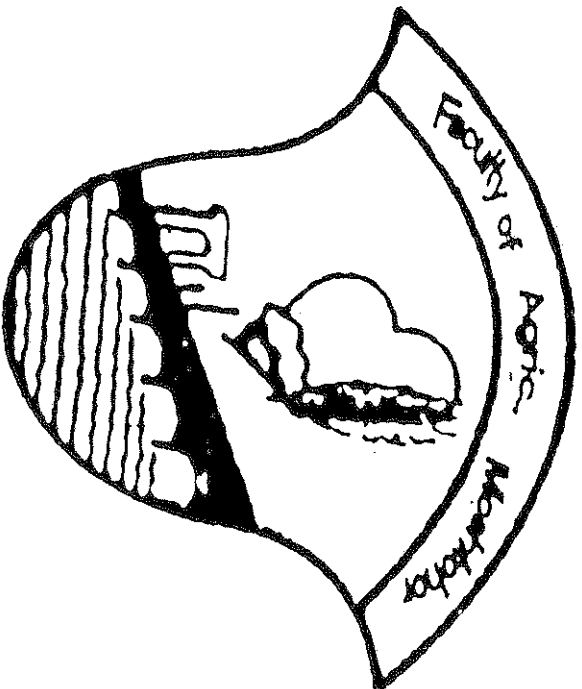


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**EFFECT OF DIFFERENT PLANTING MEDIA AND GA₃ ON
VEGETATIVE GROWTH AND CHEMICAL COMPOSITION OF
Epipremnum pinnatum "AUREUM" BUNT PLANTS
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ABSTRACT

This study was established in a greenhouse of the experimental farm of king Abdulaziz Univ at Hada Al-Sham and located about 120 Km. northeast of Jeddah, Saudi Arabia. The effect of seven planting media and three concentrations of GA₃ namely 0, 0.25 and 50 ppm on growth criteria chlorophyll a, chlorophyll b, total chlorophyll, leaf N,P and K, soluble, insoluble and total sugars of *Epipremnum pinnatum* "Aureum" Bunt plants was investigated during 1999 and 2000 seasons.

Results showed that varying planting media caused great differences in growth parameters, pigments, leaf N,P and K as well as soluble, insoluble and total sugars. Using peat moss : sand : vermiculite medium was favorable in enhancing growth criteria, pigments, leaf N,P and K and sugars. Medium containing 1 sand : 1 clay is unpreferable for plants. Raising GA₃ concentrations effectively improved plant height, number, length and cross of leaf stem diameter as well as chlorophyll a, chlorophyll b and total chlorophyll. However, N, P, K in the leaf as well as soluble, insoluble and total sugars were tended to reduce with GA₃ treatments.

Planting *Epipremnum pinnatum* "Aureum" Bunt plants in medium containing 1 peat moss : 1 sand : 1 vermiculite and spraying them three times with 25 ppm GA₃ was very responsible for stimulating growth traits and nutritional status of the plants .

INTRODUCTION

Epipremnum pinnatum plant is a very important ornamental foliage plant, it is used for indoor decoration for its beautiful leaves and good growth. The demand of this plant increased greatly because of its special kind of beauty and for the wide range of purposes can be used for hanges and grow well climbing of stick.

To produce this kind of plant healthy, application of proper planting media and application of GA₃ are very necessary. Improving aeration and supplying the plants with their requirements from various nutrients through selection an optimum planting media are accompanied with producing vigorous plant. (EL-Tanawy, 1981, EL-Khateeb, 1983, EL-Belagy' 1986 and Abu-Haidid *et al.*, 1994). In addition, application of gibberellic acid is responsible for stimulating growth criteria of various ornamental plants, Jacobs, 1979 and Thomas, 1979).

Varying planting media was followed by great differences in growth criteria and chemical constituents of *Eucalyptus angulosa* and *Eucalyptus troguata* (Al-Khoteeb, 1983), *Polygonus tuberosa* (Badran 1988), (AL-Badawy *et al.*, 1989 and EL-Mahrouk, 1996); *Freesia retracha* (Nabih, 1991), *Jasminum sambac* (AL-Batal and Kharoff, 1994), *Chrysanthemum morifolium*, *Azadirachta indica* (Abd-EL-Aziz, 2000) and *Zinnia elegans* (Manoly, 2001).

The positive action of GA₃ on growth and photosynthetic pigments was supported by the results of EL-Sayed (1991) and Hassan *et al.* (1991) on pot marigold, Abd-Alazem (1993) on *Tagetes minuta*, Manoly (1996) on Iris plants, Atha and Ahmed (1997) on *Chrysanthemum morifolium*, Salah EL-Din-Mervete (1997) on guar plants and Badran *et al.* (2001) on *Tropaeolum majus*.

The merit of this study was selecting the optimum planting media for enhancing growth criteria and nutritional status of *Epipremnum pinnatum* Aureum Bunt plants.

