

An ethnobotanical survey in selected towns of the Mediterranean subregion (Turkey)

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Abstract: This survey was carried out by face-to-face oral interviews with 379 inhabitants who agreed to be interviewed in selected localities of the Mediterranean region: Hatay (İskenderun and Narlıca), İçel (Erdeмли, Tarsus, and Silifke), and Isparta (Sav). The current study was conducted to document the ethnobotanical uses of plants. In the first step of the study, demographic profiles of the informants were evaluated. Subsequently, they were asked to state whether the plants were used for therapeutic or other purposes; then detailed information, i.e. local names, parts used, methods of preparation (decoction, infusion, poultice, ointment, etc.) was recorded; and finally the plant materials were collected for authentication. All collected plant materials have been identified and deposited at the Herbarium of Faculty of Education of Hacettepe University (HEF). In the survey, uses of 88 plant taxa from 39 plant families were documented. Plant species from the families Rosaceae, Asteraceae, and Lamiaceae were reported to be the most frequently utilized. Among the 152 plant remedies documented, 38 remedies (25.0%) for gastrointestinal disorders, 30 remedies (19.7%) for respiratory ailments, and 18 remedies (11.8%) for urinary problems were the most frequently recorded.

Key words: Ethnobotany, folk medicine, foodstuff, Mediterranean subregion, Turkey

1. Introduction

Among the ca. 11,000 higher plant taxa identified in Turkish flora, only a small fraction (ca. 1100) have been reported to be used in folk medicine for the treatment of various ailments (1). On the other hand, traditional utilization of plants other than for therapeutic purposes such as foodstuffs or tools has been poorly documented in scientific terms. This knowledge is dwindling rapidly due to the impact of modernization on society resulting in migration from villages to cities, easier access to health services etc. as well as overgrazing and overexploitation of plant resources (2). Therefore, extensive field studies should be conducted urgently. In the last 2 decades, an increasing number of ethnobotanical field surveys have been carried out in Anatolia in order to document this information before it vanishes (2). However, due to the impact of the above-cited factors, it has been ascertained that the documentation of this information only by ethnobotanical field surveys in rural areas would not be sufficient. In particular, documentation of the information from people who migrated from villages to cities is critically important. In addition to the above-cited vitiating factors, this information is also fading out

due to the lack of interest of the young generation and difficulty in accessing the plant materials in such locations (2). Therefore, alternative methodological approaches in ethnobotanical research should be made use of.

In this study, a group of students at the Faculty of Vocational Education of Gazi University were trained to conduct an ethnobotanical poll, to collect plant materials, and to prepare herbarium specimens. They were then sent to their home towns to conduct the survey. In the present study, we aimed to evaluate the results of the poll obtained in selected towns in the Mediterranean region of Anatolia.

2. Materials and methods

This survey was carried out in 6 areas of the Mediterranean region of Turkey by using the face-to-face oral interview technique. In the poll, the inquiry sheets prepared and tested for efficiency in our previous surveys were used (3). Distribution of the 379 volunteers interviewed into localities surveyed is as follows (Figure): Isparta-Sav (n: 40), Hatay-İskenderun (n: 111), Hatay-Narlıca (n: 35), Mersin-Erdeмли (n: 50), Mersin-Tarsus (n: 100), Mersin-Silifke-Taşucu (n: 43).

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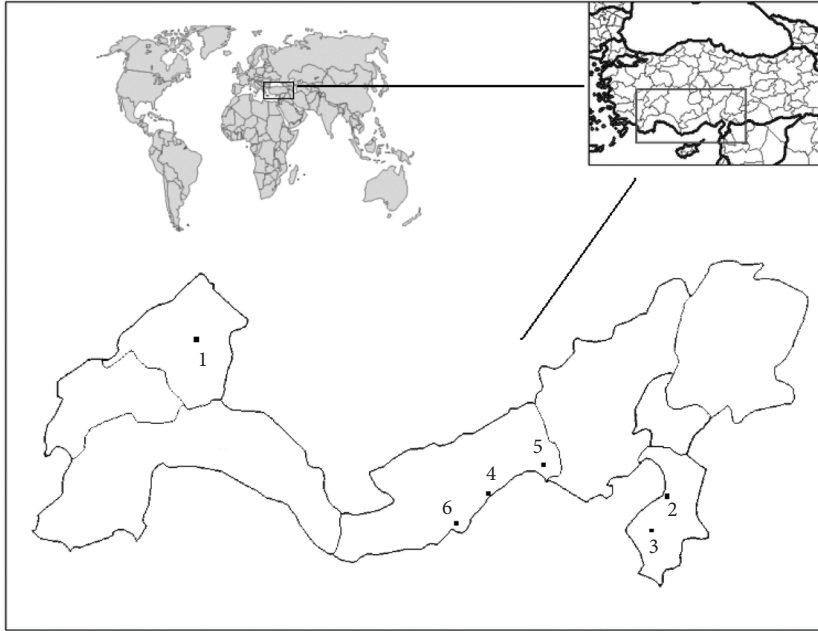


Figure. Map of surveyed area: (1) Isparta/Sav, (2) Hatay/İskenderun, (3) Hatay/Narlıca, (4) Mersin/Erdemli, (5) Mersin/Tarsus, (6) Mersin/ Silifke.

2.1. Education of interviewers

A group of volunteer students at Gazi University's Faculty of Vocational Education were selected. They were trained to conduct an ethnobotanical poll, to collect plant materials, and to prepare herbarium specimens.

2.2. Conducting and ratings of the poll

Interviews were conducted in the selected districts in each locality. For male informants interviews were generally carried out in the teahouses or in the mosque courtyard. Female informants were visited at home or at the marketplace. The informants were further asked to address people they knew with knowledge on this subject.

