

Vitis vinifera L.

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زيادة لتركيـز

/ 200 +0,025

(/ 25,75)

(/ 10)

(/ 3,08)

.%85

The Effect of Increasing Concentration of Copper and Myo-Inisitol in *In Vitro* Morphogenic Response of Grape (*Vitis vinifera* L.)

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ABSTRACT

It was found that the increased levels of copper and myo-inisitol in the culture medium was positively effective in increasing the morphogenic response of grape plants Kamali cultivar till the level of 0.025+ 200 mg/l from both compounds respectively. Since the use of this combined level caused to achieve the highest number of shoots (10 shoots/ explant) and leaves (25.75 leaves/ explant) at shoot multiplication stage as well as achieving the highest number of roots (3.08 roots/ explant) at root formation stage. The use of these levels of copper and myo-inisitol did not show any aberrant morphology appearance but the use of higher elevated levels till three times, gradually decreased the morphological response by giving lower values of the numbers of shoots, leaves and roots. At acclimatization stage, the produced plants were successfully transferred to the out-air conditions with a high survival rate reached to 85%.

Keywords: grape, copper, myo-inisitol, tissue cultures.

Vitaceae

(*Vitis vinifera* L.)

.(FAO , 2006)

.(Vignani *et al.*, 2001)

.(Jaksani *et al.*, 2008)

.(Gyulai and Purnhauser, 1993)

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(1972) Hildbrandt Schenck . / (1962) Skoog Murashige
 / 0,8 30 0,03

Yang *et al.*, 1999 Gyulai and Purnhauser, 1993 Garcia-Sogo, 1991)
 .(Sahrawat *et al.*, 1999

.(Farlex , 2010)

.(George *et al.*, 2008)

(Loewus , 1974)

(IAA)

.(Gur *et al.*,1988)

.(Dickinson and Loewus, 1980)

.(Letham , 1966)

20-15

.2010

2010

3 :1

(%5) NaOCl

15

Tween-20

.(Omer *et al.*, 2009)

(Skoog and Murashige, 1962) MS

. / 0,1
 . 8 16 1000 °2±25
 (/) +(/) CuSO₄·5H₂O
 .1600 +0,200 800 +0,100 400 +0,050 200 +0,025 100 +0,0025 :
 BA / 2
 .NaH₂PO₄·H₂O / 170
 .(Omer , 2009) / 30 HCl - / 0,4
 .(/ 7) 5,7 (pH)
 3 .() 20 ² / 1,05 °121

.(CRD)

.0,05

(%0,1)

0,5 :1 :1

MS

%70

(Dalal *et al.*, 1991)

40

.....

0,025 0,0025

(1)

/ 200 100 /

5,83

25,75 10

/ 100 +0,0025 13,00

3,50

(/ 1600 +0,200)

5,17

.(/ 100 +0,0025)

:1

2

MS

.BA /

/	()	/	+ (/)
13,00	3,50	5,83	100 +0,0025
25,75	4,04	10,00	200 +0,025
23,84	4,46	8,00	400 +0,050
20,84	4,42	8,25	800 +0,100
15,59	5,17	6,83	1600 +0,200

*

0,05

(2)

100

/ 0,025 0,0025

/ 200

3,08

/ 100 + 0,0025

(/ 5,0 0,1)

 $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

(1)

/ 0,025

.MS

/ 200



".(1988)

Cho, M.J.; Wen, J.; Lemaux, P. G. (1998). Transformation of recalcitrant barley cultivars through improvement of regenerative ability and decreased albinism. *Plant .Sci.* **138** (2), 229- 244.

Dalal, M. A.; Sharma, B.; Sharma, H. C. (1991). Effect of macro mineral salts modification in MS culture medium on oxidative browning *in vitro* culture of grape. *Indian J. Hort.*, 187-191.

- F.A.O. (2006). FAO Statistics Division. Food and Agriculture Organization of The United Nations. www.faostat.org
- Farlex, (2010). The Free Dictionary. Available online at: <http://www.thefreedictionary.com/inositol>
- Garcia-Sogo, B.; Roig, L. A. ; Moreno, V. (1991). Enhancement of morphogenic response in cotyledon-derived explants of *Cucumis melo* induced by copper ions. *Acta. Hortic.* **289**, 229-230.
- Eorge, E. F.; Michael, A. H.; Greek-Jan, D. K. (2008). "Plant Propagation by Tissue Culture". 3rd edn. Vol. 1. The Background. Springer.
- Gur, A.; Gad, A. E.; Haas, E. (1988). Rooting of apple rootstock clones as related to phenols and their oxidation. *Acta. Hort.* **227**, 160-166.
- Jaksani, M. H.; Abbas, H.; Sultana, R.; Khan, M. M.; Qasim, M.; Khan, I. A. (2008). Effect of growth hormones on micropropagation of *Vitis vinifera* L. cv. Perlette. *Pak. J. Bot.* **40**, 105-109.
- Letham, S. (1966). Regulation of cell division in plant tissues. II. A cytokinin in plant extracts: isolation and interaction with other growth regulators. *Phytochem.* **5**, 269-286.
- Loewus, F. A. (1974). The biochemistry of myo-inositol in plants. *Rec. Adv. Phytochem.* **8**, 179-207.
- Loewus, F. A.; Dickinson, W. (1980). Myo-inositol: Biosynthesis and metabolism. pp. 43-76 in Stumpf and Conn (eds.): *The Biochemistry of Plants* 3. Academic Press N. Y. 43-76.
- Lott, J. N. A.; Greenwood, J. S.; Batten, G. D. (1995). "Mechanisms and Regulation of Mineral Nutrient Storage During Seed Development". In: J. Kigel and G. Galili (Eds). Seed Development and Germination. Marcel Dekker Inc. New York. pp. 215- 235.
- Marschner, H. (Ed.). (1998). 'Mineral Nutrition of Higher Plants". 2nd edn. Academic Press, San Diego, CA, 889 p.
- Murashige, T.; Skoog, F. (1962). A revised medium for rapid growth and bioassays with tobacco tissue cultures. *Physiol. Plant.* , **15**, 473- 479.
- Omer, M. S.; Danial, G. H.; Sulayman, A. A. (2009). *In vitro* shoot tips culture of *Vitis vinifera* L. *J. Duhok. Univer.* **12**(2), 172-178.
- Purnhauser, L.; Gyulai, G. (1993). Effect of copper on shoot and root regeneration in wheat, triticale, rape and tobacco tissue cultures. *Plant Cell Tiss. Org. Cult.* **35**, 131- 139.
- Sahrawat, A. K.; Suresh, C.; Chand, S. (1999). Stimulatory effect of copper on plant regeneration in indica rice (*Oryza sativa* L.). *J. Plant. Physiol.*, **154** (4), 517- 522.
- Schenck, R. U.; Hildebrandt, A. C. (1972). Medium and techniques for induction and growth of monocotyledonous and dicotyledonous plant cell cultures. *Can. J. Bot.* **50**, 199- 204.
- Vignani, R.; Masi, E.; Crest, M. (2001). Genomic variability in *Vitis vinifera* L. "sangiovese" assessed by microsatellite and non radioactive AFLP test. ICABR.
- Yang, Y. S.; Jian, Y. Y.; Zheng, Y. D. (1999). Copper enhances plant regeneration in callus culture of rice. *Chinese J. Rice. Sci.* **13** (2), 95- 98.