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EFFECT OF SOME SUPPLEMENTS TO GROWTH MEDIA FOR SOME TRANSPLANTS OF SOME VEGETABLE CROPS AND ITS EFFECT ON QUALITY

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ABSTRACT

Germination and seedling characters are affected with some factors such as kind, temperature, natural materials, growth regulators, etc. Four plants (Tomato, Eggplant, Cucumber and Cantaloupe) were used in an experiment which was carried out at a greenhouse in Talkha - Dakahlia Governorate during the period from 2012-2013 to study the effect of four supplements Humic acid (HA), Indol-3-buttyric acid (IBA), *Lawsonia inerms* L. (Lw) and dry Yeast (Y) when each was added to the soil media at a concentrations of 1.0 g/L, 2.5 g/L and 5.0 g/L for HA, Lw and Y but 0.05 g/L, 0.1 g/L and 0.15 g/L for IBA.

The results showed that HA with 1.0 g/L leads to a significant increase in germination percent to tomato, eggplant and cantaloupe in comparison to control group. While addition of Lw with 1.0 g/L to the cucumber seeds gives a significant result compared with the control results. During the estimation of germination velocity, a significant reduction in germination days was obtained with (1.0 g/L HA to tomato, 5.0 g/L HA to cucumber, 0.15 g/L IBA to eggplant and 5.0 g/L Y to cantaloupe). Seedling height measurement shows slight significant results with 1.0 g/L Y to cucumber seeds, 2.5 g/L to tomato seeds and 5.0 g/L to eggplant and cantaloupe.

Seedling leaf area reveals that 1.0 g/L Y to cucumber seeds, 5.0 g/L Y to eggplant seeds, 1.0 g/L Lw to tomato and cantaloupe shows increased results. Results showed also slight significant values of seedling hypocotoyl length with 0.05 g/L IBA to cantaloupe, cucumber and eggplant but 1.0 g/L HA to tomato. Seedling stem neck diameter showed significant increase results with 1.0 g/L of Lw to eggplant, cantaloupe and 2.5 g/L Y to cucumber and 5.0 g/L Y to tomato. A significant values of root fresh weight was obtained by adding 2.5 g/L Y to cucumber, 5.0 g/L Y to (tomato and eggplant) and 0.05 g/L IBA to cantaloupe. Noticed significant results was obtained during measuring shoot fresh weight with 1.0 g/L Lw to tomato and cantaloupe, 5.0 g/L Y to eggplant and 2.5 g/L Y to cucumber. Chlorophyll a estimation showed a significant result with adding 5.0 g/L HA to tomato, 0.15 g/L IBA to eggplant, 1.0 g/L Lw to cucumber and 1.0 g/L Y to cantaloupe. Chlorophyll b refers to a significant increase with 0.15 g/L IBA to tomato and cucumber, 5.0 g/L HA to eggplant and cantaloupe. Total Chlorophyll a and b indicates significance with 5.0 g/L HA to tomato, eggplant and cantaloupe but 1.0 g/L Lw to cucumber.

Generally; it could be concluded that, the effect of some supplements to the growth media of some vegetable transplants crops can improves its quality and characters.

Keywords: Germination, seedling, natural materials, regulators, transplanting.

INTRODUCTION

Germination and seedling characters are affected with some factors such as kind, temperature, natural materials, growth regulators, etc. Four plants (Tomato, Eggplant, Cucumber and Cantaloupe) were used in an

experiment which was carried out at a greenhouse in Dakahlia Governorate during the period from 2012-2013.

Tomato plant is one of the world major fresh and processed vegetables. According to the FAO data 2012, Egypt was the 5th largest producer of tomato around the world with 8.625.219 tons, while eggplant occupied the 4th largest producer with 1.193.854 tons. Cucumber yield about 631.880 tons and cantaloupe with 1.007.845 tons. Some supplements play a great role in improving the germination rate and plant growth characters.

Humic acid contains humic substances which might shows antistress effects and soil aggregate formation, while henna contains carbohydrates, proteins, flavonoids, tannins and phenolic compounds, alkaloids, terpenoids, quinones, coumarines, xanthones and fatty acids which have had a potent antioxidant, antibacterial and antifungal effects.

Indol butyric acid (IBA) is one of the bioregulators which play a role in seedling emergences and influence plant physiological processes. It belongs to the auxine group. Yeast extract (Y) was capable of increasing the simulative growth compounds like gibberellins, auxines and cytokinins that act as improving plant cell division, growth and synthesis chlorophyll formation. Yeast contains protein, nucleic acids and essential oils which help in soil fertilization so, it considered as a biofertilizer.

