



## The Effect of Four Levels of GA<sub>3</sub> and BA on The Quantitative and Qualitative Characteristics of *Zantedeschia aethiopica* cv. Childsiana Pot Plant

N. Majidian<sup>1\*</sup> - R. Naderi<sup>2</sup> - A. Khalighi<sup>3</sup> - M. Majidian<sup>4</sup>

Received:19-3-2010

Accepted:27-12-2011

### Abstract

In order to study the effects of two hormones (gibberellin and benzyl adenine) on *Zantedeschia aethiopica* cv. childsiana pot plant characteristics, non dormant rhizomes dipped preplanting in gibberellin solution with concentrations 0, 100, 200 and 500 ppm and sprayed in two weeks once to flowering time with benzyl adenine solutions including 0, 100, 200 and 500 ppm, an experiment was conducted based on randomized complete design with three replications. Interaction effect between these two factors was significant on days from planting to emerging. The maximum number of days from planting to emerging, occurred in control treatment during 24 days, and also the minimum days from planting to emerging was obtained by application of 500 ppm gibberellin solution and 100 ppm benzyl adenine solution. Interaction effect between two hormones on chlorophyll content was significant. The maximum chlorophyll content related to application of 500 ppm gibberellin and 500 ppm benzyl adenine and the minimum was seen in control treatment. Interaction effect between two used hormones was significant on plant leaf number. The maximum leaf number was produced in application of 0 ppm gibberellin and 500 ppm benzyl adenine, also minimum of leaf number was produced when 500 ppm gibberellin solution and 0 ppm benzyl adenine was used. The comparison of means of interaction effects between different hormone levels on increasing rhizome weight after flowering showed that application of these hormones resulted less increasing in rhizome weight. The results showed that by increasing of hormone concentrations rhizome weight decreased.

**Keywords:** Calla lily, Pot plant, Gibberellin, Benzyl adenine, Chlorophyll, Leaf number

---

1,2,3- Former MSc Student, Associate Professor and Professor, Department of Horticulture Science, Faculty of Agriculture, University of Tehran, Respectively

(\*-Corresponding Author Email: nasrin.majidian@yahoo.com)

4- Assistant Professor, Department of Agronomy and Plant Breeding, Faculty of Agriculture, University of Guilan



## Effect of Different Ratios of Coco peat and Vermi compost as a Cultural Media on Seed Emergence and some Qualitative and Quantitative Characteristics of Sweet pepper (*Capsicum annuum* L.) Transplants

S. Gholamnejad<sup>1\*</sup> - H. Arouiee<sup>2</sup> - S.H. Nemati<sup>2</sup>

Received:22-5-2010

Accepted:22-11-2011

### Abstract

In order to investigate the effect of different ratios of cocopeat and vermicompost as a cultural media on seed emergence and some qualitative and quantitative characteristics of sweet pepper transplant (cv. Colifornia wonder), an experiment was conducted based on randomized complete design with three replications at Research Greenhouse of Department of Horticulture, Ferdowsi University of Mashhad. The treatments included: vermicompost + cocopeat (3:1), vermicompost + cocopeat (1:3), vermicompost + cocopeat (1:1) (V/V) and normal soil of transplant. The result showed that the highest fresh and dry weight of root and shoot, stem diameter, internode number, leaf area and height of transplant were obtained in vermicompost + cocopeat (3:1).

**Keywords:** Emergence, Substrates, Sweet pepper, Transplant

---

1,2,3- MSc Student and Assistant Professors, Department of Horticulture Science, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively  
(\*-Corresponding Author Email: [somy\\_horticulture@yahoo.com](mailto:somy_horticulture@yahoo.com))



## Investigation Effects of Type and Concentration of Cytokinin on In Vitro Shoot Multiplication and Hyperhydricity of Carnation (*Dianthus caryophyllus* L.)

