

ETHNOBOTANICAL ASPECTS OF SOME GEOPHYTES FROM ERGAN MOUNTAIN, TURKEY

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Abstract

The geophytes of Ergan mountain, Erzincan, Turkey were studied and documented. A total of 25 taxa belonging to 14 genera and 9 families have been collected in this study. Local name, used plant parts and the ethnobotanical uses of the geophyte - species were determined. Of the recorded taxa, 48% belonged to Irano-Twianian phytogeographic region, 12% to Europe-Siberian region and 4% to Mediterranean region. Five taxa namely, *Allium armenum* Boiss. & Kotschy, *A. sintenisii* Freyn, *Muscetoiceleste* Formin, *Fritillaria pinardii* Boiss. and *Tulipa armena* sbsp. *Lyia* (Baker) Marais recorded from the study area are endemic to Turkey.

Introduction

Turkey has been extremely rich in geophytes. There has been 540 geophyte plant species of 26 families in Turkish Flora (Özel and Erden 2010). Geophytes have been known well since the periods before Christ and have been commonly evaluated for medicinal, aromatic and ornamental purposes. The plants that have been benefited for public medicine since ancient times have also been benefited in modern medicine, as well (Özel and Erden 2010).

Eastern Anatolian Region has been the second most important region of Turkey in terms of floristic diversity. Erzincan province with a transition feature among Eastern Black Sea, Eastern Anatolia and Central Anatolia regions has been one of the important gene and endemism centers of Turkey. According to Davis (1965-1988), totally 795 species belonging to 87 families have been recorded in Erzincan and 276 of those are endemic. This number of endemic species has reached 437 in a recent study which has been carried out (Korkmaz *et al.* 2013).

The province of Erzincan with 11909 km² surface area has largely been located in Yukarı Fırat sub-region of Eastern Anatolian Region and a part of Irano-Turanian phytogeographic region. Erzincan has had 2 out of 13 endemic plant centers and six important plant sites of Turkey (Şahin and Gök 2004).

Munzur Mountain, forming natural border between Erzincan and Tunceli has been one of the most important endemic centers of Turkey and run for 120 km in east-west direction. The highest point of the mountain is Akbaba hill (3462 m). The highest temperature (41.3°C) is in July and the coldest in January with -32.5°C. Average annual rainfall is between 363.7 and 941.3 mm. The climate of Munzur Mountains is semi-arid Mediterranean climate (Yıldırım 1995, Yıldırım and Erik 1985). Ergan Mountain, has taken place on nearly 20 km south of Erzincan. It has been located on the north-east part of Munzur Mountains. The map of the Ergan Mountain has been given in Fig. 1.

Özgen *et al.* (2012) and Polat *et al.* (2012) stated that the province of Erzincan was the one that has been studied the least in Eastern Anatolian Region. Except from flora of Munzur Mountains (Yıldırım 1995) no floristical and ethnobotanical studies have been carried out in the study area before.

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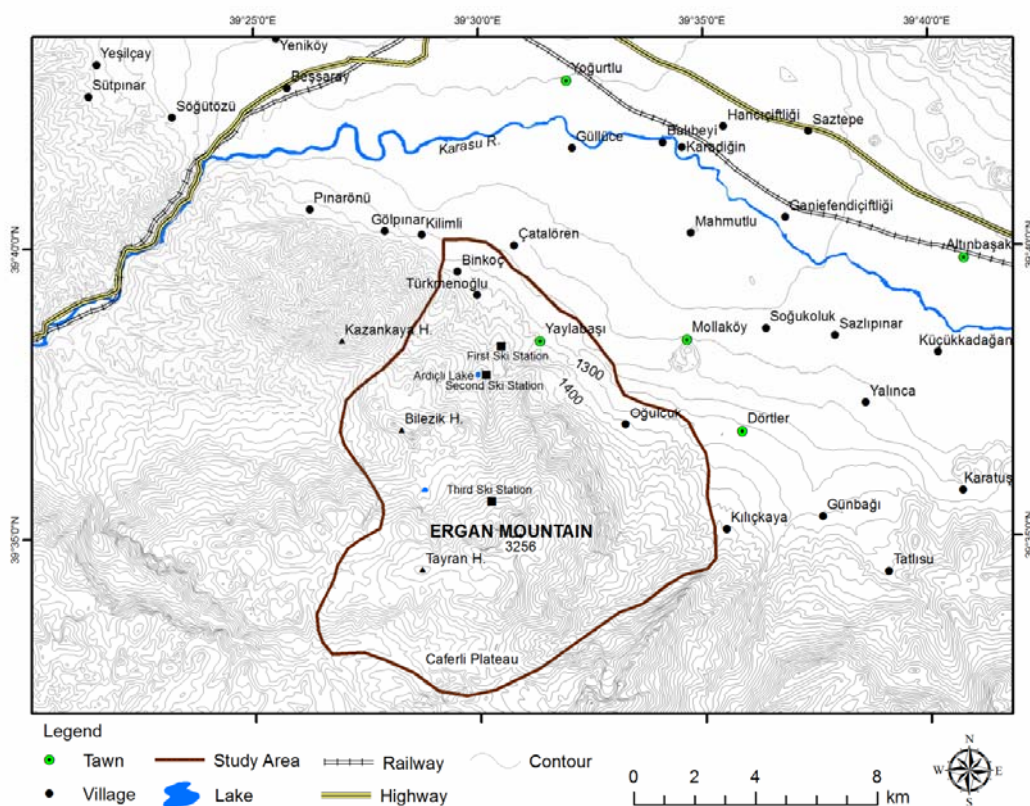


