

## A CHECKLIST OF THE FLORA OF SHANJAN PROTECTED AREA, EAST AZERBAIJAN PROVINCE, NW IRAN

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The flora of protected Shanjan rangeland in Shabestar district, Azerbaijan Province, NW Iran was studied using a 1 m x 1 m quadrat in spring and summer 2011. The climate of this area is cold and dry. In this area 94 plant species belonging to 25 families were identified as constituting the major part of the vegetation. The families in the area are *Amaryllidaceae*, *Boraginaceae*, *Campanulaceae*, *Caryophyllaceae*, *Cistaceae*, *Compositae*, *Cruciferae*, *Cyperaceae*, *Dipsacaceae*, *Euphorbiaceae*, *Geraniaceae*, *Hypericaceae*, *Linaceae*, *Melastomataceae*, *Orobanchaceae*, *Papaveraceae*, *Paronychiaceae*, *Plantaginaceae*, *Polygalaceae*, *Ranunculaceae*, *Resedaceae*, *Rubiaceae*, *Scrophulariaceae*, *Solanaceae* and *Valerianaceae*. Floristic composition is Irano-Turanian elements. Detailed analysis showed that Biennial plants were 3.19%, Annual 41.49% and Perennial 55.32%.

**Keywords:** Checklist, flora, edaphic grasslands, Shanjan Protected area, East Azerbaijan Province

**Introduction**

Iran, a country with 1,640,000 square kilometers area in the south-west of Asia within the northern hemisphere, has its specific combination of different elements of life and a special ecosystem and biodiversity due to various factors including different climatic conditions, high mountains all around and a large desert in the centre. Different phytogeographic regions in Iran's plateau cause massive genetic flow in this area which results in a variety of plant species in comparison with what obtains in neighbouring countries, although some others have very interesting points of advantage. Some plant species have been walled beyond the natural fences (as endemic), and some are scattered in other lands. Due to the diversity of climate, topography and edaphic conditions, limited areas of vegetation in Iran are very different and heterogeneous. Vegetation in Iran, in particular, consists of discrete and dispersed limited areas. Its coverage in the northern and north-western areas and humid regions is very high. But in arid areas with low precipitation and high evaporation, it is very low. However, there is very high plant diversity in Iran which is remarkable and comparable with other countries. Iran consists of 167 families of vascular plants, 1215 genera (Flora of Iran, 2012). Total Taxa in Iran are about 8,000 which include about 6417 species, 611 subspecies, 465 varieties, and 83 hybrids. Of these, about 1,810 are endemic to Iran. Present statistics are adopted from the surveys conducted in 2000 in Central Herbarium of University of Tehran. (Ghahreman and Attar, 2000).

The Flora of Iran was published by A. Ghahreman 12 volumes (Ghahreman, 1993). Check list of flora in different areas have been researched by different researchers such as Ozhatay and Kultur (2006), Çakal et al (2012), Mirahmadi et al (2012), Kara and Kızıloğlu (2012), Dumlu et al (2011), and Emerhi (2012).

East Azerbaijan, NW Iran has a great potential of plant diversity in rangelands. The aim of this research is to broadcast the current situation of plants in Shanjan rangeland in Shabestar district, NW Iran. This study intends to introduce 94 plant species belonging to 25 families of this area.

**Materials and Methods**

Research area is located in Shanjan rangeland Shabestar District with elevation of 1700-2050 m. Shabestar District is situated in East Azerbaijan Province, NW Iran between the latitude 38° 10' 60.00"N and longitude 45° 42' 0.00"E (Figure 1). Geographical significance of research area is based on the fact that its boundaries touch Maragheh District in North east, Khoy District in North West, Salmas District in West, Tabriz District in East and South East, and Urmia Super salt lake in South. The soil of the Shanjan rangeland (Figure 2) is dissected in silty loam and silty clay loam texture. The coldest months of the area are December to March, while the maximum temperature is recorded in the months of July and August. Maximum and minimum precipitations fall in the months of February and August, respectively (Obadoni et al., 2009). We have selected 10 random 1×1 quadrat samples (Figure 3) in 8 stations with about 50 m different elevation for 24 weeks (from March 20, 2011 to August 31, 2011). Plant samples have been identified in Shabestar Unit, Islamic Azad University with Flora of Iran (Ghahreman, 1993).

