

# The wild food (plants and insects) in Western Friuli local knowledge (Friuli-Venezia Giulia, North Eastern Italy)

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## ABSTRACT

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Folk traditional diets in Western Friuli include wild plants and few invertebrates (i.e. insects) that are peculiar in the Southern Alps. 156 plants are listed here, ranging from 200 m to 2200 m a.s.l.. This selection is the result of the research of 64 informants who contributed with their personal experiences. Recovery of scattered knowledge is valuable for maintaining and sustaining its use and enhancing a wild biodiversity base for agroecology, conservation and ecotourism. *Pistiç*, *frita* and *lidùm* are some of the names used for about 50–60 herbs collected in field margins, hay meadows, woodlands and the wild, most commonly in spring. In order to be consumed, most herbs are boiled together and are later sautéed with butter or lard and garlic. The higher range pre-alpine Carnic slopes have supported seasonal sheep and cow grazing and summer pastoral communities have traditionally used plants as well for salads, soups and spices in addition to the boiled-sautéed dish. Furthermore, herbs have been used as medicinal elixirs and for milk processing. For instance, *Lycopodium annotinum* L. was employed to filter milk; *Asplenium ruta-muraria* L. was cooked with maize flour to prepare "fregole" a dish eaten with milk or coffee made from barley. Specifically, collections of these useful alpine plants include: *Chenopodium bonus-henricus* L., *Aruncus dioicus* (WALTER) FERNALD, *Cicerbita alpina* (L.) WALLR., *Rumex alpinus* L., *Carlina acaulis* L., *Myrrhis odorata* (L.) SCOP., *Ranunculus hybridus* BIRIA (dry leaves used as pepper), and raw bulbils of *Polygonum viviparum* L. Some parts or products of insects were also eaten in these summer meadow areas ("magredi") and hay meadows such as the ingluvies of adult Lepidoptera (Zygaenidae *Zygaena* spp. and Ctenuchidae *Syntomis* spp.). Bees such as *Bombus* sp. were exploited for honey content in their ingluvies and their nests were exploited for honey. The pollen and nectar deposits of *Osmia* sp. inside snail shells were eaten as a snack. Of the grasshopper *Decticus verrucivorus* (L.) at least the prominent femurs were eaten raw. These local traditional habits need further ethnobiological attention and nutritional study since the loss of practical experience in collecting these

**fragments of biodiversity make their memory prone to be lost. The highest number of plant species found in Friuli is associated to the highest amount of wild plants offered in this region by specialized restaurants (Osterie) in the Northern regions of Italy.**

## **Introduction**

Wild plants as edible and curative resources are present in many different cultures including in the Italian northern regions as the local literature suggests. For the moment it suffices to mention Tuscany (Corsi & Pagni 1979; Pieroni 1997), Abruzzo (Manzi 1987) and especially Liguria in which the *prebuggiun* (a collective name for a consistent number of wild plants collected especially in spring) has positive records (Bisio & Minuto 1997), Bergamo province (GBBLR, 1997) and Piemonte (Mattiolo & al. 2001; Gibelli 2004). Nonetheless, this biodiversity knowledge seems more detailed and rich in montane and perimontane areas of North Eastern Italy in Friuli-Venezia Giulia (Paoletti & al. 1995) and in the Alps, for instance in Austria (Vogl-Lukasser & Vogl 2004). Abroad, repertories of edible plants made for Scotland (Milliken & Bridgewater 2004), Switzerland (Stefanie Jacomet, personal communication), Turkey (Ertug 1997) and the Indian Himalaya (Samant & Dhar 1997) have some relations to our lists.

We intend to present herein the list of edible species of plants traditionally collected in the Southern slopes of Carnic Pre-Alps and associated hills and higher lowlands the "magredi" of Western Friuli-Venezia Giulia region, Pordenone province, North Eastern Italy.

We shall provide information on edible insects or their products as non-conventional food as this has been largely ignored by past and contemporary literature (Paoletti & Dreon 2005a).

## **Materials and Methods**

This paper is the result of a discontinuous investigation that lasted almost 20 years, during which numerous field trips and interviews have been carried out with 64 informants aged from 40 to 90 years. The informants cover a geographical area which spans from the Erto-Casso village, near Belluno, to Vito D'Asio, village bordering with Udine (Fig.1). All informants contributing to our herbalistic database are born and most are still living in the Carnic pre-Alps area. Previous researches have been herein updated from previous datasets (Paoletti & al. 1995; Dreon 2000; Paoletti & Dreon 2005b).



