Identification of Medicinal Plants in Arshadchamani Rangelands of East Azarbaijan

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Abstract. Arshadchamani rangelands are placed in the north foothill of Sahand Mountain and near Kandovan Village. Therefore, it has plant diversity and economical values. In this region, medicinal plants are cut and sold by the stores with non-standard packaging without scientific name. Regarding the economical value of medicinal plants and thereby the investment necessity on these valuable resources for using in chemical, pharmaceutical and food industries, the collection and identification of these plants could be useful. Collection and identification of plants in the region were carried out during two years. 256 collected species were identified in herbarium and then medicinal plants were separated by the scientific references. During this project, 95 species of medicinal plants belonging to 78 genus and 32 families were identified. The highest number of medicinal plants were related to Lamiaceae (17 species), Asteraceae (11 species), Brassicaceae (10 species), Fabaceae (9 species) and Apiaceae (7 species). The life form of medicinal plant species was determined by Raunkier's method and they are including 57.89% Hemicryptophytes, 28.42% Therophytes, 7.36% Chamaephytes and 5.26% Geophytes. Six medicinal vegetation types were recognized in the are: *Ziziphora clinopoioides* Lam. *Thymus kotschyanus* Boiss. And. Hohen.,*Urtica dioica L., Alcea flavovirens* (Boiss. and Buhse) Iljin, *Stachys lavandulifolia* Vahl, *Cichorium intybus* L., *Achillea willhelmsii* C. Koch, *Stachys inflata* Benth., *Peganum harmala* L., *Rosa domescena* L. were economically very important.

Keywords: Medicinal plants, Arshadchamani, East Azarbaijan, Iran.

Introduction

Using of plants especially medicinal plants were considered due to the human needs for nutrition and treatment during the history. Following the science development, people use medicines that have chemical origin but recently due to the harms of these medicines, medicinal plants have been considered for the cure of diseases. Every country should provide a list of medicinal plants for investment on these valuable resources and the future plans. In Iran, medicinal plants prepared in the modern packages by different companies or herbalist, s shops without the determination of their scientific name. It is necessary to study the medicinal plants scientifically in different regions and use in the scientific and standard forms. Given the medicinal plant effects in Arshad chamani Rangelands, these plants can be used in medicinal and medical Institutes. The identification of medicinal plants keeps them from the extinction. Also, we can add new species to list of medicinal plants. Ebrahimi *et al*. (1997) identified 328 species of medicinal plants in East Azarbaijan. The most important families included Asteraceae, Apiaceae and Lamiaceae. In this Research Report, only few species have been presented in Kandovan. Nagiloo (2006) collected 120 medicinal plant samples and introduced 100 species belonging to 88 genus and 41 families in East Azarbaijan. Most of the species were related to Lamiaceae, Asteraceae and Apiaceae. Rasouli *et al*. (2007) identified 69 species of medicinal plants in Kiamaki Mountain. Lamiaceae had 18 species belonging to 11 genuses and Asteraceae having 11 species belongs to 9 genuses.

Materials and methods

This survey was carried out in Kandovan and Arshad chamani region, Northwest of Iran and in 55 km of south in Tabriz and 20 km of South East in Osku. This region is placed between 47□10′ to 47□20′ longitude and 37□42′ to 37□52′ latitude with about 7036 hectare. The lowest and the highest altitude were 1800 and 3000 meters, respectively.

Field studies

At first step, the studying area was determined after 1: 50000 topographic mapping. Plant sampling was conducted from 2008- 2009 during two vegetation seasons. Plant collection method was on the basis of taxonomic studies. Plants were collected with complete generative and germinative organs. Also, we took a photo of all species. Plants were transferred to herbarium. Collected samples identified based on plant taxonomy methods and using Flora Iranica (1963-1999), Flora of Turkey (1998), Colored Flora of Ghahraman (1975-2000), Flora of Iran (1980-1999), Flora of Iraq (1970), Flora of East Azarbaijan (1989-1993), Botany (1998), Plant Taxonomy, first book: Morphology Taxonomy(1993), Medicinal plants of Iran (1986), Medicinal plants (1990), Trees and Shrubs in Iran (1963), Plant Culture (1996-98) in the Herbarium of Agriculture Faculty, Tabriz University and Tabriz National Botanic Garden Herbarium. Families, genus and species were determined for every plant. The life form of plant species was determined using Raunkier, s method Raunkier, C. (1934).

