Fatty Acids Composition of Seed & Fleshoil of Prunus Microcarpa Fruit.

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Abstract

Prunus microcarpa fruit seed and flesh oils have been extracted and found to be 15.7671% and 0.3710 % respectively. The oils was analyzed qualitatively and quantitatively for the fatty acids content using GLC gas liquid chromatography. It showed that the seed oil contains five fatty acids: myristic, palmitic, stearic, oleic and, linoleic; while the flesh oil contains nine fatty acids: lauric, myristic, palmitic, palmitoleicl, stearic, oleic, linoleic, linolenic,, and erucic.

Some of the identified fatty acids were found to be unsaturated. The result indicates that it can be used as potential source for oil which may be utilized for different purposes.

Keywords *:- GLC, fatty acids, prunus microcarpa.*

Introduction

Prunus microcarpa plant occurs wild in the Kurdistan mountains and is also can be seen frequent every where in the forest zone of Kurdistan, occasional in the lower margin of the thorm- cushion zone.[1]

Prunus microcarpa belongs to Rosaceae family, this large family of 100 genera and 2000 species includes trees, shrub, and usually perennial herbs.[2]

A local name of prunus microcarpa in kurdish language is balalook, arabic name is (كرز صغير الثمرة) and English name is little cherry.[1]

Literature survey indicates that no work has been reported with regard to the fatty acids composition of the seed and flesh oils of prunus microcarpa fruit.

Consequently, it was decided to carry out a systematic study on the seeds and flesh of prunus microcarpa fruit in an attempt to contribute to the knowledge of its constituents. This part deals with the lipid fraction of the seeds and flesh.

Further investigation are being carried out and will be reported later.

*Cited from her M. Sc.Thsis

Experimental

The fruit of prunus microcarpa have been collected in June 2000 in Sulaimani governerate(north of Iraq).

The flesh of the fruit was separated by suitable method from the seed. the seed and flesh were crashed through a willy mill. The oil contents of seed and flesh were determined in a continuous soxhlet apparatus using petroleum ether (30-40)C°. The characteristie properties of the oils were determined by the conventional methods. The results are presented in Table (1).

Trans Esterification

The methyl esters of the fatty acids which were prepared by trans esterification of the oils[3] (1g of oils was put in 20ml stoppered test tube then 10ml of heptane was added, also 0.5ml of 2M methanolic KOH was added, the mixture was shaked for 20sec. and solution became clear, after a while, turbidity forms due to the separation of glycerol, the upper heptane layer containing the methyl esters was decanted in to a small vial).

GLC Analysis

Sample for GLC was prepared by using (0.2µl) of the methyl ester and subjected to vapour phase gas chromatography column.

The mobile phase was nitrogen gas and a glass column which is (6 foot) in length and (4 min) in diameter was used.

The stationary phase was %15 of DEGS (Diethylen glycol succinate) on soild material of chromosorb WAW DMCS which is the 80-100 mesh diameter.

The oven tempratures was programmed from 140C°-190C° at 8C° /min, the temperatures of both injection and the detector were 200C°. The nitrogen gas flow was 24ml/min. Identification of peaks were achieved by comparison of the retention time of the fatty acids and their methyl esters of the oils with the retention times of pure fatty acids and their methyl esters analyzed under identifical condition aided in the direct identification of the peaks on the chromatographic record. The data calculated as weight percent fatty acids is given in Table(2).

Results and Discussion

Prunus microcarpa fruit gave 15.7671% seed oil and 0.3710% flesh oil. The oils are yellow colour. The characteristies properties of the oils compared well to each other Table(1). Qualitative and quantitative analysis of the methyl esters of fatty acids of the oils showed the presence of methyl myristate, palmitate, stearate, oleate, and linoleate as the main fatty acid esters of the studied oils of both seed and flesh of prunus microcarpa fruit.

