

Traditionally used wild edible greens in the Aegean Region of Turkey

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Abstract

Turkey has the largest coastal area in the Mediterranean, possesses an extraordinarily rich flora, and a great traditional knowledge. This diversity of plants naturally affects the traditional use of plants and is reflected in the rich Turkish cuisine. Consequently, the Mediterranean Diet (whose typical components are wild greens) constitutes one of the important elements of Turkish cuisine. For this reason, the aim of this study was to determine the consumption of wild edible green plants for the Aegean Region of Turkey and to establish the similarities to or differences from consumption in other regions and other cuisine in the Mediterranean Basin. This study compiles and evaluates the ethnobotanical data currently available. There were 111 taxa that were identified as wild edible greens in the study area belonging to 26 different families. Asteraceae (21 taxa) were the most commonly consumed as food. It was followed by Boraginaceae with 19 taxa, Apiaceae with 15 taxa and Lamiaceae with 7 taxa, respectively. *Rumex* and *Erodium* were the most represented genera with 4 species. *Tamus communis* and *Asparagus acutifolius*, Mediterranean elements and distributed in all of the Mediterranean Basin, are among the most widely consumed wild plants in the area. Wild edible plants are consumed in a variety of ways. The most common type of consumption (79 taxa) was in salads. The fact that the majority of the plants used in the area are consumed in salads shows the close relationship between the local diet and the concept of the Mediterranean Diet. As a result, very promisingly, there is a renewed or increasing interest in consuming wild food plants as part of this diet.

Keywords: wild edible greens, ethnobotany, traditional knowledge, consumption, Mediterranean Diet, Aegean, Turkey

Introduction

The type of food consumed reflects the identity of people and the use of wild food plants is a very good indicator of traditional local knowledge. The main characteristics of the Mediterranean Diet has been described as mainly composed of vegetables, salads, fruits and spices, whole-grain cereals, pasta, nuts, legumes, olive oil, seafood, a moderate consumption of wine with meals, poultry consumed in low-to-moderate amounts, and a relatively low consumption of red meat [1–3]. By supplying micronutrients, vitamins, and minerals, wild plants play an important role in complementing staple foods [4]. Many of these wild foods are common and productive, as well as being highly nutritious, palatable, and easily harvested [5]. They are also important as a source of income for poor communities, as well as being a source of food and considered a healthy diet by many. Diets consumed by Mediterranean peoples have been a subject of interest since antiquity, with

more recent investigations focused on their evident health benefits.

However, the Mediterranean Basin contains many different cultures, religious beliefs, and ecologic backgrounds. This has resulted in many diets, sharing a multitude of elements. But at the same time, these diets differ in distinct local or regional traditions. Food and medicinal uses have always been the most relevant reasons for plant management in the folk traditions of the Mediterranean Region, and they still continue to be so, even in cultures that are progressively losing their close relationship with nature [2].

The studies show that Mediterranean Diet contains important dietary components that may contribute to a lower risk of cancer. Several micro-components with antioxidant potential are underlying factors that define the health benefits of this type of diet. The relative longevity of the Mediterranean people is attributed to the type of diet they consume [6]. The Mediterranean Diet is an example of sustainable food production. It is a dietary pattern that can combine taste and health, environmental protection, biodiversity protection, and consumption of local and seasonal products [7].

Turkey, which has the largest coastal area in the Mediterranean, possesses an extraordinarily rich flora and a great traditional knowledge. Due to its climate and geographical position, Turkey, with its 10000 taxa, is one of the richest countries in Europe and the Middle East, in terms of flora [8]. A total of 1/3 of the plant taxa of Turkey is endemic [9]. Anatolian people have been profiting from this variety and using plants as food and medicine since the Paleolithic [10]. This

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diversity of plants naturally affects the traditional use of plants and is reflected in the rich Turkish cuisine. Consequently, the Mediterranean Diet constitutes one of the important elements of Turkish cuisine.

Despite all the great qualities of the Mediterranean Diet, in many Mediterranean regions, including Turkey, the traditions regarding the diet are under the risk of disappearing, and therefore there is an urgent need to study them [11]. In this modern era where the fast-food culture is spreading worldwide and the transfer of ethnobotanical knowledge from old generations is diminishing, this study will be helpful for both recording the information regarding the consumption of wild edible plants as a food source and providing people with new ideas. For this reason, the aim of present study was to review the consumption of wild edible green plants and establish the similarities to or differences from consumption in other regions and other cuisine in the Mediterranean Basin.

Several previous studies have described the traditional knowledge about the plants in the research area and the uses and different needs for them such as everyday household items, traditional crafts, etc. [8,12–17].

General characteristics of the study area

CLIMATE. The Mediterranean climate is dominant in the study area, particularly along the shores of the Mediterranean, Aegean, and Marmara regions. In the Mediterranean climate, summers are hot and dry; winters are mild and rainy. The maximum precipitation falls in the winter; the minimum falls in summer. A long and arid period predominates from mid-May till mid-October. In April and May, clear and still weather conditions alternate with rain showers and cold. The difference between summer and winter precipitation is very high. The average annual precipitation is 600 to 1000 mm. The annual average temperature is 18 to 20°C. Mountains in the Aegean Region lie perpendicular to the shore and this allows the Mediterranean climate to reach inland [18–20].

VEGETATION. The study area includes the Aegean Region of Turkey (Fig. 1). It is geographically situated in the western part of Turkey. Markgraf [21] has divided the Mediterranean Region into two subdivisions: the west and the east provinces. According to this division, the study area lies in the East Mediterranean Province. In the Mediterranean Basin there is huge topographic, climatic, and geographic variability giving rise to an astounding array of species and habitat diversity [22].



Fig. 1 The map of the study area.

The vegetation in general consists of sclerophyllous shrubs and trees. The typical Mediterranean species are *Styrax officinalis* L., *Rhamnus palaestinus* Boiss., *Rhamnus punctatus* Boiss., *Arbutus andrachne* L., *Cistus creticus* L., *Satureja thymbra* L., *Salvia triloba* L., and *Sarcopoterium spinosum* (L.) Spach. Some of the representative species found in both the east and west provinces are *Quercus ilex* L., *Quercus coccifera* L., and *Pistacia terebinthus* L. The East Mediterranean Province exhibits a strong influence from the Irano-Turanian region. The typical dominant species in the Mediterranean Region is *Quercus ilex*. This species is replaced in the East Mediterranean Province by *Quercus coccifera* and among the tree species are *Ceratonia siliqua* L., *Olea europaea* L. subsp. *oleaster* (Hoffmanns. & Link) Negodi, and *Pistacia lentiscus* L. The maquis was formed as a result of the destruction of tree formations. They develop on the slopes which lack soil cover deep enough to support forest vegetation and consist of the sclerophyllous species of shrubs, together with some climbers like *Lonicera*, *Clematis*, and *Asparagus*.

