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Floristic Study of Ghasemloo (Shohada) Valley Forest Reserve and adjacent area

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Abstract: In this survey flora of protected region of Ghasemloo valley Forest reserve and adjacent areas has been studied. The study area includes about 577 ha and is located at south of Urmia. The method which used for plant collection is the same as regional floristic studies. Collected plants were recognized and determined as families, genera and species by using of indispensable references. Alphabetical list of taxa in this region was provided on the base of families, genera and species. The life form of plant species was determined by using of Raunkier's method and chorotype of plant species was determined by indispensable references. In this research 50 family, 165 genera and 204 species were identified. The largest plant family is *Compositae* with 21 genera and 26 species and the largest genera is *Astragalus* from *Papilionaceae* family with 6 species. The main biological forms respectively are: Therophytes and hemichryptophytes. The most extended chorotype with 61.28% is related to Irano-Turanian.

Key words: Flora, plant geography, life form, Urmia, Iran

INTRODUCTION

In general, determination and introducing the plant species of a region is very important for easy and rapid access to special of plant of species in a district and a known time, determining the potential and production power of region, the possibility of increasing the density of vegetation cover, determining the resistant species and endangered species and supporting them, recognition of medicinal plants for proper use of them and finally determining the vegetation cover particularly in arid regions the same as Iran. Despite of aridity, Iran is very rich with refer to biodiversity of plant species, which resulted to many studies in this field from 1648. The conducted researches with this regard are as follows: Floristic study of Band-Golestan (Kazemian *et al.*, 2003); Floristic study of English yew (*Taxus baccata* L.) in afratakhteh-Golestan (Esmailzadeh *et al.*, 2003).

Plant species of Vanak-Semirom-Isfahan (Parishani, 2003), Floristic study of Hashtad-pahlu-Lorestan (Abrari and Veiskarami, 2003); Floristic study of Palangdarreh-Qom (ZareMaivanm *et al.*, 2001); Floristic study of Dalamper-west Azarbaijan (Shaikhi, 2005) and Floristic study of National Park of Urmia Lake (Biabani, 2005). The investigation of plant biodiversity has the basic role for ecology, environmental studies, Forestry, watershed management, agriculture and etc. In addition, considering the effects of many factors on survival, distribution of plant species, destruction of some of them, leads to necessity of Floristic studies in different areas, especially in reserve. While, these sort of studies are very useful for planning with refer to protection, reclamation, management of valuable species. Releasing the above

mentioned points, present study is conducted in natural Forest reserve of Ghasemloo Valley and it's adjacent areas. This region is situated between 37°15' to 37° 20' Northern latitude and 45° 5' to 45° 10' Eastern longitude, the lowest and the highest of it's height are 1420 and 2280 meters. The mean annual rainfall is 459.6 mm. The average maximum temperature is 32.8°C in August and minimum temperature is -15.9°C in February. The main objectives of this study are to investigation of possibility of collecting the endemic species of study area, determination of collected species, contributing in the description of plant diversity of country and making possible to compare the study area with other degraded areas which are similar, finally providing the conditions for improving the degraded areas as much as possible. Protected areas of Iran with refer to floristic studies has evaluated by some researcher as follows: Investigation of floristic situation of Touran biosphere reserve (Asri *et al.*, 2000). Floristic study of Maymand Shahrehabak and identification biological forms and chorotype of area plants (VakiliShahrehabaki *et al.*, 2001) and floristic and cartographic study of protected area of Ghamishloo (Yousefi Najafabadi, 1996).

MATERIALS AND METHODS

In this investigation plant specimen of different districts of Forest reserve were collected in two years and digital photos of this region were taken.

For attaining the plants we went at there least twice, because it might in some cases the plants didn't have some reproductive or vegetative organs. We kept the

collective specimens in special nylon bags separately and all the bags labeled according to the Time, Place, geographical latitude, longitude and Altitude of the habitat of plants.

