام الفردي والمشارك للثلاثة مستخلصات نباتية كان فعالا جدا في تحسين بعض صفات النمو الخضري والحالة الغذائية للكرمات وكمية المحصول وخصائص الجودة للحبات وذلك بالمقارنة بمعاملة الكونترول وكان أفضل مستخلص نباتي في هذا الصدد هو مستخلص الثوم ثم مستخلص الكركم واحتل مستخلص الشاي الأخضر المرتبة الاخيرة في هذا الصدد.
وكان الاستخدام المشترك أفضل من الاستخدام الفردي لهذه المستخلصات في تحسين الصفات كذلك كانت هناك زيادة طردية في هذه الصفات مع زيادة التركيز المستخدم من هذه المستخلصات من ٠.٠٥ الى ٠.٢% .
لأجل تحسين كمية المحصول وخصائص الجودة للحبات في كرمات العنب الفليم سيدلس النامية في التربة الرملية فانه ينصح برش الكرمات ثلاثة مرات في بداية النمو الخضري وبعد العقد مباشرة وبعد العقد بشهر بمخلوط يتكون من مستخلص الشاي الأخضر ومستخلص الكركم ومستخلص الثوم بتركيز ٠.١% لكلا منهما.

الكلمات الدالة: مستخلصات نباتية، مستخلص الثوم- مستخلص الشاي الأخضر- مستخلص الكركم- المحصول- الجودة- العنب الفليم سيدلس.