S.M. Kharrazi<sup>1\*</sup> - S.H. Nemati<sup>2</sup> - A. Tehranifar<sup>3</sup> - A. Sharifi<sup>4</sup> - A. Bagheri<sup>5</sup>

Received:3-8-2010

Accepted:22-2-2011

### Abstract

Carnation (*Dianthus caryophyllus* L.) is the third most important cut flowers in the world. Tissue culture techniques offer an efficient method for micropropagation of this ornamental plant. In present work effects of Kinetin (Kin) and Benzyl Adenine (BA), on shoot multiplication and hyperhydricity of four carnation cultivars (Prado Aquila Kgr, Skimo Mogr, Mondeo Kgr and Innove Orange Bogr) were studied. Explants from nodal segments were cultured on MS medium supplemented with different concentrations of BA (1, 2, 3 and 4 mg/l) and Kin (1, 2, 3 and 4 mg/l) in combination with 0.2 mg/l NAA, 30 g/l sucrose and 8 g/l agar. Rooting of regenerated shoots was done in the MS medium supplemented with 1 mg/l NAA. Results indicated that there were significant differences among cultivars shoot regeneration. Eskimo and Prado Aquila Kgr with 3.2 and 1.5 shoots had the highest and lowest regeneration rate, respectively. Increasing the concentration of cytokinin from 1 mg/l to 4 mg/l lead to increased regenerated shoot number from 1.7 to 2.4 shoots per explant and increased hyperhydricity from 12% to 54%. In addition height of regenerated shoots were decreased by high concentration of cytokinin, especially BA. Based on hyperhydricity percentage of regenerated shoots, there was a significant difference between cultivars and cytokinins. Mondeo Kgr and Prado Aquila Kgr showed the highest (44%) and the lowest (23%) hyperhydricity, respectively and explants cultured in medium supplemented with BA caused more (40%) hyperhydricity than Kin (26%). Results of present work showed that by increasing the concentration of cytokinin specially BA, multiplication will be increased but also it will increase the hyperhydricity of plantlets and consequently it will lead to death of them. By considering the amount of multiplication and frequency of hyperhydricity for obtaining the highest number of normal shoots, using of MS medium containing 1 mg/l BA in combination with 0.2 mg/l NAA is suggested.

**Keywords:** Carnation, Benzyl Adenine, Kinetin, Hyperhydricity, Shoot multiplication, Micropropagation

1,2,3- MSc Student, Assistant Professor and Associate Professor, Department of Horticulture Science, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively

(\*- Corresponding Author Email: ma\_kh230@yahoo.com)

4- Faculty Member of Iranian Academic Center for Education, Culture and Research, Branch of Mashhad

5- Professor, Department of Biotechnology and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad



## Effect of Ethanol and Essential Oils on Extending Vase Life of Carnation Cut Flower (*Dianthus caryophyllus* cv. Yellow Candy)

H. Bayat<sup>1\*</sup> - M. Azizi<sup>2</sup> - M. Shoor<sup>3</sup> - N. Vahdati<sup>4</sup>

Received: 9-8-2010

Accepted: 22-11-2011

### Abstract

The main goals of this study was to evaluate the effects of ethanol and essential oils of three medicinal plants namely *Thymus vulgaris*, *Satureja hortensis* and *Carum copticum* on extending *Dianthus caryophyllus* cut flower vase life. For this purpose three individual trials were conducted using a completely randomized design with three replications. In the first trial, effects of ethanol 4% (v/v) applied continuous and pulse was determined. The results showed that postharvest life and consumer acceptance of cut flowers were increased by both applying methods. In the second trial, effects of essential oils of *Thymus vulgaris*, *Satureja hortensis* and *Carum copticum* with concentrations of 50, 100 and 150 ppm were investigated. All essential oil treatments prolonged cut flowers vase life. The line graph illustrates the amount of vase life which is showing a dramatic increase by *S. hortensis* EO (100 ppm) over control. In third trial the interactions between ethanol and the essential oil treatments were studied. Results showed that there were no significant differences in vase life and consumer acceptance between essential oil treatments and co-treatment of essential oil with ethanol. The highest relative fresh weight in sixth days from the start of the experiment was observed in *Satureja hortensis* essential oils treatment with concentration of 100 ppm which was nearly two times more than control. According to our results it seems essential oils as natural, safe and biodegradable compounds can be suitable novel alternative methods for chemical treatment in order to prolong vase life of *Dianthus caryophyllus* cut flowers. Commercialization of these compounds for optimum formulations needs further experiments.