First of all the plants were pressed and transferred to the University Herbarium of Urmia and recognized according to the *Flora Iranica*; (Rechinger 1963-2000). *Flore de L'Iran*; (Parsa 1943-1950). *Flora of Turkey*; (P.H.Davis 1965-1988). *Colored Flora*; (Ghahreman 1975-2000) and *Flora of Iran*; (S. Mobayen 1980-1996). In this manner, the place of distribution of these species also determined according to these Flora. Determining the Life Form were done by Raunkier's (1934). classification and the diagrams and spectrum of the Habitat and also the geographical plant distribution were drawn.

RESULTS

According to the survey Forest reserve about 204 species belong to 165 Genera and 50 Families have been recognized. Among the existing families, 44 families are Dicotyledonous, 3 families are monocotyledon and 2 families (Ephedraceae, Cupressaceae) are Gymnosperm and 1 family (Equisetaceae) is pteridophyta (Table 1). The biggest plant family of the region is Compositae with 26 species. Graminae (23 sp.) Rosaceae (18 sp.), Leguminosae (18 sp.), Brassicaceae (17 sp.), Umbeliferae (10 sp.) are in the next order (Fig. 1).

Among the existing genera; there are 139 genera with one species, 20 genera with 2 sp., 3 genera with 3 sp., 2 genera with 5 genera, 1 genera with 6 species. Astragalus with 6 species and Centurea and Amygdalus with 5 species are the biggest genera (Fig. 2).

Table 1: Life form and chorotype of plants in studied area

No.	Family	Species	Life form	Chorotype
1	<i>Acanthaceae</i>	<i>Acanthus dioscoridus</i> L. <i>Acer monspessulanum</i>	He	IT
2	<i>Aceraceae</i>	L. subsp. <i>cinerascens</i> (Boiss.) Yaltirik.	Ph	IT, ES
3	<i>Amaryllidaceae</i>	<i>Ixiolirion tataricum</i> (Pall.) Herb.	Cr	IT
4	<i>Anacardiaceae</i>	<i>Pistacia atlantica</i> Desf. subsp. <i>kurdica</i> (Zohary) Rech.f.	Ph	IT
5	<i>Anacardiaceae</i>	<i>Rhus coriaria</i> L.	Ph	IT
6	<i>Aristolochiaceae</i>	<i>Aristolochia bottae</i> Jaub.	He	IT
7	<i>Berberidaceae</i>	<i>Berberis integerrima</i> Bunge.	Ph	Med
8	<i>Boraginaceae</i>	<i>Alkana orientalis</i> (L.) Boiss.	Th	IT
9	<i>Boraginaceae</i>	<i>Anchusa italica</i> Retz.	Th	IT, ES
10	<i>Boraginaceae</i>	<i>Asperugo procumbens</i> L.	Th	ES
