

# Wild food plants used on the Dubrovnik coast (south-eastern Croatia)

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## Abstract

Croatia's versatile plant use traditions are still not sufficiently documented. The aim of this study was to record local traditions of wild food plant use on the Dubrovnik coast. We interviewed 40 inhabitants of 23 villages, mainly knowledgeable informants. On average 19 species were listed, which in total produced an inventory of 95 food plant species (including species whose leaves or inflorescences are used as recreational teas).

The most commonly collected are: *Sonchus oleraceus* and *S. asper*, *Asparagus acutifolius*, *Dioscorea communis*, *Cichorium intybus*, *Crepis zacintha*, *Allium ampeloprasum*, *Picris echioides* and *Foeniculum vulgare* (all of them used as vegetables), the fruits of *Rubus ulmifolius* (mainly eaten raw), the fruits of roses (*Rosa sempervirens* and *R. canina*) and the leaves of *Salvia officinalis* (both roses and salvia are used for making recreational teas). A particular feature of the local gastronomy is the collection of young *Ruscus aculeatus* shoots.

**Keywords:** ethnobotany; wild vegetables; wild edible plants; foraging

## Introduction

The documentation of traditionally used wild food plants has been carried out in many European countries over the last several years [1–6], and reviews of older ethnographic literature concerning this issue have been published [7–13]. Some results of field ethnobotanical studies have also been published in the countries of the former Yugoslavia (e.g. [14–19]), though only a few of them are solely focused on wild foods [19–21]. The Adriatic coast has a particularly rich tradition of using wild foods in nutrition. This probably stems from a combination of two factors: the low productivity of rocky soils, which made people utilize every possible food resource, and Mediterranean cultural influences (the widespread appreciation of wild greens in the Mediterranean diet). The proper documentation of wild food ethnobotany in this region has only recently begun. Wild greens sold in Dalmatian markets were documented [20], and the traditions of using wild foods in a selected site in northern Dalmatia, near Lake Vrana, were recorded [21]. Additional information on wild food plant use can be found in older ethnographic sources, wild food guides and ethno-linguistic publications [22–26]. Unfortunately no ethnobotanical studies had previously been carried out at the very southern edge of the Croatian coast – in the Dubrovnik area. As traditional ecological knowledge is eroding fast in most of Europe, the

aim of our study was to document the wild food plants used now or in the past around the city of Dubrovnik.

## Material and methods

### Study site

The study site is located around Dubrovnik, in the Croatian section of the Adriatic coast between the areas of the coast belonging to Bosnia-Herzegovina and Montenegro (Fig. 1). The investigated area was part of the Republic of Ragusa (Dubrovnik Republic) in Medieval times, and later formed part of the Habsburg Monarchy (Austro-Hungarian Monarchy), then Yugoslavia and finally Croatia. A Dalmatian/Venetian (Romanesque) language elite lived in the city of Dubrovnik for centuries, while the lower classes spoke a dialect of Croatian. Gradually the Croatian language took over, sealed by the expulsion of the last remaining Italians after World War II [27]. The Dubrovnik coast is now inhabited almost exclusively by Croatian speaking Roman-Catholics.

The climate is Mediterranean; summers are hot with short periods of drought, while the remaining seasons are characterized by abundant rainfall and moderate temperatures. According to the Meteorological and Hydrological Service of Croatia, for the period 1970–2005 the average annual mean temperature of Dubrovnik was 16.4°C, the coldest months of the year were January and February, with an average temperature of 9.3°C, and the warmest was August with an average temperature of 24.9°C. The average total annual rainfall in the same period was 1064.7 mm. The lowest amounts of

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Handling Editor: Beata Zagórska-Marek

rainfall were recorded in July, an average of 30.1 mm, and the maximum in November, an average of 141.8 mm [28].

From the phytogeographical point of view the study area is situated in the Mediterranean Region, Eastern Mediterranean Subregion, Adriatic Province, and Epiro-Dalmatian Sector [29]. According to Trinajstić [30], the area belongs to the Eumediterranean vegetational zone of evergreen holm-oak forests [the *Quercion ilicis* Br.-Bl. (1931) 1936 alliance], while the warmest and driest parts of the study area belong to the Stenomediterranean vegetational zone of wild olive and carob woodlands (alliance *Oleo Ceratonia* Br.-Bl. 1931). Vegetation in the Dubrovnik hinterland belongs to the Submediterranean vegetational zone, or the Mediterranean-montane vegetational belt of a deciduous vegetational zone of hop hornbeam and oriental hornbeam forests [alliance *Ostryo-Carpinion orientalis* Horvat (1954) 1959].

Climazonal forest vegetation can be found only in a small part of this area because, due to intensive anthropogenic activities, it has been degraded to a greater or lesser extent. Such degradation caused the formation of very significant, permanent vegetative forms like shrublands (macchia), garrigue, dry grasslands and rocky pastures.