**Fig. 1.** Area where the data on wild plants and insects came from and the informants live.

The altitudinal range of these herbalist traditional collections spans from 200m to 2200m. From the steppe-like traditionally cultivated hay formation called "magredi" to the rich and humid meadows and secondary woodlands, coppiced woodlands and field margins and the higher pre-alpine Carnic slopes. The nomenclature adopted for plants is based on Pignatti (1982) and Poldini & al. (2001) and for insects on Bertaccini & Fiumi (1997, 1999) and on Bonelli (1993).

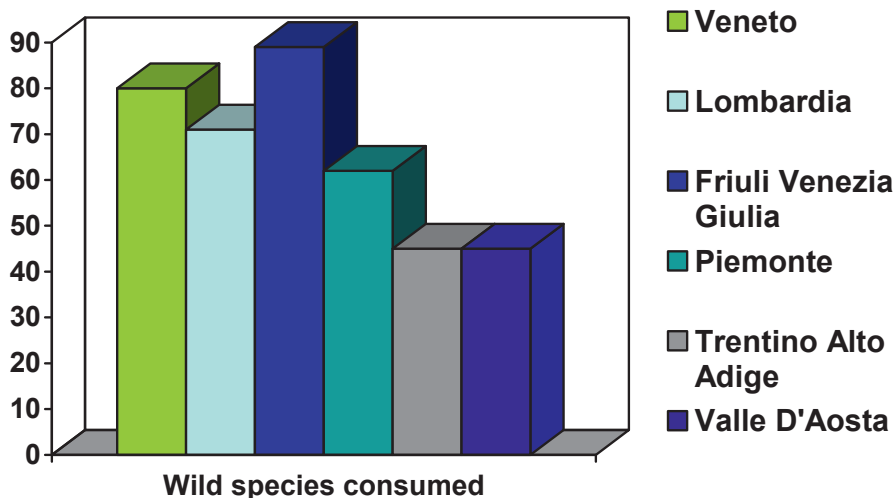


Fig. 2. Wild herbs species consumed in northern Italian regions following the "Osterie di slow food" (Anonymus 2005). Friuli-Venezia Giulia features the highest number of wild species offered in typical restaurants (Osterie).

## Results

### The biodiversity of wild plants (Figs. 3–11)

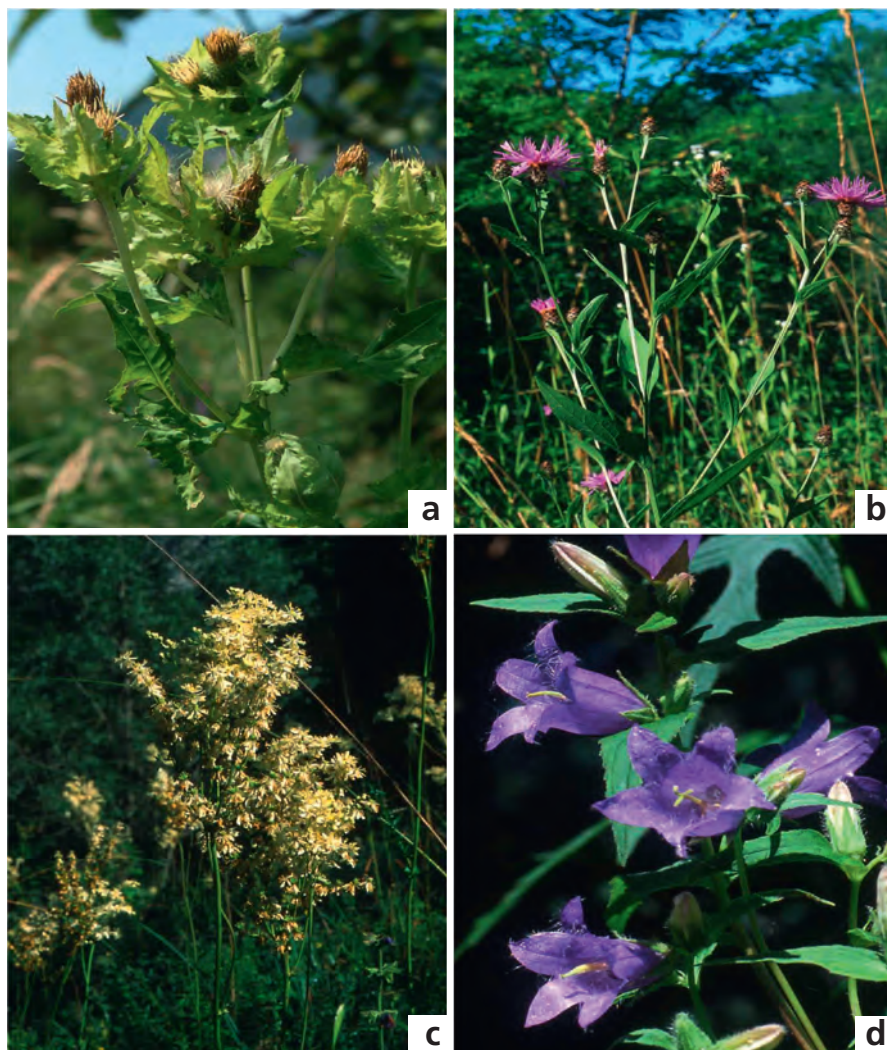
The Friuli-Venezia Giulia has a consistent biodiversity including 3675 plant species and subspecies (Poldini 2002) and it scores among all Italian regions in the first position before Piemonte (3510 species) and Tuscany (3435) with respect to floristic richness (Conti & al. 2005).