2.3. Data evaluation

After the informant assented to participate in the interview, the demographic features of the interviewees were determined, as the first step, some of which are given in Table 1. The results were evaluated statistically using SPSS 11.0. The chi-square test was used to compare different groups of data and $P < 0.05$ was evaluated as significant. Then the participants were asked to state the plants utilized as medicine, foodstuffs, or for any other purposes. Detailed information, i.e. local names, parts used, and method of preparation (decoction, infusion, poultice, ointment, etc.) of each remedy or meal, were noted. After the interview, the informants were asked to supply plant specimens. Herbarium specimens were prepared and deposited at the Herbarium of Faculty of Education of Hacettepe University (HEF). Plant specimens were identified using *Flora of*

Turkey and the East Aegean Islands (4), *Doğal Bitkilerimiz* (5), *Beytepe Bitkileri* (6), and *Kayışdağı'nın Çiçekleri* (7).

3. Results and discussion

The cultural and socioeconomic characteristics of the people in the surveyed area were previously reported and discussed in detail (8,9). The demographic features of the participants are summarized in Table 1. The proportion of female informants (70.2%) was higher than that of males (29.8%). When comparing the age groups, 38.3% of the informants were 44 years old or older, while the rest (61.7%) were 43 years old or younger. As for educational status, only a small fraction of the informants were illiterate (6.6%). This percentage seems prominently different from those observed in rural areas; for example, in our previous study in Haymana town and its villages the proportion was 28.1% (3). The most noteworthy figure in the employment status of the informants is that there were no farmers (people engaging in plant cultivation and animal breeding). A larger portion of the informants (68.9%) had lived in rural areas and 77.6% were inhabitants of that area for more than 10 years, which indicates that they moved to towns from neighboring villages.

In Table 2, data on the knowledge of informants on the utilization and benefits of plant materials are given. A larger portion of the informants (91.8%) have at least a basic knowledge of the plants and have utilized plant materials in any form whatsoever (82.8%) for over 10 years (82.9%). While 52.8% of the informants gather the

Table 1. Demographic features of the informants in the survey (n = 379).

Demographic features		Number	Proportion (%)
Sex of the informants	Female	266	70.2
	Male	113	29.8
Age of informants	Less than 30	103	27.2
	Between 31 and 43	131	34.5
	Over 44	145	38.3
Level of education	Illiterate	25	6.6
	Primary school	180	47.5
	High school	174	45.9
Marital status	Married	267	70.4
	Widowed, divorced, or unmarried	112	45.9
Employment status	Housewife	174	58.8
	Civil servant	71	18.7
	Self employed	68	17.9
	Student	28	7.4
	Others (unoccupied, retired, etc.)	38	10.1
Place where the informants live longer	Rural area	261	68.9
	Urban area	118	31.1
Period of residence in the region	Less than 10 years	85	22.4
	More than 10 years	294	77.6

plant materials themselves from nature and 26.1% both gather and purchase, 21.1% prefer to purchase from a herb dealer (48.0%) or from a local bazaar (43.9%). The source of the information on plant utilization is mainly ancestors or older people (75.5%); however, 17.8% said that the information was gathered from the mass media. In fact, this is one of the most critical and ever increasing threats in the degeneration of traditional knowledge. Among the informants utilizing plant materials, 97.0% believed that plants are safe while 99.2% believed that they are efficient. Plants are mainly utilized as foodstuffs (88.8%) and to alleviate or to treat symptoms or diseases (85.0%), in addition, for taste and aroma (52.2%), for ornamental purposes (11.1%), and as animal fodder (10.8%).

Moreover, cross-relationships (i.e. how specific demographic features of the participants related to either the knowledge or the actual use of plants for food or remedies) were further analyzed by using SPSS. As shown in Tables 3 and 4, significant cross-relationships were established between the demographic features of the informants such as age, level of education, marital status, and period of residence in the region and the knowledge about plants and the use of plants. Particularly, informants

who have lived longer in the rural area consume plants more frequently ($P < 0.05$).

All plant parts, i.e. aerial parts, roots, leaves, flowers, fruits, or seeds, were frequently used. For health benefits of the plants, the commonly used methods for preparation of remedies were boiling in water (decoction), steeping in hot water (infusion), maceration in oil, as a poultice, or directly pounding the material. For the processing of plant materials as food, fresh raw materials were either roasted or boiled in water, or cooked with rice or pounded wheat. Sometimes plants were used as ingredients of pastries after being roasted with onion or served as a salad, marmalade, or as spice etc.

In this survey, 85 plant taxa from 39 plant families and 73 genera were documented as being utilized for ethnobotanical purposes in the selected localities (Table 5). Among them, 72 taxa have been fully identified, while only the genus names of 13 specimens have been determined. Twenty-eight of the taxa documented in this survey were found to be used both therapeutically and as foodstuffs, and 35 only therapeutically and 20 only as foodstuffs. In addition, one instance of use as animal fodder and one as an ornamental were noted.

Table 2. Responses of the informant to the inquiry.

Questions and responses	Number of informants	Proportion (%)
<i>Do you have any knowledge of the benefits of plants? (n: 379)</i>		
Yes	348	91.8
No	31	8.2
<i>Do you consume plant materials? (n: 379)</i>		
Yes	314	82.8
No	65	17.2
<i>Do you have any reason for not consuming plant materials? (n: 65)</i>		
Does not have sufficient information	24	36.9
Not believed to be beneficial	21	32.3
Not much required	20	30.8
<i>Since when have you used plant materials? (n: 314)</i>		
Less than 5 years	23	7.3
Between 5 and 10 years	31	9.8
More than 10 years	260	82.9
<i>From where do you obtain the plant materials? (n: 314)</i>		
Self-gathered from nature	166	52.8
Self-gathered or purchased	82	26.1
Purchased	66	21.1
<i>From where do you purchase the plant materials? (n: 148)</i>		
Herbal shops, Akhtars	71	48
Bazaars	65	43.9
Grocer or Supermarket	12	8.1
<i>What time of the day do you prefer to gather the material from nature? (n: 248)</i>		
Anytime	197	79.4
Mornings	51	20.6
<i>What is the source of your information? (n: 314)*</i>		
Old people	237	75.5
Mass media	56	17.8
Friends	30	9.5
<i>For what purposes do you utilize plant materials? (n: 314)</i>		
Foodstuff	279	88.8
Treatment	267	85.0
Taste and aroma	164	52.2
Ornamental	35	11.1
Animal fodder	34	10.8
Soap	1	0.3
<i>How frequently do you use plant materials? (n: 314)</i>		
Frequently	180	57.3
If necessary	76	24.2
Seasonal	58	18.5
<i>Did you witness any side effects due to utilization of a plant remedy? (n: 267)</i>		
Yes	8	3
No	259	97
<i>Do you think that plant remedies are beneficial for health? (n: 267)</i>		
Yes	265	99.2
No	2	0.8

*More than one choice is marked.

