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Ethnobotanical survey of plants used in Afyonkarahisar-Turkey



Süleyman Arı1, Mehmet Temel1, Mustafa Kargıoğlu1 and Muhsin Konuk2\*



 Abstract

Background: The traditional knowledge about plants and their uses in Turkey is disappearing in recent years because the new generations of villagers migrate to big cities for a better life. Afyonkarahisar located at the intersection of roads and phytogeographical regions (Mediterranean, Iran-Turan, and Euro-Siberian) has more than 2500 plant species. This richness of plant diversity promotes the indigenous commuity for the traditional use of wild plants. The aim of the study is to show wild plants’ ethnobotanical usages associated with medicinal, food, fodder, and household goods in 31 settlements within the boundaries of Afyonkarahisar province.

Methods: The ethnobotanical data were collected from 46 informants by means of semi-structured interviews from 2012 to 2014. Ethnobotanical uses of plants of the study area were conducted in the vicinity of Afyonkarahisar (5 districts, 8 towns, 15 villages, and 3 neighborhood centers).

Results: One hundred and thirty plant taxa belonging to 39 families were recorded and collected. Hundred and seventy-eight different uses of these plants were documented and used generally for medicinal (84), food (68), fodder (16), household goods (3), dyes (3), handicrafts (3) and religious (1).

Conclusion: This study provides interesting uses of plants in the local community of Afyonkarahisar and its surrounding area, in what purpose they make use of plants, how they make use of them and obtained results will contribute to economy of villagers. Since the local people, especially in villages, are poor and do not have health care, they use the plants to treat illnesses, food, fodder, household goods and other uses (evil eye). Also this study will light the way for posterity for next generations.

Keywords: Afyonkarahisar, Ethnobotany, Food plants, Medicinal plants

Background

People have interacted with plants since ancient times. This interaction has contributed to flourishing of scien-tific fields such as ethnobotany and paleoethnobotany

1. Ethnobotanical studies began in the early 1800s when John W. Harsberger, a famous botanist, proposed ethnobotanical study for the first time [[2].](#page13) The scope of plant use has changed since the 1800s to this day. The frequency and purpose of use of plants by people vary in regard to social, cultural, and economic needs. Plants are used for purposes of food, medicine, fuel, industry, ornament, and effects. Purposes of use also vary in re-gard to people’s priority of needs [[1, 3](#page13)–[9].](#page13) Turkey, with more than 11,000 taxa is a flora-rich country due to its

\* Correspondence: [mkonuk@gmail.com](mailto:mkonuk@gmail.com)

2Department of Molecular Biology and Genetics, Faculty of Engineering and Natural Sciences, Üsküdar University, 34662 Istanbul, Turkey

Full list of author information is available at the end of the article

climate and phytogeographical positions (Mediterranean, Iran-Turan, and Euro-Siberian) is a significant position as being a flora-rich country. The endemic plants in its flora occupy 1/3 of total taxa. Anatolian people have been using these plants as food and medicine since Paleolithic times [[10, 11].](#page13) Approximately 1000 taxa are used for medicinal purposes and 350 plant species are used in internal and external trade [[12].](#page13) Afyonkarahisar is located where the three regions intersect. This makes Afyonkarahisar a flora rich region, people use the plants arund their environment for different purposes.

Turkish people living in rural areas use especially wild plants. Generally, the usage of plants are for food and medical purposes. In recent years, traditional ethno-botanical knowledge and prevalence of medicinal plants have been investigated by researchers in different areas of Turkey [[13](#page13)–[41].](#page13) As a results of these studies a great

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Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 Page 2 of 15

increase on the level of traditional knowledge of plants occured. On the other hand, more detailed studies are needed to focus region by region. Therefore this study was carried out to extend Afyonkarahisar’s ethnobotan-ical knowledge due to a limited ethnobotanical studies [[42](#page13)–[46]](#page13) conducted in the near region; living in suburbs and in villages; protecting and maintaining their trad-itional culture and customs and rich uses of plants by local people. The aims of this study were: (1) to deter-mine the local and scientific names of the plants, (2) to document and analyse the traditional ethnobotanical knowledge herited by local people living in Afyonkarahi-sar and its surrounding area.

Methods

Study Area

Afyonkarahisar is 1034 m above sea level. It is located 38° 45‘N latitude and 30° 32’ E longitude. The total area of Afyonkarahisar is 14,295 km2 and it occupies 1.8 % of Turkey’s land. In north of Eskişehir, northwest of Kütahya, east of Konya, south of Isparta, west of Uşak, southwest of Denizli and Burdur are located (Fig. [1) [46].](#page13) Despite the fact that Afyonkarahisar is located in the Aegean region, its climate is similar to that of the central Anatolia region. Winters are cold and tough with intense snow, summers are hot and dry, and spring and autumn months feature rain. Precipitation is raining in spring and autumn [[47].](#page13) According to Erinç [[48],](#page13) the index value of Afyonkarahisar is 23.9 lm. In the vegetation of Afyonkarahisar, cedar and blackpine are found along with various species including relict ones. However, blackpine forests, the dominant fac-tor of forest formation, have been significantly destroyed and oak groups have replaced them. The destruction is greater especially in fields around settlements, and these fields have turned into anthropogenic steppe [[47].](#page13) The main livelihoods of the local community in the research area are tree felling, sheep and cattle husbandry, and agri-culture. Animal husbandry consists of small numbers of cattle per household (average one), kept for meat and milk, with dairy products being sold in local bazaars. Since the area consists largely of forested hillsides, crop produc-tion is restricted to small fields, and annual incomes from agriculture are therefore relatively low. Monthly incomes are in the region of US $230–350 for workers and shep-herds, and $350 for agricultural workers in those months that they work. On average, 50 % of the population is young (under 30 years), 30 % are middle-aged (30–50 years), and 20 % are old (50+ years). Although 80 % of the middle-aged and nearly 80 % of the older generation is not literate, almost all young people are literate.

Data collection

Specimens were collected by the authors in Afyonkarahisar and its surrounding area in the years between 2012 and

2014. Thirty-one settlements were visited for field research. Two hundred people were contacted, and 46 of them ac-cepted to become our informants who have ethnobotanical experience. Thirty-five of them were male and 11 of them were female. Data were collected from nine informants be-tween the ages of 35 and 50, 17 informants between the ages of 50–65, and 20 informants over the age of 65. Inter-views with the men were usually carried out in the tea-houses where they come together, and with women in their homes, bazaars and gardens. A questionnaire was ad-ministered to the informants through face-to-face inter-views. Information that had been carried to the region from the outside and that was not used or confirmed were not included and recorded. During the interviews, the below questions were asked to the participants.

(1)Name and surname

(2)Age and sex

1. Educational level
2. Are plants collected in your region?
3. Do you have any contact with plants?
4. Can you show the plants you use in your region?
5. Can you tell the local names of the plants you use in your region?
6. In which season do you collect the plants you use in your region?
7. When collecting plant, which parts of the plant do you collect and how do you collect them?
8. Which parts of the plants do you use? (Flower, fruit, leaves, root, tuber, young shoots, branch, galbula, cupula, stem, above ground parts etc.).
9. How do you prepare and administrate the plants’ parts?

Answers given above questions with doubt were not recorded. Specimens were collected and identified by the authors according to Davis [[49]](#page13) and the studies related to the flora Afyonkarahisar by Kargıoğlu et al. [[44, 45].](#page13) Plants were photographed as well as being observed in the research field. Voucher specimens are saved in the Herbarium of Afyon Kocatepe University (AKUH). Herbarium numbers of the plant taxa were given in Table [1.](#page13)

Results and discussion

As seen in Table [1](#page13) and Fig. [2,](#page13) the number of plant taxa used by the indeginous community of Afyonkarahisar and the surrounding area is 130 that belong to 93 gen-era and 39 families, and a total of 178 ethnobotanical uses (remedies) were recorded. Medicinal use occupies the first place with 84 types of use. The others are food with 68, fodder with 16, handicrafts, painting and effects with three types of use each, and other (evil eye) with one. According to results, the percentage of species in

Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 Page 3 of 15

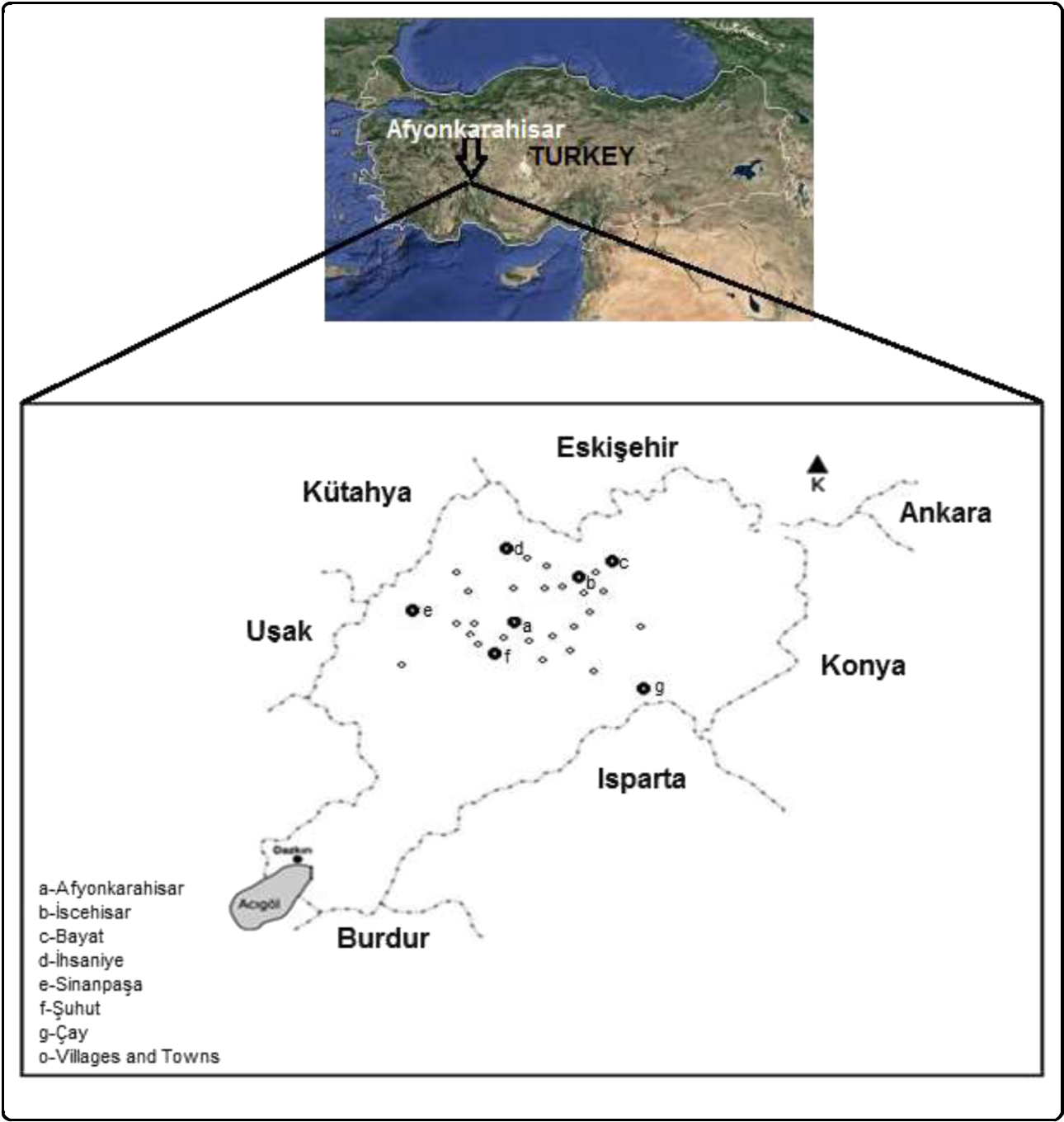


Fig. 1 The study area and Afyonkarahisar’s location map

families are Asteraceae (14 %), Lamiaceae (10 %), Rosaceae (8 %), Caryophyllaceae (5 %), Chenopodiaceae (5 %), Polygonaceae (5 %), Boraginaceae (4 %), Brassicaceae (4 %), Fabaceae (4 %), and 41 % of them are composed of other subgroups. The richest subgroup rate in terms of fre-quency of ethnobotanical uses is 15 % Asteraceae, followed by 10 % Lamiaceae, 9 % Rosaceae, 4 % Brassicaceae, 4 % Caryophyllaceae, 4 % Chenopodiaceae, 4 % Fabaceae, 3 % Boraginaceae, and 42 % other subgroups. The richest genus in terms of ethnobotanically significant is Rumex L. with 5

taxa, followed by Quercus L. with 4 taxa. Seven other 7 gen-era share thirt place with three taxa each. When we com-pare the studies of other reseachers [[5, 7, 30, 35, 38, 41],](#page13) the families of Asteraceae, Lamiaceae, Rosaceae are the most common families. But in the study of Doğan [[11]](#page13) the usage order of the families was a bit different than our find-ings. He reported that the highest number of taxa is similarly Asteraceae, but others were as Boraginaceae, Apiaceae, Lamiaceae, Caryophyllaceae and Geraniaceae. Rumex and Erodium are the most represented genera.

Table 1 List of plants used as foodstuff or medicinal purposes in Afyonkarahisar (Inner-West Anatolia)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Species | Plant Family | Local Name | Parts Used | Uses | Preparation and Administration |
|  |  |  |  |  |  |
| Acanthus hirsutus Boiss. (AKUH 7506) | Acanthaceae | Ayıpençesi | Stem, Leaf | Fodder | Stem and leaf are consumed by animals for fodder. |
| Amaranthus retroflexus L. (AKUH 7509) | Amaranthaceae | Paşa pancarı, | Leaf | Food | The plant’s leaves are fried in oil and consumed. |
|  |  | kızılbacak |  |  |  |
| Conium maculatum L. (AKUH 7520) | Apiaceae | Yılan kamışı, | Flower | Infection | The plant oil were removed and the stem is driven to kill |
|  |  | gumarcık ot |  |  | germs in the stem structure. |
| Eryngium campestre L. var. virens Link. |  | Çakırdikeni | Stem | Infection | Infusion as tea. |
| (AKUH 7528) |  |  |  |  |  |
| Arum elongatum Steven subsp. | Araceae | Basur otu | Root, Tuber | Hemorrhoid | Plant tuber part turned into powder by in effect simulating the |
| elongatum Steven (AKUH 7542) |  |  |  |  | board. The capsule was consumed. |
| Dracunculus vulgaris Schoot. (AKUH |  | Yılan bıçağı | Leaf | Infection | The leaf part is used as a salve on a wound. |
| 7564) |  |  |  |  |  |
| Muscari comosum (L.) Mill. (AKUH 7597) | Asparagaceae | Dağ soğanı, | Above ground | Circulatory system | Infusion as tea. |
|  |  | ada soğanı | parts |  |  |
| Tragopogon latifolius Boiss. var. | Asteraceae | Tekesakalı, | Leaf | Stomach disease | The leaves are directly consumed. |
| angustifolius Boiss. (AKUH 7514) |  | yemlik |  |  |  |
| Helianthus tuberosus L. (AKUH 7521) |  | Yerelması | Root, Stem | Food | Root and stem parts are directly consumed. |
| Anthemis tinctoria L. var. tinctoria L. |  | Papatya | Flower | Respiratory system | Infusion as tea. |
| (AKUH 7545) |  |  |  |  |  |
| Hieracium pannosum Boiss. (AKUH |  | Sakız otu | Root | Oral and dental health | The root of the plant is suspended in the sun, the resulting |
| 7548) |  |  |  |  | liquid such as milk dry up like chewing gum is for chewing. |
| Anthemis wallii Hub.-Mor. et Reese |  | Papatya | Flower | Asthma and shortness of breath | Infusion as tea. |
| (AKUH 7501) |  |  |  |  |  |
| Chondrilla juncea L. var. juncea. (AKUH |  | Karakavuk, | Leaf | Painkiller and stomach disease | The leaves are used in salad. |
| 7504) |  | çıtlık, çengel |  |  |  |
|  |  | sakızı |  |  |  |
| Lactuca serriola L. (AKUH 7502) |  | Tarla marul, acı | Leaf | Diet and attenuator | The leaves of the plant are consumed as part of a salad. |
|  |  | marul, dilli tura |  |  |  |
| Achillea millefolium L. subsp. millefolium. |  | Ayva denesi | Leaf, Flower | Diseases of the digestive system | Infusion as tea. |
| (AKUH 7534) |  |  |  |  |  |
| Achillea teretifolia Willd. (AKUH 7532) |  | Yaraotu | Above ground | Diseases of the digestive, skin and acne | The plant’s above ground parts boiled water by putting a |
|  |  |  | parts |  | quantity of 15 min is suspended. Tea mixed with oil is |
|  |  |  |  |  | applied on acne and wounded regions. |
| Centaurea depressa M. Bieb. (AKUH |  | Gökbaş | Leaf | Food | The leaves of the plant are consumed by making a taco. |
| 7560) |  |  |  |  |  |
| Cichorium intybus L. (AKUH 7557) |  | Acı günek, | Leaf | Painkiller and stomach diseases | The plant’s leaves are made of salad and rolls. |
|  |  | çiftlik otu |  |  |  |
| Scolymus hispanicus L. (AKUH 7503) |  | Diken | Stem | Digestive diseases | The fleshy parts of the stem of the plant is consumed |
|  |  |  |  |  | directly in the blister pack |
| Bellis perennis L. (AKUH 7511) |  | Çayır papatyası | Flower | Medical, respiratory diseases | Flower of the plant is dried, boiled water for 3–5 min by |
|  |  |  |  |  | joining strength, juice drink. |

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| Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 |

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| Page 4 of 15 |

Table 1 List of plants used as foodstuff or medicinal purposes in Afyonkarahisar (Inner-West Anatolia) (Continued)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Doronicum orientale Hoffm. (AKUH | Sarıçiçek | Flower, Leaf | Fodder | The plant flowers and leaves parts exposed to animals as |
| 7513) |  |  |  | bait. |
| Onopordum anatolicum (Boiss.) Eig. | Galgan | Stem | Digestive tract, stomachache, kidney stones | The meaty parts in the stem of the plant is removed, directly |
| (AKUH 7562) |  |  |  | from the defeated are consumed. Decoction as tea. |
| Gundelia tournefortii L. var. tournefortii | Kenger | Fruit | Skin disorders, eczema, hemorrhoids | After roasting, the fruit portion is consumed. |
| (AKUH 7556) |  |  |  |  |
| Artemisia campestris L. (AKUH 7589) | Pelin | Young shoots | Appetizer | Decoction as tea. |
|  |  | and Leaves |  |  |
| Achillea biebersteinii Afan. (AKUH 7573) | Civanperçem | Leaf, Flower | Pain relievers, stomach, respiratory distress, | Decoction as tea. |
|  |  |  | shortness of breath disorders |  |

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| Arı et al. Journal of Ethnobiology and |

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| --- | --- | --- | --- | --- |
| Inula anatolica Boiss.(AKUH 7576) |  | Basur otu | Flower | Hemorrhoids |
| Berberis crataegina DC.(AKUH 7629) | Berberidaceae | Sarıçalı | Leaf, Fruit | Kidney stones, liver |
| Anchusa leptophylla Roemer & Schultes | Boraginaceae | Ballık Otu, Kuzu | Stem, Flower, | Food |
| subsp. leptophylla (AKUH 7505) |  | dili |  |  |
| Cerinthe minor L. subsp. auriculata |  | Sarıçiçek | Flower, Leaf | Fodder |
| (Ten.) Domac (AKUH 7558) |  |  |  |  |
| Anchusa undulata L. subsp. hybrida |  | Sığırdili | Leaf | Diabetes |
| (Ten.) Coutinho (AKUH 7552) |  |  |  |  |
| Alkanna tinctoria (L.) Tausch subsp. |  | Havacıva otu | Root | Hemorrhoids |
| glandulosa Hub.-Mor. (AKUH 7561) |  |  |  |  |
| Anchusa azurea Mill. var. azurea. (AKUH |  | Kuzu dili, Ballık | Leaf | Food |
| 7553) |  | otu |  |  |
| Alyssum desertorum Stapf. var. | Brassicaceae | Yozmercimek | Fruit | Food |
| desertorum Stapf. (AKUH 7554) |  |  |  |  |

Flower is boiled in water. It is used as a treatment for hemorrhoids district.