11	<i>Boraginaceae</i>	<i>Nonnea persica</i> Boiss.	Th	Endm
12	<i>Boraginaceae</i>	<i>Onosma microcarpum</i> DC.	He	IT
13	<i>Boraginaceae</i>	<i>Onosma sericeum</i> Willd.	He	IT
14	<i>Brassicaceae</i>	<i>Aethionema carneum</i> B.	Th	IT
15	<i>Brassicaceae</i>	<i>Aethionema grandiflorum</i> Boiss.	Ch	IT
16	<i>Brassicaceae</i>	<i>Alliaria petiolata</i> M.B.	Ch	IT, Med
17	<i>Brassicaceae</i>	<i>Alyssum desertorum</i> Stapf.	Th	Cosm
18	<i>Brassicaceae</i>	<i>Arabis caucasica</i> Willd.	He	IT
19	<i>Brassicaceae</i>	<i>Aubreyia parviflora</i> Boiss.	He	IT
20	<i>Brassicaceae</i>	<i>Camelina rumelica</i> Velen.	Th	IT
21	<i>Brassicaceae</i>	<i>Capsella bursa-pastoris</i> (L.) Medicus.	Th	Cosm
22	<i>Brassicaceae</i>	<i>Cardaria draba</i> (L.) desv.	He	Med
23	<i>Brassicaceae</i>	<i>Chorispora tenella</i> (Pall.) DC.	Th	IT, ES
24	<i>Brassicaceae</i>	<i>Descurainia Sophia</i> (L.) Schur.	Th	IT
25	<i>Brassicaceae</i>	<i>Erophila verna</i> (L.) Besser.	Th	ES, IT, Med.
26	<i>Brassicaceae</i>	<i>Isatis cappadocica</i> Desv.	He	IT
27	<i>Brassicaceae</i>	<i>Nasturtium officinale</i> R.	He	IT, ES
28	<i>Brassicaceae</i>	<i>Samneraria stylophora</i> (Jaub. et. Spach) Boiss	Th	IT
29	<i>Brassicaceae</i>	<i>Sisymbrium orientale</i> L.	Th	IT
30	<i>Brassicaceae</i>	<i>Thlaspi perfoliatum</i>	Th	IT
31	<i>Capparidifoliaceae</i>	<i>Lonicera nummularifolia</i> Jaub.	Ph	IT
32	<i>Caryophyllaceae</i>	<i>Dianthus orientalis</i> Adams.	He	Endm
33	<i>Caryophyllaceae</i>	<i>Gypsophila polyclada</i> Fenzl.	He	IT, ES
34	<i>Caryophyllaceae</i>	<i>Holosteum umbellatum</i> L.	Th	Endm
35	<i>Caryophyllaceae</i>	<i>Minuartia juniperina</i> L.	He	IT, ES
36	<i>Caryophyllaceae</i>	<i>Paronychia kurdica</i> Boiss.	He	IT
37	<i>Caryophyllaceae</i>	<i>Silene chlorifolia</i> Smith.	Th	IT
38	<i>Caryophyllaceae</i>	<i>Silene marschalli</i> C.A.Mey.	He	IT
39	<i>Chenopodiaceae</i>	<i>Chenopodium album</i> L.	He	IT, ES
40	<i>Chenopodiaceae</i>	<i>Noaea mucronata</i> (Forssk.) Aschers. et Schweinf.	Ch	IT
41	<i>Chenopodiaceae</i>	<i>Salsola aucheri</i> (Moq) Bunge ex Ilyin.	Ch	IT
42	<i>Compositae</i>	<i>Achillea millefolium</i> L.	Cr	Endm
43	<i>Compositae</i>	<i>Achillea vermicularis</i> Trin.	He	IT
44	<i>Compositae</i>	<i>Acroptilon repens</i> L.	He	IT