The borders of the Mediterranean Region in Turkey were drawn by Zohary [23]. They correspond with the southern border of the distribution of *Pinus brutia* Ten. The latter is an indicator of the true Mediterranean conditions. In some places this border is drawn by the *Quercus ithaburensis* Decne. subsp. *macrolepis* (Kotschy) Hedge, but never by plants like *Quercus cerris*, *Pinus nigra* Arn., and *Juniperus* spp. Black pine is a typical indicator of the oro- and sub-Mediterranean vegetation. This vegetation is phytogeographically closer to euxinian vegetation than the Mediterranean one. The region close to Central Anatolia serves as a transition zone between the Mediterranean, the semi-desert belt, and the steppes. The climate and vegetation in general show the same characteristics as those of the Mediterranean [24].

Material and methods

This study compiles and evaluates the ethnobotanical data currently available. More than seventy literature sources were reviewed [25–101] including six from the study area [25–30]. Plant names are given according to Davis [31]. A literature review was carried out firstly for the Aegean Region, which is target study area, and then for all of Turkey and the wild edible green plants used in these areas were identified. According to Turner et al. [5], edible wild plants are root vegetables, edible greens, fleshy fruits, grains, seeds, and nuts. This study focused on the wild edible greens. It includes leaves, stems, and shoots. In addition, based on field observations, the consumption of some plant taxa is reported here for the first time. The plants' scientific names, families, local and English names, parts consumed, type of consumption and related sources are also given in Tab. 1.

Results and discussion

Altogether, 111 taxa of wild edible greens have been used in the study area (Tab. 1). *Rumex* and *Erodium* are the most represented genera, with four species. *Amaranthus*, *Tragopogon*, and *Papaver* were represented by three species. *Allium*, *Anchusa*, *Chenopodium*, *Chrysanthemum*, *Eryngium*, *Lamium*, *Lepidium*, *Scorzonera*, *Silene*, *Sinapis*, *Sisymbrium*, *Smyrniium*, *Sonchus*, and *Urtica* were represented by two species (Fig. 2).

Tab. 1 Traditionally used wild edible greens of the Aegean Region of Turkey.

Scientific name	Family	Local name	English name	Edible green part	Recipe	Use in the study area	Citation out of study area
<i>Allium ampeloprasum</i> L.	Liliaceae	Karaköremen	wild leek	leaf	Consumed as pastry. Fried with egg. Cooked with olive oil, prepared as vegetable pie.	[25]	[46,48,49,68,80]
<i>Allium subhirsutum</i> L.	Liliaceae	Köremen	hairy garlic	leaf	Consumed as pastry. Fried with egg. Cooked with olive oil, prepared as vegetable pie.	[25]	[81]
<i>Amaranthus chlorostachys</i> Willd.	Amaranthaceae	sirken, tilkikuyruğu	slim amaranth	shoot and leaf	Chopped and added to pastries and salads, or fried in a skillet and consumed with eggs.	[29]	
<i>Amaranthus retroflexus</i> L.	Amaranthaceae	horoz ibiği	common amaranth	shoot and leaf	Prepared as stew, meal, pie. Consumed raw in salads, or added to salads after boiling.	[27]	[2,11,34,37,38,41,52,61,71,77]
<i>Amaranthus viridis</i> L.	Amaranthaceae	deli sirken, tilkikuyruğu	slender amaranth	leaf	Olive oil and lemon is added after boiling and consumed as salad.	[25]	
<i>Anagallis arvensis</i> L.	Primulaceae	fare kulağı	scarlet pimpernel	leaf	Consumed as meal on its own.	[27]	[32,75]
<i>Anchusa azurea</i> Mill.	Boraginaceae	Sığirdili	wild bugloss	shoot and leaf	Consumed roasted.	[27,29]	[2,4,46,75]
<i>Anchusa undulata</i> L. subsp. <i>hybrida</i> (Ten.) Cout.	Boraginaceae	ballıkotu, kocaot	alkanet	leaf	Added to pastries.	[25,29]	[4,37]
<i>Anethum graveolens</i> L.	Apiaceae	dereotu	dill	aboveground	Added to salads, cooked with many vegetables.	[27]	[82]
<i>Arum maculatum</i> L.	Araceae	yılan yastığı	lords-and-ladies	leaf	Leaves are stuffed, consumed as meal on its own meal, or roasted.	[27]	[33,34]
<i>Asparagus acutifolius</i> L.	Liliaceae	kuşkonmaz	spiny asparagus	young shoot	Roasted like black bryony. Fried either alone or with black bryony and egg is added.	[25,26,30]	[2,4,11,42,44,48,51,66]
<i>Bellis perennis</i> L.	Asteraceae	koyungözü	daisy	leaf	Cooked with rice. In salads with other vegetables.	author's observations	[38,61,71,75,83]
<i>Berula erecta</i> (Huds.) Coville	Apiaceae	sukazayagi	cut leaf water	aboveground	Added to salads or eaten alone.	[25]	
<i>Beta</i> spp.	Chenopodiaceae	yabani pancar	parsnip beet	whole plant	Eaten raw, fried with egg.	[25]	[4,11,34,38,39,45,46,48,49,52-54,56,58,61,63,66,68,71,80,84,85]
<i>Brassica nigra</i> (L.) Koch	Brassicaceae	karahardal	black mustard	young shoot and leaf	Consumed as salad.	[25]	[2,49,59,71]
<i>Capsella bursa-pastoris</i> (L.) Medik	Brassicaceae	çobançantası	shepherd's purse	aboveground	Consumed in meal, roast, soup, or salads.	[25,27,29,30]	[47,50,60,61,63,66,83]
<i>Cardamine uliginosa</i> M. Bieb.	Brassicaceae	sukerdimesi	bitter cress	shoot and leaf	Consumed raw in salads.	[25]	
<i>Cardaria draba</i> (L.) Desv.	Brassicaceae	kediotu	whitetop	shoot and leaf	Consumed raw in salads.	[27]	[34,71]
<i>Centaurea solstitialis</i> L.	Asteraceae	çakırdikeni	yellow star thistle	leaf	Boiled and seasoned with olive oil and lemon, and eaten as refreshing food.	[25]	
<i>Chenopodium album</i> L.	Chenopodiaceae	sirken	lamb's quarters	aboveground	Boiled, prepared as salad with lemon and olive oil. Fried with onion.	[26]	[2,4,11,36-39,41,45,49,53,56,61,71,82,86-89]
<i>Chenopodium polyspermum</i> L.	Chenopodiaceae	sirken	all-seed	aboveground	Roasted. Fried with onion.	[27]	
<i>Chondrilla juncea</i> L.	Asteraceae	çengel sakızı	rush skeleton weed	aboveground	Added to pastries and salads.	[29]	[37,45,60,80]

Tab. 1 (continued)