Table 3. Cross-relationships between the demographic features of informants and their knowledge about plants (n: 379).

	Aware		Unaware	
	number	%	number	%
Sex				
Female (n: 266)	244	91.7	22	8.3
Male (n: 113)	104	92.0	9	8.0
		$\chi^2 = 0.01, P = 0.92$		
Age				
30 or younger (n: 103)	81	78.6	22	21.4
Between 31 and 43 (n: 131)	122	93.1	9	6.9
44 or older (n: 145)	145	100	0	0
		$\chi^2 = 37.038, P = 0.00^*$		
Educational status				
Illiterate (n: 25)	24	96.0	1	4.0
Primary school (n: 180)	177	98.3	3	1.7
High school (n: 174)	147	84.5	27	15.5
		$\chi^2 = 23.22, P = 0.00^*$		
Marital status				
Married (n: 267)	257	96.3	10	3.7
Widowed, divorced, or unmarried (n: 112)	91	81.3	21	18.8
		$\chi^2 = 23.653, P = 0.00^*$		
Place where the informants live longer				
Rural area (n: 261)	249	95.4	12	4.6
Urban area (n: 118)	99	83.9	19	16.1
		$\chi^2 = 14.319, P = 0.00^*$		
Inhabitancy period in the region				
Less than 10 years (n: 85)	65	76.5	20	23.5
10 years or more (n: 294)	283	96.3	11	3.7
		$\chi^2 = 34.377, P = 0.00^*$		

*P < 0.05

Table 4. Cross-relationships between the demographic features of informants and the utilization of plants (n: 379).

	Use		Do not use	
	number	%	number	%
Sex				
Female (n: 266)	226	85.0	40	15.0
Male (n: 113)	88	77.9	25	22.1
		$\chi^2 = 2.803, P = 0.094$		
Age				
30 or younger (n: 103)	68	66.0	35	34.0
Between 31 and 43 (n: 131)	108	82.4	23	17.6
44 or older (n: 145)	138	95.2	7	4.8
		$\chi^2 = 36.044, P = 0.00^*$		
Educational status				
Illiterate (n: 25)	24	96.0	1	4.0
Primary school (n: 180)	165	91.7	15	8.3
High school (n: 174)	125	71.8	49	28.2
		$\chi^2 = 27.737, P = 0.00^*$		
Marital status				
Married (n: 267)	236	88.4	31	11.6
Widowed, divorced, or unmarried (n: 112)	78	69.6	34	30.4
		$\chi^2 = 19.515, p = 0.00^*$		
Place where the informants live longer				
Rural area (n: 261)	226	86.6	35	13.4
Urban area (n: 118)	88	74.6	30	25.4
		$\chi^2 = 8.254, P = 0.004^*$		
Inhabitancy period in the region				
Less than 10 years (n: 85)	49	57.6	36	42.4
10 years or more (n: 294)	265	90.1	29	9.9
		$\chi^2 = 48.982, P = 0.00^*$		

*P < 0.05

Table 5. List of plants used for ethnobotanical purposes in the selected towns of the Mediterranean region of Anatolia.

Latin name	Herbarium number	Locality*	Local name	Part used	Ethnobotanical use	Way of preparation	UV
Anacardiaceae							
<i>Pistacia terebinthus</i> L. subsp. <i>palaestina</i> (Boiss.) Engler	08N22	6	Melengiç	FR	Foodstuff	Dried fruits are roasted and consumed as snack. Powdered fruits are used as a substitute for coffee.	0.50
Apiaceae							
<i>Anethum graveolens</i> L.	05H01	2	Dereotu	LF	Flatulency in stomach and intestines	Fresh, eaten.	0.43
	05M01	5		AE	Foodstuff	Fresh, eaten.	
	08N37	6	Baharotu	AE	Alopecia	Cooked as poultice and applied to head.	
<i>Crithmum maritimum</i> L.	08N05	6	Kaya koruğu	AE	Foodstuff	Prepare pickles or in salads.	0.50
<i>Foeniculum vulgare</i> Miller	05M02	5	Rezene	FR	Flatulency in stomach and intestines	Daily 2 glasses of infusion as tea.	0.33
<i>Petroselinum crispum</i> (Miller) A.W. Hill	05M03	5	Maydanoz	AE	Stomachache, diuretic	Daily a glass of decoction is consumed as tea.	0.20
					Uterine and ovary inflammation	Warm poultice is put inside knickers every night before bed for 1 month.	
	06F01	1		LF	Foodstuff	Fresh, eaten.	
Apocynaceae							
<i>Nerium oleander</i> L.	05M04	5	Zakkum	FL	Cancer	4-5 pieces of flowers cooked in a glass of water and 1 glass is drunk twice a week.	0.50
Araceae							
<i>Arum</i> sp.	06F02	1	Yılan bıçağı	RT	Rheumatism	Pounded fresh root is applied to affected extremity.	0.66
	05H02	2	Tirşik pancarı	FL	Oxyuris, foodstuff	Prepared as soup and consumed as food.	
	08N11	6	Yılan purçalağı	FL	Foodstuff	Cooked with milk and rice.	
				FR	Hemorrhoids	3 times a day a small drupe fruit is swallowed with water.	
Asteraceae							
<i>Anthemis tinctoria</i> L. var. <i>pallida</i> DC.	05M05	5	Papatya	FL	Sore throat, diuretic	A pinch of flowers decocted and daily 2 glasses of extract are consumed as tea.	0.50
					Eczema	Decoction is applied externally to the affected area.	

