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ORIGINAL RESEARCH PAPER

Medicinal and wild food plants of Marmara Island (Balıkesir – Turkey)

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Abstract

Medicinal and wild food plants have always played an important role in people's lives especially in rural areas. Similar situation can be said for islands due to the reason of them being isolated from mainland. This paper reports an ethnobotanical investigations performed in 2009 and 2014 to determine medicinal and wild food plants of Marmara Island. A total of 30 individuals were interviewed (19 men, 11 women). Totally, 22 plants are recorded as used as traditional folk medicine for the region, and nine of these are also used as a source of wild food. Furthermore, 18 taxa are wild sources of nutrition for the area. The plants most commonly used in the region as medicinal remedies were *Salvia fruticosa*, *Hypericum perforatum*, *Ficus carica*, and *Mentha spicata*. Plants are mostly used for the treatment of abdominal pain, the common cold, and haemorrhoids. The species most commonly used for food are: *Salvia fruticosa*, *Arbutus unedo*, *Rhus coriaria*, and *Rubus sanctus*. This ethnobotanical study conducted in this island will enable the traditional use of wild plants both as food sources and herbal remedies to be passed on to future generations.

Keywords

ethnobotany; traditional medicine; wild food plants; Marmara Island; Turkey

Your food shall be your remedy, Hippocrates

Introduction

Ethnobotanical studies are very important in revealing the global current, cultural, traditional, and historical use of plants [1] as a source of folk medicine and food; a practice which has gradually increased in Southern European countries [2–29] and also in Turkey [30–80].

The Turkish flora contains 9582 species of vascular plants, of which about 3155 are endemic to that country [81]. The Anatolian people have benefitted from the use of plants for food and medicine since the Palaeolithic. Plant diversity naturally affects the traditional use of plants as medicine and as a source of nutrition [42]. West part of Turkey, which also includes the location of this research, has been the subject of many ethnobotanical studies [1,30–36,46,47,49–53,55,56,58,63,64,70–79].

The aim of this study is to present information about the traditional use of herbal medicine and food derived from wild plants recorded for Marmara Island, a locality for which no such investigation (except for some ethnobotanical notes recorded during floristic research [82,83]) has hitherto been undertaken. This study, thus, records for the first time, the traditional use of plants for medicinal and nutritional purposes on Marmara Island, the second largest Turkish island.

Material and methods

Study area

Marmara Island ($40^{\circ}35' N$, $27^{\circ}33' E$), the second largest Turkish island, is situated in the Sea of Marmara (Fig. 1). It covers an area of 117 km^2 , and its highest point is 700 m a.s.l. It consists of five villages (Fig. 2), its population being 6000.

In ancient times, the island was called “Proikonesos” or “Proconnesus”. The modern name “Marmara” is derived from the Greek *marmaron*, which, in turn, is derived from *marmaros*, “crystalline rock”, “shining stone” because it was famous for the white marble (Latin *marmor*) quarried there [84].

Proconnesus was colonized by the Greek inhabitants of the Ionian city of Miletus, in the middle of the eighth century BC. According to historical evidence, Proconnesus was burned in 493 BC by a Phoenician fleet in the service of the Persian King Darius. In 410 BC, Proconnesus was subjected to the domination of Athens, and, in the early third century BC, it was conquered by the Romans and became part of the Roman Empire. Subsequently, it became part of the Byzantine and the Ottoman Empires, as did Constantinople and its neighboring cities [85].

