

ETHNOBOTANICAL DOCUMENTATION OF PLANTS OF BAŞHEMŞİN VALLEY, KAÇKAR MOUNTAINS NATIONAL PARK, RIZE, TURKEY

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Abstract

Ethnobotanical uses of 58 vascular plant species belonging to 24 families have been documented from Başhemşin valley of Kaçkar Mountains National Park in Rize, Turkey. The villagers used to use these plants traditionally as sources of medicine, food, beverage (tea), timber, raw material of toys and musical instruments, fire wood, ornamental, aesthetic etc. About 20 species were recorded to be medicinally used for the treatment of the cancer, diabetes, cold, cough, sniffles, flue, wounds, urinary problems, circulatory disorder, nephropathy, abdominal pain, hemorrhage and germicide. Local name, used parts and ethnobotanical uses of these taxa were documented. 18 (31.0%) taxa were found to be used with all parts, while 11 (19.0%) taxa for fruits, 8 (13.8%) taxa for stem and branches, 7 (12.0%) taxa for leaves and flowers, 5 (8.6%) taxa for flowers, 4 (6.9%) taxa for seeds, 2 (3.5%) taxa for leaves, 2 (3.5%) taxa for leaves and fruits, and 1(1.7%) taxon for fruits, stem and branches.

Introduction

Turkey as a country of warm climate zone has a very rich and diverse flora under the influence of various geographic, climatic, topographic and edaphic factors. Nowadays, if we add subspecies and varieties Turkey has 11935 plant taxa belonging to 167 families, 1320 genera and 10169 species, of which 3750 are endemic with an endemism ratio 31.25% (Davis 1965-1985, Davis *et al.* 1988, Güner *et al.* 2000 and Güner 2012). It is estimated that there are around 500 medicinal and aromatic plants in Turkey and nearly 200 of them have export potential (Kendir and Güvenç 2010). Baykal (2015) reported that Rize has 1436 plant taxa of which 225 of them are medicinal.

Investigation and documentation of ethnobotanical knowledge and prevalence of medicinal plants in Turkey have been made by different workers and about 854 publications between the years 1928-2008 are available (Kendir and Güvenç 2010). The ethnobotanical reports from different parts of Turkey after 2008, such as Tuzlacı *et al.* (2010), Polat and Satıl (2012), Sargin *et al.* (2013), Saraç *et al.* (2013) and Korkmaz *et al.* (2014) are also available. However, the present study is the first comprehensive report on the local ethnobotanical knowledge of the Başhemşin valley in Rize.

Başhemşin valley is located in Çamlıhemşin district, 75 km southeast of Rize, Turkey (Fig. 1). It is at A8 square within the Colchic sector of Euro-Siberian floristic area of Holarctic region (Davis 1965-1985) and the south-eastern border of the Kaçkar Mountains National Park. The altitude of the area is between 1650 m below Aşağıköy and 3709 m at Verçenik, the second highest summit of Kaçkar Mountains. The lower part of the study area is in the borders of the Firtına Valley hotspot (Fig. 1). The area has a very-humid, mezothermal climate without any dry season.

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The aim of present study was to evaluate and record the traditional practices, uses and indigenous knowledge on native plants of Başhemşin valley and environs to provide valuable ethnobotanical information and to encourage the conservation and sustainable utilization of ethnobotanical plants of the area.

Materials and Methods

This research is a part of the project on the flora, phytosociology and ethnobotany of Başhemşin valley and environs conducted for Doctoral dissertation study (Baykal 2015). During the years 2011-2014, all native plant taxa of Başhemşin valley and environs (latitudes $40^{\circ}40'303$ - $40^{\circ}49'540$ and longitudes $40^{\circ}51'505$ - $40^{\circ}56'416$) were collected through comprehensive field surveys. All plant species were identified by using the Flora of Turkey and the East Aegean Islands



Fig. 1. Map of the study area.

(Davis 1965-1985, Davis *et al.* 1988, Güner *et al.* 2000 and Güner 2012) checked with European flora (Tutin *et al.* 1964-1980), Russian flora (Komarov and Shishkin 1933-1964, Ketzkhoveli and Gagnidze 1971-2001) and the identified samples were compared with the herbarium samples of Blacksea Technical University, Hacettepe University and Recep Tayyip Erdoğan University. All of them were pressed and dried following standard herbarium techniques and preserved in the Herbarium of the Department of Biology, Faculty of Arts and Sciences, Recep Tayyip Erdoğan University. The ethnobotanical data were collected by interviewing the local people using questionnaire containing information on local name, used parts, usage forms and the harvesting and processing techniques. According to local register office total human population in the study area is 105. The study paid attention to 14 elderly persons whose knowledge was respected by local people. Data obtained through this ethnobotanical study are presented in Table 1. The species are arranged under different groups, standing with gymnosperms then angiosperms. Each species is provided with data on local name(s), family, used part(s), uses and voucher number.

