

Ethnobotany of Local used Medicinal Plants in Azerbaijan Republic

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Abstract

Azerbaijan has a rich flora as results of variable climate and many ecological zones. This diversity in flora provides by rich source of medicinal plants which has been utilized by national cultures during long time and hence, Nakhchivan Autonomous Republic in Azerbaijan stands out due to accumulation of medicinal folk knowledge. The study was conducted for four years mostly at west part of Azerbaijan (Lesser Caucasus and Nakhchivan Autonomous Republic regions): Shahbuz, Ordubad, Sharur, Babek, Julfa (Nakhchivan AR) and some districts from other regions of Azerbaijan - Ganja, Shamkir, Samukh, Dashkesan, Gedebe, Goygol, Tovuz, Gazakh, Agstafa, Goranboy, Tartar (Lesser Caucasus). Total of 600 samples were collected and utilization information recorded from 230 people during the study period. The highest number of samples with 160 accessions was taken from Nakhchivan region. 130 samples followed from Ganja district. Most plants (70%) used in folk medicine were wild crafted. The 33.0% of the used plant consisted green herbage, 12.8% were flowers and 10.3% were fruits. Oregano, thymus and mentha had 41, 21 and 19 accessions, respectively while some plants had single sample. One or more than one plant was reported for almost treatment of all illnesses. 240 plant species from 76 families used in folk remedies were identified in this study.

Keywords: *Ethnobotany; Folk medicine; Nakhchivan autonomous republic; Lesser Caucasus; Azerbaijan*

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Introduction

There are around 300,000 identified plant species in the World. Approximately 20,000 of them have medicinal properties, but 4,000 of those plants are used as drug and 400 have commercial value [1]. 80% of the World population uses medicinal plants for healing according to World Health Organization. Ethnobotany studies were mainly initiated in 2000's in Azerbaijan, yet the use of plants in ethnobotany had acceleration at the beginning of 1900's in the World [2].

In recent years, the increase in the residential and agricultural areas, and the decrease in medicinal plants have triggered the interest in ethnobotanical studies throughout the world. The interest in herbal medicine in Azerbaijan has progressed parallel to the increased interest in folk medicine. Recently, various studies have been conducted to prevent the folk medicine from disappearing by several scientists [3-8]. Also later, Ibadullayeva and her followers, continuing research in

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this area and received interesting results. Around 600 plant species are used for healing mainly in rural area in Azerbaijan, however, more plants are expected to be consideration for use of healing via more research [9-16]. Number of studies were conducted on ethnobotany in Azerbaijan. Mekhdiyeva [17] conducted a study of 425 species in folk medicines in Azerbaijan. According the data 27% of them had scientific value, 68% had pharmacological effect and 4% had no meaning. Ibadullayeva et al. interviewed 2246 people in 14 districts of Azerbaijan. They found that 247 plants from 32 families were used by people, 101 of them as food, 78 for healing, 65 both for food and healing. Ethnobotany studies in Azerbaijan are mainly focused at western part due to rich biological diversity and indigenous knowledge. 37.9% of 78 plant taxon, in another study 50 taxon in Ganja, 150 taxon in Nakhchivan AR and 35 taxon in Gedebe, 91 taxon in five districts of western part of Azerbaijan were used in folk medicines [15,16]. Researchers found that the highest proportion of the wild plants used in ethnobotany were from *Apiaceae* and *Asteraceae* families followed them in Nakhchivan regions and from Tovuz-Gazakh districts. Addition, there were an overlap for uses of plants, many cultivated plants were used for both purposes as nutrition and healing in the regions.

For centuries, Azerbaijan people have been using herbal medicine for the treatment of some daily diseases. The West part of Lesser Caucasus and Nakhchivan AR are the regions riches by plant diversity and indigenous knowledge. Accordingly, the traditional herbal medicines are important for the life of people. Main goal of research - find plants used in folk medicine and determinate of the using ways in Western part of Azerbaijan.

Material and Methods

Material

Local used of medicinal plants and indigenous knowledge about their aims and forms of utilization in folk medicine in Western part of Azerbaijan includes in Lesser Caucasus region.

