



Changes in the quality of the fatty acids in almond breeding program strategy And grow

Syied Hatef GORİSHI^{1,*}, Tahereh HASANLO², Ali IMANI³

¹*Department of Horticulture Science, Karaj branch, Islamic Azad University, Karaj, Iran.*

²*Department of physiology, Agricultural Biotechnology Research Institute of Iran (ABRII)*

³*Horticultural Department of Seed and Plant Improvement Institute (SPII)*

Received: 01.02.2015; Accepted: 05.05.2015

Abstract. This study was conducted to evaluate the effect of pollen donor (Eskandar Tuono) to increase fatty acid changes almond seed germination before and after the hybridization was performed . Factorial in a randomized complete block design method completely randomized design during years 2011 and 2012 on the confluence of two varieties of almonds Eskandar and Tuono pollen was used of sh-12 . In order to perform hybridization flowers Variety sh- 12 in the balloon were castrated. The pollen of the Skander and Tuono were collected pollen transfer was done at the right time Arriving hybrid fruit, seeds are collected and used to study sleep and study their properties, Beginning with a 2% solution of tetra-methyl fungicide Tyvram disulfide were sterilized for 2 minutes. The seeds of any combination of two of the 90 specimens (with skin and without skin), respectively. Changes in the fatty acid methyl oleate, which is one of the major fatty acids in peanut cultivars Tuono and Eskandar with sh- 12 were studied before and after germination.. The results showed that 73.35% methyl oleate at the Skander before germination, After germination, the Tuono 76.37% and 76.70%, respectively, before and after germination and 77.37% respectively According to the study, an increase in fatty acids in the seeds of almonds and almond lead to improved nutritional value will increase its weight. According to the study, an increase in fatty acids in the seeds of almonds and almond lead to improved nutritional value will increase its weight Thus increasing the amount of acid methyl Lynvlyat pollen in both cross with theEskander and Tuono effective sh- 12 was evaluated anymore The effects of pollen at the intersection of Skander cross with sh-12 Lynvlyat methyl showed the highest rate change.

Keywords: Almond, fatty acids, methyl oleate, linoleic acid, germination.

1. INTRODUCTION

This is due to the self-incompatible plant species (Ren et al., 2001) and for fruit varieties require pollen and pollen sources of influence on the formation of fat that has been proven therefore, in this study the effects of two types of pollen source Tuono Eskandar on the changes of endogenous substances such as fatty acids were investigated. According to what has been said in almond orchards to produce economic need for proper pollination is essential figures The pollen source on chemical composition and quality of the fruit has great effects (Svsyas Valnsv Company, 2004).

One of the major components of the almond seed oil is 35% to 70% of the total weight of dry granular form. One important aspect of the almond, the role of oleic acid from the standpoint of nutrition and health value in the range of 62% to 78% of the total fatty acids form (Abdullah et al., 1998; Garcia - Lopez et al. 1996; Kalksyvv Sura al., 1998). Some sweets such as nougat, require a high proportion of fatty acids, while the pastry and almond flour, need less of it. Sweet

*Corresponding author. *Email address: hatef_ghoreyshi@yahoo.com*

Changes in the quality of the fatty acids in almond breeding program strategy And grow

almond oil is rich in nutritional value of many of the holds, as well as a source of vitamin E, almond delaying rancidity process.

The large differences between the figures in the tocopherol content is selections. Which may affect the selection process for this trait reform because of their importance in the nutrition industry provided almonds. All these parameters are more or less hereditary and in almond breeding program is intended. The main composition of almonds and almond flavor determinant, especially after heating the fat. Lipids may be 50% or more by weight of dry almond kernels, form.

Fatty acid composition very similar, especially in almond oil and a healthy diet are generally favorable. Fat content and composition in the confectionery industry (confectionery), due to higher oil and water absorption is less important with (Alessandroni, 1980). Kernel with a high percentage of oil can be used to produce nougat Or to extract the oil, cosmetic and pharmaceutical industry used. However, a small percentage of oil needed to produce seeds with almond milk, which is a product of processed food, Because the calorie level should be similar to cow's milk (COTTA Ramusino et al., 1961). Low fat, high protein content as well as for the production of sugar, flour, almonds and a variety of food products (Longhi, 1952). Fat content of the composition is also a major determinant of longevity and stability of the oil. Sensitivity their fatty acid composition of the degree of oxidation (Senesi et al., 1996) is different. Thus, both the proportion of total fat and fatty acid components (particularly the ratio between oleic acid and linoleic acid) as an important criterion for evaluating the quality of the almond kernel (Kester et al., 1993) is considered. Analysis of the fatty acids, peroxides and result from the production of quality products for several different products of almonds (Song and Jeng, 1994), Including rancid taste (Harris et al., 1972). Oil oxidation by several factors, including the percentage of unsaturated fatty acids, light, oxygen, metal ions, temperature and enzymes (Zacheo et al., 2000; Structure et al., 2000). Is impressed. However, the "GOVARA" cultivar shows a profile of fatty acid composition, unless the contrary is intended as an oxidation resistant at the same time resistant of oxidation rancidity (Berenguer- Navarvv et al., 2002). This suggests that resistance to rancidity not only on the composition of fatty acids but before natural antioxidants such as tocopherols there. Fatty acid content and composition vary considerably depending on the genotype and its origin. Therefore, based on oil weight range between 36 and 53 Percent California cultivar (Abdullah et al., 1998). Between 35 and 61 per cent in the cultivar of Australians (Vezvaei and Jackson, 1996) and between 40 and 68 percent in European cultivar (Souty et al., 1971; Romojaro et al., 1977; Saura Calixto et al., 1981, 1988, Barbera et al., 1994; Schirra et al., 1994; Kafkas et al., 1995; Aslantas et al., 2001; Cordeiro et al., 2001; Kodad and Socias my company, 2008). The difference between the figures is striking. Some studies have shown that the effects are not significant in (Saura Calixto et al., 1981; Romojaro et al., 1988a; Kodad and Socias man company, 2008). The difference between the figures is meaningful to a lot of studies have shown the effect is not significant. While others (Barbera et al., 1994; is. Kafkas et al., 1995; Abdullah et al., 1998), significant differences were significant, probably due to the climate conditions of the test.