<i>Carduus</i> sp.	05M06	5	Kangal	ST	Foodstuff	Cooked with onion and tomato paste.	0.09
	08N13	6	Hoppan dikenli	ST	Mouth wounds	Floem of the fresh plant is removed and eaten.	
<i>Chrysanthemum coronarium</i> L.	05H03	2	Papatya	FL	Sore throat, shortness of breath, abdominal pain	Decoction is consumed as tea.	0.40
					Alopecia	Decoction is used to wash the head.	
<i>Helichrysum sanguineum</i> (L.) Kostel.	06K01	3	Sarıdağ çiçeği/ Kudama	FL	Cough, kidney stone	Infusion is consumed as tea.	0.50
<i>Sonchus asper</i> (L.) Hill subsp. <i>glaucescens</i> (Jordan) Ball	08N18	6	Sütlü ot	AE	Foodstuff	Cooked as food or used as an ingredient of pastry.	0.33
<i>Taraxacum</i> sp.	06F03	1	Karahindiba/ Sakızlık	AE	Foodstuff	As salad.	0.23
					Diabetes, orexigenic	Consumed fresh.	
	05H04	2	Hindi bağ	AE	Foodstuff	Cooked as meal and added lemon and olive oil.	
	08N25	6	Kertikli ot	AE	Foodstuff	As salad.	
<i>Tripleurospermum conoclinium</i> (Boiss.& Bal.) Hayek	06F04	1	Papatya	AE	Cough	Decoction is consumed as tea.	0.25
Berberidaceae							
<i>Berberis crataegina</i> DC.	06F05	1	Karamak	FR	Foodstuff	Fresh or cooked as jam.	0.25
Brassicaceae							
<i>Capsella bursa-pastoris</i> (L.) Medik.	06F06	1	Bici bici/ Çoban çantası	LF	Foodstuff	As salad or roasted as meal.	0.14
<i>Eruca sativa</i> Miller	05M07	5	Eşek turpu	AE	Foodstuff	As salad or as pastry or cooked with onion and tomato paste.	0.03
	05H06	2	Roka	LF	Diabetes	Fresh, eaten.	
<i>Lepidium sativum</i> L.	06F07	2	Tere	LF	Foodstuff	Fresh, eaten.	0.12
<i>Sinapis arvensis</i> L.	06F08	1	Turpotu	LF	Foodstuff	Roasted.	0.25
Cactaceae							
<i>Opuntia ficus-indica</i> (L.) Miller	05H07	2	Eşek inciri	FR	Stomachache	Fresh, eaten.	0.37
	05M08	5	Dikenli incir	FR	Foodstuff Stomachache	Fresh, eaten Daily 10 fruit are eaten.	
	08N38	6	Frenk yemişi	LF	Hemorrhoids	Ember leaves on coal and anus exposed to the vapors.	
				FR	Foodstuff Stomachache	Fresh eaten. Daily 10 fruit are eaten on an empty stomach.	
Capparaceae							
<i>Capparis ovata</i> Desf. var. <i>canescens</i> (Coss.) Heywood	05M09	5	Keber	FR	Cancer	10 fruits are mixed with 2 spoonful of filtered honey and taken orally 3 times a day.	0.50
<i>Capparis spinosa</i> L. var. <i>spinosa</i>	08N24	6	Gevil	SD	Toothache	Pounded and applied to the teeth to relieve pain.	0.66
				BD	Foodstuff	Cooked.	

Caryophyllaceae							
<i>Silene</i> sp.	08N19	6	Cıvıřtak	AE	Foodstuff	Cooked as an ingredient of pastry.	0.33
<i>Telephium imperati</i> L.	08N21	6	Göğün dürme	AE	Foodstuff	Cooked as an ingredient of pastry.	0.33
Chenopodiaceae							
<i>Beta vulgaris</i> L.	05H08	2	Yabani pancar/ Pazı	LF	Oxyuris, foodstuff	Cooked with rice or pounded wheat (bulgur) and eaten.	0.31
				WH	Constipation, orexigenic	Decoction is consumed as tea.	
<i>Chenopodium album</i> L.	06F09	1	Sirken	AE	Flatulence and intestinal gas, foodstuff	Roasted aerials parts are eaten.	0.60
<i>Spinacia tetrandra</i> Stev.	06F10	1	Ispanak	AE	Foodstuff	Roasted aerials parts are eaten.	0.50
Cornaceae							
<i>Cornus mas</i> L.	06F11	1	Kızılıcık	FR	Foodstuff	Fresh or cooked as jam.	0.33
				LF, FR	Abdominal pain	Decoction is consumed as tea.	
Cucurbitaceae							
<i>Ecballium elaterium</i> (L.) A.Rich.	05M10	5	Cırtatan	FR	Sinusitis, Migraine pain	Fruit is squeezed and juice is dropped into nostrils once monthly.	0.50
	08N03	6		FR	Sinusitis	Fruit is squeezed and juice is diluted with a half glass of water and dropped into nostrils.	
<i>Momordica charantia</i> L.	08N26	6	Kudret narı	FR, LF	Hemorrhoids, constipation, against inflammation, stomachache, psoriasis	Two whole fresh fruits are cut into pieces and placed inside a glass bottle of olive oil with several leaves and kept in sunshine for several weeks. Every morning a tablespoonful of oily extract is taken orally on an empty stomach.	0.62
Cupressaceae							
<i>Juniperus excelsa</i> Bieb.	05L01	4	Ardıç	FR	Diabetes	Three times a day 1 fruit is swallowed.	0.75
					Cough, asthma	Decoction is consumed as tea.	
Cyperaceae							
<i>Cyperus longus</i> L.	05M11	5	Ayrık otu	AE	Kidney stone	A pinch of herb is decocted and a glass of extract is taken on an empty stomach.	0.50

