RESULTS AND DISCUSSION

I.A. *Tecoma stans:*

I.A.1.Vegetative growth:

I.A.1.1.Plant height (cm):

Data in Table (1) and Fig.(1) clear that there was significant decreases in plant height of *Tecoma stans* plants by using the three growth retardants treatments. The obtained results indicated that the all treated plants were shorter than the control in both seasons.

Consequently, paclobutrozol was more effective than cycocel and uniconazole in producing compact plants in both seasons of the study (regardless the concentration) .The obtained data also reveal that tecoma plants showed lightly response to cycocel more than uniconazole by exhibited suppression of plant height in two seasons.

Regarding the effect of their concentrations, the data presented in the same Table show that the treatment with PP_{333} at 200 ppm gave the shortest plant height as 67.4 and 65.3cm for both seasons, respectively. While PP_{333} at 100 ppm or cycocel at 3000 ppm gave the next values in this concern.

In this respect **Saker (2004)** revealed that, spraying *Hibiscus rosa sinensis* and *Taberna Montana cronaria* with PP_{333} at 300 ppm and uniconazole at 187.5 ppm produced the maximum reduction of plant height.

I.A.1.2. Number of branches per plant:

According to data presented in Table (1) and Fig. (2) on mean number of branches per plant as affected by using some growth retardants treatments, it could be concluded that the three used growth retardants treatments had improving effect on branches formation with

different extends. However, in both seasons of this study, the greatest mean number of branches/plant was formed on plants treated with paclobutrozol at 200ppm which recorded 14.36 and 15.29 branches/plant in the first and second seasons, respectively. Whereas, the lowest mean number of branches /plant was gained from untreated plants(control)as it registered 8.96 and 9.46 branches/plant in both growing seasons, respectively.

On the other side, CCC at 3000 ppm increased the number of branches per plant in both seasons as 13.26 and 14.14, respectively. The pervious results are in agreement with those of **Tawila (2000)** on *Polianthes tuberosa* and pointed out that sprayed PP_{333} at 200 and 300 ppm, gave the highest number of leaves per plant.

I.A.1.3. Fresh and dry weights of branches per plant (gm):

The data obtained for fresh and dry weights of branches per plant as affected by some treatments of growth retardants are presented in Table (1).

As for fresh weight of branches per plant, it could be concluded that all the three growth retardants treatments progressively decreased the fresh weight of branches as compared with control in both seasons. Hence, in both seasons of this study the heaviest fresh weight of branches as they gave 32.1 and 30.6 g in the first and second seasons, respectively. On the contrary, the lowest fresh weight values of branches of *Tecoma stans* plant was obtained by using PP_{333} at 200 ppm (the high rate), the percentage of decrease due to this treatments reached 26.48 and 17.32 % less than control in the first and second seasons, respectively.

Table(1): Effect of PP333 , cycocel and uniconazole on plant height, number of branches and fresh and dry weights of branches/plant of *Tecoma stans*.during the first and second seasons

Parameters / Treatments		Plant height (cm)		No. of branches/plant		F.W. of branches/plant(g)		D.W. of branches/plant(g)	
		First Season	Second Season	First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		78.60	79.80	8.96	9.46	32.10	30.60	4.49	4.45
PP333	50 ppm	72.90	71.60	10.31	10.14	29.60	27.90	4.44	4.24
	100ppm	69.30	67.30	12.93	12.21	25.30	29.30	4.57	4.39
	200ppm	67.40	65.30	14.36	15.29	23.60	25.30	2.67	4.08
Cycocel	1000ppm	75.00	74.90	9.21	9.81	28.60	29.30	4.49	4.36
	2000ppm	71.80	72.60	11.61	12.14	26.70	28.00	4.48	4.20
	3000ppm	69.30	68.90	13.26	14.14	24.30	27.60	3.88	4.08
Uniconazole	50 ppm	75.10	76.10	10.11	9.69	31.30	29.60	4.53	4.29
	100ppm	74.60	72.10	12.13	11.93	29.60	28.90	4.49	4.50
	200ppm	70.30	73.20	12.96	12.81	29.40	28.30	4.49	4.69
L.S.D. at 0.05		3.26	3.12	1.89	1.76	2.16	2.46	0.62	0.53

Fig.(1): Effect of PP_{333}, cycocel and uniconazole on plant height of *Tecome stans* during the first and second seasons.

Fig.(2): Effect of PP_{333}, cycocel and uniconazole on number of branches /plant of *Tecome stans* during the first and second seasons.

Moreover, treating the plants with CCC at 3000 ppm gave lower fresh weight than other applications in both growing seasons.

With respect to dry weight of branches per plant, data presented in the same table revealed that all applied treatments of growth retardants resulted in highly significant decrease in this parameter when compared with untreated plants in both seasons of study. However, the treatments of PP_{333} at 200 ppm applied by spraying and CCC at 3000 ppm its superiorities in this concern as they registered 3.88 and 4.08g in the first and second seasons, respectively. The results of fresh and dry weights are in parallel with those obtained by **Healy *et al.*, (1993)** on Alstroemenia.

I.A.1.4. Number of leaves per branch:-

It is quite evident that the number of leaves per branch was positively responded to the all levels of PP_{333}, CCC and uniconazol in both seasons. Data tabulated in Table (2) and Fig. (3) showed that all the three used growth retardant treatments resulted in significant increasing in the mean number of leaves per branch in both seasons. Thus, in both seasons of study treated the plants with PP_{333} at 200 ppm showed to be the most effective in increasing the number of leaves per branch as it registered 16.3 and 15.8 compared with 11.16 and 12.9 for control in the first and second seasons, respectively. Using PP_{333} at 100ppm or uniconazol at 200ppm gave the next value in this concern in both seasons.