Cacco and Dell' Agnolla (1984) and Türkmen *et al*. (2004) explained the mechanism of HA activity in promoting plant growth. They proposed the mechanism through increasing cell membrane permeability, oxygen uptake, respiration, photosynthesis, phosphate uptake and root cell elongation.

Stevenson F.J. (1994) reported that humic acid (HA) is a principle of (HA) which are the major organic constituents of soil (Humus). Janick J. (1997) and Mitchell *et al*. (2000). discussed that germination includes all the steps from the seed, reserve substances are enzymatically converted into materials used in synthesis or are oxidized through respiration to release energy. The seeds require water, oxygen and proper temperature range such that biochemical processes can operate. A seed is considered germinated when it has produced a plant that is potentially capable of continuous growth. Bioregulators, IAA, IBA and NAA play a role on seedling emergencies.

El-Ghamriny *et al*. (1999) showed that recently application of dry yeast extract was useful due to its hormones, sugars, amino and nucleic acids, vitamins and minerals. The dry yeast extract (saccharomycescervisiea) is a kind of the used biofertilizers improves plant growth and soil fertilization.

Surveswaran *et al*. (2007) showed that natural plant Henna (*Lawsonia inermis* L.) contains a higher amount of phenolic compounds, flavonoids and plant hormones in which participate as antioxidants

Determination of chlorophyll a and b with Mackinney G. (1941) studied the absorption of light by chlorophyll in each transplants of supplement treatment with the use of spectrophotometer.

This experiment aimed to study the effect of some supplements of some vegetable crops and noticed its effect on quality.

MATERIALS AND METHODS

This experiment was carried out in the period of 2012-2013. Seedling trays are used of 209 wells to the family: Solanaceae (Tomato and Eggplant) and of 84 wells to the family: Cucurbitaceae (Cucumber and Cantaloupe) as a planting media for seeds germination.

Calcium carbonate powder was used as a buffer agent adjusting the pH of the soil. Four nutrients media were tested and used in this experiment: commercial HA, Indol-3-butyric acid (IBA), Henna extract (Lw) and bread yeast extract (Y). These nutrient supplements were added during the cultivation of the above mentioned four crops to study its effect on growth. Each supplement from the three nutrient (HA, Lw and Y) were used with three concentrations (1.0 g/L, 2.5 g/L and 5.0 g/L). IBA was used with a concentration of (0.05 g/L, 0.1 g/L and 0.15 g/L) each concentration of these substances has three replicates in a completely randomized block within the green house. Recording of seeds germination allowed every day until constant number of germinated seeds was produced then take five plant samples from each replicate. A control group for each character was made.

Measurement of other seedling characters:-

1) Germination percent %
2) Germination velocity (days)
3) Seedling height (cm) (g)/plant
4) Seedling leaf area (cm^2)/plant.
5) Seedling hypocotoyl length(cm).
6) Seedling stem neck diameter.(mm)/plant
7) Root fresh weight (g)/plant.
8) Shoot fresh weight (g)/plant.
9) Total Root and Shoot Fresh Weight (g)/plant.
10) Root dry weight (g)/plant.
11) Shoot dry weight (g)/plant
12) Total root and shoot dry Weight (g)/plant.
13) Chlorophyll a (µg/ml)
14) Chlorophyll b (µg/ml)
15) Total chlorophyll a and b (µg/ml)

The data were calculated on the basis of the technique of analysis of variance (ANOVA) for the experiment as mentioned by Gomez and Gomez (1984). Treatment means were compared using Duncan's (1955) multiple range test at the 5 % level of probability.

RESULTS AND DISCUSSION

Effect of different concentrations of the supplemental nutrient on the plant characters of:

I- Tomato:

Table 1: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on Germination%, Velocity and some vegetative seedling characters per plant of tomato during the period from 2012-2013.

Treatments	Conc.	Germination %	Germination velocity (days)	Seedling height (cm)/Plant	Seedling leaf area (cm^2)/Plant	Seedling hypocotyls length (cm)
Control	0	**83.09**	**6.05**	8.96	33.49	**3.09**
Humic acid g/L	1	**98.09**	**3.54**	10.38	33.85	**3.85**
	2.5	96.94	4.21	10.11	31.41	3.82
	5	92.72	4.42	9.66	29.04	3.5
Indol-3-butyric acid g/L	0.05	96.03	3.73	9.68	29.44	3.52
	0.1	96.97	3.9	9.2	24.64	3.56
	0.15	97.29	4.17	**8.44**	**23.15**	3.39
Henna g/L	1	97.93	4.66	10.98	**34.28**	3.82
	2.5	96.97	4.98	10.86	36.77	3.66
	5	96.98	5.74	9.35	32.37	3.42
Bread Yeast extract g/L	1	89.31	5.53	11.6	33.73	3.52
	2.5	96.35	5.02	**12.18**	36.99	3.7
	5	96.65	5.06	11.93	35.77	3.52
LSD	0.05	7.767	1.923	1.794	10.810	0.398

Table 2: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on seedling stem neck diameter (mm), fresh root, the fresh and dry vegetative characters per plant of tomato during the period from 2012-2013.

