

A RESEARCH ON SOME COMPOSITIONAL PROPERTIES OF MELON SEED AND BITTER ALMOND

KAVUN ÇEKİRDEĞİ VE ACIBADEMİN BAZI BİLEŞİM UNSURLARI ÜZERİNE BİR ARAŞTIRMA

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ABSTRACT: Protein and oil amounts and oil characteristics of melon seed and bitter almond were investigated. On a dry basis, the data obtained for the two seeds were as follows; crude oil 33.23 % and 51.04 %; crude protein 24.10 % and 28.13 %. The major fatty acids of the oils were linoleic acid (18:2) at the concentrations of 60.01 % and oleic acid (18:1) at the concentrations of 68.58 %, respectively.

ÖZET: Kavun çekirdeği ve acibadem protein ve yağ miktarları ile yağlarının karakteristikleri araştırılmıştır. Elde edilen bulgulara göre; kurumaddede sırasıyla, ham yağ % 33,23 ve %51,04, ham protein % 24,10 ve % 28,13'tür. Önemli yağ asitleri olarak, kavun çekirdeği yağında % 60,01 konsantrasyonunda linoleik asit (18:2) ve acibadem yağında % 68,58 konsantrasyonunda oleik asit (18:1) varlığı saptanmıştır.

INTRODUCTION

Melon (*Cucumis melo*) seed and bitter almond (*Prunus dulcis* var. *amara*) have very limited use in the world as in Turkey. Melon seeds are used in oil production in some countries, especially in Nigeria (GIRGIS ve SAID, 1968). The protein rich residue is also used as an additive in local food dishes (OGUNREMI 1978). Bitter almond is the main source of almond oil which is used as a flavour and in emollient preparations for the skin. Before refining, the kernels of the nuts and crude oil contain prussic acid (HCN), but the bitterness of the nut should deter anyone from eating enough to be poisoned (Nicholson et.al.). No data indicates that the bitter almond is consumed as a food.

Melon seed and bitter almond, which have no commercial value in Turkey, are locally used in the production of some aromatic beverages. Dried almond, sugar, starch, citric acid and water are used in the production of almond beverage. After soaked in hot water, skin of almond is removed and kernels are ground. The mixture is then cooked up to 65 brix degrees. The product obtained, can be stored for up to a year. Before serving, the product has to be diluted four times with hot water and served with cinnamon powder.

The melon beverage is locally known as subye. To produce subye, dried melon seeds are ground and mixed with sugar and cold water. After filtering the mixture through the muslin, the drink must be consumed in a short time.

The aim of our work was to determinate of some properties of melon seed, bitter almond and their oils.

MATERIALS AND METHODS

Materials

Dried melon seed and bitter almond samples were collected from Manisa-Kırkağaç and from Denizli-Tavas in Turkey, respectively.

Methods

Determination of the crude oil was performed as per APPELQUIST (1967). The protein was determined by the kjeldahl method (ANON,1969) and AOAC (ANON, 1980) method was used in determining the moisture.

The ground seeds were extracted by cold petroleum benzene. In the obtained crude oils, specific gravity, refractive index, acidity, iodine value and saponification number were determined in accordance with I.U.P.A.C. (1964).

Fatty acids were characterized by gas chromatography (DAUN et. al. 1983). After adding hexane, oil samples were transesterified by using 0.4 N methanolic NaOCH₃. Then water was added and 1 microliter of hexane layer was injected into the gas chromatograph (Varian 3400) equipped with hydrogen flame ionization detector using a 3/16"x 6' stainless steel column coated with CSP 510.

RESULTS

Moisture contents of melon seed and bitter almond were 5.15 % and 4.80 %, respectively. Table 1 shows protein and oil ratios of samples and also their oil characteristics.

Fatty acid composition of melon seed, bitter almond and some oilseeds are compared in Table 2. Gas chromatograms of melon seed and bitter almond are shown in Figure 1.