These results are in harmony with those obtained by **Abd El-Fatah (2001)** on some ornamental shrubs (*Adhatoda vasica* and *Hibiscus rosa- sciensis*) found that PP_{333} at 50 and 100 ppm increased the number of leaves/plant.

I.A.1.5. Fresh and dry weights of leaves per branch (gm):

Data presented in Table (2) clearly that. PP_{333} at200ppm and uniconazol at 100ppm succeeded in increasing the fresh weight of leaves per branch in both seasons of this study. Which gave (11.4, 11.6) and (11.4, 11.00) for PP_{333} at 200 and uniconazol at 100 for both seasons, respectively. While, the control plants gave 10.1 and 10.3gm in the first and second seasons, respectively.

As for dry weight of leaves per branch in the same table showed the response of dry weight of leaves of *Tecoma stans* plants to the effect of three growth retardants treatments followed nearly the same trend previously detected with fresh weight of leaves per branch in both seasons. In general, using PP_{333} at high rate (200ppm) and uniconazol at the medium rate (100ppm) showed to be the most effective treatments for increasing the dry weight of leaves per branch in both seasons. These results agreed with those obtained by **Youssef (2004)** on *Strelitzia reginae.*

The above mentioned results of the present study could be explained by the fact that growth retardant could be attributed to the new balance of endogenous hormones especially auxins and cytokinins existed under these treatments as will be mentioned later. So, cell division and elongation in dormant buds rise. Thus number of leaves and branches was increased. Also, the reduction in stem apical growth caused by growth retardant treatments may direct and channel the nutrients and other growth factors to the lateral buds where compensatating growth subsequently take place. The mechanism essentially confirming to the nutrient theory, (**McIntyre, 1977**).

Table(2): Effect of PP333 , cycocel and uniconazole on number of leaves, fresh and dry weights of leaves per branch of *Tecoma stans* during the first and second seasons

Parameters / Treatments		No. of leaves/branch		F.W. of leaves/branch(g)		D.W. of leaves/branch(g)	
		First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		11.16	12.90	10.10	10.30	0.81	0.73
PP333	50 ppm	13.80	13.70	11.00	9.50	0.99	0.88
	100ppm	15.90	14.60	11.10	10.20	1.09	1.00
	200ppm	16.30	15.80	11.40	11.60	1.12	1.29
Cycocel	1000ppm	12.60	13.20	10.00	10.50	0.83	0.94
	2000ppm	13.90	14.90	9.70	10.40	0.86	1.00
	3000ppm	14.70	15.60	10.10	9.40	0.92	0.91
Uniconazole	50 ppm	13.60	13.30	10.80	10.90	1.05	0.89
	100ppm	14.30	14.30	11.40	11.00	1.12	0.99
	200ppm	15.20	13.90	10.60	9.17	1.06	0.92
L.S.D. at 0.05		2.08	1.79	0.62	0.60	0.14	0.17

Fig.(3): Effect of PP_{333}, cycocel and uniconazole on number of leaves /branch of *Tecome stans* during the first and second seasons.

I.A.2.Flowering measurements:

I.A.2.1. Flowering date:

According to data presented in Table (3) and Fig.(4) on the flowering date (days) as effected by using three growth retardants under all concentrations, it could be concluded that all the three used PP_{333}, CCC and uniconazol resulted in significant increasing the days until flowering. However, the application of PP_{333} at 200ppm proved to be the most effective concentration for increasing the number of days for flowering. It gave 115 and 119 days in the first and second seasons, respectively. While , CCC at 3000ppm gave 113 and 112 days for flowering in both growing seasons, respectively. On the other side, the control plants (untreated) decreased the number of days to flowering in both seasons 92 and 97 days in two seasons, respectively. The results of flowering date are in parallel with those of **Tawila (2000)** on tuberose and **Adham (2001)** on *Althaea rosea* indicated that PP_{333} at 20 and 100ppm, CCC at 4000ppm increased the number of days to flowering date.

I.A.2.2. Number of flowers per branch:

Data presented in Table (3) and Fig. (5) indicated that the mean number of flowers per branch was greatly influenced by the growth retardants treatments as compared to control in both seasons. Thus, it could be noticed that all the three used growth retardants treatments had enhancing effect on the number of flowers/branch. Hence in both seasons of this study, the maximum number of flowers/branch was statistically induced by *Tecoma stans* plants grown in pots and treated by PP_{333} at 200ppm which gave 10.17 and 11.12 flowers/branch in the first and second seasons, respectively. Whereas, the minimum number of flowers/branch values (5.96 and 5.37) obtained from untreated plants (control) in both seasons. On the other hand, treating the plants of *T.stans* with CCC at 3000ppm caused a high increment in this

parameter as it recorded 8.94 and 8.31 in the first and second seasons, respectively. In this respect **Saker (2004)** mentioned that spraying *Hibiscus rosa sinensis* and *Tabernamontana cronaria* shrubs with PP_{333} at 200ppm and 300ppm and uniconazole at 125 ppm and 187.5ppm increased the number of flowers per plant.

I.A.2.3.Fresh and dry weights of flowers per branch (gm):

The data obtained on fresh and dry weights of flowers per branch as affected by using growth retardant treatments are presented in Table(3). All the three growth retardants resulted in significant increased in the fresh weight of flowers per branch of *Tecoma stans* plants in the two seasons. The largest fresh weight of flowers/branch was obtained by treating the plants with PP_{333} at 200ppm in the first and second seasons as they recorded 7.83 and 9.89g,respectively followed by using uniconazole at 200ppm in first and second seasons(7.68 and 7.64 g), respectively.

