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Ethnobotanical *survey of the medicinal plants in the central mountains* (North-South) in Jordan

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Abstract

An ethnobotanical survey for the wild medicinal plants in the central high mountains extending from northern to central Jordan has been carried out. A special questionnaire is prepared to test for the medicinal uses of the local wild medicinal plants in the study area. The information such as the Arabic local name, parts used for medication, methods of preparation, purpose of use, doses and any other remarks, were all collected from direct contact visits to local people by the researchers of this study. The total numbers of recorded species in all the study sites are 108 species belonging to 33 families. The families Asteraceae and Lamiaceae have recorded the highest species of medicinal plants. A number of 25 plants species were found to be more frequently used by the local people in the studied areas, 38 species were found to be used more occasionally than the remaining 22 species. Visits for the available herbalist's shops in the study area were made for all the sites of the study area. The age range of the questioned sample of the people who were interviewed was ranging between 40-65- years old. It is learned from the study that the use of wild medicinal plants is highly recommended and still practiced by the majority of local people in the study area. It has been observed that the study area is very rich in medicinal plants, where some species are becoming degraded and over cultivated. The knowledge of using wild herbs in traditional folk medicine is basically more common among the elderly rather than the young generation in most of the visited domestic areas. However, the use of medicinal plants by the locals are causing great declining of the diversity of many plant species growing in all sites visited by the authors.

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Introduction

Ethnobotany is interdisciplinary science in a position to contribute much to plant conservation. This includes a precise understanding of local social dynamics, institutions, and different values attributed to resources. These values may be symbolic, religious, or political for a given society whilst the same plant resources represent only an economic value for other societies.

Ethnobotany is a multi-disciplinary science encompassing botany, anthropology, economics, and linguistics, which studies the ways in which a society relates to its environment. It investigates and evaluates the knowledge of all phases of life amongst primitive societies and of the vegetal environment upon the life customs, believes and history of these tribal people. It also tackled the relationship between the cultural societies and medicinal plants of a specific potential. These relationships can be social, economic symbolic, religious, commercial and artistic.

The role of *ethnobotanists* is to bring a larger perspective, whilst remaining open about how the knowledge recorded will be used in the future. It is important that results are shared with the communities at every steps of the research process. With this respect efforts are made to document and integrate indigenous knowledge about land use, vegetation and forest management, non-timber forest products, medicinal plants, agro-forestry, home-gardens, and biodiversity.

Ethnobotanical approaches enable the establishments of close dialogue and communication with local people, and may ultimately facilitate the elaboration of management plans which ensure participation by local people and a void having adverse impacts on their life and their environment (Cunningham, 2001).

In Jordan the knowledge and practice of MP is inherited from predecessors since ages and still adopted by a large number of population especially, in the urban areas and the *Badia* area (Desert of Jordan). Medicinal plants in Jordan are representing 20% of the total flora. 363 species of medicinal vascular plants were recorded in Jordan (Oran & Al-Eisawi, 1998). The recent status of medicinal plants in Jordan with regards to its diversity, use by local people in folk medicine and the currently research that is taking place to test for their biological potentials is explained by (Oran, 2014); The use of medicinal plants in the high mountains of northern Jordan and their diversity has been recorded by (Oran & Al-Eisawi, 2014). A study prepared by (Al-Eisawi, 2015), evaluated the diversity of the medicinal plants in Mujib Biosphere Reserve, a number of 148 plants species were recorded in the reserve. Many studies were carried out globally with regards to the ethnobotanical knowledge (Jordan *et al.*, 2006) listed the vascular plants that are utilized by the plains Apache in southwestern Oklahoma USA. Comparative food ethnobotanical study in West bank (Palestine) which was concentrated on the edible wild herbs in west bank (Shtayeh *et al.*, 2007); an ethnobotanical survey of herbal markets and medicinal plants in Lagos state of Nigeria was carried out by (Olowokudejo *et al.*, 2008). An ethnobotanical study about medicinal plants of Poonch valley Azad Kashmir was carried out by (Khan *et al.*, 2012; Choudhary *et al.*, 2008), reviewed the work that has been done so far in the ethnobotany of Rajsthan (India). The ethnobotanical survey of medicinal plants for the treatment of diabetes mellitus in north western region of Nigeria was carried out by (Etuk *et al.*, 2010). 34 plant species were reported or cited by the herbalist for the treatment of diabetes mellitus. An ethnobotanical survey of folklore plants for treatment of Jaundice and snakebites in India was carried out by (Thirumalai *et al.*, 2010).

Another ethnobotanical survey was carried out for medicinal plants used to treat gastrointestinal disorders in Eastern Cape Province, South Africa, 26 plant species were found to be commonly used in the treatment of a variety of gastrointestinal disorders. Similar study on the ethnobotanical survey of some

medicinal plants used in traditional health care in Abeokuta areas of Ogum State, Nigeria has been conducted by (Erinoso *et al*., 2012). A number of 58 plant species were found to be useful in the treatment of various ailments such as asthma, cough, yellow fever, tuberculosis, measles, malaria, ringworm, boil, eczema, typhoid and diabetes. Ethnobotanical survey of medicinal plants of Tswapong North in eastern Botswana revealed a wealth of traditional knowledge on uses of medicinal plants in the study area. Another ethnobotanical survey of medicinal plants used by traditional healers of Adilabad district Andhra Pradesh, India was carried out by (Lingaiah *et al*., 2013). In the Mediterranean sub-region in Turkey (Akaydin *et al*., 2013), carried out an ethnobotanical survey in selected towns in Turkey, in that study uses of 88 plant taxa were documented; another survey for the medicinal plants used by herbalists in Lebanon, was conducted by (Deeb *et al*., 2013), in an attempt to study the ethnobotanical status in Lebanon, the data based on 26 local herbalists and the study revealed that 128 plants species are used for treatment of various diseases, his study also concluded that most interviewed herbalists did not hold even a high school certificate and they were not licensed for practicing folk herbal prescriptions.

Ethnobotanical survey of medicinal plants used in curing some diseases in infants in Abeokuta south local government area of Ogum state, Nigeria carried out by (Shosan *et al*., 2014) and the results of this study showed that 63 plant species are used to treat cold, malaria, fontanel, diarrhea, typhoid, chicken pox, measles, and small pox. Ethnobotanical survey of medicinal plants used in the traditional treatment of viral infections in Jos, Plateau state, Nigeria has been carried out by (Ohemu *et al*., 2014). They recorded 62 plant species that are used for different viral infections. The recipes for the treatment of viral infections were also reported. (Chauhan *et al*., 2014), has published a paper on the ethnobotanical survey in Pabbar valley, distt. Shimla, Himachal Pradesh in India. The ethnobotanical investigation of three traditional leafy vegetables [*Alternanthera sessilis* (L.) DC. *Bidens pilosa* L. *Launaea taraxacifolia* Willd] in southern and central Benin in Africa by (Sanoussi *et al*., 2015).