Treatments	Conc.	Stem neck diameter (mm)/Plant	Root fresh weight (g)/Plant	Shoot fresh weight (g)/Plant	Total Root and Shoot Fresh Weight (g)/Plant	Root Dry Weight (g)/Plant	Shoot Dry Weight (g)/Plant	Total Root and Shoot Dry Weight (g)/Plant
Control	0	0.292	**0.128**	0.88	**1.01**	**0.017**	0.082	0.099
Humic acid g/L	1	0.321	0.194	1.323	1.51	0.021	0.1	0.121
	2.5	0.318	0.169	1.233	1.4	0.02	0.097	0.118
	5	0.304	0.16	**0.88**	1.04	0.02	0.088	0.109
Indol-3-butyric acid g/L	0.05	0.294	0.201	1.191	1.39	0.022	0.08	0.103
	0.1	0.286	0.18	0.98	1.16	0.022	0.067	0.089
	0.15	**0.285**	0.153	0.911	1.11	0.02	**0.061**	**0.082**
Henna g/L	1	0.316	0.25	**1.843**	**2.09**	**0.031**	**0.139**	**0.17**
	2.5	0.31	0.214	1.61	1.82	0.025	0.1	0.126
	5	0.304	0.195	1.323	1.51	0.018	0.086	0.104
Bread Yeast extract g/L	1	0.309	0.188	1.494	1.68	0.021	0.123	0.144
	2.5	0.326	0.236	1.754	1.99	0.022	0.136	0.158
	5	**0.335**	**0.366**	1.544	1.91	0.029	0.131	0.16
LSD	0.05	0.037	0.138	0.690	0.713	0.007	0.051	0.052

Table 3: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on Chlorophyll a, b and total a and b per plant of tomato during the period from 2012-2013.

Treatments	Conc.	Chlorophyll a (µg/ml)	Chlorophyll b (µg/ml)	Total Chlorophyll a and b (µg/ml)
Control	0	1.108	0.788	1.89
Humic acid g/L	1	0.991	0.746	**1.73**
	2.5	1.451	0.991	2.44
	5	**1.575**	1.05	**2.62**
Indol-3-butyric acid g/L	0.05	1.326	0.924	2.25
	0.1	1.241	0.835	2.07
	0.15	**0.935**	**1.075**	2.01
Henna g//L	1	1.283	0.927	2.21
	2.5	1.249	0.9	2.15
	5	1.254	0.849	2.103
Bread Yeast extract g/L	1	1.361	0.833	2.193
	2.5	1.157	0.838	1.99
	5	1.56	**0.719**	2.28
LSD	0.05	0.368	0.277	0.440

II- Eggplant:

Table 4: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on Germination%, Velocity and some vegetative seedling characters per plant of eggplant during the period from 2012-2013.

Treatments	Conc.	Germination %	Germination velocity (days)	Seedling height (cm) /Plant	Seedling leaf area (cm^2)/Plant	Seedling hypocotyls length (cm)
Control	0	89.95	11.01	**5.91**	**30.2**	1.57
Humic acid g/L	1	**95.37**	13.45	10.59	46.14	1.61
	2.5	93.14	14.75	10.24	42.72	1.57
	5	91.55	**19.25**	10.27	41.59	**1.39**
Indol-3-butyric acid g/L	0.05	94.74	18.37	15.14	37.88	**1.8**
	0.1	94.26	16.35	11.98	35.92	1.69
	0.15	92.19	**10.05**	10.28	33.62	1.56
Henna g/L	1	94.58	11.47	11.42	42.2	1.71
	2.5	93.3	12.28	9.15	35.61	1.54
	5	93.3	15.09	8.147	33.32	1.43
Bread Yeast extract g/L	1	**88.36**	18.35	11.96	34.65	1.4
	2.5	89.95	14.64	13.7	46.18	1.55
	5	94.17	13.69	**23.15**	**50.51**	1.71
LSD	0.05	4.935	3.988	6.768	8.083	0.151

Table 5: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on seedling stem neck diameter (mm), fresh root, the fresh and dry vegetative characters per plant of eggplant during the period from 2012-2013.

