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Wild plants used for food by Hungarian ethnic groups living in the Carpathian Basin

Andrea Dénes[1]*, Nóra Papp[2], Dániel Babai[3], Bálint Czúcz[4], Zsolt Molnár[4]

[1] Natural History Department, Janus Pannonius Museum, Box 158, 7601 Pécs, Hungary

[2] Department of Pharmacognosy, University of Pécs, Rókus 2, 7624 Pécs, Hungary

[3] Centre for Humanities, Hungarian Academy of Sciences, Országház 30, 1014 Budapest, Hungary

[4] Centre for Ecology, Hungarian Academy of Sciences, Alkotmány 2-4, 2163 Vácrátót, Hungary

Abstract

A list of plant species used for food in Hungary and among Hungarian ethnic groups of the Carpathian Basin during the 19th and 20th centuries was compiled from 71 ethnographic and ethnobotanical sources and a survey among contemporary Hungarian botanists. Species used as food, spice, beverage or occasional snacks were collected. Sources mention 236 plant species belonging to 68 families. Most wild fleshy fruits (mostly *Rosa*, *Rubus*, *Cornus*, *Ribes*, *Vaccinium* spp.), dry fruits and seeds (*Fagus*, *Quercus*, *Corylus*, *Castanea*, *Trapa* spp.), several green vegetables (e.g. *Rumex*, *Urtica*, *Humulus*, *Chenopodiaceae* spp., *Ranunculus ficaria*), bulbs and tubers (*Lathyrus tuberosus*, *Helianthus tuberosus*, *Chaerophyllum bulbosum*, *Allium* spp.) used for food in Europe, are also known to be consumed in Hungary. A characteristic feature of Hungarian plant use was the mass consumption of the underground parts of several marsh (e.g. *Typha*, *Phragmites*, *Sagittaria*, *Alisma*, *Butomus*, *Bolboschoenus* spp., as well as the endemic *Armoracia macrocarpa*) and steppe species (e.g. *Crambe tataria*, *Rumex pseudonatronatus*). Consuming wild food plants is still important among Hungarians living in Transylvania: even nowadays more than 40 species are gathered and used at some locations.

Keywords: ethnobiology, historical ethnobotany, wild green vegetables, wild edible plants, tree saps

Introduction

In the last two decades several comprehensive surveys and reviews were performed in many European countries on wild plant use. Wild plants formed important parts of our ancestors' diet in a multitude of ways (e.g. as bread ingredients, vegetables, fruits, spices, snacks or beverages); essential in severe times, supplementary otherwise [1–3]. Revitalization of traditional practices is timely for ecology, economy and nutrition biology. Nevertheless, even though Hungary is no poorer in traditions of wild plant use than other parts of Europe, no broad-scale review has been undertaken for Hungary in this respect, yet.

Information on the human consumption of wild plant species is widely scattered among the ethnographic and botanic literature, mostly in Hungarian language. Publications on gathering economy, traditional nutrition, shepherding, forest goods utilization, and on the hunting-fishing-gathering "pákász" lifestyle in the former wetlands of the floodplains of the large Hungarian rivers are known from the end of 18th century on (e.g. [4]), and they became frequent from the second half of the 20th century. Publications of traditional research on medicinal uses of plants [5–8] and ethnobotany [9–11] also mention wild food plants, but a review concentrating on wild food plants is still missing.

In this work we systematically review and compile information on the utilization of wild food plants in the Hungarian speaking regions of the Carpathian Basin from the Hungarian ethnographic and ethnobotanical publications. Our study aims at compiling a knowledge base on wild food plants consumed in Hungary and by the Hungarians living in other countries of the Carpathian basin, containing information on the species, as well as the modes of use. As the Carpathian Basin is dominated by alluvial floodplains located on the margin of the vast Eurasian steppe regions, Hungarian traditional plant use might also include previously undocumented usage of wetland and steppe plant species, which can potentially add some new aspects to the existing knowledge on traditional plant use in Europe.

Material and methods

Flora, vegetation and history of the Carpathian Basin

The Carpathian Basin is the contiguous floodplain area of the Danube and Tisza Rivers encircled by the Carpathian

* Corresponding author. Email: denes.andrea@jpm.hu

Mountains in Central Europe. Containing an extensive transitional zone between European deciduous forests and the Eurasian steppe biome the study area harbors a particularly diverse vegetation, which is also acknowledged by the European Union by classifying the majority of this region into a singular biogeographic zone, the Pannonian biogeographic zone.

The periphery of the Carpathian Basin including the Carpathians can be characterized mostly by and alpine and subalpine vegetation, coniferous forests, which turn into broadleaved deciduous forest at lower elevations. The central part of the basin is dominated by continental forest-steppes, although only remnants of salty and sand steppes had survived to date. Gallery forests and wetlands on the floodplains of the two large rivers, Danube and Tisza, and their tributaries played a determining role in vegetation development and also in people's lives till their regulations in the second part of the 19th century. Presently their former area, as well as the majority of former steppe vegetation, is dominated by agriculture [12]. The flora of Hungary consists of 2600 species including many steppe species, whereas the flora of Transylvania is also about 2600 with significant proportions of boreal and alpine species [13]. The Carpathian Basin altogether harbors 3360 species. In addition to the dominant Eurasian, continental and European species, southern, submediterranean and Balcanic elements amount to 20%.

As a consequence of Hungarian history, there are Hungarian ethnic groups living in all countries of the Carpathian Basin. Due to ecological, historical and economic reasons, ethnicities separated from the mother country often preserve their traditions better, even archaic ones, so researchers prefer to conduct ethnographic and ethnobotanic studies among Hungarians living in Romania, Slovakia, Ukraine, Serbia and Croatia.

Research history

Historical records on the use of wild plants in Hungary are known since the Medieval period (16th century). Herbal knowledge of wise women and monks, and works of former botanists as Clusius (1526–1609), Beythe (1532–1612), Kitaibel (1758–1817), Borbás (1844–1934), and Dégen (1866–1934) are usually reviewed by ethnographers studying the gathering economy of the Carpathian Basin. Detailed records on edible plants from the end of the 18th century, can be found in the manuscript diaries of Kitaibel, reviewed recently by Molnár [4]. Rapaics [14] had published an overview on the history of food plants, going back to pre-Medieval times.

A complete list of former publications can be found in the reviews of Gunda [15,16], a key person of ethnographical research of gathering economy in Hungary. Reviews of folk nutrition [17–19] generally include more or less detailed overviews of wild plants collected for food [9,17–19]. Plants consumed during famines were studied by Rapaics [14], Györffy [20], Gunda [15,16], and Molnár [21]. The published studies collectively cover almost the entire Carpathian Basin, the most thoroughly explored regions being Transylvania [sensu lato, including e.g. Gyimes (Ghimeş) and Máramaros (Maramureş)] and the southern foothills of the Northern Carpathians [Nógrád, Heves, Borsod, and Zemplén counties as well as the Gömör (Gemer, Slovakia) region]. Nevertheless, not all papers provide a comprehensive ethnobotanical "wild food plant" survey of the studied regions – there are several papers, where the focus is on other aspects of traditional living, with only sporadic mention of a few wild plants.

Methods

We compiled a list of plant species used for food based on 71 ethnographic and ethnobotanical publications in Hungarian language. Most of the studied papers describe traditional ecological knowledge of Hugarian speaking ethnic groups living in the Carpathian Basin, even though there might be exceptions, e.g. some papers included wild food plants used by other ethnic groups (e.g. Slovaks) living in Hungary, while other papers include traditional plant use of Hungarians living even beyond the Carpathians (e.g. Hungarian refugees from Bukovina, whose plant use included ancient elements from their old home country as well as newer ones from their new home, Hungary). The studied publications explore the following regions: Dunántúli dombvidékek (SW Hungary: Őrség, Somogy, Zala, Tolna, Baranya) [22–29]; Kisalföld (NW Hungary and SW Slovakia) [30,31]; Déli-Alföld (SW Hungary and N Croatia) [32–35]; Dunántúli középhegység (mountains in W Hungary) [36,37]; Északi középhegység (Carpathian foothills in N Hungary) [38–47]; Gömör (Gemer, S Slovakia) [48–52]; Kárpátalja (Zakarpatska Oblast, W Ukraine) [53,54]; the Great Hungarian Plain [55–62]; Vajdaság (Voivodina, N Serbia) [63]; Erdély (Transylvania, Romania) [64–75]; and Bukovina (N Romania – collected from refugees settled down in Hungary) [76,77] (Fig. 1). This literature review was complemented by a survey among 34 Hungarian botanist on the wild food plants which they had collected and consumed in their childhood [78].

Fig. 1 Map of the study area including the geographic names used in the text.