Methods

The study was conducted at Shahbuz, Ordubad, Babek, Julfa, Ganja, Goygol, Terter, Shamkir, Dashkesan, Gedebe and Tovuz-Gazakh districts in Lesser Caucasus and Nakhchivan AR regions of Azerbaijan for four years. Additionally some more records were obtained from districts of other regions of Azerbaijan (Guba, Zaqatala, Shaki, Lankaran, and Yardimli). Populations of these regions have more information about medicinal plants.

The plants used as medicinal, their utilization forms and aims were determined by Trained Extension Services staff and also project staff. They collected the information and herbariums of the plant species used in districts and send the collected material and information. Excursions were organized to the districts of the study regions and samples and data were collected by the project staff. Both project staff and extension services staff collected the information and herbarium samples from people by interviewing face to face and using standard information collection forms developed by project staff.

In the study, various information were recorded, such as the age of the person giving information about medicinal plants, education level of people, the local names of the plants, where the plants were supplied, and used parts and forms of the plants for medicinal purposes and the way and aim of usage, the source of information on medicinal plants people learnt.

The herbarium samples were identified scientifically and scientific names of plants were also recorded.

Results and Discussion

The study was conducted at Ganja, Goygol, Terter, Shamkir, Dashkesan, Gedebey and Tovuz-Gazakh districts in Lesser Caucasus and Shahbuz, Ordubad, Babek, Julfa districts of Nakhchivan AR regions of Azerbaijan for four years. Additionally some more records were obtained from districts of other regions of Azerbaijan (Guba, Zaqatala, Shaki, Lankaran, and Yardimli). Total of 600 samples were collected and utilization information recorded from 230 people during the study period. Information was received such as used plant parts, using purpose (food, medicine etc.), the way of preparation (decoction, infusion, poultice or ointment, in the form of dry or fresh form), the age, education of people giving information via polling. Then data were evaluated. Herbarium material collected from the wild plants and classified by modern nomenclature.

The highest numbers of samples with 160 accessions were taken from Nakhchivan AR. Ganja district followed by 130 samples. Most plants (70%) used in folk remedies were wild crafted. 33.0% of the used plant parts - green herbage, 12.8% were flowers and 10.3% were fruits. Oregano, thymus and mentha had 41, 21 and 19 accessions, respectively while some plants had single sample. One or more than one plant was reported for almost treatment of all illnesses. 240 plant species form 76 families used in folk remedies were identified in this study. Minimum number of records was gathered from Agstafa by 4 records and Samuch by 5 records (Figure 1).

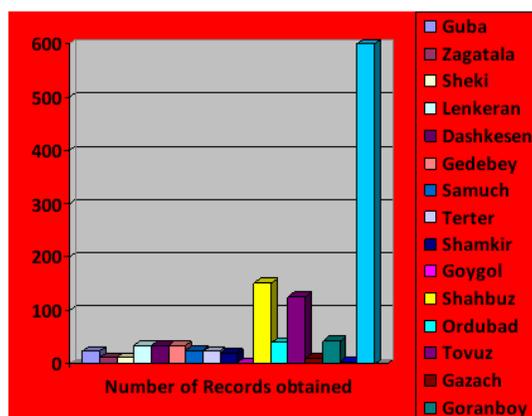


Figure 1: The number of data obtained from the study provinces.

All records were collected from 230 people and information was obtained of all ages. Majority of information (77%) were gathered from people aged 31 years - 70 years (Figure 2).

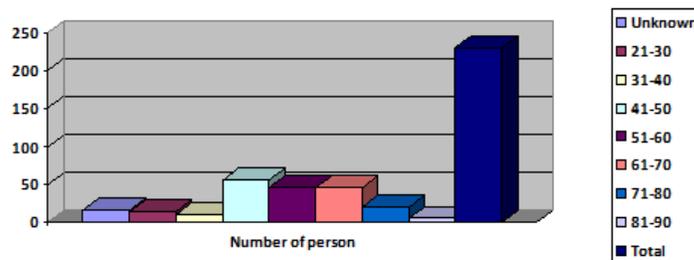


Figure 2: Numerical and proportional distribution of age groups of the surveyed population.

A large variation information collected from educated people (Figure 3). Majority of the people (60%) was primary school graduates, there was college and university graduates by the rate of 18%.