Leaves are effective for preventing kidney stones when they are consumed 15–20 days as salad. The fruit of the plant part (grape) is consumed directly.

Stem and flowers are put into the dough.

Leaves and flower parts are exposed to animals.

The plant’s leaves are boiled and are consumed by joining into the dough.

Decoction as tea, the region also has a therapeutic

equivalent of hemorrhoids.

Fresh leaves of the plant are boiled and put into dough.

Consumed directly by shepherds.

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| Ethnomedicine (2015) 11:84 |

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| --- | --- | --- | --- |
| Sisymbrium altissimum L. (AKUH 7590) | Hardal otu | Leaf, Flower | Food, Fodder |
| Barbarea sp. (AKUH 7583) | Acı tere | Leaf | Body resistance, vitamin |
| Capsella bursa-pastoris (L.) Medik. | Pastariz, bicibici | Leaf | Food |
| (AKUH 7507) |  |  |  |
| Sinapis arvensis L. (AKUH 7508) | Hardal | Leaf | Food |
| Silene dichotoma Ehrh. subsp. | Caryophyllaceae Toklubaşı | Leaf | Food |
| dichotoma Ehrh. (AKUH 7512) |  |  |  |
| Stellaria media (L.) Vill. subsp. media. | Kuşekmeği, | Leaf | Food |
| (AKUH 7510) | urgancık, |  |  |
|  | kazayağı |  |  |
| Silene vulgaris (Moench) Garcke var. | Toklubaşı | Leaf | Food |
| vulgaris (AKUH 7515) |  |  |  |

Leaf of the plant parts consumed in the form of rolls wrapped in phyllo dough. Leaves and flowers of the plant are given to animals.

The plant’s leaves are made of salad.

The plant fresh leaves are consumed in the form of pastry wrapped into rolls.

Boiled fresh leaves is consumed in taco.

The plant’s leaves are made of salad

The leaves of the plant is consumed wrapped in dough.

Fried in oil and consumed.

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| Page 5 of 15 |

Table 1 List of plants used as foodstuff or medicinal purposes in Afyonkarahisar (Inner-West Anatolia) (Continued)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Agrostemma githago L. (AKUH 7628) |  | Sakızlık otu | Flower | Digestive disorder | Infusion as tea. |
| Dianthus zonatus Fenzl. var. aristatus |  | Basur otu | Flower | Hemorrhoids | Flower part is boiled in water in 3–5 min. It is drunk for |
| (Boiss.) Reeve (AKUH 7620) |  |  |  |  | hemorrhoidal disease by the use of 10–15 sessions |
| Dianthus zonatus Fenzl var. zonatus |  | Siğilotu | Flower | Skin diseases, warts | Infusion as tea. |
| (AKUH 7598) |  |  |  |  |  |
| Vaccaria pyramidata Medik. var. |  | Mor çiçek | Flower, Leaf | Fodder | It is consumed as fresh by animals.. |
| grandiflora (Fisch. ex DC.) Cullen (AKUH |  |  |  |  |  |
| 7623) |  |  |  |  |  |
| Chenopodium album L. (AKUH 7588) | Chenopodiaceae | Sirken | Leaf | Food | The plant’s leaves are boiled, consumed in dough. |
| Chenopodium album L. subsp. album |  | Sarı sirken | Leaf | Food | The plant’s leaves are roasted and the eggs are added on to |
| var. album (AKUH 7582) |  |  |  |  | it. |
| Chenopodium foliosum (Moench) Asch. |  | İt üzümü | Fruit | Food | Fruits are eaten in fresh. |
| (AKUH 7630) |  |  |  |  |  |
| Beta trigyna Waldst. & Kit. (AKUH 7625) |  | Kır ıspanağı | Leaf | Digestive and stomach diseases | Fried in oil and eaten by shepherds. |
| Kochia scoparia (L.) Schrad. (AKUH |  | Süpürge | Branch, Stem | Household goods | Turned into a broom is used as household goods. |
| 7626) |  |  |  |  |  |
| Atriplex sp. (AKUH 7627) |  | Tellice | Flower | Immune system | Infusion as tea. |
| Cistus laurifolius L. (AKUH 7624) | Cistaceae | Pinar | Leaf, Young | Crafts, coloring, digestive | The leaves and young branches of the plant are boiled, |
|  |  |  | shoots |  | green, yellow and tones are obtained. The leaves and shoots |
|  |  |  |  |  | are boiled in water to drink. |
| Juniperus oxycedrus L. subsp. oxycedrus | Cupressaceae | Gıli gıli | Leaf, Galbula | Cholesterol, diabetes | The plant’s fruit and leaves are boiled in water for 10–15 |
| (AKUH 7622) |  |  |  |  | min for a drink. Fresh fruits are edible or boiled to prepare |
|  |  |  |  |  | juice. |
| Juniperus excelsa M. Bieb. (AKUH 7621) |  | Katran ağacı | Stem | Digestive and infection diseases | The plant body part turned into tar at high temperature and |
|  |  |  |  |  | used for cleaning of the infection and digestive problems. |
| Juniperus foetidissima Willd. (AKUH |  | Kokar ardıcı | Leaf | Skin diseases, warts | Juniper leaves, broken in and they are applied into the warty |
| 7619) |  |  |  |  | zone 30–40 sessions. |
| Equisetum ramosissimum Desf. (AKUH | Equisetaceae | Kırk kilit | Stem | Respiratory, sinusitis and arthritis diseases | Decoction as tea. |
| 7617) |  |  |  |  |  |
| Euphorbia macroclada (Boiss.) (AKUH | Euphorbiaceae | Sütleğen | Stem | Infection | The plant is removed from the body in the form of liquid |
| 7616) |  |  |  |  | milk. Liquid bread into the stained area and ingested for |
|  |  |  |  |  | treatment malaria. |
| Vicia cracca L. subsp. stenophylla Velen. | Fabaceae | Efek | Flower, Fruit | Food, fodder | Flowers and fruits are consumed directly. |
| (AKUH 7613) |  |  |  |  |  |
| Astragalus flavescens Boiss. (AKUH 7618) |  | Eşek geveni | Leaf, Flower | Fodder | The plant’s leaves and flower parts are consumed directly by |
|  |  |  |  |  | animals |
| Astragalus microcephalus Willd. (AKUH |  | Geven | Above ground | Fodder | Spiny part is burned by shepherds. A hammer or mallet |
| 7615) |  |  | parts |  | were crushed for animals to eat. |
| Coronilla varia L. subsp. varia (AKUH |  | Burçak | Flower, Leaf | Respiratory diseases | Infusion as tea. |
| 7611) |  |  |  |  |  |

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| Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 |