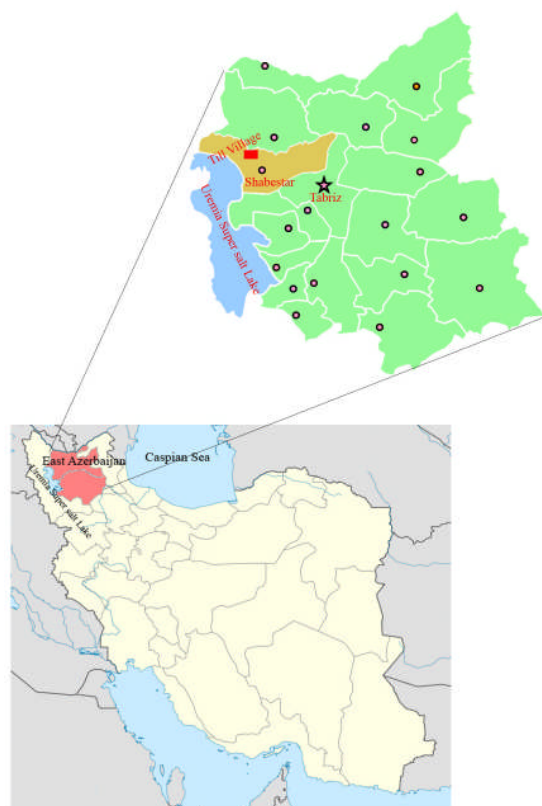
**Results and discussion**

In the research area 94 plant species belonging to 25 families were identified as constituting the major part of the vegetation (Table 1). The families in the area are *Ixilirion* (1 species), *Anchusa* (1 species), *Heterocaryum* (2 species), *Lappula* (1 species), *Lithospermum* (1 species), *Nonnea* (1 species), *Onosma* (2 species), *Rochelia* (1 species), *Campanula* (3 species), *Gypsophila* (1 species), *Agrostemma* (1 species), *Arenaria* (2 species), *Cerastium* (1 species), *Dianthus* (2 species), *Melandrium* (1 species), *Saponaria* (1 species), *Silene* (4 species), *Helianthemum* (1 species), *Achillea* (3 species), *Anthemis* (1 species), *Centaurea* (2 species), *Cerepis* (1 species), *Chardinia* (1 species), *Cosinia* (1 species), *Crepis* (1 species), *Erigeron* (1 species), *Gundelia* (1 species), *Helichrysum* (3 species), *Lasiopogon* (1 species), *Scorzonera* (1 species), *Senecio* (1 species), *Sieberta* (1 species), *Aethione* (1 species), *Alyssum* (4 species), *Cardaria* (1 species), *Conringia* (1 species), *Erysimum* (1 species), *Malcolmia* (1 species), *Nasturium* (1 species), *Thlaspi* (1 species), *Carax* (2 species), *Scabiosa* (3 species), *Ephorbia* (4 species), *Erodium* (1

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species), *Geranium* (1 species), *Boissiera* (1 species), *Hypericum* (1 species), *Linum* (1 species), *Malva* (1 species), *Orobanch* (1 species), *Papaver* (1 species), *Romeria* (1 species), *Paronchia* (1 species), *Acantholimon* (1 species), *Acantholimon* (1 species), *Polygonum* (1 species), *Adonis* (1 species), *Ceratocephalus* (1 species), *Ranunculus* (1 species), *Reseda* (1 species), *Asperula* (1 species), *Callipeltis* (1 species), *Cruciata* (1 species), *Galium* (1 species), *Bungea* (1 species), *Linaria* (1 species), *Linaria* (1 species), *Scrophularia* (1 species), *Veronica* (1 species), *Hyoscyamus* (1 species) and *Valerianella* (1 species) (Figure 4).