**Keywords:** Essential oils, Vascular blockage, Carnation cut flower, Vase life

---

1,2,3,4- PhD Student, Associate Professor, Assistant Professor and MSc Student, Department of Horticulture Science, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively  
(\* - Corresponding Author Email: hassanbayat55@gmail.com)



## Effect of Superabsorbent Polymer on Soil Volume Humidity and Turf Water Potential

H.R. Sarafrazi<sup>1\*</sup>-S.R. Mirhoseiny<sup>2</sup>- M. Babaie<sup>3</sup>

Received:25-8-2010

Accepted:22-11-2011

### Abstract

In order to analyze of soil volume humidity and water potential of turf using of different amounts of water absorbent polymer in sort of acryl amid potassium, an experiment was conducted in a randomized complete block design in four levels of polymers of 3, 6, 12 and 24 g/m<sup>2</sup> and 0 g/m<sup>2</sup> of polymers was consider as a control with three replications at research farm of Meybod Azad University in 2005. Holland variety of seed turf was use a planting, and the water consumption was monitor by counter everyday. During the experiment and in polymer treatments, based on soil humidity that measured by TDR and water of soil potentate rate of irrigating in each block using graph (P.F). During a course of 90 days sampling was done and water potential of turf was surveyed every 15 days. The result of the analysis indicated that no meaningful difference was found by reducing the water amount in treatments containing 6, 12 and 24 g/m<sup>2</sup> polymer compare with control treatment in all considered standards. Only the polymer of 3g/m<sup>2</sup> demonstrated has different efficiency of water consumption, because of the small amount of super absorbent polymers. Whereas the water consumption was saved by 75% in treatments containing polymer compare to the control.

**Keywords:** Turf (*Poa pratensis*), Super absorbent polymer, Soil volume humidity, Turf water potential

---

1,2- MSc Student and Assistant Professor, Department of Agronomy, Islamic Azad Mybood University  
(\*- Corresponding Author Email: hamid-sarafrazi@yahoo.com  
3- MSc, Department of Animal Science Research Institute



## The Effect of Cold Stratification and Acid gibberellic Pre-treatments on Seed Germination of *Angelica archangelica*, *Tanacetum cinerariaefolium* and *Chelidonium majus*

N. Hadi<sup>1\*</sup> - M.K. Souri<sup>2</sup> - R. Omidbeigi<sup>3</sup>

Received:8-9-2010

Accepted:22-11-2011

### Abstract

*Angelica archangelica*, *Tanacetum cinerariaefolium* and *Chelidonium majus* are valuable medicinal plants for which there is no comprehensive information about their seed germination in review of literatures. With regarding of the importance of simple propagation of medicinal plants and the role of seed in production of these plants, this study was set out in order to analyzing of the effects of cold stratification (control, 2, 3 and 4 weeks) and acid gibberellic (control, 100, 150, 250, 350, 450, 500 and 1000 ppm) treatments on seed germination of these species. Treatments were arranged separately in a Completely Randomized Design with 3 replicates. The results showed that the highest mean germination (percentage and rate) was observed in 3 and 4 weeks (40%) and 4 weeks (1.8 seeds per day) cold stratification for *Angelica archangelica* seeds, 3 weeks (42.67%) and 4 weeks (6.17 seeds per day) cold stratification for *Tanacetum cinerariaefolium* seeds, and 100 and 350 ppm (100%) and 500 ppm (5.22 seeds per day) GA<sub>3</sub> solutions for *Chelidonium majus* seeds.