The oldest source is from the end of the 18th century [4]; the most recent ones are up-to-date ethnobotanical surveys collected in Ghimeş, Transylvania and Hortobágy, Hungary [11,74,75]. In addition to local traditional plant names, most publications also mention the official Hungarian and/or the scientific (genus or species) Latin names of the food plants, even though these identifications can be easily mistaken if the local traditional names are similar to the official Hungarian name of another taxon. Such misidentifications are unfortunately typical in a part of the ethnography literature, nevertheless a good botanical knowledge, the descriptions of the plants discussed (if supplied), and the comparison of the different sources can effectively help to correct misidentifications [79]. In our work we corrected all obvious misidentifications which could be easily corrected, and omitted all records which were clearly invalid, but no unambiguous correction was available. Nevertheless, most of the species are mentioned in several

publications, which reduces the uncertainties, particularly in the case of plant uses which were also documented by botanists.

In the reviewed papers we focused on plants which were collected from the wild and consumed as food or food ingredient (including spices, beverages, occasional snacks, etc.). This definition excludes medical plants (consumed only for their health impacts), and plants collected only for non-food use (e.g. dye, timber, etc.). On the other hand, we included gathering from spontaneous populations of escaped and naturalized cultivated plants and non-native invasives.

Results

We found altogether 235 plant species belonging to 67 families which were mentioned from the study area. We found 216 species in the literature survey, whereas contemporary Hungarian botanists (34 data providers) mentioned 91 taxa (the overlap between the two sets was 71 species). The species are listed in detail in Tab. 1 with their local names as mentioned in the sources, and their documented modes of usage. In order to provide an indicator for record uncertainty, species data published only by ethnographers are marked with "*" in Tab. 1.

We found that it is the species of the Rosaceae family (36 species) which are consumed most often; other frequently used families include Asteraceae, Lamiaceae, Liliaceae (sensu lato, before the APG division of the family), Fabaceae and Apiaceae. The list contains 36 trees, 27 shrubs, 4 dwarf shrubs and 169 herbaceous species. Green aboveground parts (leaves, young shoots, buds, and sometimes the whole plant) of 98 species were consumed (mainly Apiaceae, Lamiaceae, Liliaceae). Flowers of 39 species (mainly Asteraceae, Boraginaceae, and Lamiaceae) and fruits/seeds of 74 species (mainly Rosaceae, Grossulariaceae, and Ericaceae) were eaten. Underground parts – roots, rhizomes, tubers, bulbs – of 23 species (mainly Liliaceae, Apiaceae, Asteraceae, and Brassicaceae) were used. Saps of 8 species and dried saps (resins, gums) of 4 species were consumed or chewed. In several cases two or three parts of the same species were consumed, e.g. *Rosa gallica*: flowers, fruits, leaves; *Fagus sylvatica*: fruits, leaves and sap; *Sambucus nigra*: flower, fruit; *Taraxacum* spp.: leaves, flowers; *Fragaria* spp.: fruits and leaves.

Green vegetables

Green parts – mainly young spring shoots or young leaves – of 51 species were prepared raw for salad, or cooked for use in soup or sauce. Species used in most regions include *Rumex acetosa*, *Urtica dioica*, *Humulus lupulus*, *Ranunculus ficaria*, and *Allium* spp. Larger leaves are often used in regional dishes as a wrapping for some meaty stuffing, e.g. *Armoracia rusticana*, *Tussilago farfara* and *Fallopia* spp. Young shoots of *Typha* spp. and *Phragmites australis* used to be consumed as a salad in the Sárköz region of Hungary, a tradition abandoned long time ago. Sixteen species including *Anthriscus cerefolium*, *Glechoma hederacea*, *Thymus* spp., and *Verbena officinalis* were used as spice, pickling or preservative. *Satureja alpina* as a spice is mentioned from the early 18th century. The green parts of several plants were used to prepare a refreshing tea or as syrup (e.g. a "pine honey" made from the buds of Pinaceae species); more interesting uses include making candy from *Melittis melissophyllum* [76], or *Fagus* leaves. Babies unable to suck were fed with pressed nettle (*Urtica*) sap (I. Németh personal communication). Some species (e.g. *Oxalis acetosella*, *Galium verum*) were used in the past as curdling agents. Herdsmen chewed *Plantago lanceolata* leaves in order to clean their teeth (I. Németh personal communication.). Eating Lemnaceae species in famine is mentioned only from the Drava floodplain.

Flowers

Even though sucking nectar and eating flowers or inflorescences is a widespread and delightful occupation of children, major food or beverage products are rarely made from flowers. As an exception, flowers of *Sambucus nigra* or *Robinia pseudacacia* are commonly used for making refreshing drinks or fried into pancakes they can serve as popular dishes. Unique is the use of inflorescences of *Carlina acaulis* as a green vegetable. Flowers of *Humulus lupulus* and *Robinia pseudacacia* were added to sourdough in many places. In Gömör, there used to be a tradition of making "flower wines" from *Robinia* or *Taraxacum* flowers ("pimpóbor") [50].

Fruits and seeds

Eating and processing wild fruits of many species is a widespread, still a living tradition in Hungary. *Fragaria*, *Sambucus*, *Rubus*, *Crataegus*, *Vaccinium*, *Ribes*, *Rosa* spp. and *Cornus mas* have been eaten fresh, baked into cakes, prepared as beverages, or dried for a later use for long time. With the advent of cheap sugar additional preservation techniques became available including syrup and jam production [17]. Some fruits (*Malus*, *Pyrus*, *Vaccinium vitis-idaea*, *Streptopus amplexifolius*) were collected unripe; they were ripened in the attic, in hay, or in the sun. Formerly cider and vinegar were fermented from the fruits of *Malus sylvestris*. A traditional fruit brandy called "pálinka" is traditionally distilled after fermentation from many fruits even today. To improve taste and color fruits and spices can also be added to "pálinka" after distillation ("ágyaspálinka"). Fruit cider and brandy production was particularly important in regions without extensive grape productions. In Gömör cider was fermented from almost all wild fruits. Rarely consumed fruits include *Streptopus amplexifolius*, *Viburnum* spp. and *Cornus sanguinea*, which are considered slightly toxic by some sources but were still documented as consumed by trustworthy publications. Several dry fruits (nuts and seeds) were also widely collected. In addition to the nuts being still economically significant (*Corylus avellana*, *Juglans regia*, and *Castanea sativa*), *Fagus sylvatica* seeds were also eaten raw or roasted. Ground *Fagus acorns*, as well as *Quercus acorns* after leaching, were also used as coffee substitutes and flour in famine times. In addition to acorns, famine flour ingredients also included dried and ground *Crataegus*, *Rosa* and *Trapa* fruits, *Glyceria* seeds and *Corylus* buds. According to Kitaibel's data from the end of the 18th century, oil was pressed from *Sisymbrium altissimum*, *Brassica nigra*, and *Fagus sylvatica* seeds. *Staphylea pinnata* nuts used to be a kids' snack; cooked unripe fruits of *Daphne mezereum* were used as black pepper substitute in the time of Kitaibel, at the beginning of the 1800s. *Carum carvi* used to be a widespread spice not only for dishes, but also for palinka and tea. Food and wine were coloured, e.g. with *Phytolacca americana*; while shiny seeds, e.g. *Vicia* spp. and *Lathyrus aphaca* were used for decorating cakes.

Underground parts

Underground parts of of several wild plants were among the most important staple foods during famines. Bulbs, tubers or rhizomes of *Alisma plantago-aquatica*, *Bolboschoenus*

Tab. 1 List of wild food plants used by Hungarians in the Carpathian Basin.

