



Plant Diversity, Life Form and Phytochoria of Hamedan Alvand Region in Iran

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Abstract

This study was carried out for determination and discrimination vegetation by Eco-phytosociology method. Flora of this area was determined by using available references. Based on collection we encountered about 290 specimens that belong to 167 genera and 41 families. The largest families in the area are Asteraceae (47 genera), Poaceae (34 genera), Lamiaceae (30 genera), Caryophyllaceae (18 genera) Papiilonaceae (17 genera). The floristic composition of the area is strongly influenced by large number of Irano-Turanian elements. The life form spectrum was characterized according to Raunkiers system. The life form spectrum observed was: Hemichryptophyte (61.62%), Chamophyte (15.14%), Therophyte (14.79%), Phanerophyte (4.58%) and Geophyte (3.87%). The largest phytochoria distribution species is Irano-Turanian (59%). Medicinal plants were identified that 71 medicinal plants species is belonging to 20 families and 57 genuses. Species riches as 290 plant species in this region distinguished by variable habitats, because of different ecologic factor and variation endogenous milieus. High variation of floristic showed variation biologic conditions and ecologic high power in this region for survivals. Anthropogenic impact of human and pasturing in this region are species downfall factors, especially rare species.

Keywords

Alvand, Flora, Life Form, Chorotype, Eco-Phytosociology Method, Iran

Subject Areas: Ecology, Plant Science

1. Introduction

Iran with an area of more than 1.6 million square km² is the sixteenth largest country in the world, placed in the Middle East and surrounded by the Armenia, Azerbaijan and Caspian Sea, Turkmenistan on the north, Afghani-

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stan and Pakistan on the east, Oman Sea and Persian Gulf on the south and Iraq and Turkey on the west. Iranian habitats support about 8000 species of flowering plants (belonging to 167 families and 1200 genera), of which almost 1700 are endemic [1]. These plant species grow on four Ecological Zones which have different physiological and climatic conditions. These four ecological zones are: Hyrcanian, Zagross, Iran-o-Turanian, Plains Mountain, Khalij-o-Ommanian.

Iran is one of countries with diverse flora and fauna. This diversity results from its topography and diverse climatic conditions which led to the emergence of habitats that are suitable for the evolution and survival of various plant and animal species.

Clearance of natural vegetation to meet the demands of an ever increasing human population has been an ongoing process as long as permanent settlements existed. Ecological and environmental problems such as soil degradation, soil erosion and alteration of natural resources are just some of the negative effects resulting from the destruction of these habitats [2].

These habitats usually regenerate through natural processes after a significant disturbance of human activities such as cutting for fuel wood, construction material and clearance for cultivation [3]. Therefore, in order to maintain the ecological equilibrium and to meet the vegetation resource requirements of the population, scientific information on the composition, structure and distribution of species is the basis for habitat development.

2. Study Area

Alvand region is located in the west of Iran, and Hamedan, Asadabad and Touyserkan cities surround it. This region is located between western longitudes 48°10' to 48°40' and northern latitudes 34°30' to 34°50'. The precipitation ranges between 206.1 and 420.7 mm, respectively. Its maximal altitude is 3428 m.

The special nature of this region and its historic sites attract tourists. The main sites of this region are the Ganjnameh, Takhteh-Nader, MeydanMishan, Kivarestan.

The climate of the study area is considered to be semi-arid, the annual precipitation being approximately 300 mm. Rainfall occurs from October to May, with a maximum during November and February of each year. Another feature characterizing the precipitation in the study site is its irregular yearly distribution. The mean monthly temperatures vary between 1.91°C and 23.45°C, the mean annual value being 10.88°C. The annual potential evaporation far exceeds the annual rainfall with a mean annual amount of 1505 mm, approximately estimated [4].

The aim of this study was to determine floristic composition and plant species diversity in the Hamedan Alvand region of Iran (Figure 1).