Scientific name	Family	Local name	English name	Edible green part	Recipe	Use in the study area	Citation out of study area
<i>Chrysanthemum coronarium</i> L.	Asteraceae	dallama	crown daisy	leaf	Eaten raw.	[41]	[4,46]
<i>Chrysanthemum segetum</i> L.	Asteraceae	sarı papatya	corn marigold	leaf	Eaten raw.	[25]	
<i>Cichorium intybus</i> L.	Asteraceae	yabani hindiba	chicory	aboveground	Leaves can be eaten raw in salads, used in yogurt salad, cooked (sautéed with onion) seasoned with oil and lemon, consumed in soup, in stew or fried with garlic and oil.	[26,27]	[2,4,11,34,37,41,42,45-49, 52,53,61,63,66,68,71,72, 80,82,84,85,90,92]
<i>Cirsium arvense</i> (L.) Scop.	Asteraceae	köygöçerten	creeping thistle	leaf	Consumed as meal or stuffed.	[27]	[4,41,53,91]
<i>Coriandrum sativum</i> L.	Apiaceae	kişniş	coriander	aboveground	Added to salad as fresh plant. Fried with onion. Chopped into various soups.	author's observations	[4,38]
<i>Crithmum maritimum</i> L.	Apiaceae	deniznarulu, kayakoruğu	rock samphire	leaf	Leaves used freshly in salads.	[25]	[61]
<i>Daucus carota</i> L.	Apiaceae	daraklık, yabani havuç	wild carrot	shoot and leaf	Consumed as meal, and stew.	[25,27,30]	[2,4,50,53,54,61,71]
<i>Echinophora tenuifolia</i> L. subsp. <i>sibthorpiana</i> (Guss.) Tutin	Apiaceae	çördük, tarhana otu	tarhana herb	aboveground	Added to tarhana.	[25,27,29]	[78,79]
<i>Echium italicum</i> L.	Boraginaceae	ayıkulağı	Italian viper's bugloss	leaf	Consumed roasted.	[27]	[32,54,91]
<i>Eremurus spectabilis</i> Bieb.*	Liliaceae	çiriş	foxtail lily	leaf	Cooked with onion.	author's observations	[42]
<i>Erodium cicutarium</i> (L.) L'Hérit	Geraniaceae	ıgnelik	redstem filaree	aboveground	Consumed fried. Added to stuffing of "sheet iron pastry" (sac böreği).	[25,27,28]	[32,37]
<i>Erodium hoefianum</i> C. A. Meyer	Geraniaceae	dönbaba, ıgnelik	stork's bill	aboveground	Consumed fried. Added to stuffing of sheet iron pastry.	[25]	
<i>Erodium malacoides</i> (L.) L'Hérit.	Geraniaceae	dönbaba, ıgnelik	Mediterranean stork's bill	aboveground	Consumed fried. Added to stuffing of sheet iron pastry.	[25]	
<i>Erodium moschatum</i> (L.) L'Hérit.	Geraniaceae	dönbaba, ıgnelik	musky stork's bill	aboveground	Consumed fried. Added to stuffing of sheet iron pastry.	[25,81]	[83]
<i>Eruca sativa</i> Mill.	Brassicaceae	yabani roka	rocket salad	leaf	Consumed raw in salads.	[29]	[2,45,47,50,52,59]
<i>Eryngium campestre</i> L.	Apiaceae	Boğa dikeni	field eryngo	shoot and leaf	Prepared as pie or stew.	[25,27]	[4,34,40,45,47-49,52,83]
<i>Eryngium creticum</i> Lam.	Apiaceae	göz dikeni	Crete an eryngo	leaf	Eaten raw in salads with oil, lemon, and vinegar.	[25]	[50,72]
<i>Falcaria vulgaris</i> Bernh.	Apiaceae	kazayağı	sickle weed	shoot and leaf	Eaten raw in salads. Leaves cooked with onion and olive oil.	[25]	[38,39,93]
<i>Foeniculum vulgare</i> Mill.	Apiaceae	arapçaçı	fennel	aboveground	Cooked as meal.	[25-27, 29,30]	[2,4,11,42,44-50,53,55, 56,58,60-63,65,66,68, 72,81-83,85,92]
<i>Fumaria officinalis</i> L.	Fumariaceae	şahtere	fumitory	leaf	Consumed as salad and pie.	[27]	[32,75]
<i>Galega officinalis</i> L.	Fabaceae	keçisakal	goat's rue	aboveground	Consumed as stew.	[27]	[32,34]
<i>Geranium dissectum</i> L.	Geraniaceae	turnagası	cutleaf geranium	leaf	Consumed as meal and pie.	[27]	

Tab. 1 (continued)

Scientific name	Family	Local name	English name	Edible green part	Recipe	Use in the study area	Citation out of study area
<i>Gundelia tournefortii</i> L.	Asteraceae	kengerotu	Tournefort's gundelia	young stem and leaf	Consumed as roasted, salad, and pickle.	[27]	[33,39,50,59,72,94-96]
<i>Lactuca serriola</i> L.	Asteraceae	acı marul, eşek marulu	prickly lettuce	leaf	Consumed as salad.	[27,29,30]	[4,11,37,45,48,49,53-55, 58,61,63,66,80,90]
<i>Lamium amplexicaule</i> L.	Lamiaceae	ballıbaba	henbit deadnettle	aboveground	Consumed as meal, added to pastry.	[27]	
<i>Lamium moschatum</i> Mill.	Lamiaceae	lülün otu	musk deadnettle	aboveground	Consumed as meal, added to pastry.	[25]	
<i>Lavatera cretica</i> L.	Malvaceae	develik, gömeç	cornish mallow	aboveground	Added to pastry.	[25]	
<i>Lepidium sativum</i> L.	Brassicaceae	tere	cress	leaf	Eaten fresh, added to salad.	[25]	[50]
<i>Lepidium spinosum</i> Ard.	Brassicaceae	kerdime	pepper cress	leaf	Eaten fresh, added to salad.	[25]	
<i>Limonium sinuatum</i> (L.) Mill.	Plumbaginaceae	sahil karanfili	wavyleaf sea lavender	young shoot and leaf	Put in olive oil and eaten raw as salad.	[25]	
<i>Malva sylvestris</i> L.	Malvaceae	ebegümeci	common mallow	aboveground	Cooked with minced meat or olive oil. Prepared as soup or put in pastry, fried with other herbs.	[25-28,30]	[2,4,32,34,37-42,45,47,49, 50,53,54,59,61,63,66,71, 72,78,83,89-91,97,98]
<i>Mentha aquatica</i> L.	Lamiaceae	Su nanesi	water mint	aboveground	Consumed as pie, soup, roasted, and salad.	[27]	[49,54]
<i>Mercurialis annua</i> L.	Euphorbiaceae	yer fesleğeni	annual mercury	leaf	Consumed as soup, and meal.	[27]	[34,52]
<i>Nasturtium officinale</i> R. Br.	Brassicaceae	su teresi	watercress	aboveground	Fried with onion. Eaten as salad.	[27,29,30]	[2,34,38,40,45,47,49,59, 61,66,72,83,88,89,91]
<i>Oenanthe pimpinelloides</i> L.	Apiaceae	kazayağı	corky-fruited water-dropwort	stem and leaf	Consumed as salad, and meal.	[25,30]	[82]
<i>Onopordum tauricum</i> Willd.	Asteraceae	eşek dikenini	Taurian thistle	stem	Consumed as salad.	[27]	
<i>Opopanax hispidus</i> (Friv.) Griseb.	Apiaceae	sarıot	opopanax	leaf	Boiled and then cooked with egg	[25]	[40]
<i>Origanum onites</i> L.	Lamiaceae	Izmir kekiği	Turkish oregano	leaf	Leaves are freshly eaten in breakfast, added to various salads.	author's observations	
<i>Ornithogalum narbonense</i> L.	Liliaceae	akbaldır	star of Bethlehem	aboveground	Consumed as meal.	[27]	
<i>Oxalis pes-caprae</i> L.	Oxalidaceae	ekşi yonca	Bermuda buttercup	young stem and leaf	Consumed mixed with green salad.	[25]	[2,4,54,71]
<i>Papaver dubium</i> L.	Papaveraceae	meşkük haşhaşı	long-head poppy	young shoot	Consumed mixed with green salad. Used as pastry stuffing. Cooked with olive oil, and prepared as vegetable pie. Consumed as meal, roasted, and soup.	[25]	[33,39]
<i>Papaver guertekense</i> Stapf.	Papaveraceae	gelincik		young shoot	Consumed mixed with green salad. Used as pastry stuffing. Cooked with olive oil, and prepared as vegetable pie. Consumed as meal, roasted, and soup.	[25]	
<i>Papaver rhoeas</i> L.	Papaveraceae	gelincik	corn poppy	young shoot	Consumed mixed with green salad. Used as pastry stuffing. Cooked with olive oil, and prepared as vegetable pie. Consumed as meal, roasted, and soup.	[25-27,30]	[2,4,11,37,41,45-49,52-54, 56,58,59,61,63,66,68,80-83, 87,89,90]

