EVALUATION OF SOME BIOCHEMICAL COMPOSITION OF SILYBUMMARIANUM SEED OIL IN TWO DIFFERENT REGIONS OF FARS STATE

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Abstract- In this study Silybummarianum was collected from Kazeron (fars-iran) and Lorestan. The oil obtained were extracted using hexane Soxhlet . Fatty acids composition was identified by Gc/Mass device , The most Fatty acids composition include compounds , Palmitic acid, Stearic acid, Oleic acid, Linoleic acid were . Silybummarianum seed oil also contained linoleic (54.71%) and oleic acids (30.42%) as the principal fatty acids were . The oil refractive index was performed with Refractometr method. Peroxide was measured with thiosulfate and peroxide value of the oil sample was 0.68(meq//kg)Kazeroon , 0.57(meq//kg) for example Lorestan. Determination of peroxide value test Which is widely used indices. The Test concentrations of peroxides and hydro peroxides formed Were measured at the start and on the , (meq//kg) milli equivalents peroxide per kg of Fat expressed.

Keywords- Silybummarianum , Soxhlet , Thiosulfate, , GC/Mass , Peroxide

I. INTRODUCTION

Edible fats, which are suitable for certain food service andbakery purposes, need to be solid or semisolid at room temperature.Those commonly used are animal fats such as tallow,Or vegetable fats and blends containing palm oil, coconut oil,and partially hydrogenated soybean oil. Their public healthdisadvantage lies in the high content of laurie, mynistic,palmitic, or trans fatty acids, each of which has been shown toraise the plasma low-density-lipoprotein (LDL) concentrationsin people, especially those at risk from hypercholesterolemia[1 , 2]. Commercial edible oils are appreciated in cooking due to the taste they give to foods and for its delicacy. In the last years, New analytical methods have been required to evaluate their processing and storage conditions [3,4,5,6,7] . The quality of edible oils with regard to freshness, storability and toxicity can be evaluated by the determination of metals. Trace levels of metals like Fe, Cu, Ca, Mg, Co, Ni and Mn are known to increase the rate of oil oxidation whileother elements such as Cr, Cd, and Pb are very important on account of their toxicity and metabolic role. Thus, the development of rapid and accurate analytical methods for trace elements determination in edible oil has been a challenge in quality control and food analysis [8].

Milk thistle, SilybummarianumGaertn from Asteraceaeplant family, is a well known medicinal plant, native to theMediterranean region of Europe and widely dispersed tomany countries throughout the world. Its medicinal effectsare documented among the alternative medicinesreferred to as liver and bile-related diseases remedy [9,10] .

SilybumMarianum (Milk thistle) is a well known medicinal plantthat has been used for centuries as a herbal medicinefor the treatment of liver-related diseases [11] It is widely prescribed by herbalists and hasalmost no known side effects. The plant is native to theMediterranean and grows throughout Europe and NorthAmerica. It also grows in India, China, South America,Africa and Australia [12] .Silymarin ,a flavonolignan complex that contains silibinin, wasisolated from this plant in the 17th century and hasbeen clinically used to treat various liver aliments formore than 3 decades [13] .

The aim of this study was to identify the composition of fatty acids , Measurement of the refractive index and the Determination of peroxide oil. milk thistle that was collected from two regions of Lorestan (Khoramabad) (West Iran) and Kazeroon (Iran – Fars) .the was evaluated .

II. COLLECTION OF SAMPLES

Milkthistle seeds were collected in July 2014 Kazero n(Iran – Fars) Height from sea level 860 m, Lorestan(Khoramabad) (West Iran) Height from sea level 500 m (Shown in Figure 1). The plant was identified by the Medicinal Plant Research Center, Shiraz University

.Milkthistle seeds were then dried at room temperature ($25C^0$) .The oil obtained were extracted using hexane Soxhlet .





KazeronLorestan

Figure 1: Geographical location Kazeron and Lorestan

2.1. Reagents and chemicals

The chemicals used in this experiment i,e, hexane, acetic acid , chloroform, potassium iodine , thiosulfate were purchased from the Merck, Germany.

1.2. Oil extraction

To perform the conventional oil extraction, a pilot-scaleSoxhlet extraction unit was operated for 9 h using AW406,which is a commercial organic solvent applied to theextraction of crude edible oils. Based on the manufacturerdata, the n-hexane content of this solvent was,30% (with a total hexane content of ,70%)[14] . (Shown in Figure 2) .

