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The effect of spraying with gasmonic growth regulator and chemical fertilizer on the anatomical characteristics of grapefruit seedlings

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Abstract---The experiment was carried out in the wooden canopy of the Faculty of Agriculture, Samarra University for the growth season 1/7 to 1/6/2022. The seedlings were brought from Salahuddin governorate in Balad district and 54 seedlings were selected from one and a half year old grapefruit seedlings, which are fed to the origin of the larg, to identify the effect of spraying with the Jasmonates (JA) and to add the endne nutrient solution to the anatomical characteristics of the grapefruit seedlings. Seedlings were sprayed with three concentrations of the Jasmonates Regulator (JA) (0, 5, and 10 mg.L-1) and the addition of three levels of high-nitrogen ENNNE nutrient solution (0, 2.5, 5 ml.L-1); The spraying operation took place on three dates, the first one, 1/7/2021 and the second one, 21 days after the first one, and so on for the third one. Carry out this study in accordance with the design of the Randomized complete Block Design (R.C.B .D) with the Jasmonettes (JA) and the ENNNE feeder solution and with three Sistle Replators per experimental unit. The results were analyzed using the variance analysis table and the factors and their overlaps were tested using the SAS ready statistical program and the lowest LSD mental difference was calculated at the probability level 0.05. The results of the study are summarized as follows:- The spraying with the Jasmonates (JA), especially the concentration G2 10 mg.L-1, led to an increase in the studied qualities of the growth frequency of the gluing, the rate of height and width of the gluing, the average length of the lower surface of the normal cells, and the average height of the upper surface of the normal cells, reaching 195.8 mm2, 31.33 micrms. 20.96 micrometer, 797.3 micrometer, 609.4

micrometer, The comparison transaction gave the lowest rate for the above-mentioned attributes. Spraying with the ENNNE nutrient solution, especially at 5 ml.L-1, has led to an increase in the morale of the hitching frequency, the length and width of the hitching of the normal cells and the height * width of the upper surface of the normal cells, reaching 191.3 mm, 35.67 m, 20.44 m, 820.9 m, 561.1 m, m, The comparison transaction gave the lowest rate for the above-mentioned attributes. The double overlap between the asmonic acid and the "ENNNE" nutrient showed significant differences in all the traits studied, as G2E2 exceeded the treatment and GOE0 gave the lowest rate for the above-mentioned traits.

Keywords---spraying, jasmonic acid, ENNNE nutrient solution, grapefruit seedlings.

Introduction

Citrus fruits are evergreen fruit trees belonging to the rutaceae family of Rutaceae, which has a number of species, the most important of which are CITRUS, PonCirus, and Fortunella. Citrus cultivation is common in sub-tropical (dry), sub-tropical and tropical areas between 40 north and 40 south latitudes, and the Citrus sex comprises four groups: The orange group, the most important of which are the oranges (Osbeck*), Sweet Orange Citrus Sinensis, Naring, the langki group, the lime group, the sour group, and the sour group. Each group includes a number of species that include many species and species (Aga and Daoud, 1991 and 2004, Zhang, Ismail).

The world's attention has been focused on the commercial use of plant growth organizations, including gasmonic, to improve the characteristics of green growth and chemical content, and to play an effective role in stimulating the phytosanitary processes necessary for plant growth and development. It is a stress hormone consisting of linolenic acids and plays a major role in stress resistance by activating the antioxidant systems responsible for resistance (Khafaji, 2014). It has been found that spraying jasmonic acid on leaves of different types of fruit trees has encouraged the formation of leaf shoots, the formation of flowers, the completion of vaccination and fertilization, as well as the resistance of trees to pathogenic and insect (Alhilal et al., 2008). A study of two citrus and Yusufi citrus varieties showed good biological activity for the Jasmonic in treated seedlings, where paper treatment led to an increase in the rate of growth and physiological prescriptions (elazab et al., 2020).