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| Page 6 of 15 |

Table 1 List of plants used as foodstuff or medicinal purposes in Afyonkarahisar (Inner-West Anatolia) (Continued)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Astragalus pisidicus Boiss. & Heldr. |  | Söğüt geveni | Above ground | Body resistance, immune system, cancer | Infusion as tea. |
| (AKUH 7612) |  |  | parts |  |  |
| Quercus ithaburensis Decne. subsp. | Fagaceae | Palamut | Cupula of the | Crafts, painting | Cupula of the plant by boiling chickpea yolk color is |
| macrolepis (Kotsch) Hedge&Yalt. (AKUH |  |  | plant |  | obtained for rug weaving. |
| 7614) |  |  |  |  |  |
| Quercus cerris L. var. cerris (AKUH 7608) |  | Kızılmeşe | Fruit | Infection, hemorrhoids, Skin disorders, | It is boiled in water and two spoons of juice is consumed |
|  |  |  |  | eczema | on an empty stomach. |
| Quercus infectoria Oliv. subsp. boissieri |  | Gerçelik | Fruit | Fodder | Plant crops are exposed as sheep bait. |
| (Reuter) O.Schwarz (AKUH 7610) |  |  |  |  |  |
| Quercus pubescens Willd. (AKUH 7595) |  | Tüylü meşe | Leaf | Fodder | The leaves of the plant are eaten by animals. |
| Hypericum perforatum L. (AKUH 7566) | Hypericaceae | Binbir otu | Above ground | Painkillers | Decoction as tea. |
|  |  |  | parts |  |  |
| Hypericum perfoliatum L. (AKUH 7555) |  | Binbirdelik otu | Leaf, Flower | Digestive system | Decoction as tea. |
| Juglans regia L. (AKUH 7607) | Juglandaceae | Ceviz kabuğu | Fruit Peel | Skin cancer, crafts and coloring | Decoction as tea. It is boiled to obtain dark brown collors |
|  |  |  |  |  | and tones for rug weaving. |
| Tymus longicaulis C. Presl subsp. | Lamiaceae | Dağ kekiği | Flower | Lowering cholesterol and sugar. | The plant is consumed in the form of oregano oil. Infusion |
| longicaulis var. subisophyllus (Borbas) |  |  |  |  | as tea. |
| Jalas (AKUH 7601) |  |  |  |  |  |
| Mentha longifolia (L.) Huds. subsp. |  | Yabani nane, | Leaf | Body resistance, vitamin, respiratory | The plant’s leaves are consumed in salad Infusion as tea. |
| typhoides (Briq.) Harley var. typhoides |  | Doğuma |  | diseases | Dried leaves of the plant are used for spices. Plant leaves are |
| (AKUH 7600) |  |  |  |  | mixed to the dough. |
| Teucrium chamaedrys L. subsp. |  | Bodurmamut, | Leaf, Flower | Painkillers, stomach and hemorrhoid | Infusion as tea. |
| chamaedry. (AKUH 7603) |  | sancıotu |  | disease |  |
| Origanum vulgare L. subsp. hirtum |  | Dağ çayı | Flower | Digestive and stomach diseases | Infusion as tea. |
| (Link) Ietsw. (AKUH 7599) |  |  |  |  |  |
| Thymus zygioides Griseb. var. lycaonicus |  | Mor kekik | Flower | Heart and vascular diseases | Infusion as tea. |
| (AKUH 7606) |  |  |  |  |  |
| Salvia cryptantha Montbret & Aucher |  | Kır çayı, şapla | Leaf, Flower | Respiratory and colds | Infusion as tea. |
| ex Bentham (AKUH 7602) |  |  |  |  |  |
| Marrubium globosum Montbret et |  | Oğul otu | Leaf | Cardiac, vascular diseases | Infusion as tea. |
| Aucher ex Bentham (AKUH 7578) |  |  |  |  |  |
| Salvia tomentosa Mill. (AKUH 7579) |  | Karakekik | Leaf, Flower | Food | Decoction as tea. |
| Salvia virgata Jacq. (AKUH 7592) |  | Kır kekiği | Flower | Food | Dried flowers are used for spices by joining tarhana soup |
| Phlomis armeniaca Willd. (AKUH 7593) |  | Zorlatma otu | Flower | Painkillers | Flower oil is applied to the pain region. |
| Thymus sipyleus Boiss. subsp. sipyleus |  | Beyaz kekik | Flower | Respiratory diseases shortness of breath, | Infusion as tea. |
| var. sipyleus (AKUH 7604) |  |  |  | influenza |  |
| Mentha pulegium L. (AKUH 7605) |  | Yarpuz | Flower | Food | Dried flowers of the herb is consumed as spices. Infusion as |
|  |  |  |  |  | tea. |
| Teucrium polium L. (AKUH 7591) |  | Acı ot | Stem | Hemorrhoids | Infusion as tea. |
|  | Linaceae | Keten | Flower | Food | The flowers of the plant are consumed directly. |

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| Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 |

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| Page 7 of 15 |

Table 1 List of plants used as foodstuff or medicinal purposes in Afyonkarahisar (Inner-West Anatolia) (Continued)

Linum hirsutum L. subsp. anatolicum

(Boiss.) Hayek var. anatolicum.(AKUH

7596)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Viscum album L. subsp. album (AKUH | Santalaceae | Bögem, burç | Leaf, Young | Respiratory, cough, digestive, intestinal gas | Infusion as tea. |
| 7594) |  |  | shoots | reliever |  |
| Arceuthobium oxycedri (Dc.) M. Bieb. |  | Ardıç burçu | Stem | Neurological diseases | Decoction as tea. |
| (AKUH 7584) |  |  |  |  |  |
| Malva sylvestris L. (AKUH 7587) | Malvaceae | Ebegümeci | Leaf | Food | After rosting in oil, it is consumed in the form of food. |
| Malva neglecta Wallr. (AKUH 7586) |  | Ebegümeci | Leaf | Painkiller | Infusion as tea. Fresh leaves of the plant participates in the |
|  |  |  |  |  | dough. |
| Morus nigra L.(AKUH 7585) | Moraceae | Doğal dut | Fruit | Infection, aphthae | Marmalade is made from fruit. |
| Peganum harmala L. (AKUH 7572) | Nitrariceae | Üzerlik | Above ground | The evil eye | It is believed to prevent for the evil eye to strike the bride |
|  |  |  | parts |  | and son-in-law. |
| Chelidonium majus L. (AKUH 7563) |  | Kırlangıç otu | Above ground | Digestion, hemorrhoids, liver, jaundice, eye | Infusion as tea (1–2 cups a day) |
|  |  |  | parts | diseases, skin diseases |  |
| Fumaria asepala Boiss. (AKUH 7543) |  | Şahtere | Flower | Iinfection, fungus | Infusion as tea. The plant’s water is applied to fungal region. |
| Papaver dubium L. (AKUH 7551) |  | Yaban haşhaşı | Leaf | Food | The leaves of the plant are consumed by making a salad. |
| Pinus nigra Arn. subsp. pallasiana | Pinaceae | Katran çamı | Stem | Infection | Tar in water is drunk for infection. |
| (Lamb.) Holmboe var. pallasiana (AKUH |  |  |  |  |  |
| 7565) |  |  |  |  |  |
| Plantago lanceolata L. (AKUH 7525) | Plantaginaceae | Sinirli yaprak | Leaf | Infection | Leaf of the plant part is driven directly to the inflamed area. |
|  |  |  |  |  | It is used for cleaning of the infection. |
| Plantago major L. subsp. intermedia |  | Yılanotu | Leaf | Infection | Leaf of the plant part affected area to be wrapped, provides |
| (Gilib.) Lange (AKUH 7531) |  |  |  |  | to outside infection. |
| Acantholimon ulicinum (Willd. & | Plumbaginaceae | Porsuk | Flower, Leaf | Household goods | Used in homes as decorative items. |
| Schultes) Boiss. subsp. lycaonicum |  |  |  |  |  |
| (Boiss. & Heldr.) Bokhari. & Edm. (AKUH |  |  |  |  |  |
| 7580) |  |  |  |  |  |
| Acantholimon acerosum subsp. |  | Keven, Porsuk | Flower | Household goods, infection, tuberculosis | Infusion as tea (1–2 cups a day) |
| lycaonicum (Willd.) Boiss. var. acerosum |  |  |  |  |  |
| (AKUH 7581) |  |  |  |  |  |
| Rumex scutatus L. (AKUH 7569) | Polygonaceae | Ekşimen | Leaf | Vitamin needs | The leaves of the plant are consumed directly. Phyllo dough |
|  |  |  |  |  | is made between the rolls. Salad is made. It is consumed |
|  |  |  |  |  | directly with salt. |
| Rumex patientia L. (AKUH 7571) |  | İlibada, Sabla | Leaf | Food | The leaf part is consumed as wheat wrapped (sarma). Leaf |
|  |  |  |  |  | of the plant part participates in the dough. |
| Rumex acetosella L. (AKUH 7574) |  | Kuzukulağı | Leaf | Food | Leaves are eaten directly. Rolls are made, It is eaten. |
| Rumex crispus L. (AKUH 7575) |  | Evelik | Leaf | Food | The leaf part is consumed as wheat wrapped (sarma). |
| Polygonum cognatum Meissn. (AKUH |  | Çobanekmeği | Leaf | Body resistance | It is eaten as salad. Leaf of the plant part eaten directly. |
| 7518) |  |  |  |  |  |

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| Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 |

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| Page 8 of 15 |

Table 1 List of plants used as foodstuff or medicinal purposes in Afyonkarahisar (Inner-West Anatolia) (Continued)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Rumex tuberosus L.subsp. tuberosus L. |  | Ekşikulak | Leaf | Body resistance, vitamin | It is eaten as salad. Leaf of the plant part eaten directly. |
| (AKUH 7519) |  |  |  |  |  |
| Portulaca oleraceae L. (AKUH 7522) | Portulacaceae | Temizlik otu | Above ground | Food | The plant’s above ground parts especially the leaves part |
|  |  |  | parts |  | joins into the yogurt. It is eaten as salad. |
| Lysimachia vulgaris L. (AKUH 7577) | Primulaceae | Mersin | Leaf | Digestive diseases | Infusion as tea (1–2 cups a day) |
| Nigella sativa L. (AKUH 7559) | Ranunculaceae | Çörek otu | Seed | Respiratory distress, shortness of breath, | The plant’s seed is consumed directly. Also, it is mixed into |
|  |  |  |  | the immune diseases | the honey. |
| Ranunculus ficaria L. subsp. ficariiformis |  | Sarıçiçek, | Flower | Digestion, hemorrhoids, skin diseases | Infusion as tea (3 cups a day) |
| Rouy & F. (AKUH 7567) |  | Düğün çiçeği, |  |  |  |
|  |  | Mayıs çiçeği |  |  |  |
| Adonis aestivalis L. subsp. aestivalis L. |  | Tavukgötü | Stem | Fodder | The stem of the plant parts are consumed by animals. |
| (AKUH 7516) |  |  |  |  |  |
| Rhamnus rhodopeus Velen. subsp. | Rhamnaceae | Yağlıcan çehri, | Fruit | Debilitating, diabetes | Fruits of the plant part eaten directly. |
| anatolicus (Grub.) Browicz & Zieliński |  | Karaköken |  |  |  |
| (AKUH 7570) |  |  |  |  |  |
| Pyrus elaeagnifolia Pallas subsp. | Rosaceae | Ahlât | Fruit | Cardiovascular diseases, hypertension | Infusion as tea(4 cups a day) Fruits of the plant part are |
| elaeagnifolia Pallas (AKUH 7568) |  |  |  |  | eaten directly. Designated as a beverage. |
| Rosa hemisphaerica Herrm. |  | Gündöndü | Fruit | Food | Fruits of the plant part eaten directly. |
| (AKUH 7549) |  | çiçeği |  |  |  |
| Rosa canina L. (AKUH 7550) |  | Kuşburnu | Fruit | Urea treatment, hemorrhoids, gastric ulcer | Dried fruit is boiled for a long time in the water to get |
|  |  |  |  |  | marmelata. The fruit is boiled and it is taken orally as cold |
|  |  |  |  |  | drink. Infusion as tea(3–4 cups a day) |
| Crataegus monogyna Jacq. subsp. |  | Öküzgötü | Fruit | Respiratory, cold | Infusion as tea(2–4 cups a day) Dried fruit is boiled for a |
| monogyna.(AKUH 7547) |  |  |  |  | long time in the water to get marmelata. |
| Prunus divaricata Ledeb. subsp. |  | Yabani erik | Fruit | Body resistance | Fruits of the plant part are eaten directly. |
| divaricata.(AKUH 7541) |  |  |  |  |  |
| Geum urbanum L. (AKUH 7535) |  | Dağçayı, | Root | Respiratory, influenza | Decoction as tea. |
|  |  | meryemotu |  |  |  |
| Crataegus aronia (L.) Bosc. ex DC. |  | Alıç | Fruit | Food | Fruits of the plant part are eaten directly. |
| (AKUH 7546) |  |  |  |  |  |
| Malus sylvestris Mill. subsp. |  | Dağ elması | Fruit | Food | The fruit of the plant is dried, boiled and drunk as juice. |
| orientalis(Uglitzk.) Browicz var. orientalis |  |  |  |  |  |
| (AKUH 7540) |  |  |  |  |  |
| Crataegus orientalis Pallas ex M. Bieb. |  | Ahlât | Fruit, Young | Diabetes, rheumatism | The ends of the branches and shoots of the plant parts are |
| var. orientalis (AKUH 7544) |  |  | shoots |  | welded, cold drink. Fruits of the plant part are eaten directly. |
| Cerasus vulgaris Mill. (AKUH 7539) |  | Yozvişne | Fruit | Kidney, diuretic | Infusion as tea(8–10 cups a day) Compote is done from |
|  |  |  |  |  | fruits. |
| Prunus armeniaca L. (AKUH 7533) |  | Kayısı kurusu | Fruit | Digestive and intestinal problems | Fruits of the plant part are eaten directly. Compote is done |
|  |  |  |  |  | from fruits. |
| Cotoneaster nummularia Fisch. & |  | Muşmula | Fruit | Food | Fresh fruits are boiled to prepare jam. Decoction as tea. |
| C.A.Mey. (AKUH 7536) |  |  |  |  |  |

