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5 Plant Diversity of the Drylands in Southeastern Anatolia-Turkey: Role in Human Health and Food Security

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Abstract

The two of the gene centres, the Mediterranean and the Near East, meet in Turkey, which comprises the Irano-Turanian, Mediterranean and Euro-Siberian phytogeographical divisions. The country is situated on the crossroads of important migratory routes and has been home to several civilizations, later therefore increases in significance. It is accepted as the centre of origin for several plants like pea, wheat, flax, lentil, chichpea, beet, tuberous species, herbaceous species like clover, medics, oats, together with woody species like pistachios, pear, vines, apple, plum and pomegranate. The wheat and barley are said to have been first cultivated in the fertile crescent. Very recent studies have revealed that wheat was cultivated for the first time at Karacadağ and its environs located in Southeastern Anatolia. In this study we have therefore included Diyarbakır, Gaziantep, Kahramanmaraş, Mardin, Şanlıurfa, Adıyaman, Siirt, Şırnak and Hakkari States from the Southeastern Anatolia Region.The plants distributed in the region were evaluated for their role in the food security. The references available on this topic were fully surveyed and current use by the local inhabitants was recorded together with the way they use these species.The plant taxa distributed in the region and their potential as animal feed was evalauted. Generally these belong to the families of Fabaceae and Poaceae. Our investigations showed that the taxa such as *Allium scorodoprasum, Anethum graveolens, Capparis spinosa* var. *spinosa, Crataegus monogyna* ssp. *monogyna, Geranium tuberosum, Glycyrrhiza glabra, Gundelia tournefortii* var. *armata, Lepidium sativum* ssp. *sativum, Malva sylvestris*, *M. neglecta, Mentha pulegium, Morus nigra, Nasturtium officinale, Nigella sativa, Olea europaea*, *Orchis coriophora, Ornithogalum narbonense, Rheum ribes*, *Rhus coriaria, Pistacia khinjuk, P. vera*, *Portulaca oleracea, Rubus sanctus, Rumex acetosella, R. pulcher*, *Thymbra spicata* var. *spicata*, *Thymus* sp., *Trigonella foenum-graecum, Urtica dioica* and *U. urens* are used by the locals as food, in salad and spices, and also consumed as tea. In addition to these, taxa such as *Capparis ovata*, *C. spinosa*, *Cerasus mahaleb*, *Glycyrrhiza glabra*, *Pistacia khinjuk*, *P. terebinthus*, *Rhus coriaria* and *Thymbra spicata* are collected from the wild and sold in the country; also exported. Many taxa distributed in the region are used in the traditional folk medicine. These are given alphabetically with their botanical name, part of the plant that is used, ailment treated and information on the preparations used.The taxa used as dye plants were also recorded.This investigation is expected to serve as a basis for future food security questions in the region.

5.1 Introduction

Turkey is a meeting place of three different plant geographical divisions with varying floral as well as climatic diversity. These phytogeographical regions are European-Siberian in the north, the Mediterranean in the west and Irano-Turanian in the central and east-south-east regions (Zohary, 1973). This has enabled the development of different

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types of ecosystems with different soil and vegetational characteristics (Yiğit *et al*., 2002; Avcı, 2005; Ozturk *et al*., 2006a, b; Ozturk *et al*., 2012c). The country also has two important gene centres of biodiversity with a transition between the Mediterranean, Near East and nine other continental countries (Vavilov, 1951).

The climatic and topographic features across the country have resulted in a remarkable biodiversity. However, the demographic outburst followed by heavy industrialization intensive land use, deforestation, wrong irrigation practices and overgrazing have created a great pressure on its biodiversity (Reynolds and Smith, 2002; Archer, 2004; Wang *et al*., 2005; Ozturk *et al*., 2006a, b; Zheng *et al*., 2006; Xu *et al*., 2008; Ozturk *et al*., 2012c). These impacts have lead to the loss and reduction of organic matter in the soil of areas with an arid or semi-arid climate (Perevolotsky and Seligman, 1998; Wallace, 2000; Yates *et al*., 2000; Tellawi, 2001; Wang, 2003; Yang *et al*., 2005; Wang *et al*., 2006a, b; Xu *et al*., 2008; Jeddi and Chaieb, 2010). Physical and chemical properties of the soil have been degraded as a result of anthropogenic influence, which is closely associated with the vegetation in the area (Ozturk *et al*., 2006a, b).

Therefore, determination of ecological structure of plant cover in the natural and semi-natural areas and land-use practices carried out on such habitats is of paramount importance in determining the extent of the changes occurring from ecological point of view. Future economical evaluation of these areas is essential for a sustainable future (Karabulut, 2006).

In this chapter, nine states from Southeastern Anatolia – Diyarbakır, Gaziantep, Kahramanmaraş, Mardin, Şanlıurfa, Adıyaman, Siirt, Şırnak and Hakkari – have been included. This area is also known as Upper Mesopotamia, and lately it has come under great pressure due to the construction of dams, highways and other activities (Ozturk *et al*., 2006a, b; Ozturk *et al*., 2012c).

The medicinal and economic potential of plants distributed on the dry lands of this area is discussed here in detail in the light of studies undertaken here during the last few decades. Moreover, the evaluation has been considered in the light of future food security and its importance for the region.

5.2 Study Area

The Southeastern Anatolian Region covers an area extending to the southern border of Syria and Iraq, formed by the chain of south-eastern Taurus mountains. A major part of this area consists of rough plains with a very few mountainous areas (Demir, 2003). Nearly half of the total land in the region is favourable for agricultural production. There is a great difference in the summer and winter temperatures: summers are hot and dry, with an impact from the climatic conditions observed under the Mediterranean precipitation regime. The climate, soils and the vegetation differ from other arid and semi-arid parts of Turkey. In general, the summer temperatures are around 25–30 °C. The average temperature in July is 31 °C in Diyarbakir, 30.4 °C in Siirt, and 27.3 °C in Gaziantep. The highest temperatures are generally above 40 °C (46.2 °C in Diyarbakir, 44 °C in Gaziantep, 46 °C in Siirt). In winter the weather is very cold and frost is common due to the effects of the continental climate. The average January temperature on low plateaus descends to 5 °C and towards the north it drops below 0 °C. The lowest temperatures are around –20 °C due to the continental climatic impacts (–24.2 °C in Diyarbakir, –19.3 °C in Siirt and –17.5 °C in Gaziantep). The temperature goes down to –30 °C on the higher altitudes of Hakkari State. The Southeastern Anatolia Region is under the influence of Mediterranean precipitation regime, with rainy winters and fairly dry summers. The average annual rainfall varies between 400 mm and 1200 mm. The plateaus of Gaziantep and Sanliurfa, together with Diyarbakir basin, receive a rainfall ranging between 400 mm and 600 mm (549 mm in Gaziantep, 726 mm in Siirt, 491 mm in Diyarbakir), which increases towards the lower parts of Taurus Mountains to 1000 mm. The highest precipitation in the region is recorded in the State of Hakkari, going up to 1000 mm on the southern slopes.

The region enters the Mesopotamian basin in the south, dominated by arid and red-coloured steppe soils, and the amount of lime in the soils is very high due to low rainfall. The area is dominated by plant species of xeric character, except for the higher altitudes of the mountains like Karacadağ, Mazı and Midyat. The steppe vegetation includes the species of Arabian origin. On the edge of steppes, the forests start from 700–850 m, with a domination by shrub such as oak, due to land degradation. Major species found here are *Quercus infectoria, Q. brantice* and *Q. libani*. The famous Tigris river occupies the middle of Diyarbakir basin, among the steppes together

with other small and large branches. *Salix triandra* and *Populus euphratica* are distributed all along the two sides of the river.

The presence of *Olea europaea* in the arid steppe parts of the Southeastern Anatolian Region among the general vegetation is highly noteworthy. The olive groves extending to Kilis, Viranşehir and Ceylanpınar. However, due to a very low relative humidity, the plants hold with difficulty. In the western part of the steppe area, especially west of the Euphrates, the vegetation changes and at around 500–600 m, the limestone plateaus are covered by *Olea europaea* and *Pistacia vera* trees. *Pistacia vera* plantations are observed commonly on the plateaus around Gaziantep-Şanlıurfa. From Gaziantep onwards, dry steppes dominate (İnandık, 1965).

In spite of the presence of poor steppe species cover in the Southeastern Anatolia Region, it has a rich diversity of Poaceae and Fabaceae members. Of ten naturally occurring wheat (*Triticum*) cultivars in Turkey, half are found to grow around the Karacadağ area. Fabaceae from the wild species of lentils, vetch, peas, sainfoin and alfalfa from Fabaceae are also distributed in this area. Many species of *Cicer, Lens, Lathyrus, Vicia, Pisum, Onobrychis, Lotus, Medicago, Trigonella* and *Trifolium* are also commonly seen in Southeastern Anatolia, and some of these are endemic to the region.

Major plant species dominating the steppe vegetation of Southeastern Anatolia are *Acanthophyllum verticillatum, Achillea bantolina, Alhagi maurorum, Astragalus gummifer, Avena barbata, Bromus macrostaphyus, Cichorium glandulosum, Convolvulus reticulatus, Dianthus multipunctatus, Delphinium peregrinum, Eryngium campestre, Euphorbia aleppica, Gentiana olivieri, Hordeum leporinum, Onosma giganteum, Silene kotschyi, Thymus syriacus, Trifolium campestre* ile *Centaurea hypericum, Trifolium campestre* and different species of *Salvia* and *Verbascum*. The major shrubs found in the region are *Amygdalus arabica*, *Cerasus microcarpa*, *Cercis siliquastrum*, *Ficus caria*, *Acer monspessulanum*, *Cerasus mahalep*, *Crataegus aronica*, *Pyrus syriaca*, *Celtis tournefortii*, *Pistacia khinjuk* and *P. vera*.

5.3 Plant Diversity

The study area has attracted the attention of large number of investigators due to its historical importance. The floristic studies have been undertaken by Davis (1965 to 1985), Davis *et al.* (1988), Güner *et al.* (2000), Aslan and Türkmen (2001), Aslan and Türkmen (2003), Yıldız (2001), Tatlı *et al.* (2002), Varol (2003), Akan *et al.* (2005a), Aydog˘du and Akan (2005), Aytaç and Duman (2005), Yapıcı and Saya (2007), Balos and Akan (2008), Eker *et al.* (2008), Atamov *et al.* (2009), Kaya and Ertekin (2009), Özuslu and Iskender (2009), Ozuslu and Tel (2010), and Ozturk *et al.* (2012c).

An evaluation of the floristic studies has revealed that a total of 3914 vascular plant taxa belonging to 121 families and 793 genera show distribution in the region, including 450 endemics. The families with highest number of taxa are Asteraceae (499 taxa), Fabaceae (467 taxa), Lamiaceae (266 taxa), Brassicaceae (220 taxa) and Poaceae (201 taxa). The genera with highest number of taxa are; *Astragalus* (152 taxa), *Allium* (65 taxa), *Centaurea* (58 taxa), *Trifolium* (55 taxa) and *Silene* (49 taxa) (see Table 5.1).

In addition to the floristic studies many investigations on the forest, steppe, halophytic, ruderal, dry stream, meadow and water-marsh vegetation of this region have also been undertaken (Varol and Tatlı, 2001; Varol and Tatlı, 2002; M. Yavuz, Şanlıurfa'nın Akçakale İlçesi'ndeki halofitik alanların florası ve vejetasyonu. Department of Biology, Institute of Science and Technology, Harran University, 2005, unpublished thesis; Atamov *et al*., 2006; Varol *et al*., 2006; Kaya *et al*., 2009; Kaya, 2010; Kaya *et al*., 2010; Tel *et al*., 2010; Yıldırım and Cansaran, 2010; Tel and Tak, 2012; Ozturk *et al*., 2014). These vegetation studies have revealed that a total of 46 plant associations have been described by the authors cited here. Out of these, the forest vegetation is represented by 17,

Table 5.1. The families and genera in Southeastern Anatolia with the highest numbers of taxa.

	Family	Number of taxa	Genera	Number of taxa
1	Asteraceae	499	*Astragalus*	152
2	Fabaceae	467	*Allium*	65
3	Lamiaceae	266	*Centaurea*	58
4	Brassicaceae	220	*Trifolium*	55
5	Poaceae	201	*Silene*	49
6	Apiaceae	197	*Euphorbia*	48
7	Liliaceae	193	*Verbascum*	47
8	Caryophyllaceae	189	*Veronica*	45
9	Scrophulariaceae	153	*Onosma*	44
10	Boraginaceae	149	*Salvia*	43

steppe by 16, halophytic vegetation by 9, ruderal by 2, dry streams by 1, meadows and water-marsh vegetation by 1 association. These associations are summarized below.

5.3.1 Forest vegetation

Pistacio khynjuki-Cotinetum coggyriae Tel *et al*., 2010; *Astragalo lamarckii-Quercetum brantii* Tel *et al*., 2010; *Lonicero ibericae-Aceretum cinerascentis* Tel *et al*., 2010; *Centaureo lycopifoliae-Pinetum brutiae* Varol and Tatlı, 2001; *Dorcynio hirsuti-Populetum tremulae* Varol and Tatlı, 2001; *Galio tenuissimi-Quercetum cerridis* Varol and Tatlı, 2001; *Potentillo crantzii-Fagetum orientalis* Varol and Tatlı, 2001; *Galio ibicini-Quercetum pinnatilobae* Varol and Tatlı, 2001; *Lagoecio cuminoides-Sytracetum officinalii* Varol and Tatlı, 2001; *Thlaspio microstyli-Cedretum libani* Varol and Tatlı, 2001; *Gastridio ventricosi-Pinetum pineae* Varol and Tatlı, 2002; *Medicagini coronatae-Pinetum brutiae* Varol *et al*., 2006; *Potentillo calycinae-Pinetum brutiae* Varol *et al*., 2006; *Verbasco amani-Abietum ciliciae* Varol *et al*., 2006; *Centaureo lycopifoliae-Pinetum pallasianae* Varol *et al*., 2006; *Nepeto trachionatae-Quercetum brantii* Kaya *et al*., 2009; *Teucrio multicauli-Crataegetum aroniae* Kaya *et al*., 2009.

5.3.2 Steppe vegetation

Astragalo cuspistipulati-Acantholimetum acerosi Varol and Tatlı, 2001; *Achilleo grandifoliae-Micromerietum brachycalicii* Varol and Tatlı, 2001; *Phlomo lineari-Astragaletum kurdicii* Varol and Tatlı, 2001; *Achilleo pseudoaleppicae-Astragaletum diphtheritae* Kaya, 2010; *Sideritido microchlamydis-Convolvuletum oxysepali* Kaya *et al*., 2010; *Phlomido capitati-Lagoecetum cominoidis* Tel and Tak, 2012; *Cardo braviphyllaris-Phletum boissierii* Tel and Tak; *Onobrycho caput-galli-Picnometum acarnae* Tel and Tak, 2012; *Salvio palaestinae-Tragopogetum pterocarpi* Tel and Tak, 2012; *Ainsworthio trachycarpae-Elymetum erosiglumis* Tel and Tak, 2012; *Balloto brachyodontae-Stachietum cataonicae* Tel and Tak, 2012; *Phlomido capitati-Picnometum acarnae* Tel and Tak, 2012; *Astragalo compacti-Amygdaletum arabicae* Tel *et al*., 2010; *Helichryso aucheri-Thymetum kotschyani* Tel *et al*., 2010; *Verbasco diversifoliae-Astragaletum cephalotis* Tel *et al*., 2010; *Phlomido capitatae-Thymetum migrici* Tel *et al*., 2010.

5.3.3 Halophytic vegetation

Halothamno hierochunticae-Salsoletum incanescentis Kaya *et al*., 2010; *Hymenolobo procumbentis-Aeluropetum lagopoidis* Kaya *et al*., 2010; *Aeluropuseto lagopoidesae-Chenopodietum vulvariae* Atamov *et al*., 2006; *Frankenieto pulverulentae-Salsoletum sodae* Atamov *et al*., 2006; *Cressa creticae-Aeluropusetum lagopoidesae* Atamov *et al*., 2006; *Prosopo farctae-Hordetum murinumae* Atamov *et al*., 2006; *Cresso creticae-Hordetum murinumae* Atamov *et al*., 2006; *Alhago manniferae-Hordetum murinumae* Atamov *et al*., 2006; *Ammio visnagae-Hordetum murinumae* Atamov *et al*., 2006.

