

## Wild food plants used in the villages of the Lake Vrana Nature Park (northern Dalmatia, Croatia)

Łukasz Łuczaj<sup>1\*</sup>, Norma Fressel<sup>2</sup>, Stjepan Perko<sup>3</sup>

<sup>1</sup> Department of Botany and Biotechnology of Economic Plants, University of Rzeszów, Werynia 502, 36-100 Kolbuszowa, Poland

<sup>2</sup> Nature Park Vransko Jezero, Kralja Petra Svačića 2; 23210 Biograd n/m, Croatia

<sup>3</sup> Eko-Zadar, Liburnska obala 6, 23000 Zadar, Croatia

### Abstract

Croatia is a country of diverse plant use traditions, which are still insufficiently documented. The aim of this study was to document local traditions of using wild food plants around Lake Vrana (northern Dalmatia, Zadar region).

We interviewed 43 inhabitants of six traditional villages north of Lake Vrana. On average 12 species were listed, which in total produced an inventory of 55 food plants and 3 fungi taxa. Wild vegetables were most widely collected, particularly by older women who gathered the plants mainly when herding their flocks of sheep. Wild fruits and mushrooms were rarely collected. The former used to be an important supplementary food for children, or for everyone during times of food shortage, and the latter were relatively rare due to the dry climate and shortage of woods.

The most commonly collected plants are wild vegetables: *Cichorium intybus*, *Foeniculum vulgare*, *Sonchus oleraceus*, *Asparagus acutifolius*, *Papaver rhoeas*, *Rumex pulcher*, *Daucus carota*, *Allium ampeloprasum* and *Silene latifolia*.

**Keywords:** ethnobotany, wild vegetables, wild edible plants, foraging, ethnomycology

“Šurljan baba parala / I zetu se nadala / Dođi zete do veče / Zaklat ćemo goveće / Ako dođeš popodne / Bit će ti šurljana i čorbe”. A traditional rhyme recorded in the study area (Pristeg and Dobra Voda), translation below:

“An old lady picked shepherd’s purse [= *Capsella bursa-pastoris*] / Hoping for her son-in-law / If you come, son by the evening / We will prepare beef / If you come in the afternoon / There will be shepherd’s purse and soup”.

### Introduction

In some countries of Europe, e.g. Spain, Italy, Poland and Estonia, intense research on the documentation of traditionally used wild food plants has been carried out over the last few years [1–12]. In some other countries, reviews of older ethnographic literature concerning this issue have been published, e.g. Slovakia, Hungary and Sweden [13–15].

The countries of the former Yugoslavia, in spite of their great biocultural diversity have produced relatively few ethnobotanical studies concerning wild food plants. Here we should mention the articles on wild food plants used in Bosnia-Herzegovina published by the late Sulejman Redžić [16,17]. Also, earlier, in 1976–1979, Bakić and Popović interviewed 5000 households on the Yugoslavian coast, all the way from Istria to the present Montenegrin-Albanian border [18]. (With the exception of a small section now belonging to Bosnia-Herzegovina and Montenegro, the coast constitutes a part of Croatia). The authors asked which of the local land and aquatic plants and animals were eaten during World War II. Unfortunately only data for the most commonly used taxa are published. Bakić and Popović report the use of 120 species of vascular plants. Out of them 38 were used by more than 30% of households. Interesting observations on the plants eaten along the Adriatic coast of Croatia and sold in its local markets can also be found in the edible plant guides of Ljubiša Grlić (e.g. [19,20]). Valuable information on the wild herbs eaten on the island of Korčula is presented in a conference paper by Sardelić [21]. Scattered information on edible wild greens can also be found in Šugar’s (2008) dictionary of Croatian plant names [22]. Čurčić’s report on the wild food plant use of Herzegovinian fishermen on the border of Dalmatia is a valuable and interesting source from as early as 1913 [23]. Last but not least, many interesting pieces of information were gathered in the recent study of wild vegetables sold in Dalmatian markets by the first author of this article and his colleagues [24].