The use of fertilizers to spray on leaves and branches, especially fruit trees, has become a fertilization method suitable for most horseshoe crops, and is particularly efficient for moving elements such as nitrogen, potassium and sulfur that are transported through the cane tissue (Kannan, 1999). One of the most important benefits of paper fertilization is to increase nutrient absorption from soil, and this idea was built on the basis that paper fertilization improves the nutritional status of the plant, leading to the plant pumping sugar and many other useful secretions from roots to the area surrounding the roots. Studies have

shown that the effects of paper fertilization include increased incidence, disease and insect resistance, improved plant drought-resistant ability, and improved quality and quantity of fruits (Havlin et al., 2005). In addition to the fact that it is not possible to use the same type of material, it is not possible to use the same type of material, but to use the same type of material as the same type of material, and to use the same type of material. The paper area of the seedling and the contents of the leaves are chlorophyll, as compared with the comparison transaction. Between (Al Hamdani *et al.*, 2018) on the effect of spraying local orange seedlings with 4 mL Miller 1-the highest morale increase in the chlorophyll leaf content, as well as an increase in mineral elements and paper area, compared to the comparison transaction.

Objective of the study

To identify the effect of spraying with Jasmonates (JA) and the addition of the endotritic solution ENNNE in the anatomical characteristics of the grapefruit function, the role of the gasmonic growth regulator in heat resistance, as well as the lack of studies on this type in Iraq.

Materials and methods of work

The experiment was carried out in the wooden canopy of the Faculty of Agriculture/University of Samarra for the 2021-2022 growth season. The seedlings were brought from Salahuddin province in Balad district and 54 were selected from the approximately one and a half year old grapefruit seedlings, which were fed to the origin of the mareng. Planted inside 5 kg container capacity Plastic seedlings were selected as homogenous as possible, seedlings were transported into larger container capacity (10 kg) in mixed soil. Samples were taken from soil used for some chemical and physical analysis (Table 1).

Table 1
Some chemical and physical qualities of soil used in the study

Trait		Value	Unit
Chemical properties			
The degree of soil interaction pH		7.45	
EC electrical connection		1.6	Mellmuse.cm3
Organic matter O.M.		8.8	g.Kg ⁻¹
Ready-made items			
N nitrogen ready		17	mg.kg-1
P-ready phosphorus		10	mg.kg-1
Potassium Ready K		123	mg.kg ⁻¹
Positive ions			
CA ready calcium		2798	mg.kg-1
Na ⁺ ready sodium		419	mg.kg-1
Magnesium Ready mg		328	mg.kg-1
Physical properties			
Detached	Clay	122	g.Kg-1
	Siln	477	g.Kg-1

Soil	Sand	502	g.Kg-1
	Tissue		Loam

* Soil analysis was carried out in the laboratory of the Department of Soil Science and Water Resources of the University of Tikrit College of Agriculture.

The study included the following transactions

- First, the first factor: spraying with a gasmonic growth regulator and with three concentrations:
 - Spraying with water only (comparison transaction) and symbol G0.
 - Spray with gasmonic acid in a concentration of 4ml .L⁻¹. Code G1
 - Spray with gasmonic acid in 8 mL concentration. L⁻¹. Code G2
- Second: Second factor: spraying with nutritious solution and with three concentrations:
 - The comparison transaction, its symbol with the symbol and its symbol with the E0 symbol.
 - Spraying with Ennne fertilizer equivalent to 2.5 g. L⁻¹ and code E1
 - Spraying with Ennne compost equal to 5 g .L⁻¹. Code "E2"
 - The spraying process took place on three dates 1/7 and the second date 21 days after the first date and so for the third date

The design followed is the design of the full randomized sectors (RCBD as a two-factor experiment (Jasmonic Growth Regulator and three-focus feeding solution) and two seedlings for each experimental unit and three repeaters to make the total number of seedlings 54, (Mohammadi and Mohammadi, 2012) .

Considered qualities

Epidermis preparation

The skin came from soft samples, and it took part of the middle of the full-grown paper to reunite the middle race. It is also the first time that the two-minute tongs have been used to cover the two ends of the skin with a glass slide and a drop of clear glycerin, then covered with the cover of the plate, and then ready for examination and study. The models under the Olympus composite microscope were examined using the inserted eyepiece scale, (5-10) skin cells were measured, the dimensions of radial wall and transverse walls were studied, the shape of the normal skin cells, the study of the dimensions of the guard cells and the shape of the gluten knot (Appendix 1, 2), The following is the text of the text:

Stomach frequency = number of stomachs in 2 mm. According to(Stace, 1965)
The terminology in the
(Dilcher ,1974) .

2. Preparation of the skin using the paint preparation Epidermis by Polish
The method (JOne, 2016) was used to prepare skin and pores and the following steps:

- I take a mature plant paper and put a little transparent polish on it.
- leave for 2-3 minutes until it is close to drying up.