5.3.4 Ruderal vegetation

Frankenio pulverulentae-Chenopodietum albi Kaya *et al*., 2010; *Prosopo farctae-Alhagietum manniferae* Kaya *et al*., 2010.

5.3.5 Dry stream vegetation

Acantho dioscoridi-Viticetum agni-casti Kaya *et al*., 2009

5.3.6 Meadows and water-marsh vegetation

Phragmitetum australisae Koch 1926

5.4 Economically Important Vascular Plants in Southeastern Anatolia

The plants in this region have been used as potential forage crops, food plants, for medicinal purposes, fuel, dye, basket making and other handicrafts, such as musical instrument making, as well as ornaments by different civilizations throughout history (Ozturk and Ozcelik, 1991; Plotkin, 2000; Ozturk *et al*., 2011; Ozturk *et al*., 2012a, b). The ethnobotanical studies published from the region indicate that 367 taxa have been evaluated as medicinals and aromatics, 225 taxa as food plants, 156 taxa as fodder, 19 taxa as herbal drinks, 19 taxa as spices, and 25 taxa in cheese making. In addition to these, nearly 159 taxa have been used for other economic purposes (fuel, ornaments, dye, musical instruments, handicrafts, brooms, baskets, toys) (see Fig 5.1). These studies reveal that the most widely used form is for medicinal and aromatic purposes (38%), followed by food plants

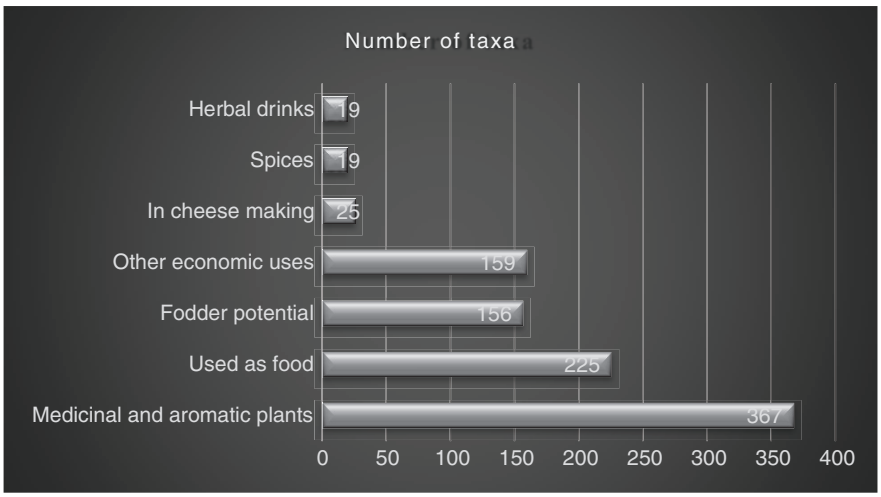

Fig. 5.1. The distribution pattern of ethnobotanical uses of plant taxa from Southeastern Anatolia.

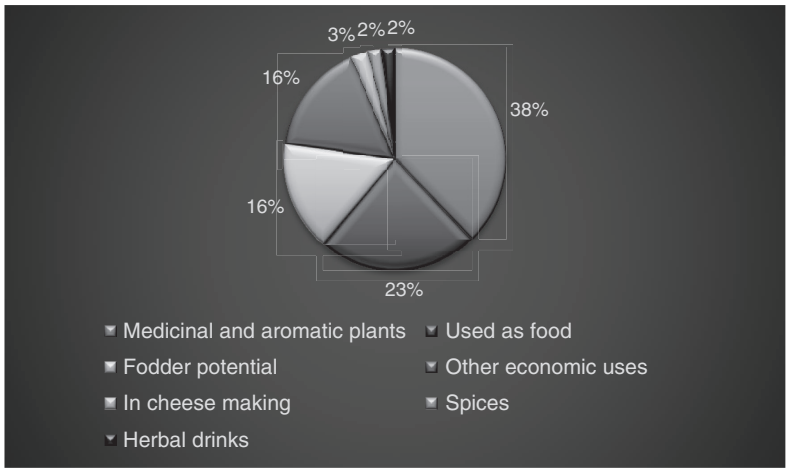

Fig. 5.2. The distribution pattern of ethnobotanical uses of plant taxa from Southeastern Anatolia on percentage basis.

(23%), fodder species (16%) and other economic uses (16%) (see Fig 5.2).

5.5 Medicinal and Aromatic Plants in Southeastern Anatolia

An evaluation of the ethnobotanical uses highlights the fact that people in this region have been using the plants as a major source for the treatment of diseases, as in other parts of the world (Blumenthal, 1998; Plotkin, 2000; Kurt *et al*., 2004; Algier *et al*., 2005; Newman and Cragg, 2007; Kendir and Güvenç, 2010; Ozturk *et al*., 2011; Pleskanovskaja *et al*., 2011; Ozturk *et al*., 2012a, b; Ozturk *et al*., 2014). This type of use dates back thousands of years (De Silva *et al*., 2009). In all, 367 medicinal and aromatic plant taxa have been reported from the study area. These are given alphabetically with their botanical name, part used, ailment treated and information on the preparations used (see Table 5.2).

An evaluation of these on the basis of disease shows that a large number of taxa are used for urinary system disorders (108 taxa), followed by stomach

Table 5.2. List of medicinal and aromatic plants distributed in Southeastern Anatolia.

	Family / Plant taxa	Treatment	Part used	Preparation	Source
	ADIANTHACEAE				
1	*Adianthum capillus-veneris*	Appetite, shortness of breath, kidney stone, expectorant, cough, urinary inflammations	AP	BO, IN, RW	8, 10
	AMARANTHACEAE				
2	*Amaranthus retroflexus*	Stomach, digestion	AP	CO	18
	ANACARDIACEAE				
3	*Cotinus coggyria*	Mouth sore	FR	GA	8
4	*Pistacia eurycarpa*	Scorpion bite, antiseptic soap	SE, ST	GU	14
5	*Pistacia khinjuk*	Stomach	ST	GU	12
6	*Pistacia terebinthus* ssp. *palaestina*	Wounds, mouth sore, anti-inflammatory, stomach, sore throat	BR, FR, LE, RO, SE, ST	DC, RW, GU, PM	6, 8, 10, 17
7	*Pistacia vera*	Wounds	LE	PM	17
8	*Rhus coriaria*	Wounds, antiseptic, diarrhoea, antipyretic, styptic, mouth sore	FR	DC, PW	1, 8, 10
	APIACEAE				
9	*Anethum graveolens*	Cholesterol, flatulence, halitosis	AP	BO, RW	1, 12
10	*Apium nodiflorum*	Appetite	SH	RW	10
11	*Bifora testiculata*	Stomach ache	AP	IN	4
12	*Diplotaenia cachrydifolia*	Rheumatism, diabetes	RO	BO	12
13	*Echinophora tenuifolia* ssp. *sibthorpiana*	Indigestion	SH	DU	17
14	*Eryngium billardieri*	Sinusitis, antifungal, bronchitis, stomach ache	RO	BO, RW	12, 14
15	*Erygnium campestre* var. *virens*	Peptic ulcer, cardiac ailments	AP, SE	AT, CO	17, 18
16	*Ferula hausknechtii*	Wounds	RO		12
17	*Ferula longipedunculata*	Aphrodisiac	RO	PW	5, 8
18	*Ferula meifolia*	Aphrodisiac	RO	PW	18
19	*Ferula orientalis*	Haemorrhoids, skin inflamation, snake bite, scorpion bite, bee stings, wormy wound (in animal)	RO	BO, PL	12, 14
20	*Ferulago cassia*	Eye infections, to encourage milk secretion in new mothers	SE	CR, IH	8
21	*Foeniculum vulgare*	Abdominal pain (in baby)	SE	BO, PW	10, 12
22	*Grammosciadium platycarpum*	Stomach ache	AP	BO	12
23	*Johrenia dichotoma* ssp. *sintenisii*	Wounds	AP	PW	12
24	*Lecokia cretica*	Hypertension	SE	CR	8
25	*Malabaila dasyanthal*	Haemorrhoids	LE	DR, FE	14
26	*Pimpinella peregrina*	Flatulence	FR	BO	14
27	*Prangos pabularia*	Wound	RO	PL	12
28	*Prangos peucedanifolia*	To prevent itch	FL		4

29	*Smyrnium connatum*	Dyspnoea (breathlessness)	ST	FE	8
30	*Torilis leptophylla*	Kidney disorders	FR, LE		4
31	*Turgenia latifolia*	Pain relief for babies	FR, LE		4
	APOCYNACEAE				
32	*Nerium oleander*	Cancer, itching	LE, RO	BO	9–11
	ARACEAE				
33	*Arum conophalloides*	Diabetes, sedative	TU	BO	14
34	*Arum detruncatum* var. *virescens*	Diarrhoea, tension, diabetes	LE	DC	13, 14
35	*Arum maculatum*	Stomach, digestive, intestines, haemorrhoids	LE, TU	CO, SW	8, 18
36	*Biarum carduchorum*	Haemorrhoids	TU	PW	2
	ARALIACEAE				
37	*Hedera helix*	Cardiac diseases	LE	IN	8
	ARISTOLOCHIACEAE				
38	*Aristolochia bottae*	Wound healing, snake bites, parasite, aemorrhoids, wound (in animal)	AP, RO	AT, BO, DR, PT, PW	6, 12, 14
	ASCLEPIDACEAE				
39	*Vincetoxicum canescens* ssp. *canescens*	Scabies	BU	PO	13
	ASPLENIACEAE				
40	*Ceterach officinarum*	Kidney stone, diuretic, urinary inflammations	AP, LE	IN	8, 18
	ASTERACEAE				
41	*Achillea bieberstenii*	Fungal ailments, menstrual pain, abdominal pain, haemorrhoids, urinary tract disorders	AP, FL, LE, SH	IN, PM	8, 11, 17
42	*Achillea goniocephala*	Asthma, rheumatism, cold, women's ailments	FL	AT	5
43	*Achillea kotschyi* ssp. *kotschyi*	Menstrual pain, abdominal pain	AP	IN	8
44	*Achillea millefolium* ssp. *millefolium*	Stomach, kidney, diabetes, tension, jaundice, typhoid	FL	AT	14, 18
45	*Achillea setacea*	Menstrual pain, abdominal pain	AP	IN	8
46	*Achillea vermicularis*	Kidney pains, diarrhoea	FL	AT, DR	14
47	*Anthemis austriaca*	Cold	FL	AT	12
48	*Anthemis cotula*	Stomach pain, cold, stomach, bronchitis, hair loss	AP, FL	BO	6, 12, 14
49	*Anthemis nobilis*	Diuretic, stomach ache	FL	IN	13
50	*Anthemis tinctoria* var. *pallida*	Stomach ache, cold and flu, peptic ulcer	AP, SH	IN	8, 17
51	*Anthemis wiedemanniana*	Pain	FL	IN	11
52	*Artemisia abrotanum*	Analgesic, parasitic, sedative, stomach	ST	BO	14
53	*Arctium minus* ssp. *pubens*	Haemorrhoids, eye ailments	FL, ST	DU, PO	12, 13
54	*Arctium tomentosum* var. *glabrum*	Abscesses	RO	PO	13
55	*Artemisia absinthium*	Shortness of breath, diabetes, cold	AP	BO, IN	8, 12

Continued

Table 5.2. Continued.

	Family / Plant taxa	Treatment	Part used	Preparation	Source
56	*Artemisia spicigera*	Rheumatism, stomach ache, abdominal pain, headache, cough	AP	BO	12
57	*Bellis perennis*	Cold and flu, diuretic, tonic, skin diseases, bronchitis, stomach ache, dyspnoea, urinary inflammations	AP, FL	BO, IN, PT	8-10, 18
58	*Carlina lanata*	Wounds	WP	PM	17
59	*Centaurea consanguinea*	Tuberculosis	SE, SH	PI	17
60	*Centaurea depressa*	Anxiety (children)	AP	IN	4
61	*Centaurea glastifolia*	Prostate treatment	AP	BO	12
62	*Centaurea iberica*	Goitre, nerve, diabetes, snake bite	LE	RW	10, 12, 14
63	*Centaurea kurdica*	Kidney ailment	FR	BO	6
64	*Centaurea lycopifolia*	Healing wounds	AP	DC, IN	8
65	*Centaurea pterocaula*	Diarrhoea	LE	BO	12
66	*Centaurea rigida*	Snake bite	LE	BO	6
67	*Centaurea saligna*	Coagulation, wound	LE	DR	14
68	*Centaurea virgata*	Abdominal pain	WP	IN	11
69	*Chrysophthalmum montanum*	Sinusitis	FL, LE	PW	11
70	*Cichorium intybus*	Ulcer, asthma, sedative, analgesic, abdominal pain, prostate treatment, hypertension, diabetes, cardiac diseases, liver diseases, cough, bronchitis	AP, RO	AT, BO, CO, DC, DR, IN, RW	8, 10, 12, 14
71	*Cichorium pumilum*	Liver diseases	RO		19
72	*Cirsium pubigerum* var. *spinosum*	Swelling	RO	PT	12
73	*Crepis sancta*	Eye ailments	FL	RW	10
74	*Gundelia tournefortii*	Stomach, strengthening of gums, appetite	AP	CO	17, 18
75	*Helianthus tuberosus*	Diabetes	TU	RW	12
76	*Helichrysum arenarium* ssp. *aucheri*	Kidney stones	AP	DC	8
77	*Helichrysum armenium* ssp. *armenum*	Urinary tract disorders, kidney stone, earache	FL	DC, IN	8, 11
78	*Helichrysum plicatum* ssp. *plicatum*	Kidney ailments, anti-inflammatory, kidney stone, earache, cancer, tumour	AP, FL, SH	AT, BO, DC, DR, DU, IH, IN	8, 12-14, 17
79	*Helichrysum stoechas*	Stomach, kidney	FL	AT	18
80	*Inula helenium* ssp. *vanensis*	Haemorrhoids	AP	PW	12
81	*Inula montbretiana*	Cancers, cold	AP	DC	8
82	*Inula oculus-christi*	Wound	FL	BO	14
83	*Lactuca saligna*	Hypertension	BU	RW	12
84	*Leontodon hispidus* var. *hispidus*	Eye ailments	FL	RW	10

85	*Matricaria aurea*	Asthma, cold, stomach ache, bronchitis, flatulence, cardiac ailments	AP, LE	BO, IN	6, 17
86	*Matricaria chamomilla*	Shortness of breath, cold, stomach, diuretic, appetite	FL	AT	17, 18
87	*Onopordum carduchorum*	Asthma, hepatitis, liver disorders, cancer	FL, LE, SE	BO, DC	14, 17
88	*Scorzonera cana* var. *cana*	Intestinal parasites	RO	FE	14
89	*Scorzonera latifolia*	Pain, sterility	RO	GU	12, 13
90	*Scorzonera mirabilis*	Headache	LE	FE	14
91	*Scorzonera tomentosa*	Fungal infections	LE	CR	8
92	*Senecio vernalis*	Eye ailments	FL	RW	10
93	*Tanacetum argenteum* ssp. *argenteum*	Pain	FL	IN	4
94	*Tanacetum argyrophyllum* var. *agrophyllum*	Diabetes	AP	BO	12
95	*Tanacetum balsamita* ssp. *balsamitoides*	Diuretic, kidney stones, parasites, wounds	FL, LE	BO, PT	12, 14
96	*Tanacetum chilliophyllum* var. *chilliophyllum*	Diabetes	AP	BO	12
97	*Taraxacum montanum*	Eye ailments, wound	LA		11, 12
98	*Taraxacum sintenisii*	Increase milk yield (cow)	AP		4
99	*Tragopogon dubius*	Gastrointestinal disorders	AP	IN	8
100	*Tragopogon pratensis*	Stomach	LE	CO	18
101	*Tripleurospermum parviflorum*	Cold, antipyretic, pain	FL	IN	10, 11
102	*Tussilago farfara*	Cough, expectorant, bronchitis	AP	IN	8
103	*Xanthium spinosum*	Urinary tract disorders	AP	BO	6
104	*Xanthium strumarium* ssp. *cavanillesii*	Kidney ailments	WP	DC	17
	BERBERIDACEAE				
105	*Bongardia chrysogonum*	Haemorrhoid, urinary antiseptic, cancers	TU	DR	14, 18
	BORAGINACEAE				
106	*Alkanna orientalis*	Stomach ache	RO	BO	14
107	*Alkanna tinctoria* ssp. *anatolica*	Peptic ulcer, wounds, burn	RB	CO, PM	17
108	*Anchusa azurea* var. *azurea*	Wounds, cancer, stomach, rheumatism	AP, RO	BO, CR	1, 6
109	*Anchusa azurea* var. *kurdica*	Diuretic, rheumatism, snake bite, swelling	FL	BO	10, 14
110	*Anchusa strigosa*	Cancer, diuretic	AP	IN	6, 11
111	*Echium italicum*	Wounds, pruritus	AP, RO	DC	8, 13
112	*Heliotropium circinatum*	Kidney ailments	WP	DC	17
113	*Heliotropium europaeum*	Antipyretic, expectorant			19
114	*Nonea pulla*	Snake bite	LE	RW	12
	BRASSICACEAE				
115	*Alyssum pateri* ssp. *pateri*	Cardiac, kidney, stomach ailments, diarrhoea	AP	BO	12

Continued

Table 5.2. Continued.