Table 1: Continued

No.	Family	Species	Life form	Chorotype
45	Compositae	<i>Anthemis</i> sp.	Th	IT
46	Compositae	<i>Artemisia</i> sp.	Ch	IT
47	Compositae	<i>Carthamus</i> sp.	Th	IT, Med
48	Compositae	<i>Centaurea aucheri</i> (DC.) Wagenitz	Th	IT
49	Compositae	<i>Centaurea behen</i> L.	He	IT
50	Compositae	<i>Centaurea iberica</i> Hausskn. ex Bornm.	He	IT
51	Compositae	<i>Centaurea solstitialis</i> L.	Th	IT
52	Compositae	<i>Centaurea virgata</i> Lam.	He	IT
53	Compositae	<i>Chardinia orientalis</i> (L.) D.C.	Th	IT
54	Compositae	<i>Cichorium intybus</i> L.	He	ES
55	Compositae	<i>Cirsium arvense</i> (L.) Scop.	He	ES
56	Compositae	<i>Cousinia grandis</i> C.A.Mey.	He	IT
57	Compositae	<i>Crepis sancta</i> (L.) Babcock.	Th	IT
58	Compositae	<i>Crupina crupinastrum</i> (Moris.) Vis.	Th	IT, ES
59	Compositae	<i>Echinops orientalis</i> Trautv.	He	IT
60	Compositae	<i>Gundelia tournefortii</i> L.	He	IT
61	Compositae	<i>Helichrysum armenium</i> DC.	Ch	IT
62	Compositae	<i>Lactuca scarioloidea</i> Boiss.	Th	IT, ES
63	Compositae	<i>Scorzonera stenocephala</i> Boiss.	He	Endm
64	Compositae	<i>Senecio vernalis</i> Woldst. and Kit.	Th	IT
65	Compositae	<i>Serratula cerinthifolia</i> (Sm.) Boiss.	He	IT
66	Compositae	<i>Taraxacum montanum</i> (C.A.Mey.) DC.	He	IT
67	Compositae	<i>Tragopogon caricifolius</i> Boiss.	He	Endm
68	Convolvulaceae	<i>Convolvulus arvensis</i> L.	Cr	IT
69	Cupressaceae	<i>Juniperus communis</i> L.	Ph	ES
70	Cupressaceae	<i>Juniperus excelsa</i> M.B.	Ph	IT, ES
71	Dipsacaceae	<i>Scabiosa rotata</i> M.B.	Th	IT, ES
72	Elaeagnaceae	<i>Elaeagnus angustifolia</i> L.	Ph	ES
73	Ephedraceae	<i>Ephedra major</i> Host.	Ch	IT, ES
74	Equisetaceae	<i>Equisetum arvens</i> L.	He	ES
75	Euphorbiaceae	<i>Euphorbia macroclada</i> Boiss.	He	IT
76	Geraniaceae	<i>Geranium tuberosum</i> L.	Cr	IT
77	Graminae	<i>Aegilops cylindrica</i> Host.	Th	IT
78	Graminae	<i>Agropyron repens</i> (L.) P.	Th	IT, ES, Med
79	Graminae	<i>Alopecurus apiatus</i> Ovcz.	Th	Endm
80	Graminae	<i>Bromus danthoniae</i> Trin.	Th	IT
81	Graminae	<i>Bromus tectorum</i> L.	Th	ES
82	Graminae	<i>Bromus tomentellus</i> Boiss.	He	IT
83	Graminae	<i>Catabrosa aquatica</i> (L.) P.	Cr	ES
84	Graminae	<i>Cynodon dactylon</i> (L.) Pers.	Cr	IT
85	Graminae	<i>Dactylis glomerata</i> L.	He	IT, ES
86	Graminae	<i>Festuca arundinacea</i> Schreb.	Cr	ES
87	Graminae	<i>Festuca ovina</i> L.	He	IT
88	Graminae	<i>Heteranthelium piliferum</i> (Bank. and Soland.) Hochst.	Th	IT
89	Graminae	<i>Hordeum bulbosum</i> L.	He	ES, Med
90	Graminae	<i>Hordeum spontaneum</i> C.A.Mey.	Th	IT, Med
91	Graminae	<i>Lolium preme</i> L.	He	IT
92	Graminae	<i>Melica persica</i> Kunth.	Cr	IT
93	Graminae	<i>Phragmites australis</i> (Cav.) Trin. ex steud.	He	Cosm
94	Graminae	<i>Poa bulbosa</i> L.	Cr	ES
95	Graminae	<i>Psathyrostachys fragilis</i> (Boiss.) Nevski.	Th	IT
96	Graminae	<i>Secal montanum</i> Gass.	Th	IT
97	Graminae	<i>Stipa barbata</i> Desf.	He	IT
98	Graminae	<i>Taeniatherum crinitum</i> (Schreb.) Nevski, Actauniv.	Th	IT, Med
99	Graminae	<i>Triticum aestivum</i> L.	Th	IT
100	Guttiferaceae	<i>Hypericum perforatum</i> L.	He	ES
101	Juglandaceae	<i>Juglans regia</i> L.	Ph	IT, ES
102	Labiatae	<i>Lamium garganicum</i> L.	Cr	IT
103	Labiatae	<i>Mentha longifolia</i> (L.) Hadson.	Cr	Endm
104	Labiatae	<i>Nepeta bracteata</i> Benth.	Th	IT
105	Labiatae	<i>Phlomis tuberosa</i> L.	He	IT, ES
106	Labiatae	<i>Salviahydrangea</i> DC.	Ch	IT
107	Labiatae	<i>Salvia nemorosa</i> L.	He	ES
108	Labiatae	<i>Stachys lavandulifolia</i> Vahl.	Ch	IT
109	Labiatae	<i>Teucrium polium</i> L.	Ch	IT, Med
110	Labiatae	<i>Thymus kotschyanus</i> Boiss.	He	IT
111	Labiatae	<i>Thymus migricus</i> Klokov and Desj-Shost.	Ch	IT

