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Morphological and biochemical study of peanut

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ABSTRACT

Amygdales scoparia is an important medicinal and commercial species from Rosaceous and resistant to heat and drought. Iran's weather is drought, then Amygdales scoparia is suitable produced bitter seeds normally but there is one Sweet Amygdales genotype's stand among of many bitter Amygdales genotypes in Naein province, and due to economical importance of Amygdales sweet seeds, this research was compared the morphological and biochemical properties of these sweet and bitter genotypes. Morphological aspects such as length and latitude leaf, shoot and petiole length seed and core weight were identified. Biochemical analysis of seed extracts, in comparison with standard sample, was determined their amygdaline quantities. Results demonstrated that shoot length, leaf length and latitude, seed diameter and core weight for sweet genotype was less from bitter ones, but petiole length of sweet genotype was more than bitter and Leaf latitude in sweet genotype is same as the bitter ones. Quantity Amygdaline in sweet sample was less from bitter ones.

Keyword: Morphologic, Biochemical, *Amygdales scoparia* L.

INTRODUCTION

Peanut species, with scientific name (*Amygdales scoparia* L) is one of dark red rose plant stands belongs to divot. There are two types of sweet and bitter almond. The thorny or thorn less tree or shrub with short branches or lacking of it, alternate deciduous leaves and flowers appearing before opening. It produces white and pink petals. Type of pink flowers produce sweet almond and kernel oils and emulsions is Nafrar. Kind of bitter almonds has white flowers and a relatively wider and shorter than the sweet varieties and contain roughly 50 % oil content Nafrarin sweet almond [3].

Its fruits is like firebrand sweet. Its bark, leaves contain toxic cyanogenic glycosides. Sweet almond flavor is mild and easily detectable rather than bitter almond. All parts such as sweet almond tree blossoms, leaves, and fruit are used in medicine.

Almonds have a particular commercial importance and is one of the export demands. Bitter almonds contain a special substance (1 to 3 percent)called amygdaline (Amygdaline). crystallized amygdaline has this raw formula H_2O, C_2O, H27, NO113 that the effect of water on this material cause to make Syanydryk acid , benzoic aldehyde (Aldehyde benzoie) and glucose that is used to prepare medical productions. Bitter almond may produce hydrogen

cyanide between 6 to 8 percent. Oil of bitter almond (benzoic aldehyde) is used in the perfume and produce a specific kind of green color called Malachite.

Cyanogenic glycoside compounds are in various tissues of plants such as seed and vegetative tissues, many plants are able to synthesize these compounds. At least 2500 species of plant families, like rosaceous, Grammys, Lynaseh and Composite are able to synthesize a cyanogenic compounds. Most of cyanogenic compounds are contained of simple sugars compound (Monogylocozid) such as Pronazyn or (Dglucoside) are as amygdaline [1].

MATERIALS AND METHODS

Raw materials and seed almond extract Method:
Peanut seeds, were collected of both sweet and bitter almond in Nain Anarak Chagrabeh in June and then scaling the porcelain mortar with liquid nitrogen and the Azote powder was typical ordinary scale. 2 g powder of each genotype were harvested at three stages with ethanol (20 mL each stage) and each time was reflex for a clock on the mixer - Magnetic Heater (with temperature around 70 ° C and 920rpm). Mixture and the supernatant filtered with a filter paper that has been circulating ethanol solvent in vacuum distillation apparatus and the solvent was removed. The samples obtained with ether and n - butanol 1:1 and 10 ml of each solution, and the Sonicated was vibrated for 20 minutes until the solvent was sublimated. The phase of butanol solution was brought to a volume of 20 ml and injected into the HPLC system.

Specifications of HPLC machinery: Analysis has been done by HPLC machine model from Knuer Well Chrom 2000 from Germany, pump model and Maxi-Star K-1000 Spectrophotometer K-2500 detector. UV detector was set at 254 nm. Erospher 100 C18 column was 25 cm in length and 4mm diameter, respectively. Mobile phase, water and methanol (50:50) and output flow duration curve 1mI/min was 60 minutes.

Procedure for standard solution of amygdaline:
The solutions with density of 400 to 800 mg/liter from standard amygdaline and in 20micro/ liter for per density has been injected to HPLC machine and its curve design in Excel software program (figure 1).Unknown sample extract of two genotypes (sweet and bitter) at a concentration of 2 mg with repeated treatment (rows 7 to 10) was injected into the device. Data output related to time curve (Ret time) of these treatments amygdaline concentration (milligrams per liter) and high peak output levels and curves, are presented in Table 1.