Fig. 1. The geographical map of the study area.

Materials and Methods

Plant samples were collected from Ergan Mountain in the spring and summer periods of 2011. The collected samples were pressed, and dried following standard herbarium techniques. The samples were identified by consulting Davis (1965-1988), Güner *et al.* (2000), Güner (2012). Help from the local Herbarium was also taken for the identification.

Furthermore, the identification (or recording) of all the plant samples were controlled from Tubives (Turkish plants data service). Plant samples were preserved in Erzincan University, Faculty of Science and Art, Department of Biology Herbarium. Further, the identification (or recording) of all the plant samples were controlled from Tubives (Turkish plants data service). The ethnobotanical feature of each taxon was ascertained by consulting Koyuncu and Arslan (2009), Şimşek *et al.* (2004), Tuzlacı and Doğan (2010). Interest to the beral medicine by the local inhabitants were also considered.

Results and Discussion

Twenty five species belonging to 14 genera and 9 families were recorded. The species and their families along with the locality of collection and date of collection have been furnished in Table 1. However, their ethnobotanical properties are listed in Table 2.

Table 1. List of the geophyte species collected from Ergan Mountain.**Amaryllidaceae**

1. *Allium armenum* Boiss. & Kotschy: Yaylabaşı District, 28.07.2011, 491, Ir.-Tur., End.
2. *Allium cardiostemon* Fisch. & Mey.: Binkoç village, 02.07.2011, 343, Ir.-Tur.
3. *Allium decipiens* Fischer ex Schultes & Schultes fil.: Yaylabaşı District, 08.06.2011, 127; Oğulcuk village, 11.06.2011, 205, Eur.-Sib.
4. *Allium kharputense* Freyn & Sint.: Binkoç village, 19.06.2011, 273, Ir.-Tur.
5. *Allium scorodoprasum* L. subsp. *scorodoprasum*: Yaylabaşı District, 11.07.2011, 397-b, Eur.-Sib., New record.
6. *Allium sintenisii* Freyn: Yaylabaşı District, 27.06.2011, 280; Yaylabaşı District, 11.07.2011, 397, Ir.-Tur., End.

Asparagaceae

7. *Muscari armeniacum* Leichtlin ex Baker: Oğulcuk village, 26.05.2011, 44; Binkoç village, 30.05.2011, 86.
8. *M. coeleste* Fomin: Yaylabaşı District, 21.04.2011, 4; Yaylabaşı District, 09.06.2011, 142, Ir.-Tur., End.
9. *M. tenuiflorum* Tausch: Erzincan: Yaylabaşı District, 08.06.2011, 94; Yaylabaşı District, 09.06.2011, 177; Binkoç village, 02.07.2011, 312.
10. *Ornithogalum oligophyllum* E.D. Clarke: Binkoç village, 30.05.2011, 56; Yaylabaşı District, 09.06.2011, 147.
11. *O. sphaerocarpum* Kerner: Binkoç village, 02.07.2011, 314.
12. *Puschkineia scilloides* Adams: Yaylabaşı District, 09.06.2011, 163, Ir.-Tur.?, New record.
13. *Scilla siberica* Haw. subsp. *armena* (Grossh.) Mordak: Yaylabaşı District, 21.04.2011, 2, Ir.-Tur.

