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# Review and Identify Plants in Tang Putak Area, Dena Protected Area, Kohkiloye and Boyerahmad Province, Iran

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**ABSTRACT**

Floristic studies are fundamental for the applied sciences such as rangeland management and conservation. Unique ecological and climatic conditions in the Tang Putak in Dena Protected Area make it a remarkable habitat for the floristic studies. The purpose of this study was to determine floristic composition and their chorology carrying a central importance in vegetation description and analysis. Therefore, 50 quadrats (100 m2) were located according to the nature of vegetation. The species and their abundance-dominance were recorded. 73 plant species, belonging to 24 families, were identified. Plant classification, based on Raunkiaer's life forms revealed Hemicryptophytes as the most abundant (55% of total) species. Therophytes, Phanerophytes and Chamaephytes contained 21, 12 and 5 percents of total plant species, respectively. Chorological characteristics of the plant species showed, about 68% of the total plant species in Tang Putak area were belonged to the Irano-Turanian Chorotype.



## Introduction

Iran is known as one of the most appealing places for studying plant diversity, as 22% of its 8000 plant species are endemic (Asri, 2000). Vegetation and floristic composition are very important for conservation of biodiversity by providing habitat for wildlife and contributing to the ecologically sustainable management of natural resources. Documenting floristic composition and vegetation types are valuable for continuing ecological research, management and conservation of plants and wildlife. Any disturbance or changes in the native vegetation may affect wildlife sustainable use of natural resources and conservation of biological diversity (Ejtehadi et al., 2005).

Flora identification of each region is fundamental to another pure and applied researches in biology. The view expressed by Tuxen (1942) that the plant can measure habitat factors better than any instrument is symptomatic of the scepticism with which the sociologist regards intensive ecological investigation, in spite of the fact that the only exact knowledge, which he possesses of the tolerance of species has been obtained by extrapolation (often unjustified) from original instrumental measurements (Tuxen, 1942). The knowledge of the floristic composition of an area is a perquisite for any ecological and phytogeographical studies and conservation management activities. In studying any particular element of vegetation, from an ecological viewpoint, the first step should be to determine the facts as they exist on the ground: the facts about the vegetation on the one hand, facts about the habitat, on the other (Nicholes, 1930). Therefore, recognition and documentation of plant species and their geographical distribution are essential for further researches and for their protection. Loss of genetic diversity and species through habitat destruction will take many years to correct and restore. So the purpose of this research was to document the floristic composition and determine the plant species chorology in Tang Putak area which are important aspects of ecological surveys and conservation.

Several other studies in Iran have done and also reported higher abundance of Hemicryptophytes. Amiri *et al*. (2008) studied floristic of Tiregan in Hezar Masjed Mts (Amiri et al, 2008). Memariani, *et al*. 2009. Also studied floristic of Fereizi in Chenaran, and both found higher abundance of Hemicryptophytes as compared to other life forms (Memariani et al, 2009. In Khabr National Park and Rouchoun wildlife refuge (Irannezhad et al, 2001), and in Meimand (Vakili, 2001), both in Kerman, and in Kalat highlands of Gonabad in Khorasan Razavi (Vaseghi et al, 2008) Hemicryptophytes were the most abundant plant life forms.

## Study area

The Study area, Tang Putak area, is located in Dena protected area in Kohkiloye and Boyerahmad province in Iran. It is between 50_ 11´ - 50_ 17´ longitude and 30_ 35´ - 30_ 37´ latitude (Fig. 1). The study area is located above sea level, in 1000-2331 m range. The average annual precipitation in the study area is about 694 mm. The annual temperature for the region during the past 20 years , varies from -18 to 39 ° C. The number of dry months for the region, are 4 months. The study area is located in the vegetal Iranian and Turanian area and contains a large collection of plants and animals known and reported in the country. The most important mammals in the study area are the wolf, tiger, goats, boar, hyena and Iranian Squirrel...

## Methods

### Species Collection and Identification

Since any detailed vegetation study is based on description and investigation of plant communities or vegetation segments that must first be recognized in the field (Mueller-Dombois and Ellenberg, 1974). Vegetation sampling was performed during the year 2014. In each vegetation type, considering the nature of vegetation, 50 quadrats of the size 100 $m^2$, were located and abundance-dominance of each species was recorded. In the present study, the abundance dominance data were not subjected to analysis.