It is clear that people reside on Marmara Island for almost the last 100 years, originated from Greece, Bulgaria, and the Black Sea region. Following the Treaty of Lausanne, in 1923, Rums living outside Istanbul were exchanged for Turkish people living

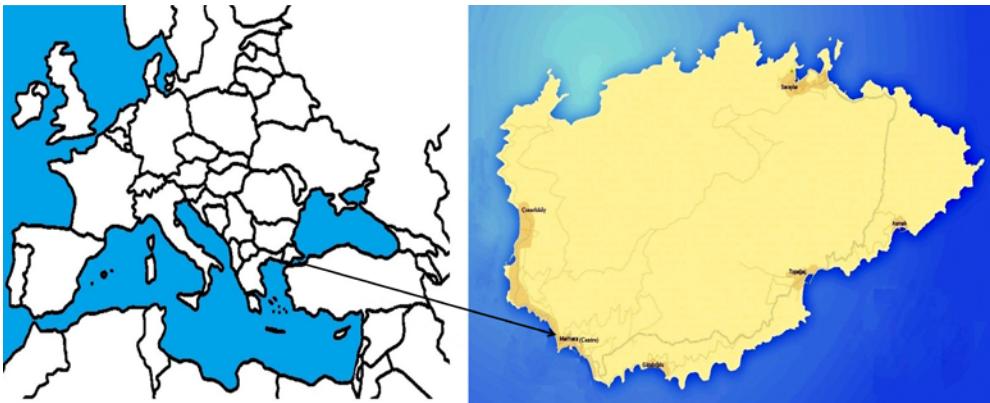


Fig. 1 Geographical location of the study area.



Fig. 2 General view of a village in Marmara Island.

in Greece [86], and Turks who had come from Greece, especially from the Island of Crete, were placed on Marmara Island. Besides these, people from the Black Sea region, and from Bulgaria, especially during the period 1912–1913, and again in the 1950s (referred to as refugees), were placed on the island.

The traditional occupations of the island are tourism and fishing. The remaining arable land is covered with olive trees, and many farmers are involved in the cultivation of grape vines, whereas other settlers work in the marble quarries (Fig. 3).

The flora of Marmara Island comprises at least 475 species of vascular plants, assigned to 312 genera and 88 families [83].

Vegetation cover of the island consists mostly of Mediterranean forest trees, maquis, and frigana (Fig. 4). Besides with plants exposed over large areas, and Europe – Siberia, which is lesser, and Euxine elements are seen in this area [87].



Fig. 3 General view of marble quarries in Marmara Island.



Fig. 4 General view of the Marmara Island's vegetation.

Field study

This ethnobotanical study addresses the use of wild plants as a source of food and medicine. During field work (2009 and 2014), all the settlements (a total of five villages: Saraylar, Çınarlı, Asmalı, Gündoğdu, and Topağaç) were visited. Data were collected mainly by means of the free listing method, and supplemented by the observations of participants during informal walks with selected key informants. A total of 30 people were interviewed. Of these, 19 were men, 11 were women. The age of informants varied from 40 to 85, the mean age being 62. Interviews were arranged at various places (e.g., tea houses, gardens, homes, etc.).

Interviewers were asked about the traditional and other domestic uses of plants, as they relate to food and medicine [88]. During the interviews, local names, names of the part(s) of the plants used, the ailments treated, the therapeutic effect, the methods of preparation, and the methods of administration were gathered for medicinal plants, and local names, names of the part(s) of the plants used and were gathered for food plants.

Besides these, species not strictly being part of our remit (i.e., not used for medicinal purposes, but nonetheless used in everyday infusions as a “recreational tea”), were also included, if specifically mentioned by the respondents [89].

The Code of Ethics of the International Society of Ethnobiology [90] was strictly followed.

The collected plants were identified by the author using the *Flora of Turkey and East Aegean Islands* [91]. Voucher specimens were deposited at the Herbarium of the Faculty of Pharmacy, University of Marmara (MARE).

Results

The plants used for medicinal and food purposes on Marmara Island are presented in Tab. 1, and arranged alphabetically according to their botanical names, together with relevant information. Taxonomical changes to The Plant List [92] are shown in parentheses in Tab. 1, together with popular scientific names. During this study, 58 specimens were collected for the region investigated and 22 taxa, belonging to 19 families, were recorded. The most common medicinal plant families present were Asteraceae (27%), Lamiaceae (20%), and Rosaceae (13%). Aerial parts and fruit parts are mainly used for medicinal purposes.