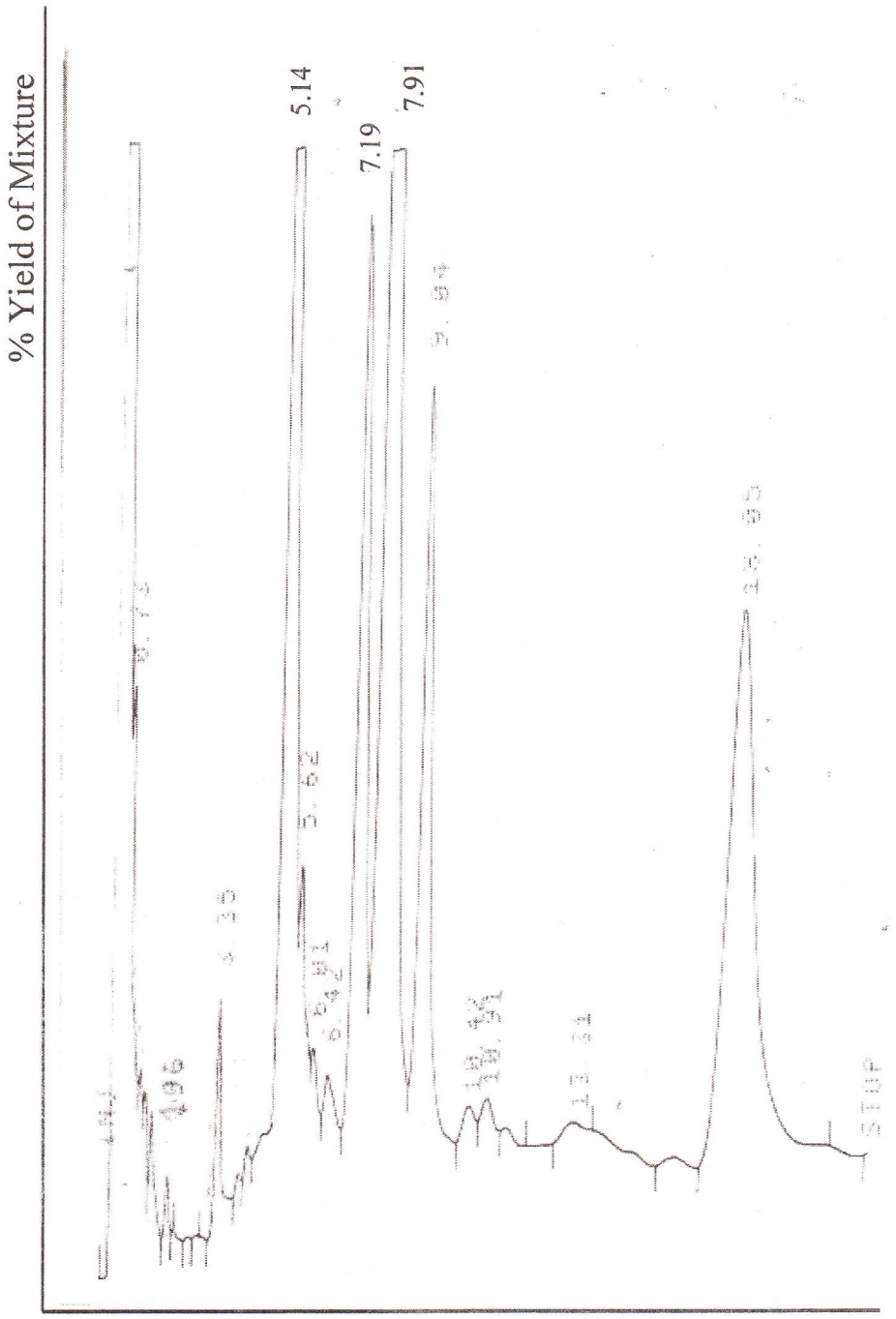

Fig. (1): GLC Chromatograms of a Mixture of Authentic Methyl Esters of Lauric, Myristic, Palmitic, Palmitoleic, Stearic, Oleic, Linoleic, Linolenic, Erucic Acids.