Results and Discussion

In the study area, 503 taxa belonging to 234 genera and 75 families were identified and 16 of them were pteridophytes and 487 were spermatophytes. Two taxa of the spermatophytes were gymnosperms while 485 were angiosperms comprising 98 monocots and 389 dicots. According to the total number of taxa, *Asteraceae* (55), *Poaceae* (49), *Brassicaceae* (28) and *Fabaceae* (27) were found to be the richest families (Baykal 2015).

Table 1. Ethnobotanical uses of the plant species of Başhemşin valley.

Sl.	VN.	Botanical name with family	Local name	Part used	Ethnobotanical uses
1	323	<i>Juniperus sabina</i> L. (Cupressaceae)	Çirti	Fruit, stem, branch	Berries are boiled, and decoction is used for urinary problems. Wood is used as firewood.
2	329	<i>Picea orientalis</i> (L.) Link. (Pinaceae)	Çam	Stem, branch	Traditional houses are made using timber of this plant. Wood is used as firewood.
3	1098	<i>Achillea latiloba</i> Lebed. (Asteraceae)	Papatya	Whole plant	Whole plant is used as ornamental plant.
4	358	<i>Achillea millefolium</i> L. (Asteraceae)	Papatya	Whole plant	Whole plant is used as ornamental plant.
5	1037	<i>Alyssum murale</i> (Brassicaceae)	Otlak	Leaf, flower	Decoction of leaves and flowers are used as tea.
6	721	<i>Alyssum simplex</i> Rudolph (Brassicaceae)	Otlak	Leaf, flower	Decoction of leaves and flowers are used as tea.
7	1059	<i>Astragalus frickii</i> Bunge (Fabaceae)	Yonca	Seed	Mature seeds are eaten as dry fruit.
8	313	<i>Berberis vulgaris</i> L. (Berberidaceae)	Kadın tuzluğu	Fruit	Fruits are eaten raw.
9	837	<i>Cardamine impatiens</i> L. var. <i>impatiens</i> (Brassicaceae)	Papayas	Whole plant	Whole plant is boiled in water, the decoction is cooled to ambient temperature, and it is used for abdominal pain in the morning on an empty stomach.
10	523	<i>Cardamine raphanifolia</i> Pourr. subsp. <i>acris</i> (Gris.) O. E. Schulz (Brassicaceae)	Papatya	Whole plant	Whole plant is boiled in water, the decoction is cooled to ambient temperature, and it is used for abdominal pain in the morning on an empty stomach.
11	838	<i>Cornus sanguinea</i> L. (Cornaceae)	Eğüt	Fruit	Fruits are eaten raw and used for marmalade.
12	383	<i>Corylus avellana</i> L. (Corylaceae)	Fındık	Seed	Seeds are used as dry fruit and for traditional pastry.
13	1055	<i>Cotoneaster integerrimus</i> Medik. (Rosaceae)	Megur	Fruit	Fruits are used for circulatory disorder.
14	1063	<i>Crataegus microphylla</i> Koch. (Rosaceae)	Ehmer	Fruit	Fruits are eaten raw for their taste.
15	334	<i>Cyclamen coum</i> Miller (Primulaceae)	Menekşe	Whole plant	Whole plant is used as ornamental plant.
16	364	<i>Cyclamen parviflorum</i> Pobed. (Primulaceae)	Menekşe	Whole plant	Whole plant is used as ornamental plant.
17	800	<i>Descurainia sophia</i> (L.) Webb. ex Prantl (Brassicaceae)	Sadırotu	Whole plant	Decoction of whole plant is used as tea.
18	895	<i>Eryngium giganteum</i> Bieb. (Apiaceae)	Diken	Whole plant	Whole plant is hunged at barnes as amulet.
19	1071	<i>Erysimum diffusum</i> Ehrh. (Brassicaceae)	Sarı ot	Whole plant	Decoction of whole plant is used as tea.
20	341	<i>Fragaria vesca</i> L. (Rosaceae)	Dağ çileği	Fruit	Fruits are eaten raw and used to make jam.

(Contd.)

(Contd.)