Interestingly, if we count the wild plants listed in the menu of typical Italian restaurants Friuli-Venezia Giulia figures at the top of the list with the highest number of wild herbs (Fig. 2). The traditional local knowledge listed herein is based on 155 species (Appendix I) and it seems to be associated to the high biodiversity used in the specialized restaurants. Accordingly, local tradition is expected to further germinate and produce new entries in specialized horticulture and a new agrotouristic, possibly more sustainable use of resources. Most of this traditional knowledge is in the memory of aging people. Needless to say, the risk of limited knowledge transfer to new generations becomes alarming. Most of the plants were collected largely in the geographical area of our interest, but some were reported only from few informants, demonstrating once again the uneven distribution of knowledge of biodiversity among villagers at different locations.



Fig. 3. – a, b: the studied area in which the wild plants are collected, in particular the *pistiç* in spring; – c, d: the 50–60 species forming the *pistiç* after collection before boiling; – e: mature fruits of this plant (*Lonicera caprifolium*) are eaten raw. – f: fruits of *Viburnum lantana* are matured in hay and then eaten raw; – g: sprouts of *Calystegia sepium* boiled and then sautéed in the *pistiç*; – h: sprouts and inflorescences of *Ornithogalum pyrenaicum* are boiled and then sautéed.

Most of these plants are normally collected in spring: Young leaves, sprouts but also flowers such as *Viola* sp. or *Primula* sp., are boiled as spinach (in Appendix I the ones indicated with \*) and later on sautéed with butter or/and lard and garlic. In the considered region the spring gathering is known as *pistiç* and in other areas of Friuli-Venezia Giulia as *frita* or *litùm*, and the local range of variability in species collection is consistent (Paoletti & al. 1995).



**Fig. 4.** Additional plants utilized for preparing the *pistiç*. Sprouts or young leaves are boiled and then sautéed. – a: *Cirsium oleraceum*; – b: *Centaurea nigrescens*; – c: *Filipendula vulgaris*, stems are also chewed; – d: *Campanula trachelium*.