#### Field study

We interviewed people (all of Croatian nationality) from 23 villages: Buići, Doli, Dubravka, Dunave, Gabrići, Gromača, Gruda, Ljuta, Majkovi, Mlini, Mokošica, Mravinjac, Mrčevo, Orašac, Osojnik, Palje Brdo, Petrača, Popolica, Riđica, Smokovljani, Šumet, Topolo and Visočani (Fig. 1). A relatively large area was chosen for the study, as the knowledge and use of wild edible plants has strongly decreased and more effort was required to find interviewees than in the case of a similar study in northern Dalmatia in the Zadar area [21]. Also for this reason, we decided to present all the species mentioned even by one respondent providing we were sure that they were identified correctly, with the awareness that these are dying out relic uses, which should be recorded.

The study was carried out throughout 2013, mainly in the spring months (March–May). The first author has spent her life in the area and has family ties in a few of the studied villages, which helped in gathering extra information on local plant uses and in choosing the informants.

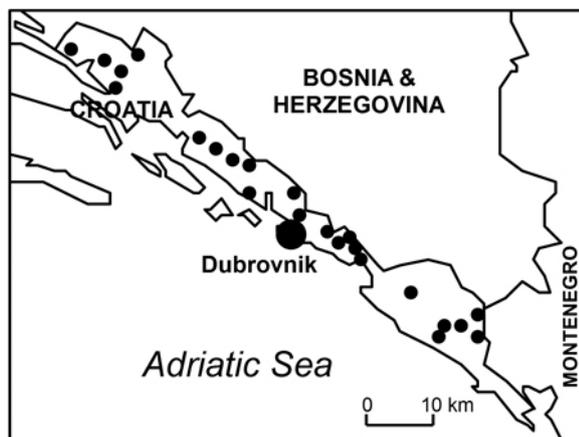


Fig. 1 The study area and the distribution of the studied villages.

The research was carried out following the American Anthropological Association Code of Ethics [31] and the International Society of Ethnobiology Code of Ethics [32]. Data were collected mainly by free listing methods. Interviews were carried out in Croatian.

Participants were selected either as the most knowledgeable people in the village, based on recommendation, or simply approached outside during their farm or garden work. Altogether, 40 free listing questionnaires were obtained, from middle-aged and elderly inhabitants (27 women, 10 men and three couples). The mean age of informants was 62 and the median 64, with the youngest interviewee aged 40 and the oldest 81.

The participants were asked their age, place of origin and present habitation. Then they were asked the following questions: what wild vegetables have you collected? What wild roots have you collected? What wild fruits have you collected? What wild mushrooms have you collected? Do you drink any herbal teas on an everyday basis?

Walks were made with some of the participants, which enabled the gathering of plants and identification of folk taxa. Voucher specimens were collected and deposited in the herbarium of the Faculty of Biology of Warsaw University (WA).

## Results

Altogether, 95 taxa of wild food plants (and 3 taxa of fungi) were recorded in the 76 species of plants that were used or remembered by at least two informants (Tab. 1). If species used only for infusions (“recreational teas”) or to spice alcohol were excluded, the total list of plants would include 78 species. Leaves and other above-ground vegetative organs are the largest category (58 species), followed by fruits (23 species), flowers (19) and underground organs (3). The leaves or shoots of 43 species are used for boiled or raw salads, 18 species of fruits are eaten raw or in the form of preserves, 14 species of plants are used to spice rakija (including the herbal rakija called “travarica”) and sweet liqueurs, and 7 species are used as culinary spices. Various organs of 27 species are used as recreational teas.

On average 19.2 species (median = 16.5) were listed by each informant, including 10.0 species of wild vegetables, 4.8 species of fruits, 2.5 species used as spices, 0.1 species with edible roots, and 0.2 species of fungi.

Wild vegetables are still widely used in the Dubrovnik area, though only a few species are used on a regular basis. These are usually weeds growing in old fields, on roadsides and in hedgerows. They are mainly collected in spring (February–April). Unfortunately wild food plants are much less popular among young people, most people who use wild foods are elderly, and a large percentage of the population have stopped using them completely.

Most wild vegetables are boiled in a mix, which is called “pazija”, [a Turkish name for beet (*Beta*) [33]] or “pakoleč” (dominant species is *Bunias erucago* [34]). They are usually boiled for 20–30 min., strained and sprinkled with olive oil, then served as a side dish. Usually only a few of the most abundant species are collected and used (sow thistle *Sonchus* spp., wild leek *Allium ampeloprasum*, bristly ox-tongue *Picris*

*echioides*, fennel *Foeniculum vulgare*, red poppy *Papaver rhoeas*, *Urospermum picroides* and *Bunias erucago*). Other species are used for pazija only rarely.