SI	VN.	Botanical name with family	Local name	Part used	Ethnobotanical uses
21	827	<i>Helichrysum graveolens</i> (Bieb.) Sweet (Asteraceae)	Zirahat	Whole plant	Whole plant is used as ornamental plant and amulet. Whole plant is kept in boiled-water for 5 minutes, the filtrate is used for nephropathy.
22	828	<i>Helichrysum plicatum</i> DC. (Asteraceae)	Zirahat	Whole plant	Whole plant is used as ornamental plant and amulet. Whole plant is kept in boiled-water for 5 minutes, the filtrate is used for nephropathy.
23	396	<i>Hypericum perforatum</i> L. (Hypericaceae)	Çiçek otu	Leaf, flower	Flowers and leaves are put into the boiled water. 15 minutes cooling, filtrate is drunk for stomach ache.
24	325	<i>Juglans regia</i> L. (Juglandaceae)	Ceviz	Seed	Seeds are used as dry fruit and for traditional pastry.
25	855	<i>Mentha longifolia</i> (L.) Hudson (Lamiaceae)	Nane	Leaf, flower	Used as spice. Decoction is used for remedy of cold.
26	426	<i>Mentha spicata</i> L. (Lamiaceae)	Nane	Leaf, flower	Used as spice. Decoction is used for remedy of cold.
27	842	<i>Onosma bracteosa</i> Hausskn. et Bornm. (Boraginaceae)	Emcek	Flower	Nectary of the flowers are eaten.
28	866	<i>Origanum vulgare</i> (Boiss.) Hayek (Lamiaceae)	Karakımık	Whole plant	Decoction is used as remedy for cold, sniffles and flue.
29	427	<i>Plantago lanceolata</i> L. (Plantaginaceae)	Damar otu	Leaf	Mashed leaves are used for hemorrhage and to cure wounds.
30	597	<i>Plantago major</i> L. (Plantaginaceae)	Damar otu	Leaf	Mashed leaves are used for hemorrhage.
31	887	<i>Polygonum cognatum</i> Meissn. (Polygonaceae)	Goncolika	Whole plant	Whole plant is cooked to make meal.
32	869	<i>Populus tremula</i> L. (Salicaceae)	Kavak	Stem, brach	Wood is used as firewood.
33	899	<i>Prunus divaricata</i> Ledeb. subsp. <i>divaricata</i> (Rosaceae)	Yabani erik	Fruit	Fruits are eaten raw and used for diabetes. They are also used for making jam.
34	357	<i>Pyrus communis</i> L. (Rosaceae)	Armut	Fruit	Fruits are eaten raw and used to prepare stewed fruit.
35	851	<i>Rhinanthus angustifolius</i> C. C. Gmelin (Scrophulariaceae)	Düdük çiçeği	Flower	Flowers are used as a whistle.
36	342	<i>Rosa canina</i> L. (Rosaceae)	Masor	Fruit	Fruits are used to make jam.
37	817	<i>Rosa dumalis</i> Bechst. subsp. <i>boissieri</i> (Crepin) E. Nilsson (Rosaceae)	Masor	Fruit	Fruits are used to make jam.

(Contd.)

(Contd.)