Plants are mainly used medicinally for [according to Use record- (*N*) value] abdominal pain, the common cold, and haemorrhoids.

During the course of the study, a total of 29 remedies were recorded. Most remedies were taken internally, the main preparation methods being infusion and direct application.

According to the local people, *Ecballium elaterium* and *Dracunculus vulgaris* should be used with great caution, since overdosing can be dangerous.

A previous floristic study for the region contains information about the local use of certain plants [82], e.g., the use of *Ballota acetobulosa* for the treatment of haemorrhoids. In this study, which was conducted 30 years later, the author found that this same plant is still used today for the treatment of haemorrhoids. The use of *Satureja parnassica* Heldr. et Sart subsp. *sipylea* P.H. Davis for the treatment of abdominal pain was also recorded. However, this plant could not be collected by the author.

The plants most commonly used in the region as medicinal remedies were *Salvia fruticosa*, *Hypericum perforatum*, *Ficus carica*, and *Mentha spicata*.

Nine taxa used medicinally (*Ficus carica* subsp. *carica*, *Malva sylvestris*, *Matricaria chamomilla* var. *recutita*, *Mentha spicata* subsp. *spicata*, *Origanum vulgare* subsp. *hirtum*, *Rosa canina*, *Rubus sanctus*, *Salvia fruticosa*, and *Urtica dioica*) are also used as food plants. Apart from these, only 18 species were used as food plants during our study.

Leaves and other aerial vegetative organs form the largest category (14 species), followed by fruit (seven species), flowers (five species), and subterranean organs (three species).

Leaves and other aerial vegetative organs are still used as the basis of raw salads, or cooked, and fruit is eaten raw; jam is made, as well as pekmez and pickle, and four species are used for spices. Five taxa (*Alcea pallida*, *Matricaria chamomilla*, *Mentha spicata* subsp. *spicata*, *Origanum vulgare* subsp. *hirtum*, and *Salvia fruticosa*) are used for recreational tea.

Wild vegetables are still used on Marmara Island. These are usually weeds growing in abandoned fields, on roadsides and in hedgerows. They are mainly collected in spring (March–April), and some fruit are collected at the end of summer and in autumn. The interviewees reported that they use wild food plants in particular, because these are considered to be healthier. For example, *Salvia fruticosa*, which is common especially in the northern and eastern parts of the region, is frequently gathered by local people, and is drunk as a tea (Fig. 5). It is the most popular drink in cafes on the island, in tea gardens, and at the homes of local people.

Of the three women interviewed, two stated that they gather *Arbutus unedo*, *Ficus carica*, *Rosa canina*, and *Rubus sanctus* while on short walks of the island, and use these to make jam and pekmez.



Fig. 5 Dried aerial parts of *Salvia fruticosa*.

Furthermore, in former times, petals of *Papaver dubium* (after removing the black parts at their bases) were steeped in a bottle full of water to which had been added lemon salt, and then exposed to sunlight. Sugar was subsequently added prior to drinking. However, its use has gradually diminished.

External parts of fruit of *Rhus coriaria*, which commonly grows in the area, are removed after drying and pulverized, before being used as a spice for salads and meals.

In this region, before *Muscari comosum* is used, it is boiled five times, and the water changed each time. Olive oil is then added and the plant eaten.

Apart from those plants growing in the area which are used for treatment, and are thus listed, *Juglans regia*, *Olea europae* var. *europae*, and *Punica granatum* are also used as sources of nutrition. However since our study relates solely to wild plants used for nutrition, this information was not included in Tab. 1.