Asparagus shoots are boiled separately and served in a similar way. They can also be fried or added to soup, often with boiled eggs. Black bryony *Dioscorea communis* (syn. *Tamus communis*), and more rarely butcher's broom *Ruscus aculeatus* (and *Smilax aspera* mentioned only by one person), are commonly used "like asparagus" ("kao šparoge"), as the shoots have a similar shape. Some Asteraceae species are also eaten raw or blanched, and dressed in olive oil (*Cichorium*, *Crepis*, *Taraxacum* etc.).

Several aromatic wild plants are used in cooking. Fennel (*Foeniculum vulgare*) is used both as a vegetable and a spice, added to pazija, and other dishes. Another common spice is bay leaf (*Laurus nobilis*), which is used to flavor meat dishes and preserves.

A large number of taxa are used as recreational teas, i.e. infusions, drunk without a particular health target. The most common plants used are rose hips (*Rosa* spp.) and sage (*Salvia officinalis*) leaves, but a number of other Lamiaceae species, both cultivated, semi-wild, and wild are used (see Tab. 1).

Wild fruits are now rarely collected, apart from snacking on blackberries or collecting *Rosa* fruits for tea. Wild mushrooms are practically unknown (only two respondents mentioned collecting parasol mushrooms *Macrolepiota procera*, and single informants mentioned collecting porcini (*Boletus* sp.) and chanterelles (*Cantarellus cibarius*).

## Discussion

The presented list of wild foods is similar to the plants collected in the Vrana area, and also typical for other Mediterranean areas. Most of the wild vegetables and fruits collected in the Dubrovnik area are also widely used in Spain, Italy and western Turkey [1–5,35]. On the other hand, worthy of attention is the use of *Ruscus aculeatus*, used similarly to asparagus. This use has only been observed in some parts Italy [36,37] and in the Istrian part of the Dalmatian coast [38]. It is not known in other parts of Dalmatia [21]. We also found that it is the only place in Dalmatia that *Tordylium apulum*, a common plant of roadside verges in southern Croatia, is still occasionally eaten in the wild vegetable mix

[this species was incorrectly provisionally identified in our previous article as "*Pimpinella peregrina* (?)" [20]].

Out of the 36 wild food plant taxa listed by Bakić and Popović [22] as the most frequently used on the ex-Yugoslav coast, as many as 26 species (or their close relatives from the same genus) are used or remembered in the Dubrovnik area.

In spite of the fact that many of the studied households are located on the coast, the only truly seaside plant collected is *Crithmum maritimum*. The plants used for everyday infusions in the Dubrovnik area are species commonly used around the Mediterranean or in other Slavic countries (e.g. [39]).

The erosion of local plant knowledge in the Dubrovnik area seems to be more extensive than on some other parts of the Croatian coast, for instance in the Vrana area. In Vrana less species were recorded per interview [21], but most people gather wild vegetables and were willing to be interviewed. On the Dubrovnik coast only a few elderly people collect wild foods now and it is very difficult to find people with knowledge of wild foods, hence this study was focused on selected key informants. The difference between Vrana and Dubrovnik can probably largely be explained by the fact that the Dubrovnik area is a region with a higher income than other parts of Dalmatia (see e.g., [http://www.dzs.hr/Hrv\\_Eng/publication/2013/12-01-02\\_01\\_2013.htm](http://www.dzs.hr/Hrv_Eng/publication/2013/12-01-02_01_2013.htm)).

It should however be borne in mind that in the Dubrovnik area a much larger area was studied than in the study on the wild food plants of the lake Vrana area.

Local differences in the list of the species still collected for vegetable mixes should be noted. For example, in the Dubrovnik area neither *Tragopogon* nor *Scolymus hispanicus* were recorded by us, although their leaves are used as food in northern Dalmatia. And vice versa – *Tordylium apulum*, which is used (but rarely) in Dubrovnik area is not known as edible in northern Dalmatia, although it also occurs there. It is difficult to establish whether these differences occur only due to differences in the abundance of species (we assume that if a species is more abundant it may be remembered better and used more frequently), or if knowledge about the edibility of some lesser used species has died out, similarly to the knowledge of wild edible greens in Eastern Europe (compare [6,8,9,13,40]). Unfortunately it is likely that the latter is true, which should urge us to extend culinary ethnobotanical research to other parts of the Balkans where this knowledge is disappearing as well.