3. Materials and Methods

In this study the unit of study (endogenous milieu) in Eco-phytosociological method is used [5]. Endogenous milieu (special station) in Eco-phytosociological method is an area of vegetation that is homogenous view point of Floristic-Ecologic. In vegetations study, Endogenous milieu determine by physiognomic-floristic-ecological criteria. Establishment of releves (sampling unit in phytosociology) was carried out randomly in each Endogenous milieu (special station) for floristic-ecologic data collecting. In this order, all ecologic-floristic data were collected of each special station. Plant specimen deposited in the herbarium, of Bu-Ali Sina University in Hamadan, Iran. After providing herbarium labels were identified using available literature [6]-[12] and comparing with identical specimens in herbarium.

The chorology of each species was determined using published data [7]-[9] [13]. Determining the life form was done by Raunchiers classification [14] and then floristic list of this area provided in Table 1. The abbreviations used in the text and the floristic list is as follow: T: Therophyte, H: Hemicryptophyte, C: Chamaephyte, P: Phanerophyte, G: Geophyte, IT: Irano-Turanian, Z: Zagrosian, KO: Khaliji_Omani, M: Mediterranean, COS: Cosmopolite, H: Khazari.

4. Results

The result of study show that about 290 species belong to 167 genera and 41 families. Among the existing families, 34 families are Dicotyledonous, 5 families are monocotyledon, 1 family (Ephedraceae) is Gymnosperms and 1 family is Pteridophyta. Compositae with 17.2% species is the most abundant family in the area, followed by families of Poaceae, Labiatae with 11.4%, 11% species, respectively (Figure 2). In the paper checklist of all

Table 1. list of species, life form and phytochoria from Hamedan Alvand region.

Scientific name	Life form	Phytocoria	Medicinal use
ASTERACEAE			
<i>Achillea tenuifolia</i> Lam.	H	IT	
<i>Aster alpinus</i> L.	H	IT	
<i>Centaurea behen</i> L.	H	IT	
<i>Centaurea iberica</i> Trev. Ex. Spreng	H	H, IT, Z	
<i>Centaurea virgata</i> Lam.	H	H, IT, Z	
<i>Cerastium dichotomum</i> L.	H	IT	
<i>Chondrilla juncea</i> L.	H	IT	*
<i>Cichorium intybus</i> L.	H	IT, H, KO	*
<i>Cirsium congestum</i> Fisch. & Dc.	H	Z, IT	
<i>Cirsium echinus</i> Hand-Mzt.	H	IT, Z	
<i>Cirsium haussknechtii</i> Boiss.	H	IT	
<i>Cirsium hygrophilum</i> Boiss.	H	IT	
<i>Cirsium lappaceum</i> M. B.	H	IT	
<i>Cirsium libanoticum</i> Dc.	H	IT	
<i>Cousinia cylindracea</i> Boiss.	H	IT, Z	
<i>Cousinia ecbatanensis</i> Bornm.	H	IT	
<i>Cousinia elwendensis</i> Bornm.	H	IT	
<i>Echinops macrophyllus</i> Boiss. & Hausskn.	H	IT	
<i>Echinops mosulensis</i> Rechf.	H	IT	
<i>Echinops orientalis</i> Trautv.	H	IT	*
<i>Echinops ritrodes</i> Bunge.	H	IT	
<i>Echinops tournefortii</i> Trautv.	H	IT	
<i>Erigeron</i> sp.	T	IT	
<i>Filago arvensis</i> L.	T	IT	
<i>Filago pyramidata</i> L.	T	IT	
<i>Gundelia tournefortii</i> L.	H	Z, IT, M, H	*
<i>Helichrysum oligocephalum</i> Dc.	H	IT	
<i>Helichrysum psychrophilum</i> Boiss.	H	IT	
<i>Inula britannica</i> L.	H	IT, Z	
<i>Inula helenium</i> L.	H	IT	*
<i>Lactuca serriola</i> L.	H	IT, Z, M, H	*
<i>Micropus supinus</i> L.	T	IT	*
<i>Onopordon acanthium</i> L.	H	IT, ES	
<i>Onopordon leptolepis</i> Dc.	H	IT	
<i>Picnomon acarna</i> (L.) Cass.	T	H, IT, Z	*
<i>Picris strigosa</i> M. B.	H	Z, IT	
<i>Scariolao rientalis</i> (Boiss.) Sojak	H	IT	*
<i>Scorzonera tortuosissima</i> Boiss.	H	IT	
<i>Senecio vulgaris</i> L.	T	IT	*
<i>Serratula cerinthifolia</i> Boiss.	H	IT, Z	
<i>Sonchus asper</i> (L.) Hill	H	I, KO, H, M	*
<i>Tanacetum parthenium</i> Schult-Bip.	C	IT	*
<i>Tanacetum persica</i>	H	IT	
<i>Tanacetum polycephalum</i> Schultz	H	IT	*
<i>Taraxacum syriacum</i> Boiss.	H	IT, Z	
<i>Tragopogon graminifolius</i> Dc.	H	H, IT	

