



## Optimizing the use of nitrogen fertilizer and irrigation water to improve the tea (*Camellia sinensis* (L.) O. Kuntze) yield and quality

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Received: 11/16/2015 ; Accepted: 06/25/2016

### Abstract

**Background and Objectives:** Harvested shoots of tea plant determine the quality of tea as a key factor and affect at least 70% of the quality of tea drink. Water and nitrogen fertilizer are the most important agricultural inputs in the production of tea leaves and shoots, which plays an important role in determining the quality and its marketability. Tea quality depends on nitrogen level, polyphenols and caffeine content of shoots. In this study for the first time in Feshalam tea research station in Guilan province, the effect of different levels of nitrogen fertilizer and irrigated water on yield and quality indicators of shoots were investigated.

**Materials and Methods:** In order to evaluate and optimize the use of nitrogen fertilizer and irrigated water on yield and some quality index of tea leaves, split block experiment on randomized complete blocks design (line-source irrigation technique) was conducted for 3 years (2008-2010) in Feshalam tea research station in Guilan province. Treatments consist of six levels of nitrogen zero, 100, 200, 300, 400 and 500 kg N ha<sup>-1</sup> and five levels of irrigation water. Irrigation schedule by monitoring moisture in root zone on basis of TDR and water balance equation was implemented twice weekly. In this experiment, weight of harvested green leaves in each plot was measured which 22.5% converted to processed tea. Factors affecting the quality of tea, such as the total amount of nitrogen in the third leaf of active shoots and some quality characteristics such as caffeine percentage, soluble solids in water (aqueous extract) and polyphenols percentage in harvested shoots in three flash (spring, summer and autumn) were also measured.

**Results:** The results showed that, increased use of nitrogen fertilizer in two splits (late May and mid-July) reduced the quality of tea and full irrigation during the dry months (July and August) increased the tea yield. Applying 300 to 350 kg N ha<sup>-1</sup> under full irrigation (3424 m<sup>3</sup> of irrigation water) leading to a doubling performance as compared to no-irrigation conditions. Instead, with increasing the amount of nitrogen fertilizer reduced the amount of polyphenols and soluble solids in water and increased the amount of caffeine and nitrogen in the tea shoots. The impact of irrigation on improving the quality of tea shoots were observed only in summer.

**Conclusion:** In order to maintain a balance between yield and quality of tea production as well as economic and environmental considerations, for full irrigation, use of 200 to 250 kg N ha<sup>-1</sup> and in rainfed forming condition, 100 to 200 kg N ha<sup>-1</sup> is recommended.

**Keywords:** Water stress, Nitrogen fertilizer, Tea quality, Tea yield

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## Effect of irrigation with the different ratios of drainage water with fresh water and foliar fertilizer application on yield and yield components of roselle (*Hibiscus sabdariffa* L.)

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Received: 11/05/2015; Accepted: 02/28/2016

### Abstract

**Background and Objectives:** Roselle belongs to the *malvaceae* family, is an annual or biennial plant cultivated for its stem, fiber, edible calyces, leaves and seeds. The crop is used in a variety of ways for home consumption, medicinal and industrial uses. As a traditional medicine, it is claimed to be effective against kidney stones and urinary bladder stones and is also used for its antibacterial, antifungal, hypocholesterolemic, antispasmodic and antihypertensive actions. Increasing demand for water resources, particularly in arid and semi-arid in the world, has led farmers use the poor quality water, such as drainage water and saline groundwater. The present investigation aims to study the in an appropriate manner, the use of saline drainage water and complete fertilizer to achieve the highest calyx yield.

**Materials and Methods:** This experiment was conducted to evaluate the yield and yield components of roselle in 2013 at the agricultural research institute of Zabol university in a complete randomized blocks in split-plot (R.C.B) design with three replications. Treatments included three levels of irrigation namely, irrigation with fresh water at all stages of grows (control), irrigation with drainage water and fresh water alternately, irrigation with drainage water for all growing stages, as main plot and spraying with three levels of complete fertilizer (NATBA-LIB): non-spraying (control), spraying with 600 g of complete fertilizer per hectare, spraying with 1200 gr of complete fertilizer per hectare, as subplots. Characteristics such as plant height, stem diameter, number of fruiting branches, thousand – seed weight, capsules weight, plant fresh and dry weight, number of fruit in plant, calyx yield and flower protein percentage were evaluated.