Figure 1: standard curve of amygdaline (base on sample density/ sub level of curve)

Morphological properties of the data recorded in different seasons and it calculated based on the length and width of leaves , branches and petiole length , seed size and weight of the core and core of two peanuts that were performed by bittersweet (Table 2) .

Diagram 1: diameter (cm) comparison of branches in the groups

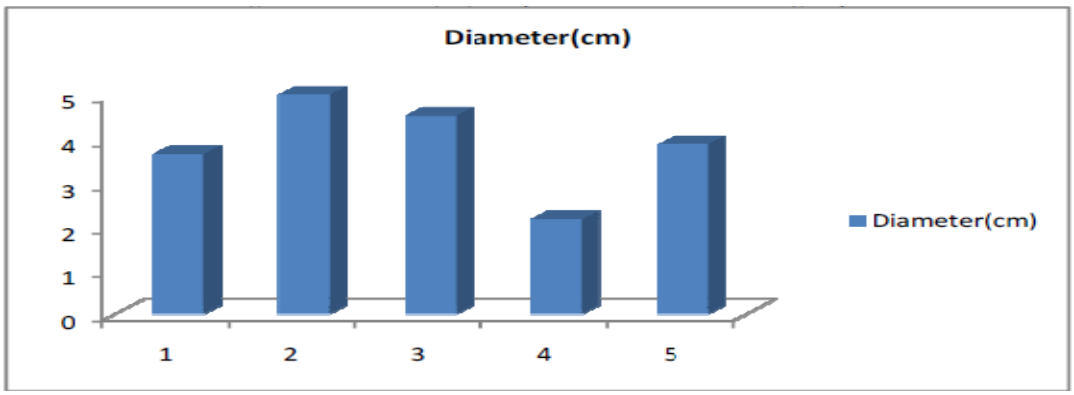

Table 1: amount of amygdaline, output peak time of curve and latitude and slope of it and compared it to standard curve

Output time (minutes)	Latitude(milliamp unit)	Sub level curve (milliamp unit/minute)	Density (mg in liter)	row
10	20	21	400	1
10	36	51	1000	2
10	94	126	2000	3
11	163	230	4000	4
11	207	305	6000	5
11	282	417	8000	6
12	37	36	693	7
12	45	59	1114	8
12	206	158	2993	9
14	96	60	2998	10

Table 2: Review of growth indicator of both bitter and sweet genotype in different seasons

Weight of core(gr)	Width diameter of seed (cm)	Length diameter of seed(cm)	Width diameter of core (cm)	Length diameter of core (cm)	Petiole length (cm)	Leave width (cm)	Leave length (cm)	Branch length (cm)	Base length (cm)
0/32	1/2	0/4	0/5	0/5	0/2	1/7	38-15	2500	Spring/sweet
0/35	1	0/32	0/45	0/53	0/22	1/8	40-17	2510	Summer/sweet
0/5	1/4	0/35	0/5	0/2	0/2	2	58-16	1900	Spring/bitter
0/45	1/1	0/3	0/45	0/24	0/22	2/2	60-18	1910	Summer/ bitter

Review of genetic diversity of almond with using microsatellite markers and morphological traits of almond by Fathi and colleagues showed genetic diversity analysis of 14 morphological characters of 56 genotypes of almond and this study found a positive correlation with yield locus of the core, percent of core, seed weight, leaf length and height.

CONCLUSION

Morphological studies by sweet and bitter Nast represents the branch length , leaf length , seed weight, seed length and diameter of the base is less in sweet than bitter , but the base of the core, petiole length and leaf width in the bitter genotype , Qatar brain longitudinal and transverse diameter of the seed of both genotypes, were equal . Both genotypes the values of the measured parameter have increased at different seasons.

Chemical studies of seed extract of sweet and bitter almonds, also represents a greater amount of amygdaline in bitter genotypes rather than sweet. Supporting this research [1] with biosynthesis of cyanogenic compounds in sweet and bitter almonds with liquid chromatography method (HPLC) showed that the amount of amygdaline in Bitter Seeds are greater than sweet one and its cause is the expression of enzymes and converted to the amygdaline and creating bitter tasting seed.

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