- also apply transparent adhesive tape covering the surface of the paint.
- This is the first time that you have been in the region.
- This is a very good place to be.
- the samples were taken using a modern Sony digital camera.

Results and Discussion

Stomach Frequency

The results of Figure 1 show that spraying with the gasmonic acid growth regulator has achieved a significant increase in the rate of higraine frequency, as G2 gave the highest rate of 195.8 mm², followed by a significant difference of G1 by a frequency of 179.8 mm². The comparison coefficient G0 gave the lowest rate of 172.8 mm². As for the effect of the "ENNNE" nutrient solution, we note from the results of the same figure that the E2 treatment achieved the highest rate of 191.3 mm², followed by E1 with a rate of 182.4 mm², while the E0 comparison gave the lowest rate of 174.6 mm². As for the double interference between the growth regulator Jasmonic acid and the ENNNE feeder solution, the results of Figure 1 showed the mental effect on the gap frequency, with the G2E2 transaction reaching the highest rate of 216.7 mm², while the G0E0 comparison giving the lowest frequency of 166 mm². The official news agency.

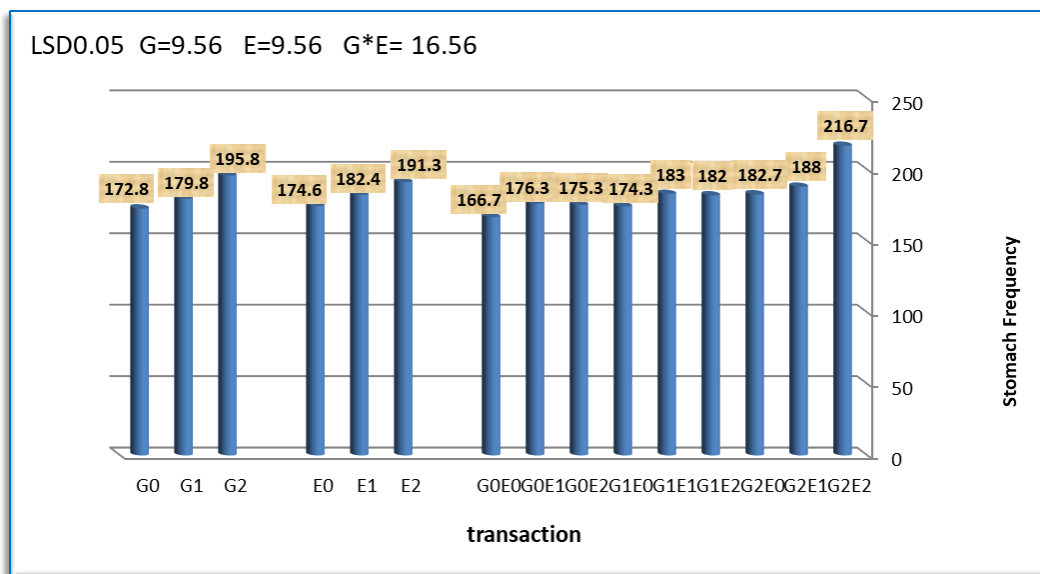


Figure 1. Spraying effect with gasmonic acid and Ennne nutrient solution in the stomach frequency of crepefruit seedling

Average length of the gaps

The results of Figure 2 show that spraying with the gasmonic acid growth regulator gave the demoanor in the gap length, as the G2 treatment gave the highest rate of 31.33 micrm, followed by the G1 treatment with a mental difference of 28.33 microns. The comparison coefficient G0 gave the lowest

amount of the gaps at 28.33 micron. As for the effect of the ENNNE nutrient solution, we note from the results of the same form that the E2 treatment achieved the highest rate of 31.22 micm, followed by the E1 transaction with a gap of 29.44 m, while the E0 comparison gave the lowest rate of 27.33 m. With regard to the interrelationship between the growth regulator of gasmonic acid and the feeder solution ENNNE, the results of figure (2) showed the mental effect on the gap length, as G2E2 achieved the highest rate of 35.67 microns. The G0E0 comparison treatment was given the lowest rate at 26.00 micron.