MATERIALS AND METHODS

This study was carried out under the greenhouse of the experimental farm of King Abdulaziz Univ. at Hoda AL-Sham and located about 120 Km. northeast of Jeddah, Saudi Arabia during 1999 and 2000 seasons .

Three hundred and fifteen uniform rooted cuttings of *Epipremnum pinnatum* Aureum having 3-5 leaves and 7-10 cm height were selected for achieving this investigation.

On the first week of May in both seasons, rooted cuttings of *Epipremnum pinnatum* Aureum were individually planted in 30 cm plastic pots using the following seven planting media.

- 1- 1 part Sand : 1 part Clay
- 2- 1 part Peat moss : 1 Part sand
- 3- 1 part Peat moss : 1 Part perlite
- 4- 1 part Peat moss : 1 part Vermiculite
- 5- 1 part Peat moss : 1 part Sand : 1 part Perlite
- 6- 1 part Peat moss : 1 part Sand : Vermiculite
- 7- 1 part Peat moss : 1 part Vermiculite + 1 Part Perlite

Each plastic pot containing one plant filled with 3 Kg planting media about three weeks from transplanting the plants were sprayed three times with GA₃ at 25 as 50 ppm in addition to the control treatment which sprayed with water triton B as a wetting agent at 0.1% was added to all GA₃ solutions Therefore, the experiment consisted from twenty-one treatments. The split plot design with three replicates (five plants per each replicate) was followed in this experiment, where the seven planting media assigned to the main plots and the three GA₃ concentration occupied the sub- plots. Fertilization was added to all plants at the rate of 2 g calcium superphosphate (15.5% P₂O₅), 2 g ammonium sulphate (20.6% N) and 0.5 g potassium sulphate (45% K₂O) per each pot. Addition of fertilizers were established at 4,8 and 12 weeks after transplanting. Irrigation was done from May 15 to October 15 (5 months) by supplying each pot with 750 cm³ of water (about 80% of the field capacity) daily in summer (May, June, July and August) and every second day during Sept. and Oct.

The following data were recorded after 5 months from starting the treatments.

- 1- Plant height (cm)
- 2- Leaf number /plant
- 3- Leaf length (cm)
- 4- Leaf cross (cm)
- 5- Stem diameter (cm)
- 6- Pigments content (mg / g fresh weight) namely chlorophyll a and b content were determined in fresh leaf samples as described by Saito *et al.* (1976), then total chlorophyll was estimated
- 7- Percentages of N,P and K in the leaf.
They were determined as dry weight basis according to procedures that outlined by Evenhuis (1978) and Page *et al.*, (1982).
- 8- Percentages of soluble and insoluble sugars content in the leaves were determined according to A.O.A.C. (1985).

The obtained data were statistically analyzed according to Mead *et al* (1993). Least significant difference test was used for comparisons between means of the different treatments.

RESULTS AND DISCUSSION

1- Effect of different planting media and GA₃ concentrations on some growth criteria of *Euphygium pinnatum* "Aureum" Plants

Data in Tables (1 & 2 & 3) clearly show that varying planting media significantly caused obvious differences on growth criteria namely plant height, number, length and cross of leaf and stem diameter. The maximum values of growth criteria were obtained owing to using media containing 1 part peat moss: 1 part sand : 1 part vermiculite compared with the other media. One part sand to one part clay planting media gave the minimum values. Using Vermiculite with Peat moss was preferable than using sand or Perlite with peat moss in

stimulating growth aspects. In other words employing planting media containing peat with the other materials namely Sand, Perlite and Vermiculite significantly improved growth traits than using 1 Sand: 1 Clay media. Using peat moss, vermiculite and sand at 1:1:1 producing vigorous *Epipremnum pinnatum* (Aureum) plants. These results were true in both seasons.

The great aeration, good drainage water and higher content of nutrients of Peat moss, Vermiculite, Sand and Perlite could explain the present results.

The great variation between various planting media on growth criteria was supported by the results of AL-Khateeb. (1983) on *Eucalyptus angulosa* and *Eucalyptus torquata*, Badran (1988) on *Polygonum tuberosa*, Al-Badawy *et al.*, (1989) on *Chrysanthemum morifolium* and Nabilh (1991) on *Freesia refracta*.

Data concerning the effect of GA₃ on growth parameters obviously revealed that increasing GA₃ concentrations from 0.0 to 50 ppm caused a gradual promotion on all growth criteria.