The aim of this study is to investigate an ethnobotanical survey of the medicinal plants in the central mountains of Jordan, using a simple questionnaire that has been prepared, and filled by the etnobotanical data for the use of medicinal plants in folk medicine by the local people of the study area.

Materials and methods

The study area

In this survey the local people in the studied areas were participated in the following geographical areas:

1. Wadi As Sir district west of Amman and Salkhada in Bader Al-Jadida suburb west of Amman, central Jordan
2. Wadi Al-Azraq, Al-Fuhais municipality, west of Amman, central Jordan
3. Dair Yousuf village / Irbid district, northern Jordan
4. Jal'd, Salt district, central Jordan
5. Rmaimeen / Salt district, central Jordan
6. Um Al-A'mad, Jerash district, northern Jordan
7. Dibbeen, Jerash district, northern Jordan

All sites were investigated about the local Arabic names of the medicinal plants in their geographical area, applications and utilization of MPs in traditional medicine, doses given for each plant using questionnaire in every site of the study which was conducted in the central mountains of Jordan. In order to test for the medicinal potential of the local knowledge of medicinal plants and their uses by the native people in folk medicine, a questionnaire was prepared for this purpose Table 1.

2. *A simple Questionnaire was prepared as shown in table* 1.

The questions addressed to the locals about the local Arabic names in the visited area, uses, the part used, the purpose of use, method of preparation, number

and duration or doses (not always known), and any other needed remarks.

Table 1. Showing the questionnaire used for the ethnobotanical survey.

No of Variables	Variables	Answers
1.	Age	
2.	Marital Status	
3.	Education	
4.	Occupation	
5.	Name of the region, town, village ...etc.	
6.	Do you use herbal and medicinal plants (Yes/No)	
7.	Local name of the medicinal plants	
8.	Scientific name of the plant	
9.	Use of the plant	
10.	Method of use	
11.	Decoction	
12.	Boiled	
13.	Fresh (eaten or chewing)	
14.	Doses per day or per week	
15.	Length of the period used	
16.	Remarks	

Ten people were questioned about their knowledge of the medicinal plants in their area. Their age ranges between 30 and 60 year olds. The medicinal plants that they were able to recognize and information of their medicinal value are few.

Data also collected about the name of the user gender, age, social status, education, profession, and name of the geographical area **Table 1.**

I. The ethnobotanical results of the medicinal plants surveyed in the studied area are shown in table 2-11

II. The families with the highest number of medicinal plants are shown in fig. 1.

III. The most recorded species in the seven studied sites are shown in fig. 2.

IV. The plant species that are deposited in the herbalist's shops are recorded in table 12.

Results

The results of the information related to the scientific names of the medicinal plants in the studied areas, such as, Arabic local, parts used, methods of preparation, purpose of use, doses and any other remarks, are documented in tables 2-8.

More than twenty different herbal shops spreading within the various governorate of the study area, Amman, Salt, Jerash, Ajloun and Irbid were visited. The herbal content of the shops was looked at to identify the plants, and to look at the type, quality, and sources of the herbs. The herbs found in these shops are listed in table 12. The total number of recorded species in all study sites and the number of species in each family are shown in table 9. The recorded families and the number of species belonging to each family are presented in table 10. The highest species recorded in families with more than two species is recorded in Fig. 1, and the most recorded species in the seven studied sites are shown in Fig. 2.

The results shown are the ethnobotanical investigations in the different geographical sites of the study area, the sites studied were:

1. Salkhada area, Bader Al-Jadeda, and Wadi As-Sir, West of Amman, central Jordan

Local people from Bader area were questioned, most of them were farmers and middle age (30-50), as the area is urbanized (farms).

All of them agreed on the names of the plants used in folk medicine. The name of the plant, (Arabic), the part used, medicinal purpose, method of preparation are all listed in table 3. It is concluded here that not all of the medicinal plants are known or used by the people of this area (Table 2).

Table 2. Showing ethno-botanical plant species used by people in Wadi As-Sir, West of Amman, central Jordan West Amman (Study area one).

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/day	Remarks
Rhus coriaria	Anacardiaceae	سماق	Flower buds, fruits	Cold beverage, blast, direct application on the skin	Anti-microbial , ulcers, burns	When needed	Common
Bifora testiculata	Apiaceae	كزبرة	Seeds	Hot beverage	Sedative-stomach pain	When needed	Common
Tordylium aegyptiaca	Apiaceae	دريهميه	Fruits	fresh	Nutritional value	When needed	Growing season
Bifora testiculata	Apiaceae	كزبرة	Fruits	decoction	Sedative, stomach pain	1	Very common
Cyclamen persicum	Primulaceae	قرن الغزال	Rhizome	Direct application	Washing heads as anti-dandruff	1-2	Growing season
Varthemia iphionoides	Asteraceae	كتيلة	All parts	Hot beverage	Stomach ailments	2-3	Common
Centaurea Iberica	Asteraceae	مرار	Leaves	fresh	Nutritional value	When available	Growing season
Cichorium pumilum	Asteraceae	هندبة	Roots, flowers	Boiling, hot beverage	Antiseptic, anti-diabetic, eczema	When necessary	Growing season
Dittrichia viscosa	Asteraceae	طيون	Flowers	Boiling, hot beverage	Tumors, chronic cough	3	Very common
Ecballium elaterium	Asteraceae	قثاء الحمير	Juice	Direct application	Jaundice treatment	few drops	Toxic
Capparis spinosa	Capparaceae	قبار، كبار	Flower buds, roots	Boiling	Diuretic, antiseptic	2	Growing season
Paronychia argentea	Caryophyllaceae	رجل الحمامة	All parts	Hot beverage	Kidney stones ailments	1 before eating	Common
Ceratonia siliqua	Fabaceae	الخروب	Pod	Cold or hot beverage	Cough	3	Very common
Tetragonolobus palaestinus	Fabaceae	جلثون	Pod	Fresh	Nutritional source	When available	Not common
Lonicera etrusca	Fabaceae	عبهر، زهر العسل	Flowers	Cold beverage	Cough, lung troubles, expectorant	1-2	Very common
Retama raetam	Fabaceae	رتم	Green parts	Hot beverage	Antidiuretic healing wounds	1	Common
Teucrium polium	Lamiaceae	جعدة	Leaves	Hot beverage	Stomach pain	When needed	Common
Ballota undulata	Lamiaceae	دبيغه (خويخة)	leaves	decoction	Stomach and intestinal pain	When needed	Common
Origanum syriacum	Lamiaceae	زعتر، بردقوش	Leaves	Decoction	Stomach pain	3	Common
Asparagus aphylla	Liliaceae	شوك، هليون، عاجول الجبل	Roots	Decoction	Kidney stones, headache	2	Not known by most
Asphodelus aestivus	Liliaceae	غيصلان	Leaves	Decoction	Sedative for rheumatic pain	1	Growing season
Olea europaea	Oleaceae	زيتون	Leaves	Hot	Hypertension, antidiabetic, antidiuretic	1	Common
Papaver subpiriforme	Papaveraceae	شقيق	Seeds	Hot beverage	Chest pains, cough	3	Recommended by most