Oleic acid is a major component of almond , ranging from 62 to 78 % of the total of more than 90 % of the content of the image on the amount of linoleic acid (Kodad and Socias man company , 2008. Schirra et al., 1993; is. Abdullah et al., 1998 Saura Calixto et al., 1981) to be associated That part of the total fat and high levels of unsaturated fatty acids, mainly oleic acid,

which increases the amount of peanut nutrient. Because this type of fatty acids in the form of cholesterol does not help. The variation of approximately 3% oil content, fatty acid has been shown that the effects of different levels of annual changes than changes its genotypes (Kodad, 2006) is. The fatty acid is oleic acid, which is the most desirable from the standpoint of quality, the highest and lowest diversity (Kodad, 2006) shows. In some adjustment on a cultivar or the parent has been *Fylzya*. Since the total amount of oleic acid, fat and sometimes much higher in progenies of parents and provides the possibility of improving the quality of almond oil.

ACKNOWLEDGMENT

Almond nuts also contain large amounts of phenolics, which is an important group of antioxidants in the human diet, with lots of variety of compounds in the brain membrane (Frison and Sporns, 2002) can be found. Often thought to be beneficial effect on health. The heritability of this trait in peanut less known although total polyphenols in almond much higher depends on the genotype. (Berenguer Navarro Prats, Moya, 2003; Kodad, 2006). Particularly high antioxidant activity in the 'Ferragnès reported. While the activity is much lower than in the "*Marcona*" (Kodad, 2006) was observed. The figure also shows that the resistance *Marcona* low rancidity during long storage periods (Garcia Pascual et al., 2003), The resistance must be caused by other physical and chemical characteristics, such as tocopherol content (Zacheo et al., 2000; Garcia -Paskval et al, 2003; Kodad et al., 2006). Or the ratio of polyunsaturated fatty acids (Kester et al., 1993; is. Zacheo et al., 1998). Almonds are a good source of α -tocopherol. It is believed the main biochemical thought acids multiple unsaturated fatty against peroxidation (Kamalladim and Appelqvist, 1996). Tocopherol concentrations in fluids is determined by multiple solidarity with antioxidant activity are associated with a given percentage of the total tocopherol content of unsaturated fatty acids (Senesi et al., 1996). In almonds, tocopherol concentration plays an important role in protection against lipid oxidation during storage resulting in long term storage (Senesi et al., 1996; Zacheo et al., 2000; Garcia-Pascual et al., 2003).

Access to varieties with high nutritional value, including the order of priority in order to increase the effective fatty acids (oleate acid, linoleic acid, stearic acid, palmitoleic acid, palmitic acid) And the amount of fatty acid profiles in relation to the impact of pollen source is considered in this study. (The plant propagation Castres and Hartmann, 1992).

2. MATERIALS AND METHODS

This study during the years 2011 and 2012 Seed and Plant Improvement Institute of Horticultural Research Station was conducted And the impact of both Eskander and Tuono the pollen (male parents) on seed germination and change some of the material in the disk anymore receptor 12 -sh (female parent) Such as fatty acids before and after germination in a factorial randomized complete Randomized complete block desing. To conduct this research, practice, hybridization was carried out in Spring 2010. In order to perform hybridization flowers sh- 12 in the balloon were castrated. The pollen of theEskander and Tuono were collected pollen transfer was done at the right time.

3. EXTRACTION OF FATTY ACIDS

To extract the fatty acids, 0.1 g of dry almonds on ice 10 ml /lit of chloroform and methanol at a ratio of one to two well worn out, Was filtered using filter paper . Pressed mortar to be returned, again with 10 ml/lit was worn and smooth. 5 ml/lit mortar and 5 ml/lit of the washing

bowl for washing the filtrate was used where it was located and was flat again. A total of 60 ml was poured into Dkantvr dKantor and about 10 ml of distilled water was added to dkantvr was shocked and a little patience while we To be composed of two phases. The upper phase was the impurities in water and methanol nonlipid been resolved and the lower phase were dissolved in chloroform containing Lipids' that.

4. HYDROLYSIS OF FATTY ACIDS

The lower phase containing lipid separate rotary evaporators and return the device was placed at 50 C ° to the evaporation of the solvent (the difference between the weight of the empty flask showed the total lipid content).