Table (1): Effect of different planting media and GA₃ concentrations on plant height and leaf number of *Epipremnum pinnatum* "Aureum" during 1999 and 2000 seasons

Character Different planting media (A)	1999		2000					
	Plant height (cm)							
	GA ₃ concentrations (B)							
	0.0	25	50	Mean (A)	0.0	25	50	Mean (A)
1 Sand : 1 Clay	97.2	106.9	107.3	103.8	111.0	144.2	144.5	133.2
1 Peat moss : 1 Sand	110.0	121.0	122.1	117.7	133.3	171.3	172.0	138.5
1 Peat moss : 1 Perlite	100.0	110.3	111.0	107.1	120.1	156.0	157.0	144.3
1 Peat moss : 1 Vermiculite	114.1	126.6	127.1	122.6	137.0	178.0	179.0	164.6
1 Peat moss : 1 Sand : 1 Perlite	106.3	116.6	117.1	113.3	127.2	165.9	166.0	133.1
1 Peat moss : 1 Sand : Vermiculite	122.0	133.8	133.9	129.9	148.3	190.0	191.0	176.4
1 Peat moss : 1 Perlite	118.1	130.6	131.0	126.5	141.9	185.0	186.0	170.9
Mean (B)	109.6	120.8	121.3		131.1	170.1	170.7	
LSD at 5%	A 2.1	B 1.0	AB 2.7		A 1.9	B 1.4	AB 3.7	
Character	Leaf number							
	LSD at 5%							
	LSD at 5%							
1 Sand : 1 Clay	19.2	20.3	20.5	20.0	20.2	21.2	21.5	20.9
1 Peat moss : 1 Sand	23.3	24.7	25.0	24.3	24.5	23.7	26.0	23.4
1 Peat moss : 1 Perlite	20.7	22.0	22.3	21.6	21.6	22.7	23.1	23.4
1 Peat moss : 1 Vermiculite	23.0	26.5	27.1	26.2	26.3	27.6	27.6	27.1
1 Peat moss : 1 Sand : 1 Perlite	22.0	23.3	24.0	23.1	23.1	24.3	24.3	23.9
1 Peat moss : 1 Sand : Vermiculite	28.0	31.0	31.0	30.0	24.4	32.3	32.5	31.4
1 Peat moss : 1 Perlite	26.3	27.9	28.1	27.4	27.6	28.9	29.0	28.5
Mean (B)	23.5	25.1	25.4		24.6	26.1	26.2	
LSD at 5%	A 1.0	B 0.8	AB 2.1		A 1.3	B 1.0	AB 2.7	

Table (2): Effect of different planting media and GA₃ concentrations on leaf length and cross of leaf of *Euphorium pinnatum* "Aurcum" during 1999 and 2000 seasons

Character Different planting media (A)	Leaf length(cm)										
	1999					2000					
	GA ₃ concentrations (B)		GA ₃ concentrations (B)		Mean (A)	GA ₃ concentrations (B)		GA ₃ concentrations (B)		Mean (A)	
0.0	25	50	Mean (A)	0.0		25	50	Mean (A)			
1 Sand : 1 Clay	8.1	8.7	8.8	8.5	8.5	9.0	9.1	8.8			
	9.2	9.8	9.9	9.6	9.7	10.4	10.5	10.2			
1 Peat moss : 1 Sand	8.5	9.1	9.2	8.9	8.9	9.5	9.6	9.3			
1 Peat moss : 1 Perlite	9.7	10.4	10.5	10.2	10.2	10.9	11.0	10.7			
1 Peat moss : 1 Vermiculite	8.9	9.5	9.6	9.3	9.3	10.0	10.1	9.8			
1 Peat moss : 1 Sand : 1 Perlite	10.9	12.1	12.1	11.7	11.6	12.9	13.0	12.5			
1 Peat moss : 1 Sand : Vermiculite	10.3	11.1	11.1	10.8	11.0	11.4	11.5	11.3			
1 Peat moss : 1 Perlite	9.3	10.1	10.1	10.1	9.8	10.5	10.6				
Mean (B)	A	B	AB		A	B	AB				
LSD at 5%	0.3	0.2	0.5		0.2	0.2	0.5				
Character	Cross of leaf (cm)										
	1 Sand : 1 Clay		1 Sand : 1 Sand		1 Peat moss : 1 Perlite		1 Peat moss : 1 Vermiculite		1 Peat moss : 1 Sand : 1 Perlite		1 Peat moss : 1 Sand : Vermiculite
5.11	5.42	5.43	5.32	5.31	5.68	5.70	5.56				
6.11	6.44	6.45	6.33	6.12	6.87	6.90	6.73				
5.41	5.68	5.70	5.59	5.68	6.08	6.11	5.95				
6.41	6.73	6.73	6.63	6.73	7.20	7.22	7.05				
5.77	6.06	6.07	5.96	6.06	6.48	6.50	6.34				
7.15	7.50	7.52	7.39	7.51	8.08	8.10	7.89				
6.81	7.15	7.15	6.37	7.15	7.61	7.63	7.46				
Mean (B)	A	B	AB		A	B	AB				
LSD at 5%	0.21	0.18	0.18		0.18	0.15					

Spraying GA₃ at 25 to 50 ppm significantly improved plant height, number, length and cross of leaf and stem diameter compared to unspraying. Raising GA₃ concentrations from 25 to 50 ppm failed to show significant stimulation on all growth traits, therefore the recommended rate was 25 ppm GA₃. Similar results were obtained in both seasons.

The interaction between planting media and GA₃ had positive effect on growth parameters, and the best results were obtained on plants grown in planting media involving Peat moss + Sand + Vermiculite at a ratio of 1:1:1 and received 25 ppm GA₃ in 1999 and 2000 seasons.