This area was divided into six elevation classes and was used from helix plot (Quadrate) method for the determination of minimal area (Fig. 2). 0.5*.x.0.5 minimal area was selected and all the plant species were registered. Then area double, quadruple, octuple and become enlarged. In every step, new species write down for every area. Duplicating of sample area continued until to decreasing number of added species to other species. Canopy (%) determined by plot (Quadrate) for every elevation class. The plant that had the most percent of canopy as dominant plant and other plants until one percent canopy introduce as companion species.

Results

From the beginning of the project, in general 400 plant samples were collected and 256 plant species were identified. The results of field and laboratory studies showed that there are 95 species of medicinal plant belonging to 32 families. Among plants that were identified, 17 species belong to Lamiaceae, 11 Asteraceae species, ten Brassicaceae species, 9 Fabaceae species and seven Apiaceae species (Table 2). *Ziziphora, Thymus, Stachys, Urtica, Malva, Cichorium, Peganum* and *Achillea* are used by Kandovan villagers. From the view point of life form, 55 species were perennial forbs, 27 species Annual forbs, seven species suffrutescent, one species Arborescent and five species Geophyte (Fig.1). Applied parts of these plants contain root, bark, leaf, flower, fruit, seed and all the other parts. The most applied parts that villagers consume belong to flower and leave in this region (Table 1). *Achillea millefolium* L. and *Mentha longifolia* (L.) Huds. are extincting in this region? Six types of medicinal vegetation plant were recognized in the area (Fig. 2. and Table 3).

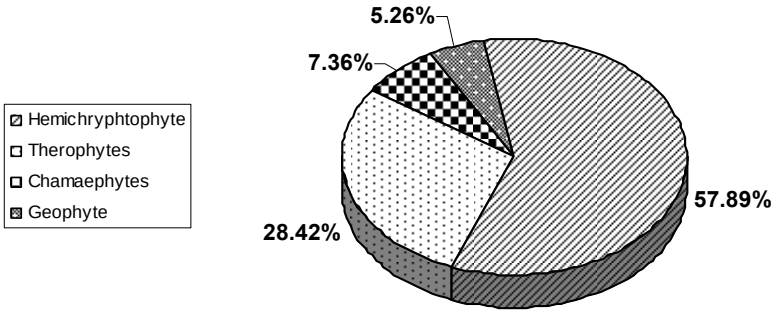

Fig. 1. Life Form of Medicinal Plants in Arshadchamani Rangelands
He= Hemichryphtophyte, Th= Therophtytes, Ch= Chamaephytes, Ge= Geophyte

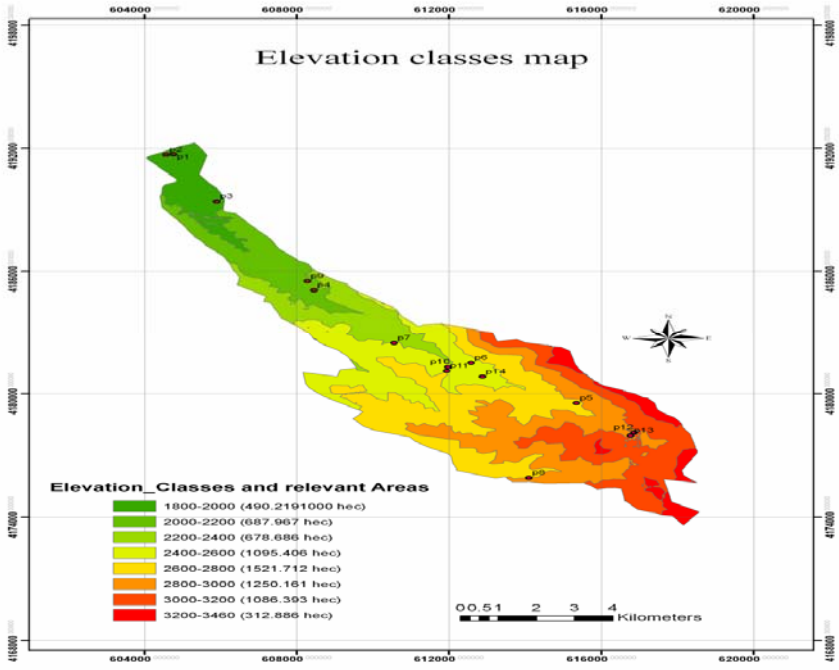

Fig. 2. Hypsometric Map Provided from Arshadchamani (study area)