Results of the dry weight of the flowers per branch attained a parallel trend with fresh weight results in both seasons. In general, the heaviest dry weight of the flowers per branch was recorded by spraying PP_{333} at 200ppm in both seasons(0.69 ,0.88), respectively. And the treatment of spraying uniconazol at 200ppm in two seasons. The results of fresh and dry weights of flowers/branch are in harmony with those of **Tawila (2000)** on tuberose and **Adham (2001)**on *Althaea rosea.*

I.A.3. Root growth measurements:

I.A.3.1. Mean number of roots per plant:

The data obtained on the mean number of roots per plant of both seasons as affected by growth retardants treatments are presented in Table(4) and Fig.(6) . Data showed that, the number of roots was greatly influenced by the growth retardants treatments as compared

Table(3): Effect of PP333 , cycocel and uniconazole on flowering date, number of flowers per branch and flowers fresh and dry weights per branch of *Tecoma stans*.during the first and second seasons

Treatments \ Parameters		Flowering date (days)		No. of Flowers /branch		F.W. of Flowers /bransh(g)		D.W. of Flowers /bransh(g)	
		First Season	Second Season	First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		92.00	97.00	5.96	5.37	3.69	3.54	0.27	0.25
PP333	50 ppm	98.00	102.00	7.23	6.93	4.69	5.33	0.39	0.45
	100ppm	112.00	110.00	9.13	10.11	6.21	8.89	0.54	0.75
	200ppm	115.00	119.00	10.17	11.12	7.83	9.89	0.69	0.88
Cycocel	1000ppm	96.00	99.00	6.43	5.98	4.43	5.11	0.34	0.39
	2000ppm	107.00	115.00	8.93	7.70	6.92	6.76	0.60	0.57
	3000ppm	113.00	112.00	8.94	8.31	7.61	7.31	0.64	0.63
Uniconazole	50 ppm	95.00	101.00	6.12	6.17	4.71	5.42	0.35	0.42
	100ppm	99.00	109.00	7.89	5.97	6.86	5.67	0.61	0.49
	200ppm	109.00	112.00	8.73	8.13	7.68	7.64	0.66	0.67
L.S.D. at 0.05		4.39	6.01	1.82	1.93	1.21	1.45	0.12	0.16

Fig.(4): Effect of PP_{333}, cycocel and uniconazole on flowering date of *Tecome stans* during the first and second seasons.

Fig.(5): Effect of PP_{333}, cycocel and uniconazole on number of flowers /branch of *Tecome stans* during the first and second seasons.

with control in both seasons. Thus, it could be noticed that all the three used PP_{333} , CCC and uniconazol treatments had enhancing effect on roots formation with different extends. In both seasons treating the plants of *T. stans* with PP_{333} at 200 ppm produced the highest number of roots per plant as it gave 14.36 and 12.39 in both seasons, respectively. In addition, the treatments of PP_{333} at 100 and uniconazol at 100 ppm gave the next value in this parameter in both seasons . While the control (untreated) plants gave the least number of roots per plant in both seasons as 9.10 and 8.97, respectively.

I.A.3.2. Fresh and dry weights of roots per plant(g):

The data obtained on fresh weight of roots/plant as affected by treatments of growth retardants are averaged in Table (4) .

Data showed that the fresh weight of roots per plant was greatly increased by using all the three growth retardants in both seasons. So, the heaviest fresh weight of roots /plant was recorded by using PP_{333} at 200ppm as it recorded (66.92 , 54.51gm) in both seasons, respectively followed descendingly by using PP_{333} at 100ppm then uniconazol at 100ppm in both seasons.

As for dry weight of roots per plant(g) , the data obtained in this parameter as affected by some treatments of growth retardants are presented in the same Table.

The results of the dry weight of the roots/plant attained a parallel trend with fresh weight results with little differences. In general, the heaviest dry weight of roots/plant was obtained by using the high concentration of PP_{333} (200ppm) applied by spraying as it recorded (11.36 , 9.23g) in the first and second seasons, respectively.

The previous mentioned findings of roots traits *i.e.,* number, fresh and dry weights could be interpreted on the basis of physiological role of the nature of growth retardants action. Since, (as will be

Table(4): Effect of PP333 , cycocel and uniconazole on Number of roots, fresh and dry weights per plant of *Tecoma stans*. during the first and second seasons.

Parameters / Treatments		No. of roots /plant		F.W. of roots /plant(g)		D.W. of roots /plant(g)	
		First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		9.10	8.97	45.90	46.74	6.88	6.44
PP333	50 ppm	10.28	9.68	51.19	47.43	8.14	7.20
	100ppm	13.27	11.86	64.62	53.37	10.41	8.52
	200ppm	14.36	12.39	66.92	54.51	11.36	9.23
Cycocel	1000ppm	9.83	9.14	47.18	44.78	7.36	6.67
	2000ppm	11.39	10.89	52.26	50.00	8.31	8.05
	3000ppm	12.48	11.76	54.91	52.92	9.61	8.78
Uniconazol	50 ppm	10.16	9.86	49.78	48.31	7.86	7.27
	100ppm	13.27	11.87	61.00	52.30	10.82	8.62
	200ppm	12.19	11.48	53.63	53.67	10.08	9.01
L.S.D. at 0.05		2.13	1.63	6.29	4.30	2.07	1.84