Fabaceae							
<i>Ceratonia siliqua</i> L.	08N02	6	Harnup	FR	Foodstuff	Boiled to a dense thickness (pekmez) and consumed as tonic.	0.31
					Cough, bronchitis	Pounded fruits are boiled in water and daily 1-2 cups of decoction are drunk.	
	05M12	5	Keçiboynuzu	FR	Foodstuff	Eaten as snack.	
					Anemia	Boiled until a dense thickness (pekmez) and daily 4-5 tablespoonfuls are taken orally.	
<i>Vicia</i> sp.	06F12	1	Fiğ	AE	Animal fodder	Fresh or fried plant.	0.33
Fagaceae							
<i>Quercus coccifera</i> L.	08N16	6	Piyнар	RT	Burns	Boiled roots and extract is applied to burned area.	0.50
Geraniaceae							
<i>Erodium laciniatum</i> (Cav.) Willd.	08N15	6	İğnelik	AE	Foodstuff	Cooked as pastry or meal.	0.16
Hypericaceae							
<i>Hypericum perforatum</i> L.	05M13	5	Kantron otu	AE	Hemorrhoids, constipation, prostatitis, diabetes, hypertension, urinary infections	A handful of dried plant is boiled in water and 2 times daily 2 glasses of extract are drunk.	0.42
				FL	Burns, diaper rash	Two bunches of dried flowers put inside a jar of olive oil (500 mL) and kept for 6 months in sunshine. The oily extract is applied externally.	
	06F13	1	Kantaron otu	LF	Rheumatism, Osteoporosis	Leaves are placed in a bottle with olive oil and kept for a while. This oily extract is applied to affected extremities.	
Iridaceae							
<i>Iris</i> sp.	08N27	6	Şalgaba	RT	Inflammatory wounds, abscess	Graded root is roasted with flour for 1-2 min and applied to wounds.	0.40
Lamiaceae							
<i>Mentha</i> sp.	08N10	6	Yarpız	AE	Foodstuff	Cooked as meal or as an ingredient of pastry.	0.31
					Hemorrhoids	Warm poultice obtained by cooking the aerial parts is applied to anus.	
	05H11	2	Sancı nanesi	AE	Common colds, Abdominal pain	Decoction is consumed as tea 2-3 times daily.	

<i>Mentha piperita</i> L.	06F14, 05H10, 05M14	1, 2, 5	Nane	LF	Abdominal pain, nausea, common colds	Daily 4 glasses of tea are drunk.	0.07
					Foodstuff	Fresh eaten or dried as spice.	
<i>Phlomis</i> sp.	08N28	6	Çobançıra	AE	Wounds	Fresh herbs are pounded and applied to the wounded area.	0.33
<i>Rosmarinus officinalis</i> L.	08N09	6	Biberiye	AE	Menopausal complaints, edema	Infusion is consumed as tea daily 1-2 cups.	0.29
<i>Teucrium polium</i> L.	05H12	2	Paryevşan	LF	Diabetes, diarrhea, stomachache	Daily 2-3 cups of decoction are drunk as tea.	0.57
	08N04	6	Acı yavşan	AE	Stomachache, hypertension, diabetes	Daily 1-2 cups of infusion are drunk as tea.	
<i>Thymbra spicata</i> L. var. <i>spicata</i>	08N31	6	Dağ kekigi	LF	Foodstuff	Dried leaves are used as spice for meat meals or yogurt soup.	0.40
				AE	Kidney stones	Infusion is consumed as tea.	
<i>Thymus</i> sp.	06L02	4	Zahter/Kekik	LF	Foodstuff	Fresh leaves mixed with green onion, tomato, and pomegranate syrup to make salad or dried leaves are used as spice.	0.05
					Stomachache, diabetes, hypertension, common colds	Infusion is consumed as tea.	
	06F15	1	Kekik	AE	Cough, common colds	Infusion is served as tea with slices of lemon.	
Lauraceae							
<i>Laurus nobilis</i> L.	05L03	4	Defne	LF	Foodstuff	Used as spice either fresh or dried.	0.47
				LF	Cough	Decoction is consumed as tea.	
				FO	Herniated disk	Fatty oil obtained from the seeds is applied to dorsal area by massage.	
	06K02	3	Defne/Har	FO	Skin care and cleaning	Soap prepared with fatty oil is used to wash the skin.	
				LF	Diabetes	Decoction is consumed as tea.	
	08N34	6	Teynel/Defne	LF	Spice	For meat dishes.	
				FO	Rheumatoid pain, cracked skin	Applied to the affected area with rubbing.	
<i>Persea gratissima</i> Gaertn. fil.	05M15	5	Avokado	LF	Kidney stone	A glass of decoction prepared with 10-15 pieces of leaves is taken 3 times a day.	0.33

Liliaceae							
<i>Allium sativum</i> L.	05H13	2	Sarımsak	Clove	Foodstuff, Against hypertension	Raw or cooked.	0.66
<i>Allium</i> sp.	05L04	4	Körmen	AE	Foodstuff	Roasted in a pan with grated onion and used as an ingredient of pastry.	0.25
Malvaceae							
<i>Hibiscus trionum</i> L.	05M16	5	Bamya	SD	Asthma, bronchitis, hemorrhoids, expectorant	A tea glass of seeds are roasted and powdered, mixed with 2 tablespoonful of honey, and taken twice daily.	0.66
<i>Malva neglecta</i> Wallr.	05H14	2	Develik/ Gömeç/Kömeç	AE	Foodstuff	Roasted with grated onion and egg added to prepare meal.	0.03
	05L05	4	Ebegömeci	AE	Foodstuff	Roasted with grated onion and used as an ingredient of pastry.	
						Constipation	
<i>Malva sylvestris</i> L.	06F16	1	Ebegümeci	LF	Foodstuff	Roasted and consumed with yogurt or in omelets.	0.19
	08N12	6	Ebegömeci	AE	Foodstuff	Cooked as meal or as an ingredient of pastry.	
					Eye pain	Poultice is applied to inflamed eye.	
<i>Malvella sherardiana</i> (L.) Jaub. & Spach	05H15	2	Ebekömeci/ Ebenkömeci	AE	Foodstuff	Cooked with rice or pounded wheat (bulgur) and eaten.	0.11
					LF	Kidney stone, constipation	
	06K03	3	Ebegömeci	AE	Foodstuff	Roasted and egg added to prepare omelets or yogurt added.	
Moraceae							
<i>Ficus carica</i> L.	06H16	2	İncir	FR	Cough, expectorant	3-4 pieces of fresh or dried fruits are grated into a glass of milk and boiled; drunk twice daily.	0.40
<i>Ficus elastica</i> Roxb.	05M17	5	Kauçuk	LX	Wart	Latex from the stem is applied to wart twice daily.	0.50
<i>Morus alba</i> L.	05M18	5	Dut/ Yalancı dut	LF	To reduce blood sugar, urinary inflammations, cancer	10-12 pieces of leaves are decocted and drunk as tea every morning on an empty stomach.	0.75