Scientific name	Local names mentioned	Parts used	Mode of use	Reference No.
Abies alba Mill.	fehérfenyő	VEG, FLO	brandy (palinka) was distilled from buds and young cones	[74]
Acer campestre L.	kokasfa, kokastorufa, juhar	FRU	immature fruits were sucked as a snack	[23,78]
Acer pseudoplatanus L.	jávor, jávorfa, hegyi juhar	SAP	beverage	[19]
Acer sp.	juhar, jávor, jávorfa	SAP	beverage	[9,52,69,72]
Acorus calamus L.*†	kálmos	SUB	spice for liqueur	[29]
Aesculus hippocastanum L.†	vadgesztenye	FRU	seeds as coffee substitute	[19,78]
Agrimonia eupatoria L.	párlófű, tüdőfű, bojtorján, bojtorván, bojtorvány, repcsik	VEG	tea	[19,43,67]
Alchemilla spp.	palástfű, harmatfű	VEG	raw as salad	[74]
Alisma plantago-aquatica L.	type of bengyele, bakacs	SUB	food in famine and for herdsmen	[16,21]
Allium atroviolaceum Boiss.*	mezei fokhagyma	VEG, SUB?	raw	[57]
Allium obliquum L.	turkesztáni hagyma	VEG, SUB?	raw	[65]
Allium oleraceum L.	érdes hagyma	VEG, SUB?	raw and as spice	[21]
Allium rotundum L.	n.d.	VEG, SUB?	eaten	[65]
Allium scorodoprasum L.	hagyma, vadhagyma, kígyóhagyma, vad fokhagyma	VEG	young leaves were eaten; also used as spice like garlic	[4,19,41,57,78]
Allium ursinum L.	vadfokhagyma, medvehagyma, medvefokhagyma, vad hagyma, medvesósdi, sorhajma, salama	VEG	salad, vegetable, spice (put into sausage)	[27,41,65,70, 73–75]
Allium victorialis L.	győzedelmes hagyma	VEG, SUB?	eaten	[4]
Allium vineale L.	n.d.	VEG, SUB	leaves and bulbs were eaten	[78]
Allium sp.	hagyma	FLO	small onions in inflorescence were children's snack	[78]
Alopecurus pratensis L.	gombos ecsetpázsit	VEG	stem was children's snack	[78]
Anchusa officinalis L.	n.d.	VEG	eaten as salad, scalded with vinegar	[65]
Anthriscus cerefolium (L.) Hoffm. subsp. *trichosperma* (Spr.) Arc. (*Chaerophyllum trichosporum*) & *A. sylvestris* (L.) Hoffm. (*Ch. sylvestre*)	zamatos turbolya, turbolya	VEG	green spice for soups and vegetables; rarely mentioned in folk literature, but in a cookbook from the end of the 19th century *A. cerefolium* was mentioned as soup and spice	[65,78,86]
Amaranthus spp.	paraj	VEG	whole plant was consumed	[78]
Arctium lappa L.	bojtorján, keserűtorzsa, burusztujlapi, keserű-torzsa lapi, büdös lapi, parti lapi, büdös levél, parti fű, lapu, bogáncs	SUB	peeled and eaten	[77,78]
Armoracia macrocarpa (W. et K.) Baumg.	torma (debreceni torma)	VEG, SUB	VEG: soup, vegetable; SUB: spice for pickles	[14,59,62]
Armoracia rusticana G. Gaertnn. B. Mey. et Schreb (*A. lapathifolia* Usteri)	torma, tormalapu	VEG, SUB	SUB: side dish for meat, VEG: leaves: soup, sauce; meaty stuffing filled into them	[9,23,36,42,52, 53,62,76]
Arrhenatherum elatius (L.) J. et C. Presl.	fű	VEG	stem was children's snack	[78]
Artemisia absinthium L.†	fehér üröm, fejér üröm	VEG	spice for brandy (palinka) and wine	[30,62,77]
Asperula odorata L.*	szagos müge	VEG	spice for liqueur	[30]
Atriplex patula L.	vad laboda, sós paréj, fodros paréj	VEG	soup	[77]
Atriplex tatarica L.	fehér laboda	VEG	raw: salad, cooked: soup, former herdsmen prisoners of war put it into hot soup in Siberia	[11,71]
Berberis vulgaris L.	fajisóska, nyúlsom, sóska, sóskaborbolya	VEG, FRU	VEG, FRU: snack; FRU: substitute for vinegar	[36,67,78]
Betula pendula Roth (*B. verrucosa* Roth)	nyír, nyírfa, májfa	SAP, VEG	SAP: fresh beverage; wine and vinegar were fermented from it; herdsmen of Transylvania and Zemplén used it for inoculation of milk. VEG: substitute for tea	SAP: [9,22–24, 29,30,38,41–44, 48,50,52,53, 56,58,63,65,66, 69,72,74]; VEG: [7]
Bolboschoenus maritimus (L.) Palla	csatak, zsiók, zsiku, zsióka	SUB	food in famine and for herdsmen	[14,16]

Tab. 1 *(continued)*

Scientific name	Local names mentioned	Parts used	Mode of use	Reference No.
Brassica nigra (L.) Koch (*Sinapis nigra* L.)	franciamustár	FRU	oil was pressed from it	[4]
Bromus sterilis L	vadzab	VEG	stem was children's snack	[78]
Bunias orientalis L.	borsoslenke, borsos lenkő, rákányéc, szümcső	VEG	soup and salad in spring	[9,74,75,78]
Butomus umbellatus L.	alacs, elecs, elecske	SUB	food in famine times and for herdsmen	[14,16,21]
Campanula persicifolia L.	kupa, tőcsérvirág, vadcsengő	FLO	snack for children	[9]
Capsella bursa-pastoris (L.) Medik.	pásztortáska	VEG, FLO	young flowering shoots were snacks for children	[74,78]
Cardamine amara L.	vízitorma	VEG	snack in early spring	[70]
Cardamine pratensis L.	n.d.	VEG	n.d.	[73]
Carlina acaulis L.	bábakalács, bábakonty, kontybába, kenyérvirág	FLO	inner part of inflorescence was a raw snack	[9,19,74,75]
Carpinus betulus L.	gyertyán	VEG, SAP	SAP: fresh beverage. VEG: leaves as a spring snack	SAP: [9,23,39]; VEG: [22]
Carex elata ALL. & *Carex* spp.	sás, limbus	VEG	leaves and stems were children's snack	[78]
Carum carvi L.	keménmag, kemény, kömény, kömén, kümén, köminy, kömin, kömind, köménd,	FRU	spice for rye bread, soups and roasted meat; brandy (palinka) with honey and cumin was a traditional drink in Transylvania	[7,9,19,36,37,41,52,67,70,71,74–78]
Castanea sativa Mill.	szelidgesztenye, geszkenye, geszkönye	FRU	roasted or cooked for sweets and cakes	[23,28–30,36,37,78]
Celtis occidentalis L.	ostorfa, zsidómeggy, zsidócseresznye, madárbogyó, gelegenye	FRU	children's snack	[78]
Centaurium erythraea Rafn.	cintória, ezerfű	VEG	raw as an appetizer; spice for brandy (palinka); tea	[26,30,57,74]
Cerasus avium (L.) Mönch (*Prunus avium*)	cseresznye, vadcseresznye, vadcserösznye	VEG, FRU, SAPs	VEG: leaf was spice for pickles. FRU: eaten raw and dried; brandy (palinka) was distilled from it; SAPs: gum chewing	[19,22,23,26,27,29,37,38,40,47,52,57,68,70,71,74,75,78]
Cerasus vulgaris Mill. subsp. *acida* (Dumort.) Dostal (*Prunus cerasus* L.)	vadmeggy	FRU	raw snack	[52,78]
Chaerophyllum bulbosum L.	baraboj, bubályka, bobályka, bubolyicska, buboicska, bóbiska, mogyorófű, turbolya, csemegebürök, trombujka, mogyorós baraboly, baraboi, fődibarabój, mihályka, mihálka, Mihályka monya	SUB	eaten raw by children, also by adults, like carrot	[9,14,42,53,58,59,62,65,67,70,75]
Chenopodium album L.	laboda, cigara	VEG	salads and vegetable	[19,65,78]
Cichorium intybus L.	katáng, vad cikória, katángkóró	SUB	grated and roasted as a coffee substitute; used even today in Transylvania	[14,74,78]
Cirsium arvense (L.) Scop.	tüvis, tövis	VEG	young spring shoots gathered for soup; peeled stems eaten raw	[9,78]
Cirsium canum (L.) All.	bojhos tövis, ökörlevél, ökörnyelv	VEG	young leaves cooked for soup	[9,73]
Cirsium oleraceum (L.) Scop.	káposztás acat	VEG	young leaves were eaten	[21]
Convolvulus arvensis L.	szulák, győtény	FRU, VEG	FRU: seeds were famine food; VEG: children's snack	[16,21,78]
Cornus mas L.	som, sum	FRU	sour jam eaten with meat; syrup; dried; brandy (palinka) distilled from it	[19,26,29,30,36–42,46–52,57,62,65,70,72,78]
Cornus sanguinea L.†	somfa	FRU	jam, syrup and brandy was made from it (even though some consider it poisonous)	[19]
Corylus avellana L.	magyarófa, mogyorófa, mogyoró, fáin magyaró, fájimogyoró, fájimagyaró, monyaru, monyaró, magyaru	FRU, VEG	FRU: baked into cakes, snack; VEG: buds: ground for flour substitute in famine	[19,22,26,27,30,36–38,42,49–53,65,67,69,72,75,78]
Crambe tataria Sebeók	tátorján	SUB	famine and herdsmen's food	[4,14,16,21,55]