It is important to point out that the fatty acid composition of pericarp tissues is generally different from the fatty acid composition of the seeds enclosed inside the fruit proper [11]

Fig (3) and fig.(4) represent chromatograms of seed and flesh of prunus microcarpa fruit, both chromatograms showed high percent of palmitic, oleic, linoleic acids

Analysis of the oil of prunus microcarpa fruit showed them to contain high percentage of unsaturated fatty acids (86.684%, 58.4754%) in both seed and flesh respectively. while the fatty acids present in (prunus cerasus L) montmorency cherry pit oil were identified to be oleic (63.6%) and linoleic (31.5%) acids by spectral and GC analysis[12].

The nutritional value of the oils determined by the amount of unsaturated fatty acids in the oils.

Table (3): Percentage of Fatty Acids Obtained From GLC Analysis of Prunus Microcarpa Fruit (Seed And Flesh).

No.	No. of carbon	Common name of the acid	Sat or unsat	Rt time			Area under peak (A%)	
				St	Seed	Flesh	Seed	Flesh
1	C12	Lauric	Sat	1.96	-----	1.96	-----	0.2354
2	C14	Myristic	Sat	3.21	3.06	3.35	1.638	1.497
3	C16	Palmitic	Sat	5.48	5.43	5.12	9.864	29.41
4	C16¯	Palmitoleic	Unsat	5.62	-----	5.61	-----	0.9578
5	C18_	Stearic	Sat	7.12	7.18	7.17	1.923	9.773
6	C18=	Oleic	Unsat	7.97	8.06	7.88	58.554	40.13
7	C18≡	Linoleic	Unsat	8.64	8.67	9.03	28.13	8.32
8	C18¯	Linolenic	Unsat	10.91	-----	10.92	-----	0.4281
9	C22	Erucic	Unsat	18.05	-----	17.81	-----	3.64

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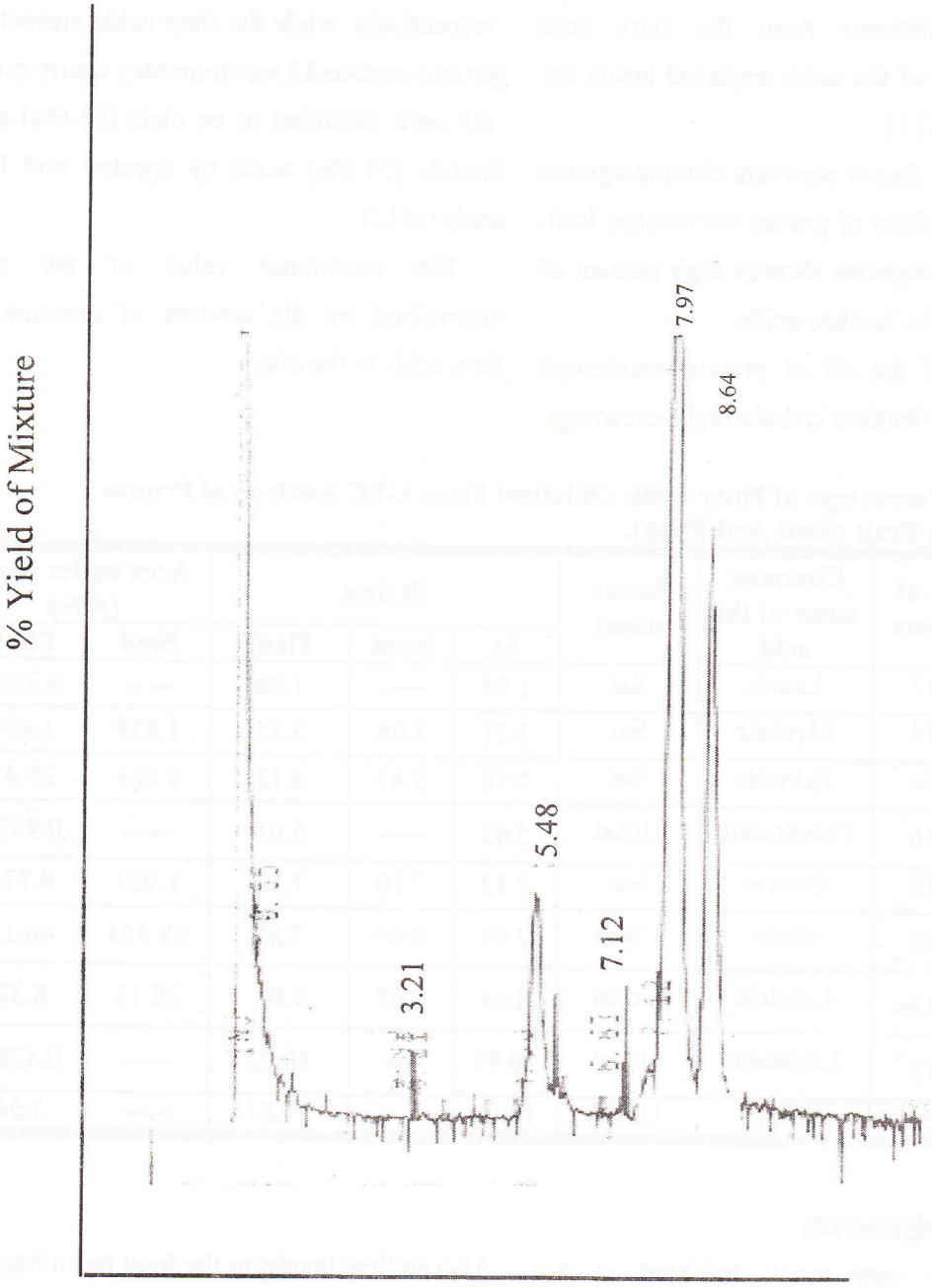