Table 1: Continued

No.	Family	Species	Life form	Chorotype
112	Labiatae	<i>Ziziphora tenuior</i> L.	He	IT, ES
113	Leguminosae	<i>Alhagi camelorum</i> Fisch.	Ch	IT
114	Leguminosae	<i>Astragalus campylosema</i>	Ch	IT
115	Leguminosae	<i>Astragalus caryolobus</i> Beek.	Ch	IT
116	Leguminosae	<i>Astragalus effusus</i> Bge.	Ch	Endm
117	Leguminosae	<i>Astragalus gossipinus</i> Fisch.	Ch	IT
118	Leguminosae	<i>Astragalus kabristanicus</i> Groosh.	Ch	IT
119	Leguminosae	<i>Astragalus mollis</i> M.B.	He	IT
120	Leguminosae	<i>Glycyrrhiza glabra</i> L.	Ch	Endm
121	Leguminosae	<i>Lathyrus chloranthus</i> Boiss.	Th	IT
122	Leguminosae	<i>Lotus corniculatus</i> L.	Th	IT
123	Leguminosae	<i>Medicago radiate</i> (L.) Boiss.	Th	IT
124	Leguminosae	<i>Medicago sativa</i> L.	He	IT
125	Leguminosae	<i>Melilotus officinalis</i> (L.) Desr.	Th	IT
126	Leguminosae	<i>Trifolium hybridum</i> L.	He	IT, ES
127	Leguminosae	<i>Trifolium pratense</i> L.	He	IT, ES
128	Leguminosae	<i>Trifolium repens</i> L.	He	IT, ES
129	Leguminosae	<i>Vicia variegata</i> Willd.	Th	IT
130	Leguminosae	<i>Vicia villosa</i> Roth.	Th	IT, ES
131	Liliaceae	<i>Allium</i> sp.	Cr	IT
132	Liliaceae	<i>Bellevallia longistyla</i> (Misc.) Groosh.	Cr	IT, Med
133	Liliaceae	<i>Colchium speciosum</i> Steven.	Cr	ES
134	Liliaceae	<i>Eremurus</i> sp.	Cr	IT
135	Liliaceae	<i>Muscari caucasicum</i> (Griseb.) Baker.	Cr	IT
136	Liliaceae	<i>Muscari neglectum</i> Guss.	Cr	IT
137	Liliaceae	<i>Tulipa</i> sp.	Cr	IT, ES
138	Linaceae	<i>Linum austriacum</i> L.	He	IT
139	Malvaceae	<i>Alcea angulata</i> (Fregn. and Sint)	He	IT
140	Malvaceae	<i>Malva sylvestris</i> L.	Th	IT, ES
141	Moraceae	<i>Ficus carica</i> L.	Ph	IT
142	Oleaceae	<i>Fraxinus excelsior</i> L.	Ph	IT, ES
143	Oleaceae	<i>Fraxinus rotundifolia</i> Miller, Gard.	Ph	IT, ES
144	Papaveraceae	<i>Papaver macrostomum</i> Boiss.	Th	IT, ES
145	Papaveraceae	<i>Romeria hybrida</i> (L.) DC.	Th	IT
146	Plantaginaceae	<i>Plantago lanceolata</i> L.	He	ES
147	Plumbaginaceae	<i>Acantholimon</i> sp.	Ch	IT
148	Polygonaceae	<i>Polygonum aviculare</i> L.	Th	IT
149	Polygonaceae	<i>Pteropyrum aucheri</i> Jaub.&Spach.	Ch	IT
150	Polygonaceae	<i>Pteropyrum oliveri</i> Jaub.&Spach.	Ch	IT
151	Polygonaceae	<i>Rheum ribes</i> L.	Ch	IT
152	Polygonaceae	<i>Rumex tuberosus</i> L.	Ch	IT
153	Primulaceae	<i>Androsace maxima</i> L.	Th	IT
154	Ranunculaceae	<i>Ceratocephalus falcata</i> (L.) Pers.	Th	IT, ES
155	Ranunculaceae	<i>Nigella arvensis</i> L.	Th	IT
156	Ranunculaceae	<i>Ranunculus arvensis</i> L.	Th	IT
157	Ranunculaceae	<i>Thalictrum</i> sp.	Cr	IT
158	Rhamnaceae	<i>Rhamnus pallasii</i> Fisch. and C.A.Mey.	Ph	Endm
159	Rosaceae	<i>Amygdalus elaeagnifolia</i>	Ph	Endm
160	Rosaceae	<i>Amygdalus korshinsky</i> (Hand-Mazt) Borum.	Ph	IT
161	Rosaceae	<i>Amygdalus kotschy</i> Boiss.	Ph	IT
162	Rosaceae	<i>Amygdalus</i> sp.	Ph	IT
163	Rosaceae	<i>Amygdalus trichocamygdalus</i> (Hand-Mazt.) woron.	Ph	IT
164	Rosaceae	<i>Cerasusmahaleb</i> (L.) Miller, Gard.	Ph	IT
165	Rosaceae	<i>Cerasus microcarpa</i> (C.A.Mey.) Boiss.	Ph	Endm
166	Rosaceae	<i>Cotoneaster nummularioides</i> Pojark.	Ph	IT
167	Rosaceae	<i>Crataegus aronia</i> (L.) Pojark.	Ph	IT
168	Rosaceae	<i>Crataegus davisii</i> Browisz, Notesr.	Ph	IT
169	Rosaceae	<i>Crataegus pseudoheterophylla</i> Pojark.	Ph	IT
170	Rosaceae	<i>Potentilla recta</i> L.	He	IT, ES
171	Rosaceae	<i>Pyrus communis</i> L.	Ph	IT, ES
172	Rosaceae	<i>Pyrus glabra</i> Boiss.	Ph	Endm
173	Rosaceae	<i>Rosa canina</i> L.	Ph	IT
174	Rosaceae	<i>Rubus caesius</i> L.	Ph	IT, ES
175	Rosaceae	<i>Sanguisorba minor</i> Scop.	He	IT, ES
176	Rosaceae	<i>Sorbus graeca</i> (Spach.) Loddiges ex Schauer, ubers.	Ph	IT
177	Rubiaceae	<i>Asperula arvensis</i> L.	Th	IT
178	Rubiaceae	<i>Galium aparine</i> L.	Th	IT