**Results:** The results showed that the effect of irrigation time was significant at 1% probability level in all variables except plant height, stem diameter, thousand – seed weight. Also the highest plant height, stem diameter, number of fruiting branches, thousand seed weight, capsules weight, plant fresh and dry weight, number of fruit in plant, calyx yield were obtained from 1200 g.ha<sup>-1</sup> of fertilizer spraying. There were significant affect by interaction irrigation and fertilizer in other variables except plant height, stem diameter and thousand seed weight. The highest (227.6 kg.ha<sup>-1</sup>) and the lowest (69 kg.ha<sup>-1</sup>) calyx yield was produced under the traits irrigation with fresh water at all stages of grows (control) and irrigation with drainage water for all growing stages, respectively. The highest of fruit number in plant (59) was obtained from 1200 g.ha<sup>-1</sup> of complete fertilizer application, although not significant differences between control and 600 g.ha<sup>-1</sup> treatments. In drainage and fresh water alternately treatment the weight of the capsule showed 20% increase compared with drainage water application. The highest flower protein percentage (22.5 %) was obtained from 600 g.ha<sup>-1</sup> of complete fertilizer and irrigation with drainage and fresh water alternately treatments.

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**Conclusion:** The results showed that the highest of calyx yield on this plant was related from irrigation with fresh water treatment. Therefore, in order to achieve the desired quantitative and qualitative characteristics of roselle, using the treated irrigation with fresh water at all stages of grows and complete fertilizer has recommended. The best method was used irrigation with drainage water and fresh water alternately method dual with complete fertilizers, if hadn't enough fresh water for all stage grows or may not be any more economically feasible and recommendable due to the increasing cost and limitation of renewable water resources.

**Keywords:** Complete fertilizer, Drainage water, Number of fruit, Roselle, Salinity



## The effect of naphthalene acetic acid on growth, yield and fruit quality of okra cv. Kano Dwarf

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Received: 12/27/2015; Accepted: 07/29/2016

### Abstract

**Background and Objectives:** Okra (*Abelmoschus esculentus* (L.) Moench) is an important economic crop that grows in tropical and subtropical regions of the world. Recently with the identification of okra properties, some studies to produce high-performance and high quality have been carried out. The use of plant regulators affects growth and qualitative characteristics of the plants. However, to determine the appropriate concentration for each plant, special investigation should be performed, because using inappropriate concentrations may have a negative impact on yield and quality of crops. Naphthalene acetic acid is one of the synthetic auxin compounds classified as a growth regulator and reproductive development. So, this study was conducted to evaluate the effect of naphthalene acetic acid and determine the appropriate concentration for growth, yield and quality improvement of okra.

**Materials and Methods:** This research was conducted in research farm of University of Zanjan. Experiment was set out in a randomized complete blocks design with three replications. Treatments include four levels of naphthalene acetic acid (0, 25, 50 and 100 mg.l<sup>-1</sup>) that were applied as foliar application. NAA concentrations used in NAA have been selected based on studies on Malvaceae family plants. Growth traits (plant height, number of branches, number of leaves, leaf area and etc.), quantitative traits (number of fruits, fruit fresh weight, total yield, number of seeds, weight of one thousand seeds and etc.) and fruit quality traits (vitamin C, total carbohydrates, mucilage percent and nitrogen, phosphorus and potassium contents of fruit) were studied.

**Results:** The results showed that naphthalene acetic acid had significant effect on growth, yield and fruit quality of okra. The highest plant height, leaf number, leaf area, number of fruits, yield, fruit dry matter, weight of one thousand seeds, total chlorophyll content and vitamin C were obtained with application of 25 mg.l<sup>-1</sup> and the lowest values of this traits was observed in 100 mg.l<sup>-1</sup> naphthalene acetic acid. The shortest time from flowering to harvest fruit observed in 25 mg.l<sup>-1</sup> naphthalene acetic acid. The highest value of total carbohydrates, mucilage percent and amount of phosphorus and potassium of fruit were obtained in 100 mg.l<sup>-1</sup> naphthalene acetic acid and the lowest values of this traits was observed in control plants.

**Conclusion:** On the basis of these results, application of naphthalene acetic acid affects growth, yield and fruit quality of okra. Growth and yield significantly decreased in response to increase in NAA concentrations. According to the results, 25 mg.l<sup>-1</sup> of naphthalene acetic acid is recommended to improve growth and fruit yield of okra.

**Keywords:** *Abelmoschus esculentus*, Mucilage, Total carbohydrate, Total chlorophyll content, Vitamin C

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## Study the effect of salicylic acid, harvest method and pollinator (bee) on seed yield of evening primrose (*Oenothera biennis* L.)