Continued

<i>Tripeluros pemundisciforme</i> Schultz	H	IT	*
BORAGINACEAE			
<i>Alkanna orientalis</i> (L.) Boiss.	H	IT, Z	*
<i>Helotropium</i> . sp.	T	IT	
<i>Lappula</i> . sp.	H	IT	
<i>Myosotis olympica</i> Boiss.	H	IT	
<i>Onosma elwendicum</i> Wettst.	H	IT	
<i>Onosma microcarpum</i> Dc.	H	IT	
<i>Trichodesma aucheri</i> Dc.	H	IT	
<i>Trichodesma incanum</i> (Bge.) A. Dc.	H	IT	
CAMPANULACEAE			
<i>Asyneuma multicaule</i> Boiss	H	IT	
<i>Asyneuma persicum</i> (Dc.) Bornm.	H	IT	
<i>Campanula latifolia</i> L.	H	IT	
CAPPARIDACEAE			
<i>Cleome iberica</i> Dc.	T	IT, M, KO	
CARYOPHYLLACEAE			
<i>Acanthophyllum microcephalum</i> Boiss.	C	IT	
<i>Arenaria insignis</i> Litw.	H	IT	
<i>Arenaria persica</i> Boiss.	H	IT	
<i>Arenaria serpyllifolia</i> L.	H	IT	
<i>Buffonia</i> sp.	H	IT	
<i>Cerastium inflatum</i> Link ex. Desf.	T	IT, KO, Z	
<i>Dianthus orientalis</i> Adams	H	IT, KO	*
<i>Dianthus tabrisianus</i> BienertBoiss.	H	IT	*
<i>Gypsophila bicolor</i> (Freyn & Sint.) Grossh.	C	IT, KO	
<i>Gypsophila caricifolia</i> Boiss.	H	IT	
<i>Gypsophila pallida</i> Stapf.	H	IT	
<i>Herniaria glabra</i> L.	H	IT	
<i>Minuartia lineate</i> Bornm.	H	IT	
<i>Minuartia meyeri</i> (Boiss.) Bornm.	T	IT, KO, Z	
<i>Silene bupleuroides</i> L.	H	IT	
<i>Silene chlorifolia</i> Sm.	C	IT	*
<i>Silene noctiflora</i> L.	H	IT	
<i>Stellaria media</i> (L.) Cyr.	T	IT, M	*
CHENOPODIACEAE			
<i>Chenopodium botrys</i> L.	T	IT, M	*
<i>Kochia prostrata</i> (L.) Schrad	H	IT	
<i>Noaeanu cronata</i> (Forsk.) Aschers Et. Schweinf	H	IT, M, KO	
CRASSULACEAE			
<i>Rosularia elymaitica</i> Berger	H	IT	
<i>Rosularia sempervivum</i> Berger	H	IT	
CRUCIFERAE			
<i>Alyssum dasycarpum</i> Step. willd	H	IT	
<i>Alyssum lanigerum</i> Dc.	H	IT	*
<i>Alyssum marginatum</i> Steud, Boiss.	T	IT	*
<i>Alyssum minus</i> (L.) Rothm.	T	IT	*
<i>Alyssum szowitsianum</i> Fisch. & Mey.	T	IT	
<i>Aubrietia parviflora</i> Boiss.	H	IT	