Tab. 1 *(continued)*

Scientific name	Local names mentioned	Parts used	Mode of use	Reference No.
Crataegus monogyna Jacq., *Crataegus oxyacantha* L. and related taxa	Istengyümölcs, Istengyümölcsfa, Istengyümöcse, édeskés galagonya, galaginya, gelegenye, gyümölcsény, Jézus Krisztus tövise	FRU, VEG	fruits and sometimes leaves were raw snack; in few places cooked into jam; dried flour substitute in famine	*C. monogyna*: [14,19,22,25, 27,34,35,39,51, 59,62,77,78]; *C. oxyacantha*: [22,30,36–38]; *C.* sp: [29,40,46, 50,76]
Crataegus nigra W. et K.	savanykás galagonya	FRU	raw snack	[35]
Crocus banaticus L. Gay (*Crociris iridiflorus* Heuff.) & *Crocus balcanicus* Janka	sáfrány & balkáni sáfrány	SUB	spread by wandering herdsmen; bulbs can be eaten	[16]
Crocus variegatus Hoppe & Hornsch	vadsáfrány	FLO	spice; flowers were collected and sold	[16]
Dactylis glomerata L.	ebír	VEG	stem was children's snack	[78]
Daphne mezereum L.†	farkasboroszlán	FRU	unripe fruits were used as a pepper substitute after cooking	[4]
Daucus carota L. subsp. *carota*	murok	SUB	added to soups and vegetables	[74]
Echium vulgare L.	édesfű	FLO	flowers (perhaps fruits also) eaten by children	[36]
Elaeagnus angustifolia L	olajfa, olajbogyó	FRU	eaten by children	[60,78]
Elymus repens (L.) Gould.	tarackbúza	VEG, SUB	VEG: raw stem as a snack; SUB: famine food	[19,78]
Equisetum arvense L.	mezei zsurló	FRU	fertile young shoots were eaten by Gypsies	[87]
Eryngium campestre L.	csipke, bikacsöke, bikacsipke, macskatövis, széhajtitövis	VEG	young shoots cooked for soup; stems and fresh leaves were eaten fresh, as salad	[18,77]; as *Xanthium spinosum*: [59,62]
Fagus sylvatica L.	bükk, bikfa, májusfa	FRU, VEG, SAP	FRU: raw and roasted for snack; for confectionery as a walnut substitute; coffee substitute; from seeds oil was pressed; famine food: ground seeds mixed into flour (even in 1957); VEG: slightly acidic leaves eaten raw by children in the spring, sometimes with sugar; SAP: children tapped and drank	FRU: [19,22,23, 33,36–39,42,50, 53,57,65,68,69, 72,74,75,78]; VEG: [19,36]; SAP: [9]
Fallopia baldschuanica (Regel) Holub	sóskafa, tőtike	VEG	leaves as a vegetable with a meaty stuffing filled into them; leaves were used as a children's snack	[78]; B Czúcz pers. comm.
Filipendula vulgaris L.	koloncos legyezőfű, bányavirág	SUB	sap pressed from roots were eaten; famine food	[9,16,21]
Fragaria moschata Duch.	piroseper, berkeeper, eper	FRU	raw and conserved as jam	[75,78]
Fragaria sp.	szamóca, bakkeper, fődi eper, földi eper, szimóca, SK: jahoda	FRU	raw and conserved as jam	[22,25,26,29,39, 42,47,50,52,62, 68,76,78]
Fragaria vesca L.	fődi eper, erdei eper, eper, vereseper, bekeeper, szamóca, vad eper, piroseper, berekeper, madár-epörgye, lányeper, bagóeper, erdei szamóca,	FRU, VEG	raw on site; jam, syrup and put into brandy (palinka)	[19,27,37,40,49, 52,57,72,74,75, 77,78]
Fragaria viridis Duch.	szamóca, csattogó eper, tokoseper, csattogó-epörgye, lányeper, bagóeper, csattogó, vadeper, réti szamóca	FRU	raw, jam, fruit and liqueur	[27,36,37,40,45, 53,78]
Galeobdolon luteum Huds. (syn. *Lamium galeobdolon* (L.) Ehrend & Polatschek.)	árvacsalyán, árvacsanál, árvalánycsanál, árvacsihán, szelidcsanál, szopóka	FLO	flowers were used as a children's snack	[19]
Galium verum L.	tejoltó galaj	VEG	used for milk inoculation	[66]
Gentiana cruciata L. & *Gentiana lutea* L.	epeburján, epefű, horecska, kösörűgyökér,	SUB	put into brandy (palinka), appetizer	[19]
Glechoma hederacea L.	katonapetrezselyem, vadpetrezselyem	VEG	green spice: parsley substitute	[19,41]

Tab. 1 *(continued)*

Scientific name	Local names mentioned	Parts used	Mode of use	Reference No.
Gleditsia triacanthos L.	koronatüsökfa, kruskuli, glédicstüsök, vad szentjánoskenyér, koronaakác, kreditsia, gleditse, édeske, szejjánoskönyérfa, ledics, lepényfa, lackószar, zsidótakony, glédicstüsök	FRU	children eat the spongy part of the fruit in autumn, or suck its sap	[11,26,27,29,36, 38,59,62,63,78]
Glyceria maxima (Hartm.) Holm. & *Glyceria fluitans* (L.) R. Br.	harmatkása	FRU	flour substitute in famine	[16,20,28,60,62]
Glycyrrhiza echinata L. & Glycyrrhiza glabra L. & Glycyrrhiza sp.	édesgyökér, idesgyökér	SUB	sweetener; children's snack; pressed juice drunk	*G. echinata*: [11, 22,28,59,62,78]; *G. glabra*: [14, 16,28,57,59,78]; *G.* sp.: [5,60,62]
Helianthus tuberosus L.	csicsóka, tótrépa, taknyos pityóka, picsóka, cicoski, mikóka, árvapityóka, árvapijó, árpapityóka, csókapityóka, csókapicsóka, disznópityóka, édespityóka, fingópityóka, fingóspityóka, picsócsa, pityójka	SUB, FLO	stands escaped from cultivation were gathered; SUB: pickled for winter; children and adult eat it raw, roasted or cooked, FLO: nectar was sucked out of flowers	[9,43,46,50,52, 57,58,62,63,71, 74,77,78]; FLO: [52]
Heracleum sphondylium L.	bojtorján	VEG	sour soup and refreshing drink was made from the leaves	[16]
Hippophaë rhamnoides L. subsp. *carpatica* Rousi	homoktövis	FRU	whole fruit was conserved in honey in Transylvania; syrup, jam	[74]
Hordeum murinum L.	vadárpa, fű, ragcsos fű, kalász	VEG	stem, spikes were children's snack	[78]
Humulus lupulus L.	komló, vadkomló	VEG, FLO	FLO: put into bread and beer sourdough (widespread); VEG: shoots fried (mainly in Transylvania); soup and vegetable like French beans	[7,9,19,27,30,36, 38,57,59,67,71, 75,77,78,86]
Juglans regia L.	dió, vad dió, dijófa	FRU, SAP	FRU: into sweets, confectionery; green husks cooked with sugar to make syrup or tea; from unripe, soft fruits pickles, jam, sweets and brandy (palinka) was made. SAP: children tapped; fresh drink	FRU: seeds in many sources; soft fruit: [68]; green husk: [19]; SAP: [9]
Juniperus communis L.	borsika, borsukafenyő, borókafenyő, bucsfenyő, sillő, süllő, borosán, borosánfenyő	FRU	spice for brandy (palinka), sour cabbage, ham marinade and pepper substitute for meat dishes; used for meat smoking: it gives a pleasant flavour to meat	[19,22,27,36–38, 50,52,68,69, 74,75]; meat smoking: [27]
Koelrauteria paniculata Laxm.	n.d.	FRU	children's snack	[78]
Lamium album L. & *L. maculatum* (L.) L. & *L. purpureum* L.	árvacsalán, árvacsalyán, árvacsanál, árvalánycsanál, árvacsihán, szelidcsanál, szopóka	FLO	children's snack	[19,70,78]
Larix decidua Mill.	fenyő	SAPs	gum was chewed for cleaning teeth	[72,78]
Lathyrus aphaca L.†	csiriborsó, csicsiriborsó, feketeborsó, fényesborsó, finyesborsó, vadborsó	FRU	nice shiny seeds were used for decorating confectionery	[9]
Lathyrus tuberosus L.	borsó viloja, borsó viola, vadborsó, csunya, csuma, csunyavirág, julisztavirág, jurisztavirág, zsírgaz, földimogyoró, fődimagyaró, földimagyaru, földi zsír, kutyulló fije, borsój, borsó, borsóvirág, dobra, csicsiriborsó, csicseriborsó, barabój, jenyestye, unalomvirág, vadborsóvirág	SUB, FRU	SUB: children and adults ate it almost everywhere; at ploughing it was ploughed out or was dug out by pigs; roasted at open fire (delicious); it has disappeared when deep ploughing came into practice and because of herbicides; FRU: seeds were eaten less often	[9,11,14,22,26, 27,35,49,52,59, 60,62,65,67,74, 75,77,78]
Lemna sp.*	fulencse	VEG	eaten by poor people	[33]
Lepidium perfoliatum L. & *L. ruderale* L.	borsika, cigánypaprika	VEG	eaten by Gypsies instead of horseradish and hot peppers	[11]
Lilium martagon L.	n.d.	SUB	bulbs were put into wine to make vinegar; herdsmen›s children ate it dried or was ground into flour	[4,65]
Linaria vulgaris Mill.*	sarkantyúvirág	FLO	flowers were snack	[59]