Fig.(6): Effect of PP_{333}, cycocel and uniconazole on number of roots/plant of *Tecome stans* during the first and second seasons.

mentioned later) PP_{333} treatments alter the endogenous level of different determined phytohormones *i.e.* auxin, gibberellins, ABA and cytokinins level that tended to increase the size of root system of *Tecoma stans* plants. It is well established that cytokinins stimulate lateral roots initiation and thus increasing the size (number, fresh and dry weights), **Devlin and Witham(1983).**

I.A.4. Chemical composition measurements:

1- Leaf nitrogen percentage:

Data presented in Table (5) indicated that N percentage in leaves of *Tecoma stans* plants was greatly affected by using all the three growth retardants as compared to control in both seasons. However, using PP_{333} at 200ppm was the most effective treatment for increasing leaf nitrogen% as it gave 1.67 and 1.73% when compared to 1.26 and 1.32% in the first and second seasons, respectively. Also PP_{333} at 100ppm showed a great increase in N% of leaves and ranked the second in this concern, followed by CCC at 3000ppm in both seasons. These results coincided with those obtained by **Youssef (2000).**

2- Leaf phosphorus percentage:

The obtained results of phosphorus % in leaves of *T.stans* plants in response to different treatments of growth retardants and tabulated in Table (5) cleared that in the first season, the plants treated with PP_{333} at 100ppm gave the most promising effect in increasing the leaves percentage of phosphorus which gave 0.16% followed by using PP_{333} at 200ppm which registered 0.15% while CCC at 3000ppm and uniconazol at 200ppm gave the third value in this concern as 0.14% compared to 0.11% for control. While in the second season , PP_{333} at 200ppm showed its superiority for increasing leave phosphorus% in the

plants. Moreover, the difference between treatments and control were significant in both seasons.

3- Leaf potassium percentage:

Data presented in Table (5) pointed out that potassium percentage in leaves was greatly affected by using all the three growth retardants in both seasons. However, the application of PP_{333} at 200ppm exhibited to be the most effective treatment for increasing K% as it recorded 3.20% compared to 2.83% for control in the first season. Moreover using CCC at 3000ppm caused a great increment in this parameter and ranked the second in this respect.

The aforementioned results of N , P and K are in accordance with those attained by **Essa (1992)** on rosa, **Abd El-Fatah(2001)** on *Adhatoda vasica* and *Hibiscus rosa sinensis.*

4-Total carbohydrates percentage:

Data of total carbohydrates percentage in dried leaves of *Tecoma stans* plants are presented in Table (5). It was obvious that PP_{333} at 200ppm resulted in significant increments in leaves total carbohydrates % in both seasons. As it gave 11.11 and 11.64%followed by uniconazol at 100ppm which recorded 10.38 , 10.73% compared to 8.29 and 9.13% for control, in the first and second seasons, respectively. These results are in line with those obtained by **Tawila(2000)** on tuberose and **Saker (2004)** who found that , spraying *Hibiscus rosa sinensis and T. coronaria* shrubs with PP_{333} at 200, 300ppm and uniconazol at 125 , 187.5ppm increased leaf total carbohydrates content .

5-Total chlorophylls (mg/100g fresh weight of leaves):

According to data presented in Table (6) , it could be concluded that , total chlorophylls content in leaves of *Tecoma stans* plants was greatly increased by using the application of PP_{333} at 200ppm which gave 239 , 249 mg/100gm fresh weight as compared to 225 ,234

Table(5): Effect of PP333 , Cycocel and Uniconazole on N% , P% , K% and total carbohydrates %. of *Tecoma stans* during the first and second seasons

Parameters / Treatments		N%		P%		K%		T. carbohydrates %	
		First Season	Second Season	First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		1.26	1.32	0.11	0.10	2.83	2.97	8.29	9.13
PP333	50 ppm	1.34	1.46	0.13	0.14	2.96	3.08	9.11	9.83
	100ppm	1.52	1.62	0.16	0.15	3.14	3.19	10.32	10.67
	200ppm	1.67	1.73	0.15	0.16	3.20	3.17	11.11	11.64
Cycocel	1000ppm	1.31	1.36	0.12	0.11	2.87	2.98	8.42	9.25
	2000ppm	1.39	1.49	0.12	0.13	2.97	3.07	8.93	11.01
	3000ppm	1.46	1.52	0.14	0.12	3.17	3.15	9.72	10.39
Uniconazol	50 ppm	1.29	1.39	0.12	0.11	2.84	3.01	8.63	9.63
	100ppm	1.36	1.49	0.11	0.13	3.09	3.09	10.38	10.73
	200ppm	1.35	1.48	0.14	0.13	3.05	3.10	9.84	10.87
L.S.D. at 0.05		0.140	0.120	0.011	0.012	0.620	0.430	0.820	0.940

mg/100gm F.W. for control in the first and second seasons, respectively .Moreover, treating the plants with uniconazol at 200ppm caused significant increments in this parameter, followed by using uniconazol at 100ppm application which ranked the third in this concern .

6- Total indoles content in leaves (mg/100g f.w.):

The average data of total indoles content of *Tecoma stans* as affected by some growth retardants treatments of this work are shown in Table (6).

Data in this Table revealed that, all the three growth retardants significantly decreased leaf total indoles content in leaves of *Tecoma stans* in both seasons . However, in the first growing season of this study the plants which treated by PP_{333} at 200ppm, CCC at 3000ppm and uniconazol at 200ppm gave the minimum total indoles as 230 , 234 and 242 mg/100g f.w. when compared with other concentrations of growth retardants or control.