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/day	Remarks
Ziziphus lotus	Rhamnaceae	سدر، عرقد	Fruits	Edible	Cough and measles	2-3	Well known
Sarcopoterium spinosum	Rosaceae	بلان، نتش، ينبوت	Roots	Boiling, hot beverage	Sedative, antidiabetic	1	Very common
Punica granatum	Rosaceae	رمان	Seeds, fruit coat	Grinding and mixing with honey to treat diarrhea and used for ulcer	Antidiuretic and jaundice	3	Growing season as well as dry fruit leathery skin
Mandragora autumnalis	Solanaceae	تفاح المجن، جرابوح	Leaves	Hot beverage	Sedative, and cough	1	Can be eaten at maturity, but is highly Toxic when green

2. Wadi Al-Azraq, Al-Fuhais municipality, West of Amman, central Jordan

Table 3. Showing ethno-botanical plant species used by people in study area in locality Wadi Al-Azraq, Al-Fuhais, West of Amman, central Jordan (Study area two).

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/Day	Remarks
Foeniculum vulgare	Apiaceae	شومر	Leaves	Hot beverage	Abdominal pain, cough	1	Very common
Nerium oleander	Apocynaceae	الدفلى	Leaves, bark	Direct extract application	Anti-syphilitic, rat poisoning	1	Toxic
Arum palaestinum	Araceae	اللوف	Leaves	Hot beverage	Anti-tumorous	2	Toxic
Varthemia iphionoides	Asteraceae	خويخة، كتيلة، هنديدة	Leaves	Hot beverage	Stomach and abdominal pain and headache	When needed	Very common
Chrysanthemum coronarium	Asteraceae	بسباس	Flowers	Hot beverage	Abdominal pain	1	Common
Dittrichia viscosa	Asteraceae	طيون	Leaves	Hot beverage not to be boiled	Cough and chest pains, arthritis pains sedative	1-4	Highly recommended
Matricaria aurea	Asteraceae	بابونج	Whole plant	Hot beverage	Abdominal and cough sedative	2-3	Very common
Anchusa strigosa	Boraginaceae	حمحم	Roots	Direct application	Wounds healer and dermal ulcers	2	Common
Cappasis spinosa	Capparaceae	قبار، كبار	Leaves, flowers	Hot beverage	Stomach wash	1	Common
Origanum syriacum	Caryophyllaceae	الزعتر الفارسي	Leaves	Hot beverage	Stomach and abdominal pain- salad garnish	When needed	hypertensive
Paronychia argentea	Caryophyllaceae	رجل الحمامة	Whole plant	Hot beverage	Kidney stones	3	Very popular medicine
Euphorbia hierosolymitana	Euphorbiaceae	لبين	Latex (juice)	Direct application	Warts treatment	1/ week	Applied directly from fresh plants in the field

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/Day	Remarks
Medicago arabica	Fabaceae	برسيم	Whole plant	Hot beverage	Anti-diabetic	1	Common
Ceratonia siliqua	Fabaceae	خروب	Pods	Hot beverage	cough	When needed	Very common
Retama raetam	Fabaceae	رتم	Whole plant	Extraction cold, direct application, cold beverage for diarrhea	Roots anti-diuretic, branches wound healer and eye troubles	1	Very common
Ficus carica	Fagaceae	تين	Latex (juice)	Direct application	Foot fleshy warts	1	Fresh application
Salvia triloba	Lamiaceae	ميرمية	Leaves	Hot beverage,	Stomach and abdominal pain relieve	When needed	Hypertensive
Mentha longifolia	Lamiaceae	نعنع بري	Leaves	Hot beverage	Stomach and intestinal pain	2-3	Hypotensive
Thymus capitatus	Lamiaceae	زعتر	Leaves	Hot beverage	Abdominal pain and cough	3	Very common
Salix babylonica	Salicaceae	صفصاف	Leaves	Hot beverage	Leprosy	1	Well known by most

3. Dair Yusuf village, Irbid district, Northern Jordan,

Ten persons were questioned. (30-65) years old. The following medicinal plants were known and recognized by the majority.

Table 4. Showing ethno-botanical plant species used by people in Dair Yusuf, Irbid, Northern Jordan (Study area three).

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/Day	Remarks
Phagnalon rupestre	Asteraceae	قدحة	Whole plant	Leaves	Knees pain sedative	Rap	Very common
Achillea santolina	Asteraceae	قيصوم	Whole plant	Hot beverage	antispasmodic	2-3	Very popular drug in the country
Anthemis palaestinum	Asteraceae	قحوان، اقحوان	Flower	Cold and hot beverage	Cough treatment	2	Very common
Matricaria aurea	Asteraceae	بابونج	Whole plant	Hot beverage	Cough and antispasmodic	2- 3,when needed	Common herb medicine, very mild drink
Anchusa strigosa	Boraginaceae	خشيمة	Roots	Powder, roots grinded	Wounds, burns and Tuberculosis	3-4	Successfully tested
Ononis natrix	Fabaceae	وسبة	Roots, flowers	Decoction	Roots diuretic, flowers depurative, flowers for eczema	2	Highly recommended
Teucrium polium	Lamiaceae	جعدة	leaves	Hot beverage	Stomach and abdominal pain, antidiabetic	2-3	Antimicrobial, anti-diabetic
Scrophularia xanthoglossa	Scrophulariaceae	عرق النسا	Roots	Root is mixed with olive oil and black seeds	Knee pain	2	Successfully tested in this area

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/Day	Remarks
Verbascum fruticosum	Scrophulariaceae	عمية، آذان الدب	Leaves, roots	Boiling	Anti-diabetic, anti-poison	1	Hairs of the plant are dangerous to the eyes

4. Jal'd – Salt North West of Amman, central Jordan

Ten people were questioned: some plants are known to the people of 50-65 years old.