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**Table 1. Floristic composition of Tang Putak. Family name, Chorotype and life form of each species have been presented**

| Rows | Family | Species | Life form | Chorotype |
|---|---|---|---|---|
| 1. | *Aceracae* | *Acer monspessulanum* | PH | IT |
| 2. | *Anacardiaceae* | *Pistacia atlantica* | PH | IT |
| 3. | *Asteraceae* | *Achillea wilhelmsii* | HE | IT |
| 4. | | Anthemis sp | TH | IT, SS |
| 5. | | *Artemisia lehmsnniana* | CH | IT |
| 6. | | *Tragopogon bakhtiaricus* | HE | IT |
| 7. | | *Crupinia crapinastrom* | TH | IT,M |
| 8. | | *Taraxicum kotschyi* | HE | IT |
| 9. | | *Centaurera virgata* | HE | IT |
| 10. | | *Cichorium intybus* | HE | IT |
| 11. | | *Cirsium arvense* | Ge | Cos |
| 12. | | *Cirsium sp.* | HE | IT |
| 13. | | *Cousinia bachtiarica* | HE | IT, M |
| 14. | | *Helichrysum sp* | He | IT,ES |
| 15. | | *Lactuca sp.* | TH | IT, M |
| 16. | | *Scariola orientalis* | TH | IT |
| 17. | *Boraginaceae* | *Onosma bodeanum* | HE | IT |
| 18. | | *Onosma sp.* | HE | IT |
| 19. | | *Solenanthus stamineus* | HE | IT,M |
| 20. | *Brassicaceae* | *Alyssum sp.* | Th | IT,M |
| 21. | | *Cardaria draba* | HE | Cosm |
| 22. | | *Fibigia macrocarpa* | HE | IT |
| 23. | | *Thalaspi sp.* | HE | IT |
| 24. | *Caprifoliace* | *Lonicera sp.* | Ph | IT |
| 25. | *Caryophyllaceae* | *Silene conoidea L.* | Th | IT,M |
| 26. | | *Gypsophila sp.* | He | IT |
| 27. | *Convulvulaceae* | *Convolvulus acanthocladus* | CH | IT |
| 28. | *Dipsacaceae* | *Pterocephalus canus* | TH | ES, IT, M |
| 29. | | *Scabiosa olivieri* | TH | IT |
| 30. | *Euphorbiaceae* | *Euphorbia connata* | HE | IT |
| 31. | *Fabaceae* | Trigonella elliptica | TH | IT |
| 32. | | *Vicia villosa* | TH | IT,M |
| 33. | | *Astragalus fasciculifolius* | HE | IT |
| 34. | | *Glycyrrhiza glabra* | He | IT |
| 35. | | *Onobrychis melanotricha* | CH | IT |
| 36. | *Fagaceae* | *Quercus persica* | PH | IT |
| 37. | *Geraniaceae* | *Geranium tuberosum* | Ge | IT |
| 38. | *Hypericaceae* | *Hypericum perforatum* | He | IT |
| 39. | | *Hypericum scubrum* | He | IT |
| 40. | *Labiatae* | *Ziziphora capitat* | He | IT |
| 41. | | *Stachys sp.* | He | IT |
| 42. | | *Phlomis olivieri* | He | IT |
| 43. | | *Teucrum polium* | He | IT |
| 44. | | *Thymus daenensis* | He | IT |
| 45. | | *Lamium aplxicaule* | He | IT |
| 46. | *Liliaceae* | *Colchicum persicum* | Ge | IT |
| 47. | | Muscari neglectum | Ge | IT |
| 48. | *Poaceae* | *Bromus danthonia* | TH | IT |
| 49. | | *Bromus sp.* | TH | IT |
| 50. | | Hodeum bulbosum | TH | IT, M |
| 51. | | *Melica sp.* | He | IT |
| 52. | | *Poa bulbosa* | Geo | IT, M |
| 53. | | *Stipa barbata* | He | IT |
| 54. | | *Stipa sp.* | He | IT |
| 55. | *Polygonaceae* | *Polygonum dumosum* | He | IT |
| 56. | | *Rheum ribes* | PH | Cos |
| 57. | *Rosaceae* | *Amygdalus scoparia* | PH | IT,SS |
| 58. | | *Cerasus microcarpa* | Ph | IT |
| 59. | | *Cratagus sp.* | PH | IT |
| 60. | | *Galium verum* | He | IT,M,ES |
| 61. | | *Rubia albicoulis* | Ch | IT,SS |
| 62. | *Thymelaeaceae* | *Daphne mucronata* | PH | IT,ES |
| 63. | *Umbelliferae* | *Smyrnium cordifolium* | HE | IT, ES |
| 64. | | *Chaerophyllum macrodata* | HE | IT, M, ES |

| | | | | |
|---|---|---|---|---|
| 65. | | *Turgenia latifolia* | HE | IT, ES |
| 66. | | *Eryngium billardieri* | HE | IT |
| 67. | *Rubiaceae* | *Calipeltis cucularis* | HE | IT |
| 68. | | *Ferula sp.* | HE | IT |
| 69. | | *Prangos sp.* | HE | IT |
| 70. | | *Bupleurum sp.* | HE | IT |
| 71. | | *Scanelix penta-veneris* | HE | IT |
| 72. | *Valerianaceae* | *Valeriana officinalis* | TH | ES, IT |
| 73. | *Violacea* | *Viola sp.* | TH | SS |