A detailed analysis showed that Biennial plants were 3.19%, Annual 41.49% and Perennial 55.32% (Figure 5).



**Figure 1:** Map of Shabestar District



**Figure 2:** Shanjan rangeland, Shabestar District, East Azerbaijan Province, NW Iran.



**Figure 3:** a 1×1 quadrat sample

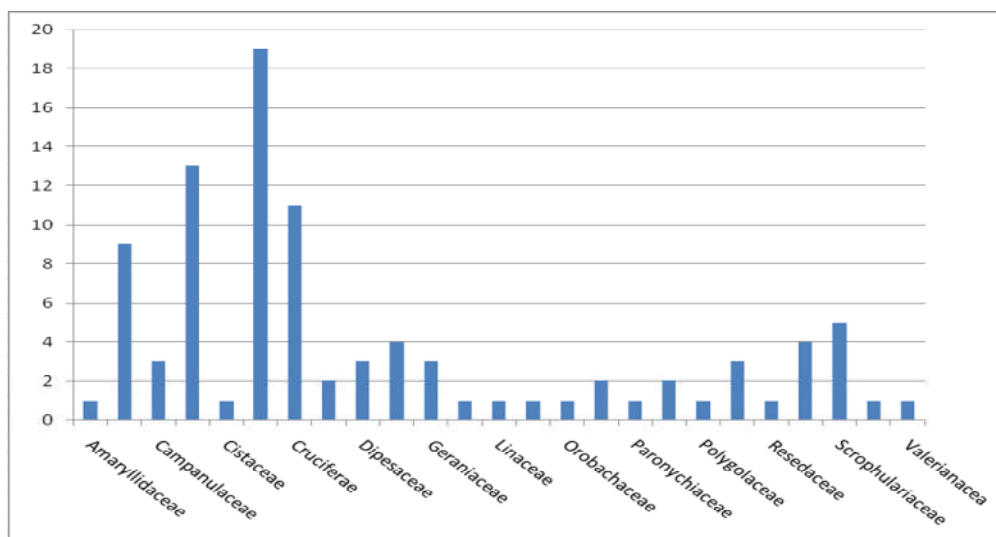
**Table 1:** Plant list in Shanjan Rangeland in Shabestar District, East Azerbaijan Province, NW Iran.