The control plants (untreated) gave the maximum value of total indoles as (296 and 287 mg/100g f.w.) in both seasons, respectively.

The results in the second season were harmony with those obtained in the first season.

These results are in conformity with the results of **Adham(2001)** who revealed that CCC at 4000ppm decreased total indoles in the leaves of *Althaea rosa* plants.

7- Total phenols content of leaves (mg/100g f.w.) :

The data obtained of total phenols content in the leaves of *T. stans* as affected by using different concentration of three growth retardants were presented in Table (6).

In the first season, it could be noticed that the greatest total phenol content was obtained by using PP_{333} at 200ppm and uniconazol at 200ppm which gave 182 mg/g f.w. followed by CCC at 3000 ppm (181 mg/g f.w.) while in the second season, using PP_{333} at 100ppm and

Table(6): Effect of PP333 , Cycocel and Uniconazole on total chlorophylls, total indoles, total phenols of *Tecoma stans.* during the first and second seasons

Parameters / Treatments		Total chlorophylls		Total indoles		Total phenols	
		First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		225	234	296	287	166	169
PP333	50 ppm	229	239	262	258	170	175
	100ppm	236	242	246	243	176	180
	200ppm	239	249	230	239	182	177
Cycocel	1000ppm	227	237	278	278	169	179
	2000ppm	231	240	247	270	176	178
	3000ppm	235	245	234	236	181	180
Uniconazol	50 ppm	229	237	281	280	168	175
	100ppm	238	239	263	269	176	178
	200ppm	239	240	242	249	182	176
L.S.D. at 0.05		8.30	7.01	9.10	7.06	10.00	12.31

CCC at 3000ppm induced the greatest total phenols content in the leaves as it gave the same results as 180 mg/g f.w.

On the other side, the control plants in both seasons gave the least values of total phenol as 166 and 169 mg/gm fresh weight. These results coincided with those obtained by **Youssef (2000)** on *S. reginae* and **Adham (2001)** on *Althaea rosea* plants.

I.B. *Cestrum elegans:*

I.B.1.Vegetative growth:

I.B.1.1. Plant height cm:

Data presented in Table (7) and Fig.(7) showed that all tested applications of PP_{333} , CCC and uniconazol induced progressive decrease the plant height of cestrum plants with significant differences as compared to control in both growing seasons. Since the shortest plants was obtained by using the high rate of PP_{333} which registered 48.4, 45.1 cm in first and second seasons, respectively. Moreover, uniconazol at 200ppm(high rate) gave the next value in this concern as 50.8 and 48.7 cm in both seasons. While CCC at 3000 ppm gave the third value as 51.9 and 49.00 cm in the first and second seasons, respectively . On the opposite the longest plants were obtained by control plants with recorded 62.1 and 59.7 cm in both seasons, respectively.

The data obtained in this result are agreement with those obtained by **Saker (2004)** on some shrubs and **Youssef (2004)**on *Steriltzia reginae* plants.

I.B.1.2. Number of branches/plant:

The results obtained for the number of branches per plant were averaged and exhibited in Table (7)and Fig.(8) they could be summarized as follows :-

Most tested applications of the three growth regulators significantly succeeded in increasing the number of branches per plant as compared to control in both seasons. Anyway the greatest number of branches was statistically produced with using high rate of PP_{333} , CCC and uniconazol in the first season as 10.32 , 10.97 and 10.32 branches per plant, respectively . While in the second season , CCC at 3000ppm gave the maximum number of branches per plant as 11.36. Moreover, using the medium rate of uniconazol and PP_{333} (100ppm) succeeded in increasing the number of branches and get the second value in this parameter as 10.32 and 10.12. On the other hand, the minimum number of branches per plant was obtained by untreated plants (control) in both seasons as

7.63, 7.32, respectively. The previous results are in agreement with those obtained by **Tawila (2000)**on *Polianthes tuberosa.*

I.B.1.3. Fresh and dry weights of branches per plant(gm):

It is quite evident that fresh weight of branches per plant was negatively responded to the all growth regulator treatments under this study.

Data obtained in Table(7) showed that plants sprayed with distilled water gave the heaviest fresh weight of branches per plant as it gave 18.3 and 17.8 in the first and second seasons, respectively .

On the contrary the least fresh weight of branches per plant was obtained by PP_{333} at 100 ppm and CCC at 3000ppm in the first season. While in the second season, the minimum fresh weight of branches per plant recorded with PP_{333} at 100 or 200ppm and CCC at 3000 and 2000ppm which recorded 14.1 , 14.9 , 14.6 and 14.2, respectively.

As for, dry weight of branches per plant , data represented in Table(10) revealed that uniconazol at 50ppm or PP_{333} at 50ppm gave the heaviest of dry weight of branches per plant in the first season as

Table(7): Effect of PP333 , Cycocel and Uniconazole on plant height, number of branches,fresh and dry weights of branches/plant of *Cestrum elegans* during the first and second seasons