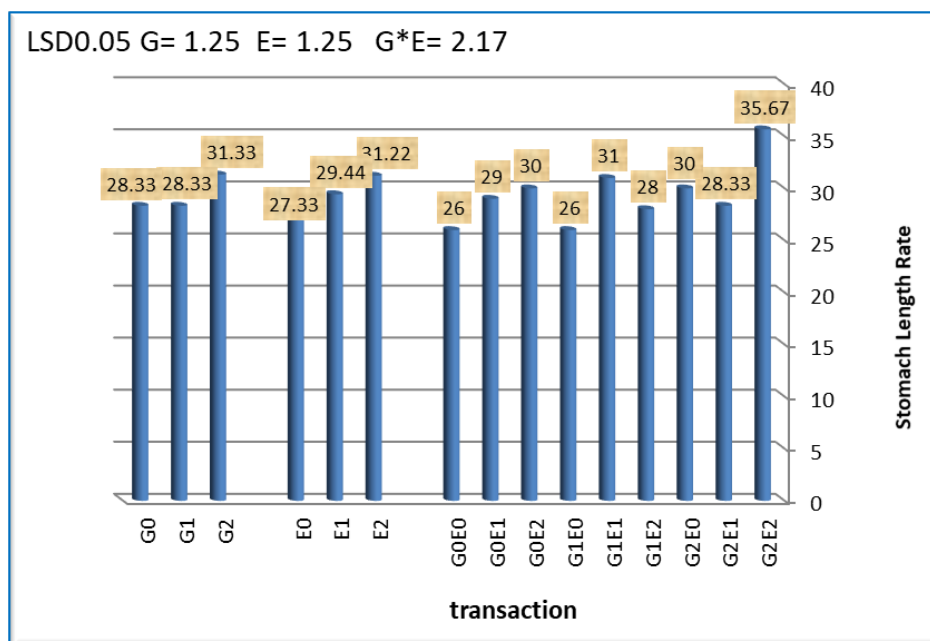


Figure 2. The effect of spraying with gasmonic acid and Ennne nutrient solution on the rate of length of stomachs for crepefruit seedlings

Rate of exposure of stomachs

The results of Figure (3) show that spraying with the gasmonic acid growth regulator has achieved a significant difference in the rate of gap width, as the G2 treatment gave the highest rate of 20.56 microns, followed by the G1 mental difference by a rate of 17.67 microns. The comparison coefficient G0 gave the lowest vacancy width rate of 17.33 micron. With regard to the effect of the "ENNNE" nutrient solution, we note from the results of the same figure that the "E2" treatment achieved the highest rate of 20.44 micron, followed by the "E1" treatment with a difference of 18.78 micm. The E0 comparison transaction gave the lowest rate in the amount of 16.33 micron width. As for the interplay between the growth regulator of the asmonic acid and the feeder solution ENNNE, the results of figure (3) showed the mental effect on the gap display rate, as G2E2 achieved the highest rate of 23.67 microns. The G0E0 comparison transaction gave the lowest rate of the hogany width, at 15.00 micron.