The flask containing a few drops of fat to be removed from the device after its Cooling to 25 ml of normal alcoholic KOH (6.5 g of potassium oxide hydrochloride in 100 ml of methanol and 70% will dissolve) Was added and the material from evaporating refrigerant returns, connect, and somewhat slowly heated to boil. Bubbling solution for one hour at this temperature. After this period, the contents of the flask 25 ml of distilled water is added and it is poured into a Dkantvr (Dkantvr number one) and 25 ml/lit Dkantvr oil added and shaken well, Time left to their own devices to the ether, which contains non-soap is located in the upper part, The lower water content was separated from the soap solution. The upper Ether poured in another Dkantvr (Dkantvr number two) and 25 ml of petroleum Ether was added to the lower part, Dkantvr shook and had to leave for a while. After the two phases were formed, they are separated. This procedure is repeated three times and each time was added to the top of the Dkantvr number two (up to completely colorless). Then 15 ml of distilled water is added to the contents Dkantvr number two after the shaking had laid himself. After the formation of two phases, the lower phase was added to Dkantvr number one. This procedure was repeated several times and each time the contents inferior to Dkantvr number one was added.

5. RELEASE OF FATTY ACIDS

Soap dissolved in 15 ml of hydrochloric acid Dkantvr numbers using a four acid were normal. Then 15 ml of petroleum ether was added and the solution was stirred and poured acid soap is also Dkantvr, they waited until the two-phase solution is formed. Which is the upper phase containing fatty acids were ether, the phases separated in another Dkantvr (number three) throw. 15 ml of petroleum ether was added to the lower phase and the operation was repeated three times and each time the upper phase was poured Dkantvr number three (for the complete separation of fatty acids). The contents Dkantvr number three, 15 ml of distilled water was added to the fatty acid was used for washing. Rinse the lower phase was discarded. The free fatty acid intake, the upper phase is poured into the flask to the rotary evaporator temperature 50 C °connected.

After evaporation of the solvent in order to remove the small droplet size to 10 ml of absolute ethanol was added to the flask contents And re-connected to the droplets of fatty acids completely eliminated. The remaining 5 ml of petroleum ether was added and the temperature was kept below zero.

6. METHYLATION FATTY ACIDS

Gas-liquid chromatographic method for the study of fatty acids (GLC) was necessary to derive it. For this purpose, petroleum ether evaporated in fatty acids and their weights were measured. Derivatization using sulfuric acid and methanol was prepared following the study, should be introduced.

7. PREPARATION OF REAGENTS

100 ml of anhydrous methanol and poured into a graduated cylinder, gently 5 ml of concentrated sulfuric acid is added and stirred constantly. The above solution was added 50 ml of toluene as a solubilizing lipids. 5 ml of the reagent is added to the dry matter content of fatty acids and was given a good shake. The above solution was transferred to a tube and it was placed in boiling water bath for one hour. After cooling, the tubes to each 5 ml of diethyl ether was added and shaken well, at this stage, the two phases were formed. The lower phase using a Pasteur pipette to the top of the organic phase was separated and about one gram of anhydrous sodium sulfate is added, after about five minutes of drying operation was performed. Extracts obtained without entering into sodium sulfate in small containers and stored at temperatures below zero degrees Celsius. Then the extract was used for injection into the column GLC. The samples studied in this work due to the dilution of the extract, solvent has completely evaporated and reconstituted with 100 ml diethyl ether containing a fatty acid is added, and stirring was used.

8. RESULTS AND DISCUSSION

8.1. Fatty Acid Changes After The Effects Of Pollen And Sampling Time

As can be seen from Table 1. The effect of pollen on the fatty acid composition before and after germination was significant at 1% level. Of methyl palmitate, methyl stearate, methyl Palmytvlyat the seeds from crosses of Eskander and sh-12 cultivar, significantly from the confluence of the seeds of cultivar Tuono and sh-12 more. (Table 2), while the amount of fatty acids such as methyl oleate, methyl Lynvlyat, methyl arachidonate and methyl Akvsyanat the seeds resulting from the cross cultivar Tuono and sh-12 are significantly higher. The first and Lynvlyat amount of other fatty acids were higher in both crosses. The first and the seeds from crosses of Eskander Lynvlyat 74.86% and 14.06%, respectively, were sh-12 and anymore. The confluence of these two fatty acids in seeds of 76.53% and 14.87% respectively Tuono and sh-12' anymore. The results found by other researchers Bayafthay. Fat in almonds consists primarily fat storage cells in the cotyledon tissue particles with a diameter of about 1 to 3 micrometers are available. (Ren et al., 2001). Salo et al (1997) have reported that genotypes of almond oil and almond variety is affected. In other oilseeds also affect the amount of oil in particular is the type genotypes. It was also reported that the climate in the oil and fatty acids and tocopherols are effective, so that in some years, but the increase in oleic acid decreased linoleic acid (Skin, 2000). Fatty acid composition Prvnvs-hay such as peaches, apricots, cherries and plums have been determined (Johansson et al., 1997; Fmnya et al., 1995). Five oleic fatty acid

Changes in the quality of the fatty acids in almond breeding program strategy And grow

(18:1), linoleic (18:2), palmitic (16:0), palmitoleic (16:1) and stearic (18:0) more than 95% of the total fat comprise. Depending on the amount of fatty acids were reported by eight adduct (Abdullah et al., 1998; Garcia-Lopez et al., 1996; Kalksyv Sura al., 1988). The evaluation showed that the fatty acid composition of almond oil and oleic acid (68%) of the fatty acid almonds, then, linoleic acid (25%) and palmitic acid (4.7%) and a small amount (2.3%) of Palmytyvlyk acid, stearic and is Rashdyk (Xi et al., 1999). According to the report, Pune almonds contains 62.5% oleic acid, 29% linoleic acid, palmitic acid, 6.5%, 0.5% Asydpalmytvlyk%, 1.5% stearic acid, respectively (Soler et al., 1988). Linoleic and oleic acids as essential fatty acids have been fixed. Oleic acid content of about 72.5% (N Paryl) and 79.9% (Krystvmvrtv) and linoleic acid content of about 13.52% (Krystvmvrtv) and 19.77 percent (N Paryl) has been reported (Sachs et al., 2008).