Continued

<i>Barbarea plantaginea</i> Dc.	T	IT	
<i>Cardamine uliginosa</i> M. B.	H	IT	
<i>Cardaria draba</i> (L.) Desv.	T	IT, KO, Z	
<i>Clastopus vestitus</i> (Desv.) Boiss.	C	IT	
<i>Drabopsis verna</i> C. Koch	T	IT	
<i>Erysimum caespitosum</i> Dc.	H	IT	
<i>Fibigia suffruticosa</i> (vent.) Sweet	C	IT, Z	
<i>Hesperis persica</i> Boiss. (L.)	T	IT	
<i>Nasturtium officinale</i> R. Br.	C	IT, KO, H	
<i>Physoptychis gnaphalodes</i> Boiss.	H	IT	
CYPERACEAE			
<i>Carex stenophylla</i> Wahlenb	C	IT	
<i>Cyperus difformis</i> L.	H	IT, KO, COS	
<i>Cyperus longus</i> L.	G	IT, KO	*
<i>Holoschoenus vulgaris</i>	H	IT	
DATISCACEAE			
<i>Datisca cannabina</i> L.	C	IT, KO	
DIPSACACEAE			
<i>Cephalaria procera</i> Fisch. & Avel.	C	IT	
<i>Pterocephalus canus</i> Coult. Ex. Dc.	H	IT	
<i>Scabiosa argentea</i> L.	H	IT	
<i>Scabiosa flavida</i> Boiss. & Hausskn	H	IT	
EPHEDRACEAE			
<i>Ephedra major</i> Host.	C	IT	
EQUISETACEAE			
<i>Equisetum arvense</i> L.	G	IT	*
<i>Equisetum ramosissimum</i> Desf.	G	IT	
EUPHORBIACEAE			
<i>Euphorbia boissieriana</i> Prokh.	H	IT	
<i>Euphorbia cheiradenia</i> Boiss. & Hohen.	H	IT, KO, Z	
<i>Euphorbia decipiens</i> Boiss. & Buhse.	H	IT	
<i>Euphorbia macroclada</i> Bioss.	H	IT	*
GENTIANACEAE			
<i>Centaurium minus</i> (Moench)	T	IT	*
<i>Centaurium pulchellum</i> Druce.	H	IT	
GERANIACEAE			
<i>Geranium montanum</i> Habl. Ex. Pall	C	IT	
JUNCACEAE			
<i>Juncus articulatus</i> L.	G	IT, Z	
<i>Juncus inflexus</i> L.	G	IT	
<i>Juncus rigidus</i> Desf.	G	IT, Z	
HYPERICACEAE			
<i>Hypericum perforatum</i> L.	H	IT	
<i>Hypericum scabrum</i> L.	H	IT, M	
LABIATAE			
<i>Acinos graveolens</i> (M. B.) Link	T	IT, KO, Z, H	*
<i>Marrubium astracanicum</i> Jacq.	C	IT, KO	
<i>Marrubium cuneatum</i> Russell	H	IT, KO	