Tab. 1 (continued)

Scientific name	Family	Local name	English name	Edible green part	Recipe	Use in the study area	Citation out of study area
<i>Paracaryum aucheri</i> (A. DC.) Boiss.	Boraginaceae	elköpürten	paracaryum	aboveground	Added to pastries and salads.	[29]	
<i>Pistacia terebinthus</i> L.	Anacardiaceae	menengic, çitlenbik	terebinth	young shoot	Fresh shoots are eaten alone. Added to pickle. Fried with onion and egg.	[29]	[2,59]
<i>Plantago lanceolata</i> L.	Plantaginaceae	sinirlot	ribwort plantain	leaf	Consumed as stuffed, pie, and salad.	[27]	[2,34,53,54,61,66,67,71,75]
<i>Polygonum cognatum</i> Meisn.*	Polygonaceae	madimak	knot-grass	aboveground	After chopping, fried with egg or made into soup with wheat grains and yogurt. Prepared as pastry.	[27,28]	[32,33,36-41]
<i>Portulaca oleracea</i> L.	Portulacaceae	semiz otu	purslane	aboveground	Consumed freshly as salad or with yogurt and garlic. Cooked with onion. Cooked as soup with other vegetables.	[25,27,28]	[2,4,32-34,37-39,45,47-50, 52,55,56,58-65,73,78, 80-82,87]
<i>Ranunculus ficaria</i> L.	Ranunculaceae	yağhot,katırmalı	lesser celandine	leaf	Prepared as salad after boiling.	[25]	[47,53,61,75,83]
<i>Raphanus raphanistrum</i> L.	Brassicaceae	turpotu	wild radish	fresh shoot and leaf	Prepared as salad with olive oil, garlic, and lemon after boiling.	[25,27,30]	[2,4,34,40,47,49,53,61,71, 82,83,88,90,92]
<i>Rapistrum rugosum</i> (L.) All.	Brassicaceae	küçük yabani turp	turnip weed	aboveground	Added to salads and pastries,	[29]	[4,47,49]
<i>Rheum ribes</i> L.*	Polygonaceae	ısgın	rhubarb	fresh shoot and young petiole	boiled and seasoned with olive oil, garlic, and lemon. Skin is removed and consumed raw or salad is made with olive oil and lemon. Fried with oil and egg is added.	author's observations	[33,36,39,40,42]
<i>Rosmarinus officinalis</i> L.	Lamiaceae	kuşdili	rosemary	leaf	Added to salads as fresh or to meat dishes or other dishes as spice after dried.	[27]	[2,4,45,48,55,58,59,87,92]
<i>Rumex acetosella</i> L.	Polygonaceae	kuzukulağı	sheep sorrel	young shoot and leaf	Due to sour taste, commonly consumed as salad or raw. Prepared as salad with yogurt. Consumed as stuffed, pie, soup, meal, and roasted.	[25,27,30]	[4,33,34,37,38,47,54-56, 61-63,66,89,91]
<i>Rumex crispus</i> L.	Polygonaceae	kıvrık labada	curled dock	leaf	Consumed as stuffed, pie, soup, meal, salad, and roasted.	[27,28]	[4,34,37-41,48,49,53-56, 61,63,71,74,75,85,90]
<i>Rumex obtusifolius</i> L.	Polygonaceae	yabani labada	broad-leaf dock	leaf	Consumed as stuffed, pie, soup, meal, salad, and roasted.	[27]	[4,55,62]
<i>Rumex patientia</i> L.	Polygonaceae	labada, evelik	patience dock	leaf	Fried with onion and egg. Added to pastry. Consumed as stuffed, pie, soup, meal, salad, and roasted.	[27,30]	[34,50,71,82]
<i>Salicornia europaea</i> L.	Amaranthaceae	deniz börülçesi	glasswort	young shoot	Boiled and prepared as salad with olive oil, lemon and garlic.	[25]	[34,82]
<i>Sanguisorba minor</i> Scop.	Ranunculaceae	çayır düğmesi	salad burnet	young shoot and leaf	Eaten in salads.	[25]	[61,75]
<i>Satureja thymbra</i> L.	Lamiaceae	taş kekliği	thyme-leaved savory	leaf	Its leaves are eaten raw in the breakfast. Added to salads. It is a spice plant.	author's observations	
<i>Scandix pecten-veneris</i> L.	Apiaceae	kişkiş	shepherd's-needle	young shoot and leaf	Used in salads. Prepared as vegetable pie.	[25]	[4,63,81]
<i>Scolymus hispanicus</i> L.	Asteraceae	şevket-i bostan	blessed thistle	bark of the root and young basal leaf stalk	Cooked with lamb meat.	[27]	[2,4,42,45-49,59-61, 63,65,68,70,80,82]
<i>Scorzonera cana</i> (C. A. Meyer) Hoffm.	Asteraceae	yakıotu, iskorçına	dog's scorzonera	leaf	Young leaves sprinkled with salt are eaten. Consumed as meal and in salads.	[25,28]	[37-39]

Tab. 1 (continued)