Geraniaceae

14. *Geranium tuberosum* L. subsp. *tuberosum*: Yaylabaşı District, 16.05.2011, 9; Oğulcuk village, 26.05.2011, 32; Binkoç village, 30.05.2011, 84; Yaylabaşı District, 09.06.2011, 166.

Iridaceae

15. *Iris caucasica* Hoffm. subsp. *turcica* B. Mathew: Yaylabaşı District, 16.05.2011, 16; Yaylabaşı District, 16.05.2011, 30; Binkoç village, 30.05.2011, 89; Oğulcuk village, 11.06.2011, 212, Ir.-Tur.

Ixioliriaceae

16. *Ixiolirion tataricum* (Pallas) Herbert subsp. *montanum* (Labill.) Takht.: Yaylabaşı District, 16.05.2011, 28, Ir.-Tur.

Liliaceae

17. *Fritillaria pinardii* Boiss.: Binkoç village, 30.05.2011, 88, Ir.-Tur., End.
18. *Tulipa armena* Boiss. subsp. *lycica* (Baker) Marais: Yaylabaşı District, 16.05.2011, 13, End.
19. *T. julia* C. Koch: Above of Oğulcuk village, 26.05.2011, 45; Oğulcuk village, 11.06.2011, 200, Ir.-Tur.

Orchidaceae

20. *Dactylorhiza iberica* (Bieb. ex Willd.) Soo: Binkoç Village, 12.07.2011, 428, Medit.
21. *D. umbrosa* (Kar. & Kir.) Nevski: above of Oğulcuk village, 18.06.2011, 233; Binkoç village, 19.06.2011, 263; Binkoç village, 02.07.2011, 319, Ir.-Tur.
22. *Orchis coriophora* L.: Yaylabaşı District, 09.06.2011, 175.
23. *O. pallens* L.: Yaylabaşı District, 16.05.2011, 10; Oğulcuk village, 26.05.2011, 38, Eur.-Sib.?

Paeoniaceae

24. *Paeonia mascula* (L.) Miller subsp. *arietina* (Anderson) Cullen & Heywood: Yaylabaşı District, 08.06.2011, 125; Yaylabaşı District, 27.06.2011, 289.

Xanthorrhoeaceae

25. *Eremurus spectabilis* Bieb.: Oğulcuk village, 18.06.2011, 240; Yaylabaşı District, 27.06.2011, 293, Ir.-Tur.

Table 1. Ethnobotanical Uses of Geophytes from Ergon Mountain

Taxon name	Local name	Used part	Usage
<i>Allium armenum</i>	Dağ Sarımsağı	Bulb	Making meals like garlic
<i>A. cardiostemon</i>	Yabancı	Bulb	Antibiotic effect and body cleaner
<i>A. decipiens</i>	Sarımsak	Flower	Ornamental plant (<i>A. kharputense</i>)
<i>A. kharputense</i>	Şiri, Şir, Koy		
<i>A. scorodoprasum</i> subsp. <i>scorodoprasum</i>			
<i>A. sintenisii</i>			
<i>Muscari armeniacum</i>	Gül, Sosun,	Flower	Tea,
<i>M. coeleste</i>	Holoz, Zağik	Leaf	Cooked as meal
<i>M. tenuiflorum</i>		Whole plant	Ornamental plants (<i>M. armeniacum</i> and <i>M. celeste</i>)
<i>Ornithogalum oligophyllum</i>	Karga soğanı	Whole plant	Ornamental plants
	Köpek soğanı		
<i>O. sphaerocarpum</i>	Tükrük otu		
<i>Puschkineia scilloides</i>	-		
<i>Sicilla siberica</i> subsp. <i>armena</i>	Sümbül		
<i>Geranium tuberosum</i> subsp. <i>tuberosum</i>	Kestane otu	Tuber	Eaten as raw and fresh (Akan <i>et al.</i> 2008, Aksakal and Kaya 2008)
<i>Iris caucasica</i> subsp. <i>turcica</i>	Nevruz, Dağ	Flower	Infusion used for the treatment of cold (Tuzlacı and Doğan 2010)
	Nevruzu		Eaten as raw
<i>Ixiolirion tataricum</i> subsp. <i>montanum</i>	Hıyarçık	Flower, Leaf	Infusion used for the treatment of cold (Tuzlacı and Doğan 2010)
		Whole plant	Eaten as raw
			Consumed by adding to the meals
<i>Fritillaria pinardii</i>		Whole plant	Ornamental plant
	Gül	Bulb	Ornamental plant (Koyuncu and Arslan 2009)
<i>Tulipa armena</i> subsp. <i>lycica</i>	Lale	Whole plant	Eaten as food
		Whole plant	Ornamental plant
<i>T. julia</i>	Lale	Whole plant	Ornamental plant (Koyuncu and Arslan 2009)
		Whole plant	Ornamental plant