	Family / Plant taxa	Treatment	Part used	Preparation	Source
116	*Capsella bursa-pastoris*	Rheumatism	AP	RW	10
117	*Cardaria draba*	Pains	AP	BO	6
118	*Crambe orientalis*	Sedative	FL	AT	14
119	*Fibigia clypeata*	Animal diseases	AP	IN	8
120	*Lepidium sativum* ssp. *sativum*	Urinary antiseptic, appetite, diuretic, wound	AP, FL	FE	1, 14
121	*Nasturtium officinale*	Appetite, hypertension	AP	CO, RW	8-10, 18
122	*Sinapis arvensis*	Diabetes, headache, rheumatism	AP, LE	CO, RW	9, 10, 18
	CAMPANULACEAE				
123	*Campanula hakkiarica*	Increase milk production, kidney stone	LE, RO	BO	14
124	*Michauxia campanuloides*	Healing wounds	LE	CR	8
	CAPPARACEAE				
125	*Capparis ovata* var. *palaestina*	Bronchitis, sedative, aphrodisiac, abdominal pain, diabetes	AP, FL, SE	AT, DR, RW	6, 10, 14
126	*Capparis spinosa* var. *spinosa*	Diuretic, aphrodisiac, appetite, ulcer	BU, FR	BO, DC, RW	5, 11
	CAPRIFOLIACEAE				
127	*Lonicera nummulariifolia*	Sedative, antidepressant	FL	AT, DR	14
128	*Sambucus ebulus*	Cancers, immune system, haemorrhoids, vasodilator, rheumatism	FR, RO, SE	BO, CR	8, 14
	CARYOPHYLLACEAE				
129	*Agrostemma githago*	Diabetes, urinary tract disorders	RO, WP	AT	18
130	*Dianthus lactiflorus*	Expectorant	FL	AT, DR	14
131	*Gypsophila nabelekii*	Diuretic, antispasmotic	RH	BO	14
132	*Silene vulgaris*	Rheumatism, sedative	BR, LE	BO	14
133	*Telephium imperati* ssp. *orientale*	Wounds, acne, chilblains, haemorrhoids	LE, WP	BO, PM	13, 17
	CHENOPODIACEAE				
134	*Chenopodium botrys*	Headache, digestive system diseases, antihelmintic, laxative	ST	AT, CO, DR	5, 14
	CONVOLVULACEAE				
135	*Convolvulus galaticus*	Purgative	RO	BO	14
	CORNACEAE				
136	*Cornus mas*	Diabetes	FR	DC	8
	CRASSULACEAE				
137	*Sedum tenellum*	Cancerous, diabetes	LE	RW	14
	CUCURBITACEAE				
138	*Bryonia multiflora*	Nevre, sedative, stomach ache, constipation, haemorrhoids	RO, SE	AT, BO, DR, FE, PI,	12, 14
139	*Cucurpita pepo*	Kidney stone	SE		14
140	*Ecballium elaterium*	Sinusitis	FR	DU, PO	6, 8, 11, 17
	CUPRESSACEAE				
141	*Juniperus drupacea*	Cough, bronchitis, asthma	CO	DC	8

142	*Juniperus excelsa*	Rheumatism, diuretic	CO, LE	BO	14
143	*Juniperus oxycedrus* ssp. *oxycedrus*	Cough, psoriasis	CO	DC, IN	6, 8, 11
	CUSCUTACEAE				
144	*Cuscuta* spp.	Liver diseases, knee pain	AP	IN	15, 16
	CYPERACEAE				
145	*Cyperus longus*	Abdominal pain (in baby), halitosis, hepatic steatosis, diabetes, stomach	TU	RW	9, 10
146	*Cyperus rotundus*	Abdominal pain (in baby), halitosis, hepatic steatosis, diabetes, stomach	TU	RW	9, 10
	DIPSACACEAE				
147	*Scabiosa argentea*	Diuretic, wound healing	RO		18
	ELAEAGNACEAE				
148	*Elaeagnus angustifolia*	Cold and flu, pulmonary analgesic	FR	AT, DR	14
	EQUISETACEAE				
149	*Equisetum arvense*	Diuretic, kidney stone	AP	BO, IN	5, 12, 13
150	*Equisetum fluviatile*	Anxiety, kidney ailments	AP	BO	12
151	*Equisetum ramosissimum*	Diuretic, kidney stone, stomach, urinary inflammations	AP, ST	DR, IN	8, 14
	EUPHORBIACEAE				
152	*Andrache telephioides*	Wounds	FL, LE	PT	11
153	*Euphorbia cheiradenia*	Constipation	LA		10
154	*Euphorbia denticulata*	Abdominal pain, diarrhoea	LA		12
155	*Euphorbia helioscopia*	Curing warts	LA		8
156	*Euphorbia heteradena*	Constipation	LA		13
157	*Euphorbia kotschyana*	Curing warts	LA		8
158	*Euphorbia macrocarpa*	Wound	LA		12
159	*Euphorbia macroclada*	Constipation, warts	LA		11, 14
160	*Euphorbia macrostegia*	Curing warts	LA		8
161	*Euphorbia peplus* var. *minima*	Curing warts	LA		8
162	*Euphorbia virgata*	Constipation	LA		12
	FABACEAE				
163	*Alhagi pseudalhagi*	Diuretic, shortness of breath, itching, asthma, diarrhoea	AP, FR	BO, DR, RW	3, 4, 10
164	*Argyrolobium crotalarioides*	Stomach ache	FL	RW	3
165	*Astragalus diptherites* var. *diptherites*	Wounds	AP	AS	3
166	*Astragalus eriocephalus*	Antibacterial, tuberculosis	RO	BO	14
167	*Astragalus gummifer*	Hair loss	ST	BO	11
168	*Astaragalus microcephalus*	Pulmonary, antibacterial	ST	GU	14
169	*Colutea cilicica*	Sedative, purgative	FL, LE	AT	14
170	*Glycyrrhiza glabra* var. *glabra*	Cold, expectorant, lung relief, bronchitis, kidney stone, diuretic, hypertension	RO	BO	1, 3, 4, 10, 11

Continued

Table 5.2. Continued.

	Family / Plant taxa	Treatment	Part used	Preparation	Source
171	*Glycyrrhiza glabra* var. *glandulifera*	Sedative, angina, pharyngitis, cold and flu, diabetes, heart ailments	RO	BO	9, 12, 14
172	*Medicago orbicularis*	Increase milk yield (cow)	AP		4
173	*Medicago sativa* ssp. *sativa*	Styptic	AP	PT	12
174	*Melilotus elegans*	Kidney ailments	WP	DC	17
175	*Melilotus officinalis*	Diuretic, aphrodisiac	FL	AT	14
176	*Onobrychis gracilis*	Cold and flu	AP	DC	8
177	*Onobrychis megataphros*	Heart and vascular diseases	AP	BO, DR	3
178	*Onobrychis sulphurea* var. *vanensis*	Diuretic, kidney stone	FL	BO	14
179	*Ononis spinosa* ssp. *leiosperma*	Diuretic, kidney stone	FL, LE, RO	BO, IN	8, 14
180	*Prosopis farcta*	Diarrhoea	FR	RW	3, 10
181	*Robinia pseudoacacia*	Diuretic	FL	IN	11
182	*Sophora alopecuroides*	Aphrodisiac, pulmonary	RO	AT, DR	14
183	*Trifolium repens* var. *giganteum*	Stomach ache	AP	BO	12
184	*Trigonella coelesyriaca*	Eye infections	AP		4
185	*Trigonella foenum-graecum*	Hypoglycaemic	SE	PO	13
186	*Trigonella mesopotamica*	Eye infections	AP		4
	FAGACEAE				
187	*Quercus brantii*	Diarrhoea, diabetes, anxiety	FR	RW	6, 7, 10, 11
188	*Quercus infectoria* ssp. *boissieri*	Diabetes,	FR	DC	7, 17
189	*Quercus ithaburensis* ssp. *macrolepis*	Diabetes, anxiety	FR	RW	9, 10
190	*Quercus petraea* ssp. *pinnotiloba*	Ulcer, haemorrhoids, coagulation	GD, LE		14
191	*Quercus robur* ssp. *robur*	Diabetes	FR	DC	17
	GENTIANACEAE				
192	*Gentiana olivieri*	Diabetes, aphrodisiac	FL, RO	BO, IN	14, 17
	GERANIACEAE				
193	*Geranium stepporum*	Diabetes, stomach, coagulative	ST	AT, DR	14
194	*Pelargonium endlicherianum*	Antihelmintic	WP	RW	11
195	*Pelargonium quercetorum*	Antihelmintic (in chıldren)	RO	BO	12
	HYPERICACEAE				
196	*Hypericum capitatum* var. *capitatum*	Pain (animal)	AP		4
197	*Hypericum capitatum* var. *luteum*	Pain (animal)	AP		4

198	*Hypericum hyssopifolium* ssp. *elongatum*	Haemorrhoid, kidney stone, purgative	FL	AT	14
199	*Hypericum lydium*	Sedative, expectorant, rheumatism, ulcer	FL	AT	5
200	*Hypericum perforatum*	Stomach ache, burns	AP, FL	DC, IN	8, 13, 18
201	*Hypericum retusum*	Stomach, appetite, expectorant, antipyretic, pain (animal)	AP, FL, LE		3, 18
202	*Hypericum scabrum*	Appetite	FL	IN	11
203	*Hypericum triquetrifolium*	Diuretic, heart pain, diabetes, stomach, pain (animal)	FL, WP	BO, DC	4, 6, 9, 10, 17
	ILLECEBRACEAE				
204	*Paronychia kurdica*	Wounds healing, gall bladder disease	AP	BO, RW	6
	IRIDACEAE				
205	*Gladiolus kotschyanus*	Aphrodisiac	TU	BO	14
	JUGLANDACEAE				
206	*Juglans regia*	Rheumatism, hair loss, purgative, antiseptic, hair loss, haemorrhoids, appetite, tonic, diabetes, wounds	FB, FR, LE, SE	DR, PM, PO, RW	7, 9–14
	JUNCACEAE				
207	*Juncus inflexus*	Kidney stone, foot pruritus, scabies	FL, RO	BO, IN	8, 12
	LAMIACEAE				
208	*Ajuga chamaepitys* ssp. *chia* var. *ciliata*	Tonic, wounds, diaphoretic, haemorrhoids	FL	IN	8, 18
209	*Cyclotrichum niveum*	Shortness of breath, stomach, anxiety, cold	ST	DC, IN	11, 18
210	*Lavandula stoechas* ssp. *stoechas*	Cold	WP	IN	17
211	*Marrubium cuneatum*	Kidney stone	ST	BO	11
212	*Marrubium parviflorum* ssp. *parviflorum*	Cold, stomach ache	WP	IN	4, 17
213	*Melissa officinalis* ssp. *inodora*	Vasodilator, headache, cardiac diseases	AP	DC, IN	8
214	*Melissa officinalis* ssp. *officinalis*	Sedative, gastrointestinal	LE	BO	14
215	*Mentha aquatica*	Stomach ache	LE	AT	18
216	*Mentha longifolia*	Cancer, tuberculosis, sedative, stomach, kidney, cold and flu, stomach ache	AP, LE, RO	BO, RW	9, 14
217	*Mentha longifolia* ssp. *longifolia*	Cold, rheumatism, allergy, headache	AP, RO	BO, PW	10, 12
218	*Mentha longifolia* ssp. *typhoides* var. *typhoides*	Rheumatism, allergy, blood coagulant, headache	AP, LE, RO	BO, CR, PW	8, 10
219	*Mentha pulegium*	Spasm, dyspnoea, stomach ache, cold, rheumatism, cough, headache	AP, FL, LE	IN, PM	1, 17, 18
220	*Mentha spicata* ssp. *spicata*	Antipyretic, stomach	LE	IN	11
221	*Micromeria congesta*	Cough, respiratory disorders	RO	BO	2
222	*Micromeria dolichodonta*	Dyspnoea, eye ailments	SH	DU, PM	17

Continued

Table 5.2. Continued.

	Family / Plant taxa	Treatment	Part used	Preparation	Source
223	*Micromeria fruticosa* ssp. *brachycalyx*	Cold and flu	AP	IN	8
224	*Nepeta flavida*	Colds	AP	IN	8
225	*Origanum majorana*	Sedative, diaphoretic, stomach ache	ST	FE	13
226	*Origanum syriacum* var. *bevanii*	Colds	LE	IN	8
227	*Origanum vulgare* ssp. *gracile*	Cold and flu, stomach, intestinal	FL, LE	IN	11, 18
228	*Phlomis kurdica*	Asthma, shortness of breath	FL		19
229	*Phlomis russeliana*	Prostate disease	LE	IN	8
230	*Prunella vulgaris*	Abdominal pain	AP	BO	12
231	*Rosmarinus officinalis*	Stomach ache	AP	AT	18
232	*Salvia multicaulis*	Wounds, cough, cold, respiratory disorders, urinary tract disorders, stomach ache	AP	BO, DU	4, 6, 18
233	*Salvia sclarea*	Cold, stomach pain	LE, SH	AT, DC, DR	14, 17
234	*Salvia cryptantha*	Cough, bronchitis	AP	IN	8
235	*Salvia syriaca*	Wounds	LE	PT	10
236	*Salvia verbenaca*	Fungal infections	LE	IN	8
237	*Salvia virgata*	Facilitate the digestion	AP		4
238	*Satureja cilicica*	Menstrual pain, abdominal pains	LE	IN	8
239	*Sideritis libanotica* ssp. *linearis*	Cold and flu	AP	IN	8
240	*Sideritis libanotica* ssp. *microchlamys*	Stomach	FL, ST	IN	11
241	*Sideritis montana*	Stomach, anxiety, cold, heart ailments	AP	AT	18
242	*Sideritis perfoliata*	Cold	AP	IN	8
243	*Sideritis syriaca* ssp. *nusairiensis*	Cold, stomach ache	SH	IN	17
244	*Stachys brantii*	Wounds	SH	PM	17
245	*Stachys lavandulifolia*	Stomach, appetite	ST	IN	11
246	*Teucrium chamaedrys* ssp. *chamaedrys*	Halitosis, toothache, appetite	LE, SH	RW	9, 10
247	*Teucrium chamaedrys* ssp. *sinuatum*	Rheumatism, stomach ache, cancer, heart and vascular disorders	AP	BO, DC, RW	11–13
248	*Teucrium chamaedrys* ssp. *tauricolum*	Haemorrhoids	AP	IN	8
249	*Teucrium polium*	Diabetes, cold, spasm, diarrhoea, rheumatism, abdominal pain, stomach ache, wounds, gastrointestinal, kidney, cancer, flatulence, antihelmintic, constipation, respiratory, ulcer, fever lowering, lung inflammations	AP, FL, LE, WP	AT, BO, DC, DR, IN, PM	1, 4, 6, 8, 11, 12, 14, 17
250	*Thymbra sintenisii* ssp. *sintenisii*	Stomach ache, tension, appetite	AP	AT	6, 19