Some different plant taxa are called by the same vernacular name by the natives. For example: *Anthemis auriculata* – *A. tinctoria* var. *tinctoria* – *Matricaria chamomilla* var. *recutita* (Papatya), *Origanum vulgare* subsp. *hirtum* – *Thymus longicaulis* subsp. *longicaulis* var. *subiophyllus* (Kekik), *Euphorbia rigida* – *Lactuca serriola* (Sütlü ot), and *Ballota acetabulosa* – *Cistus creticus* (Pamuk otu).

Tab. 1 Medicinal and wild food plants of Marmara Island (Balıkesir – Turkey).

Botanical name, family, and specimen number	Local name	Plant part used (medicine)	Ailments treated/therapeutic effect	Preparation and administration	Plant part used (food)	Modes of consumption	Use records N = 30	References
<i>Alecea palliata</i> Waldst. et Kit. (Malvaceae, MARE 11571, 17387)	Ayşefatma				Flowers	Tea	14	[69]
<i>Anchusa undulata</i> L. subsp. <i>hybrida</i> (Ten.) Coutinho (Boraginaceae, MARE 17411)	-				Flowers	Nectar sucked from the flower	11	[33,36]
<i>Anthemis auriculata</i> Boiss. (Asteraceae, MARE 11548, 11557, 17384, 17418)	Papatya	Capitulum	Abdominal pain	Inf., int.			8	
<i>Anthemis tinctoria</i> L. var. <i>tinctoria</i> [Cota tinctoria (L.) J. Gay] (Asteraceae, MARE 17407)	Papatya	Capitulum	Abdominal pain	Inf., int.			8	
<i>Arbutus unedo</i> L. (Ericaceae, MARE 11610)	Davulga, Kumariyes, Kocayemiş, Yemişgen, Yabancı çilek				Fruits	Raw, jam, pekmez	24	[33,41,43,47,69,71,78]
<i>Asparagus acutifolius</i> L. (Asparagaceae, MARE 11616)	-				Young shoots	Boiled and served with eggs, fried with (or without) eggs	13	[33,41,42,69,71]
<i>Asphodelus aestivus</i> Brot. (Xanthorrhoeaceae, MARE 11618)	Hidrellez kamaşı	Roots	Haemorrhoids	Dec., stream bath			10	Haemorrhoids [35,47] [36,58,63,64,78,82] ^b
<i>Ballota acetobulosa</i> (L.) Benth (Lamiaceae, MARE 17395)	Mayasıl otu, pamuk otu	Aerial parts	Haemorrhoids	Dec., int., before breakfast for 2 weeks			4	Haemorrhoids [82]
<i>Campanula lyrata</i> Lam. subsp. <i>lyrata</i> (Campanulaceae, MARE 11555, 11570)	Kök otu				Roots	Raw	11	[33,69]
<i>Cichorium intybus</i> L. (Asteraceae, MARE 17412)	Karakavuk, Sakız otu, Sütlü ot				Leaves Roots	Raw in salads Chewed	10 4	[31–33,36,43,71,78]