Rvzban et al (2005), oil content and fatty acid composition were assessed 4 digits of Iranian pistachio in Qazvin. Fatty acid composition of pistachio nuts by oleic and linoleic acid, which mostly consists of skins. Garcia et al (1994) stated that the conflicting relationship between linoleic acid and oleic acid found in nuts, like other fruits. Thus, if the number is high quantity of linoleic acid, oleic acid content is low and vice versa.

It is reported that walnut oil fatty acid varieties differ. This difference in detection and diagnosis of the growing numbers of suitable fatty acids have the highest level and the highest quality, it is important (Zvart et al., 1999).

The effect of sampling time on the amount of fatty acids in the 1% level of significance (Table 2). As the table (2) is observed, the amount of methyl palmitate and methyl Palmytyvlyat before and after germination, with no significant difference but their rate was slightly increased.

The amount of methyl stearate and methyl fatty acids such as Lynvlyat at 2.46% and 14.87%, respectively, before germination was. Germination was reduced by that amount so that the amount of methyl stearate and methyl Lynvlyat to 1.68 to 8.14 per cent. On the other hand, fatty acids such as oleate, arachidonate and Akvsyanat with increased seed germination. From 74.72% to 76.87%, so that the amount of oleate and arachidonate rate from 0.09% to 0.35% and from 0.09% to 0.20% Akvsyanat was considerably rising.

Carbohydrates, triglycerides and proteins constitute the major components of the endosperm. This macro molecules during the process of germination, seedling growth, consumption in order to meet the different enzyme activities.

It is reported that triglycerides as the main source of energy for the germination of seeds of oilseed crops (Hope et al., 1997). During germination and early growth of seedlings in different genera of plant oils, almost all the content stored in the seed oil is consumed (Hope et al., 1997). Detection change of lipids and fatty acids during germination of alfalfa seeds also showed that while the D Allyl Try-Glysydha decreased glycerol and glycerol mono-Allyl swelled.

The combination of fatty acids and triglycerides did not change the composition of fatty acids and Di monoglycerol and changed. The amount of palmitic and oleic acid, linoleic and linolenic increased and decreased (Hong Vgran Wald 1990).

Table 1. Eskander digits Tuono effects of pollen and changes in fatty acids.

T	Methyl palmitate	Methyl Palmytvlyat	Methyl stearate	Methyl oleate	Methyl Akvsyanat	methyl arachidonate	Methyl Lynvlyat
Effects pollen skandar	6.31a	0.61a	2.57a	74.86b	0.1b	0.20 b	14.06b
Effects pollen Tuono	5.92b	0.44b	1.57b	76.53a	0.19a	0.24a	14.87a

The mean for each column and each agent has the same letters are based on Duncan's test at 5% and 1%, not significantly different from each other.

The mean for each column and each agent has the same letters are based on Duncan's test at 5% and 1%, not significantly different from each other.

Table 2. The effect of sampling time on the impact of changes in fatty acid composition of pollen source

Treatment	Methyl palmitate	Methyl Palmytvlyat	Methyl stearate	Methyl oleate	Methyl Lynvlyat	methyl arachidonate	Methyl Akvsyanat
Before germination	6.31a	0.61a	2.57a	74.86b	0.1b	0.20 b	14.06b
After germination	5.92b	0.44b	1.57b	76.53a	0.19a	0.24a	14.87a

The mean for each column and each agent has the same letters are based on Duncan's test at 5% and 1%, not significantly different from each other. The mean for each column and each agent has the same letters are based on Duncan's test at 5% and 1%, not significantly different from each other

9. THE INTERACTION BETWEEN POLLEN AND SAMPLING TIME ON FATTY ACIDS

As can be seen from Table 3, the interaction between the pollen and the sampling time was significant at 1% on the amount of fatty acids. The results showed that the highest rate of palmitate and Palmytvlyat at the intersection of Eskander and seed germination was observed after sh-12 cultivar. Evaluation of palmitate and Palmytvlyat showed that seeds from crosses of Eskander and sh-12 anymore, anymore Tuono and sh-12 special process before and after germination showed, So that the seeds from the cross anymore Eskander, sh-12, and also Tuono cultivar Palmytvlyat sh-12 levels before and after germination showed no significant difference. The seeds from crosses of Eskander with sh-12 cultivar palmitate during germination rate was significantly increased while the seeds resulting from the cross anymore Tuono and sh-12 of palmitate significantly reduced during germination. Most of methyl stearate at the intersection of Eskandar and seeds before germination was observed at sh-12 cultivar. Methyl stearate in the seed germination rate of 3.42%, which was significantly reduced during germination and amounts to 1.72 per cent. As can be seen from Table 3. The maximum amount of methyl oleate to the amount of 77.37 % at the confluence Tuono and seed germination was observed after sh-12 cultivare.