**Tab. 1** Wild food plants and mushrooms used in the area.

Scientific name (plant names follow the Plant List [41])	Local name	Part used	Use	Frequency N = 40	Voucher specimen No. starting from WA0000370
<i>Achillea millefolium</i> L. (Asteraceae)	hajdučka trava, sporiš	FL	tea	1	
<i>Allium ampeloprasum</i> L. (Amaryllidaceae)	poriluk, divlji luk, lukovac	L	in pazija*	30	35
<i>Allium roseum</i> L. (Amaryllidaceae)	divlji luk, lukovac	L	in pazija	3	62
<i>Allium subhirsutum</i> L. (Amaryllidaceae)	divlji luk, lukovac	L	in pazija	2	
<i>Althaea officinalis</i> L. (Malvaceae)	bijeli sljez	L	tea	12	74
<i>Amaranthus cruentus</i> L. (Amaranthaceae)	trator	L	boiled	1	
<i>Amaranthus</i> spp. (Amaranthaceae)	štir	L	cooked	3	44

Tab. 1 (continued)

Scientific name (plant names follow the Plant List [41])	Local name	Part used	Use	Frequency N = 40	Voucher specimen No. starting from WA0000370
<i>Arbutus unedo</i> L. (Ericaceae)	maginja	F	raw, rakija**	20	87
<i>Arctium lappa</i> L. (Asteraceae)	čičak	S	young stems eaten by children	1	
<i>Artemisia absinthium</i> L. (Asteraceae)	osjenač	L	rakija, tea	4	
<i>Asparagus acutifolius</i> L. (Asparagaceae)	šparoge	S	boiled and served with eggs, fried with (or without) eggs, soup	38	51
<i>Asphodeline lutea</i> (L.) Rchb. (Xanthorrhoeaceae)	pečak	FL, S	young stem and inflorescences, harvested before bloom, boiled like asparagus or baked in oven (very sweet taste)	1	66
<i>Asplenium ceterach</i> L. (Aspleniaceae)	paprat, zlatna paprat	W	tea	7	54
<i>Beta vulgaris</i> L. (Amaranthaceae)	divlja blitva	L	in pazija	11	19
<i>Boletus edulis</i> Bull. s.l. (Boletaceae)	vrganj	M	grilled, fried (with eggs), stewed (pasta sauce)	2	
<i>Bumias erucago</i> L. (Brassicaceae)	pakolec	L	in pazija	18	37
<i>Cantharellus cibarius</i> Fr. (Cantharellaceae)	lisičarka	M	grilled, fried (with eggs), stewed (pasta sauce)	1	
<i>Capparis orientalis</i> Veill. (Capparaceae)	kapare	FL	preserved in vinegar, used as spice/vegetable	8	49
<i>Capsella bursa-pastoris</i> (L.) Medik. (Brassicaceae)	šurlin	L	in pazija	1	33
<i>Celtis australis</i> L. (Cannabaceae)	koščela	F	children snack	9	57
<i>Ceratonja siliqua</i> L. (Fabaceae)	rogač	F	raw, rakija, cakes	11	52
<i>Chamomilla recutita</i> (L.) Rauschert (Asteraceae)	kamomila, kamilica	FL	tea	3	
<i>Chenopodium album</i> L. (Amaranthaceae)	loboda	L	cooked	1	45
<i>Chondrilla juncea</i> L. (Asteraceae)	zvečak	L	in pazija	3	
<i>Cichorium intybus</i> L. (Asteraceae)	žučenica	L	raw or shortly boiled	35	
				(not distinguished from <i>Crepis</i> spp.)	
<i>Citrus aurantium</i> L. (Rutaceae)	ljuta naranča	F	roasted meat, tea, rakija, juice, marmelade	2	
<i>Crepis zacintha</i> (L.) Babč. and possibly other related species from the genus (Asteraceae)	žučenica	L	raw or shortly boiled	35	27, 85
				(not distinguished from wild <i>Cichorium</i> )	
<i>Cornus mas</i> L. (Cornaceae)	drenjina, drjen	F	raw, jam, syrup	7	61
<i>Crataegus monogyna</i> Jacq. (Rosaceae)	glog, gloginja	F	raw, tea	5	41
<i>Crithmum maritimum</i> L. (Apiaceae)	motar, mota	L	bloom, boiled like asparagus or bake in oven (very sweet taste)	8	47
<i>Daucus carota</i> L. (Apiaceae)	divlja mrkva	L, R	in pazija	2	20
<i>Dioscorea communis</i> (L.) Caddick & Wilkin (Dioscoreaceae)	kuke	S	boiled and served with eggs, fried with (or without) eggs	35	21
<i>Diplotaxis tenuifolia</i> (L.) DC. (Brassicaceae)	divlja rikula	L	raw salad (usually mixed with <i>Sonchus</i> ) or boiled	6	63
<i>Foeniculum vulgare</i> Mill. (Apiaceae)	morač	L	in pazija or used as spice for other dishes, rakija, preservation of olives	31	29
<i>Fragaria vesca</i> L. (Rosaceae)	divlja jagoda, fragula	F	raw	2	
<i>Fraxinus ornus</i> L. (Rutaceae)	jasen	L	tea	1	
<i>Helianthus tuberosus</i> L. (Asteraceae)	čičoka	R	emergency food	1	