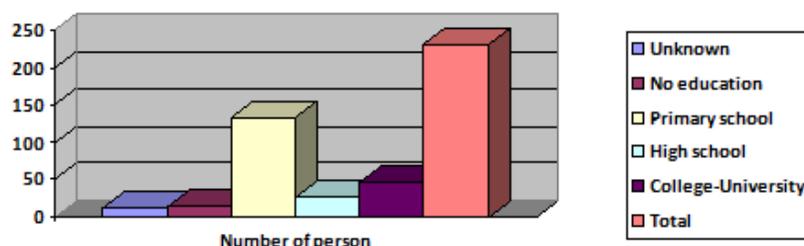


Figure 3: Data received from numerical and proportional distribution of educated people.

About of 74% of plants being exploited for therapeutic purposes were obtained from nature as well as supplied from market, grocery, herb sellers or gardens (Figure 4).

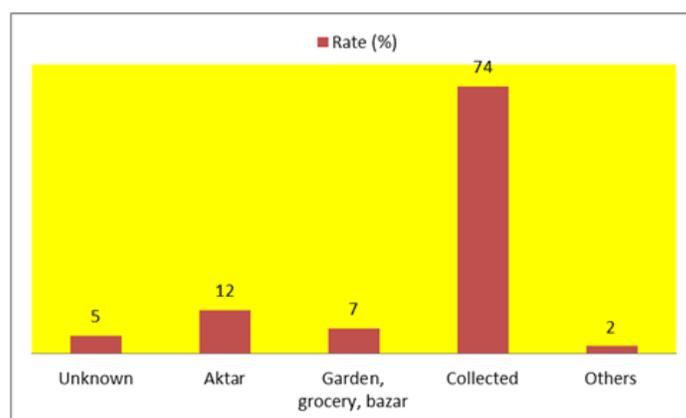


Figure 4: The source, ratio and number of supplied plants used for folk medicine.

Large variation of plant organs were used and utilized for therapeutic purposes. The utilization of upper part of plants (above-ground) such as flowers, leaves and fruits was most common with 3/4 rate. In lesser extent, cones, resin, shell, bulbs, corms and other parts are utilized (Table 1).

Some plants were used more likely than others according to records in the study area. Chief among them Thyme - 41 times, Rose - 21 times, althea or topped Salvia - 18-19 times were reported for the therapeutic properties (Table 2).

Used parts of plants	Number	Rate (%)
Plant sap	2	0.3
Kindling	1	0.2
Flower	74	12.8
Flowers and branches	2	0.3
Sprout	6	1.0
Stem shell/bark	3	0.5
Bran	1	0.2
Cone	2	0.3
Root	35	5.7
Fruit	64	10.3
Fruit skin	4	0.6
Fruit stalk	1	0.2
Fruit juice	1	0.2
Resin	2	0.3
Gum	1	0.2
Bulb/corm	11	1.8
Cork	1	0.2
Seed	33	5.3

Seed and leaf	2	0.3
Seed and flower	1	0.2
Whole plant (excl. Roots)	200	33.3
Whole plant	16	2.6
Essential oil	2	0.3
Flour	2	0.3
Oil	4	0.6
Leaf	90	15.8
Leaf and seed	3	0.5
Leaf and flower	9	1.5
Leaf and branch	11	1.8
Leaf-stem	3	0.5
Leaf-root	1	0.2
Leaf-fruit	6	1.0
Leaf-seed	3	0.5
Tuber	3	0.5
Total	600	100.0

Table 1: Used parts of plant and the number and ratio of plant organs used for medicinal purposes.

A number of 240 species from 76 families have been identified and used in folk medicine. The large proportion of information in various aspects of use were collected in this study compared with the studies conducted by researchers. Plants used in the treatment of many different diseases are freely harvested in the region at abundant amounts. Plants which are used in different parts of the world for the treatment of similar diseases might be deemed to be effective in pharmacological terms.

Local name of plant (az.) & latin name	Frequency
Keklikotu-Thymus	45
Itburnu-Rosa	21
Adaçayı-Salvia	19
Gulhatmi-Altheae	18
Cobanyastigi-Mathricaria	16
Baldirgan-Heracleum	15
Amarant-Amarantus	14
Shuyud-Anethum	13
Gicitkan-Urtica	13
Yer koku-Daucus	13
Evelik-Rumex	12
Havuc-Pastinaca	11
Mayaotu-Humulus	10
Zeytin-Olea	10
Ardıç-Juniperus	9
Ushgun-Rheum	9
Merecoyud-Asparagus	9
Defne-Laurus	9
Emegömeçi-Malva	9
Nane-Mentha	9
Heyva-Cydonia	8
Dağterchunu-Tanacetum	8
Sarımsak-Allium	8
Ceviz-Juglans	7
Gendalash-Sambucus	7
Gargıdali-Zea	7
Solmaz çiçek-Helichrysum	7
Atilbatil-Sosima	6
Iyde-Elaeagnus	6
Lavandula	6