Tab. 1 Continued

Botanical name, family, and specimen number	Local name	Plant part used (medicine)	Ailments treated/therapeutic effect	Preparation and administration	Plant part used (food)	Modes of consumption	Use records N = 30	References
<i>Cistus creticus</i> L. (Cistaceae, MARE 17383, 17408)	Pamuk otu	Flowering branches	Shortness of breath	Dec., int.			5	[34,46,55,58,63,64,74,75,78] ^b
<i>Dracunculus vulgaris</i> Schott (Ara- ceae, MARE 11643)	Yilanyatağı, Yilanzehiri	Fruits	Haemorrhoids	-, int.			6	Haemorrhoids [1,34,58,64,71,74,75] [32,77] ^b
<i>Ecballium elaterium</i> (L.) A. Rich. (Cucurbitaceae, MARE 11600, 17414)	Yabankavunu	Fruits juice	Sinusitis	-, Dropped into the nostrils			11	Sinusitis [1,36,51,56,58,63,64,70,71,74,76,78,82]
<i>Euphorbia rigida</i> Bieb. (Euphor- biaceae, MARE 11560)	Süt otu, Sütlü ot	Latex	Heel spur	-, ext.			3	[30,51] ^b
<i>Ficus carica</i> L. subsp. <i>carica</i> (Moraceae, MARE 11546, 11593, 17416)	İncir	Latex	Wart	-, ext.			14	Wart [64]
		Latex	Wart	-			12	Wart [1,34–36,46,58,63,64,70,71,74,76]
		Fruits	Haemorrhoids	Eaten			10	Haemorrhoids [70,75]
		Fruits			Fruits	Raw, jam	18	[33,36,41,42,47,69,71,78]
<i>Helichysum stoechas</i> (L.) Moench subsp. <i>barrelieri</i> (Ten.) Nyman (Asteraceae, MARE 11540, 11597)	Altun otu	Aerial parts	Kidney ailments	Inf., int., before breakfast			5	Kidney ailments [36,71] [74] ^b
<i>Hypericum perforatum</i> L. (Hyperici- caceae, MARE 17404)	Kantarot	Flowering branches	Stomach ailments	Inf., int.			19	Stomach ailments [1,30,35,46,51,55,56,58,63,74,75,78] [64,71,72,76] ^b

Tab. 1 Continued

Botanical name, family, and specimen number	Local name	Plant part used (medicine)	Ailments treated/therapeutic effect	Preparation and administration	Plant part used (food)	Modes of consumption	Use records N = 30	References
<i>Juglans regia</i> L. ^a (Juglandaceae, MARE 11563)	Ceviz	Leaves	Dental care	Crushed, ext.			2	Heart diseases [63,64], rheumatism
		Immature fruits	Heart diseases	-, eaten			4	[51,71,72,75,76]
		Immature fruits	Rheumatism	Oleat, ext.			4	[1,35,46,78] ^b
<i>Lactuca serriola</i> L. (Asteraceae, MARE 17379)	Sitiü ot, Zohya				Leaves	Cooked	19	[31,33,36,42,43,69,71]
<i>Laurocerasus officinalis</i> Roemer [Prunus laurocerasus L.] (Rosaceae, MARE 17381)	Kara yemiş				Fruits	Raw	5	[69]
<i>Malva sylvestris</i> L. (Malvaceae, MARE 11564)	Ebegümeçi	Aerial parts	Abdominal pain	Inf., int.			9	Abdominal pain [1,58,63,64]
								[30,34,36,46,55,56,74-76] ^b
<i>Matricaria chamomilla</i> L. var. <i>recutita</i> (L.) Grierson [Matricaria chamomilla L.] (Asteraceae, MARE 11582)	Papatya	Capitulum	Abdominal pain	Inf., int.		Leaves	14	[32,36,40-43,69,71]
								8
<i>Mentha spicata</i> L. subsp. <i>spicata</i> (Lamiaceae, MARE 17394)	Nane	Leaves	Nausea	Inf., int.		Capitulum	5	[43]
								14
<i>Muscari comosum</i> (L.) Mill (Asparagaceae, MARE 11565)	Askardulakus, Iskardulakus				Leaves	Spice, tea	12	[36,69]
					Tuber	Boiled in five times	6	[69]
<i>Olea europaea</i> L. var. <i>europaea</i> ^a (Oleaceae, MARE 11592, 17403)	Zeytin	Leaves	Diabetes	Inf., int. before breakfast			9	Diabetes [1,36,58,63,64,76] [34,51,71,74,75] ^b