**Keywords:** Germination, Cold stratification, Gibberellic acid, *Angelica archangelica*, *Tanacetum cinerariaefolium*, *Chelidonium majus*

---

1,2,3- MSc Student, Assistant Professor and Professor, Department of Horticultural Science, Faculty of Agriculture, Tarbiat Modares University, Tehran, Respectively  
(\* - Corresponding Author Email: n\_hadi1984@yahoo.com)



## Study of Quantitative and Qualitative Characteristics of Short Day Onion Cultivars in Isfahan

R. Aminpour<sup>1</sup>- M. Mobli<sup>2\*</sup>- A. Mortazav Bak<sup>3</sup>

Received: 15-9-2010

Accepted: 28-11-2011

### Abstract

In order to study the adaptability and bulb yield characteristics of 12 short day onion cultivars for sowing in autumn in Isfahan, an experiment was conducted at Kabootar Abad Research Station of Isfahan during two growing seasons (2007-2008 and 2008-2009). The experimental design was Randomized Complete Blocks with four replications. Cultivars included: 1- Pegasus, 2- Grano 6835(XP 0759 6835), 3- Hyb. Cirrus, 4- Texas Early White, 5- Hyb. Jaguar, 6- Century (EX 0759 2000), 7- Calera, 8- Hyb. Primavera, 9- Lahoya, 10- Texas Yellow Grano 502 (common cv. in region), 11- Contessa and 12- Hyb. Savannah Sweet. Seeds were sown in early October and common cultural practices were followed. Analysis of variances showed that the effect of year was not statistically significant. Results showed that Hyb. Cirrus produced significantly the highest total (109.39 t/ha) and marketable yield (94.47 t/ha) and Lahoya produced the lowest total (28.19 t/ha) and marketable yield (16.17 t/ha). Total and marketable yield in Texas Yellow Grano 502 were placed after cirrus. Bulb diameter and bulb height decreased as bulb yield decreased. Among cultivars, Hyb. Jaguar with 4.66 mm and Lahoya with 2.58 mm had the thickest and thinnest bulb neck, respectively. Hyb. Contessa produced the highest bulb dry matter (10.38%) and total soluble solids (10.70%). The lowest DM and TSS were belonged to Primavera and Savannah Sweet, respectively. There was a significant correlation between DM and TSS ( $r = +0.71$ ). In conclusion, Hyb. Cirrus showed good adaptability and performed better than the other cultivars in Isfahan area.

**Keywords:** Onion, Short day cultivars, Adaptability, Bulb yield, Dry matter, Total soluble solids

---

1,3- Assistant Professor and Research Instructor of Agricultural and Recourses Research Center of Isfahan  
2- Professor, Department of Horticulture Science, Collage of Agriculture, Isfahan University of Technology  
(\*- Corresponding Author Email: mobli@cc.iut.ac.ir)