Zire-Carum	6
Biyar-Glycyrrhiza	6
Okuzbogan-Bupleurum	6
Sıgır kuyruğu-Verbascum	6
Yemishan-Crataegus	6
Kudret narı-Momordica charantia	5
Limon-Citrus	5
Alca-Prunus	5
Üzerlik-Prganium	5
Sehleb-Orchid	4
Zirinc-Berberis	4
Böyürtken-Rubus	4
Nar-Punica	4
Daziotu-Hypericum	4
Shabalid-Aesculus	3
Ayrıkotu-Agrophyron	3
Çaşır-Prongos	3
Kustusham-Bronya alba	3
Çiriş out-Eremrus	3
Kuşeppeyi-Capsella bursa-pastoris	3
Çörek out-Nigella	3
Erik-Prunus armeniaca	3
Badem-Prunus dulcis	3
İncir-Ficus	3
Biber-Capsicum	3
Kovaq-Populus	3
Kushüzümü-Solanum	3
Caytikeni-Hippophae	3
Ceferi-Petroselinum	3
Kartof-Solanum tuberosum	3
Sumak-Rhus	3
Arpa-Hordeum	2
Buğda-Triticum	2
Çovdar-Secale	2
Qanteper-Cephalaria	2
At pıtrağı-Arctium	2
Topuztiken-Echinops	2
Innap-Ziziphus	2
Coke-Tilia	2
Qatırquyruğu-Equisetum	2
Ayidosheyi-Dryopteris	2
Kara turp-Raphanus sativus	2
Keçi boynuzu-Cerantonia siliqua	2
Kalxansis-Athyrium	2
Qaracohre-Taxus	2
Ezgil-Mespilus	2
Rezene-Foeniculum	2
Xiyar-Cucumis	2
Qaytarma-Potentilla	2
Şahtere-Fumaria	2
Xoruzgulu-Primula	2
Xashxash-papaver	1
Andız-İnula	1
Cincilim-Stellaria	1
Gulabetin-Pulsatilla	1
Qumluca-Arenaria	1
Tere-Chenopodium	1
Spanaq-Spinacia	1
Devedikeni-Alhagi	1
Tomat	1
Elma-Malus	1

Subiberi-Persicaria	1
Bistort-Bistorta	1
Hardal-Sinapis	1
Karanfil-Dianthus	1
Pishikotu-Valerianus	1
Yolotu-Polygonum	1
Gilas-Prunus avium	1
Kişniş Coriandrum	1
Kuzu kulağı-Oxalis	1
Künküt-Sesamum	1
Bedrenc-Melisa	1
Yulgun-Tamarix	1
Soyud-Salix	1
Portakal-Citrus sinensis	1
Qovaq-populus	1
Delicetene-Datisca	1
Dagdagan-Celtis	1
Tut-Morus	1
Dovshankelemi-Crassula	1
Armud-Pyrus	1
Kusharmudu-Sorbus	1
Qarayonca-Medicago	1
Geven-Astragal	1
Murdarca-Rhamnus	1
Dagkishnishi-Bifora	1
Üçgül benovshe-Viola tricolor	1
Yabani kok-Daucus carota	1
Yalanci cire-Pimpinella	1

Table 1: Used plant for medicinal purposes and their frequency.

Ethno-pharmacological properties of some wild herbs, their parts used on medicinal purposes and especially diseases for which they used have been shown in Table 3.