Scientific name	Family	Local name	English name	Edible green part	Recipe	Use in the study area	Citation out of study area
<i>Scorzonera elata</i> Boiss.	Asteraceae	tekesakalı	viper's grass	leaf	Young leaves sprinkled with salt are eaten. Consumed as meal and in salads.	[25]	
<i>Sedum rubens</i> L.	Crassulaceae	kayüzümü	red stonecrop	leaf	Consumed raw in salads.	[25]	
<i>Senecio vulgaris</i> L.	Asteraceae	kanaryaotu	groundsel	aboveground	Prepared as stew.	[27,30]	[37,75]
<i>Silene italica</i> (L.) Pers.	Caryophyllaceae	nakil	Italian catchfly	aboveground	Prepared as stew. Consumed raw in salads. Cooked with olive oil, and prepared as vegetable pie.	[25]	
<i>Silene vulgaris</i> (Moench.) Garcke	Caryophyllaceae	gıvışan otu	bladder campion	aboveground	Prepared as stew. Consumed raw in salads. Cooked with olive oil, and prepared as vegetable pie.	[25,27]	[4,32,34,44,46–49,53–55, 60–63,66,68,69,75,80,81, 85,87,90]
<i>Sinapis alba</i> L.	Brassicaceae	beyaz hardal	white mustard	aboveground	Roasted with egg, or boiled and made into salad.	[27,30]	[2,4,42,49,52,59,61,82,89]
<i>Sinapis arvensis</i> L.	Brassicaceae	hardal otu	wild mustard	aboveground	Roasted with egg, or boiled and made into salad. Also consumed as vegetable soup.	[25,27,29]	[11,34,37,40–42,45,49,50, 59–61,71,75]
<i>Sisymbrium altissimum</i> L.	Brassicaceae	bülbül otu	tumble mustard	aboveground	Added to pastries.	[29]	[37]
<i>Sisymbrium officinale</i> (L.) Scop.	Brassicaceae	akhardal	hedge mustard	shoot and leaf	Consumed raw in salads.	[27]	[4,34,45,49,53,61,86,90]
<i>Smilax aspera</i> L.	Liliaceae	gıcır, silcan	sarsaparilla	young shoot and leaf	After boiling, fried with onion and egg or cooked with rice. Consumed as pickled. Young shoots are eaten raw as snack.	[27]	[2,4,34,47,49,59,61]
<i>Smyrniolum conmatum</i> Boiss. et Kotschy	Apiaceae	sarıkreke	yellow Alexanders	leaf	Leaf stalks are eaten raw. Added to pickle.	[25]	
<i>Smyrniolum olusatrum</i> L.	Apiaceae	yabani kereviz	Alexanders	leaf	Cooked. Leaf stalks are eaten raw. Added to pickle.	[25]	
<i>Solanum nigrum</i> L.	Solanaceae	istifno, köpek üzümü, giritotu	black nightshade	young shoot and leaf	Boiled with courgettes, prepared as salad with lemon, garlic, and olive oil.	[25,27,30]	[2,34]
<i>Sonchus asper</i> (L.) Hill subsp. <i>glaucescens</i> (Jordan) Ball	Asteraceae	sütlot, sütlen	spiny sow thistle	leaf	Fried with onion and egg. Boiled and prepared as salad. Used as pastry stuffing. Eaten in soup or raw in salad seasoned with oil and lemon.	[29,30]	[2,4,37,45,48,49,53,54,60,61, 65,80,83,90]
<i>Sonchus oleraceus</i> L.	Asteraceae	eşek marulu, yalancı marul	sow thistle	leaf	Fried with onion and egg. After boiled prepared as salad or consumed fresh as salad. Used as pastry stuffing. Cooked with olive oil.	[25,27]	[2,4,34,45–49,53,55,56,58,60, 61,63,71,75,80,81,85,92]
<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	kuşotu	chickweed	aboveground	Prepared freshly as salad. Used as pastry stuffing.	[25,30]	[34,45,47,63,71,75,83,88]
<i>Tamus communis</i> L.	Dioscoreaceae	sarmaşık	black bryony	young shoot	Fresh shoots fried with onion and egg is added.	[25,27]	[2,34,44–52,67,68]
<i>Tanacetum</i> spp.	Asteraceae	radika, karahindiba	dandelion	aboveground	Added to pastries and green salads. Boiled and prepared as salad with olive oil, garlic, and lemon. Consumed as stew, and meal.	[25,27–30]	[2,4,11,34,42,45–48,53–56, 58,60,63,66,68,75,92,99]
<i>Thlaspi perfoliatum</i> L.	Brassicaceae	çayır akça çiçeği	cotswold pennycress	aboveground	Consumed as meal, salad, and pie.	[27]	
<i>Thymbra spicata</i> L.	Lamiaceae	zahter	zahar	leaf	Leaves are eaten in breakfast as fresh. Commonly consumed as salad. A spice plant.	author's observations	[35]
<i>Tragopogon latifolius</i> Boiss.	Asteraceae	yemlik	salsify	shoot and leaf	Added to pastries and salads.	[29]	[4,41]
<i>Tragopogon longirostris</i> Bisch. ex Sch. Bip.	Asteraceae	tekesakalı	long-beaked goat's beard	shoot and leaf	Added to pastries and salads.	[25]	[100]

Tab. 1 (continued)

Scientific name	Family	Local name	English name	Edible green part	Recipe	Use in the study area	Citation out of study area
<i>Tragopogon longirostris</i> Bisch. ex Sch. Bip.	Asteraceae	tekesakalı	long-beaked goat's beard	shoot and leaf	Added to pastries and salads.	[25]	[100]
<i>Tragopogon porrifolius</i> L.	Asteraceae	tekesakalı	salsify	shoot and leaf	Consumed as salad, or stewed with yogurt.	[27]	[47,48]
<i>Tussilago farfara</i> L.	Asteraceae	öksürükotu	coltsfoot	leaf	Consumed stuffed.	[27]	
<i>Urtica dioica</i> L.	Urticaceae	dalğan, isrgan	stinging nettle	young shoot and leaf	Fried with onion and mallow. Added to pastry stuffing. Added to salad as fresh. Consumed as soup, and stew.	[25,28]	[2,4,33,34,37,38,40-42,45,47,52-56,58,61-63,66,67,71,77,78,83,87-89,91,92,97,99,101]
<i>Urtica urens</i> L.	Urticaceae	isrgan	dwarf nettle	young shoot and leaf	Fried with onion and mallow. Added to pastry stuffing. Added to salad as fresh. Consumed as soup, and stew.	[27,30]	[4,32,34,39,49,54-56,63,101]

* Does not grow in the study area. Collected outside the study area, brought to the markets and sold.

There were difficulties in identifying the species reported as *Beta*, considering they are given at the genus level. While *Beta vulgaris* is given as wild in some studies, the use of *Beta maritima* is reported in others. However, *Beta vulgaris* has no wild localities in the Turkish flora. Another curiosity is related to *Taraxacum*. Although there is no *Taraxacum officinale* in Turkey [31], some authors, possibly due to difficulties in identification, have reported the consumption of this species as food. In addition, more than fifty *Taraxacum* taxa are naturally distributed in Turkey and most of them are consumed as food. Therefore, this genus is given as *Taraxacum* spp. in this study.