| Family                 | Botanical name                                                                   | Habit     | Flowering period |
|------------------------|----------------------------------------------------------------------------------|-----------|------------------|
| <i>Amaryllidaceae</i>  | <i>Ixilirion tataricum</i> (Pall.) et Schult.                                    | Annual    | May to June      |
| <i>Boraginaceae</i>    | <i>Anchusa italica</i> Retz. Var. <i>italica</i>                                 | Perennial | May to June      |
|                        | <i>Heterocaryum macrocarpum</i> Zak.                                             | annual    | May              |
|                        | <i>Heterocaryum szoritsianum</i> (Fisch. et C. A. Mey.) A. DC.                   | annual    | May              |
|                        | <i>Lappula barbata</i> (M.B.) Gurke                                              | annual    | May to June      |
|                        | <i>Lithospermum tenuiflorum</i> L.Fil.                                           | annual    | March to May     |
|                        | <i>Nonnea caspica</i> (willd) G. Don.                                            | annual    | May              |
|                        | <i>Onosma araraticum</i> H.Riedi                                                 | Perennial | June to July     |
|                        | <i>Onosma trachytricum</i> Boiss                                                 | Perennial | May to June      |
|                        | <i>Rochelia disperma</i> (L.F.) C.Koch.                                          | annual    | March to May     |
| <i>Campanulaceae</i>   | <i>Campanula phytidocalyx</i> Boiss. et Noe                                      | Perennial | May to June      |
|                        | <i>Campanula propinqua</i> Fisch.et Mey.                                         | annual    | May to June      |
|                        | <i>Campanula stricta</i> L.                                                      | Perennial | May to June      |
| <i>Caryophyllaceae</i> | <i>Gypsophila bellidifolia</i> Boiss                                             | Perennial | July             |
|                        | <i>Agrostemma githago</i> L.                                                     | annual    | March to May     |
|                        | <i>Arenaria gypsophiloides</i> L. var <i>gypsophiloides</i>                      | Perennial | May to June      |
|                        | <i>Arenaria polycnemifolia</i> Boiss                                             | Perennial | May              |
|                        | <i>Cerastium dichotomum</i> L.                                                   | annual    | March to May     |
|                        | <i>Dianthus crinitus</i> SM.                                                     | Perennial | July to August   |
|                        | <i>Dianthus macranthoides</i> Hausskn. ex Bornm.                                 | Perennial | June to July     |
|                        | <i>Melandrium persicum</i> (Boiss) et Buhse) bornm.                              | Perennial | May              |
|                        | <i>Saponaria orientalis</i> L.                                                   | annual    | May to June      |
|                        | <i>Silene aucheriana</i> Boiss.                                                  | annual    | March to May     |
|                        | <i>Silene marschalii</i> C.A.Mey                                                 | Perennial | May to June      |
|                        | <i>Silene morganae</i> Freyn                                                     | Perennial | June to July     |
|                        | <i>Silene pungens</i> Boiss                                                      | Perennial | May to June      |
| <i>Cistaceae</i>       | <i>Helianthemum ledifolium</i> (L.) mill. Var. <i>ledifolium</i>                 | annual    | March to May     |
| <i>Compositae</i>      | <i>Achillea micrantha</i> Willd.                                                 | annual    | June             |
|                        | <i>Achillea millefolium</i>                                                      | Perennial | July             |
|                        | <i>Achillea nobilis</i> L. subsp. <i>neilreichii</i> (kerner) Formancek.         | Perennial | June             |
|                        | <i>Anthemis tinctoria</i> L.                                                     | Perennial | May to August    |
|                        | <i>Centaurea aucheri</i> (DC.) Wagenitz Subsp. <i>Szowittsii</i> (Boiss)Wagenitz | Perennial | June to July     |
|                        | <i>Centaurea cheiranthifolia</i> Willd.Var. <i>Purpurascens</i> (DC) Wagenitz.   | Perennial | June to July     |
|                        | <i>Cerepis asadbarensis</i> Bornm.eX Rech.f.                                     | Perennial | May to June      |
|                        | <i>Chardinia orientalis</i> (L.) O Kuntze                                        | annual    | May              |
|                        | <i>Cosinia microcephala</i>                                                      | Perennial | June to July     |
|                        | <i>Crepis sancta</i> (L.) Babcock subsp. <i>sancta</i> .                         | annual    | May to June      |
|                        | <i>Erigeron acria</i> L. Confertum Boiss                                         | biennial  | March to May     |
|                        | <i>Gundelia tournefortii</i> (L.)                                                | Perennial | May to June      |