It must be stressed that none of the above mentioned studies is a case study where a small rural area is researched

\* Corresponding author. Email: [lukasz.luczaj@interia.pl](mailto:lukasz.luczaj@interia.pl)

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in depth – they were either loose observations or results of larger scale questionnaires. In order to fill this gap we aimed at studying a small section of Dalmatia consisting of a few villages north of Lake Vrana, which although situated near the Adriatic, do not form part of the tourist infrastructure and consist mainly of peasant households where traditional animal husbandry and crop cultivation is maintained and constitutes the main human activity there.

## Material and methods

### Study site

The study site is located in northern Dalmatia and it belongs to the Zadar region, apart from the SE part, i.e. the village of Kašić, which belongs to the Šibenik-Knin region (Fig. 1–Fig. 3). We studied six villages: Vrana – 790 inhabitants, Banjevci – 447, Kašić – 126, Radašinovci – 266, Pristeg – 316, and Dobra Voda – 113 (data on the number of inhabitants from the 2011 census) located in close vicinity to Lake Vrana, the largest freshwater lake in Croatia (30 km<sup>2</sup>) and the Vransko Jezero Nature Park (57 km<sup>2</sup>) [25,26]. The southern border of the area was the lake and the northern border – the road No. 27 from Benkovac to Šibenik.

Nearly all the inhabitants are Roman-Catholic Croatian (95–97% depending on the village). This stands in contrast to some villages north of the area, which are inhabited by an orthodox Serbian population and are now highly depopulated due to the tragic war in the former Yugoslavia when this area became one of the major battlefields between Croatian and Serbian military forces [27]. This resulted in severe casualties in the local population, on both sides of the conflict. For example in the village of Radašinovci it decreased from 479 in 1991 to 266 in 2011. The proportion of Roman Catholics in the village rose from 78% to 95% between 1991 and 2001 [26]. Most inhabitants make a living from mixed farming and animal husbandry (olive groves, vineyards, cereals, potatoes, sheep grazing etc.) or commute to work on the coast. The area has no tourist facilities, such as hotels or apartments, apart from a campsite near the lake. The studied villages are typical rural settlements, but the area has a rich history with several medieval ruins, including a castle. In the 11th century Vrana was an important settlement on the Dalmatian coast and the Croatian royal insignia were even held there [28].

After several pilot interviews (not included here) in settlements located in the narrow strip between the lake and coast (Drage, Pakoštane), we excluded them from this study as the level of wild plant use among the population, who make a living from tourism, is much lower there and the vegetation is slightly different, with more coastal species.

The study site is located on the edge of Ravni Kotari, a relatively flat area with gentle hills, which for centuries was one of the breadbaskets of Dalmatia. The more fertile and humid places are still cultivated or grazed but large tracts of land are abandoned and are covered by dry maquis vegetation with varying degrees of tree and shrub cover (*Juniperus oxycedrus*, *Quercus* spp.). Marshland vegetation is found around the edge of Lake Vrana.

### Field study

The study was carried out mainly in the second half of March and the second half of May 2013, with preliminary observations



Fig. 1 Location of the study area in SE Europe.

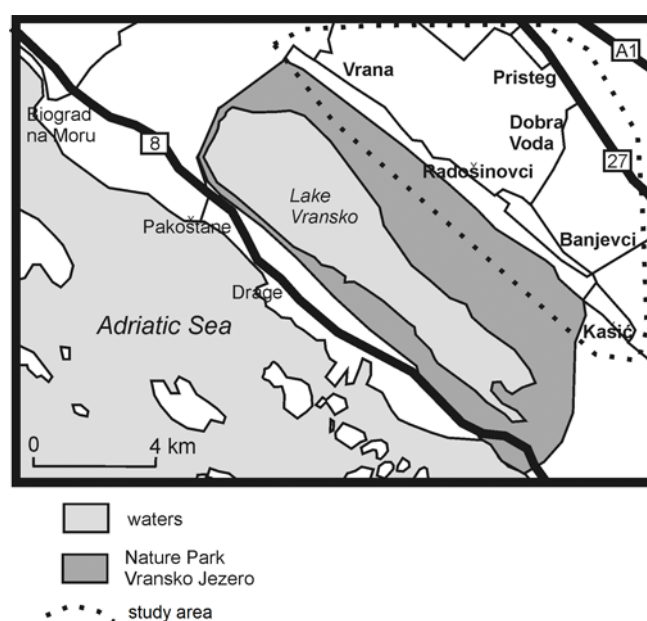


Fig. 2 The study area and the distribution of the studied villages.