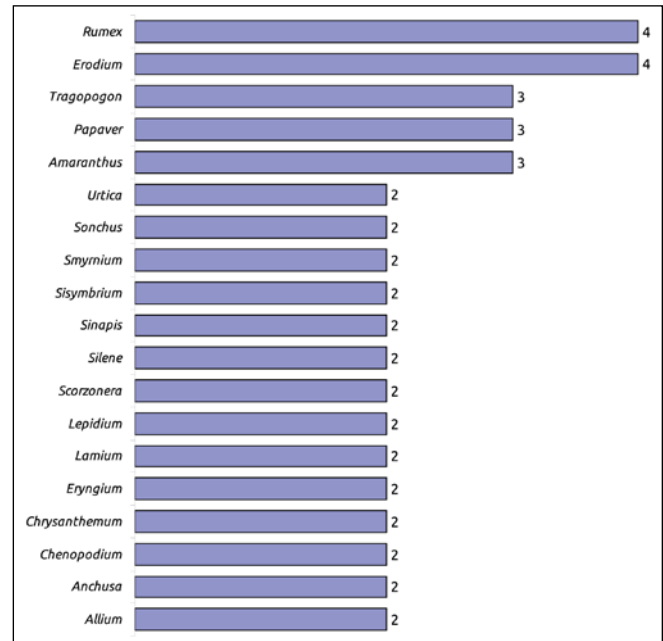


Fig. 2 Plant genera with the highest number of taxa in the study area.

Wild edible green vegetables identified in this study belong to 26 different families. Asteraceae are best represented (21 different taxa, 18% of the wild green vegetables). Other well represented families are Boraginaceae with 19 taxa, Apiaceae with 15 taxa, and Lamiaceae with 7 taxa, respectively (Fig. 3). The other 22 families have less representation, between one to six taxa each.

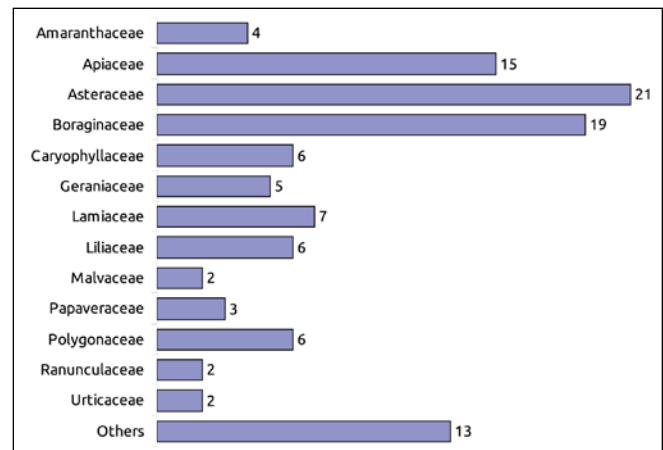


Fig. 3 Plant families with the highest number of taxa in the study area.

Wild edible plants are consumed in a variety of ways. The identified consumption types are divided into nine main categories: green salad (fresh plants and dressing), salad after boiling, salad with yogurt, raw/fresh, main dish (sautéed with oil and onion, also may have different vegetables, rice, meat etc. added), pastry/pie, soup, pickle, and stuffed. However, it must be noted that many species could be classified in more than one category. The most common type of consumption is as a salad (Fig. 4) with three sub-categories under this consumption type: green salad, salad after boiling, and salad with yogurt. Among them, only salad with yogurt is consumed without oil. All other salad types (76 taxa) are prepared with oil, as it is a typical Mediterranean region. Because olive oil is readily available in the region, it is preferred in all salads and most foods. In addition to olive oil, vinegar, lemon, and garlic are also added to salads, depending on the type of the salad. It has already been reported that salad and vegetable dishes prepared as traditional recipes in Turkish cuisine make use of many local wild plants [10,32]. Another category, following the consumption as salads, is the main dish category with 71 taxa. The pastry/pie category is represented by 42 taxa. The consumption habits of the Turkish people play an important role in the high number for this category. Due to the partiality for food made with dough, various tastes are obtained by mixing many plants in pastries. Twenty-two taxa are consumed as soup. Another category of consumption is stuffed foods. In this study area, stuffed rolls (so called “sarma” rolls) is a popular dish made especially with rice, but sometimes cracked wheat (bulgur) is preferred. Sarma rolls are primarily wrapped with the leaves of the grapevine (*Vitis vinifera* L.) and then those of cabbage (*Brassica oleracea* L.). However, nine other taxa are used to wrap sarma as well. Among these, *Arum maculatum*, which is a poisonous plant, so the leaves of this plant is consumed as sarma only after being boiled [27,33]. This type of consumption has not been reported outside the study area, while Redžić [34] reported consumption of ground parts of this plant as mush (from Bosnia-Herzegovina).

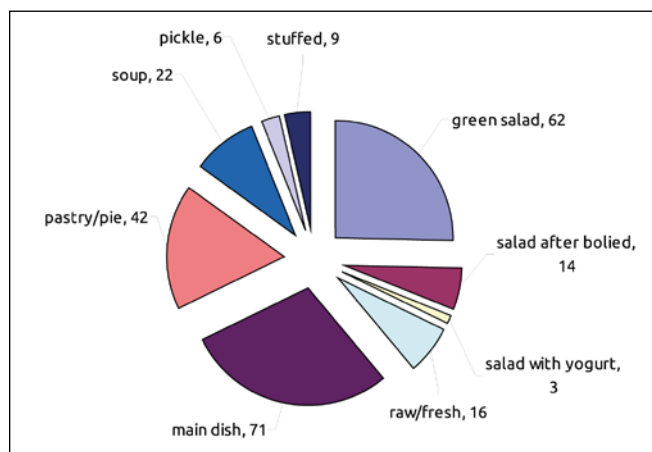


Fig. 4 Ways of consumption for the wild edible green plants in the study area.

Out of the listed wild greens some of them are both collected from the wild as well as cultivated. Plants such as *Daucus carota*, *Eruca sativa*, *Allium ampeloprasum*, *Beta vulgaris*, *Foeniculum vulgare*, *Coriandrum sativum*, *Lepidium sativum*, and *Portulaca oleracea* are mostly sold as crops. However, wild plants are either collected from nature and consumed or sold

in the open markets, as well. Especially wild *Eruca sativa* and *Lepidium sativum* are commonly consumed as a salad or raw.

The consumption of plants in an area especially that of wild edible plants as food, is closely associated with the socio-cultural features of the population. Particularly, the increase in ethnic variety in the area is supportive of a variety of plant usage and occurrence of more recipes. In light of this, Izmir province in the study area, with a population of over 3 million and the 3rd most populated city in Turkey, in the past hosted immigration from many areas. This fact has naturally influenced the consumption of a variety of wild edible plants. For instance, Cretan immigrants have had a great impact in this regard. In this study, it was concluded that the information regarding the consumption and recipes of plants such as *Scolymus hispanicus*, *Solanum nigrum*, and *Taraxacum* spp. may have been transferred to the area by immigrants from Crete.