## Study of Response of Melon Cultivars to In-Vitro Organogenesis

R. Moradmand<sup>1</sup> - A. Arzani<sup>2\*</sup> - Gh. Saeidi<sup>3</sup>

Received:7-12-2010

Accepted:27-12-2011

### Abstract

Due to heterozygosis nature of melon, its conventional breeding restricted and application of cell, tissue and molecular techniques have been perceived special attentions. This research aimed at finding desirable medium conditions for organogenesis using cotyledon, leaf and root explants in three genotypes of melon including Isfahan, Contaloup and Gargar. Explants cultured in Murashig and Skoog (MS) and their response for organogenesis were evaluated. Cotyledon explants indicated superior potential in MS supplemented with BA by producing high number of shoots and with  $1\text{mg L}^{-1}$  BA and  $0.5\text{ mg L}^{-1}$  NAA root induction were occurred. High shoot induction, 2.5 shoot in each explants, observed in MS medium supplemented with  $1\text{mg L}^{-1}$  BA in Isfahan melon cultivar. Isfahan melon cultivar indicated superior reaction to organogenesis. The greatest amount of shoots and leaves were produced by cotyledon explants. Regeneration of shoot from leaf explants was low. These explants like cotyledon produced the highest regeneration rate with MS medium containing  $1\text{mg L}^{-1}$  BA. In the present study, BA was an essential growth regulator for organogenesis and  $0.5$  and  $1\text{mg L}^{-1}$  BA to be efficient for shoot regeneration in melon. Moreover, higher level of this growth regulator ( $1.5\text{ mg L}^{-1}$ ) resulted in the inverse and significant effects on regeneration. It is concluded that, genotypes, explants and plant growth regulators were important factors in response to tissue culture in melon. Moreover, under an optimal growth regulation combination in the growth medium, only melon genotypes with a wider genetic distance could be discriminated for their organogenesis.

**Keywords:** Melon, Tissue culture, Organogenesis, Cotyledon, Growth regulators

---

1,2,3- Former MSc Student and Professors, Department of Agronomy and Plant Breeding, College of Agriculture, Isfahan University of Technology, Respectively  
a\_arzani@cc.iut.ac.ir(\*-Corresponding Author Email: )





## Grapevine (*Vitis vinifera* L.) Regeneration Via Somatic Embryogenesis from whole Flower Explant

A. Ebadi<sup>1\*</sup> - A. Jamal Mahmood<sup>2</sup> - M. Mirmasoomi<sup>3</sup> - M. Omid<sup>4</sup>

Received: 1-1-2011

Accepted: 27-9-2011

### Abstract

To produce embryogenic callus and somatic embryo, whole flower explants were collected at two sampling stages of I, III and MS medium supplemented with 5 and 10 $\mu$ m 2,4-D and 2 $\mu$ m BAP were used. For embryo differentiation, MS medium with 0.5mg/l IBA, MS medium without any plant growth regulators, MS medium with 2mg/l IBA and 0.2mg/l BAP, MS medium with 5 $\mu$ m 2,4-D and 1 $\mu$ m BAP and finally MS medium with 2mg/l BAP were used. At embryo germination stage, MS medium with 1mg/l BAP and NN medium and cold treatment for 2 weeks were used. Results showed that in all studied cultivar, collection of whole flower explants at first sampling time resulted in highest percent of embryogenic callus and somatic embryo production. Response of explants to media were affected by Genotype, as Yaghouti, Bidaneh Sefid and Flame Seedless in MS medium supplemented with 5 $\mu$ m 2,4-D and 1 $\mu$ m BAP produced highest percent of somatic embryogenic callus. However, Shahroodi did better in MS medium supplemented with 5 or 2 $\mu$ m BAP, and Askari respond well to MS medium supplemented with 10 $\mu$ m 2,4-D and 2 $\mu$ m BAP. Once again, at embryo differentiation stage, each cultivar produced the highest percent of somatic embryo in particular medium. For embryo germination and plantlets production, MS medium supplemented with 1 $\mu$ m BAP without chilling was best for Bidaneh Sefid, Yaghouti and Shahroodi, whereas Askari and Flame Seedless did best embryo germination and plantlet regeneration in MS medium supplemented with 1 $\mu$ m BAP accompanied by chilling treatment.

**Keywords:** Grapevine, Embryogenic callus, Somatic embryo, Plantlet

---

1,2- Associate Professor and MSc Student, Department of Horticulture Science, Agriculture and Natural Resources (Karaj), University of Tehran

(\* - Corresponding Author Email: aebadi@ut.ac.ir)

3- Instructor of Science Department, University of Tehran

4- Professor, Department of Agronomy and Plant Breeding, Agriculture and Natural Resources (Karaj), University of Tehran



## Study the Role of Some Macroelements on Corm Yield and Colchicine Content in *Colchicum kotschyi* Boiss. (Colchicaceae) under Soilless Culture Conditions