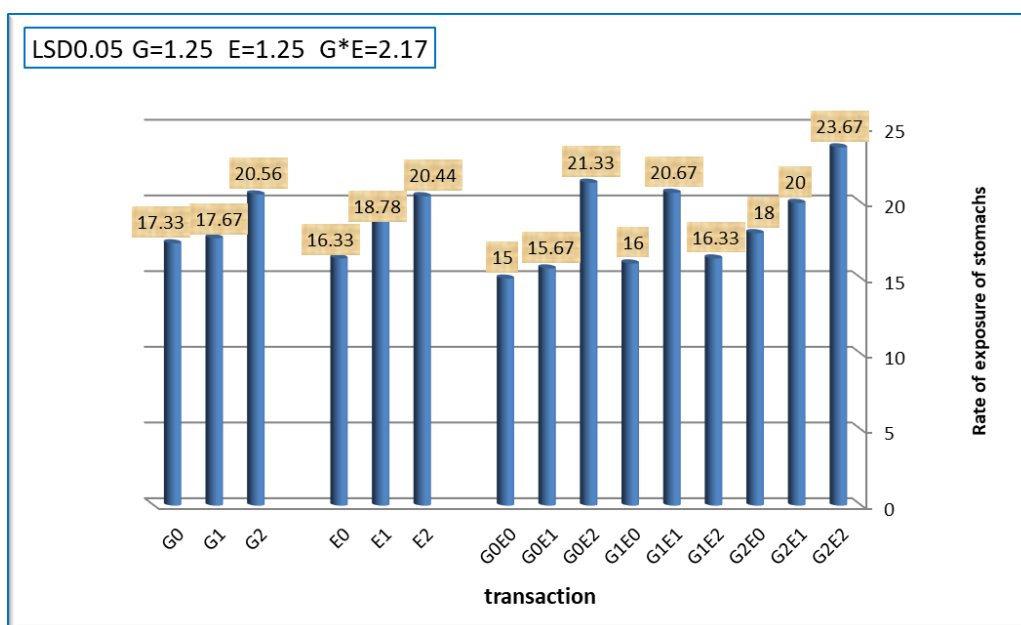


Figure 3. Spraying effect with gasmonic acid and Ennne nutrient solution in the rate of exposure of stomachs to crepefruit seedlings

Length rate * Width of the bottom surface of normal cells

The statistical analysis in Figure 4 shows that spraying with the gasmonic acid growth regulator has given the moral difference in the rate of increase of the length * width of the lower surface of the normal cells, as the G2 treatment has the highest rate of 797.3 microns. The G1 comparison factor was followed by a rate of 662.9 micrm, while G0 gave the lowest length * width of the lower surface of the normal cells to 568.4 micrm. As for the effect of the "ENNNE" nutrient solution, the results of the same form show that there are significant differences, as the treatment E2 was given the highest rate of 820.9 micron, followed by the treatment E1 with a mental difference of 614.8 micron. The E0 comparison transaction gave the lowest average length*width of the normal lower cell surface to 593.0 micron.

With regard to the double interference between the gasmonic growth regulator and the feeder solution ENNNE, the results of figure (4) showed the mental effect on the average length*width of the normal lower surface of the cells, with the G2E2 treatment reaching the highest rate of 1131.7 microns. The G0E0 transaction was given the lowest rate of 522.7 micron.

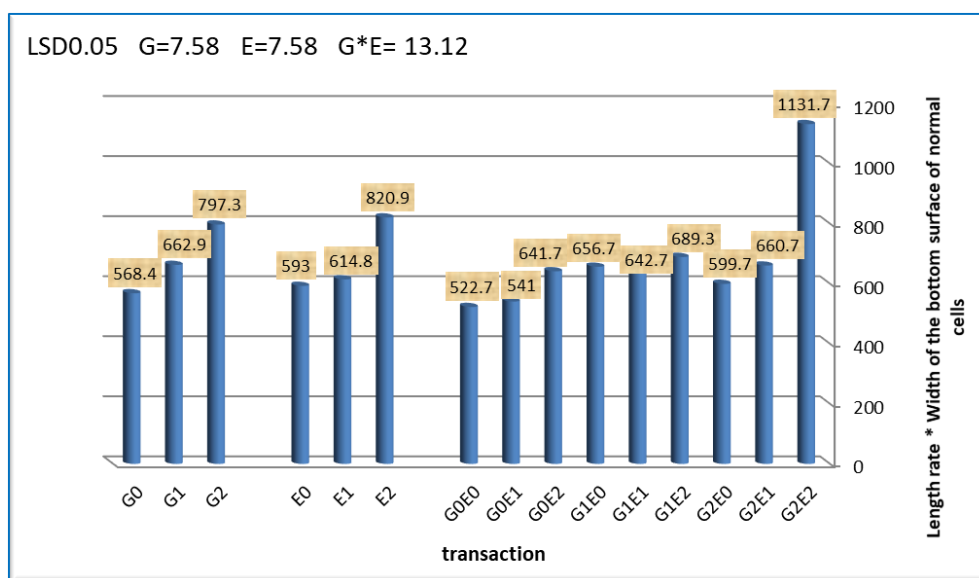


Figure 4. Spraying effect with gasmonic acid and nutrient solution Ennne length * width of the bottom surface of cells Customary for grapefruit seedlings

Length * Width for the upper surface of normal cells

The results, Figure (5), note that spraying with the gasmonic acid growth regulator has achieved significant differences in the length of the upper surface width of the usual cells, as the treatment G2 gave the highest rate of 609.4 microns, followed by a mental difference of G1 with a rate of 475.3 microns. The G0 comparison transaction gave the lowest height * width of the upper surface of the regular cells to 428.2 micrometer. As for the effect of the "ENNNE" nutrient solution, the results of the same form indicate significant differences as E2 achieved the highest rate of increase of 561.1 micrm, followed by the E1 transaction with an E1 moral difference of 484.7 m. The E0 comparison transaction gave the lowest average height * width of the upper surface of the usual cells, 467.2 micrometer. As for the interplay between the gasmonic growth regulator and the endometritic solution ENNNE, the results of figure 5 showed the mental effect on the average length*width of the upper surface of the normal cells, with the G2E2 treatment reaching the highest rate at 759.7 microns. The G0E0 transaction was given the lowest rate at 405.0 micron.