It must be noted that the species whose flowering tops or green parts are collected in small amounts for seasoning are not included in the study (e.g. *Thymbra spicata*, *Satureja thymbra*, *Origanum onites*, *Laurus nobilis* L., *Capparis ovata* Desf., and *Capparis spinosa* L.). *T. spicata* (za'atar), *O. onites* (oregano), and *S. thymbra* (thyme-leaved savory) are sold as wild in many open markets of Izmir. They are dried and used as a spice, while very rarely consumed fresh. Fresh leaves of *O. onites* are consumed raw even for breakfast in and around Izmir-Beydag. Similarly, *S. thymbra* and *T. spicata* are consumed raw or added to salads. “Za'atar salad”, a type of salad mostly known and consumed in Eastern and Southeastern Anatolia, is not commonly consumed in the study area [35]. Green, unripe fruits of *Amygdalus communis* L. are consumed very commonly in the spring months in the study area. They were not included here due to the fact that technically they are not “green vegetables”. Both cultivated and wild forms are collected and sold. However, the fruit dries and hardens in a very short time and its seeds are consumed as a snack or added to food or desserts for taste.

Rheum ribes and *Eremurus spectabilis* do not occur in the study area and *Polygonum cognatum* is very rare. However, they are common in Middle and Eastern Anatolia. *P. cognatum* is commonly consumed in various parts of Turkey [27,28,32,33,36–41], as well as *Rheum ribes* [33,36,39,40,42]. It was observed that these plants are only sold in Izmir (in the study area). There is only one reference to the consumption of *E. spectabilis* [42] in Turkey and no references from outside the country. This could be explained by the fact that these plants are Irano-Turanian elements and therefore are not distributed in the Mediterranean Basin. Market surveys showed, that sellers collect the plants in various parts of Middle and Eastern Anatolia and then transport and sell them in the markets of Izmir, but the indigenous population never consumes these plants. They are mostly consumed by immigrants from Middle and Eastern Anatolia or people who spent their childhood there. These people also bring their unique ways of using the plants and food culture. This is one of the factors that increase the variety of dishes in the region. Similarly, salad made with *Thymbra spicata*, an Irano-Turanian element, is commonly consumed in Eastern and Southeastern Anatolia. Also *Scorzonera elata* and *S. cana*, though are not commonly consumed in the study area, are sold in small amounts in some markets, because they are eaten by immigrants from Middle and Eastern Anatolia. Although the two species are used in some parts of Turkey [25,28,37,39], there are no reports of their use in other parts of the Mediterranean. Also, there is no report for the use

of *Origanum onites* and *Satureja thymbra* outside of the study area. The usage of these plants is being reported for the first time based on our field observations.

Tamus communis and *Asparagus acutifolius*, Mediterranean elements distributed in all of the Mediterranean Basin, are among the most widely consumed wild plants in the area. An interesting fact is that one of the toxic plants identified in the study is black bryony (*T. communis*) [43,44]. The plant has a bitter taste because of its saponin content. Young shoots with leaves are the least toxic parts of the plant. They have been traditionally consumed after cooking, which destroys the toxic principles [44].

Although *T. communis* and *A. acutifolius* are among the most commonly consumed species throughout the study area, usually young shoots are fried with onion [25,27] and egg [25,26,42], they are not consumed in other, non-Mediterranean, parts of Turkey. On the other hand the two species are widely used in other parts of the Mediterranean, e.g. Spain, Italy, Slovenia, Croatia, Crete, Sardinia, and Sicily, where their tender leaves are eaten both cooked and raw, in soups, and omelets [4,11,44–66]. Pieroni et al. [45] and Menendez-Baceta et al. [67] have reported that *T. communis* is first boiled and then cooked with egg or in other ways. It is thought that the cooking method aims to eliminate the bitter taste coming from the saponin. However, despite its bitter taste, it is also consumed raw, but only in Spain [4,68]. The plant was probably used as food already in the times of Pedanius Dioscorides, physician, pharmacologist, and botanist (40–90 AD). According to many scholars Dioscorides mentions this plant in his famous five-volume encyclopedia “De Materia Medica” [49] (though not everyone agrees, see [69]). This would show that some food habits have remained the same from antiquity. The plant formerly belonged to the genus *Dioscorea*, dedicated to Dioscorides. Similarly to *Tamus communis*, *Solanum nigrum* and *Arum maculatum* are also toxic. All the three plants are consumed after boiling. That way the bitter taste in the leaves is removed. Among the three, *S. nigrum* has the most toxic content. The greatest toxicity was detected in the unripe green berries. This species is important especially for Izmir in the study area. Among the locals, it is known with its Greek name “istifno”. One of the most common salads made by Cretan immigrants is prepared with this plant. The salad is prepared by boiling fresh shoots and leaves and then by adding fresh courgette, olive oil, and garlic. The use of the plant declines towards the inner parts of the Aegean region, the reason being is that the Cretan immigrants did not settled there. Interestingly, in Cyprus, only the fruits of the plant are consumed and there is no record of consumption of the green parts [59]. The usage of *S. nigrum*'s fruits is common in many parts of the world. There are records of similar types of consumption for this study area [25,27]. Redžić [34] and Hadjichambis et al. [2] reported that only fresh shoots of the plant are consumed in Bosnia and Herzegovina, and Greece.

Another typical Crete food, served even in choice restaurants, is prepared with *Scolymus hispanicus* (the bark of the root and young basal leaf stalks of the plant with lamb). Theophrastus, known as the father of botany (371–287 BC), and Pliny the Elder (23–79 AD) mention the use of this plant as food in their works [49]. The consumption of blessed thistle, which is a Mediterranean element, is not very common especially around Izmir and outside of the places where the Cretan immigrants reside. It is a commonly consumed plant in the Mediterranean countries. In Cyprus, fresh stem and

leaves are consumed raw, as well as fried or fried with eggs, after boiling [59]. In Spain, the inner parts of the prickly basal leaves are boiled and then usually lightly fried with a bit of garlic, cured ham, and scrambled eggs [70]. Neither this type of consumption nor the preparation with lamb is reported for the study area.

Daucus carota is a commonly consumed plant. Its roots are commonly used in salads and other foods. In various parts of the area, the leaves and roots of the wild form are used in the preparation of food. Shoots and leaves are consumed in the fall and winter months, while the roots are collected and consumed in the spring. Redžić [71] reported that, apart from the roots and leaves, its seeds are also used as food. Additionally, in some parts of Turkey, especially in the Mersin area, their roots are used in preparation of a sweet called “cezerye” and are widely consumed in all of Turkey.

An endemic plant, *Papaver guerlekense*, a species similar to *P. rhoeas*, is consumed mixed in green salads, used as pastry stuffing, as a main dish, roasted, in a pie, salad, and soup [25].