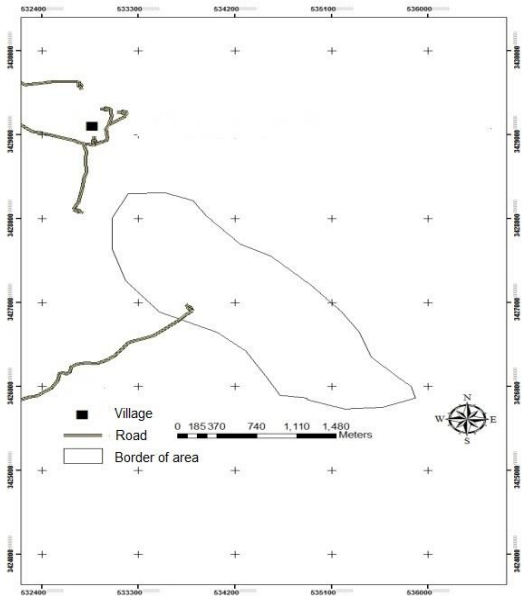


**Figure 1. Tang Putak area, Kohkiloye and Boyerahmad Province, Iran**

Species identification and their chorology were completed using Flora of Iranica (Rechinger, 1963-1998), Flora of USSR (Komarov and Shishkin, 1963- 1974), Flora of Turkey (Davis, 1965 – 1988), Flora of Iraq (Townsend et al,1985), Flora of Iran (Assadi, 1988), Color Flora of Iran (Ghahreman, 1980-2002) . Life form classification system of Raunkiaer was used to assign the life form of the species (Raunkiaer, 1934).

**Results and Discussion**

The total number of 73 plant species belonging to 24 families were identified in the study area based on (Rechinger, 1963-98), (Komarov, *et al*., 1963-1974), (Davis, 1965-1988), (Townsend and Guest, 1960-1985), (Assadi, *et al*., 1989-2002) and (Ghahreman, 1984 -2002). Species composition of Tang Putak along with their families, chorotypes and life forms are presented in Table 1.

About 68% of the total plant species in Tang Putak were belonged to the Irano-Turanian Chorotype. (Fig. 2).

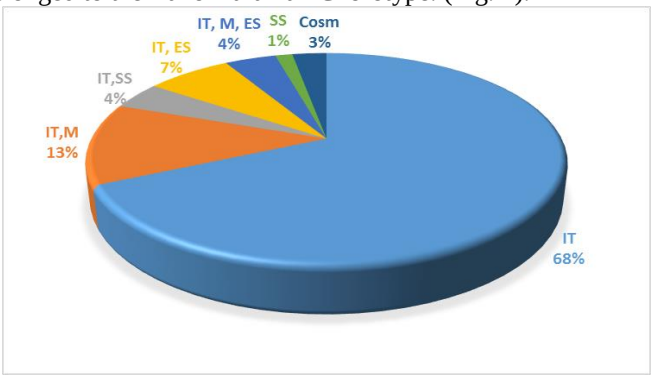


**Figure 2. Plant life forms and their relative contribution (percent) in flora in Tang Putak**

(IT= Irano-Turanian, SS= Sahra-Sidian M= Mediterranean, IT-M= Irano-Turanian, Mediterranean. ES= Euro-Siberian, IT-SS= Irano- Turanian, Sahra-Sidian. Cos= Cosmopolid. IT-M-ES= Irano- Turanian, Mediterranean, Euro-Siberian. IT-M-SS= Irano- Turanian, Mediterranean, Sahra-Sidian.)

Plant classification, based on Raunkiaer's life forms revealed Hemicryptophytes as the most abundant (55% of total) species. Therophytes, Phanerophytes and Chamaephytes contained 21, 12 and 5 percents of total plant species, respectively (Fig. 3).