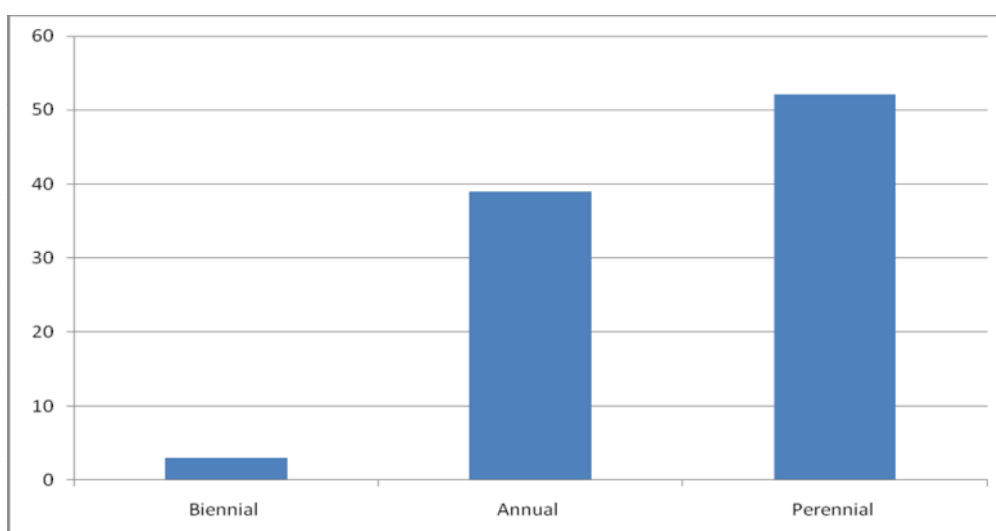
| Family                | Botanical name                                                                                | Habit          | Flowering period |
|-----------------------|-----------------------------------------------------------------------------------------------|----------------|------------------|
|                       | <i>Helichrysum araxinum</i> Takht. ex Kirp.                                                   | Perennial      | June             |
|                       | <i>Helichrysum oligocephalum</i> DC.                                                          | Perennial      | June             |
|                       | <i>Helichrysum rubicundum</i> (C.Koch) Bornm.                                                 | Perennial      | June             |
|                       | <i>Lasiopogon muscoides</i> (Desf.) D.                                                        | annual         | March to May     |
|                       | <i>Scorzonera phaeopapa</i> (Boiss) Boiss.                                                    | Perennial      | June to July     |
|                       | <i>Senecio mollis</i> Willd                                                                   | Perennial      | June to July     |
|                       | <i>Siebera nana</i> (DC.) Boram                                                               | annual         | March to June    |
| <b>Cruciferae</b>     | <i>Aethione arabicum</i> (L.) Andr. et DC.                                                    | annual         | March to May     |
|                       | <i>Alyssum bracteatum</i> (Boiss. et Buhse)                                                   | Perennial      | May to June      |
|                       | <i>Alyssum linifolium</i> Steud. et Willd. Var <i>linifolium</i>                              | Perennial      | July             |
|                       | <i>Alyssum longistylum</i> Grossh & Schischk.                                                 | Perennial      | June             |
|                       | <i>Alyssum marginatum</i> (Steud. ex Boiss.)                                                  | Perennial      | July             |
|                       | <i>Cardaria draba</i> L.                                                                      | Perennial      | March to May     |
|                       | <i>Conringia perfoliata</i> (C. A. Mey) Busch.                                                | annual         | July             |
|                       | <i>Erysimum crassipes</i> Fisch. et C.A. Mey.                                                 | Perennial      | June             |
|                       | <i>Malcolmia strigosa</i> Boiss                                                               | annual         | March to May     |
|                       | <i>Nasturium officinale</i> R.Br.                                                             | Perennial      | May to June      |
|                       | <i>Thlaspi stenocarpum</i> (Boiss) Hodge.                                                     | Perennial      | June             |
| <b>Cyperaceae</b>     | <i>Carax caucasica</i> Stev.                                                                  | Perennial      | May to June      |
|                       | <i>Carex Pseudofoetida</i> Kuentz                                                             | annual         | March to May     |
| <b>Dipsacaceae</b>    | <i>Scabiosa argentea</i> L.                                                                   | biennial       | May to June      |
|                       | <i>Scabiosa calocephala</i> Boiss                                                             | annual         | May to June      |
|                       | <i>Scabiosa rotata</i> M.B.                                                                   | annual         | March to June    |
| <b>Euphorbiaceae</b>  | <i>Euphorbia turcomanica</i> Boiss                                                            | Perennial      | July             |
|                       | <i>Euphorbia boissieriana</i> (Woron.) Prokh.                                                 | Perennial      | July             |
|                       | <i>Euphorbia cheiradenia</i> Boiss. et Hohen                                                  | Perennial      | June             |
|                       | <i>Euphorbia sequieriana</i> Necker subsp. <i>Niciciana</i> (Borb.) Rech. F.                  | Perennial      | May to June      |
| <b>Geraniaceae</b>    | <i>Erodium pulverulentum</i> (Cav.) Willd. subsp. <i>bovei</i>                                | annual         | March to May     |
|                       | <i>Geranium collinum</i> Steph. ex Willd.                                                     | Perennial      | March to June    |
|                       | <i>Boissiera squarrosa</i> (Banks et Soland.) Nevski                                          | Plantaginaceae | June             |
| <b>Hypericaceae</b>   | <i>Hypericum scabrum</i> L.                                                                   | Perennial      | March to June    |
| <b>Linaceae</b>       | <i>Linum catharticum</i> L.                                                                   | annual         | March to June    |
| <b>Melvaceae</b>      | <i>Malva Sylvestris</i> L. Var <i>Sylvestris</i>                                              | Perennial      | July             |
| <b>Orobanchaceae</b>  | <i>Orobanche anatolica</i> Boiss et Reut.                                                     | Perennial      | March to June    |
| <b>Papaveraceae</b>   | <i>Papaver arenarium</i> M.B.                                                                 | annual         | July             |
|                       | <i>Romeria hybrid</i> L.                                                                      | annual         | June             |
| <b>Paronychiaceae</b> | <i>Paronchia arabica</i> (L.) DC. Subsp. <i>brevisetia</i> (Aschers. et Schwein F.) Chaudhri. | annual         | March to May     |
| <b>Plantaginaceae</b> | <i>Acantholimon fominii</i> Kusn.                                                             | Perennial      | June to July     |
|                       | <i>Acantholimon sorchenes</i> Rech. F.                                                        | Perennial      | June             |
| <b>Polygonaceae</b>   | <i>Polygonum afghanicum</i> Meisn.                                                            | Perennial      | July             |
| <b>Ranunculaceae</b>  | <i>Adonis aestivalis</i> (L.)                                                                 | annual         | July             |