Tab. 1 *(continued)*

Scientific name	Local names mentioned	Parts used	Mode of use	Reference No.
Lolium perenne L.	fű	VEG	stem was children's snack	[78]
Lotus corniculatus and/or *L. glaber*	mogyoró, földimogyoró	SUB	roots (nodules) were children's snack	[78]
Lycium barbarum L.†	licium, kutyafa	FRU, FLO	eaten by children, but in some places forbidden because it was known as poisonous; FLO: pistil from the flowers were children's snack	[19,62,78]
Malus sylvestris (L.) Mill.	vadalma, vadóma, vadóka, madárbogyó, SK: plánka	FRU	generally everywhere vinegar was made from it; it was post-ripened, rarely eaten raw; it was dried; compote, wine, brandy (palinka) and "cibere" soup was made of it; as a spice it was put into sour cabbage	[19,22,23,26,27, 29,36,38–40, 42, 43,47–53,57–59, 62,63,67–69, 72,74,76,78]
Malva neglecta Wallr. & *Malva sylvestris* L. & *Malva* sp.	kalácska virág, papsajt, papsajtmályva, papsajtja, taknyozófű, kerekmályva, papkalács, papkenyérke, vadmályva, papsajtlevél	FRU	immature fruit was and is eaten raw by children	[9,11,14,21,22, 30,42,50,51,59, 60,62,70,75, 77,78]
Matricaria recutita L. (*M. chamomilla* L.)	libavirág, szíkfűvirág, szíkfű, kamilla	FLO	refreshing tea and medicinal infusion; flowers were children's snacks	[29,43,57,78]
Medicago sativa L.	lucwrna, lucerna	VEG	soup was made from the young shoots	[77]
Melissa officinalis L.	citromfű, citromszagú méhfű	VEG	modes of use not documented; today used as a tea and a spice, the plant occurs spontaneously	[9]
Melittis melissophyllum L.*	mecsekháti tea, mecseki-téja,	VEG	"most popular herb tea"; gathered basketful for sale; it was made into candies	[27,29]
Mentha sp., *M. aquatica* L., *M. arvensis* L., *M. spicata* cv. *crispa*, *M. longifolia* (L.) Nath., *M. pulegium* L.	balzsamka, vad fodormenta, fodorminta, menta, vízimenta, szagos menta	VEG	spice for brandy (palinka); tea	[7,11,19,43,67, 70,74,78]
Morus sp., *M. alba* L. (& *M. nigra* L.? = *M. alba* f. *nigra*)	epörgyefa, epörgye, szederfa, faszeder, eperfa, fekete eper, fehér eper, eperfa, eper	FRU	eaten raw by travellers; brandy (palinka), wine, jam, syrup made of it, without sugar	[19,26,27,29,30, 63,78]
Muscari botryoides (L.) Mill.	Szent-györgy virág	VEG, FLO	whole plant was a children's snack	[78]
Onopordum acanthium L.	bogáncs	VEG	leaves were a children's snack	[78]
Origanum vulgare L.	ezerjófű, lebetka, lebetkevirág, szúrfű, szurokfű	VEG, FLO	tea; appetizer	[19,73,74]
Oxalis acetosella L.	medvesósdi, madársósdi, medvesóska, erdei sósdi, bikksóska, kereksósnya, nyúlsaláta, nyúlsóska, nyúlsósnya, nyúlsózsnya	VEG, FLO	pressed juice was used like vinegar; chewed; raw leaves were children's snack; milk rennet	[9,16,19,38,70, 74,75,78]
Oxalis corniculata L. (*O. europaea* Jord.)	galambsóska, sárga madársóska, kakukksóska, madársóska	VEG	raw snack	[19]
Padus avium Mill.	zelnica, szelence, vadszelence	FRU	eaten by children; put into brandy (palinka)	[22,67,74]
Papaver rhoeas L.	pipacs	FLO	petals were a children's snack	[78]
Parthenocissus tricuspidata (S. et Z.) Planch.*†	vadszőllő	VEG, FRU	fruits and thin shoots were put into pickled cucumbers (even though fruits are considered toxic)	[27]
Pastinaca sativa L.	peszternák, vad pasztinák	SUB	added to soups, children's snack	[74,78]
Phragmites australis (Cav.) Steud.	nád	SUB, VEG	SUB: cooked rhizomes are herdsmen's and famine food; VEG: salad made from fresh shoots, inner part of the shoots was spring-summer snack	[11,14,23,28,78]
Phytolacca americana L.†	alkörmös	FRU	jam; food colouring	[19]
Picea abies (L.) Karsten	lucsika, vörösfenyő, veresfenyő, szëmërke szëmërcefenyő, havasifenyő, csetenyefa, lukszfenyő, parasztfenyő	VEG, FLO, SAPs	VEG, FLO: jam, syrup and preserve made from buds and juvenile cones; SAPs: gums were teeth cleaner, chewing gum substitute	[19,67,70,74, 75,78]
Pimpinella anisum L.	ánizs	FRU	spice for brandy (palinka) and confectionery	[77]
Pinus cembra L.	cirbolya	VEG, FLO	use not documented; presumably like *P. sylvestris*. Seeds: children snack	[16,78]

Tab. 1 *(continued)*

Scientific name	Local names mentioned	Parts used	Mode of use	Reference No.
Pinus sylvestris L.	lucfenyő, lucsfenyő, csëmëtefa, csetnye, lúcfenyő, lukszfenyő, veresfenyő, vörösfenyő, répafenyő	VEG, FLO	syrup was made from young buds and cones	[9,19,50,67, 69,78]
Plantago lanceolata L.	úti lapi, keskenylevelű útilapi	VEG	preservative was cooked from it; snack	[74,78]
Plantago major L. & *Plantago media* L.	úrfilapi, útilapi, útifű	VEG	raw plant put into butter against anaemia	[67]
Poa angustifolia L. & *Poa pratensis* L. & *Poa* spp.	fű	VEG	stems were used as a children's snack (chew for the sweet sap)	[78]
Polygonum lapathifolium L. & *P. aviculare* L.	savanyú keserűfű, lapulevelű keserűfű	VEG	slightly sour leaves were used as snacks	*P. lapathifolium*: [9,22,57,59]; *P. aviculare*: [78]
Polypodium vulgare L.	kőméz, édesgyükér	SUB	sweetener fresh and dried; snack; lapped into a rag it was given to babies to chew at teething; "sweet water" was made by soaking ground roots in water	[38,42,49,50,52, 67,70,74,75,78]
Portulaca oleracea L.	porcsin	VEG, FRU	eaten; leaves were children's snack; seeds were famine food	[16,78]
Potentilla anserina L.	földi mogyoró, libapimpó	VEG	young leaves were eaten	[57,58,62]
Primula veris L.	kukukvirág	FLO	flowers were cooked into a sweet syrup	[75]
Primula vulgaris Huds.	zsibavirág	VEG	whole plant was consumed	[78]
Prunus sp. & *P. cerasifera* Ehrh. & *P. domestica* L. subsp. *insititia*	fosóka szilva, fosóka, kökényszilva, korkodus, márabora, ringló, vadszilva, macskaszemű szilva	FRU SAPs	brandy (palinka), preserves, syrup, jam was made from the fruit; also dried; SAPs: gum chewing	[50,68,77,78]
Prunus spinosa L. & *P. spinosa* L. subsp. *fruticans* (Weihe) R. et Cam.	kökin, kökényszilva, kükény, kükényszilva, kökörcsönszilva, kükürcsönszilva, kökén, kükén. kükénfa, kökönye, porumbar	FRU	eaten mainly raw "after frost-bitten"; wine, soaked "kökényvíz" (blackthorn water); brandy (palinka) was made of it; also dried	[5,9,11,19,22,23, 25,29,30,36–40, 46–48,50–53,57, 59,60,62,63,65, 70,72,74,76–78]
Pulmonaria mollis Wulf & *Pulmonaria officinalis* L.	dungóvirág, dungófű, tüdőfű	FLO	children suck the nectar out of the flowers	[67,70]
Pyrus pyraster Burgsd. (*Pyrus achras* Gaertn.)	vadkörte, vackor, erdei vackor, vadvackor, malina, SK: cernice, dicka	FRU	harvested raw, ripened in the attic; stewed fruit, wine ("csügör"), vinegar, brandy (palinka) made of it; dried; soup was made from the dried fruit ("cibereleves")	[11,19,22,23, 25–27,29,36, 38–40,42,43, 46–53,57–59, 62,63,65,68,69, 72,74,76–78]
Quercus cerris L.	cserelfa, cserfa, cser	VEG, SAP, FRU	VEG: leaves were put into barrelled cucumber as a spice; SAP: herdsmen tapped it from spring to late autumn, "brown beer" for them; FRU: coffee substitute after leaching and roasting, famine food	SAP: [24,27,28, 38,39,44]; VEG: [19,77]; FRU: [16]
Quercus pubescens Willd.	magyal	FRU, VEG	FRU: herdsmen roasted the acorns on ember; VEG: leaves were put into barrelled cucumber as a spice	[14,16,77]
Quercus robur L. & *Q. rubra* L. & *Q. petraea* (Matt.) Liebl. & *Quercus* sp.	cserefa, tölgy, tölgyfa, töfa, tőfa, töljfa csepefa	VEG, FRU	VEG: leaves were put into barrelled cucumber as a spice; bark: famine flour substitute FRU: coffee substitute, children's snack and famine flour substitute: boiled acorns lost their bitter taste, after boiling it was dried, ground and mixed into flour	VEG: [77]; FRU: [19,23,27,33,35, 37,48,77,78]; Bark: [14]
Ranunculus ficaria L.	györgysaláta, papsaláta, szentgyörgybúza, madársaláta, galambsaláta, vadsaláta, búzasaláta, bükki saláta, erdejisaláta, harangversengő, kereksajáta, kakuksaláta, kukuksaláta, kukuksajáta, mezejisaláta, nyúlsaláta, nyúlsajáta, salátavirág, szaronkőtt saláta, vadsajáta, pipirisaláta	VEG	it was consumed mainly raw, with a sauce as a spring salad; roasted in speck lard with garlic; cooked for soup and vegetable (tradition survived in Transylvania); in Hungary it re-appears in markets, gathered by Gypsies	[9,27,31,35,58, 62,65,70,71,74, 77,78]
Ribes alpinum L.	leánykafüge, vad ribizli	FRU	eaten raw, wine was made from it	[70,75]