251	*Thymbra spiacata* var. *spicata*	Cold, stomach ache, diabetes, antiseptic, halitosis, sedative, cough, toothache	FL, LE, WP	DC, IN	1, 11, 13, 17
252	*Thymus fallax*	Sedative, haemorrhoids	LE	AT, FE	14
253	*Thymus kotschyanus* var. *kotschyanus*	Bronchitis, sedative, shortness of breath	AP, FL, LE	AT, BO, DR	12, 14
254	*Thymus sipyleus* ssp. *rosulans*	Cold	AP	IN	8
	LILIACEAE				
255	*Allium akaka*	Diabetes, cancer	BL	RW	14
256	*Allium cepa*	Wounds	BL	CO, RW	9, 10, 14
257	*Asparagus acutifolius*	Kidney stones, urinary inflammation, flu	AP	IN	8
258	*Colchicum szovitsii*	Sterility, rheumatism	BL	BO, DR, FE	14
259	*Danae racemosa*	Kidney stone	RO	IN	8
260	*Eremurus spectabilis*	Rheumatism, gastrointestinal, stomach	LE, RO	BO, CO	14, 18
261	*Muscari tenuiflorum*	Antibiotic, rheumatism, tumour	BL	DR, FE	8
262	*Polygonatum multiflorum*	Aphrodisiac, infertility	RH	PW	8
263	*Ruscus aculeatus* ssp. *angustifolius*	Kidney stone, urinary inflammation	RO	DC, IN	8
	LINACEAE				
264	*Linum mucronatum* ssp. *mucronatum*	For sterility (women)	FL	IN	4
265	*Linum pubescens*	Wounds, bronchitis, cough	SE		18
	LORANTHACEAE				
266	*Viscum album* ssp. *album*	Cancer, immune system, epilepsy, diabetes, cholesterol lowering, kidney stones	LE, ST	BO, IN	8, 14
	MALVACEAE				
267	*Alcea apterocarpa*	Asthma, coughing	FL		4
268	*Alcea calvertii*	Kidney stone	RO	IN	13
269	*Alcea digitata*	Emollient, asthma, diuretic, cold, wound, enteritis	AP	IN	5
270	*Alcea fasciculiflora*	Abscesses, itching of scabies	RO		13
271	*Alcea flavovirens*	Kidney, urinary tract diseases	LE	BO	12
272	*Alcea hohenackeri*	Kidney stone, urinary tract diseases, cold and flu, stomach ache	FL, LE, RO	BO, CO	10, 12
273	*Alcea kurdica*	Cancer, sedative	SE	AT, DR	14
274	*Alcea pallida*	Cough, bronchitis	FL	IN	8
275	*Alcea setosa*	Wounds	FL, FR, RO	CR	6
276	*Alcea striata*	Cough, flu, wounds, expectorant, bronchitis	FL, RO	BO, CR	6, 18
277	*Althaea armeniaca*	Asthma, coughing	FL		4
278	*Althea officinalis*	Dyspnoea, diuretic, antilithic	AP, FL	DC, IN	13, 17
279	*Malva neglecta*	Haemorrhoid, stomach ache, kidney stone, diuretic, wounds, anti-inflammatory, tension regulation, blood sugar lowering, cold, abscess	AP, LE, RO	BO, CO, DR, IN, PT, RW	1, 6, 8, 10, 11-14

Continued

Table 5.2. Continued.

	Family / Plant taxa	Treatment	Part used	Preparation	Source
280	*Malva sylvestris*	Diuretic, wounds, anti-inflammatory	AP		1
	MORACEAE				
281	*Morus alba*	Blood-forming, antipyretic, pulmonary system	FR	DR, FE	7, 10, 14
282	*Morus nigra*	Throat spasm, haematinic, antipyretic, aphrodisiac, wounds (in baby)	FR	FE, DR, DU	7, 9, 10, 14, 17
	MORINACEAE				
283	*Morina persica* var. *persica*	Cold and flu	FL	DC	8
	MYRTACEAE				
284	*Myrtus communis* ssp. *communis*	Blood sugar lowering	FR	DC	8
	OLEACEAE				
285	*Fraxinus excelsior*	Diuretic, antipyretic	LE		7
286	*Fraxinus ornus* ssp. *cilicica*	Influenza	SB	IN	8
	ORCHIDACEAE				
287	*Orchis palustris*	Aphrodisiac	TU	AT, DR	14
288	*Orchis simia*	Diabetes	TU		19
	PAPAVERACEAE				
289	*Fumaria asepala*	Eczema, itching	FL	IN	4, 18
290	*Fumaria microcarpa*	Heart, vein	FL, ST	BO	14
291	*Fumaria officinalis*	Diabetes	AP	CO	8
292	*Glaucium corniculatum* ssp. *corniculatum*	Pain	FL	IN	4
293	*Papaver arenarium*	Pain	FL		4
294	*Papaver rhoeas*	Sedative, depression, lung relief	FR, LE	BO, CO	14, 18
	PINACEAE				
295	*Abies cilicica*	Stomach ache, ulcer, colds and flu, menstrual pain	CO, RE		8
296	*Pinus brutia*	Haemorrhoids, burns, ulcer, stomach ache, tuberculosis diseases,wound healing	BU, BR, CO, RE	DC, DU, IN, PW	8, 11, 17
	PLANTAGINACEAE				
297	*Plantago atrata*	Wounds	LE	FE	13
298	*Plantago lanceolata*	Stomach ache, diabetes, wounds	LE, RO	AT, BO, FE, PT, RW	11–14, 18, 18
299	*Plantago major* ssp. *major*	Insect bites, wounds, asthma, blood coagulant, abscess	LE	CO, CR, DR, IN, RW	8, 12–14, 17
300	*Plantago maritima*	As wash for cancerous uterus	LE	DC	13
	PLATANACEAE				
301	*Platanus orientalis*	Hepatitis, angina, flu	SB	IN	14, 17
	POACEAE				
302	*Cynodon dactylon* var. *dactylon*	Diuretic, kidney stones	RH	BO, IN	8, 14

303	*Triticum sativum*	Cure abscess			14
304	*Zea mays*	Haemorrhoids, kidney, diuretic, antilithic	FR, LE, SE	BO, IN	10, 13, 14
	POLYGONACEAE				
305	*Polygonum bellardii*	Kidney stones	AP	IN	8
306	*Rheum ribes*	Diabetes, hypertension, stomach ailment, ulcer, diarrhoea, anthelmintic, digestion, osteoporosis	RH, RO, ST, SB	BO, DC, DR, IN	8, 9–14
307	*Rumex crispus*	Diuretic, kidney stones	LE	CO	18
308	*Rumex tuberosus* ssp. *horizontalis*	Wounds	LE	PT	12
	PORTULACACEAE				
309	*Portulaca oleracea*	Dysmenorrhoea (menstrual pain), diabetes, to strengthen bones (children), respiratory	AP	BO, CO, RW	9, 10, 18
	PUNICACEAE				
310	*Punica granatum*	Immune system, aphrodisiac, headache, diarrhoea	FR	FW	10, 14
	RANUNCULACEAE				
311	*Nigella sativa*	Intestinal disorders, flatulence	SE	RW	1
312	*Ranunculus constantinopolitanus*	Rheumatism, swollen feet	LE	CR	8
313	*Ranunculus kotschyi*	Rheumatism	LE	PT	12
	RESEDACEAE				
314	*Reseda lutea* var. *Lutea*	Stomach ache	RO	FE	13
	RHAMNACEAE				
315	*Paliurus spina christii*	Wounds, fungal ailments, cough (animal), antipyretic, stomach ulcer, urinary inflammation, haemorrhoids	BR, FR, RO, SE	BO, DC, IN, PM, OI	8, 11, 12, 17, 18
	ROSACEAE				
316	*Alchemilla hessii*	Wounds	LE	PT	12
317	*Amygdalus communis*	Diabetes, kidney	FR	RW	11, 18
318	*Cerasus mahalep* var. *mahaleb*	Diabetes, tonic, expectorant, cough	FR, LE, SE	BO, RW, SI	6, 8, 11
319	*Cerasus microcarpa*	Prostate ailments	FR	RW	12
320	*Crataegus aronia* var. *aronia*	Heart diseases, muscle spasm, hypertension, stomach ache	FR, LE	DC, RW	8, 10, 17
321	*Crataegus curvisepala*	Coughing	FR	AT	14
322	*Crataegus monogyna* ssp. *monogyna*	Heart ailments, sedative, antispasmodic, hypertension, diuretic, diarrhoea	FL, FR	DR, IN, RW	1, 11, 13
323	*Crataegus orientalis* var. *orientalis*	Hypertension	FR	RW	10
324	*Cydonia oblonga*	Sore throat	LE	BO	6
325	*Eriolobus trilobatus* var. *trilobatus*	Cardiac diseases, diabetes, dyspnoea	FR	DC	8
326	*Persica vulgaris*	Diabetes	SE	RW	10
327	*Potentilla erecta*	Kidney stone	AP	AT	18

Continued

Table 5.2. Continued.

	Family / Plant taxa	Treatment	Part used	Preparation	Source
328	*Potentilla speciosa* var. *speciosa*	Cancer	AP	DC	8
329	*Prunus armeniaca*	Constipation, antihelmintic	FR, SE	RW	9, 10
330	*Prunus divaricata* ssp. *divaricata*	Diabetes	FR	RW, SI	8, 11
331	*Pyrus elaeagnifolia*	Constipation	FR	RW	11
332	*Rosa canina*	Aphrodisiac, diabetes, cholesterol, cold, haemorrhoids, cough, stomach ache, antihelmintic, weight loss	FR	BO, DC, DR, IN	5, 8–14, 18
333	*Rosa damascena*	Cold	FR	BO, DR	10
334	*Rosa foetida*	Heart pain, cancer	FR	BO	6
335	*Rosa heckeliana* ssp. *vanheurckiana*	Cold, cough	FR	DR	12
336	*Rubus caesius*	Kidney stones	SE	RW	12
337	*Rubus canescens* var. *canescens*	Diabetes	RO	BO	10
338	*Rubus discolor*	Diabetes	RO	IN	11
339	*Rubus sanctus*	Infertility, kidney stones	RO	DC	17, 18
	RUBIACEAE				
340	*Galium consanguineum*	Haemorrhoids	AP	DU	12
	SALICACEAE				
341	*Salix aegyptiaca*	Toothache	LE	CR	12
342	*Salix alba*	Rheumatism, haemorrhoids, toothache	LE		7, 12
	SCROPHULARIACEAE				
343	*Linaria kurdica*	Heart, vein	LE, SE	AT	14
344	*Verbascum asperuloides*	Wounds	SH	PM	17
345	*Verbascum lasianthum*	Haemorrhoids, wounds	RO	DR	6
346	*Verbascum oreophilum*	Heart, vein	SE	BO	14
347	*Verbascum pinetorum*	Wound healing	LE	CR	8
348	*Verbascum speciosum*	Rheumatism	AP	BO	12
349	*Verbascum splendidum*	Haemorrhoids	FL	DU	17
350	*Veronica anagallis-aquatica* ssp. *oxycarpa*	Appetite	AP	RW	10
351	*Veronica orientalis*	Gum disorders	ST	BO	14
	SOLANACEAE				
352	*Hyoscyamus niger*	Sedative, depression, toothache, tooth cavity, lung and throat inflammation	LE, SE, SH	DR, FE, IH	8, 13, 14
353	*Hyoscyamus reticulatus*	For intoxication	RO, SH	FE	13

	TAMARICACEAE				
354	*Tamarix smyrnensis*	Diuretic, constipation	LE	BO	14
355	*Tamarix tetrandra*	Appetite, constipation	LE, SB		7
	THYMELACEAE				
356	*Daphne mucronata*	Toothache, rheumatism, cough	BR, SB	BO	12
	URTICACEAE				
357	*Parietaria judaica*	Cancer, sedative	SE, ST	DR	14
358	*Urtica dioica*	Cancer, rheumatism, haemorrhoids, diabetes, gynaecological diseases, anti-inflammatory, tonic, diuretic, kidney stones, hair loss, to encourage milk secretion in new mothers, sedative, cold, pain, aphrodisiac, purifies the blood, psoriasis, tuberculosis, embolism	AP, LE, SE, SH, ST	BO, CO, CR, DC, DR, DU, IN, RW	1, 5, 6, 8–14, 17, 18
359	*Urtica urens*	Diuretic, cancer, gynaecological diseases, anti-inflammatory, tonic, kidney stones, hair loss	LE, SE	AT	1, 13
	VALERIANACEAE				
360	*Valeriana dioscoridis*	Tension lowering	FL	IN	8
361	*Valeriana officinalis*	Sedative	RO		18
	VERBENACEAE				
362	*Verbena officinalis*	Analgesic, infertility, cardiac diseases, cancers, kidney stones	AP, WP	DC, IN	8, 17
363	*Vitex agnus-castus*	Itching	AP	AT	18
	VIOLACEAE				
364	*Viola kitaibeliana*	Wound healing, cough	FL, LE	CR, DC	8
365	*Viola odorata*	Vascular, stomach, kidney ailments	FL, WP	BO, RW	12
	ZYGOPHYLLACEAE				
366	*Peganum harmala*	Sedative, depression, epilepsy, haemorrhoids, prostatitis, urinary incontinence	RO, SE	BO, DC	13, 14
367	*Tribulus terrestris*	Heart ailment, atherosclerosis, cysts, kidney stone, diuretic, embolism, shortness of breath	AP, SH	BO, DC, IN	6, 8, 11, 12, 17, 18

Notes

Part used: AP: Aerial parts; BL: Bulb; BR: Branches; BU: Bud; CO: Cones; FB: Fruit bark; FL: Flower; FR: Fruit; GD: Gall dust; LA: Latex; LE: Leaves; RB: Root bark; RE: Resin; RH: Rhizome; RO: Root; SB: Stem bark; SE: Seed; SH: Shoot; ST: Stem; TU: Tuber; WP: Whole plant

Preparatıon: AS: Ash; AT: As tea; BO: Boiled; CO: Cooked; CR: Crushed; DC: Decoction; DR: Dried; DU: Direct use; FE: Fresh; FW: Fruit water; GA: Gargle; GU: Gum; IH: Inhalation; IN: Infusion; OI: Oil; PI: Pill; PL: Plant water; PM: Pomade; PO: Pounded; PT: Poultice; PW: Powdered; RW: Raw; SI: Sirop; SW: Swallowed

Sources: 1: Akan *et al*., 2005b; 2: Akan *et al*., 2008; 3: Akan *et al*., 2013b; 4: Akan *et al*., 2013c; 5: Akdoğan and Akgün, 2006; 6: Akgül, 2008; 7: Aslan *et al*., 2011; 8: Demirci and Özhatay, 2012; 9: A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis; 10: A. Gençay, Cizre (şırnak)'nin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2007, unpublished thesis; 11: N. Güldaş, Adıyaman İlinde etnobotanik değeri olan bazı bitkilerin kullanım alanlarının tespiti. Department of Biology, Institute of Science and Technology, Fırat University, 2009, unpublished thesis; 12: İ. Kaval, Geçitli (Hakkari) ve çevresinin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2011, unpublished thesis; 13: Özgökçe and Özçelik, 2004; 14: Öztürk and Ölçücü, 2011; 15: Şekeroğlu *et al*., 2011; 16: Şığva and Seçmen, 2009; 17: Tursun, 2001; 18: Yapıcı *et al*., 2009

(101 taxa) and respiratory disorders (84 taxa) (see Fig 5.3). On the basis of parts used, mainly aerial parts are used (100 taxa), leaves (84 taxa) and flowers (71 taxa) (see Fig 5.4). The most common preparation methods are boiled (20%), followed by infusion (18%), raw (11%) and decoction (10%). Other uses and their percentages are given in Fig 5.5.