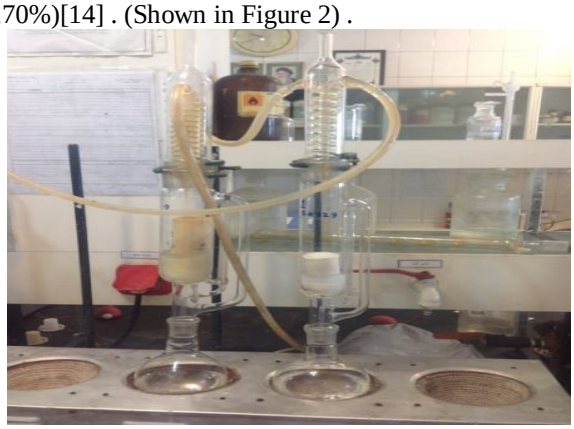


Figure 2

:Silybummarianum seed oil extraction by soxhlet and hexane

2.3 .Analysis of fatty acids

The fatty acid composition was determined by conversionof oil to fatty acid methyl esters prepared by mixingof 950 lL of n-hexane and 50 mg of oil followed byadding 50 lL of sodium methoxide[15] .Fatty acids were transformed to their methyl esters(FAME), following the method of He and Xia [16] andwere determined by using a gas chromatograph TraceSeries (PEG20 M) equipped with a flame ionizationdetector. The FAME sample (1.5 lL) was injected and GCseparation was carried out on a capillary column(PEG20 M; 30 m 9 0.25 mm 9 0.25 lm). The carrier gaswas nitrogen and the column flow rate was 0.8 mL/min.The oven temperature was held initially at 180 _C for1 min, increased from 180 to 240 _C at a rate of 3 _C/minand then maintained at 240 _C for 10 min. The temperaturesof the injection port and detector were 250 and260 _C, respectively. FAME were positively identified bymatching their retention time data and mass spectra withthose of the standards. The fatty acid composition wascalculated from the total identified fatty acid area [17] .

2.4 .Measuring the refractive index of oil

To measure the refractive index of of a drop of oil in the oil Refractometr throw refractive indexthan the refractive index of water is calculated at 40 ° C.Oil and refractive index of can be calculated by Refractometr .(Shown in Figure 3)



Figure 3: Measuring the refractive index of oil

2.5 .Determination of peroxide oil

The peroxide value measurement method is based on standard tests of food (AOAC) Association of official analytical chemists was [18] . In this method, the amount of 5 g sample was prepared in a 250 mL flask Maier sandi ngweighed and 30 mL of solvent (mixture of acetic acid and chloroform) to be added . . Then about / 5 ml of potassium iodine is added and mixed for 1 minute laidandbeoccasional resident is be stirred . . Then, 30 ml of distilled water was added and the solution was added a few drops ofgluestarch and soluble thiosulfate 0.02% is the normal title . When the color of a transparent mode and stop the titration was clear and peroxide valueis calculated by the formula [18] .Experiments were performed three times for each sample . (Shown in Figure 4) .

(1000×normality×Dose titration volume)/Sample volumes





Figure 4: Measurement of oil peroxide

III. RESULTS AND DISCUSSION

Silybummarianum seed oil fatty acids were identified by GC . The fatty acid composition of seed oil, Silybummarianum that was collected from two locations Kazeron and Lorestan, Included $C_{16:0}$, $C_{18:0}$, C18:1 , C18:2 were .(Table 1) reported a 25.32% oil yield for Silybummarianum seeds. While our results are in accordance withthe previous reports on Silybummarianum seeds, variations in oilyield and oil content may be due to the differences invariety of plant, cultivation climate, ripening stage, theharvesting time of the seeds, location and the extractionmethod used [19, 20] .Silybummarianum seed oil also contained linoleic (54.71%)

and oleic (30.42%) acids as the principal fatty acids [21,22] .also found that linoleic acid was the principal fatty acidfollowed by oleic, 52.1 and 32.14%, respectively, for the oil extracted from anunspecified variety of Silybummarianum seed oil alsoreported to have linoleic acid (52.78%) as a principle fatty acid [23,24].

Table 1 : Fatty acid composition of S .marianum seed oil

Fatty acid composition		Fatty acid in S . marianum seed (sample Kazeron)	Fatty acid in S . marianum seed (sample Lorestan)
C1 6:0	Palmitic acid	7.99	9.26
C1 6:1	Palmitoleic acid		
C1 7:1	Margaric acid		
C1 8:0	Stearic acid	5.607	5.01
C1 8:1	Oleic acid	28.54	30.42
C1 8:2	Linoleic acid	54.71	52.78
C1 8:3	α-Linolenic acid	3.13	2.51
C2 0:0	Arachidic acid		
C2 2:0	dodecanoic acid		

Silybummarianum oil refractive index measurement was performed with Refractometr .The results were determined by Refractometr . (Shown in Table 2) .The double bond is less than the number of lower refractive index and The refractive index is higher than the melting point and lower saturation .

Table 2 : Measurement of the refractive index of S. marianum seed oil

Sample	Refractive index
S .marianum seed oil (sample Kazeron)	1.4651
S .marianum seed oil (sample Lorestan)	1.4656

Determination of peroxide value test Which is widely used indices. The est concentrations of peroxides and hydro peroxides formed Were measured at the start and on the (meq//kg) mill equivalents peroxide per kg of Fat expressed .Because residents the absence of peroxide Manipulation of the test samples must be carefully There. High lipid peroxide value of the index is corrupt. The peroxides can cause irreversibly damage Cell proteins, resulting in degeneration and necrosis The cells are .On the other hand to increasing levels of peroxide To enter the auto-oxidation stage (stage of development)Provides. The peroxide value by taking Expiration date of the

product, normal oil indexIs taken. However the conditions of production, packaging, Stored and preservation of the oilOils are healthy [25,26]. The measurement results are(shown in Table 3). peroxide Silybummarianum oil .

Table 3: Measuring the peroxide sample

Sample	Results peroxide (meq//kg)
S .marianum seed oil (sample Kazeron)	0.68
S .marianum seed oil (sample Lorestan)	0.57

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