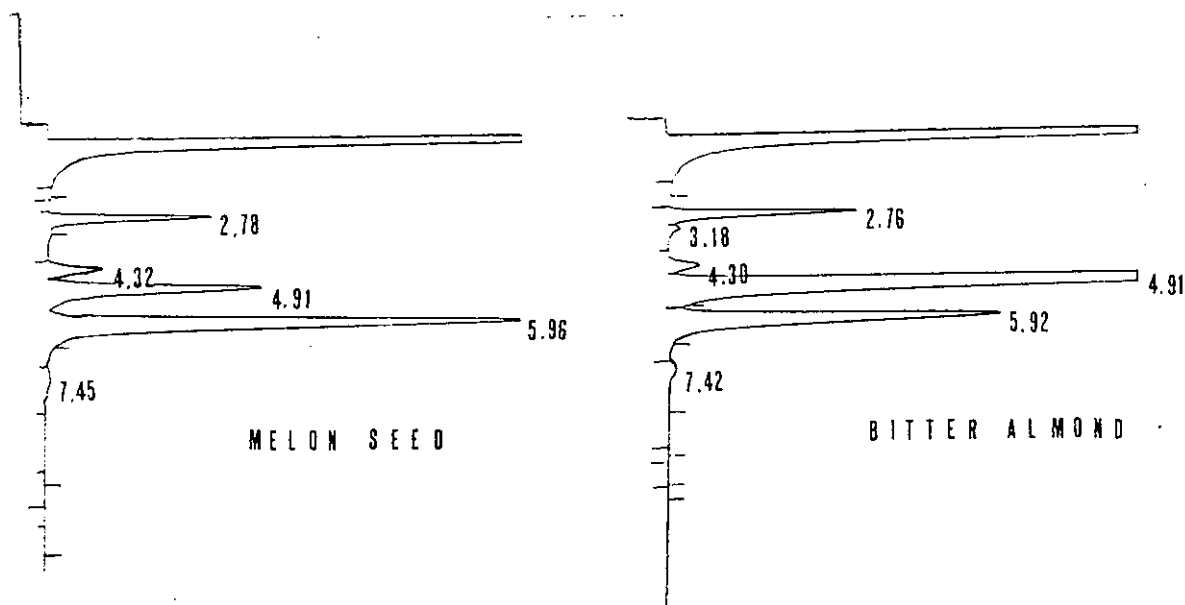


Figure 1: Gas chromatograms of melon seed and bitter almond

Table 1: Some compositional properties (dry basis) and oil characteristics of melon seed and bitter almond

Assay	Melon Seed	Bitter Almond
Seed		
Crude oil (%)	33.23	51.04
Crude protein (%)	24.10	28.13
Oil		
Specific gravity (25/25 C)	0.921	0.916
Refractive index (20 C)	1.4740	1.4699
Acidity, % as oleic acid	0.22	0.27
Iodine value	129.0	103.6
Saponification number	192	190

Results obtained from melon seeds were similar and comparable to other publications (LAZOS 1986, KAMEL et. al 1982). The major fatty acids of melon seed oil and bitter almond oil were linoleic acid

(18:2) and oleic acid (18:1), respectively. Results in Table 2 revealed that melon seed oil was very similar to corn and sunflower oil, while bitter almond oil was similar to olive oil and with the exception of linolenic acid content to canola oil.

Table 2: Fatty acid composition of melon seed, bitter almond and some oilseeds

Fatty acid	Melon seed	Bitteralmond	Sunflower (a)	Corn(a)	Canola (a)	Olive (a)
16:0	10.81	7.28	7.0	11.0	4.0	14.0
16:1	-	0.59	-	-	-	-
18:0	5.34	1.16	5.0	2.0	2.0	2.0
18:1	23.38	68.58	19.0	27.0	55.0	64.0
18:2	60.01	21.92	66.0	59.0	26.0	16.0
18:3	0.46	0.46	-	1.0	10.0	-
20:0	-	-	-	-	2.0	-

a) Vaisey-Genser and Eskin, 1989.

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YAZARLARA DUYURU

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