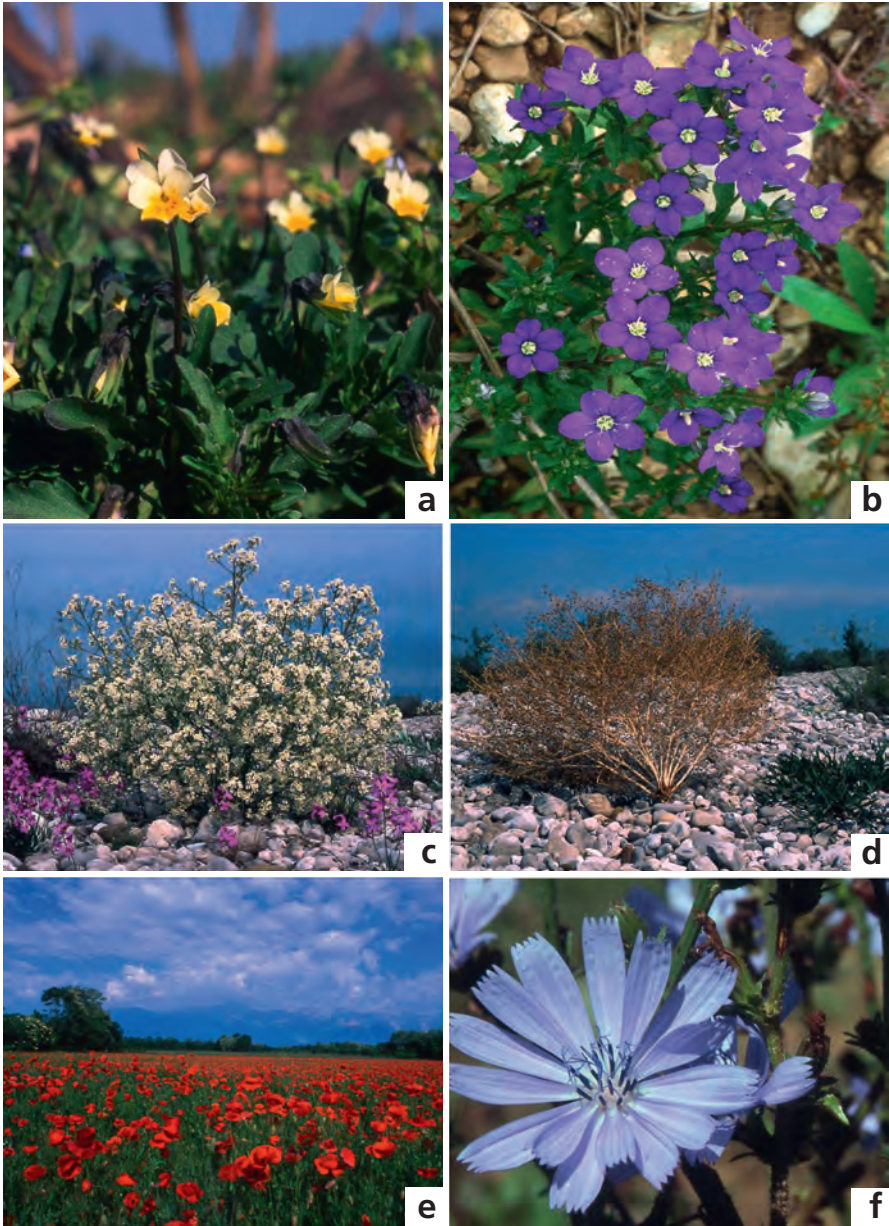
Some plants are also preserved as preparations (boiled and preserved in oil) for fall-and winter consumption, such as *Chenopodium bonus-henricus* L., *Aruncus dioicus* (WALTER) FERNALD, *Cicerbita alpina* (L.) WALLR., *Ruscus aculeatus* L. The last three species are improperly recorded as "wild asparagus".

Other wild plants, at least in the past but in some cases even now, were consumed in the summer season as well, i.e. *Polygonum persicaria* L., *Chenopodium album* L., *C. polyspermum* L. and *Carlina acaulis* L.



**Fig. 5. Additional plants utilized for preparing the *pistiç*. Sprouts or young leaves are boiled and then sautéed. – a: *Viola reichenbachiana*; – b: *Lamium orvala*, flowers are also sucked; – c: *Muscari botryoides*; – d: *Lamium purpureum*.**

Our list (Appendix I) cites three ferns. *Lycopodium annotinum* L. has been used on the prealpine Carnic slopes to filter milk, however, no data are available about its possible impact on milk quality, taste and composition. *Asplenium ruta-muraria* L., has been adopted as companion of the maize preparation "fregole" and was eaten with milk or together with barley-based coffee. Informants suggested that the preparation "fregole" was a food base for several days during hunting on the mountains and provided a sense of satiety



**Fig. 6.** The "magredi" are steppe-like lowland grassy formations. – a: *Viola arvensis*; – b: *Legousia speculum-veneris*; – c, d: *Crambe tataria*, this interesting plant offers raw leaves for salads; – e: *Papaver rhoeas*; – f: *Cichorium intybus*, sprouts are boiled and later sautéed



soon after its consumption. Of the third species *Polypodium vulgare* L., the raw rhizome is eaten as a snack.