Table 1: Continued

No.	Family	Species	Life form	Chorotype
179	Rubiaceae	<i>Galium verum</i> L.	He	IT
180	Salicaceae	<i>Salix alba</i> L.	Ph	IT, ES
181	Scrophulariaceae	<i>Odontites aucheri</i> Boiss.	Th	IT, ES
182	Scrophulariaceae	<i>Scleranthus orientalis</i> Rossler.	Th	IT
183	Scrophulariaceae	<i>Verbascum phoeniceum</i> L.	He	IT, Med
184	Scrophulariaceae	<i>Verbascum</i> sp.	He	IT, ES
185	Scrophulariaceae	<i>Veronica orientalis</i> Miller.	Ch	IT
186	Solanaceae	<i>Hyocyamus reticulatus</i> L.	Th	IT
187	Thymelaeaceae	<i>Daphne mucronata</i> Royle.	Ph	IT
188	Ulmaceae	<i>Ulmus carpinifolia</i> Borkh.	Ph	ES
189	Ulmaceae	<i>Ulmus glabra</i> Hudson.	Ph	ES
190	Umbeliferae	<i>Eryngium billardieri</i> Delar.	He	IT
191	Umbeliferae	<i>Falcaria vulgaris</i> Bernh.	He	IT
192	Umbeliferae	<i>Ferula communis</i>	He	IT
193	Umbeliferae	<i>Pimpinella affinis</i> Ledeb.	Th	IT
194	Umbeliferae	<i>Pimpinella corymbosa</i> Boiss.	Th	IT
195	Umbeliferae	<i>Prangos uloptera</i> DC.	He	IT
196	Umbeliferae	<i>Scandix iberica</i> M.B.	Th	IT
197	Umbeliferae	<i>Sium sisarum</i> L.	Cr	ES
198	Umbeliferae	<i>Smyrnum cordifolium</i> Boiss.	Th	IT
199	Umbeliferae	<i>Torilis leptophylla</i> (L.) Reichenb.	Th	IT
200	Urticaceae	<i>Urtica dioica</i> L.	He	IT
201	Valerianaceae	<i>Valeriana sisymbriifolia</i> Vahl.	He	IT
202	Violaceae	<i>Viola odorata</i> L.	Cr	IT
203	Vitaceae	<i>Vitis sylvestris</i> Gmelin.	Ph	IT
204	Zygophyllaceae	<i>Peganum harmala</i> L.	Ch	IT