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| Family                  | Botanical name                                                                       | Habit          | Flowering period |
|-------------------------|--------------------------------------------------------------------------------------|----------------|------------------|
|                         | <i>Ceratocephalus falcatus</i> (L.) Pers.                                            | annual         | June             |
|                         | <i>Ranunculus lomatocarpus</i> F. et M.                                              | annual         | June             |
| <i>Resedaceae</i>       | <i>Reseda transitoria</i> Rech.F.                                                    | biennial       | July             |
| <i>Rubiaceae</i>        | <i>Asperula arvensis</i> L. Var <i>albida</i> bornm.                                 | annual         | July             |
|                         | <i>Callipeltis cucullaria</i> Stev.                                                  | annual         | June             |
|                         | <i>Cruciata coronata</i> (Sibth. Et Sm.) Ehendf subsp. <i>persica</i> (DC.) Ehrendf. | Perennial      | June             |
|                         | <i>Galium humifusum</i> Bieb                                                         | Perennial      | July             |
| <i>Scrophulariaceae</i> | <i>Bungea trifida</i> (Vahi.) C.A. Mey. Var <i>linifolia</i> (Vahi.) C.A. Mey.       | Perennial      | July             |
|                         | <i>Linaria chalepensis</i> (L.) Mill.                                                | annual         | June             |
|                         | <i>Linaria simplex</i> (Wild.) DC.                                                   | Plantaginaceae | June             |
|                         | <i>Scrophularia striata</i> Boiss                                                    | Perennial      | July             |
|                         | <i>Veronica beccabungal</i> . Subsp. <i>abscondita</i> M.A.Fischer                   | Perennial      | July             |
| <i>Solanaceae</i>       | <i>Hyoscyamus pusillus</i>                                                           | annual         | June             |
| <i>Valerianacea</i>     | <i>Valerianella vesicaria</i> (L.) Moench                                            | annual         | March to May     |



**Figure 4:** Plant family members in Shanjan Rangeland in Shabestar District, East Azerbaijan Province, NW Iran



**Figure 5:** Plants Habit in Shanjan Rangeland in Shabestar District, East Azerbaijan Province, NW Iran

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