Continued

<i>Marrubium vulgare</i> L.	H	IT, Z, KO, M	*
<i>Mentha longifolia</i> (L.) Hudson.	H	IT, KO	*
<i>Nepeta crispa</i> Willd		IT	*
<i>Nepeta fissa</i> C. A. Mey.	H	IT	
<i>Nepeta pungens</i> (Bunge) Benth.	T	IT	
<i>Nepeta straussii</i> Hausskn & Bornm.	T	IT	*
<i>Phlomis anisodonta</i> Boiss.	H	IT, KO, Z	
<i>Phlomis olivieri</i> Benth.	H	IT, KO, Z	
<i>Phlomis persica</i> Boiss.	H	IT, Z	
<i>Phlomis polioxantha</i> Rechf.	H	IT, Z	
<i>Prunella vulgaris</i> L.	C	IT	*
<i>Salvia aethiopsis</i> L.	H	IT	*
<i>Salvia multicaulis</i> Vah1.	C	IT, KO	*
<i>Salvia spinosa</i> L.	H	IT, KO	*
<i>Scutellaria multicaulis</i> Boiss.	H	IT, KO	
<i>Scutellaria nepetifolia</i> Benth.	H	IT, KO	
<i>Scutellaria pinnatifida</i> A. Hamilt.	H	IT, KO	
<i>Stachys acerosa</i> Boiss.	C	IT, KO	
<i>Stachys inflata</i> Benth.	H	IT, KO	*
<i>Stachys lavandulifolia</i> Vah1.	H	IT, KO, H	*
<i>Stachys multicaulis</i> Benth.	C	IT	*
<i>Stachys setifera</i> C. A. Mey.	G	IT, KO	
<i>Teucrium orientale</i> L.	H	IT, KO	*
<i>Teucrium polium</i> L.	H	IT, M, KO	*
<i>Thymus daenensis</i> Celak.	H	IT, Z	
<i>Thymus kotschyanus</i> Boiss. & Hohen	C	IT, Z	*
<i>Ziziphora cllinopodioides</i> Lam.	C	IT, Z	*
LILIACEAE			
<i>Allium paniculatum</i> L.	G	IT, Z	
<i>Colchicum</i> sp.	G	IT, Z	
LINACEAE			
<i>Linum catharticum</i> L.	T	IT, Z	
LYTHRACEAE			
<i>Lythrum salicaria</i> L.	H	IT	*
MALVACEAE			
<i>Alceakurdica</i> (Schlecht.) Alef.	H	IT	
OLEACEAE			
<i>Fraxinus</i> sp.	H	IT	
ONAGRACEAE			
<i>Epilobium hirsutum</i> L.	H	IT	
<i>Epilobium palustre</i> L.	H	IT	
ORCHIDACEAE			
<i>Epipactis palustris</i> (L.) Crantz	H	IT	
PAPILONACEAE			
<i>Astragalus alopecias</i> Pallas	H	IT	
<i>Astragalus caprinus</i>	H	IT	
<i>Astragalus eriopodus</i> Boiss.	H	IT	
<i>Astragalus glaucops</i> Bornm.	H	IT	