5.6 Plants Consumed as Source of Food

Lately with an understanding of the use of synthetic foods as a cause of obesity, people have started going back to natural plant foods. These have become an indispensable part of daily human nutrition, becuae of their richness in minerals, fibre

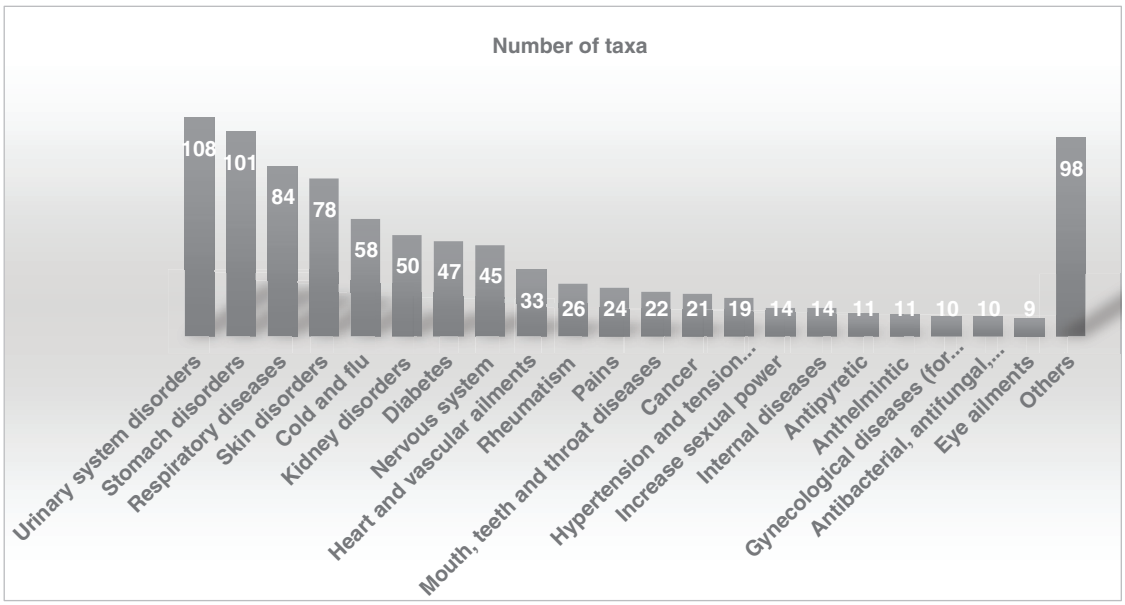

Fig. 5.3. Therapeutic uses of the medicinal and aromatic plants in Southeast Anatolia

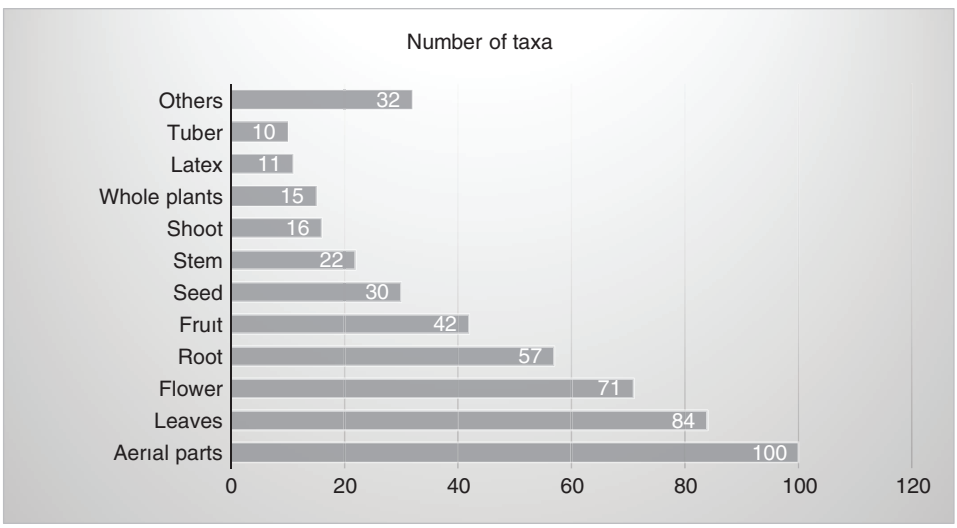

Fig. 5.4. The parts of the medicinal and aromatic plants used in Southeastern Anatolia.

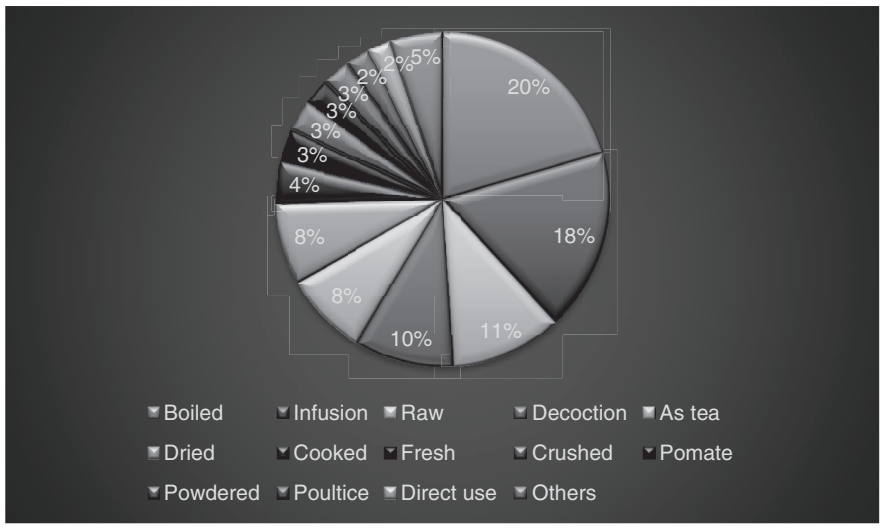

Fig. 5.5. The percentages of the preparations used in the traditional folk medicine.

and vitamins (Tukan *et al*., 1998). The collection and use of plants as food in Turkey is a very old custom (Ozturk and Ozcelik, 1991; Ozturk *et al*., 2012a). The people have been trying to satisfy their feeding needs by collecting plants from their surrounding mountains and forests. This tradition still continues in rural areas (Ozturk *et al*., 2011; Ozturk *et al*., 2012a, b), and is especially common in Southeastern Anatolia (Ozturk and Ozcelik, 1991; Ozturk *et al*., 2014). In the light of studies undertaken in this region, a total of 225 taxa have been recorded as being used as food plants (see Table 5.3). On the basis of consumption of plant parts, mainly fruits have been used (61 taxa), followed by aerial parts (49 taxa) and leaves (44 taxa). Other current uses are given in Fig. 5.6. These are consumed as raw (63.71%) or cooked (30.24%). Other types of consumption are boiled (2.02%), as gum (2.02%), as nectar (1.61%) and latex (0.4%).

The plants consumed in daily use as foods are collected during the appropriate seasons and sold at the local markets (Surmeli *et al*., 2001). These plants include taxa such as *Capparis ovata, C. spinosa, Cerasus mahaleb, Glycyrrhiza glabra, Pistacia khinjuk, P. terebinthus, Rhus coriaria* and *Thymbra spicata*. Some of these are also exported. Although the use as food plants varies from state to state, a large number of these are also used as spices and as flavouring agents in cheese making or as herbal drinks. The plants used as spices include 19 taxa (see Table 5.4); 25 taxa in cheese making (see Table 5.5), and 13 taxa as herbal teas (see Table 5.6).

In addition to the teas prepared from differrent plant taxa (Ozturk *et al*., 2011), special coffees are prepared from the fruits of *Pistacia khinjuk* (Akan *et al*., 2005b) and *P. terebinthus* (A. Gençay, Cizre (Şırnak)'nin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2007, unpublished thesis; A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis), the seeds of *Ricinus communis* (İ. Kaval, Geçitli (Hakkari) ve çevresinin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2011, unpublished thesis). The fruit juices of *Morus nigra* and *Punica granatum* (A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis) are sold commonly, together with the syrup prepared from the roots of *Glycyrrhiza glabra* (Akan *et al*., 2005b; A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis).

Table 5.3. The plants consumed as foods in Southeastern Anatolia.

	Plant taxa	Part used	Preparation	Source
1	*Alcea flavovirens*	LE	Cooked	1
2	*Alkanna froedinii*	AP	Raw	1
3	*Alkanna orientalis* var. *orientalis*	AP	Cooked	2
4	*Alkanna trichophylla* var. *mardinensis*	FL	Nectar	3
5	*Alliaria petiolata*	LE		4
6	*Allium akaka*	LE	Raw	1
7	*Allium ampeloprasum*	LE	Cooked	5, 6
8	*Allium cepa*	BL	Raw, Cooked	2, 5
9	*Allium giganteum*	LE	Raw	1
10	*Allium kharputense*	AP	Raw	2
11	*Allium scorodoprasum* ssp. *rotundum*	AP		7
12	*Allium stamineum*	LE	Raw, Cooked	6
13	*Amaranthus viridis*	LE, SH	Cooked	2, 5
14	*Amygdalus communis*	FR	Raw	1, 2, 5, 6
15	*Anchusa azurea* var. *azurea*	AP	Cooked	7, 8
16	*Anchusa azurea* var. *kurdica*	AP	Cooked	2
17	*Anchusa strigosa*	LE	Cooked	6
18	*Andrache telephioides*	SH	Raw	6
19	*Anethum graveolens*	AP, LE, ST	Raw	1, 8
20	*Anthemis hyalina*	ST		7
21	*Argyrolobium crotalarioides*	SE	Raw	9
22	*Arum conophalloides* var. *conophalloides*	AP	Boiled, Cooked	1
23	*Arum italicum*	AP	Cooked	5
24	*Arum maculatum*	LE	Cooked	6
25	*Astragalus hamosus*	FR	Raw	3
26	*Berberis crataegina*	SE	Raw	2
27	*Brassica nigra*	AP	Raw	8
28	*Campanula sclerotricha*	LE	Cooked	1
29	*Capparis ovata* var. *palaestina*	BU, FR	Raw	2, 5, 7
30	*Capparis spinosa* var. *spinosa*	BU		10
31	*Capsella bursa-pastoris*	AP, FR, SH	Cooked, Raw	2, 3, 5
32	*Cardaria draba*	AP	Boiled	3
33	*Cardemine uliginosa*	AP	Raw	1
34	*Carduus nutans* ssp. *leiophyllus*	ST	Eaten	11
35	*Carduus nutans* ssp. *nutans*	ST	Eaten	7
36	*Carduus pycnocephalus* ssp. *albidus*	ST	Eaten	7
37	*Celtis glabrata*	FR	Raw	1
38	*Celtis tournefortii*	FR	Raw	8
39	*Centaurea cynarocephala*	RO	Raw	3
40	*Centaurea hyalolepis*	FL		11
41	*Centaurea iberica*	SH	Cooked	2
42	*Centaurea polypodiifolia* var. *szovitsiana*	SH	Cooked	6
43	*Centaurea solstitialis* ssp. *solstitialis*	AP		7
44	*Centaurea triumfettii*	AG	Gum	7
45	*Centranthus longiflorus* ssp. *longiflorus*	LE	Raw	1
46	*Cerasus avium*	FR	Raw, Cooked	2
47	*Cerasus microcarpa*	FR	Raw	1
48	*Chaerophyllum macropodum*	ST	Raw	1
49	*Chaerophyllum macrospermum*	AP	Boiled, Cooked	1
50	*Chondrilla juncea* var. *juncea*	RO	Gum	3
51	*Cicer arietinum*	FR, SE	Raw, Cooked	2, 5
52	*Cichorium intybus*	AP, SH	Raw, Cooked	2, 3

Continued

Tabel 5.3. Continued.

	Plant taxa	Part used	Preparation	Source
53	*Cirsium arvense* ssp. *arvense*	AP, ST	Raw	2, 5
54	*Cirsium lappaceum*	LE	Raw	10
55	*Cirsium pubigerum* var. *spinosum*	ST	Raw	1
56	*Cirsium vulgare*	ST	Fresh	7
57	*Citrullus lanatus*	FR, SE	Raw, Dried	2, 5
58	*Convolvulus arvensis*	LE	Raw	1
59	*Convolvulus betonicifolius* ssp. *peduncularis*	LE	Raw	1
60	*Convolvulus stachydifolius*	LE	Cooked	2
61	*Coriandrum sativum*	LE, SE	Raw	1
62	*Coronilla scorpioides*	SE	Raw	9
63	*Crataegus aronia* var. *aronia*	FR	Raw	2, 3
64	*Crataegus monogyna* ssp. *monogyna*	FR	Raw	6, 8
65	*Crataegus orientalis* var. *orientalis*	FR	Raw	2, 5
66	*Crataegus pontica*	FR	Raw	1
67	*Crepis sancta*	FL	Raw	5
68	*Crocus cancellatus* ssp. *damacenus*	BL		11
69	*Crocus pallasii*	BL		11
70	*Cucumis melo*	FR, SE	Raw, Dried	2, 5
71	*Cucurbita pepo*	FR	Dried, Cooked	2, 5
72	*Cyperus longus*	TU	Raw	2
73	*Cyperus rotundus*	TU	Raw	2
74	*Dianthus strictus* var. *strictus*	FL		11
75	*Diospyros kaki*	FR	Raw	2, 5
76	*Diplotaenia cachrydifolia*	AP	Cooked	1
77	*Dranculus vulgaris*	AP	Cooked	2
78	*Echinophora tenuifolia* ssp. *sibthorpiana*	AG, LE		7, 10
79	*Echinops heterophyllus*	CA, ST	Raw	1
80	*Echinops orientalis*	CA	Raw	1
81	*Echinops pungens* var. *adenoclades*	CA	Raw	2, 5
82	*Echinops sphaerocephalus* ssp. *sphaerocephalus*	CA	Raw	2
83	*Elaeagnus angustifolia*	FR	Raw	2, 5
84	*Eremurus spectabilis*	SH	Cooked	1, 2
85	*Erodium cicutarium* ssp. *cicutarium*	FR	Raw	2, 3
86	*Erophila verna* ssp. *verna*	LE		7
87	*Eryngium billardieri*	RO, ST	Raw	1, 2, 5
88	*Eryngium campestre* var. *virens*	ST	Raw	2, 3, 5
89	*Erysimum repandum*	AP	Cooked	2
90	*Euphorbia cheriradenia*	LA		5
91	*Falcaria vulgaris*	AP	Raw, Cooked	1
92	*Ferula orientalis*	SH	Raw, Cooked	1
93	*Ficus carica* ssp. *carica*	FR	Raw, Cooked	2, 5
94	*Foeniculum vulgare*	AP	Raw	6
95	*Geranium tuberosum* ssp. *deserti-syriacum*	TU	Raw	11
96	*Gladiolus atroviolaceus*	FL	Raw	3
97	*Gundelia tournefortii* var. *armata*	RO, SH	Raw, Cooked	7, 8
98	*Gundelia tournefortii* var. *tournefortii*	RO, ST	Raw, Latex, Gum, Cooked	1–3, 5, 6
99	*Helianthus annuus*	SE	Raw	1, 2, 5
100	*Helianthus tuberosus*	TU	Raw	1
101	*Hibiscus esculentis*	FR	Cooked	2, 5
102	*Hordeum bulbosum*	BL	Raw	1, 2
103	*Hyacinthella nervosa*	AG		7
104	*Imperata cylindrica*	FL	Raw	2
105	*Iris masia*	FL	Raw	2

Continued

Tabel 5.3. Continued.