Myrtaceae							
<i>Eucalyptus camaldulensis</i> Dehn.	05M19	5	Okalıptuz	LF	Kidney disorders	15-20 pieces of leaves are decocted and one glass is drunk 3 times daily. Two handfuls of leaves are boiled in water and the extract is added to a bath tub of warm water and bathed in every 3 days.	0.50
<i>Myrtus communis</i> L.	08N29	6	Murt	LF	Stress	Daily 1 glass of tea is drunk.	0.40
				FR	Foodstuff	Eaten.	
	05H17	2	Hambeles/ Murt	FR	Diarrhea, foodstuff	Fresh fruit is eaten.	
				LF	Diabetes	Infusion is consumed as tea, 1-2 times a day.	
Oleaceae							
<i>Olea europaea</i> L. var. <i>europaea</i>	06K04	3	Zeytin	LF	To reduce blood pressure	Infusion is consumed as tea.	0.33
	05H18	2		LF	Diabetes	Infusion is consumed as tea twice daily.	
	05M20	5		LF	Oral wounds (mouth, tongue and palate)	Four times a day, 3 leaves are chewed until recovery.	
	08N33	6		LF	Oral wounds Common cold	Leaves are chewed. Decoction is consumed as tea twice daily.	
Papaveraceae							
<i>Papaver macrostomum</i> Boiss. & Huet ex Boiss. <i>Papaver</i> sp.	06K05	3	Gelincik	AE	Ornamental	Fresh or dried.	0.50
	05L06	4	Gelincik/Lale	LF	Foodstuff	Cooked with onion as an ingredient of pastry.	0.04
	08N14	6	Lale	AE	Foodstuff	Cooked as meal or as an ingredient of pastry.	
Pinaceae							
<i>Pinus brutia</i> Ten.	05M21	5	Çam	LF	Bronchitis	One glass of decoction prepared with a handful of leaves is drunk daily on an empty stomach.	0.75
	08N35	6		FR	Bronchitis, stomachache, cough	Cones boiled with sugar to obtain a thick syrup and 2dessertspoonful of this syrup taken orally daily.	
Plantaginaceae							
<i>Plantago major</i> L. subsp. <i>major</i>	06K06	3	Kuzukulağı	AE	Foodstuff	Cooked as meal or omelets prepared with roasted leaves and egg.	0.07
Poaceae							
<i>Cynodon dactylon</i> (L.) Pers var. <i>villosus</i> Regel	06F17	1	Ayrık otu	RT	Sterility	Decoction is consumed as tea.	0.50
<i>Panicum miliaceum</i> L.	05M22	5	Darı	FL	Kidney stone, diuretic	Spikelets are decocted in water and daily 2 glasses are consumed as tea.	0.66

Polygonaceae							
<i>Rumex conglomeratus</i> Murray	06F18	1	Labada	LF	Foodstuff	Roasted as meal or stuffed with rice.	0.50
<i>Rumex scutatus</i> L.	05M23, 08N20	5, 6	Kuzu kulağı/ Ekşi kulak	AE	Foodstuff	Fresh or roasted with onion, tomato paste, and egg.	0.12
<i>Rumex tuberosus</i> L.	05L07	4	Ekşi kulak	AE	Foodstuff	Fresh or roasted as an ingredient of pastry.	0.25
Portulacaceae							
<i>Portulaca oleracea</i> L.	05M24	5	Semiz otu/ Soğukluk	AE	Foodstuff	Fresh or as an ingredient of pastry after being roasted with onion and tomato paste.	0.03
					Diabetes	Daily 1 glass of decoction prepared with a pinch of plant is taken orally on an empty stomach.	
					Kidney stone	A plate of poultice is eaten every day.	
	08N06	6	Semiz otu, Tokmakan	AE	Foodstuff	Cooked as meal or as an ingredient of pastry.	
Rosaceae							
<i>Cerasus avium</i> (L.) Moench	05M25	5	Kiraz	BK	Kidney problems, urinary infections	Peeled 15-20 cm long strips from the stem are decocted and 1-2 glass of this extract is consumed as tea.	0.66
<i>Crataegus monogyna</i> Jacq. subsp. <i>azarella</i> (Gris.) Franco	06F19	1	Alıç	FR	Sedative	Fresh fruit is eaten.	0.50
<i>Cydonia oblonga</i> Miller	06F20	1	Ayva	LF	Cough	Decoction is consumed as tea.	0.10
	05M26	5		LF	Diarrhea, bronchitis, cough	Decoction prepared with 15-20 pieces of leaves and 1 glass of this extract drunk 3 times a day.	
<i>Eriobotrya japonica</i> (Thunb.) Lindl.	05H19	2	Yeni dünya	FL	Common cold, cough, expectorant	Infusion prepared with either fresh or dried flowers is consumed as tea (lemon slices and sugar may be added if necessary to taste).	0.29
	06K07	3					
	05M27	5		LF, FL			
<i>Malus sylvestris</i> Miller subsp. <i>orientalis</i> (A. Uglitzkich) Browicz var. <i>orientalis</i>	05M28	5	Elma	FR	Asthma	Peeled pericarps of apple fruit (1 kg) are boiled in water and daily 3-4 spoonfuls are taken orally.	0.66
				SD	Pimple	5-10 apple seeds are chewed once daily.	
<i>Prunus domestica</i> L.	05L08	4	Dağ eriği	FR	Stomachache	Stewed fruits are eaten.	0.50
<i>Prunus divaricata</i> Ledeb. subsp. <i>divaricata</i>	06F21	1	Yaban eriği	FR	Foodstuff	Fresh fruit is eaten.	0.50
<i>Rubus canescens</i> DC. var. <i>glabratus</i> (Godron) Davis & Meikle	05H20	2	Bögürtlen	RT	Diabetes	Decoction is consumed as tea.	0.50