Continued

<i>Astragalus gossypinus</i> Fischer	C	IT	*
<i>Astragalus hymenocalyx</i> Boiss.	H	IT	
<i>Astragalus parrowianus</i> Boiss. & Hausskn.	H	IT	*
<i>Astragalus satiger</i>	H	IT	
<i>Cicer anatolicum</i> Alef.	H	IT	*
<i>Cicer oxyodon</i> Boiss. & Hohen	H	IT	
<i>Lotus corniculatus</i> L.	H	IT, M	*
<i>Medicago lupulina</i> L.	H	IT, KO, H	
<i>Medicago sativa</i> L.	H	IT, KO, H	
<i>Ononis spinosa</i> L.	C	IT	*
<i>Sophora alopecuroides</i> L.	H	IT	*
<i>Trifolium pratense</i> L.	H	IT	
<i>Trifolium radicum</i> Boiss. & Hohen	H	IT	
PAPAVERACEAE			
<i>Papaver rhoeas</i> L.	T	IT, KO, Z, H,	*
<i>Papaver dubium</i> L.	T	IT, KO, H, COS	*
<i>Papaver fugax</i> Poir.	T	IT, KO, Z, H	
PLANTAGINACEAE			
<i>Plantago gentianoides</i> Sibth. & Sm.	H	IT, KO, H	
<i>Plantago lagopus</i> L.	T	IT, KO, H	
<i>Plantago lanceolata</i> L.	H	COS	*
<i>Plantago major</i> L.	H	COS	*
PLUMBAGINACEAE			
<i>Acantholimon bromifolium</i> Boiss.	C	IT, Z	
<i>Acantholimon olivieri</i> (Jaub. & Spach) Boiss.	C	IT, Z	*
POACEAE			
<i>Agropyrum elongatiforme</i> Drobov	H	KO, H, Z, IT	
<i>Agropyrum intermedium</i> P. Beauv.	H	KO, H, Z, IT	
<i>Agropyrum longe_aristatum</i> Boiss.	H	KO, H, Z, IT	
<i>Agropyrum pectiniforme</i> Roemer & Schultes	H	KO, H, Z, IT	
<i>Agropyrum tauri</i> Boiss. & Bal.	H	KO, H, Z, IT	
<i>Agropyrum trichophorum</i> Richter	G	KO, H, Z, IT	
<i>Agrostis canina</i> L.	C	IT	
<i>Agrostis gigantea</i> Roth.	C	IT	
<i>Arrhenatherum kotschyi</i> Boiss.	C	IT	
<i>Bothriochloa ischaemum</i> (L.) Keng.	C	IT	
<i>Brachypodium sylvaticum</i> P. Beauv.	H	IT	
<i>Bromus danthoniae</i> Trin.	T	IT, Z, KO	
<i>Bromus tectorum</i> L.	T	IT, M, COS	
<i>Bromus tomentellus</i> Boiss.	H	IT	
<i>Calamagrostis pseudophragmites</i> koel.	C	IT	
<i>Cynodon dactylon</i> (L.) Pers.	C	IT, KO, H	*
<i>Dactylis glomerata</i> L.	C	IT	
<i>Eremopoa persica</i> (Trin.) Roshev	T	IT, KO	
<i>Festuca ovina</i> L.	H	IT	
<i>Festuca rubra</i> L.	C	IT	
<i>Hordeum bulbosum</i> L.	H	Z, IT, H	
<i>Hordeum violaceum</i> Boiss. & Huet.	C	IT, KO	

Continued

<i>Leucopoa sclerophylla</i> Krecz. & Bobrov	T	IT, KO	
<i>Melica jacquemontii</i> Decne. Ex. Jacquem.	T	IT, KO	
<i>Melica persica</i> Kunth.	H	IT	*
<i>Oryzopsis lateralis</i> (Regel) Stapf.	H	IT, KO	
<i>Oryzopsis molinioides</i> (Boiss.)	H	IT, KO	
<i>Phalaris arundinaceae</i> L.	H	IT, KO	
<i>Phragmites australis</i> Trin.Ex.Steud.	H	IT, KO	
<i>Poa bulbosa</i> L.	C	IT, M, Z, H, KO	
<i>Poa trivialis</i> L.	T	IT, M	
<i>Stipa barbata</i> Desf.	H	IT	
<i>Taeniatherum crinitum</i> (Schreb) Nevski	T	IT	
<i>Trisetum flavescens</i> (L.) P. Beauv.	C	IT	
POLYGONACEAE			
<i>Polygonum bistorta</i> L.	H	IT	*
<i>Polygonum luzuloides</i> Jaub. & Spach	H	IT	
<i>Polygonum paronychioides</i> C. A. Mey, Hohen	H	IT	
<i>Polygonum polycnemoides</i> Jaub. & Spach.	T	IT, KO, Z	
<i>Rumex chalepensis</i> Miller	C	IT, M	
<i>Rumex conglomerates</i> Murr.	H	IT, M	
<i>Rumex crispus</i> L.	H	IT, M	*
PRIMULACEAE			
<i>Primula auriculata</i> Lam.	H	IT	
RANUNCULACEAE			
<i>Delphinium</i> sp.	C	IT	
<i>Ranunculus sericeus</i> Banks & Soland	C	IT	
ROSACEAE			
<i>Alchemilla kurdica</i> Rothm. Ex. Bornm	H	IT	
<i>Alchemilla persica</i> Rothm.	H	IT	
<i>Amaygdalus lycioides</i> Spach	P	IT	*
<i>Cerasus microcarpa</i> (C.A.Mey)Boiss.	P	IT, H	*
<i>Cerasus microcarpa</i> (C.A.Mey.)Boiss.	P	IT, H	*
<i>Cotonoaster</i> sp.	P	IT	
<i>Crataegus pontica</i> C. Koch.	P	IT	
<i>Crataegus pseudoheterophylla</i> Pojark.	P	IT	*
<i>Potentilla canescens</i> Besser	H	IT	
<i>Potentilla recta</i> L.	H	IT	
<i>Rosa canina</i> L.	P	IT	*
<i>Rosa elymaitica</i> Boiss. & Hausskn.	P	IT	
<i>Rosa orientalis</i> Dupont Ex. Ser.	P	IT	
<i>Rubus anatolicus</i> (Focke.) Focke. Ex. Hausskn.	P	IT	
<i>Rubus saxatilis</i> L.	P	IT	
<i>Sanguisorba minor</i> Scop.	H	IT, KO	*
<i>Sibbaldia parviflora</i> Willd.	G	IT, KO	
RUBIACEAE			
<i>Asperula glomerata</i> (M. B.) Griseb.	T	IT	
<i>Asperula setosa</i> Jaub. Et. Sp.	T	IT	
<i>Callipeltis cucularis</i> Stev.	T	IT, Z	
<i>Cruciatatau rica</i> Ehrend.	H	IT, Z	