Treatments	Conc.	Stem neck diameter (mm)/Plant	Root fresh weight (g)/Plant	Shoot fresh weight (g)/Plant	Total Root and Shoot Fresh Weight (g)/Plant	Root Dry Weight (g)/Plant	Shoot Dry Weight (g)/Plant	Total Root and Shoot Dry Weight (g)/Plant
Control	0	**0.163**	**0.469**	**1.31**	1.776	0.044	**0.132**	**0.176**
Humic acid g/L	1	0.24	0.686	2.346	**1.533**	0.053	0.236	0.289
	2.5	0.243	0.586	2.193	2.78	0.052	0.224	0.276
	5	0.216	0.483	2.04	2.523	0.05	0.219	0.269
Indol-3-butyric acid g/L	0.05	0.257	0.767	2.826	3.594	0.054	0.282	0.337
	0.1	0.26	0.639	2.142	2.835	0.049	**0.889**	0.272
	0.15	0.25	0.619	2.001	2.62	0.047	0.202	0.249
Henna g/L	1	**0.276**	0.843	2.18	3.023	0.061	0.221	0.282
	2.5	0.256	0.791	1.92	2.711	0.054	0.205	0.259
	5	0.24	0.725	1.66	2.385	**0.043**	0.178	0.221
Bread Yeast extract g/L	1	0.248	0.494	2.934	3.428	**0.062**	0.288	0.35
	2.5	0.246	0.693	2.863	1.902	0.048	0.258	0.307
	5	0.244	**0.946**	**3.109**	**4.056**	0.049	0.31	**0.359**
LSD	0.05	0.030	0.246	0.604	1.014	0.011	0.544	0.065

Table 6: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on Chlorophyll a, b and total a and b per plant of eggplant during the period from 2012-2013.

Treatments	Conc.	Chlorophyll a (µg/ml)	Chlorophyll b (µg/ml)	Total Chlorophyll a and b (µg/ml)
Control	0	**1.065**	1.139	2.74
Humic acid g/L	1	1.542	1.121	2.666
	2.5	1.543	1.118	2.663
	5	1.639	**1.265**	**2.903**
Indol-3-butyric acid g/L	0.05	1.521	1.1	2.62
	0.1	1.547	1.125	2.67
	0.15	**1.642**	1.151	2.79
Henna g/L	1	1.555	1.119	2.67
	2.5	1.488	1.077	2.56
	5	1.46	1.067	2.52
Bread Yeast extract g/L	1	1.297	**0.709**	**2**
	2.5	1.331	0.767	2.1
	5	1.547	1.073	2.62
LSD	0.05	0.262	0.227	0.462

III- Cucumber:

Table 7: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on Germination%, Velocity and some vegetative seedling characters per plant of cucumber during the period from 2012-2013.

Treatments	Conc.	Germination %	Germination velocity (days)	Seedling height (cm) /Plant	Seedling leaf area (cm^2)/Plant	Seedling hypocotyls length (cm)
Control	0	95.16	**2.33**	6.38	46.49	**3.36**
Humic acid g/L	1	92.86	1.78	6.66	53.38	4.11
	2.5	88.95	1.74	6.18	41.63	3.87
	5	**70.63**	**1.66**	**5.51**	41.45	3.56
Indol-3-butyric acid g/L	0.05	95.24	2.27	7.23	72.67	**4.14**
	0.1	94.45	2.11	6.22	67.56	3.95
	0.15	94.05	1.89	6.11	58.5	3.84
Henna g/L	1	**96.03**	1.82	6.72	63.29	4.01
	2.5	95.16	1.98	6.42	61.8	3.89
	5	88.33	1.95	6.06	**29.26**	3.76
Bread Yeast extract g/L	1	78.57	1.86	**7.43**	**86.72**	3.8
	2.5	86.11	1.68	6.98	86.54	3.76
	5	89.29	1.86	7.25	83.41	3.89
LSD	0.05	17.705	0.480	0.911	14.934	0.471

Table 8: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on seedling stem neck diameter (mm), fresh root, the fresh and dry vegetative characters per plant of cucumber during the period from 2012-2013.

Treatments	Conc.	Stem neck diameter (mm)/Plant	Root fresh weight (g)Plant	Shoot fresh weight (g)Plant	Total Root and Shoot Fresh Weight (g)/Plant	Root Dry Weight (g)/Plant	Shoot Dry Weight (g)/Plant	Total Root and Shoot Dry Weight (g)/Plant
Control	0	0.513	0.43	2.9	3.33	**0.033**	0.251	0.29
Humic acid g/L	1	0.526	0.62	3.23	3.85	0.04	0.231	0.271
	2.5	0.526	0.5	3.16	3.66	0.038	0.182	0.22
	5	**0.25**	0.65	3.15	3.79	0.034	0.211	0.245
Indol-3-butyric acid g/L	0.05	0.56	0.75	3.07	3.82	0.074	0.206	0.28
	0.1	0.52	0.58	3.29	3.45	0.058	0.174	0.232
	0.15	0.493	0.46	2.89	3.35	0.049	0.172	0.222
Henna g/L	1	0.54	0.45	2.79	3.23	0.082	0.247	0.33
	2.5	0.526	0.35	2.72	3.08	0.067	0.199	0.266
	5	0.493	**0.33**	**2.08**	**2.41**	0.042	**0.137**	**0.18**
Bread Yeast extract g/L	1	0.566	0.74	3.79	4.54	**0.088**	**0.256**	**0.339**
	2.5	**0.606**	**0.87**	**3.89**	**4.77**	0.078	0.228	0.306
	5	0.586	0.74	3.74	4.49	0.08	0.243	0.324
LSD	0.05	0.051	0.374	0.609	0.802	0.016	0.050	0.055