Table 1. List of Medicinal Plants in Arshad Chamani Rangelands

Row	Scientific name	Family	Life form	Applied parts
1	*Acantholimon racteatum (Giard) Boiss*	Plumbaginaceae	Chamaephyte	Aerial organs
2	*Achillea millefolium* L.	Asteraceae	Hemichryphtophyte	inflorescence
3	*Achillea willhelmsii* C.Koch	Asteraceae	Hemichryphtophyte	inflorescence
4	*Adonis aestivalis* L.	Ranunculaceae	Therophtyte	All parts
5	*Alcea flavovirens(Boiss & Buhse)*	Malvaceae	Hemichryphtophyte	Flower
6	*Alliaria petiolata (*M.B) Cavara & Grande	Brassicaceae	Hemichryphtophyte	Flowering top branch, Leaf
7	*Allium Akaka Gmel.*	Liliaceae	Geophyte	Leaf, Corm
8	*Anchusa italica* Retz.	Boraginaceae	Hemichryphtophyte	Aerial organs
9	*Anthemis altissima* L.	Asteraceae	Therophtyte	Flower
10	*Astragalus microcephalus* Willd.	Fabaceae	Chamaephyte	Shoot, root
11	*Astragalus aureus* Willd.	Fabaceae	Chamaephyte	Shoot, root
12	*Astragalus effusus* Bunge	Fabaceae	Hemichryphtophyte	Shoot, root
13	*Asyneuma pulchellum (*Fisch & Mey.) Bornm	Campanulaceae	Hemichryphtophyte	_
14	*Brassica elongata L.*	Brassicaceae	Hemichryphtophyte	_
15	*Capsella bursa -pastoris (*L.) Medicus	Brassicaceae	Therophtyte	All organs
16	*Cardaria draba* (L.) Desve	Brassicaceae	Therophtyte	Leaf, Seed
17	*Centaurea depressa* M.B.	Asteraceae	Therophtyte	Aerial organs
18	*Chenopodium album* L.	Chenopodiaceae	Therophtyte	Fruit, Leaf
19	*Chenopodium foliosum (Moench) Aschers.*	Chenopodiaceae	Therophtyte	Fruit
20	*Cichorium intybus* L.	Asteraceae	Hemichryphtophyte	Leaf, Root Seed, Flower
21	*Cirsium arvense (L..)* Scop	Asteraceae	Hemichryphtophyte	Leaf, Root
22	*Convolvulus arvensis L.*	Convolvulaceae	Hemichryphtophyte	Shoot, Root, Leaf
23	*Coronilla varia L.*	Fabaceae	Hemichryphtophyte	Leaf
24	*Descurainia sophia* (L.) Schur.	Brassicaceae	Therophtyte	Flowering top branch, Seed
25	*Echinops pungens* Trautv.	Asteraceae	Hemichryphtophyte	Aerial organs
26	*Eremostachys Laciniata* (L.) Bunge	Lamiaceae	Hemichryphtophyte	_
27	*Eruca sativa* Lam.	Brassicaceae	Therophtyte	All organs
28	*Eryngium caeruleum* M.B	Apiaceae	Therophtyte	_
29	*Erysimum subulatum* J.Gay.	Brassicaceae	Therophtytes	_
30	*Euphorbia helioscopia* L.	Euphorbiaceae	Therophtyte	Root, Seed
31	*Euphorbia heteradenia* Jaub & Spach.	Euphorbiaceae	Hemichryphtophyte	_
32	*Falcaria vulgaris* Bernh	Apiaceae	Hemichryphtophyte	Aerial organs ,young leaves
33	*Fumaria vaillantii* Loisel.	Fumariaceae	Therophtyte	All organs
34	*Galium verum* L.	Rubiaceae	Hemichryphtophyte	Aerial organs,Root,
35	*Geranium tuberosum* L.	Geraniaceae	Geophyte	Shoot, Leaf

