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Allelopathy extracts various parts of pigweed germination and seedling growth corn

Elnaz Farajzadeh Memari Tabrizi^{*1} and Mehrdad Yarnia²

¹Young Researchers Club, Tabriz Branch, Islamic Azad University, Tabriz, Iran

²Department of Agronomy, Faculty of Agriculture, Tabriz Branch, Islamic Azad University
Tabriz, Iran

ABSTRACT

Weeds are plants that only 1 percent of the world's great economic damage will be caused (1). The result showed that pigweed extract on corn and interaction type extract with different time had significant difference on 1% and there were significant difference at 1% on bean seedling growth. Maximum germination percent was 55% by control level corn. Maximum germination percent in bean was control level. Root and shoot extract pigweed 12% decreased. The result showed that extracts of various organs; the level of weed control is a downward growth trend.

Key word: Allelopathy, germination and corn.

INTRODUCTION

Allelopathy is science and study of chemical interaction between plants. Leaves and debris leaves (the most important and stable source), roots (with fewer Allelochemical that are less stable), pollen and flowers (most concentrated), skin (low concentration), stems (sometimes property Allelopathy), seeds and fruits of the property or actively are Allelopathy (2). Some researchers reported that leaves, root and seed are main source Allelochemical but leaves are important source Allelochemical. Roots had lower Allelopathy potential than leaves. Shoot had Allelochemical that sometime shoot are main source toxicity (3).

MATERIALS AND METHODS

A split plot experiment based on randomized complete design with five replications. Treatment was:

A: Weeds extract: 1) control (sterile water) 2) extract (shoot, leaf and flower) 3) extract (root)
B: Different time (3, 7 and 10).

Collect the weeds

The plant samples, flowering weeds in the fields of the College of Agriculture, Islamic Azad University of Tabriz was collected.

Preparation of extract

Samples were then dried and milled. To prepare the plant extract, 10 g in 100 ml water and then immersed for 24 hours straight and was centrifuged. The extract was obtained from 1 to 10.

Laboratory Investigation

Tested in vitro and isolated manually winnow the seeds of weeds and broken seeds, in order to prevent damage to existing pathogens in the seeds were surface sterilized. Glass Petri dishes after washing put own electrical in temperature 110 ° C for 24 hours.

Filter paper and Petri dishes for 12 hours under the hood, electric lamp, and UV radiation put. Then, two filter paper in Petri floor and another filter paper were placed on seeds. 25 seeds in each Petri put. The extracts of the weed *Amaranthus* and disinfected water, were used as controls. The experiment was at 24 ° C. Exit the seedlings germinated in the experiment at a rate of 5 mm was defined. ISTA tested according to international regulations for crop germination continued.

Root length, shoot length, seedling length and seedling dry weight, germination rate GP CVG, the range of germination, TSG, seedling dry weight measured. These components were used to calculate the following relations:

$$GP = n/N * 100 \text{ , } TSG = \sum(N * T) / \sum N \text{ , } GVG = 1 / TJG$$

Variance calculations, including statistical data, and compared using the statistical program MSTATC and draw graphs using Excel software.

RESULTS

Seedling length

Treatment corn seed with pigweed extract in type extract and different time and interaction had significant difference in 1%(table1). Highest seedling length was 6.914cm by control and minimum was shoot extract pigweed equal 1/058cm. applying the extract reduced the level of control seedling (Figure1). Allelopathy effect compounds in the early period of growth can be seen (germination, seedling growth). These compounds affect on Mechanisms action and influence on the DNA (alkaloids), photosynthetic and mitochondrial function, Fithohormon function, the absorption of ions and water balance (phenolic) are stopped(4).

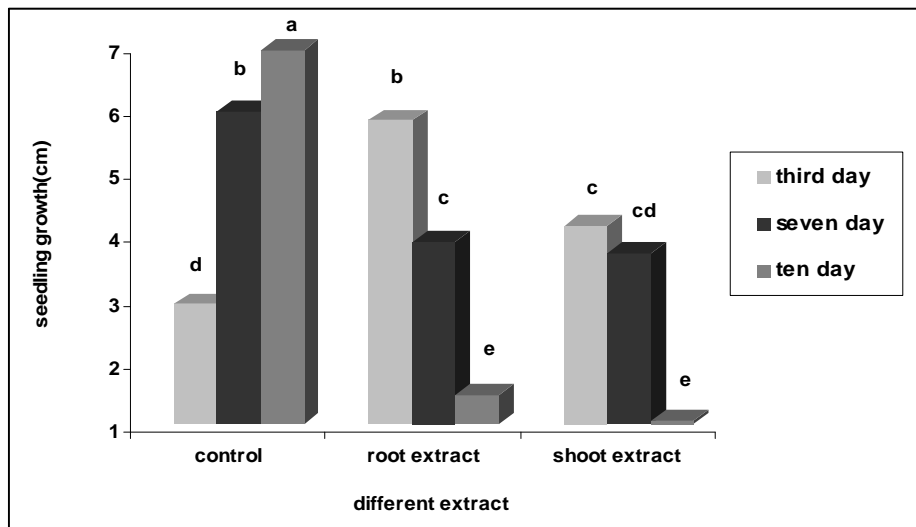


Fig1) Effect of different extract and times on seedling length

Germination percent

Type of extract had significant difference at 5% by pigweed extract and different time had significant difference 1% on interaction extract and different time on germination percent corn (table1). Comparison of interactions indicates a significant difference between treatments. Maximum germination percent was 55% by control level and the minimum amount of components on the seventh day of the extract equivalent to 13 percent decrease in pigweed is equivalent to 42 percent (figure2).