Detection change of methyl oleate in seeds of both crosses showed that the methyl oleate during germination significantly increased considerably rising So that the amount of methyl

oleate at the intersection of Eskander and seeds before germination cultivar sh- 12 73.35% to 76.37% with increased seed germination. The seeds are also derived from the cross cultivar Tuono and methyl oleate at sh-12 before germination rate was 76.70%, with 77.37% increase seed germination. As seen from Table 3 - see, the amount of methyl Lynvlyat the seeds from the cross cultivar Tuono and sh-12 in the pre-germination significantly higher than in seeds from crosses of Eskander and sh-12 more were anymore. The methyl Lynvlyat the seeds from the cross cultivar Tuono and 15.70% in the sh- 12's before the germination of seeds from crosses of Skander's and sh- 12's cultivar before germination was 14.04%. As can be seen from Table 3, the amount of methyl arachidonate in seeds of both cross cultivar Alexander, sh- 12, and sh-12 cultivar Tuono and significantly increased during germination. The amount of methyl arachidonate at the intersection of Eskander and seeds before germination cultivar sh- 12 was 0.1% with a 0.3% increase seed germination. Also, the amount of methyl arachidonate sh-12 seeds resulting from the cross cultivar Tuono and before germination was 0.09% with a 0.4% increase seed germination. Evaluation of changes in the seeds resulting from the cross-methyl Akvsyanat anymore Eskander and sh-12 showed that it was during the germination has not changed and its value before and after the confluence of seed germination were not significantly different from each other, So that the result of the confluence of the seeds before germination rate was 0.1%.

Unlike seeds from crosses of Eskander and the amount of methyl Akvsyanat cultivar sh- 12 before and after germination were not significantly different from each other, The seeds from the cross cultivar Tuono and sh-12 of methyl Akvsyanat significantly increased during germination, so that the rate of 0.09% to 0.3% in the pre-germination increased after germination. In general fatty acids in seeds resulting from the cross cultivar Eskander and sh-12 showed the greatest amount of fatty acids methyl oleate with 73.35% is allocated. After Lynvltat with 14.04% is methyl. After these two fatty acids that have the main contribution of fatty acids to methyl palmitate by 6.09% to 3.42 methyl stearate, methyl Palmytvlyat by 0.57%, with 0.1% methyl arachidonate and methyl Akvsyanat are. Also check the seed fatty acids derived from the cross cultivar Tuono and sh- 12 showed the greatest amount of fatty acid methyl Seeds from these crosses are the first with 76.70% is allocated. After Lynvltat with 15.70% is methyl. After these two fatty acids that have the main contribution of fatty acids to methyl palmitate by 6.13%, and 1.50% methyl stearate, methyl Palmytvlyat by 0.41%, and 0.09% methyl arachidonate and methyl Akvsyanat are. These results were consistent with the findings of other researchers (Shi et al., 1999).

Fat storage lipids in almond essence consists in the cotyledon tissue cells are particles (with diameters of 1 to 3 micrometers). (Ren et al., 2001). (Salo et al., 1997) have reported that genotypes of almond oil and almond variety is affected. In other oilseeds also affect the amount of oil in particular is the type genotypes. It was also reported that the climate in the oil and fatty acids and tocopherols are effective, So that in some years, but the increase in oleic acid decreased linoleic acid (Skin, 2000). The evaluation showed that the fatty acid composition of almond oil and oleic acid (68%) of the fatty acid almonds, then, linoleic acid (25%) and palmitic acid (4.7%) and a small amount (2.3%) of Palmytyvlyk acid, stearic and is Rashdyk (Xi et al., 1999). According to the report, Pune almonds contains 62.5% oleic, 29% linoleic acid, palmitic acid, 6.5%, 0.5%, palmitoleic, stearic 1.5%, respectively (Soler et al., 1988).

Linoleic and oleic acids as essential fatty acids have been fixed. Oleic acid content of about 72.5% (N Paryl) and 79.9% (Krystvmvrtv) and linoleic acid content of about 13.52% (Krystvmvrtv) and 19.77 percent (N Paryl) has been reported (Sachs et al., 2008).

Rvzban et al (2005), oil content and fatty acid composition were assessed 4 variety of Iranian pistachio in Qazvin. Fatty acid composition of pistachio nuts by oleic and linoleic acid, which mostly consists of skins. Garcia et al. (1994), stated that the conflicting relationship between linoleic acid and oleic acid found in nuts, like other fruits. Thus, if the number is high quantity of linoleic acid, oleic acid content is low and vice versa. It is reported that walnut oil fatty acid varieties differ. This difference in detection and diagnosis of the growing numbers of suitable fatty acids have the highest level and the highest quality, it is important (Zvart et al., 1999). In a study of the composition is stored in two varieties of safflower seed germination and early growth of seedlings at various stages of investigation and 54.7% reported that the amount of oil and 54.3% of the stored seeds and 45.1% to 49.5% had (Tvngag and co-workers 2012). A study of physiological changes and lipid composition of sunflower seeds (*Helianthus annuus L.*) during seed germination were studied.

The results of this study showed that rapid germination containing phospholipids, glycolipid and sterols increased in length from 1 to 6 days While their germination rates began to rise after 4 days of culture. Seedlings grown in the amount of palmitic acid and oleic acid in the rapid growth increased at 6 and 8 days While the germination of seeds grown in terms of the amount of palmitic acid, oleic acid and decreased Astaryyk (Mvnshy et al., 2007). The study of lipid synthesis during germination of seeds of soybean cultivar was found that during the germination rate increased more glycerol decreases the amount of phospholipids. The results showed that the ratio of phospholipids to Fsvglysylvha significantly increased (Harvrd, 1974).

The changes of lipids and fatty acids during germination of alfalfa seeds were investigated. The results of this study showed that the amount of di-Allyl Try-Glysyrdha decreased while glycerol and glycerol mono-Allyl swelled. The composition of fatty acids did not show much change but Glysyrd fatty acids, glycerol mono, di and changed so that the amount of palmitic and oleic acid, linoleic and linolenic increased and decreased (Hong and Gran Wald, 1990). This research study is AGL2007-65,853-C02-02 from the Spanish CICYT.