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| Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 |

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| Page 9 of 15 |

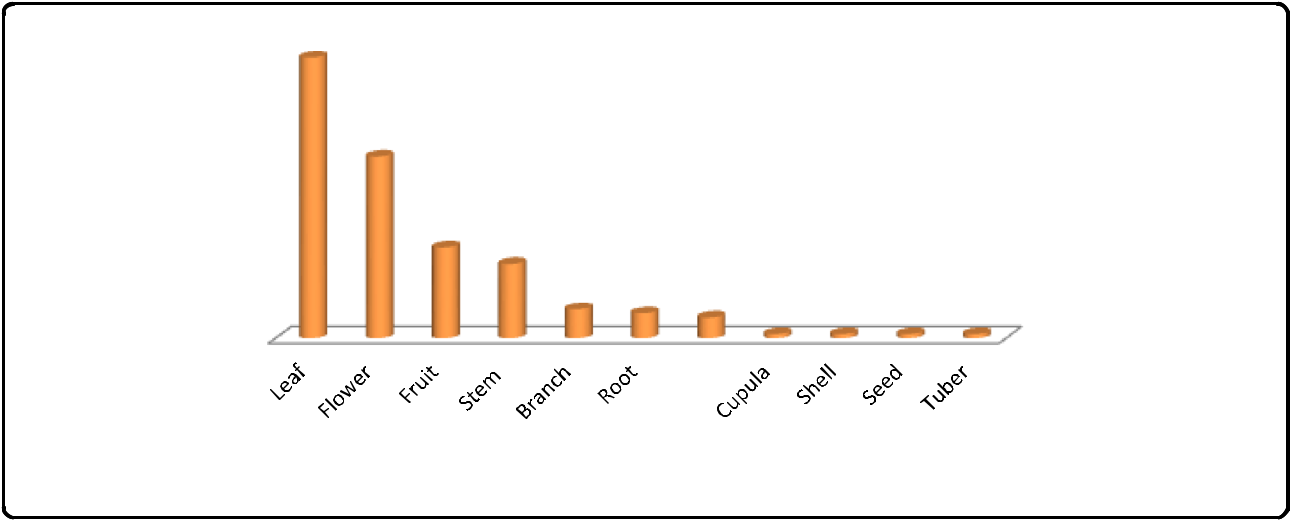
Table 1 List of plants used as foodstuff or medicinal purposes in Afyonkarahisar (Inner-West Anatolia) (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Salix alba L. (AKUH 7538) | | Salicaceae | Söğüt | Leaf | Painkiller, stomach and respiratory diseases, | Infusion as tea(2 cups a day) |
|  |  |  |  |  | shortness of breath |  |
| Linaria genistifolia (L.) Mill. subsp. | | Scrophulariaceae | Geyşenik, | Flower | Fodder | Animals consume directly. |
| genistifolia (AKUH 7537) | |  | Meryem otu |  |  |  |
| Linaria genistifolia (L.) Mill. subsp. | |  | Geyşenik, | Leaf, Flower | Skin disorders, eczema | Portions of the leaves and flowers are boiled. It is applied 2– |
| confertiflora (AKUH 7517) | |  | Meryem otu |  |  | 3 times a day for eczema areas. |
| Verbascum sp. (AKUH 7527) | |  | Öküz kuyruğu, | Leaf, Flower | Respiratory, asthma, shortness of breath, | Infusion as tea(2–4 cups a day) It is applied 2–3 times a day |
|  |  |  | sığırkuyruğu |  | skin diseases, warts, eczema | for eczema areas. |
| Linaria grandiflora Desf. (AKUH 7529) | |  | Sarışın | Leaf, Flower | Fodder | Animals consume directly. |
| Urtica dioica L. (AKUH 7526) | | Urticaceae | Isırgan | Leaf | Cancer, leukemia | Decoction as tea. |
| Urtica urens L. (AKUH 7530) | |  | Dağlayan | Leaf | Skin cancer | Decoction as tea. |
| Urtica pilulifera L. (AKUH 7524) | |  | Isırgan otu | Leaf | Food | Decoction as tea. |
| Tribulus terrestris L. (AKUH 7523) | | Zygophyllaceae | Çoban | Flower, Leaf, | Kidney sand, hemorrhoids | Leaves are consumed to make taco. The flower oil is applied |
|  |  |  | çökerten | Root |  | for hemorrhoids. |
|  |  |  |  |  |  |  |

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| Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 |

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| Page 10 of 15 |

Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 Page 11 of 15



68

44

22

18

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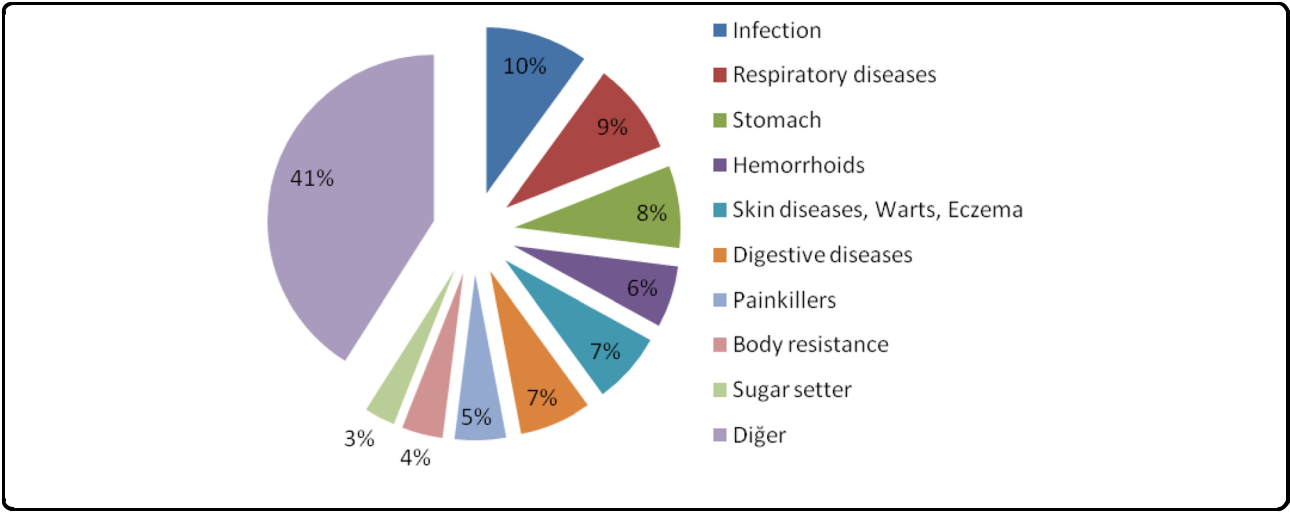
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Fig. 2 Used parts of the medicinal plants and their usage frequencies in the study area

When the 130 taxa’s usage types are analyzed, it can be seen that the most frequently used parts were leaves (68), flowering branches and flowers (44), fruits

1. and stem (18) (Fig. [2)](#page13). The usage frequencies of plant parts are observed to be different from local to local [[5, 7, 30, 35, 38, 41].](#page13)

Medicinal use occupies the first place among 178 types of use with 84 remedies. The province of İzmir, Denizli, Ankara, Bilecik, Balıkesir, Muğla are close to our study area. The results of analysis showed that the percentage of the uses shows some similarities. The medicinal plants (47.2 %) are the most cited in Afyonkarahisar. This is almost in agreement with former studies by Ertuğ et al. [[7]](#page13) in Buldan (Denizli) with 42 %, Ertuğ [[41]](#page13) in Muğla with 43 %, Şimşek et al. [[5]](#page13) with 60 % in Ankara, Ugulu et al. [[35]](#page13) with 67 % in Izmir and Güler et al. [[30]](#page13) with 58 % in Bozüyük (Bilecik). These results revealed that local people prefer widely to use the plants



for medicinal purposes. The reasons for using the plants widely could be economic, because reaching them easily in folk bazaars and actars with a small amount of money. On the other hand, cultural aspects also play an importan role to use the plants for medicinal purposes.