carried out in spring and summer 2012. The second author is also a local nature park ranger and frequently takes part in the life of the studied villages. The research was carried out following the “American Anthropological Association code of ethics” [29] and the “International Society of Ethnobiology code of ethics” [30]. Data were collected mainly by free listing methods. Interviews were carried out in Croatian and in most cases recorded with a sound recorder, and are available from the first author.

Participants were approached outside during their farm work. Altogether, 43 free listing questionnaires were obtained, mainly from middle-aged and elderly inhabitants (33 women, aged 46 to 84, and 10 men, aged 30 to 78). The mean age of informants was 62 and the median 65.

The participants were asked their age, place of origin and habitation. Then they were asked the following questions:

- (i) what wild vegetables have you collected?
- (ii) what wild roots have you collected?
- (iii) what wild fruits have you collected?
- (iv) what wild mushrooms have you collected?





**Fig. 3** A typical landscape around Vrana.

As most interviews were performed outdoors and most wild food grows in the vicinity of farms the participants usually eagerly showed the collected plants and helped us collect the voucher specimens. In the case of some rarely listed wild plants we showed them to other inhabitants in order to establish their opinion of their edibility (some plants, although rarely listed are widely known as edible in the area, e.g. *Celtis australis*, *Lactuca serriola*, *Tragopogon* etc.)

Voucher specimens were collected and deposited in the herbarium of the Faculty of Biology of Warsaw University (WA).

## Results

Altogether, 57 species of wild food plants were recorded in the area (plus 3 taxa of mushrooms; *Tab. 1*, *Tab. 2*). This includes 37 species whose wild leaves are used, 17 species with edible fruits and 2 species whose roots are eaten. On average 12.4 species (median = 12) were listed by each informant: 9.3 wild vegetables (median 9), 2.9 fruits (median 2), 0.3 roots, 0.3 fungi (median 0 for both).

Wild vegetables are still widely used in the Lake Vrana area. These are usually weeds growing in old fields, on roadsides and in hedgerows. They are mainly collected in spring (March–April). We often encountered shepherds who, in their spare time, filled the pockets of their aprons with wild plants, which were later brought home, sorted and used (*Fig. 4*, *Fig. 5*). Although

the wild vegetables, apart from the few most common ones, like fennel or asparagus, are less popular among young people, many middle-aged people (40–50 years old) still collect them and have wide knowledge of them.

Most wild vegetables are boiled in a mix, which is called “svakober”, which translates as “pick all”. They are boiled for 20–30 min., strained and sprinkled with olive oil, then served as a side dish. They are often eaten with preserved ham (“pršut”) or potatoes.