Table 3. Interaction between Eskander and Tuono pollen varieties and sampling time on changes of fatty acids

Treatment	time	Methyl stearate	Methyl Palmytvlyat	Methyl palmitat	Methyl Akvsyanat	methyl arachidonate	Methyl Lynvlyat	Methyl oleate
Pollen Eskandar	Before germination	3.42a	0.59a	6.09b	0.1b	0.1c	14.04b	73.35c
	After germination	1.72b	0.64a	6.54a	0.3b	0.3b	14.08b	76.37b
Pollen Tuono	Before germination	1.50c	0.41b	6.13b	0.09b	0.09c	15.70a	76.70b
	After germination	1.64b	0.48b	5.72c	0.3a	0.4a	14.05b	77.37a

10. FIGURES AND DRAWINGS

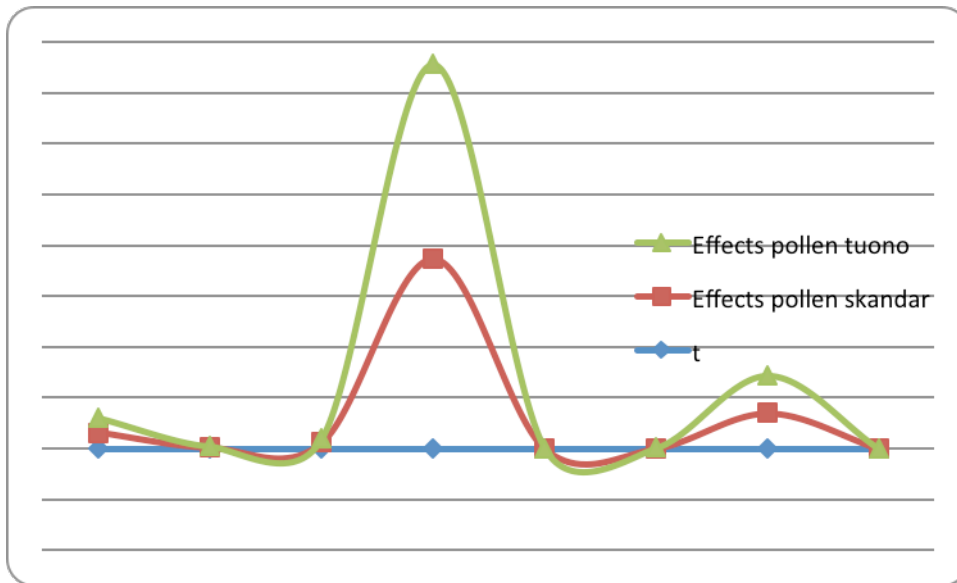


Figure 1. The effect of pollen on the changes of fatty acids.

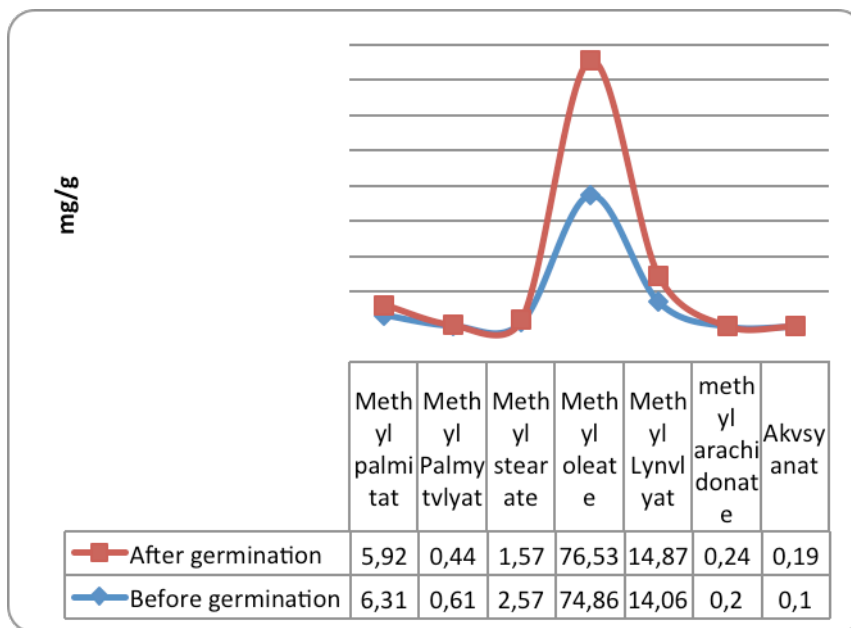


Figure 2. The effect of sampling time on fatty acid changes after the impact of pollen source.