Latin names of species	The part used on medicinal purposes	What diseases are they used at
<i>Thymus kotschyanus</i> Boiss et Hohen (Lamiaceae)	Surface part	Used against cough, bronchitis, dysentery, angina, flatulence, worms, colds and flu viruses
<i>Rosa canina</i> L. (Rosaceae)	Completely matured fruits	Avitaminosis, scurvy, hemorrhagic diatesis, cholelstit, hepatit, kidney and bladder, gastroenteric diseases, antiburns, wounds and infecsions
<i>Althaea officinalis</i> L.- (Malvaceae)	Root	For diseases of the respiratory tract, gastric ulcer, diarrhea, acute gastritis, enterocolitis, abdominal cramps, cystitis, angina.
<i>Inula helenium</i> L. (Asteraceae)	Roots and root crops	Diseases of the gastrointestinal tract, diseases of the stomach and duodenum, bronchitis, colds, coughs, worms.
<i>Achillea millefolium</i> L. (Asteraceae)	Grass, flower, leafs	Gastritis, peptic ulcer disease, bloody diarrhoea, internal bleeding, as a sedative, as a diuretic.
<i>Humulus lupulus</i> L. (Cannabaceae)	Surface part	Antispasmodic, analgesic, sedative, sedative, appetizing, anti-inflammatory, diuretic, anticonvulsant, deworming effects.
<i>Pinus sylvestris</i> L. (Pinaceae)	Leavs and buds	Heat rash, some skin diseases, scab, pharyngitis, anti cough and rachitic as well as diuretic
<i>Quercus robur</i> L. (Fagaceae)	Bark and sometimes fruitcase	Stomatitis, gingivite, chronical tonzillite, gastro-enteric bleeding, diarrhea, stomach keen ache, burn and skin diseases
<i>Morus alba</i> L. (Rosaceae)	Bark of its trunk and roots, matured fruits, leafs	Cardio-vascular system, anaemia, scarlatina, chickenpox, angina, stomach ulcer, rheumatism, worm driving out, cold, epilepsy and itch
<i>Rheum ribes</i> L. (Polygonaceae)	Roots and rhizome	In big doses a weak laxative, in little doses as appetite improver, contracting, skin diseases and bile driving out
<i>Chelidonium majus</i> L. (Papaveraceae)	Surface part	Warts, wounds, ulcers, skin tuberculosis, skin cancer, liver, jaundice and bile diseases
<i>Ribes nigrum</i> L. (Rosaceae)	Leaves and berries	Avitaminosis, kidney diseases, cold, gastritis, cholelstitite, anaemia, rheumatism, infecsion, respiratory passage diseases, skin diseases, salt driving out, tuning of heart-vascular system
<i>Filipendula ulmaria</i> (L.)	Rhizome/root stock and	Cold, diarrhea, dizenteria, different skin dieases, eczema, worm driving out