The rate of food, fodder, others (household goods, dyes, handicrafts and religious) are 38.2, 9 and 5.6 %, respect-ively. The rates are similar with the studies of Ertuğ [[41]](#page13) in Muğla (38, 15, 5 %) and Şimşek et al. [[5]](#page13) in Ankara (36 %, others (4 %)). According to the data obtained from field work field, plants used by people for infection (10 %), respiration (9 %), stomachache (8 %), skin diseases, wart, eczema (7 %), digestion (7 %), hemorrhoids (6 %), painkiller (5 %), body resistance (4 %), blood sugar regulator (3 %), and other diseases (41 %) (Fig. [3,](#page13) Table [1)](#page13). Polat & Satıl [[38]](#page13) reported that various diseases are gastro-intestinal disor-ders, respiratory and throat diseases, diabetes, kidney ailments, healing cut and wounds, hemorrhoids, anorexia

Fig. 3 The use aim and usage percentages of the plants in the study area

Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 Page 12 of 15

and hypertension stabilizer in Edremit Gulf (Balıkesir). This shows us that the priority of people in using medicinal plants in different localities is different to treat ailments.

We have seen that the culture and ethnobotanical in-formations that people have gained with centuries of traditional methods are disappearing. Especially today, we can say that increasing of purchasing power and the wealth level has led to a decrease in the use of plants, with more people buying convenience foods, to use cul-tivated plants, and supplying their medication needs by buying pharmaceuticals from a pharmacy. We deter-mined that in areas where purchasing power is low, people are more prone to ethnobotanical culture.

Particularly, the facts that there are no pharmacies in villages and towns, economic power is low, increased contact with plants, and success in solving some medi-cinal problems with culture they gained over generations promoting ethnobotanical culture. In comparison to some studies conducted in near areas (in Anatolia), there are some differences in local naming, purpose of use, and how to use plants.

While Agrostemma githago “Sakızlık otu” is used in me-dicinal purposes especially in digestive and alvine condi-tions in the study region. It is used as ornament along with medicinal purposes [[23].](#page13) We saw that the plant Amaranthus retroflexus was used both as food and for medicinal purposes, especially to treat conditions such as influenza or cold [[23].](#page13) It was also observed that the plant is called different names such as “Paşa pancarı” and “Kızıl-bacak” in different localities. Bellis perennis, which is called as “Çayır papatyası”, is used for medicinal purposes to treat respiratory diseases. It is also used for cold and flu, stomach-ache, strengthen hair [[19].](#page13) It is noted that Capsella bursa-pastoris “Çoban çantası” is consumed as food by informants, it is also used as food and fodder [[1],](#page13) as food, medicine, fodder and other [[23]](#page13) and as food and medicine [[50].](#page13) People eat it in meal, roast, soup, or salads [[11],](#page13) cooked as meal with rice and eaten with garlic-yogurt [[22].](#page13) We note that the purpose of use as food is common in the compared studies.

Cerinthe minor subsp. auriculata is given to the ani-mals as fodder; people are also reported to use it as food in times of famine [[1].](#page13) Chelidonium majus, called “Kırlangıç otu”, is used especially as food and medicine by locals, and it is reported that it benefits conditions re-lated to liver and hemorrhoids. Previous study showed that Chelidonium majus is used to treat wart [[23].](#page13) In some regions, its medicinal uses and purposes differ.

It was reported that Dianthus zonatus was used to treat wart by the studies [[1, 23, 50]](#page13) as we found the same purpose. On the other hand, Ficus carica L. is used to treat wart in Bozüyük (Bilecik–Turkey) [[30].](#page13) Dracuncu-lus vulgaris is called “Deli otu” and is used for infections, and the same aim was reported in the previous studies

[[1, 23, 50].](#page13) It is called as “Yılan bırcağı, köpeksiyen” in Edremit (Balıkesir-Turkey) and used for hemorrhoids, carminative (for animal) [[38].](#page13) Hypericum perforatum shows the same usage as painkiller in the study region and this was repoted in the previous studies [[1, 23, 50].](#page13) It is also used for stomachache by the report of Güler et al. [[30].](#page13) While Portulaca oleracea, “temizlik otu”, is greatly consumed as food in Afyonkarahisar, it is used as salad, pickle and jam in Mersin and Adana provinces (Turkey) [[18].](#page13) Urtica dioica, called “Isırgan”, is used to treat cancer and leukemia by informants. In the other studies, it is used for medicinal purposes [[1, 23, 50]](#page13) and for dye [[20, 27].](#page13) The plant Vaccaria pyramidata var. grandiflora is used as fodder in the study region.

Sample survey of some plants is conducted according to compared data. We can come to the conclusion that both local names and uasege purposes of the plants are either the same or vary sometimes. People’s frequency of contact with plants, relation status, passing the plant to next gener-ation, means, and environmental conditions may cause this variety. When we compared some of the plants with some studies in Turkey and in the other countries, we found some differences. While Anchusa azurea var. azurea is used to treat stomachache, vulnerary, and female sterility as reported in other region [[51, 52],](#page13) we found that it is used as food in the study region. Capsella bursa-pastoris is used as an astringent; in burn wound care, for constipation and intestinal spasm, as a diuretic, a hemostatic, and for in-testines, kidney swelling, rheumatism, and urinary disor-ders [[23, 53](#page13)–[55],](#page13) we report that it is used as food. Peganum harmala is used for the eliminating the evil eye in our study and used as an analgesic, to treat epilepsy and headache [[56],](#page13) rheumatic pain [[44].](#page13) Papaver dubium is used to treat cold [[57],](#page13) while it is used as food and sedative in our study. Mentha longifolia is used to treat halitosis, constipation, common cold, fever, and general weakness and is antispasmodic [[58, 59],](#page13) while it is used to treat Vitamin C deficiency in this study. Morus alba is used to treat cancer in our study, while it is used to treat anemia, blood forming, dizziness, hepatitis, incontinence, insomnia, and palpitations in other locals [[40, 60].](#page13) Plantago major is reported to be used by wrapping its leaf around wounded area causing suppuration to flow out. In other studies, it is used to treat, cicatrizer, constipation, hemorrhoids, and wounds [[58, 61].](#page13) While Tribulus terrestris is used to treat athlete’s foot, eczema, kidney and gallstones, hemorrhoids, and warts [[38, 62],](#page13) our study showed that its leaves are consumed by forming wraps. Local people also drink its oil, and it is reported to benefit kidney gravel. The oil of the plant is applied to area affected by hemorrhoids.

Salix alba is reported to be used to treat athlete’s foot and vaginal itching [[23],](#page13) we found that it is used to treat pain, stomachache, and respiratory conditions in this study. Urtica dioica is used to treat asthma, blood sugar,

Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 Page 13 of 15

and intestinal pains, and is used as a diuretic, galacta-gogue, and post-partum depurative [[63, 64]](#page13) while it is used to treat cancer and leukemia in our study. Cratae-gus monogyna is used to treat respiratory conditions and cold while it is also used to treat arythmia, cardiotonic, diabetes, and is a vasodilator [[23].](#page13)

The majority of the Origanum vulgare, Thymus spp., Hy-pericum perforatum, Achillea millefolium, Rosa canina,

Melissa officinalis, Mentha longifolia etc. species are well known in European folk medicine for their digestive prop-erties, which is also one of the reasons cited for the selec-tion of plants for teas to accompany meals [[65, 66].](#page13) In the Russian study area, the most used medicinal herbs are Hy-pericum perforatum and Plantago major. The Russian respondents considered it important to use medicinal herbs during winter times to prevent flu and common colds [[67].](#page13) Amaranthus spp. [[68, 69],](#page13) Arum elongatum and Lactuca spp. [[70],](#page13) Atriplex sp. [[71, 72],](#page13) Malva neglecta [[73],](#page13) Malva sylvestris [[70, 74],](#page13) Morus nigra, Ono-pordum anatolicum [[70, 75],](#page13) Plantago major [[76],](#page13) Rumex patientia, Sinapis arvensis [[1, 11, 70](#page13)–[80],](#page13) Salvia spp., Beta trigyna [[81, 82],](#page13) Urtica dioica [[83],](#page13) the leaves of taxa are used for preparing food (sarma = stuffed food etc.) in the folk cuisines of Turkey and the Balkans. In our study we observed that Peganum harmala’ burn incense is be-lieved in to bring about good deed. In the wedding day, the bride and groom are being incensed to get rid off the evil’s harm. It is used in Pakistan for emotional dis-turbances, painful menstruation, seizures, insanity and itchy skin. Abdominal pain and smoke has insecticidal properties [[84].](#page13)

Pinus nigra in Anatolia (spoon making, animal fodder, wetland making), Cedrus libani (bowl and spoon making), Salix alba (basket weaving), Juglans regia (dyes), Quercus infectoria (dyes) are used for different purposes [[85].](#page13)

The local names and common families and some spe-cies were shared in Anatolia and central Asia (Uzbekistan) [[18, 86, 87].](#page13) For example, yarpuz/nane for Mentha sp., Qoratut/dut for Morus sp., itburnu/kuş burnu for Rosa sp. (Tablo 1) [[87].](#page13) In this case, it is a sign that the culture of Anatolia common with central Asia as coming the roots from there.