	Plant taxa	Part used	Preparation	Source
106	*Iris persica*	FL, RH	Raw	5, 6
107	*Iris reticulata* var. *reticulata*	FL	Boiled	3
108	*Ixiolirion tataricum* ssp. *montanum*	FL	Nectar	3, 7
109	*Juglans regia*	FR	Raw	5, 6
110	*Jurinea pulchella*	SH	Cooked	2
111	*Lactuca serriola*	AG, LE		7, 10
112	*Lathyrus annuus*	FR	Raw	2
113	*Lathyrus cicera*	FR, SE	Raw, Cooked	2, 9
114	*Lathyrus gorgoni* var. *gorgoni*	SE	Raw	2
115	*Lathyrus inconspicuus*	FR, SE	Raw	2, 3
116	*Lathyrus palustris* ssp. *palustris*	SE	Raw	2
117	*Lathyrus sativus*	SE	Raw	9
118	*Lens culinaris*	SE	Cooked	5
119	*Lens orientalis*	SE	Raw	9
120	*Lepidium sativum* ssp. *sativum*	AP	Cooked, Raw	2, 5, 8
121	*Malus sylvestris* ssp. *orientalis*	FR	Raw, Cooked	1, 2, 5
122	*Malva neglecta*	AP, FR, LE	Cooked, Raw	2–4, 6
123	*Malva sylvestris*	FR, LE	Cooked	10
124	*Malvella sherardiana*	AP	Raw	11
125	*Matricaria aurea*	FR, LE	Raw	3
126	*Mentha longifolia* ssp. *longifolia*	LE	Raw	2
127	*Mentha longifolia* ssp. *typhoides* var. *typhoides*	LE	Raw, Cooked	2, 5
128	*Mentha pulegium*	LE	Direct use	10
129	*Mentha spicata* ssp. *spicata*	AP	Raw	6
130	*Michauxia laevigata*	ST	Raw	1
131	*Morus alba*	FR	Eaten fresh, Cooked	1, 2, 5, 12
132	*Morus nigra*	FR	Raw	2, 5, 10, 12
133	*Myrtus communis*	FR	Raw	2
134	*Nasturtium officinale*	AP	Cooked, Raw	2, 5, 8
135	*Nigella sativa*	SE	Raw	8
136	*Nonea pulla*	LE	Raw	1
137	*Notobasis syriaca*	SH	Raw, Cooked	2, 5, 7
138	*Olea europaea*	FR	Raw	2, 5, 10
139	*Onobrychis crista-galli*	SE	Raw	9
140	*Ononis spinosa*	LE	Eaten, Dried	1
141	*Onopordum acanthium*	ST	Raw	2, 5
142	*Onopordum carduchorum*	ST	Raw	3
143	*Onosma molle*	FL	Nectar	11
144	*Onosma roussaei*	FL	Nectar	3
145	*Onosma sericeum*	AP	Cooked, Gum	2, 7
146	*Ornithogalum narbonense*	AP, LE, ST	Cooked, Raw	4, 8
147	*Oryza sativa*	SE	Cooked	2, 5
148	*Papaver rhoeas*	BU, FL, LE	Cooked, Raw	2, 3
149	*Pelargonium quercetorum*	LE	Raw, Cooked	1
150	*Persica vulgaris*	FR	Raw, Cooked	2, 5
151	*Pimpinella anthriscoides* var. *anthriscoides*	SH	Cooked	1
152	*Pimpinella eriocarpa*	AG		7
153	*Pistacia khinjuk*	FR	Raw	1, 8
154	*Pistacia terebinthus* ssp. *palaestina*	FR, SH, ST	Raw, Gum	2, 5, 6
155	*Pistacia vera*	FR	Raw	10
156	*Pisum sativum* ssp. *elatius* var. *pumilio*	SE	Raw	9
157	*Polygonum arenastrum*	AP	Raw, Cooked	2, 5
158	*Polygonum cognatum*	AP	Raw, Cooked	2

Continued

Tabel 5.3. Continued.

	Plant taxa	Part used	Preparation	Source
159	*Portulaca oleracea*	AP, SH	Raw, Cooked	1–3, 5, 6, 8, 10
160	*Prangos pabularia*	AP	Cooked	2
161	*Prosopis farcta*	FR		2
162	*Prunella vulgaris*	SH		1
163	*Prunus armeniaca*	FR	Raw, Cooked	2, 5
164	*Prunus divaricata*	FR	Raw	6
165	*Punica granatum*	FR	Raw	2, 5
166	*Pyracantha coccinea*	FR	Raw	2
167	*Pyrus commnis* ssp. *communis*	FR	Raw, Cooked	2, 3, 5
168	*Pyrus elaeagnifolia*	FR	Raw, Cooked	6
169	*Pyrus syriaca* var. *syriaca*	FR	Raw, Cooked	1
170	*Quercus brantii*	FR	Raw	1
171	*Quercus infectoria* ssp. *boissieri*	LE	Boiled	2
172	*Ranunculus kochii*	LE	Raw	1
173	*Rheum ribes*	SH, ST	Raw	1, 2, 5, 6
174	*Rhus coriaria*	FR	Raw	1, 2
175	*Rosa canina*	FL, FR	Cooked, Raw	1, 6
176	*Rubus caesius*	FR	Raw	1
177	*Rubus canescens* var. *canescens*	FR	Raw, Cooked	2, 5
178	*Rubus discolor*	FR	Raw, Cooked	6
179	*Rubus sanctus*	FR, RO	Raw	1, 3, 10
180	*Rumex acetosella*	LE	Raw	8
181	*Rumex alpinus*	LE	Raw	1
182	*Rumex conglomeratus*	LE	Raw, Cooked	2, 5
183	*Rumex crispus*	LE	Raw, Cooked	2
184	*Rumex scutatus*	LE	Raw	6
185	*Rumex tuberosus* ssp. *horizontalis*	LE	Cooked	1
186	*Salvia poculata*	LE	Cooked	1
187	*Scandix stellata*	AP	Cooked	3
188	*Scorpiurus muricatus* ssp. *villosus*	FR		2
189	*Scorzonera mollis* ssp. *mollis*	RO	Raw, Cooked	1
190	*Scorzonera pseudolanata*	TU	Raw	3
191	*Sesamum indicum*	SE	Raw	5
192	*Silene coniflora*	FL		7
193	*Silene dichotoma* ssp. *dichotoma*	AP	Cooked	3
194	*Silene vulgaris* var. *vulgaris*	WP	Raw	6
195	*Sinapis alba*	AP	Raw	8
196	*Sinapis arvensis*	LE, ST	Raw	5, 6, 7
197	*Sisymbrium altissimum*	AP	Raw, Cooked	3
198	*Smyrnium olusantrum*	ST	Raw	1
199	*Symphytum kurdicum*	LE	Cooked	1
200	*Thymbra sintenisii* ssp. *sintenisii*	AP	Raw	3
201	*Thymbra spicata* var. *spicata*	AP	Raw	8
202	*Torilis tenella*	AP	Raw, Cooked	3
203	*Tragopogon buphthalmoides* var. *buphthalmoides*	LE, RO	Raw	1, 6, 10
204	*Tragopogon buphthalmoides* var. *latifolius*	AP	Raw	1
205	*Tragopogon longirostris* var. *longirostris*	SH	Raw	2
206	*Tragopogon pusillus*	FR		11
207	*Triticum aestivum*	SE	Cooked	5
208	*Urtica dioica*	AP, WP	Raw, Cooked	2, 5, 10
209	*Vaccaria pyramidata* var. *grandiflora*	SE		2
210	*Veronica anagallis-aquatica* ssp. *oxycarpa*	AP	Raw	2
211	*Vicia aintabensis*	SE	Raw	9

Continued

Tabel 5.3. Continued.

	Plant taxa	Part used	Preparation	Source
212	*Vicia alpestris* ***ssp****. alpestris*	SE	Raw	1
213	*Vicia anatolica*	SE	Raw	9
214	*Vicia cracca* ssp. *tenuifolia*	SE	Raw	1
215	*Vicia ervilia*	SE	Raw	2
216	*Vicia faba*	SE	Raw	2
217	*Vicia hybrida*	SE	Raw	9
218	*Vicia narbonensis* var. *narbonesis*	FR, SE	Raw	3, 9
219	*Vicia pannonica* var. *purpurascens*	FR	Raw	3
220	*Vicia sativa ssp. nigra* var. *nigra*	FR, SE	Raw	2, 9
221	*Vicia sativa ssp. nigra* var. *segetalis*	FR	Raw	2
222	*Vicia sativa* ssp. *sativa*	FR	Raw	2
223	*Vitis vinifera*	FR, LE	Raw, Cooked	1–3, 5
224	*Zea mays*	FR	Cooked	1, 2, 5
225	*Ziziphora tenuior*	AG		7

Notes

Part used: AG: Above ground; AP: Aerial parts; BL: Bulb; BU: Bud; CA: Capitulum; FL: Flower; FR: Fruit; LA: Latex; LE: Leaves; RH: Rhizome; RO: Root; SE: Seed; SH: Shoot; ST: Stem; TU: Tuber; WP: Whole plant

Sources: 1: İ. Kaval, Geçitli (Hakkari) ve çevresinin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2011, unpublished thesis; 2: A. Gençay, Cizre (Şırnak)'nin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2007, unpublished thesis; 3: Akgül, 2008; 4: Yapıcı *et al*., 2009; 5: A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis; 6: N. Güldaş, Adıyaman İlinde etnobotanik değeri olan bazı bitkilerin kullanım alanlarının tespiti. Department of Biology, Institute of Science and Technology, Fırat University, 2009, unpublished thesis; 7: Akan *et al*., 2013c; 8: Akan *et al*., 2005b; 9: Akan *et al*., 2013b; 10: Şığva and Seçmen, 2009; 11: Akan *et al*., 2008; 12: Aslan *et al*., 2011.

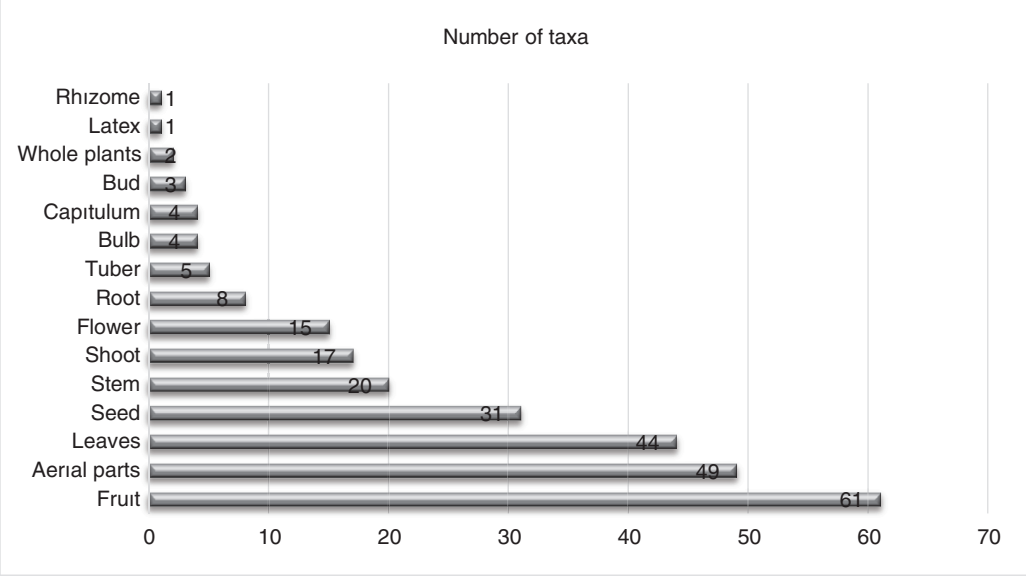

Fig. 5.6. The parts used as foods with the number of taxa in Southeastern Anatolia

Table 5.4. Plants used as spices in Southeast Anatolia.

	Plant taxa	Part used	Source
1	*Allium ampeloprasum*	Shoot	1, 2
2	*Allium longicuspis*	Aerial parts	1
3	*Filipendula ulmaria*	Aerial parts	1
4	*Foeniculum vulgare*	Aerial parts	1, 2
5	*Mentha aquatica*	Leaves	3
6	*Mentha longifolia* ssp. *longifolia*	Aerial parts	1, 2
7	*Mentha longifolia* ssp. *typhoides* var. *calliantha*	Leaves	1, 4
8	*Mentha pulegium*	Leaves	3
9	*Mentha spicata* ssp. *spicata*	Leaves	5
10	*Ocimum basilicum*	Aerial parts	1
11	*Origanum vulgare* ssp. *gracile*	Leaves, Flower	5
12	*Primula auriculata*	Aerial parts	1
13	*Ranunculus kotschyi*	Leaves	1
14	*Rhus coriaria*	Fruit	1, 2, 4–7
15	*Salvia syriaca*	Fruit	7
16	*Scilla persica*	Leaves	1
17	*Thymbra sintenisii* ssp. *sintenisii*	Aerial parts	7
18	*Thymbra spicata* var. *spicata*	Leaves, Flower	5, 8
19	*Thymus kotschyanus* var. *kotschyanus*	Aerial parts	1

Sources: 1: İ. Kaval, Geçitli (Hakkari) ve çevresinin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2011, unpublished thesis; 2: A. Gençay, Cizre (Şırnak)'nin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2007, unpublished thesis; 3: Tursun, 2001; 4: A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis; 5: N. Güldaş, Adıyaman İlinde etnobotanik deg˘eri olan bazı bitkilerin kullanım alanlarının tespiti. Department of Biology, Institute of Science and Technology, Fırat University, 2009, unpublished thesis; 6: Şığva and Seçmen, 2009; 7: Akgül, 2008; 8: Akan *et al*., 2005b

Table 5.5. The plants added to cheese in Southeastern Anatolia.

	Plant taxa	Part used	Source
1	*Allium giganteum*	Aerial parts	1
2	*Allium kharputense*	Aerial parts	2
3	*Allium scorodoprasum* ssp. *rotundum*	Shoot	1
4	*Allium trachycoleum*	Shoot	1
5	*Allium vinele*	Shoot	2
6	*Chaerophyllum macrospermum*	Aerial parts	1
7	*Diplotaenia cachrydifolia*	Aerial parts	1
8	*Eremurus spectabilis*	Aerial parts	2
9	*Euphorbia cheiradenia*	Latex	2
10	*Ferula haussknechtii*	Shoot	3
11	*Ferula orientalis*	Shoot	1
12	*Ferulago angulata* ssp. *angulata*	Aerial parts	1
13	*Ferulago angulata* ssp. *carduchorum*	Aerial parts	1
14	*Ferulago stellata*	Aerial parts	1
15	*Gundelia tournefortii* var. *tournefortii*	Shoot	1
16	*Heracleum persicum*	Aerial parts	1
17	*Medicago sativa* ssp. *sativa*	Root	1
18	*Pimpinella kotschyana*	Aerial parts	1
19	*Prangos pabularia*	Aerial parts	2
20	*Primula auriculata*	Aerial parts	1

Continued

Table 5.5. Continued.

	Plant taxa	Part used	Source
21	*Prunella vulgaris*	Shoot	1
22	*Ranunculus fenzlii*	Aerial parts	2
23	*Sium sisarum* var. *lancifolium*	Aerial parts	1
24	*Thymus kotschyanus* var. *kotschyanus*	Aerial parts	1
25	*Trigonella foenum-graecum*	Aerial parts	4

Sources: 1: İ. Kaval, Geçitli (Hakkari) ve çevresinin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2011, unpublished thesis; 2: A. Gençay, Cizre (Şırnak)'nin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2007, unpublished thesis; 3: Özgökçe and Özçelik, 2004; 4: N. Güldaş, Adıyaman İlinde etnobotanik değeri olan bazı bitkilerin kullanım alanlarının tespiti. Department of Biology, Institute of Science and Technology, Fırat University, 2009, unpublished thesis

Table 5.6. The plants used as herbal teas in Southeastern Anatolia.

	Plant taxa	Part used	Source
1	*Anthemis hyalina*	Flower	1
2	*Cyclotrichum leucotrichum*	Aerial parts	1
3	*Lamium macrodon*	Flower	2
4	*Micromeria cristata*	Stem	3
5	*Phlomis armeniaca*	Flower, Leaves	2, 4
6	*Salvia multicaulis*	Flower, Leaves	2, 4
7	*Salvia syriaca*	Flower	2
8	*Scutellaria tomentosa*	Above ground	5
9	*Sideritis libanotica ssp. linearis*	Aerial parts	6
10	*Sideritis libanotica ssp. microchlamys*	Stem	3
11	*Stachys lavandulifolia*	Stem	3
12	*Teucrium polium*	Flower	7
13	*Thymbra spiacata* var. *spicata*	Leaves	8, 9

Sources: 1: Akan *et al*., 2008; 2: A. Gençay, Cizre (Şırnak)'nin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2007, unpublished thesis; 3: N. Güldaş, Adıyaman İlinde etnobotanik değeri olan bazı bitkilerin kullanım alanlarının tespiti. Department of Biology, Institute of Science and Technology, Fırat University, 2009, unpublished thesis; 4: A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis; 5: Akan *et al*., 2013c; 6: Akgül, 2008; 7: Akan *et al*., 2013c; 8: Akgül, 2008; 9: Şığva and Seçmen, 2009.