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Received: 01/16/2016; Accepted: 04/20/2016

### Abstract

**Backgrounds and Objectives:** In agriculture crop yield is the most important factor. Plants with indeterminate growth habit are problematic for on time harvesting and causes yield loss. Honey bee helps pollination of self and cross pollinator plants. On the other hand under stressed situation plant eager to complete sexual cycle of its life, so using stress inducing compounds to reduce vegetative growth of indeterminate plants might be beneficial.

**Materials and Methods:** Present research conducted in as factorial experiment based on completely randomized blocks design. Treatments of experiment included pollinator (cage with honeybee, cage without pollinator (isolated) and free pollinators, salicylic acid (0 and 200 ppm) and pre-harvest treatments (flame, without flame). In this study parameters such as plant height, number of flowers and capsule, capsule length, weight of seed contained capsule, number of seeds, side branch, TSW and seed yield investigated.

**Results:** Based on obtained results, honey bee factor affected significantly on capsule length, the weight of 1000 seeds (TSW), weight of seed contained capsules, seed yield of the plant, number of seeds in each capsule, the number of flowers per plant and number of capsules. Salicylic acid affected singly the number of branches. On the other hand, in plants treated by flame pre-harvest, the weight of seed contained capsule and number of branches affected significantly. The interaction effect of the honey bee and salicylic acid on measured parameters was not significant. In contrast to that, a significant effect of the interaction of honey bee and flame was observed on capsules. Also treating with both flame and salicylic acid affected plant height, the weight of seed contained capsule, the number of branches, the length of capsule and seed yield. Simultaneous use of pollinator, flame and salicylic acid significantly affected the weight of seed contained capsules, the length of capsules and seed yield.

**Conclusion:** Evening primrose is self-pollinator and even clystogam, nevertheless the result showed that pollinator plays an important role in increasing seed yield. Plant treating with flame one week before harvest as pre-harvest treatments seems to stimulate the filling of seed via increasing the speed of nutrient transport to seed and fastened seed maturation. By stopping the plant growth via burning the stem by flame vegetative growth stops and it stimulates the seed filling. As the highest quality of seed is expected at seed maturity, the high seed quality will be achievable by using mentioned treatments. It seems that, by using anyway to inducing tension during seed ripening of evening primrose, an indeterminate plant, accelerates seed formation and reduces seed maturity period which results in a higher seed quality and quantity.

**Keywords:** Flame, Honey bee, Evening primrose, Salicylic acid, yield

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## Determination the appropriate nutrient solutions for flowering of potted *Anthurium* (*Anthurium andreanum* cv. Lentini Red) in soilless culture

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Received: 03/12/2016; Accepted: 06/05/2016

### Abstract

**Background and Objectives:** *Anthurium* (*Anthurium andreanum*) is one of the most beautiful and expensive produced flowers in the world with high yield and quality for investment. Duration of vegetative and reproductive growth of *anthurium* is heavily influenced by nutrition, but few studies have been conducted to determine the exact ratios of elements for its nutrition. This study was carried out in order to compare the effects of different nutritional solutions on flowering of potted *anthurium* in soilless culture.

**Materials and Methods:** This experiment was carried out in a completely randomized design with 4 different nutrient solutions as treatments, with 4 replications (each replication consisted of 5 pots), in a research green house in University of Guilan from November '2014 to July '2015. The differences between nutritional solutions were the amount of used potassium nitrate and calcium and the existence and the lack of ammonium, the first nutritional solution (ammonium and less Ca) included nitrate: total nitrogen, 4: 4.5 and ammonium: total nitrogen, 0.5:4.5 with 2 meq Ca/L and 2.9 meq K/L nutrient solution. The second nutritional solution (nitrate, high K and Ca) included nitrate : total nitrogen, 7.2: 7.2 with 4 meq Ca/L and 4.6 meq K/L nutrient solution and the third nutritional solution (nitrate and high Ca) included nitrate: total nitrogen, 7.2: 7.2 with 4.6 meq Ca/L and 4 meq K/L nutrient solution. The fourth nutritional solution (ammonium and high Ca) included nitrate: total nitrogen, 7.2: 7.8 and ammonium: total nitrogen, 0.6: 7.8 with 4 meq Ca/L and 4 meq K/L nutrient solution. Nutrient solutions were used based on plant requirement.