Tab. 1 *(continued)*

Scientific name	Local names mentioned	Parts used	Mode of use	Reference No.
Ribes aureum Pursch	aranyribizli	FRU	snack	[78]
Ribes nigrum L.	fekete ribizli, fekete ribizli, fekete szöllő, fekete vërëszőlő	FRU	eaten raw (also in gardens)	[9,50,74]
Ribes petraeum Wulf.	borfüge	FRU	eaten raw	[75]
Ribes rubrum L.	piros ribizli, vad ribizli	FRU	eaten raw (also in gardens)	[38,74]
Ribes uva-crispa L.	egres, egris, füge, szőrős füge, vad egres, agris, piszke, büszke	FRU	eaten raw; gathered for preserves and soup	[9,38,70,74, 75,78]
Robinia pseudacacia L.	akác, fehér akác, agacsi, ágác, mézvirág, kukucka, agáca	FLO, VEG	FLO: whole flower or just the nectar was children's snack; in many places it was fried in pancake dough; tea; less often wine was made of it; sometimes added to bread sourdough. VEG: young leaves were eaten by children	FLO: [19,23,27, 29,31,36,38,50, 59,60,70,74,77, 78]; to bread: [17]; VEG: [59]
Rosa canina L. agg. & *Rosa corymbifera* Borkh. (*Rosa dumetorum* Thuill.) & *Rosa* sp.	csipkerózsa, hecseli, hecsedli, hecserli, rózsabogyó, pecs, bucske, bücske, bütyke, seggvakaró, seggvakarcs, istengyümőcs, vadrózsa, csipkefa, szaragógya, szagrógya, bicskerózsa, csitkenye, csitke, csipka, hecse, hecse-pecse, hecsebokor, tüvisfa hecsempecs, csicskenye, csipkebokor	FRU, FLO	FRU: syrup, jam, preserves, stewed fruit, soaked drink; with yeast it was made into wine; "cibere" soup, enriched with bread; dried: tea; ground: flour substitute in famine; FLO: refreshing drink, vinegar and preserves were made from petals	*R. canina*: [9,11, 19,22,25,26,29, 30,36–40,42,43, 45–50,52,53,57, 60,65,68,71, 74–78]; *R. corymbifera*: [19, 22]; *Rosa* sp.: [22,59,62,74]
Rosa gallica L.	selyemrózsa, fátyolrózsa, rózsa, csicskenye nagylevelű csipkerózsa	FRU, FLO, VEG	FLO: syrup and jam were made from the petals with sugar and citric acid. VEG: tea from leaves. FRU: tea, jam, syrup.	[19,22,23,74,76]
Rubus caesius L. & *Rubus* sp. (also as *Rubus tomentosus* Borkh)	szeder, seder, fődi szeder, erdei szeder, fődi szödörnye, szödör, csuszkor, promber, futó szëdër, szëdër, földi szeder, vad szeder, fekete szeder, szederincs, szederéncs, szedernye, szeder, vadszeder, tüskeszeder szödörnye, kódis szeder, víziszeder, SK: carnica	FRU, VEG	FRU: eaten raw in the past and also today; jam, preserves, wine, brandy (palinka), syrup, thick jam ("dulcsesz") was made of it. VEG: tea from leaves	*R. caesius*: [9,11, 19,22,26,27,30, 35,36,45,47,49, 52,72,74,76–78]; *Rubus* sp.: [22,25,29,30,36, 38,42,43,48,52, 57–60,62,68]
Rubus fruticosus agg.	szeder, fekete szeder, fás szödörnye, tüskeszeder, lószamóca	FRU	FRU: eaten raw in the past and also today; wine, brandy (palinka) was made of it; sold in markets	[19,22,27,38,42, 65,75,77,78]
Rubus idaeus L.	málna, mána, malina, mánafa, málnafa	FRU, VEG	FRU: eaten raw; jam, syrup, wine, brandy (palinka) was made of it; also put into brandy (palinka); fruits were conserved in syrup. VEG: tea was made from leaves.	[19,23,38,40,42, 43,45,47–52,65, 67,70,72, 74–76,78]
Rumex acetosa L. & *Rumex* sp.	sóska, réti sóska, vadsóska, sóslorjum, sóslórum, vadsóska, papsaláta, sósdi, tavaszi sóska, sóski, sósnya, vadsósnya, lósóska	VEG	mentioned by almost all sources. It was an important spring vegetable everywhere; field snack, eaten raw mainly by children; cooked for soup and sauce; also used for inoculation of milk	*R. acetosa*: [9,19, 22,23,27,35,36, 38,39,42,43,46, 49–53,57–59,62, 65–67,70,77,78]; *Rumex* sp.: [33, 47,60,71,78]
Rumex acetosella L.	madársóska	VEG	mainly snack; sometimes eaten after being boiled in salty water; also used for inoculation of milk	[43,49,50,52,65, 66,78]
Rumex patientia L.	lósóska, lósósdi	VEG	cooked for sauce and soup	[5,31,43,76,78]
Rumex pseudonatronatus Borb.*	lósóska	VEG	stuffed with meat and rice like cabbage	[59]
Sagittaria sagittifolia L.	alacs, elecs, elecske	SUB	famine food	[14,16]
Salvia pratensis L. & *S. nemorosa* L.	bárányláb & vadorgona	FLO	flowers and nectar were snacks	[75,78]