<i>Rubus sanctus</i> Schreber	05M29	5	Böğürtlen	RT	Kidney stone, urinary infection, diabetes, stomachache	Daily one glass of decoction is drunk on an empty stomach.	0.31
Scrophulariaceae							
<i>Verbascum</i> sp.	05L09	4	Sığır kuyruğu	RT	To drain inflammation	Boiled in water and the poultice obtained is applied to abscess.	0.75
	06F23	1		FL	Cough	Decoction is consumed as tea.	
	08N07	6	Bozkulak	LF (basal)	Pain of abarticulation or broken bones	Basal leaves of the plant are boiled to obtain a poultice and it is applied externally to the affected area.	
Tiliaceae							
<i>Tilia rubra</i> DC. subsp. <i>caucasica</i> (Rupr.) V. Engler	06F24	1	Ihlamur	LF	Common cold	Decoction is consumed as tea.	0.03
Urticaceae							
<i>Urtica dioica</i> L.	05M30	5	Isırganotu	AE	Foodstuff	Fresh or roasted with onion and tomato paste as an ingredient of pastry.	0.07
	06F25	1		AE	Diabetes, cancer, hemorrhoids, urinary infection	Decoction is consumed as tea on an empty stomach in the mornings.	
	06K08	3		AE	Alopecia	Decoction is used to wash hair.	
<i>Urtica pilulifera</i> L.	05H21	2	Isırgan	AE	Foodstuff	Fresh or roasted with onion and tomato paste as an ingredient of pastry.	0.40
					Indigestion, cancer, dermatophytes infections of feet or hands	Decoction is consumed as tea.	
<i>Urtica urens</i> L.	05L10	4	Isırgan	AE	Foodstuff	Fresh as salad or roasted with onion and tomato paste as an ingredient of pastry.	0.12
					Kidney stone, urinary infections, cancer	Daily 2 cups of decoction are consumed as tea.	
					Rheumatic pain	Poultice is applied externally to affected area.	
					Surgical wounds or open wounds	Decoction is kept overnight and consumed as tea twice daily on an empty stomach.	
	08N17	6		AE	Foodstuff	Cooked as meal or as an ingredient of pastry.	
					Cancer, inflammatory abscess, rheumatic pain, bronchitis, menopausal complaints	Daily 2 cups of decoction are consumed as tea.	
Verbenaceae							
<i>Vitex agnus-castus</i> L.	08N23	6	Hayıt	FR	Foodstuff Kidney sand	Fresh fruit is eaten.	0.33
Violaceae							
<i>Viola</i> sp.	06F25	1	Menekşe	FL	Cough	Daily 2 cups of decoction are consumed as tea.	0.50

*Localities: 1. Isparta, Sav ; 2. Hatay, İskenderun; 3. Hatay, Narlıca; 4. Mersin, Erdemli; 5. Mersin, Tarsus; 6. Mersin, Silifke, and Taşucu

Abbreviations: AE: aerial part; BD: bud; BK: bark; FL: flower; FO: fatty oil; FR: fruit; LF: leaf; LX: latex; RT: root; SD: seed; WH: whole plant; ST: stem

Among the plants documented in the survey, the most frequently referred to were from 3 families of the plant kingdom: Rosaceae (11.3%), Asteraceae (8%), and Lamiaceae (8%). On the other hand, among the plant taxa in Table 5, only *Tripleurospermum conoclinium* (Boiss. & Bal.) Hayek from Asteraceae was an endemic plant to Turkey and it was used as “daisy” by the inhabitants and it is categorized under LC (Least Concern).

Among the 152 therapeutic uses, 38 remedies (25.0%) were documented as being used for gastrointestinal disorders (flatulency, indigestion, stomachache, abdominal pain, nausea, hemorrhoids, constipation, and diarrhea) and 30 remedies (19.7%) for respiratory system ailments (cough, as an expectorant, bronchitis, common colds, sore throat, and asthma). These 2 most recurrently reported groups of remedies are followed by urinary system disorders (passing kidney stones, urinary infections) (18 remedies; 11.8%), inflammatory ailments (abscesses, rheumatism, genital inflammations, migraine pain, toothache, prostatitis) (17 remedies; 11.2%), for regulating blood sugar (15 remedies; 9.9%), dermatological problems (wounds, eczema, burns, pimples) (9 remedies; 5.9%), cancers (8 remedies; 5.3%), cardiovascular disorders (6 remedies; 3.9%), and infectious diseases (sinusitis, dermatophytes infections) (6 remedies; 3.9%). The recurrence order of disease groups seems more-or-less similar to those reported in the previous papers published on the folk medicines of the Mediterranean subregion (8,9). However, in those previous studies conducted in rural areas the frequency of plant remedies for the treatment of cancers (diagnosed by physicians) was not more than 1 or 2. This might be due to the recent negative impact of the media on traditional plant uses.

The most popular remedy in the study area was *Urtica* species. Remedies prepared from the aerial parts of 3 species of this genera (*U. dioica* L., *U. pilulifera* L., and *U. urens* L.) were reported for the management of various disorders such as diabetes, cancer, hemorrhoids, urinary infections, alopecia, indigestion, dermatophytes infections, kidney stones, urinary infections, rheumatic pains, wound healing, inflammatory abscess, bronchitis, and menopausal complaints as well as a foodstuff in all locations studied. This is followed by *Hypericum perforatum* L. The flowering aerial part of this plant was used to treat hemorrhoids, constipation, prostatitis, diabetes, hypertension, urinary infections, burns, diaper rash, rheumatism, and osteoporosis.