The loss of knowledge on edible wild plants has recently caused some poisoning due to improper identifications. For instance, poisonous sprouts of *Aconitum napellus* L. were confused with the very different plant *Cicerbita alpina* (L.) WALLR. or with *Aruncus dioicus* (WALTER) FERNALD. Two people in Lombardy, Val Camonica, died recently, poisoned by having eaten *Aconitum napellus*. Although in the region considered here, fatalities have not been reported recently, hospitalizations were required in a few cases.

A few of these wild herbs have been introduced in the domestication process and *Aruncus dioicus* (WALTER) FERNALD and *Myrrhis odorata* (L.) SCOP. can be found in some backyard gardens in our region and in Austria (Vogl-Lukasser & Vogl 2005). In some gardens of the Val Colvera, *Carum carvi* L., *Fragaria vesca* L., *Silene vulgaris* (MOENCH) GARCKE, *Aruncus dioicus* (WALTER) FERNALD and *Chenopodium bonus-henricus* L. have been introduced. This is the first step for maybe more intensive domestication and a new economy resource based on local biodiversity.

### **Biogeographical and historical considerations**

Appendix II summarizes the situation of wild edible species from different regions. Most species listed in our work are considered edible in a number of countries especially in the East: Turkey, Iran (Shokri & Safaian 1992), Greece (Lambraki, 2001) and also the Appenine and prealpine environments in Italy (Picchi & Pieroni 2005). *Papaver rhoeas* L., *Cichorium intybus* L., *Stellaria media* (L.) VILL., *Plantago lanceolata* L., *Lactuca serriola* L., *Urtica dioica* L., *Chenopodium album* L., *Malva sylvestris* L. and *Centaurea cyanus* L. are in most cases linked to agriculture and nitrogen availability (Pignatti 1976; Poldini & al. 2001) and can be considered companions of agricultural development in the last 12000 years, having spread from the Fertile Crescent. An interesting edible plant, *Crambe tataria* СЕБЕОК, whose leaves are consumed raw at Arba and Vivaro, is rather localized in the steppe vegetation "magredi" and has its potential origin in Hungary. The presence in Friuli can be dated back to ancient Romans who were eating roots called *chara* ([www.henriettesherbal.com/eclectic/sturtevant/crambe.html](http://www.henriettesherbal.com/eclectic/sturtevant/crambe.html)) that can be attributed to this plant.