Tab. 1 *(continued)*

Scientific name	Local names mentioned	Parts used	Mode of use	Reference No.
Sambucus ebulus L.†	födi bodza, földi bodza, gyalogbodza, gyalog bédza, födi-boza, borzang, fekete borzag, csete	FRU FLO	FRU: jam and syrup was cooked, brandy (palinka) was distilled from it; jam was made mixed with pumpkins. It was not eaten raw, and was used less often than *S. nigra*. FLO: tea.	FRU: [19,26,27, 30,37–39,45,69, 77]; FLO: [77] CZB
Sambucus nigra L. & *Sambucus* sp.	fabodza, borza, bodzavirág, gyalogbodza, bodza, fehér bozza, bozda, bozzafa, bojzafa, fekete bojza, bodzafa, bozdafa, borzag, borza, borzafa	FLO, FRU	FRU: jam was cooked; brandy (palinka) was distilled from it; used for colouring wine. FLO: tea, refreshing drink, syrup, "elder champagne"; fried in pancake dough: "elder doughnut"	[5,9,19,27,30,37, 42,43,49,50,52, 57,59,60,62,67, 69,74,75,78]
Sambucus racemosa L.*	n.d.	FRU	red fruits were eaten	[37,69]
Satureja alpina (L.) Scheele (*Thymus alpinus* L.)	n.d.	VEG	mountain herdsmen used it as a spice	[4]
Scorzonera hispanica L.	fekete gyökér	SUB	eaten	[36,37]
Scorzonera purpurea L. subsp. *rosea* (*Scorzonera rosea* W. et K.)	bakceka	FLO	children's snack	[74]
Setaria spp.	muhar	VEG	stem was used as a children's snack (chewed for the sweet sap)	[78]
Sinapis arvensis L.	repce, rabcsont, rebcsont	VEG, FRU	FRU: oil pressed; VEG: soup was made from young spring shoots	[4,74 76,77]
Sisymbrium altissimum L. (as *Sisymbrium pannonicum* Jacq.)	magas zsombor	FRU	oil pressed	[4]
Smyrnium perfoliatum L.	őzsaláta	VEG	salad was made from raw leaves	[19]
Solanum nigrum L.†	fekete szöllő, fekete vad szöllő, káposztaszöllő	FRU	sweet fruits were eaten by children (it is considered poisonous, but the source notes: "1–2 pieces do not make any harm")	[77]
Solidago gigantea Ait.	vadkender	VEG	children's snack	[78]
Sonchus arvensis L.	n.d.	VEG	n.d.	[65]
Sorbus aucuparia L.	belekenyér, istenkenyere	FRU	fruits eaten	[19,69]
Sorbus domestica L. & *Sorbus* sp.	berkenye, berkenyi	FRU	dried	[22,28,36,37]
Sorbus torminalis (L.) Cr.	barkóca, vadbarkóca	FRU	sweet, pulpy fruits were eaten by children, herdsmen	[37–40]
Staphylea pinnata L.*	klokocs,	FRU	eaten by children	[38]
Stellaria media (L.) Vill.	galambbegy, tyúkhúr, korpafű	VEG	eaten as salad and vegetable	[11,78]
Streptopus amplexifolius (L.) DC	nyúleper	FRU	fruits ripen in hay by winter, eaten raw	[75]
Symphytum officinale L.†	feketenadály, fekete nadálytő, dongóvirág	VEG, FLO	VEG: young leaves were eaten fried in harsh times; FLO: children's snack	FLO: [9]; VEG: [14], SZGY
Taraxacum officinale Weber & *T. laevigatum* (Willd.) DC.	öregapám pogácsája, láncvirág, lánclapi, cikória, tyúkvirág, pitypang, pipevirág, marcivirág, láncfű, kákics, kutyavirág, pimpó, békavirág, bíkavirág, cikornya, csikára, hóttok virága, kotlóvirág, láncoslapu, nyúlsaláta, pipefű, pipevirág, tejesbúrjány, tejesbúrján, tejesfű, tejefű, fűgörhe, tejesgaz, tejes vadsaláta, tyúksegge, csorbóka, libuskavirág	VEG, FLO	VEG: young leaves were eaten as salad in spring; FLO: syrup was cooked from soaked flowers; or "cikoria honey" was made from flowers with thick sugar syrup; in Gömör "pimpó wine" was fermented from the flowers; in some places it was regarded as poisonous	[9,19,22,28,50, 59,63,65,70,74, 75,78]; *T. laevigatum*: [59,62]
Taxus baccata L.†	tiszafa	FRU	arils were eaten as children's snack	[78]
Thymus serpyllum L. & *Thymus* sp.	csombor, kakukkbora, kakukkfüj, vadborsfüj, vadcsombor	VEG	spice	[19,30,60,62,78]
Tilia platyphyllos Scop. & *Tilia cordata* Mill. & *Tilia* sp.	hársfa	FLO	tea; condiment for brandy (palinka) and wine	[19,27,29,38,40, 43,61,78]

Tab. 1 *(continued)*

Scientific name	Local names mentioned	Parts used	Mode of use	Reference No.
Tragopogon orientalis L. (as *Tragopogon pratensis* L.)	bakceka, bakszaka, baszkata, csuka, édesfű, idesfű, tefesfű, kukukté, szasza, szekeboka, tejesbúrján, tejesbúrjány	VEG	in the past young sweet stems were eaten peeled; in autumn curly leaves were chewed; in some places it was cooked in whey	[9,50,65,67,75]
Trapa natans L.	sulyom, suly, sójom	FRU	cooked and roasted; flour substitute in famine; till the 1930s it was sold in large quantities	[5,11,14,16,30, 33–35,58–60,62]
Trifolium pannonicum JACQ	nagy fehér vad here	FLO	syrup was cooked from the flowers; children's snack	[74]
Trifolium pratense L.	vörös lóhere, lucerna, istenke cipókája	FLO	children's snack	[16,35,78]
Trifolium repens L.	lóhere	VEG	leaves and stem were used as a children's snack	[78]
Tripleurospermum perforatum (Mérat) M. Lainz	kamilla	FLO	flowers were children's snacks	[78]
Tussilago farfara L.†	fodbájlapi, podbánlapi, podbállapi, martilapi, martilapu, martivirág, partilapu, pipevirág, ciberelapu, fehérhátu lapu, tejfölös lapu, pitypang, gyermekláncfű	VEG, FLO	VEG: stuffed with meat or mush; soup, vegetable, salad, in spring salad soup with bones (first cooking water was poured off, because it was bitter); FLO: flowers cooked into sugar syrup	[9,19,65,67, 71,74]
Typha latifolia L. & *Typha angustifolia* L.	csella, elecske, bengyele, pintér gyékény, nádi botikó	SUB, VEG	SUB: rhizomes were eaten raw or cooked by herdsmen; famine food; VEG: salad from young leaves	[4,14,28,30,34, 59,61,62,78]
Ulmus glabra Huds. ? = ? *Ulmus minor* Mill. & *Ulmus* sp. = *U. laevis* L.*	szilfa	SAP	fresh drink	[27,33]
Urtica sp., *Urtica dioica* L. & *Urtica urens* L.	csijány, csián, csiján, csalán, csihán, csallán, csollán, csohán, csonár, csajánt, csojánt, csoján, csojány, csohány, csípős csajánt, csípős csojánt, csípős csojány, csípős csollán, széleslevelü csoján, csípős csohán	VEG	soup, vegetable and salad was made from fresh shoots; weak children were fed with nettle; eggs with nettle: eastern dish; tea	[9,19,23,28,33, 36,48,50,52,53, 63,65,71,74–78], NI; *U. urens*: [52,53,65,77]
Vaccinium gaultherioides Bigelow	takonkokojza	FRU	eaten raw	[75]
Vaccinium myrtillus L.	feketekukujza, feketekokojza, kakóca, kakojza, fekete áfonya, fekete kukojsza, áfinya, áfinyála, háfonya, háfinya, feketemeggy, boronyica, brusnyica	FRU, VEG	FRU: raw; as jam, liqueur, syrup, preserves; preserved in rum; put into brandy (palinka); VEG: tea from leaves	[9,16,19,30, 48–52,70,72, 74–76,78]
Vaccinium vitis-idaea L.	piroskokojza, piroskukujza, fojminc, piros kukojsza, piros kakojza, havasi meggy, vörös áfonya, piros áfonya, ménisora, fásmeggy, botonyica, brusnyica	FRU	eaten raw, fresh and as pickles; preservation: pickled; sweet preserves; put into brandy (palinka) and wine; cooked into wine: glee; preserved in alcohol; dried; harvested semi-ripe and ripened in the sun	[19,48–52,70,74, 75,78]
Valerianella locusta (L.) Latterade	vadsaláta, nyúlsaláta, galambbegy saláta, madárka saláta	VEG	eaten in spring as salad, poured with sauce	[19,27,38,53,78]
Valerianella olitoria (L) Poll. or *V. dentata* (L.) Poll.	madársaláta, papsaláta, vadsaláta	VEG	eaten as salad with oil and vinegar	[22]
Verbena officinalis L.	vasfű, vasfűj, vasfi, szaporagaz	VEG	put into pickled cucumbers; spice and preservative	[9,38,67]
Viburnum lantana L.† & *Viburnum* sp.	nyomittó, nyomtató, ostorménfa, barátsza, barátszar, farkascseresnye, gusfa, bangita, korbácsnyélfa, ostórminya, ostornyélfa, szentfa, Szent-Ilona szőlő, szereputyka	FRU	fruits and pressed juice; snack for children	[9,19,26,67,74]
Viburnum opulus L.†	kányafa, kánya, veres kánya, gána, kálenka, kalina, kalinafa, kalinka	FRU	raw when frost-bitten but bitter: jam and syrup was made of it	[19,74]
Vicia spp.	csicseriborsó, vadborsó	FRU	cakes were decorated with its shiny seeds	[9]
Vitis sylvestris C. C. Gmel. (*V. vinifera* L. subsp. *sylvestris*)	vadszőlő	FRU	children's snack; vinegar and brandy (palinka) was fermented from it	[22,27,68,78]

Tab. 1 *(continued)*

Further poisonous species, tasted and snacked by some Hungarian botanists in their childhood include *Chelidonium majus* L, VEG *Conium maculatum* L. (VEG: piece of internode), *Hedera helix* L. (FRU), *Ligustrum vulgare* L. (FRU), *Parthenocissus quinquefolia* (L.) Planch (FRU), *Salix alba* L. (VEG: leaves), *Syringa vulgaris* L. (VEG: branch).