Table 5. Showing ethno-botanical plant species used by people in Jal'd – Salt North West of Amman, central Jordan (Study area four).

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/Day	Remarks
Pistacia palaestina	Anacardiaceae	بطم	Oil or the resin	Direct application	Antispasmodic	Twice a day	Well known
Foeniculum vulgare	Apiaceae	الشومر	Leaves and branches	Hot beverage	Chest and back pain relive	1	Rarely known
Arum palaestinum	Araceae	لوف، سلجلج، رجل الاسد	Leaves, corms	Mixed with onion and salt	Anti-tumorous	1	Well known and used by many
Eminium spiculatum	Araceae	لوف، دنيدلة	Juice	Powder	Anti-tumorous	1-2	Common
Achillea santolina	Asteraceae	جعدة الصبيان	flower	Cold or hot	Stomach and antispasmodic	1	Very common
Ecballium elaterium	Asteraceae	قثاء الحمير	Juice	Direct application	Jaundice, epilepsy and headache	Few drops	Highly toxic
Matricaria aurea	Asteraceae	بابونج	Flowers, branches	Cold or hot beverage	Abdominal pain	1-2	Well known
Phagnalon rupestre	Asteraceae	قدحة	Leaves, flowers	Dry roll	Joints pain and cauterize	When needed	Very common
Varthemia iphionoides	Asteraceae	شتيلة، كتيلة	Leaves	Cold beverage, extraction or decoction	Abdominal pain	2-3	Very common
Sinapis alba	Brassicaceae	لفيتة	Leaves and green branches	Eat fresh and cooked	Vitamin source	When available	Common
Cappais spinosa	Capparaceae	قبار	Roots	Hot beverage	For arthritis	When having pain	Common
Paronychia argentea	Caryophyllaceae	شويشة الراعي	Whole plant	Decoction	Kidney stones	1	Very common and highly recommended
Ephedra aphylla	Ephedraceae	قضاب، علندا	All parts, branches	Cold beverage	For hay fever, cold, cough and bronchitis	1	Well known
Ononis natrix	Fabaceae	وسبة، لبيد	Roots	Hot beverage	Wound healing, eczema treatment as	When needed	Very common
Mentha longifolia	Lamiaceae	نعنع	leaves	Cold or hot beverage	Abdominal pain	1-2	Well known
Micromeria nervosa	Lamiaceae	زعيتمان	leaves	Hot beverage	For nausea	1	Well known
Salvia triloba	Lamiaceae	ميرمية	leaves	Cold or hot beverage	Abdominal pain, antispasmodic	3 -4	Very much applied

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/Day	Remarks
Teucrium polium	Lamiaceae	جعدة	Leaves	Hot beverage	Abdominal pain, anti-diabetic	3-4	Very common
Thymus capitatus	Lamiaceae	زعتر	Leaves	Hot beverage	Expectorant Antispasmodic, cough	1-3	Well known
Alcea setosa	Malvaceae	ختمية	Flowers	Hot beverage or cold	Cough and chest pain	1	Common
Plumbago europaea	Plumbaginaceae	خامشة	Whole plant	Powder	Leprosy treatment as rap	When needed	Very well known
Sarcopoterim spinosum	Rosaceae	نتش، بلان	All plants	Hot beverage	Anti-diabetic, anticoagulant	Every day 2 times	Very common and highly recommended

5. Rmaimeen / Salt district, central Jordan

Table 6. Showing ethno-botanical plant species used by people in Rmaimeen / Salt district, central Jordan (Study area five).

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/Day	Remarks
Pistacia palaestina	Anacardiaceae	بطم (صمغ)	Resin	Oral, mixed with animal gee	Cough	1-2	Common
Bongardia chrysogonum	Apocynaceae	عريفة الديك، رجل الديك	Roots	Boiled	Anti-tumorous, stomach pain	1	Common
Arum palaestinum	Araceae	لوف	Leaves	Decoction	Anti-tumorous	1	Very common
Achillea santolina	Asteraceae	جعيدة الصبيان	Flowers	Hot beverage	Abdominal pain, anti-diuretics	2-3	Very common
Phagnalon rupestre	Asteraceae	قدحة	Leaves and floral parts	Hot beverage	Knee pain, abdominal pain	When needed	Very common
Cistus salviifolius	Cistaceae	لباد	Flowers	Boiled	Cough, tracheal ailments	1-2	Common
Micromeria nervosa	Lamiaceae	عشبة الشاي، زعيتمان	All parts	Hot beverage	Nausea	When necessary	Very common
Thymus capitatus	Lamiaceae	زعتر بري	Leaves	Hot beverage	Cough, antispasmodic	3	Very common

6. Um Al-A'mad, Jerash district, Northern Jordan

Table 7. Showing ethno-botanical plant species used by people in Um Al-A'mad, Jerash district, Northern Jordan (Study area six).

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/ Day	Remarks
Pistacia atlantica	Anacardiaceae	البطم	Resin	Mixed with animal gee	Cough, asthma	2	Common
Arum palaestinum	Araceae	خبيزة	Leaves	Boiled	Anti-tumorous	3	Very common
Anthemis palaestinum	Asteraceae	قحوان	Flowers	Mixed with olive oil, left under sun shine one week	Arthritis, diabetics	2-3	Common

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/ Day	Remarks
Matricaria aurea	Asteraceae	بابونج	All parts	Hot beverage	Cough, abdominal pain	3-4	Very common
Capparis spinosa	Capparaceae	كبار	Roots	Mixed with honey and olive oil	Back and joints pain	1-2	Very common
Calycotome villosa	Fabaceae	قنديل، الحزقوق،عر يفة الديك	Whole plant	Flowers are dried and powdered	Animal fat flavoring	When needed	Common
Quercus coccifera	Fagaceae	بلوط	Fruit	Boiled	Treatment of uncontrolled urination	3	Common
Thymus capitatus	Lamiaceae	زعتر	Leaves	Hot beverage	Cough, abdominal pain	3-4	Very common
Salvia triloba	Lamiaceae	ميرمية	Leaves	Hot beverage	Abdominal pain	4	Very common
Teucrium polium	Lamiaceae	جعدة	Leaves	Boiled	Antidiabetic, abdominal pain	3-4	Very common
Plumbago europaea	Plumbaginaceae	خامشة	Leaves	Fresh grinding	Leprosy	1 every week	Very common
Rumex pulcher	Polygonaceae	حميض	Leaves	Cooked as pies	Anorexia	Growing season	Common
Anemone coronaria	Ranunculaceae	شقيق	Whole plant	Boiling with olive leaves	Asthma, knee pain	1-2	Common
Reseda lutea	Resedaceae	رتا	All parts	Hot	Wound healing, hypertension	1	Highly recommended
Urtica pilulens	Urticaceae	قريص الحكة، الدبيقه	Whole plant	Boiling with Pistachio gum	Anti-diabetic	2	Very common

7. Dibbeen, Jerash district, Northern Jordan

Table 8. Showing ethno-botanical plant species used by people in study Dibbeen, Jerash district, Northern Jordan (Study area seven).