The beneficial effect of GA₃ on increasing cell enlargement as well as the biosynthesis of proteins (Jacobs, 1979) could explain the present results.

The obtained results are in close agreement with regards to GA₃ with those reported by EL-Sayed (1991) on pot marigold, Abd-Alazem (1993) on *Tagetes minuta* and Manoly (1996) on Iris plants

Table (3): Effect of different planting media and GA₃ concentrations on stem diameter and chlorophyll of *Epipremnum pinnatum* "Aureum" during 1999 and 2000 seasons

Character Different planting media (A)	Stem diameter (cm)						
	1999			2000			
	GA ₃ concentrations (B)						
	25	50	Mean (A)	0.0	25	50	Mean (A)
1 Sand : 1 Clay	4.11	4.32	4.33	4.25	4.03	4.27	4.29
1 Peat moss : 1 Sand	4.71	4.95	4.96	4.87	4.62	4.85	4.86
1 Peat moss : 1 Perlite	4.31	4.52	4.53	4.45	4.22	4.47	4.48
1 Peat moss : 1 Vermiculite	4.99	5.25	5.27	5.17	4.89	5.18	5.20
1 Peat moss : 1 Sand : 1 Perlite	4.51	4.74	5.74	4.99	4.42	4.69	4.70
1 Peat moss : 1 Sand : Vermiculite	5.41	5.68	5.70	5.59	5.30	5.62	5.63
1 Peat moss : 1 Vermiculite : 1 Perlite	5.16	5.42	5.42	5.33	5.06	5.36	5.37
Mean (B)	4.74	4.68	5.13		4.64	4.92	4.93
LSD at 5%	A	B	AB		A	B	AB
	0.15	0.10	0.27		0.13	0.10	0.27
Character	Chlorophyll a (mg / g fresh weight)						
1 Sand : 1 Clay	2.41	2.53	2.55	2.50	2.13	2.43	2.44
1 Peat moss : 1 Sand	3.05	3.20	3.21	3.15	2.99	3.14	3.15
1 Peat moss : 1 Perlite	2.61	2.74	2.75	2.70	2.56	2.69	2.70
1 Peat moss : 1 Vermiculite	3.18	3.34	3.35	3.29	3.11	3.27	3.30
1 Peat moss : 1 Sand : 1 Perlite	2.85	3.00	3.04	2.96	2.79	2.93	2.89
1 Peat moss : 1 Sand : Vermiculite	3.55	3.73	3.75	3.68	3.48	3.65	3.66
1 Peat moss : 1 Vermiculite : 1 Perlite	3.41	3.58	3.60	3.53	3.34	3.51	3.52
Mean (B)	3.01	3.16	3.16		2.44	3.09	3.10
LSD at 5%	A	B	AB		A	B	AB
	0.12	0.06	0.16		0.11	0.05	0.13

2- Effect of different planting media and GA₃ concentrations on leaf pigment content of *Epipremnum pinnatum*. Aureum.

It is evident from the data in Tables (3,4) that chlorophyll a, chlorophyll b and total chlorophyll in the fresh leaf were varied significantly according to differing planting media. Using Peat moss alone from Sand Perlite or Vermiculite significantly enhanced such three pigments compared to using planting media namely Sand: Clay Application of triple media was favorable than using double media in this connection. The preferable materials applied with peat moss in this respect were Vermiculite, Sand and Perlite in descending order. Growing plants in planting media namely Peat moss + Sand + Vermiculite at 1 : 1 : 1 was beneficial in maximizing such three chemical constituents compared to the other media. The lowest values were recorded on plants grown under 1 sand : 1 clay medium. These results were nearly the same in both seasons.

The positive action of planting media on supplying the plants with their requirements from aeration, water and nutrients could explain the present results.

Table (4): Effect of different planting media and GA₃ concentrations on chlorophyll b and total chlorophyll of *Epidrumum pinnatum* "Aureum" during 1999 and 2000 seasons