Conclusions

This study documented and analyzed traditional ethno-botanical knowledge and 178 different remedies of 130 taxa belonging to 39 families. The results of this study indicated that the local community of the study area used the plants as medicinal (84) and food (68) fodder (16), household goods (3), dyes (3), handicrafts (3) and religious (1). The most common cited usages of plants are still folk medicine and food. Because villagers are generally migrating to big cities and benefiting from the

facilities of modern medicine, the heritage of traditional ethnobotanical knowledges is decreasing dramatically. Although this relieve some of the pressures on some plant species, documenting and analizing the indigenous wild plants’ ethnobotanical usages through ethnobotan-ical studies is still important for the conservation of traditional ethnobotanical knowledge.

Competing interests

The authors declare that they have no competing interests.

Authors’ contributions

SA, main author, involved in the study design, conducting of interview, field work, literature Review and general data collection and systematization. MT wrote the first draft, and MK2 wrote ms, designed figures, references and participated in fieldwork. MK1 diagnosed the plants, and participated in fieldwork. All authors read and approved the final manuscript.

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Author details

1Department of Molecular Biology and Genetics, Science & Arts Faculty, Afyon Kocatepe University, 03200 Afyonkarahisar, Turkey. 2Department of Molecular Biology and Genetics, Faculty of Engineering and Natural Sciences, Üsküdar University, 34662 Istanbul, Turkey.

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References

1. Vural G. Ethnobotanical features some of the wild plants on the Honaz mountain and its environment, MSc thesis. Afyonkarahisar: Afyon Kocatepe University; Department of Biology; 2008.
2. Cotton CM. Ethnobotany principles and applications. Chichester: John WIiley & Sons; 1996. 424 pp.
3. Harsha VH, Hebbar SS, Hegde GR, Shripathi V. Ethnomedical knowledge of plants used by Kunabi tribe of Karnataka in India. Fitoterapia. 2002;73:281–7.
4. Randriamiharisoa MN, Kuhlman AR, Jeannoda V, Rabarison H, Rakotoarivelo N, Randrianarivony T, et al. Medicinal plants sold in the markets of Antananarivo. Madagascar J Ethnobiol Ethnomed. 2015;11:60.
5. Uğulu İ, Başlar S, Yörek N, Doğan Y. The investigation and quantitative ethnobotanical evaluation of medicinal plants used around Izmir province, Turkey. J Med Plant Res. 2009;3(5):345–367.
6. De Natale A, Pollio A. Plants species in the folk medicine of Montecorvino Rovella (Inland Campania, Italy). J Ethnopharmacol. 2007;109:295–303.
7. Ertuğ F, Tümen G, Çelik A, Dirmenci T. Ethnobotanical survey of Buldan (Denizli), 2003. TUBA Culture Inventory. 2004;2:187–218.
8. Tahraoui A, El-Hilaly J, Israili ZH, Lyoussi B. Ethnopharmacological survey of plants used in the traditional treatment of hypertension and diabetes in South-Eastern Morocco (Errachidia Province). J Ethnopharmacol. 2006;110:105–17.
9. Teklehaymanot T, Giday M, Mehdim G, Yalemtsehay M. Knowledge and use of medicinal plants by people around Debre Libanos Monastery in Ethiopia. J Ethnopharmacol. 2007;111:271–83.
10. Güner A, Ozhatay N, Ekim T, Baser KHC. Flora of Turkey and the East Aegean Islands. Edinburgh: Edinburgh University Press; 2000.
11. Dogan Y. Traditionally used wild edible greens in the Aegean Region of Turkey. Acta Soc Bot Pol. 2012;81(4):329–42.
12. İnan E, İpek G, İpek A. Endemic medicinal plants of Çankırı. J Turkish Sci. 2012;5:38–40.
13. Tabata M, Sezik E, Honda G, Yeşilada E, Fukui H, Goto K, et al. Traditional medicine in turkey III: folkmedicine in east Anatolia, Van and Bitlis provinces. Int J Pharm. 1994;32:3–12.

Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84

1. Yeşilada E, Honda G, Sezik E, Tabata M, Fujita T, Tanaka T, et al. Traditional medicine in Turkey V. Folk medicine in the inner Taurus Mountains.

J Ethnopharmacol. 1995;46:133–52.

1. Baytop T. Therapy with medicinal plants in Turkey (past and present). 2nd ed. Istanbul: Nobel Medicine Publication; 1999. p. 118–9.
2. Tuzlacı E, Erol MK. Turkish folk medicinal plants, Part II. Eğirdir (Isparta). Fitoterapia. 1999;70:593–610.
3. Yeşilada E, Sezik E, Honda G, Takaishi Y, Takeda Y, Tanaka T. Traditional medicine in Turkey IX. Folk medicine in north-west Anatolia. J Ethnopharmacol. 1999;64:195–210.
4. Everest A, Ozturk E. Focusing on the ethnobotanical uses of plants in Mersin and Adana provinces (Turkey). J Ethnobiol Ethnomed. 2005;1:6.
5. Hayta S, Polat R, Selvi S. Traditional uses of medicinal plants in Elazığ (Turkey). J Ethnopharmacol. 2014;154:613–23.
6. Doğan Y, Başlar S, Mert HH, Ay G. Plants used as natural dye sources in Turkey. Econ Bot. 2003;57(4):442–53.
7. Sezik E, Yeşilada E, Honda G, Takaishi Y, Takeda Y, Tanaka T. Traditional medicine in Turkey X. Folk medicine in Central Anatolia. J Ethnopharmacol. 2001;75:95–115.
8. Simsek I, Aytekin F, Yesilada E, Yildirimli Ş. An ethnobotanical survey of the Beypazarı, Ayaş, and Güdül District Towns of Ankara province (Turkey). Economic Bot. 2004;58:705–20.
9. Sargın SA, Akçicek E, Selvi S. An ethnobotanical study of medicinal plants used by the local people of Alaşehir (Manisa) in Turkey. J Ethnopharmacol. 2013;150:860–74.
10. Tuzlacı E, Aymaz PE. Turkish folk medicinal plants, Part IV: Gönen (Balıkesir). Fitoterapia. 2001;72:323–43.
11. Öztürk F, Ölçücü C. Ethnobotanical features of some plants in the district of Şemdinli (Hakkari-Turkey). Int J Acad Res. 2011;3:120–5.
12. Malyer H, Özaydın S, Tümen G, Er S. Ethnobotanics characteristics of plants sold in herbalist in Tekirdağ and its surroundings. Dumlupınar Univ J Sci. 2004;7:103–11.
13. Özgökçe F, Özçelik H. Ethnobotanical aspects of some taxa in East Anatolia (Turkey). Econ Bot. 2004;58:97–704.
14. Elçi B, Erik S. Ethnobotanical properties of Güdül (Ankara) and near environs. Hacettepe Univ J Pharmacy. 2006;25:57–64.
15. Ezer N, Arısan ÖM. Folk medicines in Merzifon (Amasya, Turkey). T J Bot. 2006;30:223–30.
16. Güler B, Manav E, Uğurlu E. Medicinal plants used by traditional healers in Bozüyük (Bilecik–Turkey). J Ethnopharmacol. 2015;173:39–47.
17. Akan H, Korkut MM, Balos MM. An ethnobotanical study around Arat Mountain and its surroundings (Birecik, Sanlıurfa). Fırat Univ J Sci and Eng. 2008;20:67–81.
18. Satıl F, Akçiçek E, Selvi S. An ethnobotanicaly study in Madra Mountain (Balıkesir—İzmir) and vicinity. Research J Biol Sci. 2008;1:31–6.
19. Koyuncu O, Yaylacı ÖK, Tokur S. A study on Geyve (Sakarya) and its environs in terms of ethnobotanical aspects. Herb J Syst Bot. 2009;16:123–42.
20. Sarper F, Akaydın G, Şimşek I, Yeşilada E. An ethnobotanical field survey in the Haymana district of Ankara province in Turkey. T J Biol. 2009;33:79–88.
21. Ugulu I, Baslar S, Yorek N, Dogan Y. The investigation and quantitative ethnobotanical evaluation of medicinal plants used around Izmir province. Turkey J Med Plants Res. 2009;3:345–67.
22. Tuzlacı E, İşbilen DFA, Bulut G. Turkish folk medicinal plants, VIII: Lalapaşa (Edirne). J Marmara Pharm. 2010;14:47–52.
23. Uysal İ, Onar S, Karabacak E, Çelik S. Ethnobotanical aspects of Kapıdağ Peninsula (Turkey). Bio Di Con. 2010;3:15–22.
24. Polat R, Satıl F. An ethnobotanical survey of medicinal plants in Edremit Gulf (Balıkesir—Turkey). J Ethnopharmacol. 2011;139:626–41.
25. Demirci S, Özhatay N. An ethnobotanical study in Kahramanmaraş (Turkey); wild plants used for medicinal purpose in Andırın. Kahramanmaraş T J Pharm Sci. 2012;9:75–92.
26. Sağıroğlu M, Arslantürk A, Akdemir ZK, Turna M. An ethnobotanical survey from Hayrat (Trabzon) and Kalkandere (Rize/Turkey). Bio Di Con. 2012;5:31–43.
27. Ertuğ F. Wild edible plants of the Bodrum area (Muğla, Turkey). Turk J Bot. 2004;28:161–74.
28. Honda G, Yeşilada E, Tabata M, Sezik E, Fujita T, Takeda Y, et al. Traditional medicine in Turkey VI. Folk medicine in West Anatolia: Afyon, Kütahya, Denizli, Muğla, Aydın provinces. J Ethnopharmacol. 1996;53:75–87.
29. Akçiçek E, Vural M. Indegenous names and ethnobotanical properties of Kumalar mountain (Afyon) and its vicinity. Herb J Syst Bot. 2003;10(2):151–62.