**Fig. 4** Some respondents were actually encountered while coming back from trips to collect wild vegetables.

**Tab. 1** Wild food plants and mushrooms used in the area, in order of decreasing frequency.

Folk name	Frequency <i>N</i> = 43	Species	Part	Preparation
žutanca, žutanica, radić	37	<i>Cichorium intybus</i> L.	l	raw or boiled
komorač	33	<i>Foeniculum vulgare</i> Mill.	l	boiled
kostriš	32	<i>Sonchus oleraceus</i> L.	l	boiled
šparoge	29	<i>Asparagus acutifolius</i> L.	l	boiled, fried
makalj, makelj, mak	27	<i>Papaver rhoeas</i> L.	l	boiled or raw
štavljak	26	<i>Rumex pulcher</i> L.	l	boiled
divlja mrkva, mrkvica	25	<i>Daucus carota</i> L.	l, r	boiled (leaves), raw (roots)
divlji luk	23	<i>Allium ampeloprasum</i> L.	l	raw or boiled
ušac	23	<i>Silene latifolia</i> Poir.	l	boiled
brmbeč, brmečica, brmečuša, sikavac	20	<i>Scolymus hispanicus</i> L. and <i>Eryngium campestre</i> L.	l, r	boiled
kopriva	18	<i>Urtica dioica</i> L.	l	boiled, dried for medicine
divlja jagoda, kupina	17	<i>Rubus ulmifolius</i> Schott	f	tea, raw, jam
prva, planika, maginja, magunja	15	<i>Arbutus unedo</i> L.	f	rakija, pekmez, raw
divlja kruška, divlje jabuka	12	<i>Pyrus amygdaliformis</i> Vill.	f	raw
drinina, drinjina, dren	11	<i>Cornus mas</i> L.	f	raw
kozija brada	11	<i>Scorzonera laciniata</i> L., <i>Tragopogon pratensis</i> L. and related taxa	l	boiled
krastavac, širopica,	10	<i>Picris echioides</i> L.	l	boiled
dimovac	9	<i>Crepis sancta</i> (L.) Babč.	l	boiled
smreka, smrika, kozarača	9	<i>Juniperus macrocarpa</i> Sibth. and Sm., <i>Juniperus oxycedrus</i> L.	f	raw and in rakija
trnina	9	<i>Prunus spinosa</i> L.	f	raw
pečurke	7	<i>Agaricus</i> sp.	m	boiled
iglica	6	<i>Erodium cicutarium</i> (L.) L'Her. ex Aiton	l	boiled
salatuša, divlja salata	6	<i>Lactuca serriola</i> L.	l	raw and cooked
kravlja gubica	6	an unidentified name of an Asteraceae plant	l	boiled
šurljen, šurljan	5	<i>Capsella bursa-pastoris</i> L.	l	boiled, also in soup
tavka	5	<i>Chondrilla juncea</i> L.	l	raw salad
gloginje, glog	5	<i>Crataegus monogyna</i> Jacq.	f	raw
žir [name of acorns]	5	<i>Quercus ilex</i> L. and <i>Q. pubescens</i> Willd.	f	baked and boiled, until World War II
oskoruša	5	<i>Sorbus domestica</i> L.	f	raw and dried
kokna volica, koknja volica	5	<i>Viola arvensis</i> Murray	l	boiled
štir	4	<i>Amaranthus retroflexus</i> L.	l	boiled
koštela	4	<i>Celtis australis</i> L.	f	raw, also rakija
drača, kolačći, kolači	4	<i>Paliurus spina-christi</i> Mill.	f	immature fruits eaten as a children's snack
škripac, škripavac, ušac	4	<i>Silene vulgaris</i> (Mch.) Garcke ssp. <i>angustifolia</i> Hayek	l	boiled
svičica	4	<i>Torilis nodosa</i> (L.) Gaertn.	l	boiled
loboda, laboda	3	<i>Chenopodium album</i> L.	l	boiled
crvenjak, crvenki	3	<i>Geranium molle</i> L.	l	boiled
šliz, sliz, sljez	3	<i>Malva sylvestris</i> L.	l	boiled
divlja maslina	3	<i>Olea europaea</i> L.	f	pressed into oil
bljušt, kukljar, kukelj, kukač	3	<i>Tamus communis</i> L.	l	boiled
divlja blitva	2	<i>Beta vulgaris</i> subsp. <i>maritima</i> (L.) Moq. (syn. <i>B. maritima</i> L.)	l	boiled
sikovac	2	<i>Cirsium</i> sp.	l	boiled
čelica, kubljanac	2	<i>Lamium amplexicaule</i> L.	l	boiled
sunčenica, sunčanica	2	<i>Macrolepiota cf procera</i> (Scop.) Singer	m	fried, boiled
murva divlja	2	<i>Morus nigra</i> L.	f	raw
kupusak, kupusić	2	<i>Myagrum perfoliatum</i> L.	l	boiled
gorušica, ognica	2	<i>Sinapis arvensis</i> L.	l	boiled
vunica, mišakinja	2	<i>Stellaria media</i> L.	l	boiled
maslačak	2	<i>Taraxacum</i> sp. pl.	l	raw or boiled
vrganj	1	<i>Boletus</i> section <i>Eduleae</i>	m	
rogač	1	<i>Cerantonia siliqua</i> L.	f	
slačak	1	<i>Convolvulus arvensis</i> L.	l	boiled
trputac	1	<i>Plantago cf major</i> L.	l	boiled