**Results:** Results of analysis of variance showed significant differences among 4 different treatments regarding the height of plant, number of leaf and flower, peduncle length and diameter, spathe's length and width, fresh and dry weight of root, the concentrations of nitrogen, potassium, magnesium and calcium in leaf and the spathe's anthocyanins content. There was no significant difference regarding flower longevity, foliage's fresh and dry weight, leaf phosphorus and iron concentrations. The most number of leaves was related to the ammonium and less Ca nutrient solution and the most number of flowers was related to the ammonium and less Ca and ammonium and high Ca nutrient solutions. The height of plant, peduncle length and diameter, spathe's length and width, fresh and dry weight of root in plants fed by the nitrate and high Ca and ammonium and high Ca nutrient solutions were more than the others. The spathe's anthocyanins content and leaf's nitrogen concentration in plants fed by the nitrate, high K and Ca and ammonium and high Ca nutrient solutions were more than the others. The nitrate, high K and Ca and nitrate and high Ca nutrient solutions produced the most concentration of leaves potassium and magnesium. Calcium concentration in plants fed by the ammonium and less Ca nutrient solutions was less than the other plants.

**Conclusion:** Quantitative and qualitative characteristics of flower in pot *anthurium* plants, using the ammonium and high Ca nutrient solution in flowering stage, were better than the others.

**Keywords:** Spathe, *Anthurium*, Reproductive growth, Mineral elements, Flowering

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## **Effect of different forms of nitrogen, on pH value of culture medium during somatic embryogenesis of tomato (*Solanum lycopersicon* L.) plant**

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Received: 12/10/2015; Accepted: 04/10/2016

### **Abstract**

**Backgrounds and Objectives:** One of the most important factors that effect on formation and development of somatic embryogenesis is culture medium composition and the most important compound is nitrogen. Pervious researches evaluated effect of different forms of nitrogen on somatic embryogenesis and cell suspension culture, but they didn't evaluate the effect of each form separately or in combination with other forms. Therefore present study conducted to evaluate different forms of nitrogen, singly, in combination to other forms and in different ratios.

**Materials and Methods:** In order to evaluate the effect of different forms of nitrogen on somatic embryogenesis of tomato, an experiment conducted in a complete randomized design (CRD) with eight treatments and four replications in tissue culture laboratory of Agricultural Sciences and Natural Resources University of Gorgan. Applied treatments includes: B5 medium contained nitrate or ammonium or casein hydrolysate as sole nitrogen, B5 medium contained two forms of nitrogen together such as ammonium with nitrate, ammonium with casein hydrolysate or nitrate with casein hydrolysate and B5 medium with no nitrogen content. Complete B5 medium with all three nitrogen forms candidate as control. In this experiment hypocotyl segments of tomato seedlings cultured in modified B5 medium (based on treatments) that contained 2-4, D. after 25 days in order to embryo realization, explants transferred into modified B5 medium without 2-4, D. Thirty five days after realization phase characters such as number of somatic embryos, secondary pH value of culture medium at the end of both induction and realization phase and Chlorophyll content of plant materials were measured.

**Results:** Results showed that different forms and different portion of nitrogen had remained the different effects on somatic embryogenesis. The most reduction in pH value of medium occurred in medium contained ammonium as sole nitrogen source and the minimum reduction of pH happened in medium contained casein hydrolysate. Results showed that there were significant differences in number of embryo and development of them in a way that the maximum number of embryos formed in complete B5 medium and medium contained both nitrate and casein hydrolysate. Results also showed that different nitrogen treatments significantly affected chlorophyll content of plant materials presented in culture medium in a way that the maximum total chlorophyll, chlorophyll a and b obtained in medium contained nitrate and casein hydrolysate and complete B5 medium, respectively.

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**Conclusion:** Different forms of nitrogen in combination with other forms and in different relative portions had different effects on formation and development of somatic embryos that regenerated from hypocotyl segments of tomato. Due to results obtained in this study, it can be concluded that using proper form and portion of nitrogen could enhance embryogenesis frequency and somatic embryos development.

**Keywords:** Ammonium, Casein hydrolysate, Nitrate, pH, Somatic embryos





## Grouping of Hamedan garlic clones and determination of effective traits on *in vitro* bulblet production using multivariate statistical methods

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Received: 12/24/2015; Accepted: 07/25/2016

### Abstract

**Background and Objectives:** Garlic has the second rank in *Allium* species in the case of highly used plant species after onion with high nutritional and medicinal values. Meristem culture is an *in vitro* bulblet production method for removing the viral diseases. Multivariate statistical methods simultaneously evaluated several genotypes in terms of numerous characters and are widely used to assess the genetic diversity. The purposes of current study are use of multivariate methods to assess and initial classification of Hamedan garlic clones according to micropropagation and *in vitro* bulblet production traits derived from meristem culture and preliminary identification of most desirable traits on bulblet production.