Page 14 of 15

1. Kargıoğlu M, Cenkci S, Serteser A, Evliyaoğlu N, Konuk M, Kök MŞ, et al. An ethnobotanical survey of interior-west Anatolia. Turkey Hum Ecol. 2008;36:763–77.
2. Kargıoğlu M, Cenkci S, Serteser A, Konuk M, Vural G. Traditional Uses of Wild Plants in the Middle Aegean Region of Turkey. Hum Ecol. 2010;38:429–50.
3. Arı S, Kargıoğlu M, Temel M, Konuk M. Traditional tar production from the Anatolian black pine [Pinus nigra Arn. subsp. pallasiana (Lamb.) Holmboe var. pallasiana] and its usages in Afyonkarahisar, Central Western Turkey. J Ethnobiol Ethnomed. 2014;10:1–9.
4. Acar H. Gypsium soils and vegetation relations in Afyonkarahisar. MSc thesis. Afyonkarahisar: Afyon Kocatepe University, Department of Biology; 2012.
5. Erinç S. Klimatoloji ve Metotları. İstanbul: İ.T.Ü. Deniz Bilimleri ve Coğrafya Enstitüsü; 1984.
6. Davis PH. Flora of Turkey and the East Aegean Islands. Edinburgh: Edinburgh University Press; 1988 (Vol 1–10).
7. Alpaslan Z. The ethnobotanical properties of Ergan Mountain (Erzincan), MSc thesis. Erzincan: Erzincan University, Department of Biology; 2012.
8. Altundag E, Ozturk M. Ethnomedicinal studies on the plant resources of east Anatolia, Turkey. Proced Soc Behav Sci. 2011;19:756–77.
9. Cakilcioglu U, Civelek Ş. Flora of the region between Coper Mine and Tekevler Village (Maden-Elazığ). Bio Di Con. 2011;4:54–66.
10. Macia MJ, Garcia E, Vidaurre PJ. An ethnobotanical survey of medicinal plants commercialized in the markets of La Pazand El Alto. Bolivia J Ethnopharmacol. 2005;97:337–50.
11. Aburjai T, Hudaib M, Tayyem R, Yousef M, Qishawi M. Ethnopharmacological survey of medicinal herbs in Jordan, the Ajloun Heights Region. J Ethnopharmacol. 2007;110:294–304.
12. Leto C, Tuttolomondo T, La Bella S, Licata M. Ethnobotanical study in the Madonie Regional Park (Central Sicily, Italy). Medicinal use of wild shrub and herbaceous plant species. J Ethnopharmacol. 2013;146:90–112.
13. Eissa TAF, Palomino OM, Carretero ME, Gómez-Serranillos MP. Ethnopharmacological study of medicinal plants use disorders in Sinai Peninsula. Egypt J Ethnopharmacol. 2014;151:317–32.
14. Çakılcıoğlu U, Şengün MT, Türkoğlu I. An ethnobotanical survey of medicinal plants of Yazıkonak and Yurtbaşı Districts of Elazığ Province. Turkey J Med Plants Res. 2010;4:567–72.
15. Çakılcıoğlu U, Khatun S, Turkoğlu I, Hayta S. Ethnopharmacological survey of medicinal plants in Maden (Elazığ-Turkey). J Ethnopharmacol. 2011;137:469–86.
16. Durmuşkahya C, Öztürk M. Ethnobotanical survey of medicinal plants used for the treatment of diabetes in Manisa. Turkey Sains Malaysiana. 2013;42:1431–8.
17. Mathur A, Joshi H. Ethnobotanical studies of the Tarai region of Kumaun, Uttarakhand. India Ethnobot Res Appl. 2013;11:175–203.
18. Di Novella R, Di Novella N, De Martino L, Mancini E, De Feo V. Traditional plant use in the national park of Cilento and Vallo Di Diano, Campania, Southern. Italy J Ethnopharmacol. 2013;145:328–42.
19. Said O, Khalil K, Fulder S, Azaizeh H. Ethnopharmacological survey of medicinal herbs in Israel, the Golan Heightsand the west Bankregion. J Ethnopharmacol. 2002;83:251–65.
20. Ghorbani A. Studies on pharmaceutical ethnobotany in the region of Turkmen Sahra, north of Iran (part 1): general results. J Ethnopharmacol. 2005;102:58–68.
21. Pieroni A, Quave CL. Traditional pharmacopoeias and medicines among Albanians and Italians in Southern Italy: a comparison. J Ethnopharmacol. 2005;101:258–70.
22. Pardo-de-Santayana M, Blanco E, Morales R. Plants known as “té” (tea) in Spain. An ethno-pharmaco-botanical review. J Ethnopharmacol. 2005;98:1–19.
23. Sõukand R, Kalle R. The use of teetaimed in Estonia, 1880s-1990s. Appetite. 2012;59:523–30.
24. Stryamets N, Elbakidze M, Ceuterick M, Angelstam P, Axelsson R. From economic survival to recreation: Contemporary uses of wild food and medicine in rural Sweden, Ukraine and NW Russia. J Ethnobiol and Ethnomed. 2015;11:53.
25. Baytop T. Turkish dictionary of plant names. Ankara: Türk Dil Kurumu Yayınları; 2007.
26. Güneş S. Ethnobotanical investigation on the use of plants in the villages of Karaisali (Adana), MSc thesis. Niğde: Niğde University; Department of Biology; 2010.
27. Dogan Y, Baslar S, Ay G, Mert HH. The use of wild edible plants in western and central Anatolia (Turkey). Econ Bot. 2004;58(4):684–90.

Arı et al. Journal of Ethnobiology and Ethnomedicine (2015) 11:84 Page 15 of 15

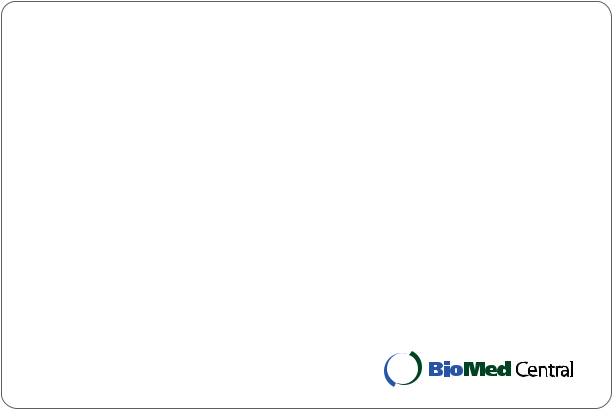
1. Nedelcheva A. An ethnobotanical study of wild edible plants in Bulgaria. Eurasia J Bio Sci. 2013;7:77–94.
2. Markova M. Hrana i hranene. Mezhdu priroda i kultura [food and nutrition: between nature and culture]. Sofia: Profesor Marin Drinov Academic Publishing House; 2011.
3. Mükemre M. Ethnobotanical features of Konalga, Sırmalı, Dokuzdam Villages (Çatak/Van) and their vicinity, MSc thesis. Van: Yüzüncü Yıl University; Department of Biology; 2013.
4. Emre Bulut G. Ethnobotanical investigations in Bayramiç (Çanakkale), MSc thesis. Istanbul: Marmara University; Department of Pharmaceutical Botany; 2008.
5. Gürdal B, Kültür Ş. An ethnobotanical study of medicinal plants in Marmaris (Muğla, Turkey). J Ethnopharmacol. 2013;146:113–26.
6. Pieroni A, Rexhepi B, Nedelcheva A, Mustafa B, Hajdari A, Kolosova V, et al. One century later: The folk botanical knowledge of the last remaining Albanians of the upper Reka Valley, Mount Korab. Western Macedonia J Ethnobiol Ethnomed. 2013;9:22.
7. Dogan Y, Ugulu I, Durkan N. Wild edible plants sold in the local markets of İzmir. Turkey Pak J Bot. 2013;45:177–84.
8. Yücel E, Güney F, Yücel ŞL. The wild plants consumed as a food in

Mihalıççık district (Eskişehir/Turkey) and consumption forms of these plants. Bio Di Con. 2010;3(3):158–75.

1. Simşek I, Aytekin F, Yesilada E, Yıldırımlı S. An ethnobotanical study among the population on the purpose of plant utilization in Anatolia. In: Başer KHC, Kırımer N, editors. 14. Herbal Pharmaceutical Raw Materials Conference Proceedings. Eskişehir: Eskisehir Anadolu University; 2002. p. 434–57.
2. Poyraz Kayabaşı N. The ethnobotanical examine in the villages of Manyas and Manyas, MSc thesis. Balıkesir: Balıkesir University; Department of Biology; 2011.
3. Kaval I. The ethnobotany of Geçitli (Hakkari) and its vicinity, MSc thesis. Van: Yüzüncü Yıl University; Department of Biology; 2011.
4. Aras N. ‘Sarma’ and ‘Dolma’: Rolled and stuffed dishes as therapy tools for

the Anatolian women in the kitchen. In: Mc Williams M, editor. Wrapped and stuffed foods. Proceedings of the Oxford symposium on food and cookery 2012. Totnes: Prospect Book; 2013. p. 57–67.

1. Balos MM. The flora and ethnobotany of the region between Zeytinbahçe and Akarçay (Birecik), MSc thesis. Şanlıurfa: Harran University; Department of Biology; 2007.
2. Sultana S, Khan MA, Ahmed M, Zafar M. Indigenous knowledge of folk herbal medicine by the women of district Chakwal Pakistan. Int Web J Ethnobot Leaflets. 2006;10:243–53.
3. Polat R, Satıl F. Ethnobotanical investigations in Havran and Burhaniye (Balıkesir). J TUBA Culture Inventory. 2010;8:65–100.
4. Bingöl F. Some drug samples sold in the herbal markets of Ankara. Herb J Syst Bot. 1995;2(2):83–110.
5. Sezik E, Yesilada E, Shadidoyatov H, Kuliyev Z, Nigmatullaev AM, Aripov HN, et al. Folk medicine in Uzbekistan. I. Toshkent, Djizzax, and Samarqand provinces. J Ethnopharmacol. 2004;92:197–207.



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