M. Alirezaie Noghondar<sup>1\*</sup>- H. Arouiee<sup>2</sup>- Sh. Rezazadeh<sup>3</sup>- M. Shoor<sup>4</sup>- H. Bayat<sup>5</sup>

Received:6-3-2011

Accepted:27-9-2011

### Abstract

*Colchicum kotschyi* Boiss (colchicaceae) is one of the sixteen Iranian native *colchicum* species, containing considerable amount of colchicine. To study the effect of different nutrient levels on corm yield and colchicine content of *Colchicum kotschyi* Boiss under open field soilless culture, an experiment was performed in a randomized complete design at the Horticultural Research Station of Ferdowsi University of Mashhad, during the 2008-2009. Treatments were three nutrient solutions (included; I: 100, 60, 150, 105, II: 150, 67, 200, 158 and III: 200, 75, 260, 250 ppm for N, P, K and Ca, respectively) with three replications (five samples per each replication). The uniform corms were collected from the wild environment in August and planted in the pots, containing 50% cocopit + 50% perlite, in open field in September and fed by different nutrient solutions. The highest and the lowest fresh and dry yield of corm observed in plants treated by nutrient solutions III and I, respectively. Maximum and minimum of corm dry matter percent ( 28.4 and 23%, respectively), maximum and minimum amount of colchicine per gram of dry matter (0.533 and 7.04 mg/g dry matter, respectively) and maximum and minimum of total colchicines yield (0.264 and 2.407 mg/g dry matter) were observed in II and I nutrient treatments, respectively. The results indicated that the best colchicine yield resulted from the solution of II including 150, 67, 200, 158 ppm for N, P, K and Ca, respectively compared to other treatments.

**Keywords:** Colchicine, *Colchicum kotschyi* Boiss, Corm yield, Nutrient solution, Soilless culture

---

1,2,4,5- PhD Student, Assistant Professors and PhD Student, Department of Horticultural Science, Faculty of Agriculture, Ferdowsi University of Mashhad, Respectively

(\*- Corresponding Author Email: [mortezaalirezaie@yahoo.com](mailto:mortezaalirezaie@yahoo.com))

3- Assistant Professor, Department of Pharmacognosy and Pharmaceutics, Institute of Medicinal Plants, ACECR, Karaj



## Investigation of the Effect of N Form in the Response of Snap Bean (*Phaseolus vulgaris* L. cv. Alpha) to NaHCO<sub>3</sub> in Hydroponic System

N. Rasooli<sup>1</sup>- H.R. Roosta<sup>2\*</sup>- M.H. Shamschiri<sup>3</sup>

Received:4-4-2011

Accepted:28-11-2011

### Abstract

Nitrogen is one of the main essential elements for plant that growth and efficiency of plant is related to it. In addition, most of the water and soil resources in Iran are calcareous. In order to evaluate the interactive effect of different concentrations of sodium bicarbonate and nitrogen form on snap bean in hydroponic system, this research was done in factorial design with two factors, sodium bicarbonate (0, 1, 5 and 15 mM) and nitrogen form (ammonium and nitrate). Results showed that vegetative growth was decreased by using ammonium compared to nitrate, and bicarbonate caused increase of the effect of ammonium toxicity and reduced the plant growth. Flower and pod production were increased by using ammonium compared to nitrate. In the presence of nitrate in nutrient solution, addition of bicarbonate caused reduction in reproductive growth of snap bean plants that can be due to the cumulative effect of bicarbonate and nitrate on the pH increase in nutrient solution.

