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EXTRACTION OF CHLOROPHYLL AND CAROTENE FROM IRRADIATED PARSLEY PLANT

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ABSTRACT: ABSTRACT: The comparative of different method for extraction of chlorophyll and carotene from Parsely plant were studied in this work .The extraction of plant pigments were done after irradiated of plant at different dose of gamma radiation .The two method of extraction of Chlorophyll and carotene pigments were heating method and mashing method. It was clear from this study that the concentration of chlorophyll and carotene more concentrated by using mashing method [(8)] .

KEY WORDS: extraction, plant pigments , chlorophyll, carotene ,mashing method ,heating method

I.INTRODUCTION

In recent years many of different methods were studied to extraction of plants pigments as heating method and mashing method . It was found that using mashing method for extraction is the best method than heating method may be because of heating method act on destroying the pigments It is clear from fig (1) the importance of plant pigments where the chlorophyll pigments consider the main reason for production of red blood cells ,many of foods as vegetables were irradiated by different dose of gamma radiation to prevent it from many organisms and bacteria and to use it for a long time [(1)]. However, the effect of the irradiation of gamma rays on the plants pigments in plants has not been deeply investigated yet. Moreover, changes may be happened on the structure and concentration of pigments[(10)].

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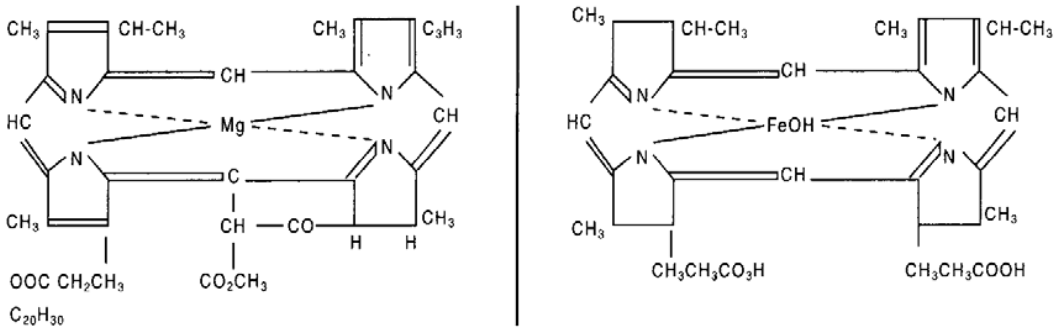
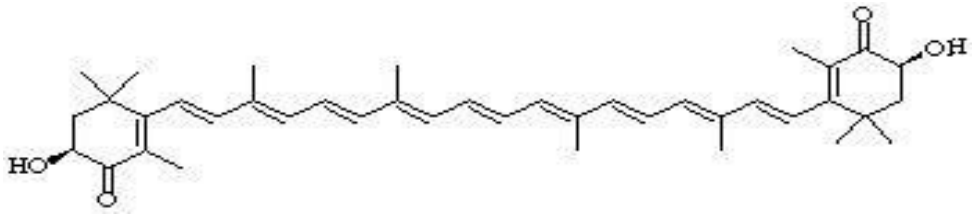


Molecular structure of Blood Cell **Molecular structure of Chlorophyll** **Red**



Fig(2): Chemical structure of carotene

PARSLEY PLANT: parsley is known for being a blood cleanser. It is also high in vitamin C, which makes it a really great inflammatory fighting food and helps the body absorb iron. It is rich in vitamin K, a molecule that stimulates a protein that helps to build our bones.

II.EXPREMINTAL

SAMPLE PREPARATION

The seeds of Parsley planet was divided into five lots , each one was irradiated by gamma ray at different doses (0, 40 , 50 , 80, 100 Gy, (Dmax\Dmin (ASTM, 1995). The seeds were growing in Faculty of Agriculture – Taif University .The seeds which irradiated at doses (50 , 80 , 100) didn't grow [10]

METHODS OF EXTRACTION

1- heating methods:The plant pigment was wormed with different solvent ,different contact time, different weight of plant then filtered using filter paper .

2- mashing method : the pigments were extracted by grinding leaves with a mortar and pestle in different solvents, at different time of mashing and at different weight of plants[3].

Factors influence the extraction of plant pigments .

Effect of different solvents: three different solvents were using as
(30% acetone , 85% acetone , 70% petroleum ether , 70% ethanol)
.**Effect of different time**: the two method of extraction studied the following time
(1 , 5 , 10 , 15 , 30 , 45 , 60 m)
.**Effect of different weight of planet**:The pigments were extracted at different weights

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III. RESULTS AND DISCUTION

Effect of different solvents

It was clear from table (1) that 70% ethanol is the best solvent [2]

Effect of different time

The influence of different time are shown in Table (2), The results show that the concentration of chlorophyll was increased at 30 min and stable after that , the results indicated also that the mashing method for extraction is more suitable than heating and the chlorophyll pigments were destroyed after the plant was irradiated by 40 Gy[5].

Effect of different weights of plants:

It was shown from table (3) that the concentration of chlorophyll increased with increasing the weights of parsley up to 1 gm and after that it decreased , this may be due to strict hindrance effect[6].