Table 9: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on Chlorophyll a, b and total a and b per plant of cucumber during the period from 2012-2013.

Treatments	Conc.	Chlorophyll a (µg/ml)	Chlorophyll b (µg/ml)	Total Chlorophyll a and b (µg/ml)
Control	0	**0.85**	**0.794**	**1.64**
Humic acid g/L	1	0.88	0.806	1.68
	2.5	0.89	0.842	1.74
	5	1.01	0.995	2.01
Indol-3-butyric acid g/L	0.05	1.11	0.951	2.06
	0.1	1.14	0.999	2.14
	0.15	1.29	**1.078**	2.37
Henna g/L	1	**1.32**	1.062	**2.38**
	2.5	1.2	1.009	2.3
	5	1.2	1.003	2.2
Bread Yeast extract g/L	1	0.98	0.858	1.84
	2.5	1.03	0.914	1.95
	5	1.12	0.999	2.12
LSD	0.05	0.152	0.112	0.253

IV- Cantaloupe:

Table 10: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on Germination%, Velocity and some vegetative seedling characters per plant of cantaloupe during the period from 2012-2013.

Treatments	Conc.	Germination %	Germination velocity (days)	Seedling height (cm) /Plant	Seedling leaf area (cm^2)/Plant	Seedling hypocotyls length (cm)
Control	0	96.03	2.41	**3.32**	**47.02**	1.89
Humic acid g/L	1	**88.41**	2.5	4.3	71.29	2.13
	2.5	97.39	2.56	4.02	67.55	2.03
	5	96.03	**2.99**	3.68	57.6	1.99
Indol-3-butyric acid g/L	0.05	93.65	1.8	4.32	67.72	**2.37**
	0.1	92.46	2.05	4.28	63.93	2.17
	0.15	92.06	2.26	4.18	61.16	2.14
Henna g/L	1	95.64	2.05	4.38	**77.34**	2.25
	2.5	94.44	2.2	4.37	72.54.	1.99
	5	**82.46**	2.22	4.07	64.34	**1.83**
Bread Yeast extract g/L	1	90.08	1.99	3.88	56.87	1.94
	2.5	94.05	1.68	4.18	62.5	2.25
	5	94.84	**1.57**	**4.82**	66.2	2.25
LSD	0.05	9.009	0.631	0.532	11.076	0.394

Table 11: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on seedling stem neck diameter (mm), fresh root, the fresh and dry vegetative characters per plant of cantaloupe during the period from 2012-2013.

Treatments	Conc.	Stem neck diameter (mm)/Plant	Root fresh weight (g)/Plant	Shoot fresh weight (g)/Plant	Total Root and Shoot Fresh Weight (g)/Plant	Root Dry Weight (g)/Plant	Shoot Dry Weight (g)/Plant	Total Root and Shoot Dry Weight (g)/Plant
Control	0	**0.243**	0.543	**1.96**	**2.5**	**0.03**	**0.143**	**0.173**
Humic acid g/L	1	0.376	0.59	2.93	3.52	**0.054**	0.242	**0.296**
	2.5	0.373	0.51	2.91	3.42	0.045	0.211	0.256
	5	0.353	**0.483**	2.57	3.06	0.036	0.187	0.223
Indol-3-butyric acid g/L	0.05	0.392	**0.831**	**3.36**	**4.19**	0.043	0.229	0.272
	0.1	0.378	0.685	3.2	3.88	0.041	**0.247**	0.287
	0.15	0.335	0.645	3.02	3.66	0.04	0.219	0.259
Henna g/L	1	**0.443**	0.78	**3.36**	3.81	0.038	0.217	0.255
	2.5	0.393	0.722	3.2	3.92	0.038	0.205	0.243
	5	0.344	0.579	3.56	3.64	0.034	0.192	0.227
Bread Yeast extract g/L	1	0.357	0.771	2.71	3.51	0.044	0.197	0.24
	2.5	0.371	0.734	2.87	3.6	0.048	0.22	0.266
	5	0.328	0.591	2.88	3.48	0.041	0.21	0.251
LSD	0.05	0.064	0.230	0.602	0.856	0.013	0.039	0.045

Table 12: The Effect of Different Concentrations of Humic Acid, Indol-3-Butyric Acid, Henna and Yeast Extract on Chlorophyll a, b and total a and b per plant of cantaloupe during the period from 2012-2013.