**Keywords:** Alkalinity, Ammonium, Bicarbonate, Plant nutrition, Nitrate

---

1,2,3- MSc Student and Assistant Professors, Department of Horticulture Science, Faculty of Agriculture, Vali-e-Asr University of Rafsanjan, Respectively  
(\*-Corresponding Author Email: roosta\_h@yahoo.com)



## The Effect of UV-C Irradiation on the Quality and Shelf Life of Fresh Pistachio Nut Cultivars (Ohadi and Akbari)

H. Khatib<sup>1\*</sup> - S.H. Mirdehghan<sup>2</sup> - N. Doraki<sup>3</sup>

Received:30-5-2011

Accepted:22-11-2011

### Abstract

In this study, fresh pistachio of 'Ohadi' and 'Akbari' cultivars expose to the UV-C radiation with a wavelength of 0, 3, 6 and 12 kJ/m<sup>2</sup>, then located at temperature of 1 ± 3 degrees Celsius for 45 days. Properties or attributes, including weight loss, stiffness and sensory evaluation of fresh pistachio after 20 and 45 days storage were measured. Results showed that pistachio nut weight losses (28.77%) was less than the amount of weight loss of pistachio clusters (33.39%). UV-C 6 kJ/m<sup>2</sup> treatment showed the lowest weight loss than other treatments (p<0/01). During the storage, amount of weight loss was increased. Rate of browning of hull, shell and clusters of UV-C 6 kJ/m<sup>2</sup> treatment were less than other treatments and control samples. Rate of browning of hull, shell and clusters of UV-C 12 kJ/m<sup>2</sup> treatment were more than control samples time of storage (p<0/01). The strong flavor in fresh pistachio of 'Ohadi' cultivar was less than in 'Akbari' cultivars. Firmness in the fresh pistachio during the storage compared with began deduction experiment and at end experiment rose. UV-C treatments had the lowest microbial infection than control samples. Fresh pistachio clusters had more microbial infection compared to pistachio nuts.

**Keywords:** Weight loss, Surface pattern, Panel test, Firmness, Microbial activity

---

1,2- MSc Student and Assistant Professor, Department of Horticulture Science, Faculty of Agriculture, Vali-e-Asr University of Rafsanjan

(\*-Corresponding Author Email: h\_agri@yahoo.com)

3- Medical Science Group, Rafsanjan Nutrition Laboratory



## Study of Genetic Diversity in Iranian Pistachio Cultivars with Inter- microsatellite ISSR Markers

A. Taghizad<sup>1</sup>- J. Ahmadi<sup>2\*</sup>- R. Haddad<sup>3</sup>- M. Zarrabi<sup>4</sup>

Received:13-6-2011

Accepted:22-11-2011

### Abstract

Pistachio is one of the most important horticultural crops of Iran. The best way to have high yields is genetically pure and homogenous gardens. Thereby, study of genetic diversity makes this possible to have homogenous gardens with high performance genotypes. In the present study, the genetic diversity among nineteen cultivars was assessed using inter-simple sequence repeats (ISSR) primers. The survey was done by 20 ISSR primers, out of them 10 with polymorphic bands were selected for genotyping. With 10 ISSR primers, 114 DNA fragments (loci) were produced that 73 of them (64.03%) were polymorphic. The mean of polymorphism information content (PIC) for the primers was ranged from 85% to 91%. The genetic similarity matrix was constructed using Jaccard coefficient. The genetic distance was ranged from 0.53 (low similarity) between kale-ghochi, hosein-khani and ebrahim-abadi up to 0.83 (high similarity) between kale-ghochi and ahmad-aghai. Based on cophenetic correlation coefficients, the best Clustering dendrogram was constructed by unweighted pair group method using arithmetic average (UPGMA). Cluster analysis revealed three main groups with 2, 4 and 13 pistachio varieties in each group. The present study showed that the use of ISSR markers for investigation on genetic diversity and providing genetic identifications of different Iranian pistachio cultivars could be useful and informatics.