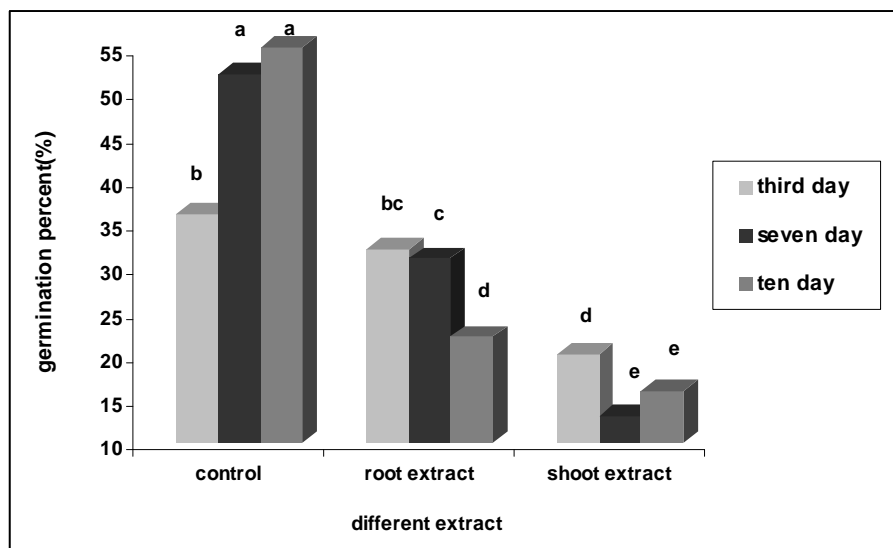


Fig2) Effect of different extract and times on corn germination percent

Rate root/shoot

There were significant difference at 1% level by different part of pigweed extract and interaction extract in different time had significant difference on root/shoot rate. Maximum rate root/shoot

on the Third Day was 3/028 in control and minimum on the ten day by shoot and root extract pigweed (figure3).

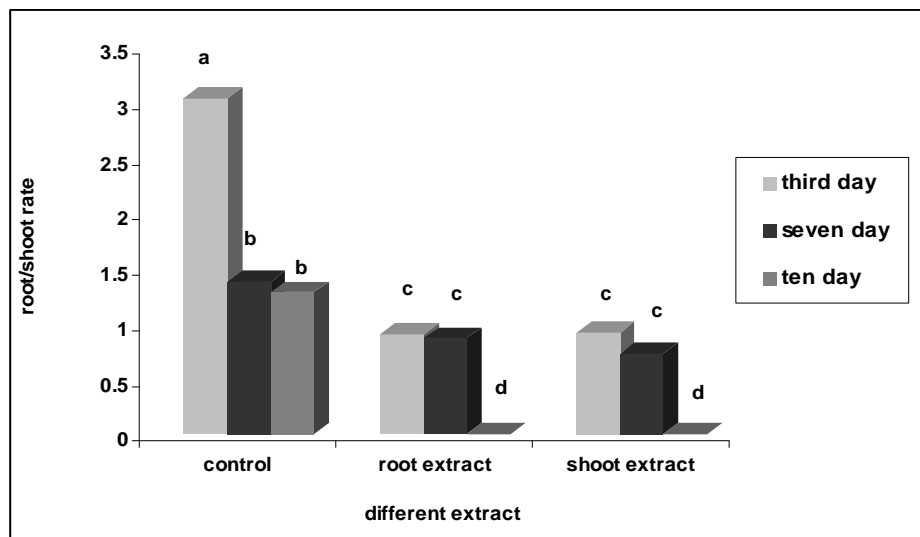


Fig3) Effect of different extract and times on root/shoot rate

Dry weight

Results of the variance in corn seeds showed no significant difference treated with extracts of various parts of pigweed.

Table 1) Analysis Variance of traits in corn

s.v	df	Seedling length(cm)	GP(%)	Root/Shoot
replication	4	4/26 ^{n.s}	57/022 ^{n.s}	0/027 ^{n.s}
Weed extract	2	20/291 ^{**}	3763/356 [*]	2/496 ^{**}
Main error	8	1/954	452/439	0/125
time	2	54/047 ^{**}	567/356 ^{**}	0/966 ^{**}
Replication*time	8	1/123 ^{n.s}	7/856 ^{n.s}	0/096 ^{n.s}
Time*weed extract	4	2/805 ^{**}	84/022 ^{**}	1/065 ^{**}
Sub error	16	0/505	9/147	0/057
c.v(%)		17/84	9/83	4/72

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