Character Diferent planting media (A)	Chlorophyll b (mg./g fresh weight)									
	1999					2000				
	25		50		Mean (A)	25		50		Mean (A)
1 Sand : 1 Clay	1.11	1.21	1.22	1.18	1.08	1.20	1.22	1.17	1.17	1.17
1 Peat moss : 1 Sand	1.62	1.77	1.78	1.72	1.57	1.74	1.75	1.69	1.69	1.69
1 Peat moss : 1 Perlite	1.31	1.43	1.44	1.39	1.27	1.41	1.42	1.37	1.37	1.37
1 Peat moss : 1 Vermiculite	1.74	1.90	1.91	1.85	1.69	1.88	1.95	1.82	1.82	1.82
1 Peat moss : 1 Sand : 1 Perlite	1.41	1.54	1.55	1.50	1.37	1.52	1.55	1.47	1.47	1.47
1 Peat moss : 1 Sand : Vermiculite	1.95	2.10	2.11	2.05	1.89	2.05	2.15	2.01	2.01	2.01
1 Peat moss : 1 Vermiculite : 1 Perlite	1.85	2.00	2.01	1.95	1.79	1.99	2.00	1.93	1.93	1.93
Mean (B)	1.31	1.71	1.72	1.52	1.69	1.79	1.70	1.70	1.70	1.70
LSD at 5%	A 0.10	B 0.05	AB 0.13	A 0.12	B 0.06	AB 0.16	A 0.12	B 0.06	AB 0.16	A 0.12
Character	Total chlorophyll (mg./g fresh weight)									
1 Sand : 1 Clay	3.52	3.74	3.77	3.68	3.39	3.63	3.66	3.56	3.56	3.56
1 Peat moss : 1 Sand	4.67	4.97	4.99	4.88	4.56	4.88	4.78	4.78	4.78	4.78
1 Peat moss : 1 Perlite	3.92	4.17	4.19	4.09	3.83	4.10	4.12	4.02	4.02	4.02
1 Peat moss : 1 Vermiculite	4.92	5.24	5.26	5.14	4.80	5.15	5.20	5.05	5.05	5.05
1 Peat moss : 1 Sand : 1 Perlite	4.26	4.54	4.59	4.46	4.16	4.45	4.48	4.36	4.36	4.36
1 Peat moss : 1 Sand : Vermiculite	5.50	5.83	5.86	5.73	5.37	5.74	5.76	5.62	5.62	5.62
1 Peat moss : 1 Vermiculite : 1 Perlite	5.26	5.58	5.61	5.48	5.13	5.50	5.52	5.38	5.38	5.38
Mean (B)	4.58	4.87	4.90	4.78	4.46	4.78	4.81	4.81	4.81	4.81
LSD at 5%	A 0.24	B 0.11	AB 0.29	A 0.23	B 0.13	AB 0.34	A 0.23	B 0.13	AB 0.34	A 0.23

These results are in harmony with these obtained by Al-Batal and Kharoff (1994) on *Jasminum sambac*, El-Mahrouk (1996) on *Chrysanthemum morifolium*, Abd El-Aziz (2000) on *Zinnia elegans*.

There was a gradual promotion on chlorophyll a, chlorophyll b and total chlorophyll in the leaf with increasing GA₃ from 0.0 to 50 ppm. Spraying GA₃ at 25 to 50 ppm was significantly favorable for improving such leaf pigments than unspraying. Increasing GA₃ concentrations from 25 to 50 ppm failed to show any measurable increase in such chemical criteria. Similar results were obtained in both seasons.

Growing plants in medium containing Peat moss: Sand: Vermiculite at 1: 1: 1 plus spraying them with 25 ppm GA₃ succeeded in producing the maximum values of plant pigments in both seasons.

These results could be explained on the light of the effect of GA₃ on enhancing growth criteria and the biosynthesis of proteins (Thomas, 1979).

Similarly, Jacobs (1979) reported that GA₃ is concerned with the biosynthesis of chlorophylls.

Table (5): Effect of different planting media and GA₃ concentrations on percentage of N, and P, of *Epipremnum pinnatum* "Aureum" during 1999 and 2000 seasons

Character Different planting media (A)	N %									
	1999					2000				
	0.0	25	50	Mean (A)	0.0	25	50	Mean (A)		
1 Sand : 1 Clay	3.00	2.80	2.78	2.86	2.94	2.73	2.72	2.80		
1 Peat moss : 1 Sand	3.71	3.45	3.44	3.53	3.64	3.39	3.38	3.47		
1 Peat moss : 1 Perlite	3.22	2.99	2.98	3.06	3.16	2.94	2.93	3.01		
1 Peat moss : 1 Vermiculite	3.92	3.55	3.64	3.74	3.84	3.57	3.55	3.65		
1 Peat moss : 1 Sand : 1 Perlite	3.50	3.26	3.24	3.33	3.43	3.19	3.18	3.27		
1 Peat moss : 1 Sand : Vermiculite	4.11	3.82	3.81	3.91	4.03	3.75	3.74	3.84		
1 Peat moss : 1 Perlite	3.93	3.65	3.63	3.74	3.85	3.58	3.56	3.64		
Mean (B)	3.63	3.37	3.36	3.56	3.31	3.31	3.29	3.41		
LSD at 5%	A 0.14	B 0.11	AB 0.29	A 0.11	B 0.09	AB 0.24				
Character	P %									
	1999					2000				
	0.0	25	50	Mean (A)	0.0	25	50	Mean (A)		
1 Sand : 1 Clay	0.31	0.27	0.25	0.28	0.33	0.29	0.28	0.30		
1 Peat moss : 1 Sand	0.49	0.43	0.42	0.45	0.52	0.46	0.43	0.47		
1 Peat moss : 1 Perlite	0.38	0.33	0.31	0.34	0.40	0.35	0.33	0.36		
1 Peat moss : 1 Vermiculite	0.56	0.49	0.48	0.51	0.59	0.51	0.50	0.53		
1 Peat moss : 1 Sand : 1 Perlite	0.44	0.39	0.38	0.40	0.45	0.40	0.39	0.41		
1 Peat moss : 1 Sand : Vermiculite	0.66	0.58	0.57	0.60	0.69	0.61	0.69	0.63		
1 Peat moss : 1 Perlite	0.60	0.53	0.52	0.55	0.60	0.53	0.52	0.55		
Mean (B)	0.49	0.43	0.42	0.51	0.45	0.45	0.49	0.49		
LSD at 5%	A 0.04	B 0.03	AB 0.08	A 0.05	B 0.04	AB 0.11				