Tab. 1 Continued

Botanical name, family, and specimen number	Local name	Plant part used (medicine)	Ailments treated/therapeutic effect	Preparation and administration	Plant part used (food)	Modes of consumption	Use records N = 30	References
<i>Origanum vulgare</i> L. subsp. <i>hirtum</i> (Link) Jetswaart (Lamiaceae, MARE 11635)	Kekik	Aerial parts	Cold,	Inf., int.			7	Cold [51,56,58,70]
<i>Papaver dubium</i> L. (Papaveraceae, MARE 11537, 11543, 17399)	Bayrak, Gelincik, Lale	Aerial parts	Abdominal pain	Inf., int.			6	Abdominal pain [64] [34,46,51,56,75] ^b
<i>Pistacia terebinthus</i> L. subsp. <i>terebinthus</i> (Anacardiaceae, MARE 11590)	Çitlenbik, menengiç, sakız				Leaves	Spice, tea	16	[33,43,47,58,69]
<i>Punica granatum</i> L. ^a (Punicaceae, MARE 11620)	Nar	Seeds	Diarrhea	Eaten	Petals	Syrup	10	[69]
<i>Pyrus amygdaliformis</i> Vill. var. <i>amygdaliformis</i> (Rosaceae, MARE 11636)	Ahlat				Leaves	Cooked	8	
<i>Raphanus raphanistrum</i> L. (Brassicaceae, MARE 11539)	Turp filizi				Shoots	Stewed then salad	14	[33,42,43,69,78]
<i>Rhus coriaria</i> L. (Anacardiaceae, MARE 11611, 17376)	Ekşimik otu, Sumak				Fruits	Pickle	19	[36,43,47,69,71]
<i>Rosa canina</i> L. (Rosaceae, MARE 11567)	Kuşburnu, Şeytan gülü, Yabani gül	Fruits	Cold	Dec., int.	Young shoots	Boiled then salad	17	[31–33,36,41–43,47,69,71,78]
<i>Rubus sanctus</i> Schreber [<i>Rubus ulmifolius</i> Schott subsp. <i>sanctus</i> (Schreb.) Sudre] (Rosaceae, MARE 17373)	Böğürtlen, Yabani karamık	Roots	Eczema	Dec., int.	Fruits	Jam	16	[43,47,58,69,71]
							11	Cold [1,35,51,55,58,64,70,72,74] [30,63,75,76] ^b
							4	[32,33,43,69]
							22	Eczema [74] [1,30,35,36,46,56,64,70–72,76,78] ^b [36,43,47,69,71,78]

Tab. 1 Continued

Botanical name, family, and specimen number	Local name	Plant part used (medicine)	Ailments treated/therapeutic effect	Preparation and administration	Plant part used (food)	Modes of consumption	Use records N = 30	References
<i>Rumex acetosella</i> L. (Polygonaceae, MARE 11638)	Kuzukulağı				Young shoots	Raw in salads	19	[33,41–43,47,69]
<i>Salvia fruticosa</i> Miller (Lamiaceae, MARE 11531)	Ada çayı	Leaves	Cold	Inf., int.			18	Cold [36,71] [30,74,78] ^b
		Leaves	Abdominal pain	Inf., int.			10	Abdominal pain [35,71,79]
<i>Styrax officinalis</i> L. (Styracaceae, MARE 11559, 11533, 11581)	Yaban ayyası				Leaves	Tea	30	[36,47,69,71]
<i>Thymus longicaulis</i> C. Presl subsp. <i>longicaulis</i> var. <i>subtrophyllus</i> (Borbás) Jalas (Lamiaceae, MARE 11634)	Kekik				Flowers	Nectar sucked from the flower	9	[69]
<i>Tragopogon longirostris</i> Bisch. ex Schultz var. <i>longirostris</i> [<i>Tragopogon porrifolius</i> L. subsp. <i>longirostris</i> (Sch. Bip.) Greuter] (Asteraceae, MARE 11594, 11608)	Karakavuk, Saktız otu				Leaves	Spice	18	[42,64,79]
<i>Urtica dioica</i> L. (Urticaceae, MARE 17382)	Isırgan, Sırgan	Leaves	Haemorrhoids	Inf., int.	Stems	Raw	9	[42,69]
					Leaves	Cooked	13	Haemorrhoids [35,51,58,71,72,75,76] [1,46,55,56,70,74,78] ^b [42,47,58,69,71]

int. – internal use; ext. – external use. ^a Cultivated plants. ^b Different usage.