5.7 Plants Used as Fodder in Southeastern Anatolia

Meadows and pastures are an important genetic source for cultivated plants, contribute much to biological diversity, serve as the areas of shelter for animals, and shield land from erosion, in addition to serving as the most important natural sources of forage plants for animals (Aydın and Uzun, 2002; Ozturk *et al*., 2012c). These habitats are also very important as a cheaper feed-source for animal nutrition and animal health in terms of the quality of animal products. Therefore, pasture and meadow areas and their efficiency is of paramount importance (Kaya *et al*., 2001; Babalık and Sönmez, 2009).

Harlan (1983) has separated the fodder plants into four geographical regions. He has reported that Turkey includes three of these regions: Europe, Mediterranean and Middle East. He reports that the some of the species of *Lolium*, *Trifolium*, *Medicago*, *Dactylis*, *Festuca*, *Avena*, *Phleum*, *Lupinus* are spread out in the centre of Europe, whereas some species of *Dactylis*, *Festuca*, *Avena*, *Phleum*, *Lupinus* are from the Mediterranean and some species of *Trifolium*, *Medicago*, *Onobrychis*, *Agropyron*, *Festuca*, *Bromus* from the Middle East.

Turkey is known as the first cultivation centre of Leguminosae members like *Vicia, Pisum, Lupinus*, and *Lens* (Harlan, 1971; Zohary and Hopf, 1994; Ozturk *et al*., 2012d). *Hordeum spontaneum* is believed to be the ancestor of barley, *Avena strigosa* the ancestor of oats, and *Secale anatolicum, S. montanum* and *S. segatale* the ancestors of rye. *Lens orientalis* is the ancestor of lentil, *Vicia galilae* the ancestor of beans, *Pisum elatius* and *P. humile* are ancestors of pea. These have all spread across Anatolia. Şanlıurfa and its environs are known as the gene resource of plants, especially of wheat (*Triticum*) and lentil (*Lens*) (Ekim, 1994; Cevheri and Çetin, 2010).

In this context, and in the light of studies conducted in the region, Southeastern Anatolia shows a potential spread of fodder plants with a total of 156 taxa (see Table 5.7). Nearly 50% of (78 taxa) these taxa belong to the Fabaceae family including 15, 13, 10, 7, 7, 6 and 6 taxa respectively from *Trifolium, Vicia, Medicago, Lathyrus, Trigonella, Astragalus* and *Onobrychis*.

Table 5.7. The potential fodder plants from Southeastern Anatolia.

	Plant taxa	Part used	Source
1	*Acanthus syriacus*	Aerial parts	1
2	*Aegilops triuncialis* ssp. *triuncialis*	Aerial parts	2
3	*Alcea setose*	Aerial parts	3
4	*Alhagi pseudalhagi*	Fruits, Aerial parts	4, 5
5	*Alkanna orientalis*	Leaves	4
6	*Anchusa azurea* var. *azurea*	Leaves	2, 4
7	*Anchusa azurea* var. *kurdica*	Leaves	2
8	*Anchusa strigosa*	Aerial parts	2
9	*Astragalus chiristianus*	Aerial parts	3
10	*Astragalus gummifer*	Aerial parts	6
11	*Astragalus hamosus*	Aerial parts	7
12	*Astragalus lamarckii*	Root	7
13	*Astragalus russelii*	Root	1, 7
14	*Astragalus xylobasis* var. *angustus*	Aerial parts	1
15	*Avena sterilis* var. *sterilis*	Aerial parts	1, 5
16	*Bromus japonicus* ssp. *japonicus*	Aerial parts	2
17	*Bunium paucifolium* var. *paucifolium*	Aerial parts	1
18	*Centaurea iberica*	Aerial parts	5
19	*Centaurea stapfiana*	Aerial parts	3
20	*Cephalaria hakkarica*	Aerial parts	8
21	*Cephalaria procera*	Aerial parts	9
22	*Cephalaria setose*	Aerial parts	5
23	*Chrozophora tinctoria*	Aerial parts	2
24	*Chrysopogon gryllus* ssp. *gryllus*	Aerial parts	2
25	*Cicer arietinum*	Leaves, Aerial parts	4, 5
26	*Cicer echinospermum*	Aerial parts	7
27	*Cichorium intybus*	Aerial parts	5
28	*Convolvulus arvensis*	Aerial parts	1, 3
29	*Coronilla scorpioides*	Aerial parts	1, 7
30	*Crepis sancta*	Aerial parts	4, 5
31	*Cynodon dactylon* var. *villosus*	Aerial parts	2
32	*Cynosurus effuses*	Aerial parts	2
33	*Daucus broteri*	Above ground	1
34	*Echinops sphaerocephalus* ssp. *sphaerocephalus*	Aerial parts	5
35	*Echium italicum*	Aerial parts	3
36	*Eremopyrum bonaepartis* ssp. *bonaepartis*	Above ground	1
37	*Erysimum repandum*	Aerial parts	5
38	*Euphorbia microsphaera*	Above ground	1
39	*Ferula hausknechtii*	Aerial parts	8

Continued

Table 5.7. Continued.

	Plant taxa	Part used	Source
40	*Ferula orientalis*	Aerial parts	8
41	*Galium aparine*	Aerial parts	8
42	*Geranium tuberosum* ssp. *tuberosum*	Aerial parts, Tuber	1, 3
43	*Gundelia tournefortii*	Aerial parts	5
44	*Gypsophila viscose*	Above ground	1
45	*Hedysarum pannosum*	Above ground	1, 7
46	*Helianthus annuus*	Stem, Leaves	4, 8
47	*Heliotropium europaeum*	Aerial parts	4
48	*Hippocrepis unisiliquosa* ssp. *unisiliquosa*	Aerial parts	1, 7
49	*Hordeum bulbosum*	Aerial parts	4, 5
50	*Hordeum murinum* ssp. *leporinum* var. *leporinum*	Above ground	1
51	*Hordeum spontaneum*	Above ground	1
52	*Hymenocarpus circinnatus*	Aerial parts	7
53	*Jurinea pulchella*	Stem	5
54	*Lactuca undulata*	Aerial parts	2
55	*Lathyrus annuus*	Aerial parts	5
56	*Lathyrus aphaca* var. *modestus*	Above ground	1
57	*Lathyrus cicera*	Aerial parts	5, 7, 9
58	*Lathyrus gorgoni* var. *gorgoni*	Aerial parts	5
59	*Lathyrus inconspicuus*	Aerial parts, Fruits	3, 5
60	*Lathyrus palustris* ssp. *palustris*	Aerial parts	5
61	*Lathyrus sativus*	Above ground	1
62	*Lens culinaris*	Fruits	4, 5
63	*Lens orientalis*	Aerial parts	7
64	*Leontodon hispidus* var. *hispidus*	Aerial parts	5
65	*Lithospermum purpurocaeruleum*	Aerial parts	3
66	*Lotus aegaeus*	Aerial parts	7
67	*Medicago lupulina*	Aerial parts	7
68	*Medicago minima* var. *minima*	Above ground	1, 7
69	*Medicago noeana*	Aerial parts	7
70	*Medicago orbicularis*	Aerial parts	7, 9
71	*Medicago polymorpha* var. *vulgaris*	Above ground	1
72	*Medicago radiate*	Above ground	1, 3, 5, 7
73	*Medicago rigidula* var. *cinerascens*	Aerial parts	5
74	*Medicago rigidula* var. *rigidula*	Above ground	1, 4, 7
75	*Medicago rigidula* var. *submitis*	Aerial parts	3
76	*Medicago sativa* ssp. *sativa*	Aerial parts	7, 8
77	*Melica ciliata* ssp. *ciliata*	Above ground	1
78	*Melilotus officinalis*	Aerial parts	7
79	*Notobasis syriaca*	Shoot	5
80	*Onobrychis altissima*	Above ground	1
81	*Onobrychis armena*	Above ground	1, 4, 5
82	*Onobrychis cornuta*	Aerial parts	8
83	*Onobrychis crista-galli*	Aerial parts	7
84	*Onobrychis kotschyana*	Above ground	1, 7
85	*Onobrychis megataphros* var. *podperae*	Above ground	1
86	*Onopordum acanthium*	Aerial parts	4, 5
87	*Onosma sericeum*	Aerial parts	5
88	*Oryza sativa*	Aerial parts	4, 5
89	*Paliurus spina-christii*	Leaves	8
90	*Papaver rhoeas*	Aerial parts	3
91	*Phlomis bruguieri*	Above ground	1

Continued

Table 5.7. Continued.

	Plant taxa	Part used	Source
92	*Phlomis kurdica*	Above ground	1
93	*Pisum sativum* ssp. *elatius* var. *pumilio*	Above ground	1
94	*Platanus orientalis*	Leaves	4, 5
95	*Prangos pabularia*	Whole plants	8
96	*Prosopis farcta*	Aerial parts	5
97	*Pterocephalus pyrethrifolius*	Flower	3
98	*Quercus brantii*	Leaves, Fruit	5
99	*Quercus ilex*	Leaves, Fruit	5
100	*Quercus infectoria* ssp. *boissieri*	Leaves, Fruit	4, 5, 8
101	*Quercus ithaburensis* ssp. *macrolepis*	Leaves, Fruit	4, 5
102	*Salvia multicaulis*	Aerial parts	3
103	*Salvia syriaca*	Above ground	1
104	*Scandix stellata*	Above ground	1
105	*Scorpiurus muricatus* var. *subvillosus*	Above ground	1, 7
106	*Scorzonera kotschyi*	Above ground	1
107	*Scorzonera laciniata* ssp. *laciniata*	Aerial parts	2
108	*Senecio vernalis*	Aerial parts	4, 5
109	*Smyrniopsis aucheri*	Aerial parts	8
110	*Sorghum halepense* var. *muticum*	Aerial parts	4, 5
111	*Tanacetum argyrophyllum* var. *agrophyllum*	Aerial parts	8
112	*Taraxacum sintenisii*	Above ground	1
113	*Tragopogon longirostris* var. *longirostris*	Shoot	3, 5, 9
114	*Trifolium angustifolium* var. *angustifolium*	Aerial parts	4, 5, 7
115	*Trifolium boissieri*	Aerial parts	7
116	*Trifolium bullatum*	Aerial parts	7
117	*Trifolium campestre*	Above ground	1, 4, 5
118	*Trifolium dasyurum*	Above ground	1
119	*Trifolium echinatum* var. *echinatum*	Above ground	1, 5
120	*Trifolium hybridum var. hybridum*	Aerial parts	5
121	*Trifolium leucanthum*	Above ground	1, 7
122	*Trifolium nigrescens* ssp. *petrisavii*	Aerial parts	5, 9
123	*Trifolium physodes* var. *psilocalyx*	Aerial parts	5
124	*Trifolium pilulare*	Above ground	1, 7
125	*Trifolium resupinatum* var. *resupinatum*	Above ground	1
126	*Trifolium spumosum*	Above ground	1
127	*Trifolium stellatum* var. *stellatum*	Aerial parts	7
128	*Trifolium tomentosum* var. *tomentosum*	Above ground	1, 5, 7
129	*Trigonella capitata*	Aerial parts	5
130	*Trigonella coelesyriaca*	Above ground	1, 7
131	*Trigonella filipes*	Above ground	1, 7
132	*Trigonella mesopotamica*	Above ground	1
133	*Trigonella monantha* ***ssp****. monantha*	Above ground	1, 7
134	*Trigonella monspeliaca*	Above ground	1
135	*Trigonella spruneriana* var. *spruneriana*	Above ground	1, 5, 7
136	*Tripleurospermum parviflorum*	Flower, aerial parts	4, 5
137	*Triticum aestivum*	Aerial parts	2
138	*Triticum dicoccoides*	Above ground	1
139	*Turgenia latifolia*	Above ground	1
140	*Vaccaria pyramidata* var. *grandiflora*	Aerial parts	3, 5
141	*Vaccaria pyramidata* var. *oxyodonta*	Above ground	1
142	*Vicia anatolica*	Above ground	1, 7
143	*Vicia assyriaca*	Aerial parts	7

Continued

Table 5.7. Continued.

	Plant taxa	Part used	Source
144	*Vicia cracca* ssp. *tenuifolia*	Aerial parts	8
145	*Vicia ervilia*	Aerial parts	5, 7
146	*Vicia faba*	Aerial parts	5
147	*Vicia hybrid*	Aerial parts	3
148	*Vicia narbonensis* var. *narbonesis*	Fruits	3
149	*Vicia palaestina*	Aerial parts	7
150	*Vicia pannonica* var. *purpurascens*	Fruits	3
151	*Vicia sativa* ssp. *nigra* var. *nigra*	Above ground	1, 5
152	*Vicia sativa* ssp. *nigra* var. *segetalis*	Above ground	1, 5
153	*Vicia sativa* ssp. *sativa*	Above ground	1, 5
154	*Vicia villosa*	Aerial parts	7
155	*Vitex pseudo-negundo*	Leaves	5
156	*Zea mays*	Aerial parts	4, 5

Sources: 1: Akan *et al*., 2013c; 2: Akan *et al*., 2008; 3: Akgül, 2008; 4: A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis; 5: A. Gençay, Cizre (Şırnak)'nin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2007, unpublished thesis; 6: N. Güldaş, Adıyaman İlinde etnobotanik değeri olan bazı bitkilerin kullanım alanlarının tespiti. Department of Biology, Institute of Science and Technology, Fırat University, 2009, unpublished thesis; 7: Akan *et al*., 2013b; 8: İ. Kaval, Geçitli (Hakkari) ve çevresinin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2011, unpublished thesis; 9: Yapıcı *et al*., 2009.

5.8 Other Economic Plants Used in Southeastern Anatolia

Apart from the uses given above, plants in the region are also used in basket making, toys, brooms, musical instruments, handicrafts, in house constructions, decorations, as natural dyes, and as fuel. A total of 159 taxa are used for this purpose (see Table 5.8).

The majority are used as fuel (49 taxa: 22.38%), or as ornaments (35 taxa: 15.98%), followed by handcrafts (35 taxa: 15.98%) (see Fig 5.7). The number of taxa and their percentages in the production of dyes is 27 taxa (12.33%), musical instruments 25 taxa (11.42%), brooms 15 taxa (6.85%) (see Fig 5.7).

Trigonella monantha ssp. *noeana*, *Ballota saxalis* ssp. *saxalis*, *Cyclotrichum leucotrichum*, *Matricaria aurea* and *Parietaria judaica* are used as aromatic plants; *Ammi visnaga*, *Verbascum orientale* and *Verbascum kotschyi* as insectisides; *Pistacia terebinthus* ssp. *palaestina* and *Pistacia khinjuk* in soap making; *Ammi visnaga* (A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis) and *Daucus littoralis* in making tooth picks; *Alcea hohenackeri* as detergent; *Cyperus longus* for rope and *Eremurus spectabilis* for gum production (Akan *et al*., 2005b; A. Gençay, Cizre (Şırnak)'nin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2007, unpublished thesis; Akan *et al*., 2008; N. Güldaş, Adıyaman İlinde etnobotanik değeri olan bazı bitkilerin kullanım alanlarının tespiti. Department of Biology, Institute of Science and Technology, Fırat University, 2009, unpublished thesis; İ. Kaval, Geçitli (Hakkari) ve çevresinin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2011, unpublished thesis; A. Akgül, Midyat (Mardin) civarında etnobotanik. Graduate School of Science, Ege University, Izmir, Turkey, 2008, unpublished thesis). The total percentage of these uses in general does not go beyond 6.37%. Photographs of some of the representative medicinal plants and other aspects can be found in Fig. 5.8.

5.9 Conclusions

A determination of the drought-tolerant plant species which will be suitable for dry conditions in the future needs to be considered for food security (Ozturk *et al*., 2011; Ozturk *et al*., 2012a, b, c). Ecological sustainability is another important factor,

Table 5.8. Other economic uses of plants in Southeastern Anatolia.