3- Effect of different planting media and GA₃ concentrations on percentages of N, P and K in the leaf of *Epipremnum pinnatum* "Aureum"

It is clear from the data in Tables (5 & 6) that N, P and K in the leaf were significantly different according to varying planting medium. Using all planting media containing peat moss with the other materials significantly increased the leaf content of N, P and K than using Sand: Clay medium. The addition of Vermiculite, Sand or Perlite along with Peat moss in descending order considerably raised the values of these nutrients. The maximum values were recorded due to using Peat moss, Sand and Vermiculite at 1:1:1. Growing the plants in 1 Sand: 1 Clay medium resulted in the minimum values.

The beneficial effect of planting media on supplying the plants with their requirements from nutrients could explain the present results. In addition, these materials were very effective in increasing the availability of N, P and K for plants.

These results are in coincidence with those obtained by Badran (1988, on *Piantes tuberosa*, Nabih (1991) on *Freesia refracta*, Abou-Hadid *et al.* (1994) on cucumber plants and Manoly (2001) on *Zinnia elegans*.

Data concerning the effect of GA₃ on leaf content of N, P and K clearly show that these was a gradual reduction on N, P and K in the leaf with increasing

GA₃ concentration from 0.0 to 50 ppm. The three macro nutrients in the leaf significantly tended to reduce with application of GA₃ at 25 to 50 ppm compared to using 0.0 ppm GA₃. Significant differences in this connection were observed between various GA₃ concentrations except between using the higher two concentrations namely 25 and 50 ppm. These results were true in both seasons.

Table (6): Effect of different planting media and GA₃ concentrations on percentages of K and soluble sugars of *Eupyrenum pinnatum* "Aureum" during 1999 and 2000 seasons.

Character Different planting media (A)	K %									
	1999					2000				
	GA ₃ concentrations (B)		GA ₃ concentrations (B)		Mean (A)	GA ₃ concentrations (B)		GA ₃ concentrations (B)		Mean (A)
0.0	25	50	Mean (A)	0.0		25	50	Mean (A)		
1 Sand : 1 Clay	0.86	0.79	0.78	0.81	0.91	0.85	0.84	0.87		
1 Peat moss : 1 Sand	1.11	1.02	1.00	1.04	1.10	1.02	1.01	1.04		
1 Peat moss : 1 Perlite	0.95	0.87	0.86	0.89	0.97	0.90	0.88	0.92		
1 Peat moss : 1 Vermiculite	1.21	1.11	1.09	1.14	1.21	1.13	1.11	1.15		
1 Peat moss : 1 Sand : 1 Perlite	1.04	0.96	0.95	0.98	1.04	0.97	0.96	0.99		
1 Peat moss : 1 Vermiculite	1.41	1.31	1.30	1.34	1.38	1.28	1.26	1.31		
1 Peat moss : 1 Perlite	1.28	1.19	1.18	1.22	1.27	1.18	1.17	1.21		
Mean (B)	1.12	1.04	1.02	1.13	1.13	1.05	1.03	1.07		
LSD at 5%	A	B	AB	A	B	AB	A	B	AB	
	0.06	0.05	0.13	0.05	0.04	0.11				
	Soluble sugars %									
Character	A	B	AB	A	B	AB	A	B	AB	
1 Sand : 1 Clay	5.00	4.65	4.64	4.76	5.25	4.88	4.87	5.00		
1 Peat moss : 1 Sand	5.41	5.03	5.01	5.15	5.70	5.30	5.29	5.43		
1 Peat moss : 1 Perlite	5.15	4.79	4.78	4.91	5.41	5.03	5.02	5.15		
1 Peat moss : 1 Vermiculite	5.55	5.16	5.15	5.29	5.82	5.41	5.40	5.54		
1 Peat moss : 1 Sand : 1 Perlite	5.30	4.93	4.92	5.05	5.57	5.18	5.17	5.31		
1 Peat moss : 1 Sand : Vermiculite	5.35	5.44	5.42	5.57	6.14	5.71	5.70	5.85		
1 Peat moss : 1 Perlite	5.74	5.34	5.32	5.47	6.03	5.61	5.60	5.75		
Mean (B)	5.42	5.05	5.03	5.47	5.70	5.30	5.29	5.43		
LSD at 5%	A	B	AB	A	B	AB	A	B	AB	
	0.11	0.08	0.21	0.09	0.07	0.19				

The maximum values on leaf content of N, P, K were obtained on plants grown in medium containing Peat moss Sand and Vermiculite at rate of 1:1:1 without the application of GA₃.