Ph: Phanerophyte; Th: Therophyte; He: Hemicryptophyte; Cr: Cryptophyte; Ch: Champhyt, IT: Irano-Touranean; Med: Mediterranean; ES: Europe Siberean; Cosm: Cosmopolitan; Endem: Endemic.

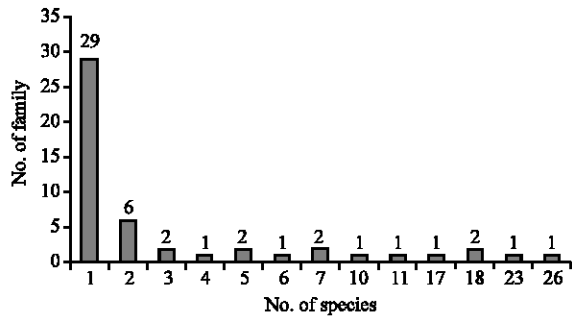


Fig. 1: The column chart of frequency species in family

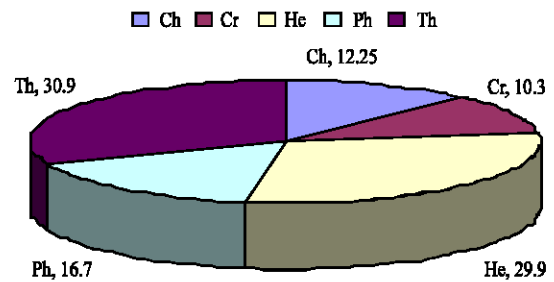


Fig. 3: The pie chart of life form plants of studied area

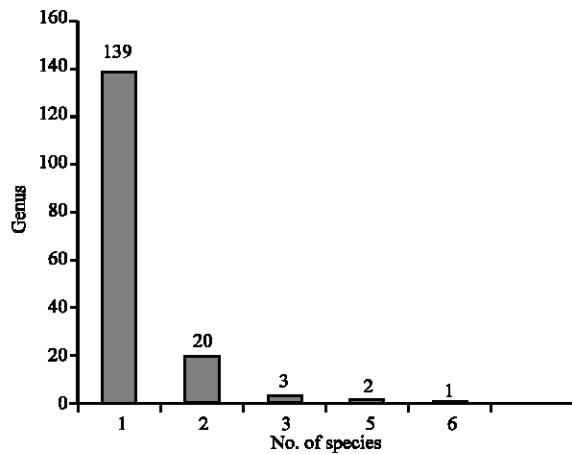


Fig. 2: The column chart of frequency species in genus

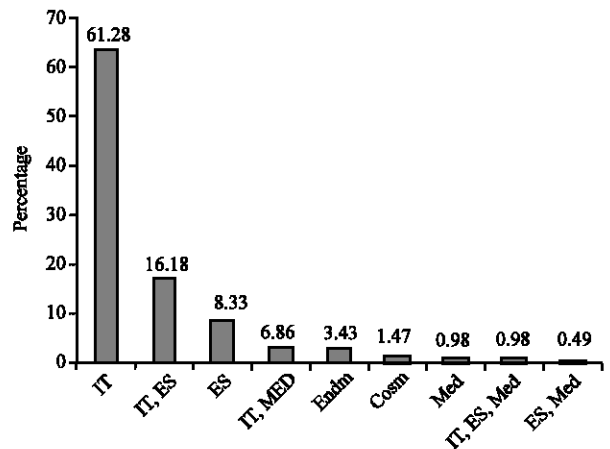


Fig. 4: The column chart of percentage of phytocorya in studied area

Iranian endemic species especially in these regions are 14 species. The Life Form percentage of plants in the Forest reserve are as follows: Th 30.90%, He 29.90%, Ph 16.70%, Ch 12.25%, Cr 10.30% (Fig. 3).