Scientific Name (Latin)	Family	Arabic Name	Part Used	Method of Preparation	Purpose of Use	Doses/Day	Remarks
Ajuga chia	Lamiaceae		All parts	Rap	Wounds	1	Common
Dittrichia viscosa	Asteraceae	طيون	Leaves	Hot beverage	Ant diabetic, for 40 days	2	Very common
Teucrium polium	Lamiaceae	جعدة	Leaves	Hot beverage	Cold, colic pain	2-4	Very common
Paronychia argentea	Caryophyllaceae	رجل الحمامة	All parts	Hot beverage	Anti-diabetic, kidney stones	2	Very common
Fumana parviflora	Fumaricaceae	شترج	Leaves, flowers	Boiled	Flowers for eczema,	1	Common
Arum palaestinum	Araceae	لوف، قرقيطة	Leaves	Boiled	Anti-tumorous	2	Very common
Leontice leontopetalum	Leonticaceae	حميرة الظهر	Leaves	Grinding	Anti-tumorous	1	Common

Table 9. Showing the total number (No.) of recorded species in all study sites and the no of species in each family.

No of species in each family	Families	*Species*	Rerecorded species
4	Anacardiaceae	*Pistacia atlantica*	1.
	Anacardiaceae	*Pistacia palaestina*	2.
	Anacardiaceae	*Pistacia palaestina*	3.
	Anacardiaceae	*Rhus coriaria*	4.
5	Apiaceae	*Bifora testiculata*	5.
	Apiaceae	*Bifora testiculata*	6.
	Apiaceae	*Foeniculum vulgare*	7.
	Apiaceae	*Foeniculum vulgare*	8.
	Apiaceae	*Tordylium aegyptiaca*	9.
1	Apocynaceae	*Bongardia chrysogonum*	10.
1	Apocynaceae	*Nerium oleander*	11.
6	Araceae	*Arum palaestinum*	12.
	Araceae	*Arum palaestinum*	13.
	Araceae	*Arum palaestinum*	14.
	Araceae	*Arum palaestinum*	15.
	Araceae	*Arum palaestinum*	16.
	Araceae	*Eminium spiculatum*	17.
21	Asteraceae	*Achillea santolina*	18.
	Asteraceae	*Achillea santolina*	19.
	Asteraceae	*Achillea santolina*	20.
	Asteraceae	*Anthemis palaestinum*	21.
	Asteraceae	*Anthemis palaestinum*	22.
	Asteraceae	*Centaurea iberica*	23.
	Asteraceae	*Chrysanthemum coronarium*	24.
	Asteraceae	*Cichorium pumilum*	25.
	Asteraceae	*Dittrechia viscosa*	26.
	Asteraceae	*Dittrichia viscosa*	27.
	Asteraceae	*Dittrichia viscosa*	28.
	Asteraceae	*Matricaria aurea*	29.
	Asteraceae	*Matricaria aurea*	30.
	Asteraceae	*Matricaria aurea*	31.
	Asteraceae	*Matricaria aurea*	32.
	Asteraceae	*Phagnalon rupestre*	33.
	Asteraceae	*Phagnalon rupestre*	34.
	Asteraceae	*Phagnalon rupestre*	35.
	Asteraceae	*Varthemia iphionoides*	36.
	Asteraceae	*Varthemia iphionoides*	37.
	Asteraceae	*Varthemia iphionoides*	38.
2	Boraginaceae	*Anchusa strigosa*	39.
	Boraginaceae	*Anchusa strigosa*	40.

No of species in each family	Families	*Species*	Rerecorded species
1	Brassicaceae	*Sinapis alba*	41.
4	Capparaceae	*Cappais spinosa*	42.
	Capparaceae	*Capparis spinosa*	43.
	Capparaceae	*Capparis spinosa*	44.
	Capparaceae	*Cappasis spinosa*	45.
1	Caprifoliaceae	*Lonicera etrusca*	46.
4	Caryophyllaceae	*Paronychia argentea*	47.
	Caryophyllaceae	*Paronychia argentea*	48.
	Caryophyllaceae	*Paronychia argentea*	49.
	Caryophyllaceae	*Paronychia argentea*	50.
2	Cistaceae	*Cistus salviifolius*	51.
	Cistaceae	*Fumana parviflora*	52.
2	Cucurbitacaeae	*Ecballium elaterium*	53.
	Cucurbitaceae	*Ecballium elaterium*	54.
1	Ephedraceae	*Ephedra aphylla*	55.
1	Euphorbiaceae	*Euphorbia hierosolymitana*	56.
11	Fabaceae	*Calycotome villosa*	57.
	Fabaceae	*Ceratonia siliqua*	58.
	Fabaceae	*Ceratonia siliqua*	59.
	Fabaceae	*Medicago arabica*	60.
	Fabaceae	*Ononis natrix*	61.
	Fabaceae	*Ononis natrix*	62.
	Fabaceae	*Retama raetam*	63.
	Fabaceae	*Retama raetam*	64.
	Fabaceae	*Tetragonolobus palaestinus*	65.
	Fagaceae	*Ficus carica*	66.
	Fagaceae	*Quercus coccifera*	67.
20	Lamiaceae	*Ajuga chia*	68.
	Lamiaceae	*Ballota undulata*	69.
	Lamiaceae	*Mentha longifolia*	70.
	Lamiaceae	*Mentha longifolia*	71.
	Lamiaceae	*Micromeria nervosa*	72.
	Lamiaceae	*Micromeria nervosa*	73.
	Lamiaceae	*Origanum syriacum*	74.
	Lamiaceae	*Origanum syriacum*	75.
	Lamiaceae	*Salvia triloba*	76.
	Lamiaceae	*Salvia triloba*	77.
	Lamiaceae	*Salvia triloba*	78.
	Lamiaceae	*Teucrium polium*	79.
	Lamiaceae	*Teucrium polium*	80.
	Lamiaceae	*Teucrium polium*	81.
	Lamiaceae	*Teucrium polium*	82.