The reduction in N, P and K in the leaf in response to application of GA₃ may be attributed to their depletion and exhaustion in forming new tissues (Jacobs 1979).

The results of Hassan *et al.*, (1991) who worked on pot marigold and Abd-Alazem (1993) who worked on *Tagetes minuta*, supported the present results.

4- Effect of different planting media and GA₃ concentrations on soluble, insoluble and total sugars in the dry leaf of *Epipremnum pinnatum*.

Data in Tables (6 & 7) clearly show that varying planting media was of beneficial and significant influence on soluble, insoluble and total sugars in the leaf in both seasons. All media containing peat moss and the other components caused a significant increase in such three chemical traits compared to those free from peat moss (1 Sand: 1 Clay). The maximum values were detected in plant growing in medium consisting from Peat moss : Sand: Vermiculite at 1:1:1 ratio. Plants growing in 1 S and : 1 Clay medium had the leaves with the lowest values. Similar results were obtained in both seasons.

The great uptake of N, P and K by plants due to using various media could lead to increase the biosynthesis of carbohydrates and formation of various sugars.

Similar results were obtained by EL-Khateeb (1983) on *Eucalyptus angulosa* and *Eucalyptus torquata*, Al-Badawy et al., (1989) on *Chrysanthemum mortifolium* and Nabih (1991) on *Freesia refacta*.

Table (7): Percentages of different planting media and GA₃ concentrations on percentages of unsoluble and total sugars of *Epipremnum pinnatum* "Aureum" during 1999 and 2000 seasons

Character Different planting media (A)	1999					2000				
	Unsuable sugars %					Total sugars %				
	GA ₃ concentrations (A)		GA ₃ concentrations (B)			GA ₃ concentrations (A)		GA ₃ concentrations (B)		
	0.0	25	50	Mean (A)	Mean (B)	0.0	25	50	Mean (A)	Mean (B)
1 Sand : 1 Clay	5.91	5.77	5.76	5.81	6.20	6.01	6.01	6.01	6.07	6.07
1 Peat moss : 1 Sand	6.50	6.33	6.31	6.38	6.83	6.63	6.62	6.62	6.69	6.69
1 Peat moss : 1 Perlite	6.11	5.93	5.92	5.99	6.42	6.23	6.20	6.28	6.28	6.28
1 Peat moss : 1 Vermiculite	6.71	6.51	6.50	6.57	7.05	6.83	6.81	6.90	6.90	6.90
1 Peat moss : 1 Sand : 1 Perlite	6.30	6.11	6.10	6.17	6.62	6.42	6.41	6.48	6.48	6.48
1 Peat moss : 1 Sand : Vermiculite	7.09	6.89	6.88	6.95	7.44	7.22	7.21	7.29	7.29	7.29
1 Peat moss : 1 Perlite : 1 Vermiculite : 1 Perlite	6.85	6.64	6.63	6.71	7.19	6.97	6.96	7.04	7.04	7.04
Mean (B)	6.50	6.31	6.30		6.82	6.62	6.60			
LSD at 5%	A	B	AB		A	B	AB			
	0.14	0.08	0.21		0.11	0.07	0.19			
Character	Total sugars %									
	GA ₃ concentrations (A)		GA ₃ concentrations (B)			GA ₃ concentrations (A)		GA ₃ concentrations (B)		
	0.0	25	50	Mean (A)	Mean (B)	0.0	25	50	Mean (A)	Mean (B)
1 Sand : 1 Clay	10.91	10.42	10.40	10.58	11.45	10.89	10.88	11.07	11.07	11.07
1 Peat moss : 1 Sand	11.91	11.36	11.32	11.53	12.53	11.93	11.91	12.12	12.12	12.12
1 Peat moss : 1 Perlite	11.26	10.72	10.70	10.89	11.83	11.26	11.22	11.44	11.44	11.44
1 Peat moss : 1 Vermiculite	12.26	11.67	11.65	11.86	12.87	12.24	12.21	12.44	12.44	12.44
1 Peat moss : 1 Sand : 1 Perlite	11.60	11.04	11.02	11.22	12.19	11.60	11.58	11.79	11.79	11.79
1 Peat moss : 1 Sand : Vermiculite	12.94	12.33	12.30	12.52	13.38	12.93	12.91	13.14	13.14	13.14
1 Peat moss : 1 Perlite : 1 Vermiculite : 1 Perlite	12.59	11.98	11.95	12.17	13.22	12.58	12.56	12.79	12.79	12.79
Mean (B)	11.92	11.36	11.33		12.52	11.92	11.90			
LSD at 5%	A	B	AB		A	B	AB			
	0.20	0.15	0.40		0.23	0.12	0.32			

Concerning the effect of GA₃ on sugars, data in Tables (6&7) obviously reveal that there was a proportional reduction in soluble, insoluble and total sugars with increasing GA₃ concentrations from 0.0 to 50 ppm. Application of

GA₃ at 0.0 to 50 ppm significantly decreased such chemical traits compared to unspraying. Raising GA₃ concentration from 25 to 50 ppm failed to show any significant reduction on soluble, insoluble and total sugars. These results were true in both seasons.