**Keywords:** ISSR, Genetic diversity, Marker, Pistachio

---

1,2,3,4- MSc Student, Associate Professor and Assistant Professors, Department of Agricultural Biotechnology, Imam Khomeini International University, Qazvin, Respectively  
(\* - Corresponding Author Email: njahmadi910@yahoo.com)



## The Study of Autotetraploidy Induction in Basil (*Ocimum basilicum*) by Colchicines Treatment

S. Malekzadeh Shafaroudi<sup>1\*</sup>- A. Ghani<sup>2</sup>- M. Habibi<sup>3</sup>- A. Amiri<sup>4</sup>

Received:26-8-2011

Accepted:27-12-2011

### Abstract

In order to induce autopolyploidy in basil (*Ocimum basilicum*) two separate experiments (seed treatment and cotton plug method on apical meristem) were conducted in a factorial experiment based on completely randomized design including colchicines concentrations (0, 0.05%, 0.1% and 0.2%) and the treatment time (6, 12 and 24 h) with four replications. On seed treatment all plants except control were perished. Morphological characteristics and flowcytometry data were used to detect and confirm polyploidization. The morphological and microscopic results showed that colchicines concentrations significantly affect autopolyploidy induction and the most cases (3.63%) observed on 0.05% concentration. Treatment time and interaction between concentration and time did not show a significant effect on this character. However the simple effects of concentration and treatment time were significantly different on survival percentage. Also concentration X time interaction showed a significant effect on this trait. Among the colchicines concentration levels, the second level (0.05%) showed the maximum survival percentage (47.7%) after the control. Higher concentrations caused more death in plants. Also the highest survival percentage (60.5%) appears in 12h duration of treatment. Generally, the best results to induce polyploidy obtained in 0.05% colchicines concentration for six hours when the treatment was treated using cotton plug.

**Keywords:** *Ocimum basilicum*, Ploidy level, Flowcytometry, Colchicines

---

1,3- Assistant Professor and PhD Student, Department of Biotechnology and Plant Breeding, Faculty of Agriculture, Ferdowsi University of Mashhad

(\*-Corresponding Author Email: malekzadeh-s@um.ac.ir)

2,4- PhD Student and MSc Student, Department of Horticulture Science, Faculty of Agriculture, Ferdowsi University of Mashhad



## Effect of Cr<sup>3+</sup> on Lipid Peroxidation and Antioxidative Enzymes (APOX, SOD, and PPOX) Activity in Sweet Basil (*Ocimum basilicum* L.)

R. Bishekolaei<sup>1\*</sup> - H. Fahimi<sup>2</sup> - S. Saadatmand<sup>3</sup> - T. Nejadsattari<sup>4</sup>

Received:12-9-2011

Accepted:13-2-2012

### Abstract

Effect of Cr<sup>3+</sup> concentrations (1, 2, 4, 6, and 8 mg L<sup>-1</sup>) on lipid peroxidation / MDA production and antioxidative enzyme activity (APOX, SOD, and PPOX) in root and leaf tissues of sweet basil seedlings (*Ocimum basilicum* L.) during 6week treatment in hydroponic culture was studied. Increasing Cr<sup>3+</sup> in the culture medium ( $\geq 4$  mg L<sup>-1</sup>) caused significant enhancement of APOX, SOD, and PPOX activity in root and leaf tissues of sweet basil seedlings, compared with the control ( $P \leq 0.01$ ). Introducing of  $\geq 4$  mg L<sup>-1</sup> Cr<sup>3+</sup> to the culture medium of sweet basil seedlings caused enhancement of MDA level in root and leaf tissues compared with the control ( $P \leq 0.01$ ) indicating Cr-induced oxidative stress and membrane lipid peroxidation in basil seedlings under treatment.

**Keywords:** *Ocimum basilicum* L., Cr<sup>3+</sup>, Antioxidative enzyme, Lipid peroxidation, Hydroponic culture

---

1-Assistant Professor, Department of Biology, Islamic Azad University, Qaemshahr Branch

(\*-Corresponding Author Email: rbishe@gmail.com)

2,3,4-Assistant Professors and Associate Professor, Department of Biology, Islamic Azad University, Science and Research Branch, Respectively