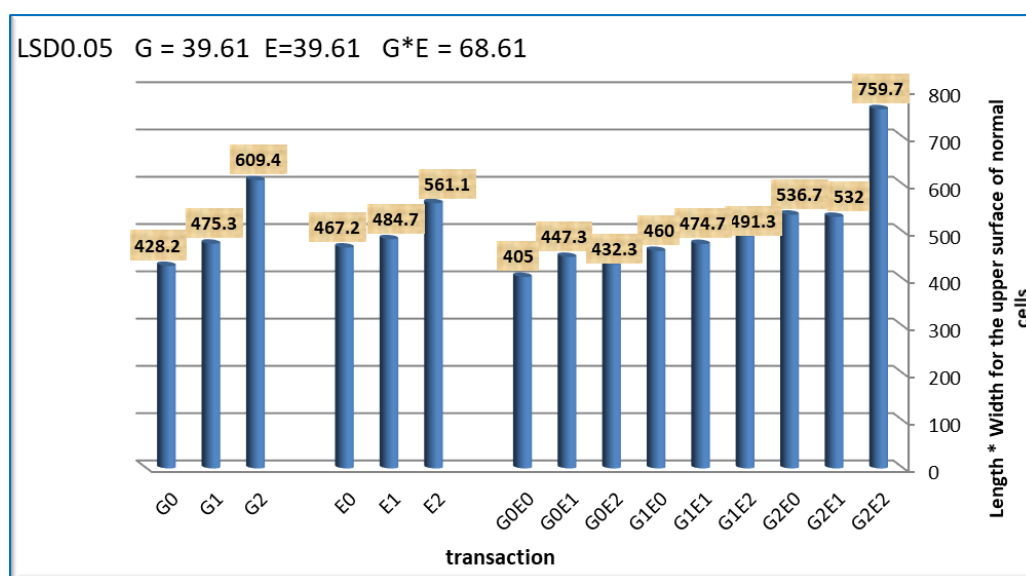


Figure 5. Effect of jasmonic acid spraying and ennne nutrient solution *width* for the upper surface of normal crepefruit cells

Discussion

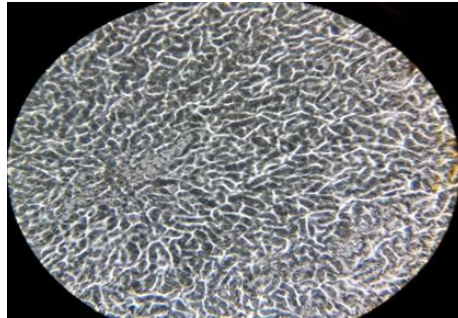
The improvement of commonly studied traits as a result of treatment with gasmonic acid may be due to the stimulation of processes responsible for cell division and elasticsation, and cell elasticsation is controlled by various processes such as changes in cell wall mechanical properties, biochemical processes, and genetic expression (Alkhafj, 2014) Increased growth may also be explained to the interference of gasmonic with other internal hormones, which include a solidarity response with oxins and a complementary effect by gobrillins (Mandava et al., 1981). The positive response shown in the traits of green growth in the above figures may be due to the role played by the eNNE nutrient solution, which contains major nutrients, particularly nitrogen, and the physiological role in the formation of amino acids, including triptophane, the starting compound, in the construction of oxins that have a role in promoting divisions Cellular and eldopsis (Taizo and Zeiger, 2010) as well as entering into the formation of enzyme-related facilities and aids such as NADP and NAD necessary for energy transmission and availability (Al-Sahaf, 1989).