No of species in each family	Families	*Species*	Rerecorded species
	Lamiaceae	*Teucrium polium*	83.
	Lamiaceae	*Thymus capitatus*	84.
	Lamiaceae	*Thymus capitatus*	85.
	Lamiaceae	*Thymus capitatus*	86.
	Lamiaceae	*Thymus capitatus*	87.
1	Leonticaceae	*Leontice leontopetalum*	88.
2	Liliaceae	*Asparagus aphylla*	89.
	Liliaceae	*Asphodelus aestivus*	90.
1	Malvaceae	*Alcea setosa*	91.
1	Oleaceae	*Olea europaea*	92.
1	Papaveraceae	*Papaver subpiriforme*	93.
3	Plumbaginaceae	*Plumbago europaea*	94.
	Plumbaginaceae	*Plumbago europaea*	95.
	Plumbaginaceae	*Plumbago europea*	96.
1	Polygonaceae	*Rumex pulcher*	97.
1	Primulaceae	*Cyclamen persicum*	98.
1	Ranunculaceae	*Anemone coronaria*	99.
1	Resedaceae	*Reseda lutea*	100.
1	Rhamnaceae	*Ziziphus lotus*	101.
3	Rosaceae	*Punica granatum*	102.
	Rosaceae	*Sarcopoterium spinosum*	103.
	Rosaceae	*Sarcopoterium spinosum*	104.
1	Salicaceae	*Salix babylonica*	105.
1	Scrophulariaceae	*Scrophularia xanthoglossa*	106.
1	Scrophulariaceae	*Verbascum fruticosum*	107.
1	Solanaceae	*Mandragora autumnalis*	108.
1	Urticaceae	*Urtica pilulens*	109.

Table 10. Showing the recorded families and the number (No) of species belonging to each family. Notice final families in the side rows 3&4 with more than two species.

1. Families	2. No. of Species in each family	3. Families with highest Sp. No.	4. Species No.
Asteraceae	21	Asteraceae	21
Lamiaceae	20	Lamiaceae	20
Fabaceae	9	Fabaceae	9
Araceae	6	Araceae	6
Apiaceae	5	Apiaceae	5
Anacardiaceae	4	Anacardiaceae	4
Capparaceae	4	Capparaceae	4
Caryophyllaceae	4	Caryophyllaceae	4
Plumbaginaceae	3	Plumbaginaceae	3
Rosaceae	3	Rosaceae	3
Boraginaceae	2	Boraginaceae	2
Cistaceae	2	Cistaceae	2
Cucurbitaceae	2	Cucurbitaceae	2
Fagaceae	2	Fagaceae	2
Liliaceae	2	Liliaceae	2
Apocynaceae	1		

1. Families	2. No. of Species in each family	3. Families with highest Sp. No.	4. Species No.
Apocynaceae	1		
Brassicaceae	1		
Caprifoliaceae	1		
Ephedraceae	1		
Euphorbiaceae	1		
Leonticaceae	1		
Malvaceae	1		
Oleaceae	1		
Papaveraceae	1		
Polygonaceae	1		
Primulaceae	1		
Ranunculaceae	1		
Resedaceae	1		
Rhamnaceae	1		
Salicaceae	1		
Scrophulariaceae	1		
Solanaceae	1		
Urticaceae	1		

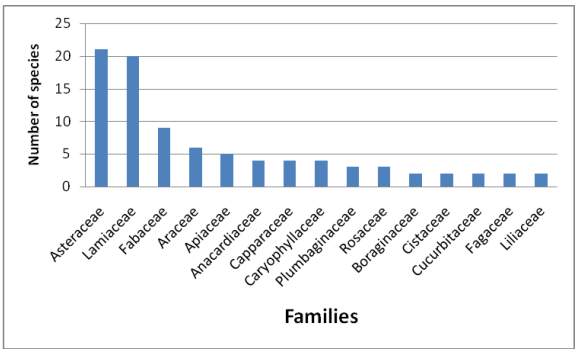

Fig. 1. Showing the highest species recorded in families with more than two species.

Table 11. Showing species occurrence in in the study areas (z) and their ratios (z/7*100). Only species occurring in two or more of study sites are considered.

Arum palaestinum	5	71
Teucrium polium	5	71
Cappais spinosa	4	57
Matricaria aurea	4	57
Paronychia argentea	4	57
Thymus capitatus	4	57
Achillea santolina	3	43
Dittrichia viscosa	3	43
Phagnalon rupestre	3	43
Plumbago europaea	3	43
Salvia triloba	3	43
Varthemia iphionoides	3	43
Anchusa strigosa	2	29
Anthemis palaestinum	2	29
Bifora testiculata	2	29
Ceratonia siliqua	2	29
Ecballium elaterium	2	29
Foeniculum vulgare	2	29
Mentha longifolia	2	29
Micromeria nervosa	2	29
Ononis natrix	2	29
Origanum syriacum	2	29
Pistacia palaestina	2	29
Retama raetam	2	29
Sarcopoterium spinosum	2	29

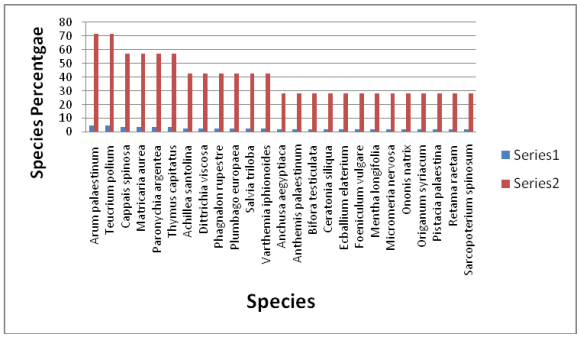

Fig. 2. showing the most recorded species in 7 sites.

Herbalists Visits

More than twenty different herbal shops spreading within the various governorate of the study area, Amman, Salt, Jerash, Ajloun and Irbid were visited. The herbal content of the shops was looked at to identify the plants, and to look at the type, quality, and sources of the herbs.

Various aspects of herbal and medicinal plants were investigated through direct or in direct asking the owners of such shops. The questions were rather simple and proposed in a friendly way to avoid offending the people who are selling such products. The answers and recorded remarks are summarized and found to fall under the following categories.

1. Quality of the herbal shops
2. Packing of the herbal products
3. Education of the people working in these shops
4. Their ability to know the scientific names
5. Their proper knowledge of plant uses and doses
6. Source of these herbs
7. Types of the herbs found in most of the shops
8. Types of the plant parts preserved
9. Quality of herbal plants
10. Trade size in the market?