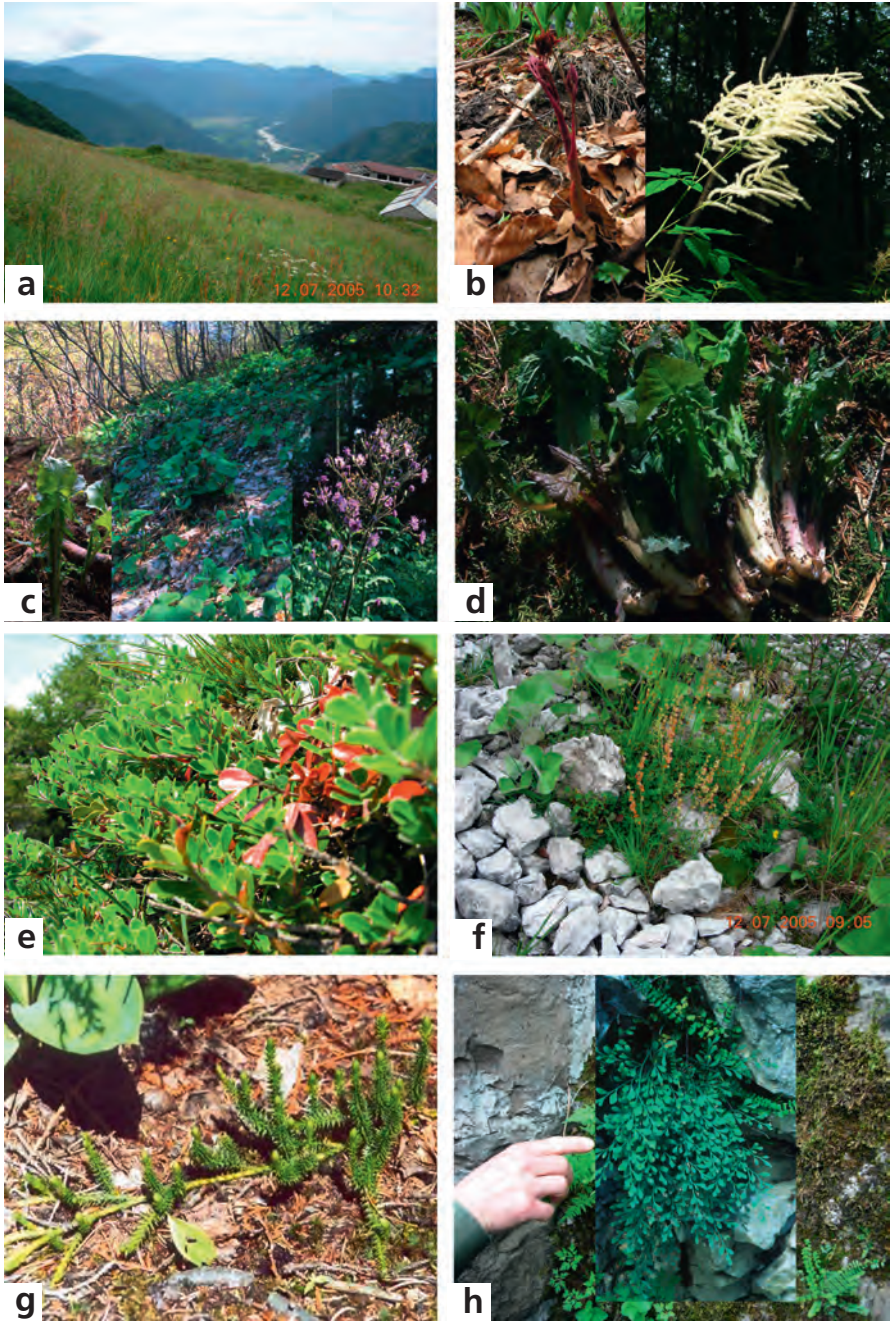


Fig. 7. – a: Carnic Pre-Alps grazed slopes 800–2200 m; – b: *Aruncus dioicus*; – c, d: *Cicerbita alpina*, young shoots are boiled and sautéed as asparagus and/or preserved in oil for later consumption; – e: *Arctostaphylos uva-ursi* mature fruits and flowers are eaten raw; – f: *Rumex scutatus*; – g: *Lycopodium annotinum*, used to filter milk; – h: *Asplenium ruta-muraria* to prepare "fregole" by cooking maize flour with these leaves.

## Insects as food resource for children

Plant collecting is traditionally mostly done by women, however, in Friuli the unusual collection of insects and their byproducts as raw snack food was normally carried out by boys and girls, 5–14 years old. In an area dominated by hay crops including the flower-rich meadows "magredi" of Vivaro, Cimolais and Arba and other hay meadows of Tramonti, Polcenigo and Erto e Casso. The youngest informant who could provide a direct personal experience of such consumption is now 40 years old.

*Zygaena transalpina* (ESPER, 1780), *Z. ephialtes* (LINNAEUS, 1758) and *Syntomis phegea* (LINNAEUS, 1758) are colorful summer moths that can be easily caught by hand on flowers, where they are collecting nectar. They do not escape (both *Zygaena* and the similarly colorful *Syntomis*) as most Lepidoptera do under predators' attack. *Zygaena* is poisonous by containing HCN in its body (Harborne 1988) and are mimicked by the aposematic *Syntomis*. The abdomen of these moths was removed and the protruding internal ingluvies was sucked out. The ingluvies content is based on "honey" liquid made of sugars such as fructose and glucose.

However, at least *Zygaena* species contain poisonous cyanogenic compounds (HCN) in their bodies and are currently a subject of study. We have conducted research to understand the level of possible risk associated to this entomophagous behaviour. In fact no risk was associated, since the ingluvies are atoxic even though the body contains cyanogenic compounds (Zagrobelyny & al. 2009)

In some villages, informants showed us how to collect *Bombus* spp. and their honey reservoirs. In early spring, *Bombus*-honey was collected from nests underground. The same informants reported that they obtained honey by dissection of hand-captured *Bombus*. In this case stinging is among the potential risks of such entomophagous behaviour.

An additional interesting use of an insect food reservoir was that of pollen, preserved in empty snail shells by *Osmia* sp. [possibly *Osmia bicolor* (SCHRANK, 1781)]. This reservoir was easily found by our informants (in the area of Erto and Casso) because of the very unusual transportation of coniferous needles (*Pinus nigra* ARNOLD or *P. sylvestris* L.) by *Osmia* to cover their reservoir in the empty shell. By "following the aerially transported needles", the informants were able to locate the shells and eat their rich pollen and nectar reservoirs that were accumulated to feed the offspring of *Osmia* (Bonelli 1993).