Phosphorus has improved vegetable and therefore anatomical traits through its role in photosynthesis and its entry into energy-rich compounds, thereby increasing the production of intra-plant nutrients necessary for plant growth, is necessary for cell division, as well as for the structure of nocidents, energy-carrying compounds, and some enzymes. It is also due to the role of prosol in plant processing with the largest elements of NPK, which has increased vegetable growth through increasing the division and growth of the marastomatic cells, increasing the surface area of the leaves, and increasing the nutrients produced in leaves, such as carboheirers and proteins, needed for plant tissue construction, which have increased growth characteristics Al-Khadri (Gendiya, 2003) and these results are consistent with Al-Hamdani and others, (2018).

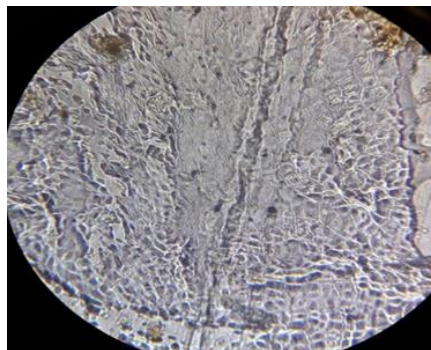
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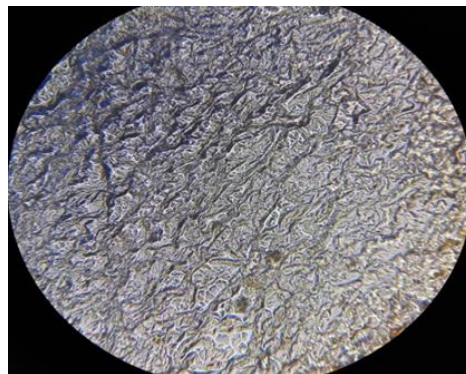
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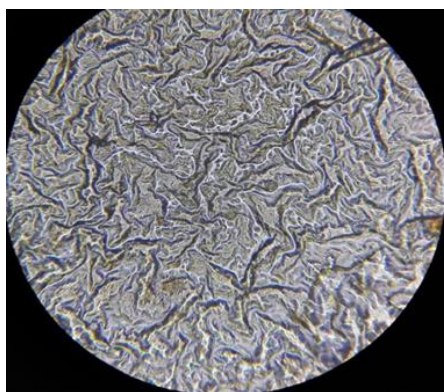
V(G0E 0 , G0E1)



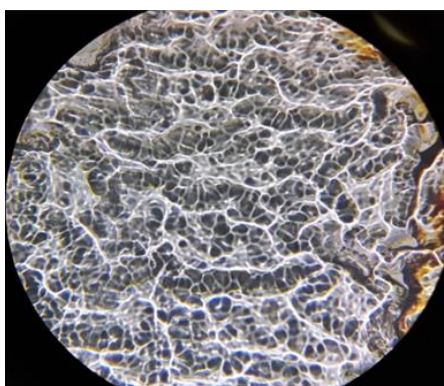
V(G0E2 , G1E0)



V(G1E 1 , G1E2)



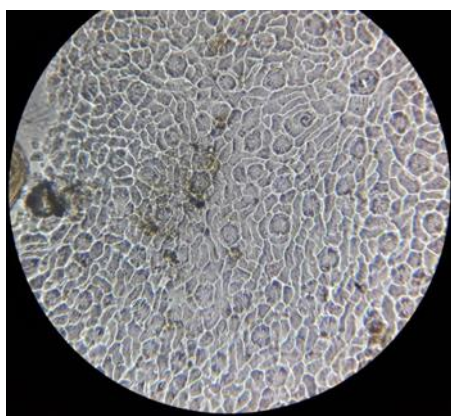
V(G₂E₀ , G₂E₁)



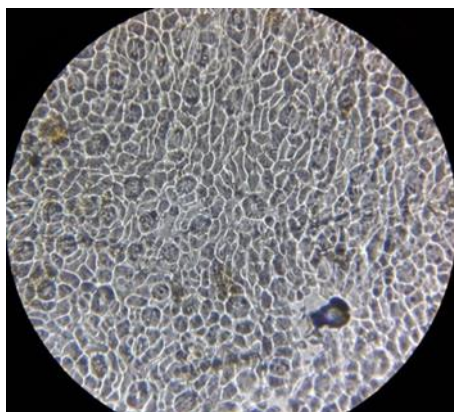
V(G₂ E₂)

Annex 1: Normal skin cells and no gaps in the upper skin of samples studied under 40x strength .