Pistacia terebinthus is not a common plant in the study area. It is generally collected from nature and its fresh shoots consumed raw. It is sold in the markets in small amounts. Due to its resin content, it is added to pickles for taste and also cooked with onion and egg. It is only in Cyprus that the plant is used in a similar way [59]. Although there are no literature data on the use of its seeds, a type of coffee is made of the, called “Kenger coffee”, which is consumed widely instead of normal coffee in the Eastern Anatolian region (Y. D., unpublished data).

In this study, the Malvaceae family is represented by *Lavatera cretica* and *Malva sylvestris*. The former is not commonly consumed [25]. It is usually fried with other herbs and added to pastry. However, the other member of the family, *M. sylvestris*, is one of the most widely consumed plants in the study area, as well as in other parts of Turkey and all of the Mediterranean Basin. The plant is cooked with minced meat or olive oil, prepared as a soup, put in pastry, or fried with other herbs. In the Aegean part of Turkey it is usually eaten in pastry. Apart from this type of use, common mallow is consumed raw in salads in Northern Italy [66] and Lebanon [72]. This type of use is not encountered anywhere else.

In addition to *M. sylvestris*, which is widely distributed and commonly consumed in the study area, various *Malva* species such as *Malva moschata* L., *Malva cretica* Cav., *Malva nicaeensis* All., and *Malva parviflora* L. can be found, although not so commonly. Although these plants can also be consumed similar to *M. sylvestris*, there are no reports of their use. In other areas, *M. neglecta* Wallr. is consumed like *M. sylvestris* [32,33,36,39,41,73–77].

Plantago lanceolata is one of the plants that is consumed as stuffed, in a pie, and as a salad in the study area, but in other parts of Turkey its fresh leaves are consumed raw. Only Menendez-Baceta et al. [67] reports its fresh leaves being consumed raw in Spain. The closest to this type of use in this area is to chop it up and add to salads. Pieroni [53,54] reports its use as soup and Redžić [34] reports it as cooked vegetables.

Chrysanthemum coronarium (Asteraceae) is one of the rare plants whose leaves are consumed only raw [25]. Similar usage has only been reported for Palestine [50], whereas in Spain it is cooked [4]. There are no other reports for its use. However, consumption of *C. segetum* in the same manner as *C. coronarium* has been reported by Ertug [25] for Bodrum, which is included in the study area. *Rumex acetosella* is one of the plants that is consumed raw in the study area. It is eaten

directly from the field and, in addition to its many other uses. Its green leaves are consumed widely in rural areas due to their sour taste. Plants that are sold in the markets are mostly consumed as a salad [27]. It is commonly consumed in Asian Minor and the whole of Europe.

Purslane (*Portulaca oleracea*) is a plant that is widely distributed and consumed as food from Central Asia to Central America, from Myanmar to Brazil and from the U. K. to Yemen [49]. It is a commonly consumed plant in the study area and in the whole Mediterranean Basin. Its aboveground parts are added to green salads [27], especially its fresh leaves which are mixed with yogurt and consumed as a salad widely in the study area. They are also commonly cooked. Both the wild and cultural forms exist and the wild forms are preferred in the rural areas, whereas the cultivated varieties are preferred in the urban areas. Purslane, a plant recommended for medicinal use by Dioscorides, has been used as a medicinal food all over the world since antiquity [49,56].

The leaves of *Sonchus oleraceus*, used in the study area and mentioned already by Dioscorides as food, are consumed as a salad and soup in many parts of the world [49]. In addition to this type of use, it is commonly consumed as a pastry and main dish, as well as boiled and prepared as a salad.

Salicornia europaea (glasswort), which is only consumed along the shores in the Western Anatolia, is a succulent and halophyte plant that grows in salt marshes and seashores. It is commonly consumed but only in areas close to the coast as a salad after boiling. Garlic and especially olive oil are added. It is also eaten in other parts of the Mediterranean [34].

One of the most interesting plants used in the study area is *Echinophora tenuifolia* subsp. *sibthorpiana*. It is a very well known and commonly used plant everywhere in Turkey. It is known as “tarhana herb” and is consumed as an addition to the tarhana soup, a soup unique to Anatolia. This taxon is added to tarhana when fresh to give a pleasant aroma and used as an aromatic food preserver in order to prevent pickles from frothing [25,27,29,78,79]. No other use of this plant has been reported outside of Anatolia.

In Western Anatolia, the most commonly eaten wild edible greens are *Asparagus acutifolius*, *Beta* spp., *Cichorium intybus*, *Foeniculum vulgare*, *Malva sylvestris*, *Papaver rhoeas*, *Portulaca oleracea*, *Silene vulgaris*, *Taraxacum* spp., and *Urtica dioica*. These taxa are also widely consumed in other parts of the Mediterranean Basin. Some species, such as *Tamus communis*, are very commonly consumed in the study area according to the author’s unpublished observations, although this is not supported by earlier publications. An ethnobotanical research was carried out by Hadjichambis et al. [2] between 2003–2006 in seven countries from the Eastern Mediterranean (Cyprus, and Greece), the Western Mediterranean (Italy, and Spain), the Adriatic/Balkan Mediterranean (Albania) and the North-African Mediterranean (Egypt, and Morocco). It was a European Union-funded RUBIA Project and wild and semi-domesticated food plant consumption was investigated in these countries. As a result of the survey, 294 wild food plant taxa were documented. Asteraceae was the most represented family with 63 taxa. Of the identified plants 21% belonged to this family compared to 19% in this study. Similar results were obtained in another study carried out in a part of the study area [30]. The aforementioned wild edible plants are consumed as food in various ways; however, they include some invasive weeds and species under agricultural pest management. In many parts of Turkey, especially in Western Anatolia, some species such

as *Anagalis arvensis*, *Cichorium intybus*, *Fumaria officinalis*, *Lactuca serriola*, *Lamium amplexicaule*, *Lamium moschatum*, *Malva sylvestris*, *Papaver rhoeas*, *Raphanus raphanistrum*, *Sinapis arvensis*, *Sisymbrium officinale*, *Stellaria media*, and *Tragopogon latifolius* are considered as invasive field pests and are controlled with agricultural chemicals. They cause a loss of yield in crops, especially in grains, and therefore various herbicides are applied, which decreases the availability of wild greens.

Conclusion

In total, 111 taxa that were identified as wild edible greens in the study area belong to 26 different families. Asteraceae is the most commonly consumed family and the results of this study show parallels with other Mediterranean areas.

The majority of the plants identified are species widely distributed in the Mediterranean Basin, due to the fact that the Aegean Region has a Mediterranean climate. In addition, the eastern borders of the region are adjacent to the Irano-Turanian Phytogeographical Region and therefore it contains species unique to that region. As a consequence, there exist species that are not consumed in other Mediterranean countries.

The fact that the majority of the identified plants in the area are consumed as a salad show the local diet has strong Mediterranean features. As a result, very promisingly, there is a renewed or increasing interest in consuming wild food plants as a part of the diet.

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