Parameters / Treatments		Plant height (cm)		No. of branches/plant		F.W. of branches/plant		D.W. of branches/plant	
		First Season	Second Season	First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		62.10	59.70	7.63	7.32	18.30	17.80	2.00	1.95
PP333	50 ppm	58.30	52.60	8.94	8.64	17.40	16.30	2.07	1.98
	100ppm	54.60	49.30	9.76	10.12	16.50	14.10	1.98	1.69
	200ppm	48.40	45.10	10.32	9.14	14.30	14.90	1.75	1.93
Cycocel	1000ppm	60.80	56.20	9.11	8.93	16.40	15.30	1.96	1.83
	2000ppm	57.30	51.30	9.87	10.90	14.30	14.60	1.74	1.83
	3000ppm	51.90	49.00	10.97	11.36	15.40	14.20	1.90	1.84
Uniconazole	50 ppm	59.30	54.30	8.12	7.82	16.90	16.70	2.12	2.10
	100ppm	54.20	50.70	9.14	10.32	15.60	15.10	2.00	1.99
	200ppm	50.80	48.70	10.32	9.94	15.60	15.80	1.92	2.01
L.S.D. at 0.05		4.31	6.09	1.14	1.20	2.07	2.22	0.18	0.15

Fig.(7): Effect of PP_{333}, cycocel and uniconazole on plant height of *Cestrum elegans* during the first and second seasons.

Fig.(8): Effect of PP_{333}, cycocel and uniconazole on number of branchs/plant of *Cestrum elegans* during the first and second seasons.

2.07 and 2.12 gm, respectively in the first season. While PP_{333} at 200ppm and CCC at 2000ppm gave least dry weight of branches per plant in the first season as 1.75and 1.74 gm, respectively.

In the second season, uniconazol at 50ppm gave the heaviest dry weight of branches as 2.10gm but PP_{333} at 100 ppm gave the minimum dry weight of branches as 1.69gm.

I.B.1.4. Number of leaves per branch:

Concerning the effect of the three growth regulators treatments on the number of leaves per branch, the results presented in Table (8) and Fig.(9) showed that the highest values of this parameter were obtained by spraying cestrum plants with PP_{333} at 200 and 100ppm which gave 29.8 and 28.7 No. of leaves per branch in the first season, respectively. Also CCC at 3000 ppm and uniconazol at 200ppm ranked second in this concern and gave 26.00 and 26.8 leaves, respectively. While in the second season , PP_{333} at 200ppm and 100ppm showed the superiority in this concern as it gave 29.00, 28.50. Also the high rate of uniconazol (200ppm) significantly increase the number of leaves per branch as 27.00. The control plants gave the lowest number of leaves per branch in both seasons as 21.7 and 23.4, respectively. These results are in harmony with those obtained by **Abd El Fatah (2001)** on some ornamental shrubs (*Adhatoda vasica and Hibiscus rosa-sciensis)*found that PP_{333} at 50 and 100ppm increased the number of leaves per plant.

I.B.1.5. Fresh and dry weights of leaves per branch (gm):

Data tabulated in Table (8) indicated that all concentrations of three growth regulators significantly succeeded in increasing the fresh weight of leaves per plant. The heaviest fresh weight as 37.1 gm was obtained by PP_{333} at 100ppm also PP_{333} at 200ppm gave the next value

Table(8): Effect of PP333 , Cycocel and Uniconazole on number of leaves, fresh and dry weight of leaves per branch of *Cestrum elegans* during the first and second seasons

Parameters / Treatments		No. of leaves/branch		F.W. of leaves/branch		D.W. of leaves/branch	
		First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		21.70	21.70	23.40	28.20	30.10	2.03
PP333	50 ppm	24.90	25.60	32.10	32.70	2.60	2.58
	100ppm	28.70	28.50	37.10	39.10	3.15	3.06
	200ppm	29.80	29.00	35.90	37.20	2.98	3.27
Cycocel	200ppm	23.40	24.70	30.10	31.60	2.31	2.33
	1000ppm	25.60	26.80	32.00	33.70	2.62	2.69
	2000ppm	26.00	26.70	31.70	33.10	2.78	2.87
Uniconazole	3000ppm	22.00	24.80	30.10	31.70	2.16	2.37
	50 ppm	24.60	26.70	30.90	33.30	2.62	2.83
	100ppm	26.80	27.00	33.20	33.70	2.92	2.96
L.S.D. at 0.05	200ppm	3.10	3.96	2.92	2.24	0.30	0.34

Fig. (9): Effect of PP_{333}, cycocel and uniconazole on number of leaves/branch of *Cestrum elegans* during the first and second seasons.

as 35.9 gm in this parameter. In the second season PP_{333} at 200ppm gave the maximum fresh weight of leaves per branch as 37.2 gm while PP_{333} at 100ppm gave the second value as 36.1 gm .

In both seasons, the control plants gave the least fresh weight of leaves per branch as 28.2 and 30.1 gm, respectively.

As for dry weight of leaves per branch , the results are in harmony with those obtained in the fresh weight, the heaviest dry weight of leaves as 3.15gm obtained with PP_{333} at 100ppm in the first season in Table (8). While PP_{333} at 200ppm gave the heaviest dry weight of leaves per branch as 3.27gm in the second season. Also PP_{333} at 100 ppm gave the next value as 3.06 in this respect. These results agree with obtained by **Saker (2004) and Youssef(2004).**

I.B.2. Flowering measurements:

I.B.2.1. Flowering date:

According to results presented in Table (9) and Fig.(10) of flowering date (days) as affected by using different concentrations of three growth retardants . PP_{333} at 200ppm the most effective concentrations for increasing the number of day until flowering. It gave 121 and 123 days for flowering in two seasons, respectively. Also CCC at 3000ppm gave the next value as 118 and 119 days in two seasons, respectively. But the control plants (without any growth retardants) gave the shortest number of days to flowering as 98 and 96 days in both seasons,

respectively. These results were significant in both seasons between control and high or medium concentrations of PP_{333} at, CCC and uniconazol.