Tab. 1 (continued)

Folk name	Frequency <i>N</i> = 43	Species	Part	Preparation
štucanj	1	<i>Portulacca oleracea</i> L.	l	boiled
rašeljka	1	<i>Prunus mahaleb</i> L.	f	
brekinja	1	<i>Sorbus torminalis</i> (L.) Crantz	f	
ditelnica	1	<i>Trifolium</i> sp.	l	boiled

Part used: f – fruits; h – aerial parts as aromatic spice; l – young leaves or young rosettes, used for boiled salads; m – mushrooms.

Tab. 2 Plants mainly used as medicine, but mentioned in our questionnaire as a source of everyday infusions (“recreational” tea).

Folk name	Frequency <i>N</i> = 43	Species	Part	Preparation
šipak	14	<i>Rosa canina</i> L.	f	infusion
kadulja	10	<i>Salvia officinalis</i> L.	l	infusion, rakija
stolisnik	2	<i>Achillea</i> cf. <i>millefolium</i> L.	l, fl	infusion
smilje	2	<i>Helichrysum italicum</i> (Roth) G. Don	fl, l	infusion, rakija
metvica divlja, menta	2	<i>Mentha</i> spp.	l	infusion
buhač	1	<i>Anthemis</i> sp.	fl	infusion
pelin	1	<i>Artemisia absinthium</i> L.	l	infusion
matičnjak	1	<i>Melissa officinalis</i> L.	l	infusion
gospina trava	1	<i>Hypericum perforatum</i> L.	fl	infusion
rutva	1	<i>Ruta graveolens</i> L.	l	infusion
majčina dušica	1	<i>Thymus</i> sp.	fl, l	infusion
lipa	1	<i>Tilia cordata</i> Mill., <i>T. tomentosa</i> Moench, <i>T. platyphyllos</i> Scop.	fl	infusion

Part used: f – fruit; fl – flowers; l – leafy parts.

Asparagus shoots are boiled separately and served in the same way. Some Asteraceae species are also eaten raw or blanched, and dressed in olive oil (*Cichorium*, *Taraxacum* etc.).

Fennel (*Foeniculum vulgare*) is used both as a vegetable and a spice, added to svakober, and other dishes. It is often added to boiled broad beans (*Vicia faba*), which is one of the traditional local specialities.

Wild fruits are now rarely collected, apart from snacking on blackberries or collecting *Rosa* fruits for tea. In the past (up until the 1960s) they were widely collected by undernourished children, and made into jams (“pekmez”) or added to home-made fruit brandy (“rakija”). Now this is only occasionally done.

Wild mushrooms are little known and little collected. There is only one forest in the area (a few dozen ha of oak wood) and some people, rarely, collect *Boletus* there. The only two more frequently collected mushroom taxa are *Agaricus* and *Macrolepiota procera*, both gathered from open pastures.