Fig. (2): GLC Chromatograms of a Mixture of Authentic Methyl Esters of Myristic, Palmitic, Stearic, Oleic, Linoleic Acids.

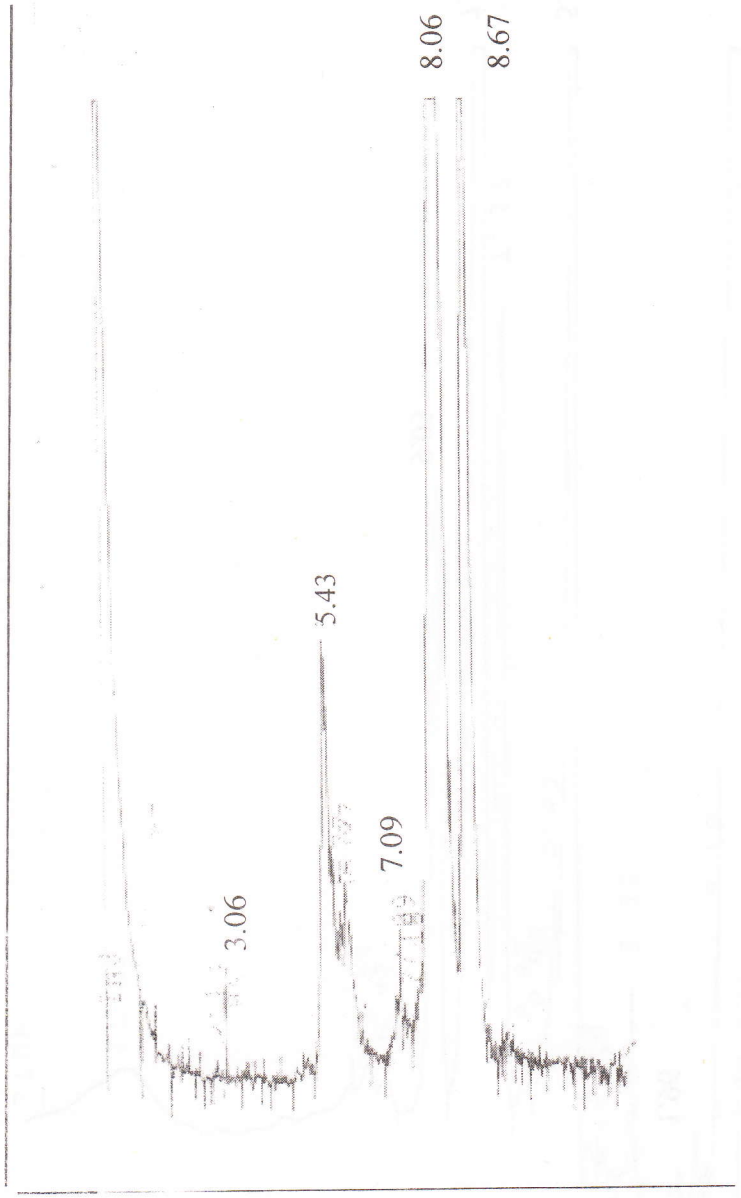

Fig. (3): GLC Chromatograms of Methyl Esters of Fatty Acids Present in the Seed of Prunus Microcarpa Fruit.

