*J. Basic. Appl. Sci. Res.*, 2(3)2856-2859, 2012
© 2012, TextRoad Publication
ISSN 2090-4304
Journal of Basic and Applied Scientific Research
*www.textroad.com*

# Effects of Salinity and Component Allelopathic *Convolvulus arvensis* L and its Interaction Effect on Germination and Seedling Growth Wheat

**Elnaz Farajzadeh Memari Tabrizi[1*], Mehrdad Yarnia[2], Vahid Ahmadzadeh[3] and Noshin Farajzadeh[4]**

[1,3,4]Young Researchers club, Tabriz Branch, Islamic Azad University, Tabriz, Iran
[2]Associate prof. Department of Agronomy, Faculty of Agriculture, Tabriz Branch, Islamic Azad University Tabriz, Iran.

## ABSTRACT

Salinity is one of the most restricting factors on crop productivity. Estimated that 20 percent of cropland is under salinity effect. Allelopathic interaction are also one of the other main factors on reducing germination and growth that has very complicate mechanism and can effect on all aspects of plant growth and development. But their aren't no data on this two factors. In this reason the most important goal of this survey was to evaluate the salinity- allelopathy interaction on wheat that is the most important cereal in the world. Results from analyzes of variance show that salinity have significant effect on all aspects of seedling growth in 1% level, but there are no significant effect in germination. Allelopathic compound have also significant effect on all surveyed aspects in 1% level. Salinity- allelopathy interaction was also significant in all aspects except for germination in 1% level. The most important result of this assay was that salinity and allelopathy can cause significant decrease in seedling growth and also this two factor can bolster each other effects. In this reason we most control this two decreasing factor.
**KEYWORDS:** Salinity, Allelopathic compound, Wheat, Germination, Seedling growth, Interaction.

## INTRODUCTION

Successful seedling establishment, the most important step is determining the competitive strength and fertility of crops, depending on the germination and seedling growth. Soil salinity through reduction water absorption, low elongation and cell division, preventing the movement of material storage, Decreased synthesis of hormones and nutrients and toxic effects reduce germination percent, germination rate and seedling growth is Cereal grains like barley and wheat seeds, even though the sensitivity to salinity in the germination increased (2, 4, 7 and 9).

Thus, in saline environments, plants adapt to salinity during germination and early seedling growth is critical for the establishment (2). In addition, germination under field conditions are often affected by interference, allelopathy. Stopping in germination may change the activity of enzymes that transfer onto a storage compounds during germination affect (5). Irregularities in the respiration rate also led to a limitation of metabolic energy (ATP) and eventually will reduce the germination and seedling growth (8). Allelopathic compounds will not only result in reduced germination, but also may cause a delay in germination. Seedlings that have a larger adverse condition such as low soil moisture or nutrient limitation better compete with their neighbors It also can delay germination by Osmotic effects on water uptake and cell elongation to be particularly (6).

Allelochimical reducing seedling growth also. Even if remains, seed and early seedling growth under strict control of these compounds. Microscopic studies showed that the cells are placed under the influence Allelochimical. Abnormal mitochondria Appearance and food reserves are accumulated (1).

## MATERIALS AND METHODS

A factorial experiment based on randomized complete block design with three replications. Treatment was
A ($a_1$: Solution with EC=0, $a_2$: Solution with EC=3 and $a_3$: Solution with EC=6),
B ($b_1$: Distilled water, $b_2$: *Convolvulus arvensis* extract 1:10 and $b_3$: *Convolvulus arvensis* extract 1:20)

***Corresponding Author:** Elnaz. Farajzadeh Memari Tabrizi, Young Researchers club, Tabriz Branch, Islamic Azad University, Tabriz, Iran. Email: farajzadeh.. elnaz@yahoo.com