## Discussion

The presented list of wild foods is also typical for other Mediterranean areas. Most of the wild vegetables and fruits collected in the Vrana area are also widely used in Spain and Italy. This confirms our hypothesis that as far as the collection of wild food is concerned, the area forms part of a Mediterranean cultural



Fig. 5 Collecting wild vegetables is often an additional activity when looking after herds of sheep – the plants are put in the pockets of an apron.

area, spreading from Spain to western Turkey [1–5,31,32]. On the other hand worthy of attention is the use of *Myagrimum perfoliatum* (Brassicaceae) and *Torilis nodosa* (Apiaceae), species whose consumption had not been previously reported by any ethnobotanical studies. Only a related species from the genus *Torilis*, i.e. *Torilis arvensis* (Huds.) Link subsp. *arvensis*, is used as a spice in Crete [32]. The list of recorded wild greens is long on a European scale, but shorter than the number of wild greens used in some parts of Asia (e.g. [33,34]).

The frequency of quoting wild vegetable use in this study is similar to the frequency of wild vegetables sold in the whole of Dalmatia as recorded in research in local markets [24] and as recorded by Bakić and Popović over 30 years ago (Tab. 3) [18]. For more than half of the more common taxa there were no significant differences in frequency. Only *Rumex pulcher* is a special case, very rarely sold in the markets but commonly eaten in the area. This similarity of data from the markets and from local study confirms the great usefulness of market surveys. Market surveys allow for quick and easy data gathering and they also enable confirmation of which species are actually used on a larger scale [35–38]. The two main disadvantages of market surveys are the danger of recording plants sold for outsiders, e.g. town inhabitants or tourists, which may be very different from the plants eaten in the countryside, and the omission of plants, which may not be sold but are used. In the case of Dalmatia, however, we see a large similarity in the locally eaten mix and the mixes sold in the Dalmatian markets.

**Tab. 3** Comparison of frequency of wild vegetables used in salad mixes (not separately, like *Asparagus*, *Tamus* and *Cichorium*) in questionnaires from the Vrana area and from market surveys in the whole of Dalmatia [24].

Species	Markets N = 68 (%)	Vrana area N = 43 (%)	Significance chi-squared test
<i>Foeniculum vulgare</i>	63	86	
<i>Lactuca serriola</i>	7	14	
<i>Picris echioides</i>	40	23	
<i>Sonchus olearaceus</i>	79	74	
<i>Taraxacum</i> spp.	15	4	
<i>Silene latifolia</i>	13	53	***
<i>Papaver rhoeas</i>	41	63	
<i>Tragopogon</i> & <i>Scrozonera</i>	9	26	*
<i>Daucus carota</i>	19	58	**
<i>Rumex pulcher</i>	3	60	***
<i>Allium ampeloprasum</i>	69	53	

Significance: \*  $P < 0.05$ ; \*\*  $P < 0.01$ ; \*\*\*  $P < 0.001$ .

Out of the 36 wild food plant taxa listed by Bakić and Popović [18] as the most frequently used on the ex-Yugoslav coast, as many as 29 species (or their close relatives from the same genus) are used or remembered in the Vrana area.

As the study area is located several kilometres from the coast, no typical seashore edibles, like *Salicornia salina* and *Plantago coronopus*, eaten in some parts of Dalmatia, were recorded in this study.

The accidentally recorded plants used for everyday infusions in the Vrana area are species widely used around the

Mediterranean or in other Slavic countries (e.g. [39]). This is probably only a small proportion of the medicinal plants known in the area. The erosion of local plant knowledge in the Vrana area seems to be much smaller than on other parts of the Croatian coast, for instance on the more developed Istria [40] or around Dubrovnik (personal observations).

This study clearly confirms that this part of Dalmatia is clearly one of the very few parts of herbophilous Slavic territories where the use of wild greens is still common. In northern Slavic countries [6–10,14,41,42] as well as northern Croatia (authors' personal observations) wild greens are either no longer used at all, or only one or a few species are known and utilized, although up to the 19th century, their use had been more widespread [43]. On the other hand, in the predominantly woodless Dalmatia, mushrooms are little utilized compared to central and northern Croatia and other Slavic countries (e.g. [44]). Research is needed in other parts of Croatia and neighbouring countries to broaden our knowledge of plant use patterns.

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## Authors' contributions

The following declarations about authors' contributions to the research have been made: carried out the interviews: ŁŁ, NF, SP; wrote the manuscript: ŁŁ.

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