Tab. 1 (continued)

Scientific name (plant names follow the Plant List [41])	Local name	Part used	Use	Frequency N = 40	Voucher specimen No. starting from WA0000370
<i>Helichrysum italicum</i> (Roth) G. Don (Asteraceae)	smilj	FL, L	tea	4	25
<i>Hypericum perforatum</i> L. (Hypericaceae)	gospina trava	FL	tea	7	60
<i>Juniperus oxycedrus</i> L. (Cupressaceae)	smrča, smrekina	F	rakija	10	26
<i>Lactuca serriola</i> L. (Asteraceae)	[no name]	L	in pazija	2	78
<i>Laurus nobilis</i> L. (Lauraceae)	lovorika	L	spice and preservative	16	42
<i>Lavandula angustifolia</i> Mill. (Lamiaceae)	lavanda	FL, L	tea	4	82
<i>Macrolepiota cf procera</i> (Scop.) Singer (Agaricaceae)	sunčanice, sunčica	M	grilled, fried (with eggs), stewed (pasta sauce)	2	
<i>Malva sylvestris</i> L. (Malvaceae)	crni sljez	L, FL, R	tea	10	68
<i>Melissa officinalis</i> L. (Lamiaceae)	matičnjak, pčelinja ljubica, melisa	L	tea	4	80
<i>Mentha</i> spp. including <i>M. piperita</i> L. and <i>M. spicata</i> L. (Lamiaceae)	metvica	L	tea	6	71, 77
<i>Morus alba</i> L., <i>M. nigra</i> L. (Moraceae)	bijela murva (for <i>M. alba</i> ), crna murva (for <i>M. nigra</i> )	F	raw	9	67
<i>Myrtus communis</i> L. (Myrtaceae)	mrča	F	liqueur, rakija	18	69
<i>Opuntia ficus-indica</i> (L.) Mill. (Cactaceae)	divlja smokva, indijska smokva, kaktus	F	raw	3	
<i>Origanum majorana</i> L. (Lamiaceae)	mažuran	FL, L	spice	2	70
<i>Origanum vulgare</i> L. (Lamiaceae)	origano	FL, L	spice	5	
<i>Paliurus spina-christi</i> Mill. (Rhamnaceae)	crna drača	F	tea and children's snack	15	50
<i>Papaver rhoeas</i> L. (Papaveraceae)	mak	L	in pazija	15	48
<i>Picris echioides</i> L. (Asteraceae)	hrastej, rastej, pazija	L	in pazija	25	
<i>Phlomis fruticosa</i> L. (Lamiaceae)	[no name]	FL	nectar as children snack	1	73
<i>Pimpinella anisum</i> L. (Apiaceae)	aniš	F	tea	2	
<i>Pinus pinea</i> L. (Pinaceae)	pinj	F	raw	1	
<i>Plantago lanceolata</i> L. (Plantaginaceae)	muška bokvica	L	tea (mainly), in pazija	6	58
<i>Plantago major</i> L. (Plantaginaceae)	ženska bokvica	L	tea (mainly), in pazija	1	
<i>Portulaca oleracea</i> L. (Portulacaceae)	tušt, tušac, štir, medenica	L	boiled with onion or raw salad	4	65
<i>Prunus cerasus</i> L. (Rosaceae)	višnja	F	raw, liqueur	1	
<i>Prunus spinosa</i> L. (Rosaceae)	trnina	F	raw	2	
<i>Punica granatum</i> L. (Lythraceae)	divlji šipak, ljuti šipak	F	raw, juice	11	55
<i>Pyrus amygdaliformis</i> Vill. (Rosaceae)	trnovača	F	raw	9	84
<i>Quercus pubescens</i> Willd. (Fagaceae)	žir (about acorns), hrast (the tree)	F	emergency food, baked, remembered only from stories	3	39
<i>Ranunculus neapolitanus</i> Ten. (Ranunculaceae)	[no name]	L	in pazija	1	23
<i>Reichardia picroides</i> (L.) Roth (Asteraceae)	sladić	L	in pazija	4	79
<i>Rosa sempervirens</i> L. and <i>R. canina</i> L. (Rosaceae)	šipurak, šipurika, šipak, divlja ruža, srbi guzica	F	tea, jam	23	34
<i>Rosa ×centifolia</i> L. = <i>R. gallica</i> var. <i>centifolia</i> (L.) Regel (Rosaceae)	vonjača, čentifolia, ruža	FL	liqueur (rozulin)	3	
<i>Rosmarinus officinalis</i> L. (Lamiaceae)	rusmarin, ružmarin	L	spice for marinades, rakija	15	16
<i>Rubus ulmifolius</i> Schott (Rosaceae)	kumpiena, kupjena, kupina	F	raw, jams, syrup	33	53
<i>Rumex pulcher</i> L. (Polygonaceae)	štavolj, štavelj	L	in pazija	2	56
<i>Ruscus aculeatus</i> L. (Asparagaceae)	koštrava, koštrika	S	boiled, eaten like asparagus, nowadays rarely	15	38
<i>Salvia officinalis</i> L. (Lamiaceae)	pelin, kadulja	L, FL	tea, syrup from flowers, rakija	23	72
<i>Sambucus nigra</i> L. (Adoxaceae)	zovina	FL	tea, syrup	7	64