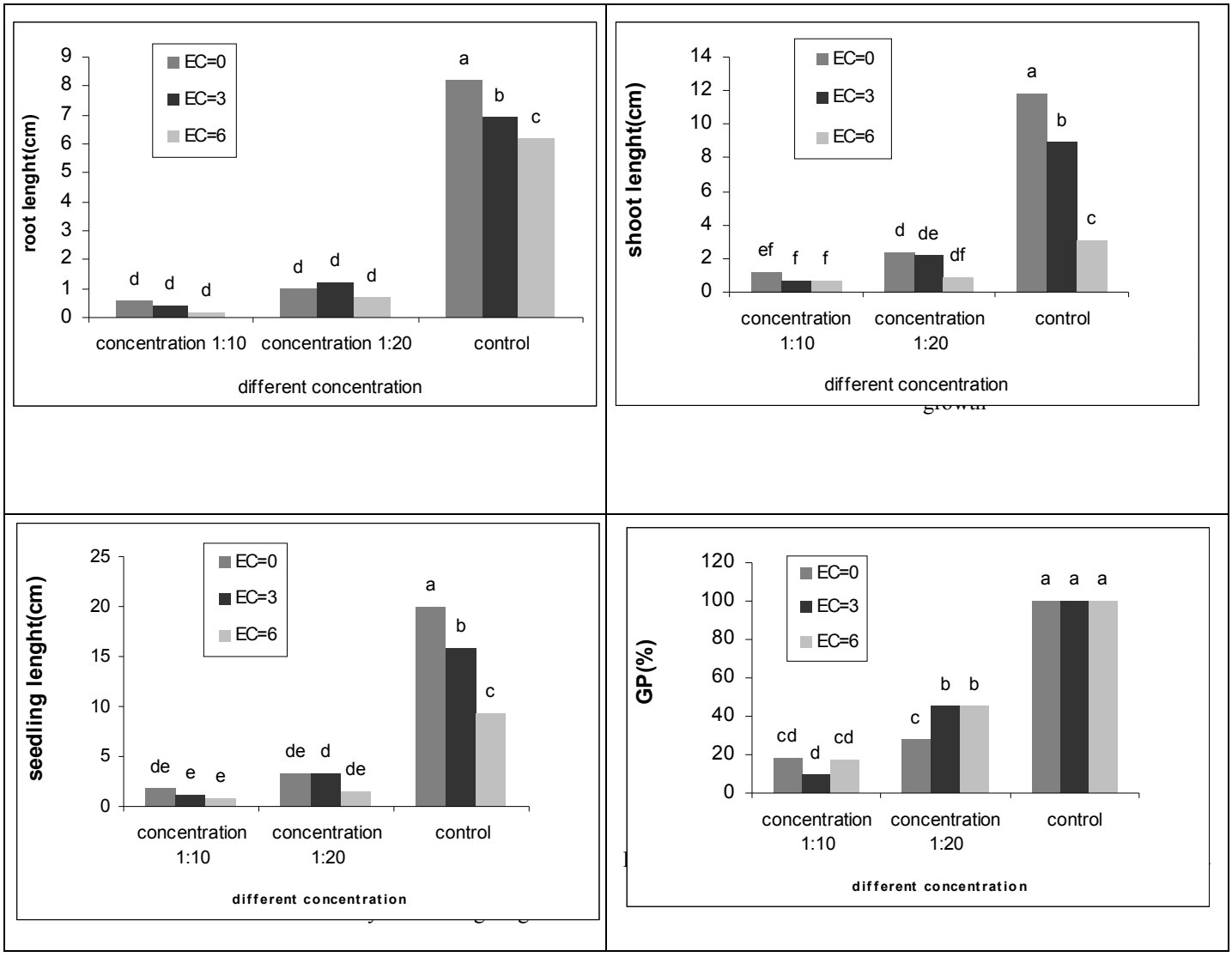
To prepare extracts of *Convolvulus arvensis* weeds collected in the oven at a temperature of 80 for 48 hours and then the powder was dried. After sifting the sample of 20 grams per 100 cc of water in the plant was immersed for 24 hours then extract was filtered and used for experiments. For the preparation of sterilized culture medium in each Petri two layers of filter paper were sterilized and between layers of filter paper 20 wheat seeds were disinfected. Then into each Petri dish 5 cc of each treatment solution was poured. Root length, shoot and seedling measurements and on 3, 7, and 10 days to be sampled to determine its dry weight. MSTAT-C and EXCEL were used to analyze data and draw graphs, respectively.