Plants growing on Peat moss : Sand : Vermiculite medium and unsprayed with GA₃ had the maximum values in both seasons.

The great exhaustion of sugars in building new tissues in response to application of GA₃ could explain the present results.

These result are in conformity with those obtained by EL-Sayed (1991) and Hassan *et al.* (1991) on pot marigold Abd-Alazeem (1993) on *Tagetes minima* and Manoly (1996) on Iris plants.

As a conclusion, growing *Epipremnum pinnatum* "Aureum" Bunt plants in medium containing 1 part Peat moss : 1 part Sand : 1 part Vermiculite and spraying them with GA₃ at 25 ppm is necessary for improving growth criteria and nutritional status of the plants.

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تأثير بيئات نباتية مختلفة والجيرلين على النمو الخضري والتراكيب الكيماوي للنباتات البوتس

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كلية الأرحاص والبيئة وزراعة المناطق الجافة ... جامعة الملك عبد العزيز - جدة - المملكة العربية السعودية

أجريت هذه الدراسة بمصطلح الأبحاث الزراعية بجامعة الملك عبد العزيز بهدف الشلم والتي تقع شمال شرق جدة بحدود ١٢٠ كيلو متر بالمملكة العربية السعودية

تم دراسة تأثير سبعة بيئات نباتية مختلفة وثلاثة تركيزات من حوامل الجيرليك هي صفقر ، ٢٥ ، ٥٠ جزء في المليون على صفات النمو ، كلورفيل أ ، كلوروفيل ب ، الكلوروفيل الكلي ، ومحتوى الورقة من عناصر النيتروجين والفسفور والبوتاسيوم وكذلك نسبة السكريات الأائيه والغير ذائيه والكلية وذلك خلال موسمي ١٩٩٩ ، ٢٠٠٠ .

أشارت نتائج الدراسة الى ان اختلاف البيئات النباتيه يؤدي الى تفاوت كبير في صفات النمو والصبغات ومحتوى الورقة من النيتروجين والفسفور والبوتاسيوم وكذلك نسبة السكريات الأائيه والغير ذائيه وكان استخدام البيئه النباتيه المكونه من البيت مومن ، الرمل ، الغير ميكوليت مفضلا في تحسين خصائص النمو والصفات ومحتوى الورقة من النيتروجين والفسفور والبوتاسيوم كذلك نسبة المستسكيات الأائيه والغير ذائيه والكلية وكانت البيئه النباتيه المكونه من الجيرلين الى حوث تحسن واضع في للنباتات وقد ادى رفع التركزات المستخدمة من الجيرلين الى حوث تحسن واضع في كلوروفيل أ ، كلوروفيل ب ، و الكلوروفيل الكلي . أما محتوى الورقة من النيتروجين والفسفور والبوتاسيوم والسكريات الأائيه والغير ذائيه والكلية فقد كان يحصل الى الانخفاض بمعاملات الجيرلين .

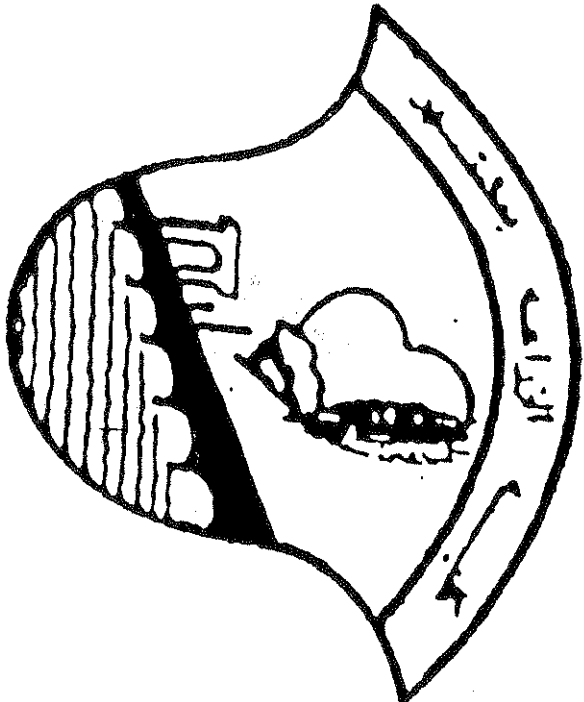
أدى زراعة نباتات البوتس في بيئه نباتيه مكونه من ١ جزء بيت مومن ، ١ جزء رمل : ١ جزء فير ميكوليت مع رشها لثلاثة مرات بالجيرلين بتركيز ٢٥ جزء المليون الى تحسين النمو والحاله الغذائيه للنبات بدرجة كبيره .

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