Tab. 1 (continued)

Scientific name (plant names follow the Plant List [41])	Local name	Part used	Use	Frequency N = 40	Voucher specimen No. starting from WA0000370
<i>Satureja montana</i> L. (Lamiaceae)	konjski vrjesak	FL, L	tea, rakija	5	24
<i>Scorzonera laciniata</i> L. (Asteraceae)	kozja brada	L	in pazija	1	30
<i>Silene vulgaris</i> (Moench) Garcke (Caryophyllaceae)	pucalica	L	in pazija	2	59
<i>Silybum marianum</i> (L.) Gaertn. (Asteraceae)	sjekavica	L	in pazija	1	
<i>Sisymbrium officinale</i> (L.) Scop. (Brassicaceae)	[no name]	L	in pazija	1	
<i>Smilax aspera</i> L. (Smilacaceae)	tetivika	S	eaten like asparagus	1	46
<i>Sonchus oleraceus</i> L. and <i>Sonchus asper</i> (L.) Hill (Asteraceae)	čevčeg, kostriječ, kostreš	L	main component of pazija	38	17
<i>Smyrnum olusatrum</i> L. (Asteraceae)	vrati muž, lesandra, divlja selen	L	in pazija	0	
				(but found sold in the market in 2013)	
<i>Sorbus domestica</i> L. (Rosaceae)	oskoruša	F	raw, jam	8	83
<i>Taraxacum officinale</i> Weber (Asteraceae)	maslačak	L	raw or shortly boiled salad	11	
<i>Teucrium montanum</i> L. (Lamiaceae)	ivan trava, dubačak	FL, L	tea, rakija	1	40
<i>Thymus</i> sp. (Lamiaceae)	popovac, poponac, popunac, majčina dušica	FL	tea, rakija, spice	9	36
<i>Tilia</i> spp. (Tiliaceae)	lipa	FL	tea	3	86
<i>Tordylium apulum</i> L. (Apiaceae)	vrati muž, mužobrad	L	in pazija	2	31
<i>Tropaeolum majus</i> L. (Trapaeolaceae)	ljubidrag, dragušac	FL	like capers	1	
<i>Urospermum picroides</i> (L.) Scop. ex F.W. Schmidt (Asteraceae)	pleština, plešti guzica, pakoleć, pazija	L	in pazija	8	22, 32
<i>Urtica dioica</i> L. (Urticaceae)	kopriva	L	in pazija, tea	12	43
unidentified Apiaceae	divlji petrusin	L	in pazija	1	
unidentified Asteraceae ( <i>Cirsium</i> sp.?)	badelj	L	in pazija	2	
<i>Carduus</i> sp.?)					

## Acknowledgments

We are grateful to the vice-Rector of the University of Rzeszów, Prof. Sylwester Czopek for granting additional financial support to this study.

## Authors' contributions

The following declarations about authors' contributions to the research have been made: wrote the text and led all the interviews: KD; wrote the text and took part in half of the interviews: ŁŁ.

## Competing interests

The following declarations about authors' competing interests have been made: ŁŁ: I have no competing interests apart from the fact that I am a section editor in the *Acta Societatis Botanicorum Poloniae* journal; KD: no competing interests.