Discussion

Comparison of the present study with other, previous, comprehensive, ethnobotanical studies of plants used in neighboring areas for folk medicine [1,30–36,46,47,49–53, 55,56,58,63,64,70–79] is presented in Tab. 1. It reveals that, *Ecballium elaterium*, *Ficus carica*, and *Hypericum perforatum*, recorded from 12 localities, are the most common herbal medicinal plant on Marmara Island and its surrounding area. Some of the plants listed in Tab. 1 are also common in other Mediterranean countries and have been recorded in many other ethnobotanical studies [2–12]. They include: *E. elaterium*, *Ficus carica*, *H. perforatum*, *Juglans regia*, *Malva sylvestris*, *Olea europaea*, *Origanum vulgare*, *Rubus sanctus*, *Rosa canina*, and *Urtica dioica*. Comparison of the traditional uses of plants, as found in the literature [1,31–80], revealed that current study was the first record for the occurrence of *Anthemis auriculata* in Turkey.

The evaluation of plants used as a wild source of nutrition, when compared with other studies of those plants used both in Turkey [69], and in the Aegean Region [42], revealed that many common plants are used for this purpose. Some plants listed in Tab. 1 were also recorded in studies conducted on the Balkan Peninsula, in Italy, and Spain [13–29]. For example: *Arbutus unedo*, *Asparagus acutifolius*, *Cichorium intybus*, *Ficus carica* subsp. *carica*, *Malva sylvestris*, *Rosa canina*, and *Urtica dioica*. It is noted that eight taxa (*C. intybus*, *F. carica* subsp. *carica*, *M. sylvestris*, *Raphanus raphanistrum*, *Rhus coriaria*, *R. canina*, *Rubus sactus*, *Rumex acetosella*) are distinctive as wild food plants especially in west of Turkey. They also have mutual usages such as jam (*F. carica* subsp. *carica*, *R. canina*, *R. sanctus*), salad (*C. intybus*, *R. raphanistrum*, *R. acetosella*), cooked vegetable (*M. sylvestris*), spice (*R. coriaria*), and raw (*F. carica*, *R. sactus*) [1,31–33,36,40–43,47,69,71,78].

Despite both studies conducted in Turkey and on the Balkan Peninsula, in Italy and Spain, there were few records describing the use of *Muscari comosum* as a food source.

The plants used for everyday infusions on Marmara Island are those species commonly used in other Mediterranean countries [89].

Some vernacular names for medicinal plants are recorded here for the first time [93,94]. They include: *Kumariyes* (*Arbutus unedo*), *hidrellez kamışı* (*Asphodelus aestivus*), *yıllanyatağı* (*Dracunculus vulgaris*), *askardulus*, *ıskardulus* (*Muscari comosum*), *bayrak* (*Papaver dubium*), *eğişimik otu* (*Rhus coriaria*), and *yabani karamık* (*Rubus sanctus*).

Conclusion

This research, conducted on the second largest Turkish island, Marmara Island, has investigated those plants used as traditional household remedies and as wild sources of food. Here, the use of *Anthemis auriculata* as a herbal remedy is recorded and detailed for the first time. Also the rare use of *Muscari comosum* is recorded. The study also revealed that the results obtained for Marmara Island closely resembled those obtained for other Mediterranean countries. This ethnobotanical study will enable the traditional use of wild plants both as food sources and herbal remedies to be passed on to future generations.

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Supplementary material

The following supplementary material for this article is available at <http://pbsociety.org.pl/journals/index.php/asbp/rt/suppFiles/asbp.3501/0>:

Appendix S1 Questionnaire form.

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