Estimation Levels of Some Biological Contents of Locally Wild *Amygdalus L.*

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Abstract

The seeds of four species of ***amygdalus L***.named: ***amygdalus Arabica***, ***amygdalu***s ***orientalis***, ***amygdalus spartiodes***, and ***amygdalus korschinskii*** were collected during summer season 2007 from north of Iraq. Their dried stony hulls were removed. The dried seeds, their oils and proteins and carbohydrates levels were estimated. Ash, iodine number, and peroxide values were calculated. Data obtained reflects a higher average of oil percent than the common sources and ranged from 42.8% to 43.9%. The average values of proteins, carbohydrates, and ash were 33.1%, 17.25%, and 2.28% respectively.

Percent levels of the elements Fe, Cr, K, and Na were found to be of 7.29%, 1.462%, 0.205%, and 0.0215% respectively in ***amygdalus arabica*** species.

Keywords: ***Amygdalus***, biological contents.

الخلاصة

بذور اربعة انواع من بذور نبات شجرة اللوز البري ***amygdalus L*** وهي:

amygdalus Arabica, ***amygdalus***, ***orientali orientalis***, ***amygdalus spartiodes***, ***amygdalus korschinskii.***

تم جمعها من شمال العراق خلال فترة الصيف من العام 2007 حيث ازيلت اغلفتها الحجرية التركيب وتم تقدير الزيوت الكلية و البروتينات والكاربوهيدرات الكلية وكذلك كمية الرماد الناتج من حرقها. حسبت قيم الرقم اليودي ورقم البيروكسيد في الزيوت الناتجة. دللت نتائج البحث على وجود نسب عالية من الزيوت المستخلصة تراوحت ما بين 42.8% و 43.9% . لقد بلغت معدلات قيم البروتينات والكاربوهيدرات والرماد النسب 33.1% و17,25% و 2.28% على التوالي. كما اعطت النتائج محتويات المعادن المدروسة ولكل من الحديد و الكروم و البوتاسيوم و الصوديوم بالنسب التالية : 7.29% و 1.46% و 0.205% و 0.0215% وذاك في الصنف العربي من البذور ***amygdalus Arabica***

Introduction

North of Iraq is a dry land form more than 85% 0f the total available lands for agriculture characterized by rocky slope, moral banks on sandstone slabs in the foot hills. Under such sever ecological conditions, the ***amygdalus L***. are grown as the only common plants in this area. One of the famous trees of amygdalus are the almond trees which grow to a height of 10-25 ft and bears a peach like fruit. The

outer pulpy portion of the fruit is thin and inedible. Many varieties of almonds are grown but they can broadly divide into two types, Bitter and sweet [1]. Both type's ever green and deciduous trees and shrubs with alternate leaves, flower. The fruit have the stone surrounded by a fleshy larger. Most species appreciate an alkaline soil and require full exposure to sun [2]. The bitter species contain amygdalin and an enzyme which causes its hydrolysis to glucose, benzaldehyde and hydrocyanic acid. The species also on steam distillation can produce a volatile oil [3]. In fact, most of these oils are too valuable and used in many cosmetic products [4]. Literature survey revealed that a very little chemical works has been done on ***amygdalus L***. especially that grown in north of Iraq [5]. The aim of this study was concentrated on the estimation percent levels of the oil extracted and other contents of biological values from ***amygdalus L***. as a wild species.

Materials and Methods

Collection of seeds:

Fruit samples ***amygdalus Arabica***, ***amygdalus***, ***orientalis***, ***amygdalus spartiodes***, and ***amygdalus korschinskii*** were harvested in its optimum state of ripenes during July of 2007 from the mountain of Sulaimania city. Studying their morphology and chemical characterization, their seeds samples were isolated from their fruits and subjects to the analysis.

Determination of oil contents:

Seeds (10gm of each species) were taken by removal of the stony hulls, dried for two days in an air oven (60Cº) until constant weight is obtained. They were later grounded through a wily mill and oils were extracted with diethyl ether and using soxhlet apparatus [6]. The oils were recovered by ether evaporation in a rotary evaporator and then they were dried in desiccators for one hour and weighed. The characteristics properties, % contents, Iodine no., and Peroxide no. (table-1) of the oils were determined by conventional methods[7]..

Determination of minerals of importance biological values:

Fe, Cr, K, and Na elements, their percent levels (table-2) were estimated from ***amygdalus Arabic*** the most famous species distributed in the area by using atomic absorption analysis.

Biological contents determination:

Total proteins content percent was determined using Kjeldhal techniques (AACC Method). Total carbohydrates were determined according to the protocol used by Rashid (2005) [8]. and adopted from that of Person (1971) [9]. Ash content was obtained by exposing the seeds to combustion procedure and collection of ash. Table (3), revealed the data obtained [10] .

Results and Discussion

Amygdalus L., the four species, ***amygdalus Arabica***, ***amygdalus orientalis***, ***amygdalus spartiodes***, and ***amygdalus korschinskii*** their seeds oil extraction revealed oil contents of 43.9%, 43.2%, 43.0%, 42.0% respectively with average content of 43.0% (table-1). These oils were yellow in color, and their characteristics were compared well to each other. Quality of the extracted oils were tested through the determination of the iodine number (table-1) which represents the most useful figure for identifying oil and particular group that give a reasonable measurement of the unsaturation of the oil investigated. As a measure for the rancidity or degree of oxidation but not the stability, the peroxide numbers of the oils were determined (table-1) idicating the primary oxidation. Noticeable values of 10 and 20 in the peroxide number correlate with the rancidity of the oil [9]. Ash analysis can give an idea about mineral contents [8,11]. and the species

amygdalus arabica seeds studied, their analysis resulted in Ash contents of 2.1% (table-2). The choice of this species was made due to its widely distributed around north of Iraq mountains. ***Amygdalus Arabic***, their mineral contents revealed percent levels of 7.29% Fe, 1.426% Cr, 0.205% K, and 0.0215% Na (table-2). Percent products of protein and carbohydrates content of these species were found to be 32.7%, 33.0%, 33.9%, and 32.7%. Total percents of the carbohydrates determined were 17.8%, 16.8%, 17.5%, and 17.0% (table-3).

Due to the previously stated figures, the author suggested that ***amygdalus*** L. is of biological value specially for human being, the only contrast being the bitter test of it due to the amygdalin presence. In spite of this, the species ***amygdalus L***. was used locally as a pharmaceutical drug for treatment of diabetes mellitus [10].

Table 1: Oil contents, Iodine number, and peroxide number of the different Amygdalus L. species.

Species	% Oil	Iodine No.	Peroxide No.
Amygdalus Arabica	43.9	88	1.04
Amygdalus Orientalis	43.2	86	0.94
Amygdalus Spartioides	43.0	87	1.0
Amygdalus Korschinskii	42.0	89	0.91

Table – 2: Elements contents of different *Amygdalus L.* species

Elements	Ash	% content
Fe	2.1	7.29
Cr	2.1	1.462
K	2.1	0.205
Na	2.1	0.0205

Table – 3: Protein, Carbohydrate, and Ash total contents.

Species	%		
	Protein	Carbohydrate	Ash

Amygdalus arabica	32.7	17.8	2.1
AmygdalusOrientallas	33.0	16.8	2.1
AmygdalusSpartioides	33.9	17.0	2.2
AmygdalusKorschinskii	32.7	17.3	2.6
Average	33.1	17.3	2.3

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