## References

- Hadjichambis AC, Paraskeva-Hadjichambi D, Della A, Giusti ME, De Pasquale C, Lenzarini C, et al. Wild and semi-domesticated food plant consumption in seven circum-Mediterranean areas. *Int J Food Sci Nutr.* 2008;59(5):383–414.
- Ghirardini M, Carli M, del Vecchio N, Rovati A, Cova O, Valigi F, et al. The importance of a taste. A comparative study on wild food plant consumption in twenty-one local communities in Italy. *J Ethnobiol Ethnomed.* 2007;3(1):22. <http://dx.doi.org/10.1186/1746-4269-3-22>
- Tardío J, Pardo-De-Santayana M, Morales R. Ethnobotanical review of wild edible plants in Spain. *Bot J Linn Soc.* 2006;152(1):27–71. <http://dx.doi.org/10.1111/j.1095-8339.2006.00549.x>
- Bonet MÀ, Vallès J. Use of non-crop food vascular plants in Montseny biosphere reserve (Catalonia, Iberian Peninsula). *Int J Food Sci Nutr.* 2002;53(3):225–248. <http://dx.doi.org/10.1080/09637480220132841>
- Leonti M, Nebel S, Rivera D, Heinrich M. Wild gathered food plants in the European Mediterranean: a comparative analysis. *Econ Bot.* 2006;60(2):130–142. [http://dx.doi.org/10.1663/0013-0001\(2006\)60\[130:WGFPIIT\]2.0.CO;2](http://dx.doi.org/10.1663/0013-0001(2006)60[130:WGFPIIT]2.0.CO;2)
- Łuczaj Ł, Pieroni A, Tardío J, Pardo-de-Santayana M, Sökand R, Svanberg I, et al. Wild food plant use in 21st century Europe: the disappearance of old traditions and the search for new cuisines involving wild edibles. *Acta Soc Bot Pol.* 2012;81(4):359–370. <http://dx.doi.org/10.5586/asbp.2012.031>
- Łuczaj Ł. Dziko rosnące rośliny jadalne użytkowane w Polsce od połowy XIX w. do czasów współczesnych. *Etnobiologia Pol.* 2011;1:57–125.
- Kalle R, Sökand R. Historical ethnobotanical review of wild edible plants of Estonia (1770s–1960s). *Acta Soc Bot Pol.* 2012;81(4):271–281. <http://dx.doi.org/10.5586/asbp.2012.033>
- Dénes A, Papp N, Babai D, Czúcz B, Molnár Z. Wild plants used for food by Hungarian ethnic groups living in the Carpathian Basin. *Acta Soc Bot Pol.* 2012;81(4):381–396. <http://dx.doi.org/10.5586/asbp.2012.040>
- Łuczaj Ł. Ethnobotanical review of wild edible plants of Slovakia.