**Materials and Methods:** Ten different garlic clones of Hamedan province were used in this experiment as plant materials. The garlic cortex were separated and washed by distilled water then sterilized by ethanol (70%) for 10 min and sodium hypochlorite (2%) for 30 min. After decontamination, meristems were separated in sterile condition under a binocular microscope and were cultured on MS culture medium supplemented with 5  $\mu$ M NAA and 10  $\mu$ M BA. The cultured samples were then transferred to growth chamber with 25°C temperature and photoperiod of 16.8 h (day.night). Meristem culture experiment was carried out as a completely randomized design with 3 replications in 2015. After 38 days, micropropagation and bulblet production traits were measured on different clones of garlic. Finally, multivariate statistic methods were used to classification of clones and to detection of the most effective traits on *in vitro* bulblet production.

**Results:** Results of principal components analysis showed that three first principal components explained 71% of the total variance. According to these results, bulblet globularity, root weight, leaf number, mean of leave length, bulblet number and the longest leaf showed highest effects on two first principal components. Stepwise regression analysis indicated that leaf number, bulblet globularity and mean of leave length were the most important effective traits on yield (bulblet number) and explained 77.88% of total variance. Based on path analysis results, the traits of number of leaf and mean of leave length showed the maximum positive direct and significant at  $P < 0.01$  (1.286) and negative indirect effects and significant at  $P < 0.01$  on yield (-0.50) (bulblet number), respectively, which can be used to select of high yield garlic clones.

**Conclusion:** The results of this research can be used to identify the garlic clones using effective morphological traits such as leaf length, leaf number, longest leaf length, plantlet fresh weight, leaf weight, bulblet weight and root weight and other traits, used in breeding programs and *in vitro* production of garlic.

**Keywords:** Garlic, Principle components analysis, Path analysis

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“Short Technical Report”

**Effect of seed priming on seed germination indexes  
of six ornamental seasonal plants**

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Received: 01/11/2016; Accepted: 04/18/2016

**Abstract**

**Background and Objectives:** Rapid germination of margin plants, including zinnia (*Zinnia elegans*), calendula (*Calandula officinalis*), carnation (*Dianthus caryophyllus*), daisy (*Bellis perennis*), gazania (*Gazania splendens*) and rudbeckia (*Rudbeckia hirta*) accelerates the creation of landscape. Priming is one of the treatments to enhance the seed germination. The seeds absorb water under priming and the early stage of seed germination is done, but the radicle does not appear. Priming causes to uniformity of germination and shortens the time interval planting to emergence. Seeds can protect against biotic and abiotic factors in the critical stage of seedling establishment. Penetrated chemical compounds into the embryo stimulate effective metabolic activity in germination. Since the rapid preparation of seasonal plants is important in successful landscape creation, therefore, objective of this study was to evaluate the effects of seed priming on germination of some ornamental seeds.

**Materials and Methods:** A factorial experiment in a completely randomized design with three replications had been carried out to evaluate the effect of seed priming on seed germination indexes of calendula, carnation, zinnia, daisy, gazania and rudbeckia. Treatments consisted of control, 50 mg<sup>-1</sup> gibberellin, NaCl 1% and distilled water. Evaluated traits were germination percent, seed germination value, germination rate, daily mean germination and daily peak germination.

**Results:** The results showed that carnations, zinnia and daisy have the highest percentage of germination and the lowest germination was related to Gazania. Among the priming treatments, priming with water have the highest germination mean and maximum germination percentage. In interaction effects, "daisy × without priming" had the highest impact on germination percentage, mean daily germination, germination value, number of germination per day and the maximum percentage of seed germination. "Daisy × priming with NaCl 1%" had the highest impact on germination percentage and seeds mean germination.

**Conclusion:** Based on the results, response of various species to seed priming treatments was not the same, but priming generally causes to improve of seed germination. In this research, hydropriming and priming with 1% NaCl resulted in maximum germination. Since hydropriming is simple, cheap and without chemical applying, we can suggest this manner to propagators.