The results of flowering date are in parallel with those obtained by **Tawila (2000)** on tuberose, **Adham (2001)** on *Althaea rosea* and **Dhiman *et al.*,(2002)** on lilium cvs. Pollyana and Gran Paradiso.

I.B.2.2.Number of flowers per plant:

Data tabulated in Table (9) and Fig.(11) indicated that the mean number of flowers per plant was great influenced by high and medium concentrations of PP_{333} , CCC and uniconazol in both seasons. Moreover, the biggest number of flowers per plant was statistically induced by spraying CCC at 3000ppm which gave 20.1 and 21.00 flowers/plant in the first and second seasons, respectively . Also PP_{333} at 200ppm and uniconazol at 200ppm gave the second number of flowers per plant as 19.7, 19.2 and 19.5 , 19.7 in the first and second seasons , respectively. While the least number of flowers per plant as 15.2 and 16.3 produced by control in both growing seasons, respectively . In this respect **Saker(2004)** who mentioned that spraying *Hibiscus rosa sinensis* and *Tabernamontana coronaria* shrubs with PP_{333} at 200 and 300 ppm and uniconazol at 125 and 187.5ppm increased the number of flowers per plant.

I.B.2.3. Fresh and dry weights of flowers per plant(gm):

The data obtained on fresh weight flowers per plant are presented in Table (9). The maximum fresh weight of flowers per plant was obtained by spraying the plants with PP_{333} at 200ppm in the first and second seasons as they recorded 14.50 and 14.90 gm, respectively followed by using CCC at 3000ppm which gave 13.01 and 13.21 in both growing seasons, respectively.

On the other and the control plants which spraying with distelled water gave the fresh weight as 6.93 and 6.97g in both seasons, respectively.

Concerning the results of dry weight of the flowers per plant attained a parallel trend with fresh weight results in two seasons. Generally , the heaviest dry weight of the flowers per plant was

Table(9): Effect of PP333 , Cycocel and Uniconazole on flowering measurments during the first and second seasons of *Cestrum elegans*.

Treatments / Parameters		Flowering date (days)		No. of Flowers /plant		F.W. of Flowers /plant		D.W. of Flowers /plant	
		First Season	Second Season	First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		98.00	96.00	15.20	16.30	6.93	6.97	0.63	0.67
PP333	50 ppm	100.00	105.00	17.30	17.90	9.25	9.83	0.71	0.73
	100ppm	115.00	112.00	18.90	19.20	11.38	11.50	0.79	0.80
	200ppm	121.00	123.00	19.70	19.50	14.50	14.90	0.83	0.81
Cycocel	1000ppm	99.00	109.00	16.30	16.90	8.33	8.41	0.69	0.71
	2000ppm	114.00	116.00	17.80	18.10	8.95	9.01	0.73	0.79
	3000ppm	118.00	119.00	20.10	21.00	13.01	13.21	0.92	0.94
Uniconazole	50 ppm	98.00	97.00	15.90	16.80	7.13	7.89	0.63	0.69
	100ppm	101.00	107.00	17.10	17.50	8.82	8.75	0.72	0.73
	200ppm	109.00	111.00	19.20	19.70	9.01	9.20	0.79	0.80
L.S.D. at 0.05		4.52	6.29	1.09	1.18	1.01	1.22	0.11	0.12

Fig.(10): Effect of PP_{333}, cycocel and uniconazole on flowering date of *Cestrum elegans* during the first and second seasons.

Table(10): Effect of PP333 , Cycocel and Uniconazole on Number of roots, fresh and dry weights per plant of *Cestrum elegans* during the first and second seasons.

Parameters / Treatments		No. of roots /plant		F.W. of roots /plant		D.W. of roots /plant	
		First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		8.07	8.00	50.19	56.80	6.12	6.98
PP333	50 ppm	8.67	9.29	56.70	63.70	7.31	8.66
	100ppm	10.43	11.36	70.90	71.50	9.28	10.15
	200ppm	12.64	13.24	75.80	82.00	10.91	12.38
Cycocel	1000ppm	9.19	10.16	62.40	71.20	7.98	9.39
	2000ppm	10.26	9.87	65.60	67.10	8.72	9.32
	3000ppm	11.97	12.00	71.30	74.40	11.31	10.56
Uniconazol	50 ppm	9.00	9.67	62.10	66.70	7.94	9.06
	100ppm	11.87	10.13	65.80	65.80	8.68	9.34
	200ppm	10.93	11.00	67.70	67.10	9.81	10.41
L.S.D. at 0.05		1.32	1.47	8.32	7.21	1.24	1.26

Fig.(12): Effect of PP_{333}, cycocel and uniconazole on number of roots/plant of *Cestrum elegans* during the first and second seasons.

medium concentration of PP_{333} at (100ppm) gave the third result as 70.9 and 71.5 in two seasons, respectively. While, the control plants produced the minimum fresh weight of roots per plant in both growing seasons as 50.19 and 56.80, respectively. These results were significant in both seasons.

Concerning the dry weight of roots per plant(g) , data presented in Table (10) cleared that CCC at 3000 ppm (the high rate) succeeded to give the heaviest dry weight of roots per plant as 11.31g in the first season. Also, PP_{333} at high rate (200ppm) gave the next value in this parameter as 10.91g in the first season. While in the second season , the high rate of PP_{333} (200ppm) produced the maximum dry weight of roots per plant as 12.38g. While PP_{333} at 100ppm, CCC at 3000ppm and uniconazol at 200ppm gave the next value in this concern as 10.15, 10.56 and 10.41g per plant . On the other side control plants in both growing seasons gave the minimum dry weight of roots per plant as 6.12 and 6.98g, respectively. All data were significantly in both seasons between control and all treatments. These result of fresh and dry weights of roots per plant are in harmony with those obtained by **Adham (2001)** *on Althaea rosa* and **Youssef (2004)**on *Steriltzia reginae* plants.