- Acta Soc Bot Pol. 2012;81(4):245–255. <http://dx.doi.org/10.5586/asbp.2012.030>
11. Svanberg I. The use of wild plants as food in pre-industrial Sweden. *Acta Soc Bot Pol.* 2012;81(4):317–327. <http://dx.doi.org/10.5586/asbp.2012.039>
  12. Redžić S. Wild edible plants and their traditional use in the human nutrition in Bosnia-Herzegovina. *Ecol Food Nutr.* 2006;45(3):189–232. <http://dx.doi.org/10.1080/03670240600648963>
  13. Łuczaj Ł, Köhler P, Pirożnikow E, Graniszewska M, Pieroni A, Gervasi T. Wild edible plants of Belarus: from Rostaŋski's questionnaire of 1883 to the present. *J Ethnobiol Ethnomed.* 2013;9(1):21. <http://dx.doi.org/10.1186/1746-4269-9-21>
  14. Pieroni A, Giusti ME. The remedies of the folk medicine of the Croats living in Čičarija, northern Istria. *Coll Antropol.* 2008;32(2):623–627.
  15. Šavikin K, Zdunić G, Menković N, Živković J, Čujić N, Tereščenko M, et al. Ethnobotanical study on traditional use of medicinal plants in South-Western Serbia, Zlatibor district. *J Ethnopharmacol.* 2013;146(3):803–810. <http://dx.doi.org/10.1016/j.jep.2013.02.006>
  16. Rexhepi B, Mustafa B, Hajdari A, Rushidi-Rexhepi J, Quave CL, Pieroni A. Traditional medicinal plant knowledge among Albanians, Macedonians and Gorani in the Sharr Mountains (Republic of Macedonia). *Genet Resour Crop Evol.* 2013;60(7):2055–2080. <http://dx.doi.org/10.1007/s10722-013-9974-3>
  17. Zlatković BK, Bogosavljević SS, Radivojević AR, Pavlović MA. Traditional use of the native medicinal plant resource of Mt. Rtanj (eastern Serbia): ethnobotanical evaluation and comparison. *J Ethnopharmacol.* 2014;151(1):704–713. <http://dx.doi.org/10.1016/j.jep.2013.11.037>
  18. Pieroni A, Rexhepi B, Nedelcheva A, Hajdari A, Mustafa B, Kolosova V, et al. One century later: the folk botanical knowledge of the last remaining Albanians of the upper Reka Valley, Mount Korab, Western Macedonia. *J Ethnobiol Ethnomed.* 2013;9(1):1–19. <http://dx.doi.org/10.1186/1746-4269-9-22>
  19. Redžić S. Use of wild and semi-wild edible plants in nutrition and survival of people in 1430 days of siege of Sarajevo during the war in Bosnia and Herzegovina (1992–1995). *Coll Antropol.* 2010;34(2):551–570.
  20. Łuczaj Ł, ZovkoKončić M, Miličević T, Dolina K, Pandža M. Wild vegetable mixes sold in the markets of Dalmatia (southern Croatia). *J Ethnobiol Ethnomed.* 2013;9(1):2. <http://dx.doi.org/10.1186/1746-4269-9-2>
  21. Łuczaj Ł, Fressel N, Perković S. Wild food plants used in the villages of the Lake Vrana Nature Park (northern Dalmatia, Croatia). *Acta Soc Bot Pol.* 2013;82(4):275–281. <http://dx.doi.org/10.5586/asbp.2013.036>
  22. Bakić J, Popović M. *Nekonvencionalni izvori u ishrani na otocima i priobalju u toku NOR-a.* Beograd. Beograd: Izd. Mornaričkog glasnika; 1983.
  23. Grlić L. *Enciklopedija samoniklog jestivog bilja.* Rijeka: Ex Libris; 2005.
  24. Grlić L. *Enciklopedija samoniklog jestivog bilja.* Zagreb: August Cesarec; 1986.
  25. Sardelić S. *Samoniklo jestivo bilje – mišanca, gruda, parapač...* Wild edible herbs – Mišanca, Gruda, Parapač... *Etnološka Istraživanja.* 2008;1(12–13):387–396.
  26. Šugar I. *Hrvatski biljni imenoslov. Nomenclator botanicus Croaticus.* Zagreb: Matica Hrvatska; 2008.
  27. Harris R. *Dubrovnik: a history.* London: Saqi Books; 2006.
  28. Dolina K. *Forecasting of airborne pollen seasons in the Mediterranean region of Croatia [PhD thesis].* Zagreb: University of Zagreb, Faculty of science, Department of Biology; 2012.
  29. Rivas-Martínez S, Penas A, Díaz TE. *Biogeographic map of Europe.* Cartographic service. León: University of León; 2004. Available from: [http://www.globalbioclimatics.org/form/bg\\_med.htm](http://www.globalbioclimatics.org/form/bg_med.htm)
  30. Trinajstić I. *Plantgeographical division of forest vegetation of Croatia.* Zagreb: Razred za prirodne znanosti, Hrvatska akademija znanosti i umjetnosti; 1995. (*Annales Forestales*; vol 20/2).
  31. American Anthropological Association Code of Ethics [Internet]. 2013 [cited 2013 Sep 10]; Available from: <http://www.aaanet.org/issues/policy-advocacy/upload/AAA-Ethics-Code-2009.pdf>
  32. International Society of Ethnobiology Code of Ethics (with 2008 additions) [Internet]. 2013 [cited 2013 Sep 10]; Available from: <http://ethnobiology.net/code-of-ethics/>
  33. Iveković F, Broz I. *Rječnik hrvatskoga jezika.* Zagreb: Štamparija Karla Albrechta; 1901.
  34. Kovačić S, Nikolić L, Ruščić M, Milović M, Stamenković V, Mihelj D, et al. *Flora jadranske obale i otoka.* Zagreb: Školska knjiga; 2008.
  35. Dogan Y. Traditionally used wild edible greens in the Aegean Region of Turkey. *Acta Soc Bot Pol.* 2012;81(4):329–342. <http://dx.doi.org/10.5586/asbp.2012.037>
  36. Lentini F, Venza F. Wild food plants of popular use in Sicily. *J Ethnobiol Ethnomed.* 2007;3(1):15. <http://dx.doi.org/10.1186/1746-4269-3-15>
  37. Dreon AL, Paoletti MG. The wild food (plants and insects) in Western Friuli local knowledge (Friuli-Venezia Giulia, North Eastern Italy). *Contrib Nat Hist.* 2009;12:461–488.
  38. Pericin C. *Erbe di campo nella cucina istriana e la saggezza dei proverbi.* *La Ricerca.* 1999;25–26:13–16.
  39. Sōukand R, Quave CL, Pieroni A, Pardo-de-Santayana M, Tardío J, Kalle R, et al. Plants used for making recreational tea in Europe: a review based on specific research sites. *J Ethnobiol Ethnomed.* 2013;9(1):58. <http://dx.doi.org/10.1186/1746-4269-9-58>
  40. Łuczaj Ł. Changes in the utilization of wild green vegetables in Poland since the 19th century: a comparison of four ethnobotanical surveys. *J Ethnopharmacol.* 2010;128(2):395–404. <http://dx.doi.org/10.1016/j.jep.2010.01.038>
  41. The Plant List: a working list of all plant species [Internet]. 2014 [cited 2014 Sep 10]; Available from: <http://www.theplantlist.org/>