. Table (1) :Effect of different solvents for extraction of pigments in parsley plant

Effect of different solvent	Heating method		Mashing method	
	Conc. of chlorophyll (at 0Gy)	Conc. of chlorophyll (at 40Gy)	Conc. of chlorophyll (at 0Gy)	Conc. of chlorophyll (at 40Gy)
Acetone 30%	0.894	----------	1.924	----------
Acetone 85%	0.171	----------	0.135	----------
Petroleum Ether70%	0.211	----------	1.076	----------
Ethanol 70%	1.065	-----	2.831	-------

Table (2): Effect of different contact time

Different contact time, min.	Heating method		Mashing method	
	Conc. of chlorophyll (at 0Gy)	Conc. of chlorophyll (at 40Gy)	Conc. of chlorophyll (at 0Gy)	Conc. of chlorophyll (at 40Gy)
1 m	0.313	---------- --	0.222	----------
	0.471	----------	0.831	----------

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5 m				
10 m	**0.626**	**----------**	**1.046**	**----------**
15 m	**0.904**	**----------**	**1.279**	**----------**
30 m	**1.016**	**----------**	**2.000**	**----------**
45 m	**1.450**	**----------**	**2.124**	**----------**

Table (3) :Effect of different weights of parsley plant

Different weight ,gm	**Heating method**		**Mashing method**	
	Conc. of chlorophyll (at 0Gy)	**Conc. of chlorophyll (at 40Gy)**	**Conc. of chlorophyll (at 0Gy)**	**Conc. of chlorophyll (at 40Gy)**
0.1	0.601	----------	1.713	----------
0.5	1.183	----------	1.929	----------
1	1.640	----------	2.547	----------
2	1.371	----------	1.947	----------
3	1.029	----------	1.320	----------
4	0.753	----------	0.831	----------
5	0.341	----------	0.122	----------

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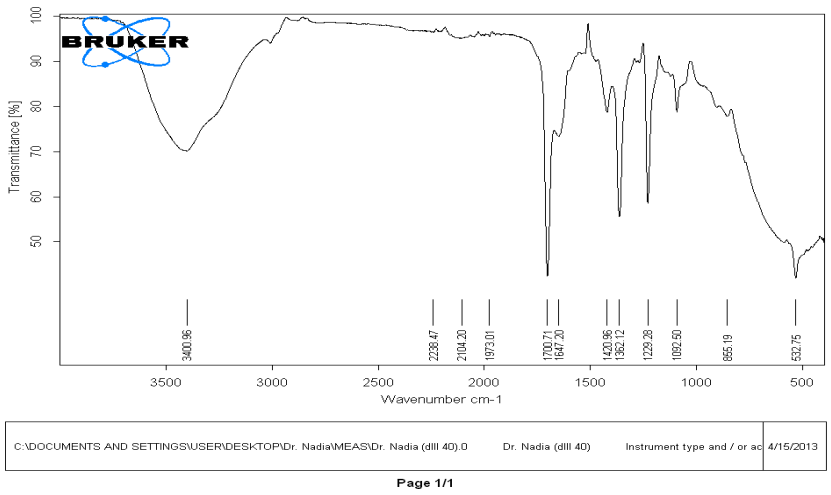
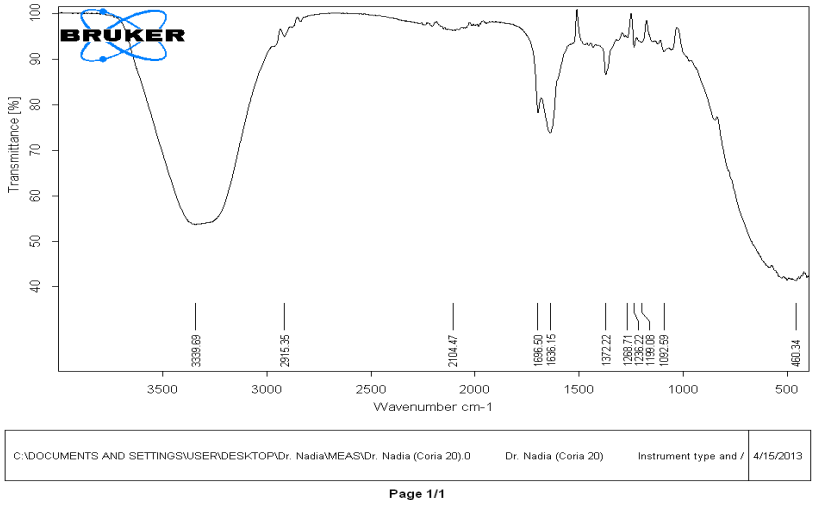


Fig(3): The Spectrophotometer spectrum of chlorophyll for parsley plant before irradiation



Fig(4): The Spectrophotometer spectrum of chlorophyll for parsley plant after irradiation by 40Gy

IV.CONCLUSION

In conclusion we can say that the mashing method for extraction the chlorophyll is more suitable than heating method and this may be due to the heating method act on destroying the pigments[9]. It can be concluded also that the vegetables as parsley it must not irradiated at 40 Gy to prevent it from many organisms because this dose lead to that the structure of chlorophyll was destroyed as represent in Fig (3,4)[11] . The optimum conditions for extraction this pigments are the following , the weight of plant was 1 gm for parsley, the reaction time was 30 mint. and the suitable solvent of extraction was 70% ethanol.

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