Maxim. (Rosaceae)	surface part, flower	and diuretic, bleeding of stomach and lungs
<i>Agrimonia eupatoria</i> L. (Rosaceae)	Surface part in the flowerence period	Chronical diseases of liver, rheumatism, chronical diseases of gastroenteric diseases of mouth cavity and pharinx, foot dislocations and skin ulcers
<i>Melilotus officinalis</i> (L.) Pall. (Fabaceae)	Herb and thin part of its trunk in the flowerence period	Respiratory diseases, expectorant, breast-softening means, gas-deducing means, ulcer, furuncle, purulent wounds' treatment and rheumatism
<i>Peganum harmala</i> L. (Nitrariaceae)	All parts	Nervous, diseases-epidemic ensefalit, parkinsonism, cold, malaria, rheumatism, itch and stomach diseases; as diuretic and sweat driving out
<i>Hypericum perforatum</i> L. (Hyperaceae)	Surface part	Gastroenteric inflammation, cholestistit, hepateit, cystitis, stomatitis, pharingitis, tonsillit, angina, rheumatism, tuberclosis, inside bleeding, furuncle, mastitis, abcess, burn, worm driving out and diuretic
<i>Hippophae rhamnoides</i> L. (Elaeagnaceae)	Fruit	Hypo- and avitaminozes, trophic ulcers, stomatitis, respiratory passages, skin tuberclosis, cancer diseases, stomach ulcer, burns, radiation
<i>Origanum vulgare</i> L. (Lamiaceae)	Surface part in the flowerence period	Mouth cavity diseases, tooth aches, erysipelas, furuncle, skin rashes, rheumatism, cholestistit, stomach spasm, paralysis, epilepsy, for appetite and anti cough
<i>Plantago major</i> L. (Plantaginaceae)	Leaf (humid or dry), grass and juice	Stomach ulcer, gastroenteric diseases, stomach and duodenal guts ulcers, anti cough, whooping cough, phlegmons and burns.
<i>Viburnum opulus</i> L. (Vibirnaceae)	Bark of its trunk and fruit	Rheumatism of joints, improves arterial pressure by increase of heart muscle tune, and as a laxative
<i>Sanbucus nigra</i> L. (Sanbugaceae)	Flower and fruit	German measles, measles, inflammation of respiratory tracts, pharyngitis, avitaminosis, malaria, diabetes, kidney diseases, diuretic.
<i>Tussilago farfara</i> L. (Asteraceae)	Flower and leaves	Kidney, bile channals different diseases, ascaridoz, blood rehabilitation and some skin diseases
<i>Helichrysum plicatum</i> DC. (Asteraceae)	Flower	Gastroenteric diseases, liver diseases, diarrhea, sweat riding out, headaches, joint aches, jaundice, itch, worm riding out
<i>Tanacetum vulgare</i> L. (Asteraceae)	Flower and leaves	Dyzenhery, stomach catharrah, anaemia, jaundice, as bile riding out ödqovucu kimi, liver, kidney diseases, diabetes, rheumatism, malaria and cold
<i>Matricaria chamomilla</i> L. (Asteraceae)	Anthodium and flowers	Chronical colitis, eczema, cleaning of pygment spots, burns, chronical liver diseases, jaundice, bladder, kidney, skin diseases, profilactics of malaria, anaemia, rheumatism and insomnia
<i>Taraxacum officinale</i> Wigg. (Asteraceae)	Root and surface part	Gastroenteric and kidney diseases, worm riding out, angina, dentals inflammations, heat, diabetis, anti cough, anti thirst, rheumatism and in strengthenin of organizm
<i>Verbascum densiflorum</i> Bertol. (Scrophulariaceae)	Petals	Gall bladder, liver diseases, gastritis, dispepsia, ulcers, pleuritis, lungs and spleen diseases, worm riding out an iuredic
<i>Centaurium umbellatum</i> Gilib. (Asteraceae)	Surface part	Rheumatism, diabetes, lungs diseases, whooping cough, kidney aches, blodder inflammation, epilepsy, deuretic and regulates function of liver
<i>Dryopteris filix mas</i> (L.) Schott (Dryopteridaceae)	Nodules	In the expulsion of tapeworms (broad tapeworm, bull and pig solitary), rheumatic pains, leg muscle spasms, wounds, ulcers.
<i>Bryonia alba</i> L. (Cucurbitaceae)	Root	Used in human joint rheumatism. Increases of arterial pressure by increasing the tone of the heart muscle, has a mild laxative effect.
<i>Asparagus officinalis</i> L. (Asparagaceae)	Roots and nodules	Rheumatism, diabetes, lung diseases, whooping cough, kidney pain, inflammation of the bladder, epilepsy, diuretics, improves liver function, improves heart function, and improves heart rate.

Table 3: Ethno-pharmacological properties of some wild herbs.

Discussion

Frequency of plants used in Azerbaijan and in closest border countries - Turkey and Iran is the same. Compared using plants as medicinal and from species variety and generally using in Nakhcnivan and in bordering regions in Turkey - Igdır and in Iran - Tabriz also is the same [18,19]. However, there are more materials on the use of plants in the Anatolian region of Turkey [20,21]. At the same time, Azerbaijan is a Caucasian country, all specific indicators to the use of plants in the region as a whole are also applied here to identical diseases despite a slightly different approach [22].

Conclusion

So, results of four year study have been presented in paper. The study was conducted mostly at Lesser Caucasus, concretely in west part of Azerbaijan and Nakhchivan Autonomous Republic. Total of 600 samples were collected and utilization information recorded from 230 people during the study period. The highest number of samples with 160 accessions was taken from Nakhchivan region. 130 samples followed in Ganja district. Most plants (70%) used in folk medicine were wild crafted. 33.0% of the used plant parts consisted green herbage, 12.8% were flowers and 10.3% were fruits. Oregano, thymus and mentha had 41, 21 and 19 accessions, respectively while some plants had single sample. One or more than one plant was reported for almost treatment of all illnesses. 240 plant species from 76 families used in folk remedies were identified in this study. The obtained results once again have showed both from a medical and historical point of view value of ethnobotanical studies directly linking with scientists and the local population. In the future, the development of ethnobotanical research will serve to ravage and use medicinal plants to an even greater extent in clinical medicine and ethno-pharmacological use of plants will play an important role in the production of new drugs.

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