Sl.	VN.	Botanical name with family	Local name	Part used	Ethnobotanical uses
38	954	<i>Rosa pulverulenta</i> Bieb. (Rosaceae)	Masor	Fruit	Fruits are used to make jam.
39	1090	<i>Rubus idaeus</i> L. (Rosaceae)	Hamduka	Fruit	Fruits are eaten raw and used to make jam.
40	1069	<i>Rubus saxatilis</i> L. (Rosaceae)	Hamduka	Flower	Fruits are eaten raw and used to make jam.
41	643	<i>Salix caprea</i> L. (Salicaceae)	Sögüt	Stem, brach	Wood is used as firewood.
42	749	<i>Salvia verticillata</i> L. (Lamiaceae)	Dut Çiçeği	Leaf, flower	Decoction of flower and leaf is used as tea.
43	586	<i>Sempervivum minus</i> Turill (Crassulaceae)	Dut Çiçeği	Leaf, flower	Flowers and leaves are eaten raw.
44	769	<i>Sibbaldia parviflora</i> Willd. (Rosaceae)	Fındık otu	Seed	Mature seeds are eaten as dry fruit.
45	644	<i>Sorbus aucuparia</i> L. (Rosaceae)	Dağ güzeli	Stem, branch	Wood is used as firewood.
46	839	<i>Sorbus caucasica</i> Zinserl. var. <i>yaltirikii</i> Gökşin (Rosaceae)	Dağ güzeli	Stem, branch	Wood is used as firewood.
47	1115	<i>Sorbus umbellata</i> Fritsch. (Rosaceae)	Dağ güzeli	Stem, branch	Wood is used as firewood.
48	746	<i>Stachys cretica</i> (Lamiaceae)	Dut Çiçeği	Flower	Nectaries are eaten.
49	372	<i>Tanacetum parthenium</i> (L.) Sch. Bip. (Asteraceae)	Papatya	Flower	Flowers are boiled in water for 5 minutes and filtrate is used as tea.
50	1013	<i>Thymus longicaulis</i> C. Presl sensou lato. (Lamiaceae)	Çay çiçeği	Whole plant	Decoction is used as remedy for cold, sniffles and flue.
51	1000	<i>Thymus praecox</i> Opiz subsp. (Lamiaceae)	Çay çiçeği	Whole plant	Decoction is used as remedy for cold, sniffles and flue.
52	635	<i>Thymus nummularius</i> M. Bieb. Klokov et Des.-Shost.(Lamiaceae)	Çay çiçeği	Whole plant	Decoction is used as remedy for cold, sniffles and flue.
53	628	<i>Trifolium canescens</i> Willd. (Fabaceae)	Palalı otu	Flower	Flowers are used to prepare tea.
54	775	<i>Ulmus glabra</i> Hudson. (Ulmaceae)	Karaağaç	Stem, brach	Wood is used as firewood.
55	429	<i>Urtica dioica</i> L. (Urticaceae)	Isurgan	Whole plant	Decoction of whole plant is used as remedy for cancer.
56	450	<i>Vaccinium myrtillos</i> L. (Ericaceae)	Megur	Fruit, leaf	It is used to make jam. Both leaves and fruits are used as remedy for diabetes and are used as tea.
57	1092	<i>Vaccinium uliginosum</i> L. (Ericaceae)	Megur	Fruit, leaf	It is used to make jam. Both leaves and fruits are used as remedy for diabetes and are used as tea.
58	840	<i>Colchicum speciosum</i> Steven. (Colchicaceae)	Güz çiçeği	Whole plant	Mashed plant is used as germicide.

VN: Voucher number.

A total of 58 taxa, belonging to 43 genera and 24 families were documented for their ethnobotanical uses (Table 1). The family *Rosaceae* with 14 species is reported as the largest representative of ethnobotanical plants in the study area which is followed by *Lamiaceae* by 8 species, *Brassicaceae* with 6 species, *Asteraceae* with 5 species, *Fabaceae*, *Ericaceae*, *Primulaceae*, *Plantaginaceae* and *Salicaceae* each with 2 and the remaining 15 families with 1 species in each.

The villagers use 18 (31.0%) taxa with all organs. They use 11 (19.0%) taxa for fruits, 8 (13.8%) for stem and branches, 7 (12.0%) for leaves and flowers, 5 (8.6%) for only flowers, 4 (6.9%) for only seeds, 2 (3.5%) for leaves only, 2 (3.5%) taxa for leaves and fruits and 1 (1.7%) for fruits, stems and braches.

The ethnobotanical plants of the study area have high potential to be used as medicine, nutrition and ornamentals etc. and are thus important in terms of economy. For example, the ethnobotanically useful plants *Vaccinium myrtillus* L. and *Vaccinium uliginosum* L. of the study area can be introduced to cultivation and influence the establishment of small industries locally. Their fruits could be used for preparing jelly while leaves for preparing tea and folk medicine for diabetes. In addition, these species could be a source of income for local people of the study area.

Though the study area is in the border of the Kaçkar Mountain National Park, the ethnobotanical plants of this area have been under the risk due to overgrazing, road buildings, hay, firewood cuttings etc. For example the endemic *Sorbus caucasica* Zinserl. var. *yaltirikii* Gökşin was exploited by the local people for its woods without any restrictions and due to this destruction only two individuals of this species were found to be survived. As a result, this species is highly threatened in the study area.

The indigenous knowledge on plant usage and methods were confined only to the elderly persons of above 60 - 70 years old in the study area. The indigenous knowledge decreases day by day with the death of people. The youth use modern medicines because of their availability and efficiency and in contrast misbeliefs about folk medicine. Because of this fact we have to record these valuable data. Due to frequent overgrazing, hay, habitat degradation, infrastructural development and unsustainable uses of plants in the study area several ethnobotanical plant species expected to be extinct in the area in near future and therefore, various initiatives for their conservation, including educational programs, should be carried out in the study area.

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