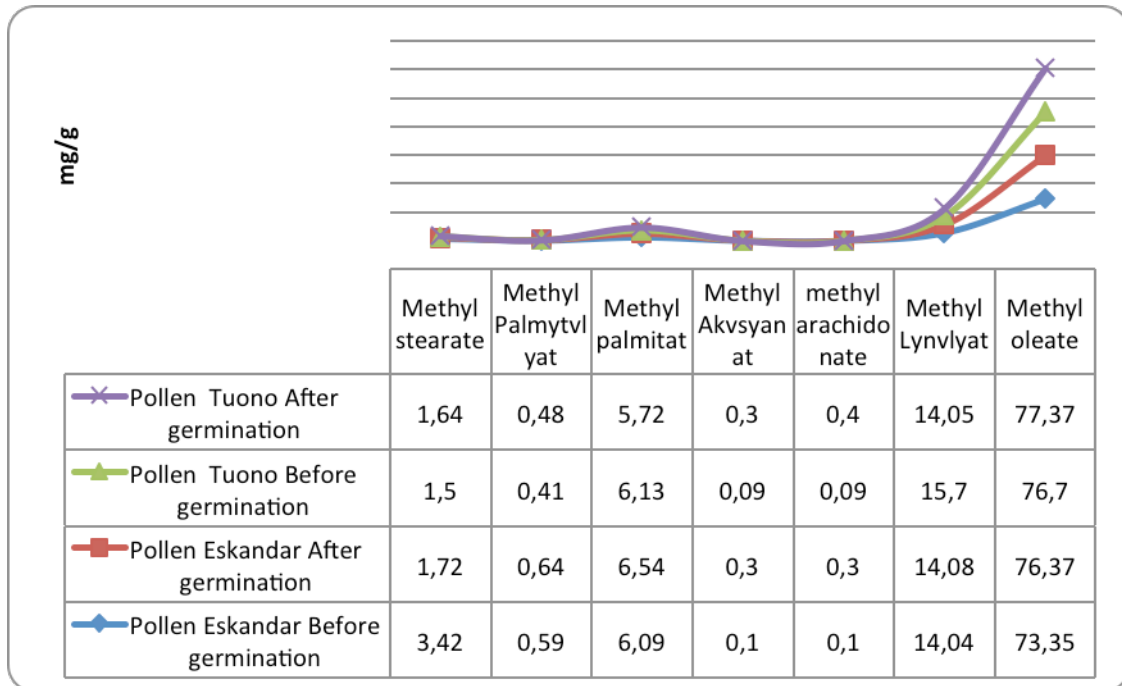


Figure 3. Interaction between Eskander and Tuono pollen varieties and sampling time on changes of fatty acids.

11. CONCLUSIONS

Due to the fact that acid oleate Jzmmhtryn almond seed fatty acid is shown in this study Seeds from the confluence with the greatest change in the amount of 76.37 percent Eskaander × cultivar sh- 12 milligrams per gram to 3.02% of modified fatty acids in the figure has improved. But increase the amount of fatty acids in both crosses were positive. So that the seeds from the cross cultivar Tuono ×sh- 12 milligrams per gram, which is 0.67% of the amount of 77.37% increase compared to the prior approval of the first germination rate of increase in the acid.

Unsaturated fat protein found in almonds makes use of this product is effective in cardiovascular congestion precautions. Finally, the almond is the only source of food and eating it all amino acids in the body are provided. The high fat content increases product durability So pay attention to the improvement of the above can be effective in producing a rich and healthy communities.

REFERENCES

- [1] Askin, M.A., Balta, M.F., Tekintas, F.E., Kazankaya, A., Balta, F., 2007. Fatty acid composition affected by kernel weight in almond [*Prunus dulcis* (Mill.) D.A. Webb. genetic resources. *J. Food Comp. Anal.* 20, 7–12.
- [2] Abdallah, A., Ahumada, M.H. and Gradziel, T.M. 1998. Oil content and fatty acid composition of almond kernels from different genotypes and California production regions. *J. Am. Soc. Hort. Sci.* 123:1029–1033.

- [3] Beringer, H., and N.P. Saxena. 1968. Effect of temperature on the tocopherol content of seed oils. *Z. Pflanzenern. Bodenk.* 120:71–78.
- [4] Dicenta, F., Ortega, E., Ca'novas, J.A., Egea, J., 2002a. Self-pollination vs. cross-pollination in almond: pollen tube growth, fruit and fruit characteristics. *Plant Breeding* 121, 163–167.
- [5] Dogan, M. and Akgul, A. 2005. Fatty acid composition of some walnut (*Juglans regia* L.) cultivars from east Anatolia. *Grasasy Aceites (Sevilla)*. 4: 328-331.
- [6] Dong-dong, C., Jin, H., Xin-xian, H., Xian-ju, W., Ya-jing, G and Zhou-fei ,W. 2008. Relationships between changes of kernel nutritive components and seed vigor during development stages of F1 seeds of *sh2* sweet corn. *Journal of Zhejiang University Science*. Volume 9, Issue 12, pp 964-968.
- [7] Feng, C., LAN-JU, M, Xiao- long, A., Shu, G and Tang, C. 2011. Lipid Peroxidation and Antioxidant Responses during Seed Germination of *Jatropha curcas*. *International journal of agriculture & Biology*: (13) 25-30.
- [8] Garcia, J. M., I. T. Agar. and J. Streif. 1994. Lipid characteristics of kernels from different hazelnut cultivars. *Journal of Agricultural and Forestry*. 18:199-202.
- [9] García-López, C., N.Grané-Teruel, V. Berenguer-Navarro, J.E. García-García, and M.L. Martín-Carratalá. 1996. Major fatty acid composition of 19 almond cultivars of different origins. A chemometric approach. *J. Agr. Food Chem.* 46:963–967.
- [10] García-Pascual, P., M. Mateos, V. Carbonell, and D.M. Salazar. 2003. Influence of storage conditions on the quality of shelled and roasted almonds. *Biosystems Eng.* 84: 201–209.
- [11] Hallabo, S.A.S., El-Wakeil, F.A., Morsi, M., Khairy, S., 1975. Chemical and physical properties of apricot kernel oil and almond kernel oil. *Egypt. J. Food Sci.* 3, 1–5. Hassanein, M.M.M., 1999. Studies on non-traditional oils. I. Detailed studies on different lipid profiles of some Rosaceae kernel oils. *Grasas y Aceites* 50, 379–384.
- [12] Harwood, J. 1974. Lipid Synthesis By germinating soya bean. *Photochemistry*. vol. 14. pp. 1985-1990.
- [13] Hoppe A, Th eimer RR. Degradation of oil bodies isolated from cotyledons during germination of rapeseed seedlings. *J Plant Physiol* 151: 471-478, 1997.
- [14] Huang, lands grunwald, C. 1990. Lipid and Fatty Acid Changes during germination of Alfalfa Seeds. *Photochemistry*, Vol. 29, No. 5, pp. 1441-1445, Hyson, D.A., B.O. Schneeman, and P.A. Davis. 2002. Almonds and almond oil have similar effects on plasma lipids and LDL oxidation in healthy men and women. *J. Nutr.* 132:703–707.
- [15] Johansson, A., Laakso, P., Kallio, H., 1997. Characterization of seed oils of wild, edible Finish berries. *Z. Lebensm. Unters. Forsch. A* 204, 300–307.
- [16] Kamymak, H. 2012. The relationships between seed fatty acids profile and seed germination in cucurbit species. *Žemdirbystė=Agriculture*, vol. 99, No. 3. pp. 299–304.
- [17] Kester, D.E., Gradziel, T.M., Micke, W.C., 1994. Identifying pollen incompatibility groups in California almond cultivars. *J. Am. Soc. Hort. Sci.* 119, 106– 109.
- [18] Kodad O., Socias i Company R., Prats M.S. and López Ortiz M.C., 2006. Variability in tocopherol concentrations in almond oil and its use as a selection criterion in almond breeding. In: *J. Hort. Sci. Biotechnol.*, 81, p. 501-507.
- [19] Kodad, O., R. Socias i Company, M.S. Prats, and M.C. López Ortiz. 2006. Variability in tocopherol concentrations in almond oil and its use as a selection criterion in almond breeding. *J. Hort. Sci. Biotechnol.* 81:501–507.