The plants phytocorya distributions of the Forest reserve are as follows: IT 61.28%; IT, ES 16.18; ES 8.33%; IT, Med 3.43%; Endem 6.86%; Med 0.98 %; IT, Med, Es 0.98% Cosm 1.47%; Med, Es 0.49% (Fig. 4).

DISCUSSION

It is concluded from the results of the study that the study area despite of limited surface area, is very rich with refer to plant diversity. This conclusion is supported by the existence of 50 families, 165 genera and 204 species.

Astragalus diversity with its 6 species in the Forest reserve which is mountainous, shows that Astragalus has adapted to the mountainous conditions. Comparison of life forms shows that the Therophytes with 30.9% have the highest dominance. In fact, life forms of the plants indicate the possibility of adaptation of plants to environmental factors especially climatic condition. In addition, different life forms are the base of plant communities structure. In other word, natural vegetation cover is resulted from the effects of all climatic factors, and the plant communities are completely adjusted to climatic region. Plants by using different the mechanisms adapting themselves with environmental condition, so, to spend dry period in dormant and complete their life cycle in suitable condition with refer to moisture. Relatively high percentage of therophyte indicates the fact that, they spend vegetative period in the form of seed and in a short period that area has higher rainfall (21 of march to 21 of June). In other months they are rare and sometimes only they remains are visible. Hemi-cryptophyte, with 29.9% dominance are the second group that adapted to conditions of area. They adapted and developed them selves to area by using different ways such as: reserving water, using ground water, reducing their water need by loosing their leaves and reduction of vegetative growth (Asri, 2003). Generally, the above mentioned plant groups by increasing their tolerance to aridity, are adapted physiologically, morphologically, or anatomically to area which leads to reduction of water use. Dominance of Therophytes and Hemi-cryptophytes clearly indicate the adaptation of these plants to aridity of area which are supported by Asri (1999) and Hamzeh (1995).

The low percentage of Cryptophyte, Champhyte, Phanerophyte shows that they are not adapted to existence climate and edaphical situations. Each plant

species has it's special ecological area with a known tolerance to life conditions of area. There fore, the geographical distribution of plant species depending on life conditions of area and adaptation of plants to area (Asri, 1999).

The phytocorya distribution of plants reflects the climate conditions. Considering to this fact that 61.28% of plants in Forest reserve are Irano-Turanian elements, so we can conclude that these regions are belong to Irano-Turanian. Because of the vicinity to Mediterranean and Euro-Siberian, there are elements with distribution limited to this region.

The existence endemic species due to climatic climax in plants community and the diversity in Iran climate. It should be mentioned that the study area is under different conserving strategies including: protected area and non-protected area, additionally, with refer to conserving policies the protected area has the best situation. Abundance of species of composition may be indicates the destruction of some parts of study area, or the destruction may be resulted from other reasons. Any way, despite of protection of area destruction even in limited sizes need a serious investigation. It is experiencly understood that the increasing of the number of some plant families including compositae accompanied with destruction in area; following studies support the mentioned fact: (Vakili *et al.*, 2001), (Archibold, 1995). According to rich biodiversity of study area which resulted from floristic study, it is quite possible to concentrate the improving practices and reclamate to area again.

The most frequent species are as follows: *Thymus kotchyanus*, *Bromus danthoniae*, *Festuca arundinacea*, *Hordeum bulbosum*, *Juniperus excelsa*, *Acer monspessulanum*, *Pistacia atlantica*, *Amygdalus eleagnefalia* and *Medicago sativa*.

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