I.B.4. Chemical composition measurements:

I.B.4.1- Leaves nitrogen percentage:

Results presented in Table (11) indicated that nitrogen percentage in leaves of cestrum plants was affected by some concentrations of the three growth retardants as compared to control leaves in both seasons. Also, the differences between control and treatments were significant in both seasons . However using PP_{333} at 200ppm (high rate) gave the maximum nitrogen percentage in the first season. While CCC at 2000ppm (medium rate) produced the next value

in this concern as 1.46% in the first season. But in the second season , PP_{333} at 200ppm gave the highest N% as 1.53, while PP_{333} at 100ppm , CCC at 3000ppm and uniconazol at 200ppm gave the same pattern as 1.48 , 1.49 and 1.48%, respectively. On the other side, the control leaves gave the least N% in both seasons as 1.31 and 1.39 in both seasons, respectively.

2- Leaves phosphorus percentage:

Data tabulated in Table(11) pointed out phosphorus percentage in leaves was great affected by using different concentrations of PP_{333} , CCC and uniconazol in both seasons. However, PP_{333} at the hight rate (200ppm) gave the highest P% in both seasons as 0.15%. While CCC at 3000ppm and uniconazol at 200ppm gave the same result as 0.14% of phosphorus in the second season. The control leaves in both seasons produced the least phosphorus percentage as 0.12 and 0.13%, respectively. The differences between control and applications were significant in both seasons.

3- Leaves potassium percentage:

The data obtained on potassium percentage in leaves as affected by different treatments of three growth retardants are presented in Table(11).Data showed that the PP_{333} at200ppm gave the maximum potassium percentage in both seasons as 3.11 ,3.26%, respectively. Also spraying CCC at 2000ppm and uniconazol at 200ppm gave the same result as 2.97% in the first season only. While in the second season, CCC at 3000 gave the next value as 3.18% in this concern followed by CCC at 2000ppm which produced 3.12 of K% in the leaves of cestrum. On the other side, leaves of control gave the minimum potassium percentage in both seasons as 2.63 and 2.82, respectively.

leaf disks and intact plant *i.e.,* cytokinins retard chlorophylls degradation, preserve it and increase its synthesis (**Devlin and Witham ,1983**), Besides, cytokinins active a number of enzymes participating in a wide range of metabolic reactions in the leaves. These reactions included the maturation of proplastid into chloroplasts. These enzymes could be divided into groups according to their response to cytokinins. The first group of enzymes could be said to relate to chloroplast differentiation, while the second group could be related to cytokinin stimulated group (**Kulaeva, 1979**). Also, the increase in chlorophyll content due to growth retardants treatments might be attributed to the character of some growth retardant on depressing leaf area which lead to intensification of pigments in leaf. These results go on line with that obtained by **Selim** (1985) on *Bougainvillea Mrs Butte*, **Khalafalla(1995)** on *Benrgonia semperflorens,* (**Desouky (1994)** and **Youssef (2004)** on *S. reginae* reported that PP_{333} treatments increased leaf chlorophylls (a ,b) and carotenoids .

6- Total indoles content in leaves (mg/100g fresh weight of leaves):

The average data of the total indoles content of cestrum plants as affected by different concentrations of three growth retardants of this study are shown in Table (12).

Results in this Table revealed that, all the concentrations of three growth retardants significant decreased leaves total indoles content of cestrum in both seasons . The leaves of control gave the maximum total indoles content in both seasons as 283 and 273 (mg/100g fresh leaves), respectively

On the other side, PP_{333} at 200ppm gave the least total indoles in both seasons as 269 and 259 mg/100g fresh weight of leaves, respectively.

7- Total phenoles content in leaves (mg/100g fresh weight) :

The data obtained of total phenols content in the leaves of cestrum plants as affected by spraying different rates of CCC , PP_{333} and uniconazol were presented in Table (12).

In both seasons, the greatest total phenoles content was obtained by spraying PP_{333} at 200ppm (high rate) produced the 191 and 194 mg/g fresh weight , respectively. Uniconazol at 100ppm gave the next value as 190 mg/100gm in two growing seasons. While the control plants produced the minimum total phenoles in two seasons as 169 and 163mg/100gm fresh weight, respectively. These results coincides with that obtained by **Adham (2001)** on *Althaea rosea* plants

Table(12): Effect of PP333 , Cycocel and Uniconazole on total chlorophylls, total indols, total phenols of *Tecoma stans.* during the first and second seasons

Parameters / Treatments		Total chlorophylls		Total indols		Total phenols	
		First Season	Second Season	First Season	Second Season	First Season	Second Season
Control		239	231	283	273	169	163
PP333	50 ppm	243	237	277	268	183	171
	100ppm	249	242	272	263	187	177
	200ppm	252	247	269	259	190	194
Cycocel	1000ppm	240	233	270	268	184	189
	2000ppm	249	238	275	263	186	178
	3000ppm	247	242	277	265	183	174
Uniconazol	50 ppm	241	235	278	268	182	185
	100ppm	245	242	270	265	190	190
	200ppm	250	238	271	261	187	183
L.S.D. at 0.05		7.32	9.24	8.19	9.23	5.72	6.34