Treatments	Conc.	Chlorophyll a (µg/ml)	Chlorophyll b (µg/ml)	Total Chlorophyll a and b (µg/ml)
Control	0	1.685	1.269	2.957
Humic acid g/L	1	**1.568**	1.268	**2.837**
	2.5	1.726	1.348	3.073
	5	1.808	**1.452**	**3.26**
Indol-3-butyric acid g/L	0.05	1.624	**1.258**	2.883
	0.1	1.74	1.354	3.093
	0.15	1.802	1.432	3.237
Henna g/L	1	1.694	1.369	3.063
	2.5	1.746	1.302	3.047
	5	1.735	1.428	3.16
Bread Yeast extract g/L	1	**1.826**	1.377	3.203
	2.5	1.63	1.299	2.927
	5	1.784	1.337	3.12
LSD	0.05	0.143	0.153	0.268

The results showed that HA with 1.0 g/L leads to a significant increase in germination percent to tomato (98.09%), eggplant (95.37%) and

cantaloupe (98.41%) in comparison to control group (83.09%), (89.95%), (96,03%) respectively. While addition of Henna extract with 1.0g/L to the cucumber seeds gives a significant result (96.03%) compared with the control results (95.16%). During the estimation of germination velocity, a significant reduction in germination days was obtained with 1.0 g/L HA to tomato from 6.05 to 3.54 days, with 5.0 g/L HA to cucumber from 2.33 to 1.66 days. Addition of IBA with 0.15 mg/L also leads to reduction of germination days from 11.01 to 10.05 days to the eggplant. Yeast extract with 5.0 g/L to cantaloupe seeds leads to reduction of germination from 2.41 to 1.57 days.

Seedling height measurement shows slight significant results with yeast extract 1.0 g/L to cucumber seeds from 6.38 cm to 7.43 cm and with a rate of 2.5 g/L to tomato seeds from 8.96 cm to 12.18 cm but with a rate of 5.0 g/L to eggplant and cantaloupe from 5.91 cm, 3.32 cm to 23.15 cm and 4.82 cm respectively. Seedling leaf area reveals that yeast extract with 1.0 g/L to cucumber seeds changes leaf area from 46.49 cm2 to 88.72 cm2 and with a rate of 5.0 g/L to eggplant seeds from 30.20 cm2 to 50.01 cm2. While henna extract with a rate of 1.0 g/L leads to a significant increase in leaf area of tomato and cantaloupe from 33.49 cm2, 47.02cm2, to 43.28 cm2, 77.34 cm2 respectively. Results showed also slight significant values of seedling hypocotoyl length with IBA 0.05 g/L to cantaloupe (2.37 cm vs. (versus). 1.89 cm) to cucumber (4.14 cm vs. 3.36 cm) and to eggplant (1.57 cm vs. 1.80cm), while the hypocotoyl length of tomato increase from 3.09 cm to 3.85 cm with 1.0 g/L HA treatment.

Seedling stem neck diameter of eggplant and cantaloupe showed a significant increase with henna extract 1.0 g/L, 0.276 vs. 0.163 and 0.243 vs. 0.443 mm respectively. Yeast extract with 2.5 g/L leads to increase in stem neck diameter of cucumber from 0.513 mm to 0.606 mm. Also, yeast extract with 5.0 g/L to the soil media of tomato increase the diameter of stem neck from 0.292 mm to 0.335 mm. A significant values of root fresh weight in yeast 2.5 g/L adding to the cucumber and 5.0 g/L to the tomato and eggplant, 0.87g vs. 0.43 g to cucumber and 0.366 g vs.0.128g, 0.946g vs. 0.469 g for tomato and eggplant respectively. While the IBA in a rate of 0.05 g/L produce a significant value to cantaloupe 0.831 g vs. 0.543 g. Noticed significant results was obtained during measuring shoot fresh weight with 2.5 g/L yeast extract to cucumber (3.89 g vs. 2.90 g), with 5.0 g/L to eggplant (3.109 g vs. 1.31 g) and with henna extract with a rate of 1.0 g/L to tomato (1.843g vs. 0.88g) and to cantaloupe (3.36g vs. 1.96g). Chlorophyll, a,, estimation showed a significant result with adding 5.0 g/L HA to tomato (1.575 µg/mL vs. 1.108 µg/mL), with 0.15 g/L IBA to eggplant (1.642 µg/mL vs. 1.065 µg/mL for the control), with 1.0 g/L to the cucumber (1.32 µg/mL vs. 0.85 µg/mL) and with 1.0g/L to the cantaloupe (1.826 µg/mL vs. 1.685 µg/mL). While chlorophyll, b, refers to a significant increase with 0.15 g/L IBA to tomato, cucumber (1.075 µg/mL vs. 0.788 µg/mL), (1.078 µg/mL vs. 0.794 µg/mL) and with 5.0 g/L HA to eggplant, cantaloupe (1.265 µg/mL vs. 1.139 µg/mL) and (1.452 µg/mL vs. 1.269 µg/mL) respectively. Total chlorophyll a and b indicates significance with 5.0 g/L treatment to each of tomato, eggplant and cantaloupe (2.620 µg/mL vs. 1.890 µg/mL), (2.90 µg/mL vs. 2.74 µg/mL), (3.260 µg/mL vs.