Row	Scientific name	Family	Life form	Applied parts
36	*Goldbachia laevigata* M.B.	Brassicaceae	Therophtyte	Seed
37	*Helichrysum armenium* DC.	Asteraceae	Hemichryphtophyte	–
38	*Heracleum anisactis* Boiss. & Hohen	Apiaceae	Hemichryphtophyte	Root, Fruit
39	*Heracleum persicum* Desf.ex Fischer.	Apiaceae	Hemichryphtophyte	Fruit, Leaf
40	*Hyoscyamus niger* L.	Solanaceae	Therophtyte	Leaf, Seed
41	*Hypecum pendulum* L.	Papaveraceae	Hemichryphtophyte	Flowering top branch
42	*Ixiolirion tataricum* (Pall.) Herb.	Amaryllidaceae	Geophyte	Flowering top branch, Corm
43	*Lamium album* L.	Lamiaceae	Hemichryphtophyte	Flowering top branch
44	*Lamium amplexicaule* L.	Lamiaceae	Therophtyte	Flowering top branch
45	*Linum usitatissimum* L.	Linaceae	Therophtyte	Seed
46	*Lotus corniculatus* L.	Fabaceae	Hemichryphtophyte	Flowering top branch, Seed
47	*Malabaila dasyantha* (C.Koch) Grossh	Apiaceae	Hemichryphtophyte	–
48	*Malva neglecta* Wallr.	Malvaceae	Hemichryphtophyte	Flowering top branch, Seed, Leaf
49	*Marrubium astracanicum* Jacq.	Lamiaceae	Hemichryphtophyte	Flowering top branch
50	*Medicago sativa* L.	Fabaceae	Hemichryphtophyte	Flowering top branch
51	*Melilotus officinalis* (L.) Lam.	Fabaceae	Therophtyte	Flowering top branch
52	*Mentha longifolia* (L.) Huds.	Lamiaceae	Hemichryphtophyte	Aerial organs
53	*Muscari neglectum* Guss.	Liliaceae	Geophyte	Bulb
54	*Nastartium officinale* (L.) R.Br	Brassicaceae	Hemichryphtophyte	All organs
55	*Nepeta speciosa* Bornm	Lamiaceae	Hemichryphtophyte	Flowering top branch
56	*Onopordon acanthium* L.	Asteraceae	Hemichryphtophyte	Fruit, Root ,Aerial organs
57	*Onopordon leptolipis* DC.	Asteraceae	Hemichryphtophyte	Leaf, Fruit, Root, Aerial organs
58	*Onobrychis cornuta (*L.) Desv.	Fabaceae	Chamaephyte	–
59	*Papaver argemone* L.	Papaveraceae	Therophtyte	Flower
60	*Papaver bracteatum* Lindl.	Papaveraceae	Hemichryphtophyte	Capsule, Leaf
61	*Papaver glaucum* Boiss.& Hausskn	Papaveraceae	Therophtyte	Capsule
62	*Papaver orientale* L.	Papaveraceae	Hemichryphtophyte	Capsule
63	*Peganum harmala* L.	Zygophylaceae	Hemichryphtophyte	Root, Seed, Leaf
64	*Phlomis olivieri* Benth.	Lamiaceae	Hemichryphtophyte	Flowering top branch
65	*Pimpinella saxifraga* (L.) Hudson	Apiaceae	Hemichryphtophyte	Flowering top branch
66	*Plantago lanceolata* L	Plantaginaceae	Hemichryphtophyte	All organs
67	*Polygonum avicular* L.	Polygonaceae	Therophtyte	Aerial organs
68	*Prangos uloptera* DC.	Apiaceae	Hemichryphtophyte	First leaves
69	*Primula auriculata* Lam.	Primulaceae	Therophtyte	Aerial organs
70	*Ranunculus arvensis* L.	Ranunculaceae	Therophtyte	All organs
71	*Reseda lutea* L.	Resedaceae	Hemichryphtophyte	Aerial organs

Row	Scientific name	Family	Life form	Applied parts
72	*Rosa damascena* Mill.	Rosaceae	Chamaephyte	Flower
73	*Rosa iberica* Stev.	Rosaceae	Phanerophyte	Fruit
74	*Rumex acetosella* L.	Polygonaceae	Hemichryphtophyte	Leaf
75	*Salvia hydrangea* D.C.	Lamiaceae	Chamaephyte	Flowering top branch
76	*Salvia nemorosa* L.	Lamiaceae	Hemichryphtophyte	Flowering top branch
77	*Salvia verticillata* L.	Lamiaceae	Hemichryphtophyte	Flowering top branch, Leaf
78	*Sangisorba minor* Scop.	Rosaceae	Hemichryphtophyte	All organs
79	*Scabiosa olivieri* Coult.	Dipsaceae	Therophtyte	Flower
80	*Scutellaria pinnatifida* A.Hamilt.	Lamiaceae	Hemichryphtophyte	–
81	*Sisymbrium loeselii* L.	Brassicaceae	Therophtyte	–
82	*Solanum nigrum* L.	Solanaceae	Therophtyte	Seed, Fruit
83	*Stachys inflata* Benth.	Lamiaceae	Hemichryphtophyte	Aerial organs
84	*Stachys lavandulifolia* Vahl.	Lamiaceae	Hemichryphtophyte	Flowering top branch
85	*Teucrium orientale* L.	Lamiaceae	Hemichryphtophyte	–
86	*Teucrium polium L.*	Lamiaceae	Hemichryphtophyte	Flowering top branch
87	*Thymus kotschyanus* Boiss.et.Hohen.	Lamiaceae	Geophyte	Flowering top branch
88	*Tragopogon graminifolius* DC.	Asteraceae	Hemichryphtophyte	Leaf
89	*Trifolium pratense* L.	Fabaceae	Hemichryphtophyte	Flowering top branch
90	*Urtica dioica* L.	Urticaceae	Hemichryphtophyte	Leaf, Seed ,Aerial organs
91	*Verbascum speciosum* Schrad.	Scrophulariaceae	Hemichryphtophyte	Leaf, Flower
92	*Veronica anagalis- aquatica* L.	Scrophulariaceae	Therophtyte	Flowering top branch
93	*Viola odorata* L.	Violaceae	Hemichryphtophyte	All organs
94	*Viola tricolor* L.	Violaceae	Therophtyte	Flower, Root
95	*Ziziphora clinopoioides* Lam.	Lamiaceae	Chamaephyte	Leaf, Flower