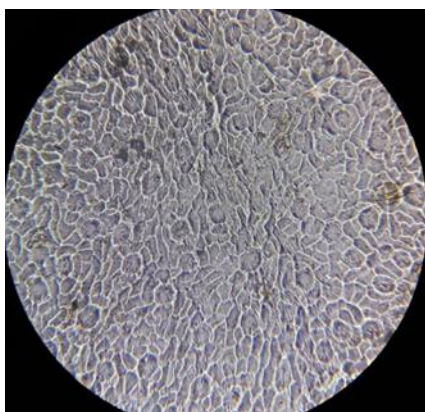
Note: - Do not contain gaps in the upper skin.



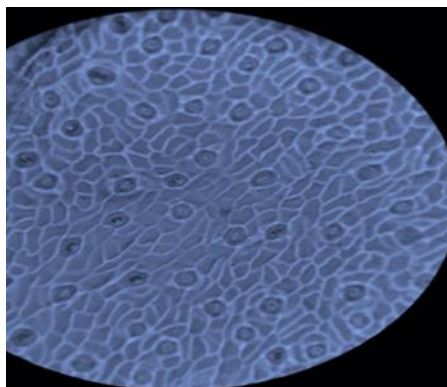
V (G₀E₀)



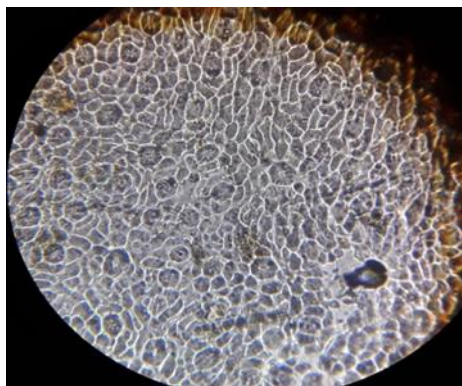
V (G0E1)



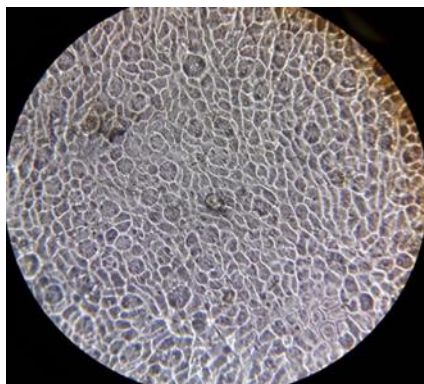
V (G0E2)



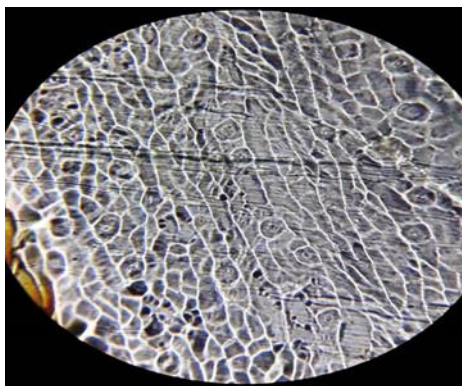
V (G1E1)



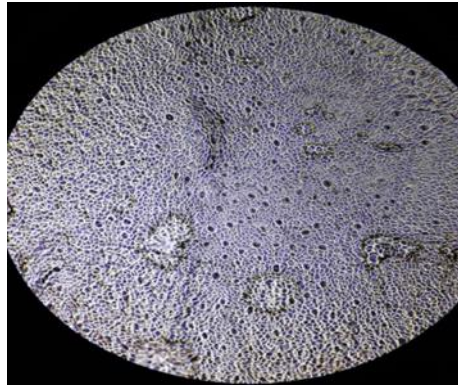
V (G1E2)



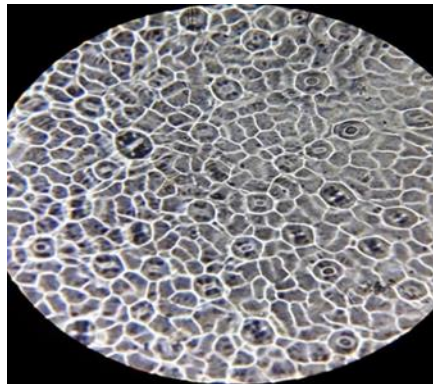
V (G1E0)



V (G2E0)



V (G2E1)



V (G2E2)

Annex 2: Normal skin cells and gaps in the lower skin of samples studied under 40x strength