**Keywords:** Seed priming, Seeds germination, Ornamental plants

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“Short Technical Report”

**The qualification of germination response of zygophyllum (*Zygophyllum atriplicoides* L.) and hemp (*Cannabis sativa* L.) seeds to temperature**

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Received: 12/17/2015; Accepted: 04/16/2016

**Abstract**

**Background and Objectives:** Cardinal temperatures are one of major inputs of more simulation model of growth and crop development and prediction of phenological stage of plant. Various mathematical models have been proposed for definition of response of rate germination to temporal treatments or reaction of accumulation germination percent to different levels of temperature. Consequently, assessment of response of germination and emergence to temperature and detection of cardinal temperatures for made of predicting models of germination and emergence, choosing of appropriate sowing date, selection of tolerance species and genotypes of zygophyllum and hemp to up or down temperatures and determination of the best areas for successful establishment is useful. Therefore, this study performed based on those necessary goals.

**Materials and Methods:** For study of germination in zygophyllum and hemp, a CRD experiment performed in seed research laboratory of Islamic Azad University, Mahabad Branch, with four replications that temperature treatment were considered twelve levels as: 1, 3, 5, 7, 10, 15, 20, 25, 30, 35, 40, 45 and 50 °C for hemp and eight levels for zygophyllum included: 5, 7, 10, 15, 20, 25, 30 and 35 °C. In this research, describing of reaction of germination to temperature and determination of cardinal temperatures were investigated by non-linear regression model as segmented model.

**Results:** Results revealed that temperature had the significant effects on rate and germination percent in two plants. In zygophyllum, the highest germination percent in this plant observed in 15-20 °C. Furthermore, the lowest germination rate obtained in temperature 7 °C and lower than it and the higher temperature than 30 °C. Also, in hemp plant as similar as zygophyllum, the maximum germination percent observed in range 15-20 °C. As expected, the highest germination rate occurred in this temperature range. Qualification of seed germination reaction of two plants using segmented result in cardinal temperatures of zygophyllum as: base, upper and bottom optimum and ceiling temperatures involve: 7.2, 21.07 and 30.0 °C respectively. So, cardinal temperatures of hemp were 4.74, 23.98 and 45.95 °C. Also, the maximum germination rate ( $r_{max}$ ) was 0.007 and 0.041 in zygophyllum and hemp, respectively.

**Conclusion:** Overall, results showed that rate and percent germination raised significantly to 15-20 °C whereas when temperature increase until 30 °C, germination reach to zero in zygophyllum, in spite of no germinating obtained in 50 °C in hemp. Also, results appointed that segmented model could estimate cardinal temperatures of germination fairly in hemp and zygophyllum.

**Keywords:** Germination, Model, Temperature, Non-linear regression

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“Short Technical Report”

**Investigate the physiological and compositions characteristics  
of seed and fruits of bitter apple (*Citrullus colocynthis* L.)  
in different regions of Sistan and Baluchestan province**

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Received: 11/18/2015; Accepted: 05/16/2016

**Abstract**

**Background and Objectives:** There are a lot of medicinal plants which they're found as wild in plains and hillsides habitat. Bitter apple with scientific name *Citrullus Colocynthis* L. is from the family of Cucurbitaceae, as herbaceous, lying or rising stem and fiber-covered plant. The objective of study was to investigate the physiological and compositions characteristics of seed and fruits of bitter apple in Sistan and Baluchestan province.

**Materials and Methods:** The research was performed in the nested plan in completely random with four replications. In this study, it was measured the physiological features of the collected seed. In first, the Ethanol and Butanol extract of the fruit were provided and they were analyzed chemically by GC and GC/MS. The obtained data were compared by Duncan comparative test at five percent level.

**Results:** The results represented that the habitat conditions lead to significant difference in amount of the seed ash percent, Ca, N, K, Zn elements and seed soluble carbohydrate at one percent. As there was the most amount of seed ash and carbohydrate in the collected seed of Zabol and the most amount of Zn, C, K elements were obtained in seeds of Iran-shahar. Also, the results represented that Fe element available in the seed of the plants had significant difference at 5%. The results (GC) of Ethanol extract of the fruit represented that there were cucurbitacins A, B, C, D, E, L and two compositions of colocynthis and colocynthis in the fruits with various amounts. The results of Gc/MS of Butanol extract of the plant fruit identified compositions such as alcohols, ketones, Epoxy compounds and hydrocarbons, which they are accounted a part of active biological compounds.

**Conclusion:** Difference in seed physiological features and chemical compounds of the plant fruit between townships and areas inside the townships can be due to difference in ecological features of the area as temperature, humidity, elevation, soil types and also soil elements condition and it requires to more study on this province and other areas with various climatic.

**Keywords:** Bitter apple, The percentage of oil, Minerals, Climate

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