FLO – flowers, inflorescences, sometimes only petals or nectar; FRU – fruits or seeds; n.d. – no data about local names in the sources; SAP – liquid sap of trees; SAPs – dried forms of saps (resin or gums); SUB – subterranean parts (rhizomes, roots, bulbs, tubers); VEG – leaves, shoots, buds, sometimes the whole plant. * Uncertain identification (species inclusion in the list is based only on ethnographic sources). † Plant (the consumed part) is mentioned to be poisonous by some sources.

maritimus, *Butomus umbellatus*, *Crambe tataria*, *Filipendula vulgaris*, *Phragmites australis*, *Sagittaria sagittifolia* and *Typha latifolia* were known as important famine foods. *Crambe tataria* and *Typha latifolia* were reported to be preferred to bread as a staple food by some herdsmen even in normal times [60]. Collecting and eating *Lathyrus tuberosus* tubers used to be a widespread practice after ploughing. *Polypodium vulgare* and *Glycyrrhiza* rhizomes were generally consumed as kids' snacks and used as a sweetener. Tubers of *Chaerophyllum bulbosum* and *Helianthus tuberosus* were important wild vegetables eaten raw and cooked. *Acorus calamus* and *Gentiana roots* were used as pálinka spices; whereas *Cichorium intybus* roots can serve as a coffee substitute, still in use Transylvania [74].

Tree saps

Tapping trees for sap used to be a common practice in the forested regions of Eurasia. Saps from *Betula pendula*, *Quercus cerris*, *Carpinus betulus*, *Ulmus* spp. and *Acer pseudoplatanus* trees were generally drunk raw. *Carpinus betulus*, *Fagus sylvatica* and *Juglans regia* trees were also tapped in Transylvania. *Betula pendula* sap used to be an important commercial item sold in larger quantities at markets as a refreshing beverage, a medicine or a curdling agent. *Quercus cerris* sap was an important water source for herdsmen where spring water was scarce. Oaks giving the best sap were tapped permanently with built-in elder tubes; some trees were visited for drinking for 20 years. The dried resin of *Picea abies*, *Larix decidua*, *Prunus cerasifera* and *Cerasus avium* was used for chewing. This was not only useful for cleaning teeth, but also for stimulating the production of saliva, which was needed for spinning.

Social aspects of the gathering activities

Wild food plants, especially fruits, were collected both for own use or for sale. Unwritten laws regulated gathering. Signing an area rich in blueberries or strawberries, or a wild fruit tree, or arriving first in the gathering day, anyone could reserve the fruits for himself [16]. According to a documented tradition [48], families without horses were allowed to do gathering in closer to the village than families possessing horses. Horses knew their job, they followed their owners with baskets on their backs. Gathering traditions went from generation to generation in communities, sometimes in families. Jam making from *Sambucus ebulus* was a community activity among German-speaking people till the 1930s, like jam-making from *Rosa canina* in some villages; this latter tradition exist even today (e.g. in the village Szarvaskő), but more as a tourist attraction.

It was also noted that some people were ashamed that they need to eat green leaves, and were unwilling to speak about it, since gathering ("nettle-eating") was often regarded as a sign of poverty in some communities [9]. Teachers coming from an urban environment also influenced children to give up snacking on wild plants: in a documented case children have to write down 500 times "grass is eaten only by ruminant beasts" as a punishment [50].

Discussion

The diverse natural vegetation of the Carpathian Basin was a rich source of wild food plants. The consumption of wild plants was of different magnitude and economic significance in different periods and different regions, depending both on the natural characteristics of the landscape and the socio-economic background and tradition-preserving ability of the families or communities. The importance of gathering activities changed in parallel with the areal loss of natural vegetation and with socio-economic changes. The greatest changes occurred in the lowland floodplains, where traditional gathering, fishing and hunting activities provided livelihood for many people. After the extensive drainage of the floodplains in the late 19th and early 20th centuries, the utilization of wild food plants dropped dramatically. The two main reasons behind this transition were the reduced availability of the most important wetland plants and the new economic opportunities in the transformed landscape dominated by arable fields, which rendered gathering unnecessary, and left no time for such activities [16,32,35]. The tradition of consuming wild food plants could survive for a longer time in forested and mountain regions unsuitable for agricultural production, where the proportion of natural vegetation was larger. In such regions there were several documented cases of people actively consuming 20–30 species even in the middle of the 20th century (e.g. [27,36,50,74,75]). Snacking of wild fruits, flowers, and raw wild vegetables survived longest among herdsmen and children.

Today, the gathering and consumption of wild plants is increasingly becoming popular and fashionable activity again. Factors behind this process include health-conscious nutrition as well as the worsening economic situation experienced by many. Some species e.g. *Allium ursinum*, *A. scorodoprasum*, *Sambucus nigra*, *Ranunculus ficaria*, *Rosa canina*, *Prunus spinosa*, *Rubus*, *Crataegus*, and *Urtica* spp., are appearing in markets as sources for fashionable "nature products". Gathering wild plants for sale is generally a seasonal subsistence activity of the poorest people – e.g. gypsies or elderly people. Under harsh economic conditions the consumption of wild goods becomes a matter of survival. There always have been (and there are still) places, where indigent families made use of everything "presented by the Creator in his endless good will since the beginning of times" [63].

More traditional forms of gathering activities can also be a living tradition today. Among Hungarians living in Transylvania the traditional use of wild plants have continued till today in many places. There are settlements, where more than 30–40 wild species are used in everyday life [74,75], and wild fruits (e.g. *Fragaria*, *Vaccinium* spp.) are commonly sold in markets.

Comparing Hungary to Mediterranean (e.g. Spain and Italy [1,2]) and to the countries north of Hungary (Poland [3,80,81], Slovakia [82], Estonia [83]) there are some striking similarities and differences. Use of most wild fruits and seeds, as well as the little importance of wild greens is similar to that of Poland, Slovakia and Estonia. Similar to several Mediterranean countries, the consumption of the members of Liliaceae is high in Hungary.

A specific feature of the traditional plant use of the Hungarians is the mass consumption of the underground parts of some wetland species, particularly *Typha* spp. but also *Phragmites*, *Sagittaria*, *Alisma*, *Butomus*, and *Bolboschoenus*. Another Hungarian characteristic is the widespread consumption of some continental steppe species, reaching the Great Hungarian Plain from the east, most notably *Crambe tataria*, *Rumex pseudonatronatus* and the endemic *Armoracia macrocarpa*. The traditional knowledge of these plants might have arrived into the Carpathian Basin with the Hungarians coming from the Eurasian steppes in 896 AD. The Turkic origin of the common names of several species (e.g. "tátorján": *Crambe tatarica*, "bojtorján": *Arctium lappa*, "gyékény": *Typha latifolia*, "som": *Cornus mas*, "katáng": *Cichorium intybus*) suggests that these species might have been consumed before the Hungarians settled in the Carpathian basin. Interestingly, there are no records of Hungarians using some species (e.g. *Aegopodium podagraria*, *Alliaria petiolata*, *Sonchus oleraceus*, *Lactuca serriola*, *Stachys palustris*) common in the Carpathian Basin, which are important wild vegetables in other European countries, Poland, Germany, Spain or Italy [1–3,79–84].

Conclusions

We reviewed 71 papers and manuscripts summarizing information on the use of 236 species. Although we did our best to find all relevant papers, it is still necessary to search for further literature, and, particularly, to perform additional field data collection in order to record the traditions still surviving in some regions. One might ask: is it not too late? Does the knowledge on wild food plants and their traditional use still exist? As a few contemporary field studies testify, there is some hope left. There are places where this kind of traditional knowledge still exists, and even new species or new uses for old species can be documented. There are hints that this knowledge may exist also in other regions, and some communities consciously revitalize ancient traditions for economic or other reasons (e.g. the production of rosehip jam as a community activity in Szarvaskő village). But the erosion of traditional knowledge on wild food plants is very fast.

There are several regions where no research on this topic was ever pursued, (e.g. Hanság, Zselic, Mecsek, Balaton region); and the traditional wild plant use of non-Hungarian ethnic groups living in Hungary (e.g. Germans) would be also worth to explore. Exploring and documenting this form of traditional ecological knowledge is an important part of conserving cultural heritage. Lessons on sustainable interactions between nature and human communities can become an important source of information in an uncertain and energy scarce future [85]. In addition to serving as a basis for novel business opportunities, traditional forms of wild plant use can also improve the cohesion and resilience of local communities.

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