Continued

<i>Galium aparine</i> L.	T	IT, Z	*
<i>Galium mite</i> Boiss. & Hoh.	C	IT	
<i>Galium setaceum</i> Lam.	T	IT, KO, Z	
<i>Galium verum</i> L.	C	IT	*
<i>Rubia tinctorum</i> L.	H	IT	
SALICACEAE			
<i>Salix acmophylla</i> Boiss.	P	IT	
<i>Salix</i> sp.	P	IT	
SCROPHULARIACEAE			
<i>Linaria grandiflora</i> Desf.	H	IT	
<i>Scrophularia azerbaijanica</i> Grau.	H	IT, KO	
<i>Scrophularia nervosa</i> Benth.	H	IT, KO	
<i>Scrophularia variegata</i> M. B.	H	IT, KO	
<i>Verbascum agrimoniifolium</i>	C	IT	
<i>Verbascum nudicaule</i> (wydl.)Takht.	C	IT	
<i>Verbascum songaricum</i> Schrenk Ex. Fisch. & C. A. Mey.	C	IT	*
<i>Verbascum speciosum</i> Schrad.	H	IT, KO	*
<i>Veronica anagallisaquatica</i> L.	H	IT	*
THYMELAEACEAE			
<i>Dendrostelleralessertii</i> Van Tiegh.	C	IT	
UMBELLIFERAE			
<i>Bupleurum Exaltatum</i> M. B.	H	IT	
<i>Bupleurum gerardii</i> All.	H	IT	
<i>Echinophora platyloba</i> Dc.	H	IT	
<i>Eryngium billardieri</i> F. Delaroché	H	H, IT	
<i>Eryngium pyramidale</i> Boiss. & Houskn.	H	H, IT	
<i>Ferula orientalis</i> L.	H	IT	
<i>Grammosciadium platycarpum</i> Boiss. & Hausskn.	T	IT	
<i>Leutea gracillima</i> M. Pimen.	H	IT	
<i>Peucedanum</i> sp.	H	IT	
<i>Pimpinella affinis</i> Ledeb.	H	IT	
<i>Pimpinella aurea</i> Dc.	H	IT	
<i>Pimpinella tragium</i> Vill.	H	IT	
<i>Prangosu loptera</i> Dc.	H	IT	
<i>Rhabdosciadium aucheri</i> Boiss.	H	IT	
<i>Rhabdosciadium petiolare</i> Boiss. & Hausskn.	H	IT	
<i>Siumsis aroideum</i> Dc.	H	IT	
URTICACEAE			
<i>Urtica dioica</i> L.	H	IT, KO	*
VALERIANACEAE			
<i>Valerianasis ymbriifolia</i> Vahl.	H	IT, KO	

The low percentage of Chamaephyte, Geophytes and Phanerophyte shows that they are not adapted to existence climate and edaphically situations. Each plant species has its special ecological area with a known tolerance to life conditions of area. Therefore, the geographical distribution of plant species depending on life conditions of area and adaptation of plants to area [16].