2.957 µg/mL) and with 1.0 g/L henna extract to cucumber (2.38 µg/mL vs. 1.64 µg/mL).

Marked increase observed after adding HA with 1.0 g/L to seeds of tomato, eggplant and cantaloupe while a best result obtained to a cucumber seeds was by adding Lw in a rate of 1.0 g/L as shown in Table 1.

It may conclude that addition of HA in low concentrations during planting helps in seeds germination. These result might be attributed to the fact that the (HA) are recognized as a key component of soil fertility properties (Gulser F. *et al*. (2010), Rengrudkijph and partida G. J. (2003)). HA control chemical and biological of rhizosphere (Nardi *et al*. (2005) and Trevisan *et al*. (2009)) which increases the rate of absorption of ions on root surfaces and their penetration into the cells of the plant tissue. The mechanism of HA activity in promoting plant growth is not completely known, but several explanations have been proposed by some researches such as oxygen uptake, photosynthesis, increase cell membrane permeability, respiration, phosphate uptake and root cell elongation (Cacco and Dell' Agnolla (1984), Türkmen *et al.* (2004)) exceptionally, Picolo A. *et al.* (1993) observed that the HA extracted from an oxidation cool has no effect on germination percentage.

A reverse effect of delaying the germination velocity of eggplant seeds than the control which had been obtained with almost all concentration additives except with the recorded above mentioned concentration of IBA (0.15 g/L).

Moreover, all other studied characters were significantly improved by different concentration treatments whilst the higher doses of the treated substances from HA,IBA and Lw diminished approximately the majored characters and these findings are in harmony with those reported by Türkmen *et al*.(2004).

Exceptionally, yeast extract in slightly higher value giving a significant ratio in most of the majored characters.

Tables (8-9) where the dry weight of total cantaloupe seedlings and the dry weight per seedling showed significant difference than the control whether the seeds were treated with low concentration of HA (1.0 g/L), these finding agreed with the Atefe Ameri and Ali Tehranifar (2012), they concluded that using of HA is proposed as fertilizer of activator nutrition uptake of leaf and growth if was used in low concentration. Other findings of cantaloupe was obtained when the IBA used relatively with low concentration (0.05 g/L).

Table (11-12) in tomato showed a higher values of treatment with HA (5.0 g/L) gives an increased ratio for chlorophyll a. Conversely, the same higher value of HA results in a higher value of chlorophyll b in eggplant and cantaloupe.

Also, IBA in a higher concentration (0.15 g/L) achieved a relatively significant value for chlorophyll a in the eggplant, while the same concentration results in an increased value of chlorophyll b in tomato and cucumber. In contrast the above results of a higher concentration, the lower applications of Y (1.0 g/L) and Lw (1.0 g/L) had produced higher values of chlorophyll a for cantaloupe and cucumber respectively.

Finally, a first record considered to henna as a nutrient supplement to the soil media of seeds of vegetable crops in this experiment which made germination operate and continued the plant growth. Author might owe this to its contents of phenolic compounds, hormones and flavonoids. Analysis of henna powder in Agric. Res. Center, Food Tech. Res. Institute Cairo – Egypt.

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تأثير بعض الإضافات إلى بيئة نمو شتلات بعض محاصيل الخضر وأثر ذلك على جودتها

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أجريت التجربة الحقلية في صوبة في طلخا - محافظة الدقهلية - مصر. خلال موسم الزراعة عام ٢٠١٢-٢٠١٣ علي نوعين من العائلة الباذنجانية (الباذنجان والطماطم) ونوعين من العائلة القرعية (الخيار والكنتالوب)، وكان الهدف من الدراسة التعرف على تأثير بعض الإضافات (حمض الهيومك التجاري - حمض الإندول-٣-بيوتيرك التجاري - مسحوق الحناء - مسحوق خميرة الخبز الجافة) على بيئة نمو الشتلات للحصول على أفضل جودة لها.