## RESULT

The results of variance analysis of traits, root length, shoot length, seedling length, seedling dry weight and germination showed that Salinities (0, 3, and 6 ds/ m) in all studied traits except germination have significant effect on the 1% level and Various concentrations in all the traits of weeds is significant. Weed extract× salinity interaction in all traits except germination of weed extract significant at 1% level shows. Comparison of single-round effects of salinity showed that except for germination, salinity effect has a negative impact on other traits. Also, *Convolvulus arvensis* extract, 1 to 20 and 1 to 10, with minor differences the same effect has had an impact on traits that Indicate that low concentrations compounds Allelopathic impact. High concentration hadn't effect on plant response. Weed extract×salinity interaction showed that Salt and compounds Allelopathic effects are intensified. At this stage of development of an antagonistic nature of the salt compounds Allelopathic there. The result of this experimental showed that Salinity and interaction of the reducing agents Allelopathic plant growth, especially in the early stages of growth that In addition, each of which is the reduction of one another but also strengthen. Therefore, management must be appropriate to control the action.

**Table 1: Table of variance analysis**

| S.V | df | Germination percent | Root lenght | Shoot lenght | Seedling lenght | Dry weight |
|---|---|---|---|---|---|---|
| Salinity | 2 | $89.815^{ns}$ | 0.373** | 17.476** | 45.814** | 0.016** |
| Weed extract | 3 | 19625.926** | 8.646** | 175.138** | 522.787** | 0.037** |
| Salinity* Weed extract | 6 | $173.148^{ns}$ | 0.215** | 8.351** | 26.123** | 0.039** |
| C.V% | 11 | 12 | 8.9 | 7.6 | 14 | 13.25 |




**Acknowledgment**

We wish to thanks the Young Researchers club, Tabriz Branch, Islamic Azad University.

## REFERENCES

[1]-Meighati,F.2005. allelopathy. From Concept to Application. Tehran.

[2]- Abo-Kassem, E., E. M. Effect of salinity.2007. Calcium interaction on growth and nucleic acid metabolism in five species of chenopodiaceae. Turk. J. Bot.31. 125-134.

[3]- Begum, F., J. L. Karmoker., Q. A. Fattah., and A. F. M. Maniruzzaman.1992.The effect of salinity on germination and its correlation with K+, Na+, Cl- accumulation in germinating seeds of Triticum aestivum L. cv. Akbar. Plant and Cell Physiology.Vol, 33. No 7. pp 1009-1014.

[4]- Durate, G., N. F. Lopes., D. M. Moraes., R. N. Silva.2006.Physiological guality of wheat seeds submited to saline stress. Revista Brasilera de Semetes.Vol. 28. Num 1. pp 122-126.

[5]- El-Khatib, A, A., A, K, Hegazy., and H, K, Gala. 2004.Does allelopathy have a role in the ecology of *Chenopodium murale*. Ann. Bot. Fennici.41:37-45.

[6]- Escudero, A., M, J, Albert., J, M, Pita., and F, P, Garcia.2000.Inhibitory effects of *Artemisia herba alba* on the germination of the gypsophyte *Helianthemum squamatum*. Plant Ecology.148:71-80.

[7]- Othman, Y., G. Al-Kharaki., A. R. Al- Tawaha., and Al- Horani.2006,Variation in germination and ion uptake in barley genotype under salinity conditions. World Journal of Agricultural Science.2(1): 11-15.

[8]- Preston, C, A., H, Betts., and I, T, Baldwin.2002.*Methyl jasmonate* as an allelopathic agent: *sagerbrush* inhibits germination of a neighbouring tobacco. Nicotiana Attenata. Chemical Ecology.Vol 28. No 11.

[9]- Niazi, B. H., J. Rozema., and M. Athar.2003. Effect of pre germination and post germination treatment with growth hormones (Kinetine and abscisic acid) on ion concentration and biochemical contents of fodderbeet and seabeat under saline conditions. Gen. Appl. Plant Physiology.31(1-2). 89-104.