Quality of the Herbal Shops

Herbal shops are found to belong to two simple categories:

i. Specialized herbal shops that are selling herb products, incense, spices and sometimes including perfumes.
ii. None specialized shops who are selling herbs in addition to normal grocery products.

Packing of the Herbal Products

Packing of herbal products was found in most cases to be of a very simple type. Cloth bags (Sacs) filled with herbs which are arranged at the entrance of the shops. Small seeds, powders or crushed material are found in plastic, metal buckets, or square wooden containers. In other case, plastic, or glass, jars are used to put the products. In more well organized shops a series of wooden or metal drawers are made at the back or one sides of the shop in a rack like system. Sometimes labels are put on these containers and often they are with no labels.

In some cases, new products such as herbal tea bags are found in the shops as well new products of variable pack sizes are either produced locally or imported from Syria, India, China or other countries.

Education of the People Working in These Shops

Indirect asking or even from speaking with the owner one can tell what is the level of education those people. It becomes clearer if one behaves more friendly and asking them about some scientific knowledge regarding the plants, they become even more frank when you tell them that you are doing a scientific investigation, and then they start asking back, who are you and where you are working? If they know that, you are working at the university and you do not belong to the Ministry of Health or Food Department, then they tend to speak more freely.

The education level of most people in this trade is mostly less than high school on average. Again, most of those people are young generation and do not have the traditional experience one would expect. It is just a market and they are selling the most popular herbs that people are purchasing, especially, Za'tar, (Thyme), Sana Mekka (Senna), Ja'da (*Teucrium*) and Carkadeh (Roselle).

Ability to Know the Scientific Names

Since the education of the owners of herbal shops is rather limited, then it was very unlikely to know scientific names or even common English names.

Proper Knowledge of Plant Uses and Doses

As for the use of the plants and their experience about their effect, they will just say this is a very well-known plant; everybody is buying it for this purpose. Moreover, they stress on the fact, that you just take it and if you don't like it bring it back. Of course, no body would come back, since the price paid in most cases is not worth coming back and spending the time and effort.

Regarding the doses, nothing is documented in a proper way. If you just ask about the use of certain plants, they will say take a little and boil in water and drink. They cannot precisely tell how often, one

should use the plant, what is the proper amount one should take? How long should the extract is kept boiling? For example, they say take alfalfa seeds boil in water and drink for reducing diabetes. They cannot give how many grams and in how much water one should boil? And for how long period one should use the plant? They say boil the seeds, drink, put the excess in the refrigerator, and keep going like this.

Type and Source of Herbal Plants

The source of the plants available in these shops is variable:

i. Jordanian Plant

Some of the plants are growing locally in Jordan under local condition especially, the plant species of: *Paronychia argentea* (Rijl Al-Hamameh), *Artemisia herba-alba* (Sheeh), *Achillea fragrantissima* (Qaisoom), *Artemisia judaica* (Baitharan), *Artemisia arborescens* (Thagn Ash-Shaikh). *Origanum syriacum* (Za'tar), *Thymus capitatus* (Za'tar Farsi), *Teucrium polium* (Ja'dah). *Salvia triloba* (Maramieh).

ii. Imported plants

Such plants are imported from different countries such as Syria, Lebanon, Egypt, Sudan, India, China or others. Some of the example herbs imported from Syria and Lebanon are Both *Origanum syriacum* and *Salvia triloba*, since the local production in not enough for the local consumption especially, if we know that a huge amount of *Origanum syriacum* is used as a spicy morning dish eaten with hot bread and olive oil or made as pastry called (Manageesh, Man'eesh). In addition, seeds such as *Pimpinella anisum* (anise, aniseed Yansoon), *Nigella sativa* (Black seed, Nigella or Hab*et al*-Barakeh), and *Foeniculum vulgare* (Fennel). Other plants are imported from Egypt especially, *Anthemis camomile* (Camomile), *Ammi visnaga* (Khelleh). In Jordan, one of the major imported medicinal plants from Sudan or India is *Cassia italica*, (Senna) and *Hibiscus sabdariffa* (Roselle, Karkadeh), *Rheum officinale* roots (Rubarb, Rubbas or Atrafan) are also imported although a local species *Rheum palaestinum* occurs in Jordan.

Types of the Plant Parts Preserved

The plants presents in most shops are found in the following form:

i. Whole plant
ii. Coarsely crushed plants (most common)
iii. Leaves
iv. Fragments of roots
v. Seeds
vi. Fruits

Quality of Herbal Plants

The quality of medicinal plants is not really in good condition or clean due to the fact that they contain fragments of other plant parts or dirt. The stored plants have neither expiry date nor any information about the date of collection or purchase or packing. Often they are left in the open air to collect dust, smoke, odors, or even beetles eating cellulose, or feces of small rodents such as mice or others. Sometimes the plant parts especially, *Paronychia, Artemisia, Achillea* and others are mixed with wild plant particles especially, hay, and grass fragments.

What is the size of this trade in the market?

There are no actual estimates of the size of the herb market in terms of money per year or consumed amount per year. As far as it looks, there is a great demand for herbal plants in the market because; herbal shops are ever increasing, since this business is becoming more popular than previous times. This part of information should be studied carefully and thoroughly. If the Ministry of Health in association with Ministry of Agriculture or other governmental departments are conducting such a study, there will be always a hidden part related to private dealing with some villagers or Bedouins who can collect medicinal plants and sell them privately.

The kinds of plant species observed in the herbal shop are listed in Table 12.

Table 12. Showing most common medicinal plants found in herbal shops.