نفذت التجارب بتصميم القطاعات العشوائية الكاملة بثلاث تركيزات من كل مادة (١جم/لتر، ٢.٥جم/لتر، ٥جم/لتر) من حمض الهيومك ، مسحوق الخميرة و مسحوق الحناء، بينما التركيزات (٠.٠٥جم/لتر، ٠.١٠جم/لتر، ٠.١٥جم/لتر) من حمض الإندول-٣-بيوتيرك. أيضاً تم عمل مجموعة (كنترول) ضابطة لكل تركيز من الإضافات.

ويمكن تلخيص النتائج التي تم الحصول عليها فيما يلي:

- أوضحت النتائج أنه بإضافة حمض الهيومك (١جم/لتر) أدى إلى زيادة معنوية في نسب الإنبات لكل من الطماطم والباذنجان والكنتالوب بينما أدى إضافة مسحوق الحناء (١جم/لتر) إلى زيادة معنوية للخيار.
- عند قياس سرعة الإنبات وجد أن هناك فروق معنوية حيث اختزلت عدد أيام الإنبات باضافة (حمض الهيومك (١جم/لتر) في الطماطم، و(٥جم/لتر) في الخيار. واضافة حمض الإندول-٣-بيوتيرك (٠.١٥ جم/لتر) في الباذنجان، ولكن إضافة مسحوق الخميرة (٥جم/لتر) في الكنتالوب. وجود فروق معنوية عند قياس ارتفاع الشتلات عند إضافة مسحوق الخميرة (١جم/لتر) للخيار و(٢.٥جم/لتر) للطماطم و(٥جم/لتر) للباذنجان والكنتالوب، وأيضاً عند قياس المساحة الورقية وجد أن مساحة الورقة تزيد معنوياً باضافة مسحوق الخميرة (١جم/لتر) للخيار و(٥جم/لتر) للباذنجان. أما مسحوق الحناء (١جم/لتر) فقد زاد معنوياً مساحة الورقة في الطماطم والكنتالوب. كما تشير النتائج بجدول قياس طول السويقة الجنينية السفلى إلى وجود فروق معنوية بسيطة عند إضافة حمض الإندول-٣-بيوتيرك إلى بيئة شتلات النمو إذ بلغ أعلى متوسط زيادة للكنتالوب والخيار والباذنجان باضافة (٠.٠٥ جم/لتر) لكل منهم ولكن (١جم/لتر) للطماطم.وجود فروق معنوية عند قياس قطر السويقة الجنينية السفلى عند إضافة مسحوق الحناء (١جم/لتر) لكل من (الباذنجان والكنتالوب) ولكن للخيار بتركيز (٢.٥جم/لتر) وللطماطم بتركيز(٥جم/لتر).
- أدى إضافة مسحوق الخميرة الجافة إلى تسجيل قيم عالية ذات فروق معنوية في الوزن الجذري الطازج بتركيزات ((٢.٥جم/لتر) للطماطم و(٥جم/لتر) للباذنجان والخيار). ولكن بإضافة حمض الإندول-٣-بيوتيرك بتركيز (٠.٠٥جم/لتر) للكنتالوب.أيضاً أدى إضافة مسحوق الخميرة الجافة إلى تسجيل قيم عالية ذات فروق معنوية ملحوظة في مقاييس الوزن الخضري الطازج بتركيز (٢.٥جم/لتر) للخيار و(٥جم/لتر) للباذنجان. وبإضافة مسحوق الحناء بتركيز (١جم/لتر) للطماطم والكنتالوب.أوضحت النتائج وجود فروق معنوية عند قياس محتوى الكلورفيل (أ) بإضافة حمض الهيومك بتركيز (٥جم/لتر) للطماطم وباضافة حمض الإندول-٣-بيوتيرك (٠.١٥ جم/لتر) للباذنجان ومسحوق الحناء (١جم/لتر) للخيار و مسحوق الخميرة الجافة (١جم/لتر) إلى الكنتالوب. وكانت النتائج عند قياس المحتوى الكلورفيللي (ب) تشير إلى زيادة معنوية بإضافة حمض الإندول-٣-بيوتيرك (٠.١٥ جم/لتر) للطماطم وللخيار وبإضافة حمض الهيومك (٥جم/لتر) للباذنجان وللكنتالوب. وكما تشير النتائج إلى أن مجموع المحتوى الكلورفيللي أ، ب يعطي زيادة معنوية بإضافة حمض الهيومك بتركيز (٥جم/لتر) في كل من الطماطم والباذنجان والكنتالوب ولكن مسحوق الحناء بتركيز (١جم/لتر) للخيار.

اجمالا يمكن تلخيص أن أثر اضافة بعض الاضافات الي بيئة نمو بعض شتلات الخضر من الممكن أن تحسن من جودتها وصفاتها.