Astragalus diversity with its 8 species in this area which is mountainous shows that Astragalus has adapted to the mountainous conditions.

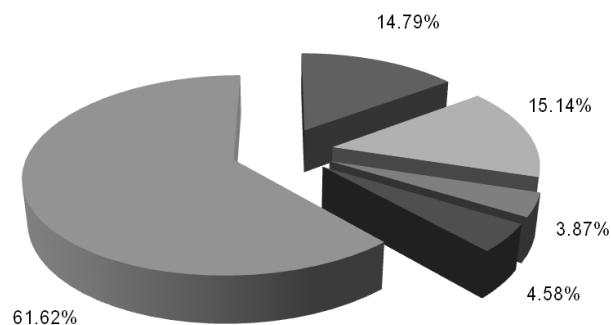


Figure 3. The pie chart of life form of species Hamedan Alvand region.

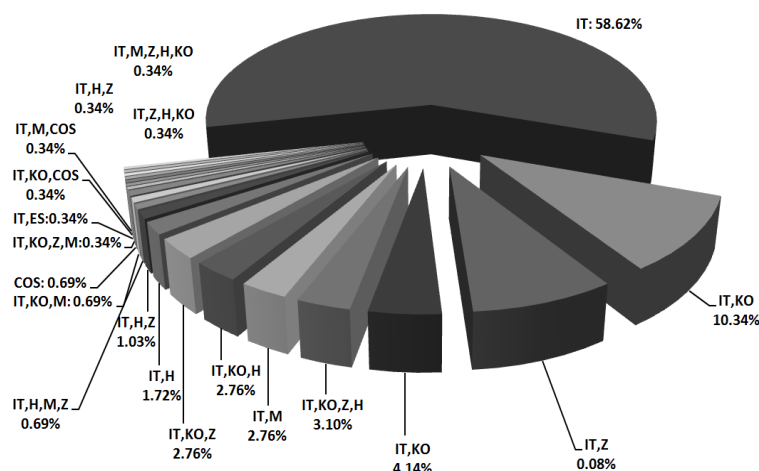


Figure 4. The pie chart of percentage of phytochoria of species Hamedan Alvand region.

The Chorotype distribution of plants reflects the climate conditions. Considering to this fact that 59% plant species in a region are IT elements, so this region belong to IT. IT (the Irano-Turanian region) is characterized by low rainfall and a long dry season.

The existence of Compositae family with large diversity is the result of destruction in this region. It is experience understood that the increasing of the number of some plant families including Asteraceae accompanied with destruction in area, following studies support the mentioned fact [15] [18].

About 71 medicinal species were determined in this area that was shown in **Table 1**. Presence of important medicinal plants is indicated Potential of region as pool of medicinal plants.

Some of most important species area as follows: *Thymus kotschyamus*, *Ziziphora clinopodioides*, *Stachys inflata*, *Stachys lavandulifolia*. The presence of high biodiversity, visual and historical regions as: Ganjnameh, eye-catching landscape of Alvand top, Takhteh-Nader, MeydanMishan, Kivarestan, have encouraged research, educational and tourist activities in the region.

The rapid development of tourism industry, Tele Cabin in recent years has had a significant effect on the vegetation and landscape. Ganjnameh has a long history of human occupation with ancient civilizations well reflected in the archaeological records.

Existence of ruderal plant such as *Cardaria craba* in this region showed anthropogenic impacts. As human population levels and resource requirements continue to grow, function of ecosystem (net primary productivity) and species richness distributions are likely to be increasingly affected by anthropogenic land-use [17] [19] [20].

The research in the Alvand Hamedan region has revealed the importance of this region in terms of plant biodiversity, and particularly of touristic characteristics, which urgently require further management and conservation activities.

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