Table 2. The Most Important Pant Families in Arshad Chamani

No	Family	Species number	No	Family	Species number
1	Lamiaceae	17	5	Rosaceae	3
2	Asteraceae	11	6	Apiaceae	7
3	Brassicaceae	10	7	Papaveraceae	5
4	Fabaceae	9	8		

Table 3. Medicinal Plant Types in Different Elevation Classes of Arshad Chamani

No	Altitude	Medicinal plant types
1	1800-2000	*Astragalus- Salvia*
2	2000-2200	*Salvia- Eryngium- Cirsium*
3	2200-2400	*Medicago- Pimpinella- Salvia*
4	2400-2600	*Astragalus- Thymus- Achillea-*
5	2600-2800	*Onobrychis- Cirsium- Astragalus*
6	2800-3000	*Cirsium - Papaver*

Discussion

The studies of medicinal plants have importance from the viewpoint of regional potential determination and using them as medicine. Manafi (1994) studied pollen in honey samples and concluded that Asteraceae, Lamiaceae, Fabaceae and Brassicaceae were the important families in Azarbaijan. Ebrahimi (1997) identified medicinal families of Asteraceae, Lamiaceae, and Apiaceae in East Azarbaijan. Nagiloo (2006) identified medicinal plants in East Azarbaijan and reported Lamiaceae, Asteraceae, Apiaceae families. Rasouli *et al*. (2007) identified medicinal plants in Kiamaki Mountain of East Azarbaijan. Lamiaceae and Asteraceae were the most important medicinal families in this region. Mosavi *et al*. (2004) showed that Asteraceae, Lamiaceae and Rosaceae were the most important medicinal families in Zanjan province. Jafari *et al*. (2006) identified 155 medicinal plants from 361 species in which Asteraceae, Lamiaceae, Rosaceae and Fabaceae were the most important medicinal families in Fars province. Zarezadeh *et al*. (2005) found that most of the medicinal plants were related to Lamiaceae with 24 species, Asteraceae with 19 species and Brassicaceae with 18 species, Rosaceae with 20 species,
Apiaceae and Liliaceae each with 12 species and Solanaceae and Malvaceae families each with 9 species, in Yazd province Zargari (1990) reported some of medicinal plants in Tabriz such as *Achillea*, *Cichorium*, *Chrysanthemum* and their effective materials. In comparision with identified medicinal plants in the other regions of Iran and Arshadchamani, it was shown that Asteraceae, Lamiaceae, Fabaceae and Apiaceae are some important medicinal families. Therefore, the investigations conducted by other researchers in Iran support our findings in some parts. Applied parts such as Flowering parts, root, fruit, leave, seed and flower are used as medicine.The most consumption belongs to the flower and leaves in this region.
In this region, medicinal species are used for the treatment of many diseases in the form of sweltering or distillate such as *Cichorium*, *Thymus*, Some of species also are used as medicine by villagers and are not registered in scientific references, therefore, they are not referred in this article. *Thymus* and *Achillea* are extinction due to the excessive and non-scientific usage including the uproot for marketing and earning money. Therefore, the training of rurals and tourists is necessary for the correct use of natural resources. *Astragalus, Salvia* and *Cirsium* are dominant medicinal plant types in this region. This project helps to collect the medicinal plants and the keeping of natural resources in Iran. Since Kandovan Village is a tourist attraction and the occupation of villagers is the animal husbandry and the selling of medical plants grown in Arshadchamani rangelands,it is recommended that their collection date,location and scientific names will be labeled in English to be marketable.`

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