	Plant taxa	Fuel	Ornamental	Dye	Musical Instruments	Handcrafts	Broom	Basket	Toy	Others	Source
1	*Abies cilicica*				x						1
2	*Acer monspessulanum ssp. cinerascens*					X					2
3	*Acer pseudoplatanus*				x						1
4	*Adianthum capillaris*		x								3
5	*Alcea hohenackeri*		x							x	4, 5
6	*Alhagi pseudalhagi*						x				6, 7
7	*Alkanna hirsutissima*			x							7
8	*Alkanna megacarpa*			x							7
9	*Alkanna orientalis var. orientalis*			x							3, 4
10	*Alkanna tinctoria ssp. anatolica*			x							8
11	*Amaranthus patulus*		x								3, 4
12	*Amaranthus viridis*		x								3, 4
13	*Ammi visnaga*									x	3, 4, 9
14	*Amygdalus communis*	x			x	X					1, 2, 4
15	*Anagyris foetida*							x			10
16	*Anchusa azurea var. Azurea*					X					11
17	*Anemone coronaria*		x								4
18	*Anthemis tinctoria var. Pallida*			x							8
19	*Artemisia annua*		x				x				3, 4
20	*Arundo donax*				x	X					1, 2, 4
21	*Astragalus aduncus*	x									6
22	*Astragalus amblolepis*	x									4
23	*Astragalus gaziantepicus*	x									6
24	*Astragalus karabaghensis*	x									2
25	*Astragalus microcephalus*	x									12
26	*Astragalus pycnocephalus var. pycnocephalus*	x									2
27	*Astragalus russelii*	x							x		6, 7
28	*Ballota saxalis ssp. Saxalis*									x	11
29	*Berberis crataegina*	x				X					4
30	*Buxus sempervirens*				x						1
31	*Cardaria draba*	x									7
32	*Carpinus orientalis*	x			x	X					1, 13
33	*Carthamus tinctorius*			x							14
34	*Castanea sativa*				x						1

Continued

Table 5.8. continued.

	Plant taxa	Fuel	Ornamental	Dye	Musical Instruments	Handcrafts	Broom	Basket	Toy	Others	Source
35	*Celtis australis*							x			10
36	*Centaurea iberica*	x									3
37	*Cerasus mahalep var. Mahalep*					X					2, 11
38	*Cerasus microcarpa*				x						1
39	*Convolvulus betonicifolius*		x								3
40	*Convolvulus holosericeus*						x				15
41	*Convolvulus stachydifolius*		x								3, 4
42	*Cornus mas*				x						1
43	*Cotinus coggyria*			x							11
44	*Crataegus aronia var. Aronia*	x									4, 8
45	*Crataegus orientalis var. orientalis*	x							x		3, 4
46	*Crupina crupinastrum*						x				11
47	*Cyclotrichum leucotrichum*									x	11
48	*Cyperus longus*									x	2
49	*Datura innoxia*		x								3, 4
50	*Daucus littoralis*									x	4
51	*Delphinium peregrinum*		x								15
52	*Diospros ebenum*				x						1
53	*Elaeagnus angustifolia*		x								3, 4
54	*Eminium rauwolfii var. rauwolfii*			x							7
55	*Eminium spiculatum var. spiculatum*			x							7
56	*Eremurus spectabilis*									x	2
57	*Erodium cicutarium ssp. cicutarium*								x		7
58	*Eucalyptus camaldulensis*	x				X					4, 13
59	*Fagus orientalis*				x						1
60	*Fraxinus excelsior*	x			x	X					1, 5, 13
61	*Fritallaria imperialis*		x								2, 3, 5
62	*Fritillaria persica*		x								3, 5
63	*Geranium dissectum*								x		15
64	*Gladiolus atroviolaceus*		x								3, 4
65	*Gladiolus micranthus*		x								7
66	*Gleditsia triancanthos*	x	x								4
67	*Gossypium herbaceum*	x									3, 4
68	*Helianthus annuus*	x									3, 4

69	*Iberis acutiloba*						x				7
70	*Imperata cylindrica*					X					4
71	*Ipomoea purpurea*		x								2
72	*Iris masia*		x			X					4
73	*Iris persica*		x								3, 4, 7
74	*Ixiolirion tataricum ssp. tataricum*		x								7
75	*Jasminum fruticans*			x							8
76	*Juglans regia*			x	x	X					1, 2, 4, 13
77	*Juncus inflexus*					X					2, 3, 4
78	*Juniperus excelsa*				x						1
79	*Kochia scoparia*						x				15
80	*Lagoecia cuminoides*		x								4
81	*Lantana camara*		x								4
82	*Malva neglecta*							x			11
83	*Matricaria aurea*								x		11
84	*Medicago noeana*							x			7
85	*Morus alba*	x			x	X		x			1, 2, 3, 13
86	*Morus nigra*	x			x	X					1, 2, 13
87	*Narcissus tazetta ssp. Tazetta*		x								4
88	*Nerium oleander*	x	x			X					3, 4, 5
89	*Olea europaea*	x									8
90	*Onobrychis cornuta*	x									2
91	*Paliurus spina christii*			x		X					8, 11
92	*Papaver rhoeas*		x					x			3
93	*Parietaria judaica*								x		11
94	*Peganum harmala*					X					4, 11
95	*Phlomis brugueri*	x									15
96	*Phragmites australis*	x				X					4, 8
97	*Picea orientalis*				x						1
98	*Pinus brutia*	x			x						1, 8
99	*Pinus nigra ssp. Pallasiana*	x			x	X					1, 13
100	*Pistacia khinjuk*								x		9
101	*Pistacia terebinthus ssp. palaestina*								x		4, 11
102	*Platanus orientalis*	x			x	X					1, 3, 4, 8, 13
103	*Polygala supina*						x				15
104	*Polygonum bellardii*						x				11
105	*Populus alba*	x			x	X					1, 13
106	*Populus euphratica*	x	x			X		x			3, 4, 11, 13

Continued

Table 5.8. continued.

	Plant taxa	Fuel	Ornamental	Dye	Musical Instruments	Handcrafts	Broom	Basket	Toy	Others	Source
107	*Populus nigra ssp. Nigra*	x				X		x	x		2, 5, 10, 13
108	*Prosopis farcta*	x					x				4
109	*Prunus armeniaca*			x							4
110	*Prunus spinosa*				x						1
111	*Pterocarya fraxinifolia*			x							5
112	*Punica granatum*				x			x			1, 10
113	*Pyracantha coccinea*		x								4
114	*Pyrus syriaca var. Syriaca*	x									2
115	*Quercus brantii*	x		x		X					2, 4, 11, 13
116	*Quercus ilex*	x		x							4
117	*Quercus infectoria ssp. boissieri*	x		x		X					2, 3, 4, 8, 13
118	*Quercus ithaburensis ssp. macrolepis*	x		x							3, 4
119	*Quercus robur ssp. Robur*	x									8
120	*Ranunculus asiaticus*		x								4
121	*Rhus coriaria*	x		x							3, 8
122	*Rosa canina*		x	x							2, 4
123	*Rosa damascena*		x		x						1, 4
124	*Rubia tenuifolia ssp. Doniettii*								x		11
125	*Rubia tinctorium*			x							2
126	*Rubus canescens*		x								3
127	*Rubus sanctus*			x							2
128	*Rumex tuberosus ssp. horizontalis*			x							2
129	*Salix aegyptiaca*	x				X					2
130	*Salix alba*	x				X		x			2, 3, 4, 13
131	*Salix babylonica*	x				X					4
132	*Salix excelsa*	x				X					4
133	*Salix viminalis*							x			10
134	*Salsola tragus*	x									15
135	*Salvia verticillata ssp. amasiaca*			x							2
136	*Salvia verticillata ssp. verticillata*			x							2
137	*Salvia virgata*			x							2

138	*Scabiosa argentea*							x			7, 11
139	*Scrophularia striata*							x			11
140	*Senecio vernalis*			x							3
141	*Sideritis libanotica ssp. linearis*							x			11
142	*Suaeda altissima*							x			3, 4
143	*Tagetes erecta*		x								2
144	*Tamarix smyrnensis*		x								4
145	*Tamarix tetrandra*					X					13
146	*Tilia rubra*				x						1
147	*Trigonella monantha ssp. noeana*									x	11
148	*Triticum aestivum*					X			x		3, 4, 11
149	*Triticum vulgare*								x		3
150	*Tulipa julia*		x								3, 4
151	*Typha angustifolia*					X					2
152	*Ulmus glabra*	x				X					13
153	*Verbascum kotschyi*									x	15
154	*Verbascum orientale*									x	15
155	*Vitex pseudo-negundo*	x				X		x			4, 11
156	*Vitis vinifera*	x									11
157	*Washingtonia filifera*		x								3, 4
158	*Xeranthemum annuum*							x			2, 11, 12
159	*Zea mays*	x									2, 3

Sources: 1: Akan *et al.*, 2013a; 2: İ. Kaval, Geçitli (Hakkari) ve çevresinin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2011, unpublished thesis; 3: A. Gelse, Adıyaman çevresinin etnobotanik özellikleri [Ethnobotanical Properties of the Adiyaman Environment]. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2012, unpublished thesis; 4: A. Gençay, Cizre (Şırnak)'nin etnobotanik özellikleri. Department of Biology, Institute of Science and Technology, Yüzüncü Yıl University, 2007, unpublished thesis; 5: N. Güldaş, Adıyaman İlinde etnobotanik değeri olan bazı bitkilerin kullanım alanlarının tespiti. Department of Biology, Institute of Science and Technology, Fırat University, 2009, unpublished thesis; 6: Akan *et al*., 2013b; 7: Akan *et al*., 2013c; 8: Şığva ve Seçmen, 2009; 9: Akan *et al*., 2005b; 10: Akan, 2013; 11: Akgül, 2008; 12: Yapıcı *et al*., 2009; 13: Aslan *et al.*, 2011; 14: Özgökçe and Özçelik, 2004; 15: Akan *et al*., 2008.

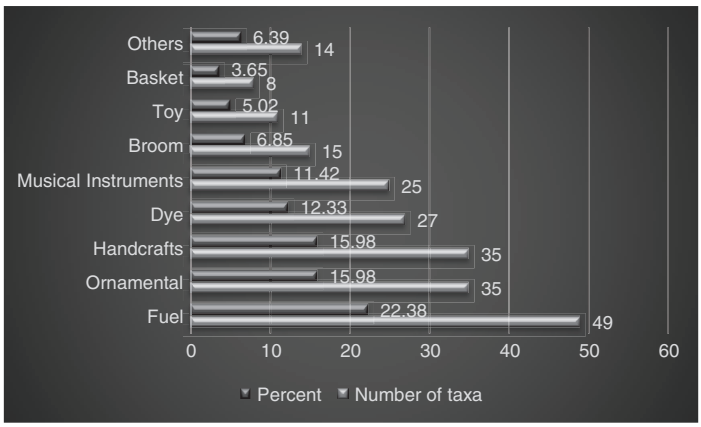

Fig. 5.7. Number and percentages of Southeastern Anatolian plant taxa with other economic uses.

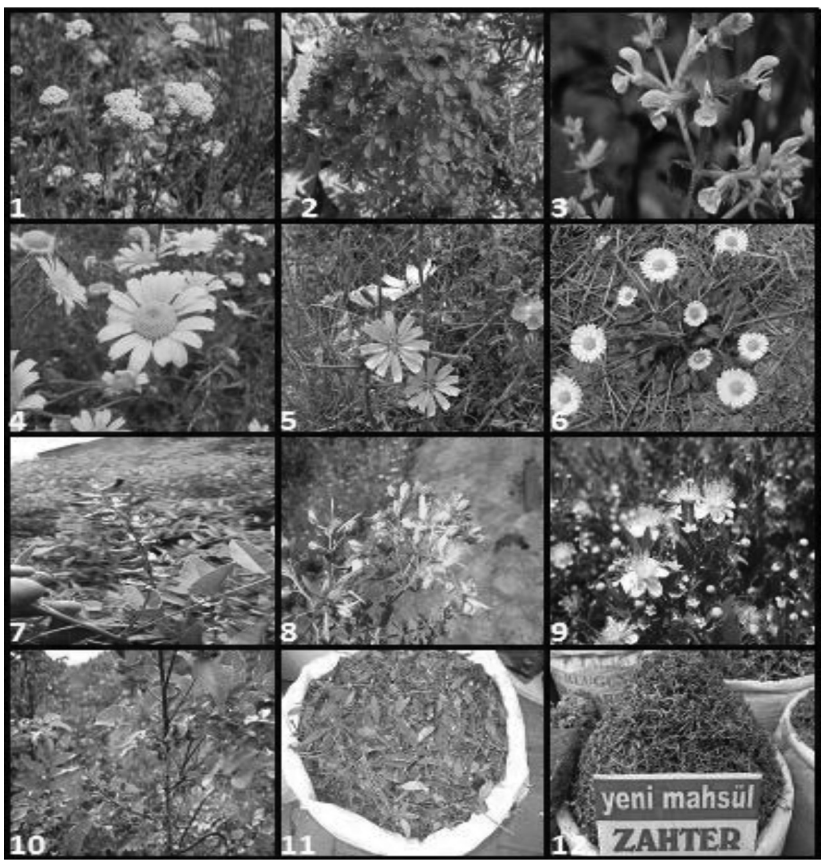

Fig. 5.8. Some commonly used medicinal plants from the study area: 1. *Achillea bieberstenii*; 2. *Hypericum capitatum* var. *capitatum*; 3. *Salvia syriaca*; 4. *Anthemis tinctoria*; 5. *Cichorium intybus*; 6. *Bellis perennis*; 7. *Glycyrrhiza glabra* var. *glandulifera*; 8. *Hypericum perforatum*; 9. *Myrtus communis*; 10. *Pistacia terebinthus* ssp. *palaestina*; 11. *Viscum album*; 12. *Thymbra spicata*.

especially for medicinal, aromatic and other economically important plants. It is not possible to place a price on these, but they have great economic value (Costanza and Farber, 2002; Farber *et al*., 2006). The use of such plants in agricultural activities carries great weight for humans as well as domesticated animals, in particular because both south-west Asia and Turkey are gene centres of these plants; therefore it is imperative to identify these taxa. Conservation of the economically important medicinal and other plants in this context is also high priority. It is necessary during conservation to look at how these plants are utilized by local people. A protection of genetic resources in Turkey is perhaps the highest priority (Pleskanovskaja *et al*., 2011).

The laws for 'nature and species protection' cannot be applied effectively unless alternatives are developed for collecting plants from nature. The best option in this connection is to employ cultivation practices for such plants. Endangered species and those threatened with extinction should be considered in terms of their contribution to the natural environment and the economy of the country. A sustainable conservation of genetic resources from our natural wealth and for future research is also very important (Bayram *et al*., 2010).

For medicinal and aromatic plants, as well as other plants of economic importance for relevant stakeholders and industry, a long-term plan is a pre-requisite. For economically important plants, it is essential that we study their behaviour under future climate-change scenarios, together with drought, flooding, erosion, other natural disasters, ecosystem viability and sustainable land management. We must work on the market preferences and demand trends of genetic resources and biodiversity, their varietal development, organic products, the planning related to their production based on industry issues. There is also a need to create research inventories and collaboration platforms. In addition, each organization needs close cooperation and communication among themselves as well as with the local inhabitants (Bayram *et al*., 2010).

The world today is facing the crisis of antibiotic-resistant strains of viruses. The major hindrance for herbal therapies is the lack of amalgamation of indigenous knowledge with modern medical practices, because little or no scientific data is available regarding the safety and efficacy of the herbal drugs. There is an urgent need to document and authenticate the available indigenous knowledge with modern scientific principles.

During the next 50 years, the global population is expected to reach a level of 9 billion. This will lead to a decrease in renewable natural resources. Housing and farmland use will increase, leading towards to a decrease in the number of species. The area of fertile soils will dwindle and deforestation will add to the species loss. Climate change will add to this loss with a depletion of water resources. Undoubtedly all of these factors will pose great threats for future generations (Pleskanovskaja *et al*., 2011). Out of our natural resources, in particular, availability of medicinal and aromatic plants together with other consumable herbals will suffer greater loss (Ozturk *et al*., 2011; Ozturk *et al*., 2012a, b, c).

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