No	Scientific name	Family	Arabic name
1.	*Ammi visnaga*	Apiaceae	خله
2.	*Apium graveolens*	Apiaceae	كرفس
3.	*Coriandrum sativum*	Apiaceae	كزبرة
4.	*Cuminum cyminum*	Apiaceae	كراوية
5.	*Daucus carota subsp. maxima*	Apiaceae	خلة
6.	*Ferula blanchei*	Apiaceae	مروحة، جدة
7.	*Foeniculum vulgare*	Apiaceae	شومر
8.	*Pimpinella anisum*	Apiaceae	يانسون
9.	*Arum hygrophyllum*	Araceae	لوف
10.	*Sambucus nigra*	Araliaceae	بيلسان
11.	*Achillea fragrantissima*	Asteraceae	قيصوم
12.	*Achillea santolina*	Asteraceae	فلفل؛ شويشة الراعي
13.	*Anthemis camomile*	Asteraceae	بابونج
14.	*Artemisia herba-alba*	Asteraceae	شيح
15.	*Artemisia judaica*	Asteraceae	بعيثران
16.	*Matricaria aurea*	Asteraceae	بابونج
17.	*Lepidium sativum*	Brassicaceae	رشاد
18.	*Sinapis alba*	Brassicaceae	خردل
19. 1	*Paronychia argentea*	Caryophyllaceae	رجل الحمامة
20.	*Juniperus phoenicea*	Cupressaceae	عرعر
21.	*Ricinus communis*	Euphorbiaceae	خروع
22.	*Alhagi maurorum*	Fabaceae	عاقول
23.	*Cassis italica*	Fabaceae	سنامكة، عشرج
24.	*Ceratonia siliqua*	Fabaceae	خروب
25.	*Glycyrrhiza glabra*	Fabaceae	سوس
26.	*Lupinus termis*	Fabaceae	ترمس
27.	*Medicago sativa*	Fabaceae	برسيم
28.	*Trigonella foenum-graecum*	Fabaceae	حلبة
29.	*Crocus sativa*	Iridaceae	زعفران
30.	*Mentha piperita*	Lamiaceae	نعنع
31.	*Micromeria nervosa*	Lamiaceae	زوفا
32.	*Origanum syriacum*	Lamiaceae	زعتر
33.	*Salvia triloba*	Lamiaceae	ميرمية
34.	*Teucrium polium*	Lamiaceae	جعدة
35.	*Thymus capitatus*	Lamiaceae	زعتر فارسي
36.	*Laurus nobilis*	Lauraceae	غار
37.	*Allium sativum*	Liliaceae	ثوم
38.	*Lausonia inermis*	Lythraceae	حناء
39.	*Hibiscus sabdariffa*	Malvaceae	كركديه
40.	*Ficus carica*	Moraceae	تين، قطين
41.	*Rheum officinalis*	Polygonaceae	رباص، عطرفان
42.	*Rheum palaestinum*	Polygonaceae	عطرفان
43.	*Nigella sativa*	Ranunculaceae	حبة البركة
44.	*Ziziphus spina-christi*	Rhamnaceae	سدر
45.	*Crataegus aronia*	Rosaceae	زعرزر
46.	*Crataegus azarolus*	Rosaceae	زعرور، نبق
47.	*Ruta chalepensis*	Rutaceae	سذاب، فيجن
48.	*Urtica pilulifera*	Urticaceae	قريص

The results of this study showed that the highest families with medicinal plants in the study area were Asteraceae, Lamiaceae, Fabaceae and Apiaceae, whereas the families of Apocynaceae, Cistaceae, Fagaceae, Liliaceae, Rosaceae and Scrophulariaceae showed lower number of medicinal plants as shown in Fig. 1.

Discussion

This ethnobotanical study is providing a source of taxonomical data about the wild medicinal plants in the central mountains of Jordan and their medicinal values as applied by the local people in folk medicine. Moreover it reflects the richness of plant biodiversity of the study area, particularly the wild medicinal plants, which are used by the native populations through history for a long period of time in the

treatment of diseases as alternative medicine. The use of different plant species for the treatment of various ailments looks similar in the different sites of the study area as shown in tables 3-11. A remarkable observation in this study showed the ignorance of the young generation about the identity and the use of these medicinal plants in treating diseases, on the contrary the eldest were very familiar with applications of local medicinal plants in traditional medicine. The study revealed a number of 47 families of vascular flowering plants, with redundancy of similar species in the different studied sites, with some plant species that showed highest occurrence in other sites as shown in Fig. 1 and 2.

However the most recorded species in the seven study sites sequentially were *Arum palestinum, Teucrium polium, Capparis spinosa, Matricaria aurea, Paronychia argentea, Thymus capitatus, Achillea santolins, Dittricha viscosa, Phagnalon rupestre, Plumbago europaea, Salvia triloba, Varthemia iphinoides, Anchusa strigosa, Anthemis palaestina, Bifora testiculata, Ceratonia siliqua, Ecballium elaterium, Foeniculum vulgare, Mentha longifolia, Micromeria nervosa, Ononis natrix. Origanum syriacum, Pistacia atlantica, Retama raetam, and sarcopoterium spinosum* as shown in Fig. 2.

Conclusion

It is learned from the present ethnobotanical investigation in the different sites of the study area, and from the participation of the local community in most of the study sites and the direct communication with local communities and visits took place to all mentioned sites, the following facts:

1. Most of the people questioned were of age range between 40-60 (few were young shepherd boys)
2. The absence of very old age sample of people (Men or Women).
3. The isolation of citizens (inhabitants) living closely to the study area.
4. Most of the investigated areas were people living nearby their farms or house or serving in farms or shepherd boys.
5. The knowledge of the local medicinal plants is not as expected, the people are seems ignorant about the majority of their native medicinal plants.
6. The use of native medicinal plants in the different sites are used and practiced more or less similarly by locals in most sites of the study area Jerash, Zai, Dibeen, Rmamea, Ajloun, Irbid, Amman (Bader), Fuhais and Mahis).
7. The local Arabic names of the MPs are largely similar in all the studied, examples are:

- *Ononis* is called wasba, Lubaid in all the sites, with similar uses.
- *Paronychia* is called Rijl Al-Hamamah in all the sites with similar uses.
- *Plumbago* is called Khamshah in the all sites with similar uses.
- *Varthemia* is called Chetailah in all the sites except in Al-Fuhais, it is also called Hendedeh.

8. Most of the medicinal plants used by the locals in all of the study sites are used as decoction or boiled in water.
9. The MPs that are used by the locals in the different sites of the study area are used mainly for pain relief or for microbial infections, respiratory ailments and cancer.

Based on this survey, it was found that the use of medicinal herbs in folk medicine is declining in most of the investigated areas. Some reasons are to be considered as follows:

a) Degradation of the wild plants resources including the MP.
b) Grazing.
c) Urbanization.
d) Road construction.
e) Forest destructions.
f) Lack of elderly people in most of the study localities, hence the youth are comprising the large number of the population.
g) Lack of public awareness or knowledge about medicinal plants, the people kept saying in every visit

to the study sites: "Our grandfathers and grandmothers used to know much more than us!"

h) The use of medicinal plants by the locals are causing great declining of the diversity of many species growing in all sites visited by the investigators.

i) The medicinal plants that were seen in the herbalist shops are mostly imported from different parts of the world. Although the herbalists claimed the opposite, however, it is advised to deal carefully with such herbs and about the exact identity and use.

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