(Contd.)

	Soğan Çili	Tuber	No usage
<i>Dactylorhiza iberica</i>			Aphrodisiac, roborant against child diarrhea and food. Sahlep is produced from its tubers (Baytop 1999)
<i>D. umbrosa</i>	Holoz	Flower Tuber	Honey bees take nectar to make honey Sahlep is obtained from the tubers (Baytop 1999). Used as aphrodisiac, roborant, against child diarrhea, and as food.
<i>Orchis coriophora</i>	Salep	Root	Sahlep, Ornamental plant.
<i>O. pallens</i>	Salep	Whole plant	It can be evaluated as ornamental plant
<i>Paeonia mascula</i> subsp. <i>arietina</i>	Orman Gülü, Şakayık	Young flowers, Leaf and branches Whole plant	Tea Meal Ornamental plant
			Used for diabetes, Grown as ornamental plant, Tranquilizing and diarrhea preventive, Effective against epileptic seizures and cough (Baytop 1999), waiting for 7-8 hours in cold water, roasted with butter and egg (Şimşek <i>et al.</i> 2004), Infusion from aerial parts is used to decrease blood glucose level (Tuzlaci and Doğan 2010), Used as vegetable (Koyuncu and Arslan 2009)
<i>Eremurus spectabilis</i>	Çiriş, Kiriş, Helige	Root and Leaves	Leaves are cooked to make meal, root is crushed and rubbed to head to treat headache. Aerial parts are cooked with egg and butter. Moreover, It can be evaluated as ornamental plants A pomade prepared from its root is used for mange and syphilis (Baytop 1999). An adhesive is obtained from the rhizome. Added to herby cheese. The root is boiled and drunk for the treatment of rheumatism. Leaves are used as vegetable (Koyuncu and Aslan 2009), The decoction prepared from its roots is internally used to decrease blood glucose level and petioles of the leaves are externally used for the treatment of eczema and fungus (Tuzlaci and Doğan 2010)

Among the geophyte species 48.0% belong to Irano-Turanian phytogeographic region, 12.0% to Europe-Siberian region and 4.0% to Mediterranean region. In addition, *Allium scorodoprasum* subsp. *scorodoprasum* and *Puschkineia scilloides* have been determined as a new record to B7 square. Five taxa (*Allium armenum*, *A. sintenisii*, *Muscari celeste*, *Fritillaria pinardii* and *Tulipa armena* subsp. *lycia*) found in the study area were determined as endemic to Turkey (Ekim *et al.* 2000).

All species collected from the study area have been found as having important ethnobotanical features (Table 1). A total of 16 taxa has been recognized as ornamental. Although use of the roots of *Asphodeline tenuior* subsp. *tenuiflora* var. *tenuiflora* was not encountered in the study area, according to Tuzlacı and Doğan (2010) it has been used for the treatment of scars.

Geophyte plants have created an important part of the species existing in natural flora of Turkey. According to this study, they have high potential to be used at medicine and ornamental planting and are important in terms of economy. Further studies should be carried out on the geophytes of the study area, especially to introduce them in the cultivation, so that they can more significantly contribute to the economy. They have been under the risk of many reasons such as land clearing, overgrazing, industrialization, agricultural pests, forest fires, road building works and export (Ekim *et al.* 1989). Constructional works for ski-run and ski-facilities have been going on in Ergan Mountain areas. Besides, stock-breeding and grazing which are common in the province have also been recognized as the major threats to the rare and endemic geophyte plant species growing in the area. Stubble burning which has been found as common even in central villages of the province has been an essential factor that threatens the natural life and plant diversity. So, different conservation initiatives including the educational activities to increase the public inform public awareness should be implemented in the area for sustainable development.

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