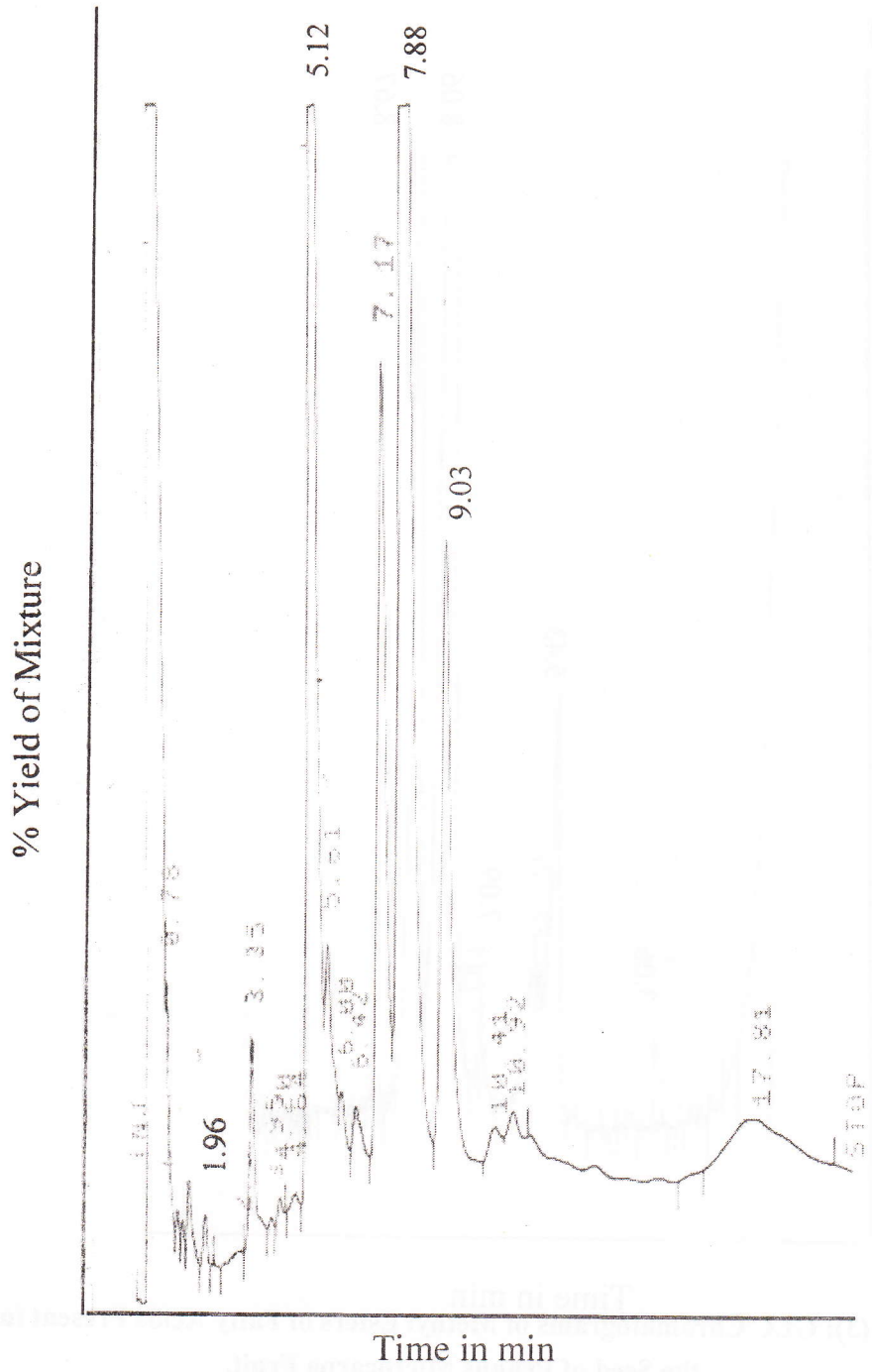

Fig. (4): GLC Chromatograms of Methyl Esters of Fatty Acids Present in the Flesh of Prunus Microcarpa Fruit.

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تەرکیبی ترشە چەوریەکان لەناو ڕۆنی ناوک وگۆشتی میوەی Prunus microcarpa

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پوختە

ئەم توێژینەوەیە بریتیە لە دەرهێنانی ڕێژەی ڕۆن لە ناو میوەی بەلاڵوک (ناوک لەگەڵ گۆشت) پاش دەرهێنانی بەتوێنەری ئیسەری بترۆلی و ئەو ڕێژەیەی کەدەستمان کەوت بەم شێوەیە بوو (لەناو ناوک ١٥,٧٦٧١٪ و لەناو گۆشت واتە بەرگی دەرەوەی میوەکە ٠,٣٧١٠٪).شیکردنەوەی ڕۆنەکان بەئامێری GLC پاش گۆرینیان بۆسەر شێوەی ئەستەری بەرامبەر دەریخست کەئەم ڕۆنانە بەشێکی زۆری ترشەکانی لەجۆری ناتێرکراون وەهەروەها دەرکەوت کە (٥) پێنج چەشنە ترشی ڕۆن لەناو ڕۆنی ناوکەکەدا هەیە وەکو مایرستیک,پالمتیک,ستێریک,ئۆلیک,لینۆلیک بەلاّم (٩) چەشنیش لە ترشی ڕۆن لەناو گۆشتەکەی ولتە بەرگی دەرەوەدا هەیە وەکو: لوریک, مایرستیک, پالمتیک, پالمیتۆلیک, ستێریک, ئۆلیک, لینۆلیک, لینۆلینیک, لەگەڵ ئێریوسیک.

ترکیب الحوامض الدهنیة لزیوت نواة وغلاف ثمرة Prunus microcarpa

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الخلاصة

تناول البحث عن تحدید نسبة الزیوت في ثمرة نبات prunus microcarpa بعد استخلاصها بمذیب الایثر البترولي وکانت النسب التي تم الحصول علیها على النحو الآتي : (١٥,٧٦٧١٪ نواة البذرة,٠,٣٧١٠٪ لحم الثمرة) وقد تمت تحلیل الزیوت کمیا ونوعیا بأستخدام جهاز(GLC) کروموتوغرافیا الغاز بعد تحویل هذه الأحماض الى الأسترات المقابلة ودلت النتائج على وجود (٥) خمس أحماض دهنیة في البذرة وهي: مایرستیک,بالمتیک,ستریک,اولیک و لینولیک.و(٩) تسعة أحماض دهنیة في لحم الثمرة وهي : لوریک,مایرستیک,بالمتیک,بالمتولیک,ستریک,اولیک,لینولیک,لینولینیک,أریوسیک.

وقد تبینت من النتائج أن غالبیة الأحماض الدهنیة الموجودة غیر مشبعة مما تشیر الى استخدام النبات کمصدر للزیوت.

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