Several prominent previously unreported utilizations are also documented in Table 2. For example, a cancer remedy prepared with 4-5 pieces of *Nerium oleander* L. flowers was administered twice weekly, possibly due to the toxic nature of the plant. Fruit of a widespread bush in the subregion, *Capparis ovata* Desf., was also prescribed as a remedy against cancer.

Among the health benefits listed in Table 5, several utilizations have not been reported elsewhere in the scientific documents published so far on Turkish folk medicine (1). These are as follows (classified based on the similar or related activities): *Anethum graveolens* L. aerial parts and *Chrysanthemum coronarium* L. flowers for alopecia; *Anthemis tinctoria* L. flowers for eczema; *Carduus* sp. stems for oral wounds; *Iris* sp. roots for inflammatory wounds and abscess; *Chrysanthemum coronarium* flowers for sore throat and shortness of breath; *Olea europaea* L. leaves for common colds; *Arum* sp. flowers and *Beta vulgaris* L. leaves against oxyuria; *Taraxacum* sp. aerial parts, *Portulacca oleracea* L. aerial parts, and *Eruca sativa* Miller leaves for diabetes; *Opuntia ficus-indica* (L.) Miller fruits for stomachache; *Opuntia ficus-indica* leaves, *Hibiscus trionum* L. seeds, and *Momordica charantia* L. fruits for hemorrhoids; *Chenopodium album* L. aerial parts for flatulence and intestinal gas; *Cornus mas* L. fruits and leaves for abdominal pain; *Momordica charantia* fruits for psoriasis, inflammation, and constipation; *Eriobotrya japonica* (Thunb.) Lindl. leaves/flowers and *Myrtus communis* L. fruits for diarrhea; *Capparis ovata* fruits and *Morus alba* L. leaves for cancers; *Hypericum perforatum* L. aerial parts for prostatitis and osteoporosis; *Morus alba* leaves for urinary inflammations; *Cyperus longus* L. aerial parts, *Panicum miliaceum* L. flowers, *Portulacca oleracea* aerial parts, and *Eucalyptus camaldulensis* Dehn. leaves for kidney disorders and kidney stones; *Rosmarinus officinalis* L. aerial parts for menopausal complaints; *Myrtus communis* leaves against stress; and *Verbascum* sp. basal leaves against pain of broken bones.

On the other hand, several additional utilizations may also be regarded as new:

(a) *Capparis spinosa* L. seeds for toothache (in a previous report was reported for headache);

(b) Other species of the genus or other plant part were reported for similar uses: *Tripleurospermum conoclinium* aerial parts for cough (previously *T. oreades* was reported for the same); *Malvella sherardiana* (L.) Jaub. & Spach aerial parts for kidney stones and constipation (previously other *Malva* sp. also reported for the same purposes);

(c) Other plant part was reported for similar use: *Eriobotrya japonica* flowers for common cold (previously leaves were reported for similar use).

Moreover, in order to determine the reliability of the information, Informant's Consensus Factor (F_{IC} values) for each disease category was estimated based on the classification listed in Table 6 and the results are given in Table 7.

In conclusion, as regards the number of plant species and the diversity of information documented, the results obtained in this survey seem quite interesting. In spite of residing in urban areas, inhabitants still use plant remedies gathered either from the suburbs of the town or purchased from local bazaars and herb dealers. In fact,

keen interest in wild plants on the part of the inhabitants of the Mediterranean subregion living in either rural or urban areas was also reported as the most distinguishing characteristics in the previous studies (3,8,9). Furthermore, the methodological approach practiced in this survey yielded quite successful results in terms of documentation

of folkloric information on plant utilizations. Therefore, further surveys to be carried out in towns, city centers, or suburbs might be helpful for preserving this cultural wealth. Utmost care should be given to eliminate the negative impact of the media on authentic ethnobotanical information.

Table 6. The classification of remedies based on pharmacological activity (1).

Type of disorder	Principle symptoms
Respiratory system disorders	Asthma, bronchitis, common colds, cough, shortness of breath, expectorant, sinusitis, sore throat
Gastro-intestinal disorders	Abdominal pain, constipation, diarrhea, flatulence and intestinal gas, flatulency in stomach and intestines, hemorrhoids, herniated disc, indigestion, kidney stone, nausea, orexigenic, stomachache
Urinary disorders	Diuretic, kidney disorders, kidney stone, prostatitis, urinary infections, urinary inflammations
Gynecological disorders	Menopausal complaints, sterility, uterine and ovary inflammation
Dermatological disorders	Abscess, alopecia, burns, cracks on the skin, diaper rash, eczema, inflammatory abscess, inflammatory wounds, pimple, psoriasis, surgical wounds or open wounds, skin care and cleaning, wart, wounds
Endocrine and metabolic diseases	Diabetes, to reduce blood sugar
Cardio-vascular complaints	Hypertension, to reduce blood pressure
Immune system diseases and cancers	Cancer (without specifying the type)
Skeleto-muscular problems	Against inflammation, edema, osteoporosis, rheumatic pain, to drain inflammation
Oral hygiene or oral diseases	Mouth wounds, oral wounds, toothache
Central nervous system disorders	Migraine, sedative, stress

Table 7. Informant's consensus factor (F_{IC} value) for each disease category.

Category of diseases	Number of taxa	Use citations	F_{IC} value
Respiratory system disorders	22	179	0.88
Gastro-intestinal disorders	29	136	0.79
Urinary disorders	17	52	0.69
Gynecological disorders	4	20	0.84
Dermatological disorders	13	51	0.76
Endocrine and metabolic diseases	14	47	0.72
Cardio-vascular complaints	5	8	0.43
Immune system diseases	6	32	0.84
Skeleto-muscular problems	7	16	0.60
Oral hygiene or oral diseases	3	6	0.60
Central nervous system related diseases	3	4	0.33

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