- [20] Kodak, O. and Socias, R. 2008. Fruit quality in almond as related to the type of pollination in self compatible genotypes. *J. Amer. Soc. Hort.* 133(3): 320-326.
- [21] Mehran, M., Filsoof, M., 1974. Characteristics of Iranian almond nuts and oils. *J. Am. Oil Chem. Soc.* 51, 433–434.
- [22] Munshi¹, S. K., Sandhu¹, S and Sharma¹, S. 2007. Lipid Composition in fast and slow germinating Sunflower (*Hellanthus annuus* L.) Seeds. *Gen. Appl. Plant Physiology.* 33 (3-4), 235-246.
- [23] Offem, J., Egebe, E and Onen, E. 2006. Changes in lipid content and composition during germination of groundnuts. *Journal of the Science of Food and Agriculture.* Volume 62, Issue 2, 147–155.
- [24] Oukabli, A., Lansari, A., Loudiyi, W., Abousalim, A., 2001. Effets endogamiques sur la germination et la croissance de semis du cultivar autocompatible Tuono (*Prunus dulcis*). *Fruits* 56, 197–205.
- [25] Oukabli, A., Lansari, A., Wallali, D.L., Abousalem, A., Egea, J., Micheaux-Ferrier, N., 2000. Self and cross pollination effects on pollen tube growth and fertilization in self-compatible almond *Prunus dulcis* ‘Tuono’. *J. Hort. Sci. Biotechnol.* 75, 739– 744.
- [26] Ren, Y., K.W. Waldron, J.F. Pacy, and P.R. Ellis. 2001. Chemical and histochemical characterization of cell wall polysaccharides in almond seeds in relation to lipid bioavailability, pp. 448–452. In W. Pfannhauser, G.R. Fenwick, and S Khokhar (eds.), *Biologically active phytochemicals in food.* Royal Soc. Chemistry, Cambridge, UK.
- [27] Riazi, GH., M. Rahemi and Sh. Khanizadeh. 1996. Effects of selected pistachio pollen on developmen and quality of pistachio nuts of three commercially grown cultivars. *Journal of Plant Nutrition.* 19(3): 635-641.
- [28] Romero, M.P., M.J. Tovar, T. Ramos, and M.J. Motilva. 2003. Effect of crop season on the composition of virgin olive oil with protected designation of ‘Les Garrigues’. *J. Am. Oil Chem. Soc.* 80:423–430.
- [29] Salvo, F., G. Dugo, A.Cotroneo.1997 .Composition of almond oil. II. Distinction of sweet almond oil from blends with peach and apricot seed oil", *Rivista Italiana delle Sostanze Grasse*, Vol 57, No.:1, p. 24-26.
- [30] Socias i Company, R., and Alonso, J.M., 2004. Cross-incompatibility of ‘Ferragne’ s’ and ‘Ferralise’ and pollination efficiency for self-compatibility transmission in almond. *Euphytica* 135: 333–338.
- [31] Soler, L., Canellas, J., Saura-Calixto, F., 1988. Oil content and fatty acid composition of developing almond seeds. *J. Agric. Food Chem.* 36, 695–697.
- [32] Wanasundara, P.K., Wanasundara, U.N and Shahidi F. 1999. Changes in Flax (*Linum usitatissimum* L.) Seed Lipids during Germination. *Canadian journal agricultural research.*43-49.
- [33] ng to water stress”, *Indian Journal of Biology Technology*, 1, 44-49.