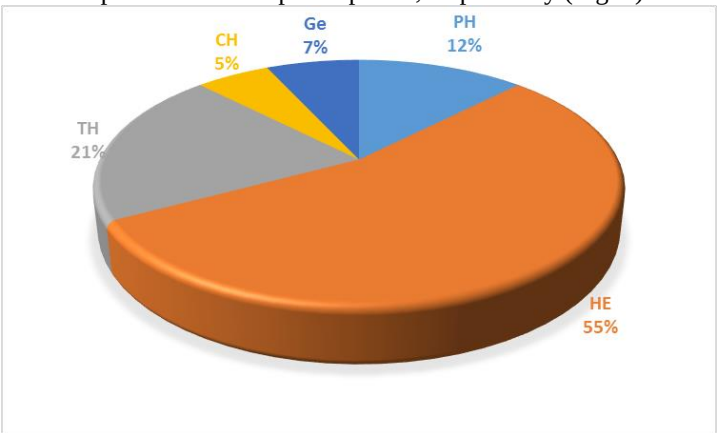


**Figure 3. Plant Life forms and their relative percentage in flora in Tang Putak**

(He: Hemicryptophytes, Th: Therophytes, Ch: Chamaephytes, Ph: Phanerophytes, Ge: Bulbous geophytes,)

Among the 24 plant families found in the Tang Putak, *Asteraceae* was the most abundant. (Fig. 4).

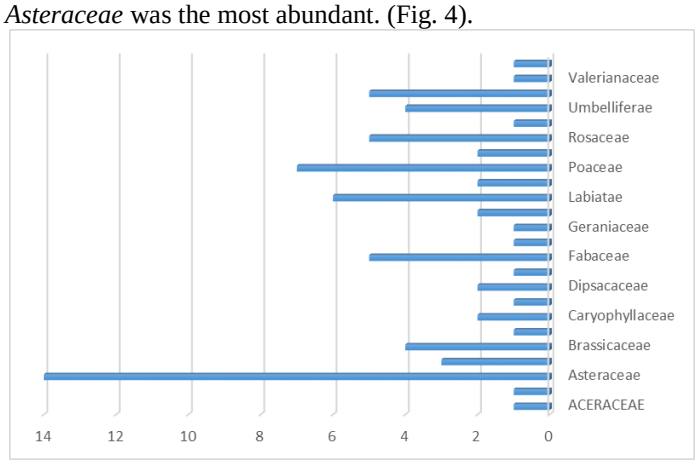


**Figure 4. Abundance of plant species in Tang Putak**

**Conclusion**

Hemicryptophytes was the most abundant life form in Tang Putak area. Documenting floristic composition of a habitat is valuable for continuing ecological research, management and conservation of plants and animals. Resources available for conservation of species and ecosystems are in short supply relative to the needs for those resources. Targeting conservation and management actions toward the species and ecosystems require clearly established priorities such as study of floristic composition as a principle tool in biodiversity which was

considered in the study. So, in this research, identification of 73 plant species in Tang Putak area along with their chorology, plant family and life form are of central importance for further ecological investigation, conservation and management of wildlife refuge of Iran.

Any life forms, in each plant communities vary. That this difference is the basis of the structure of plant communities (Mobin, 1981). Higher frequency of Therophytes and Hemicryptophytes in Tang Putak area can be related to their high adaptation to the Mediterranean climate conditions (Zohary, 1973). The classification was based on Ranker system, Hemicryptophytes having 55% share of the total number, make up the dominant life form, that it is common in cold and mountainous climate and shows its adaptability with Regional ecological conditions (Ghahremani Nejad and Agheli, 2009). Therophytes with 21 percent of the frequencies in the region are next. Therophytes prevalence in the region is related to factors such as human intervention, which decreases perennial plants and increases the chance for developing Annual plants (Ghahremani Nejad and Agheli, 2009). Overall, Hemicryptophytes and Phanerophytes, make up 76 percent of the plants in the region. This shows that the climatic conditions of the region are suitable for growing in temperate regions (Ismail-Zadeh et al, 2005). This type of life forms, have an important role in stabilizing soil (Batooli, 2003). Iranian-Turanian elements, with 68%, are in first place. A large percentage of Iranians – Turanian, related to the increase in the height range (Najafi Tireh Shbankareh et al, 2005).

During most of the summer and all winter times, Hemicryptophytes lose their aboveground parts while Therophytes remain as seed. Therefore, these plants avoid summer drought and winter cold stresses (Barbour et al, 1987). In conclusion, rangelands of Tang Putak area confer a relatively rich floristic composition, which is a result of plant responses to Mediterranean climate as well as intense livestock grazing. A combination of climate and land use impact has led to dominance of Hemicryptophytes and Therophytes. The active growth periods of these life forms are concurrent with the rainy season in early spring (Tavili et al, 2009). Climate and human have significant effect on the flora of all habitats in the Tang Putak area.

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