Near Vivaro village, the grasshopper *Decticus verrucivorus* (LINNAEUS, 1758) ("cavaletons") was collected in summer on the meadows ("magredi") for feeding turkeys held in backyard-gardens. However, children reported that, before

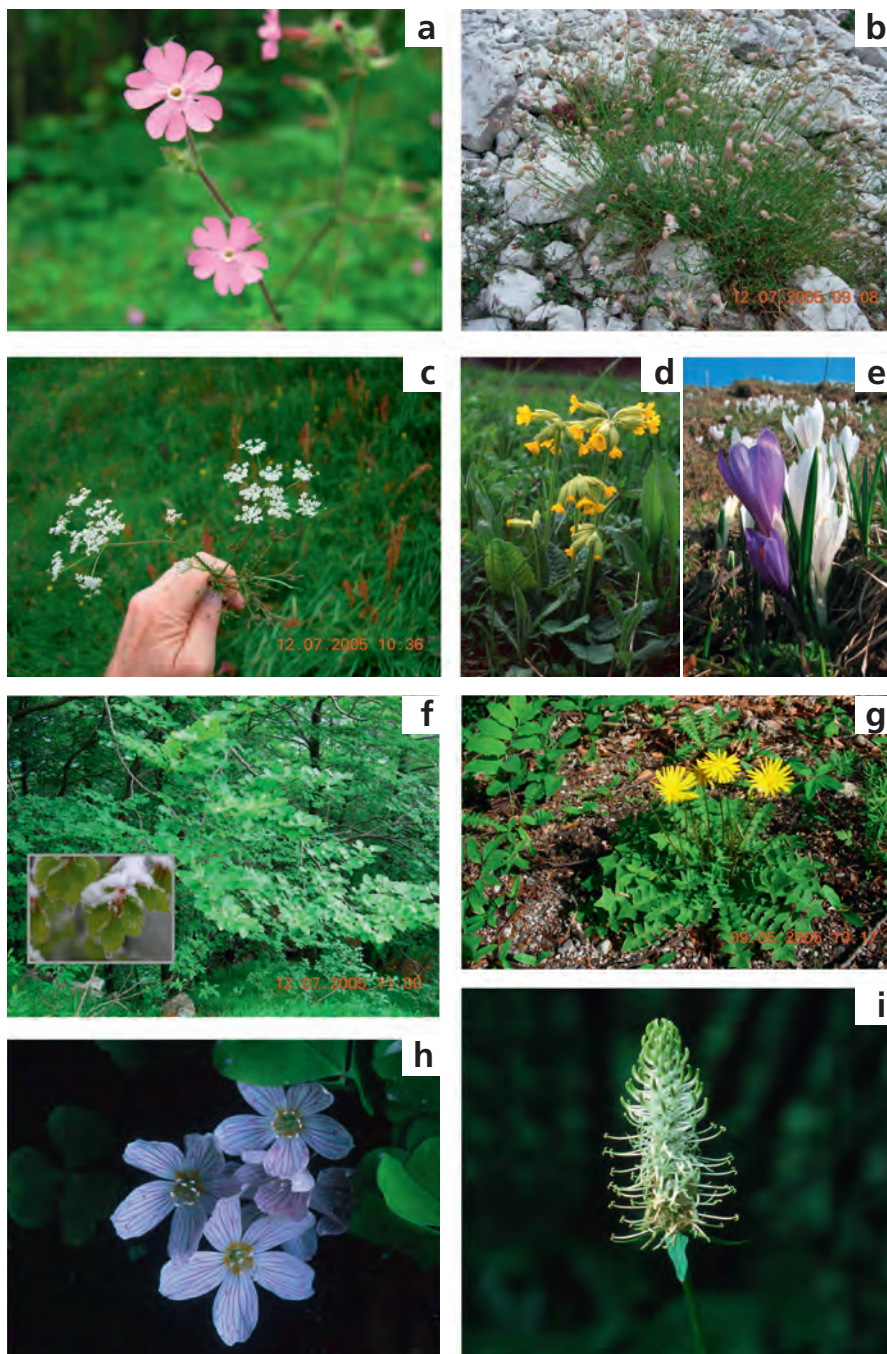
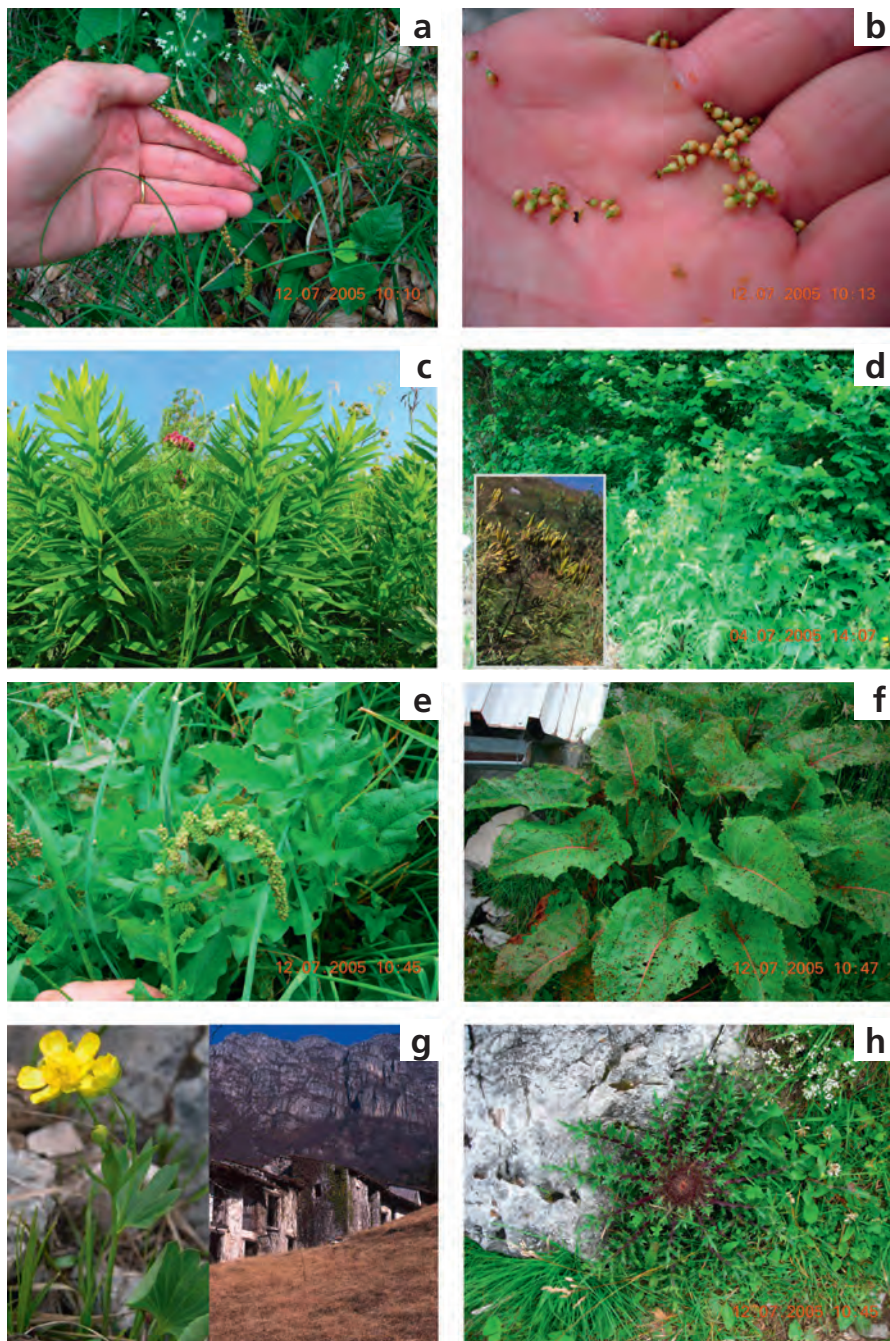


Fig. 8. – a: *Silene dioica*; – b: *Silene vulgaris*; – c: *Carum carvi*, seeds are used for meat preparations including "pitina" a sort of sheep salami; – d: *Primula veris*; – e: *Crocus albiflorus*, only bulbs are eaten raw; – f: *Fagus sylvatica*, young leaves and fruits are eaten raw; – g: *Aposeris foetida*; – h: *Oxalis acetosella*; – i: *Phyteuma spicatum*, sprouts and young leaves are boiled and sautéed.



**Fig. 9.** – a, b: *Polygonum viviparum*, bulbils are eaten raw; – c: *Polygonatum verticillatum*, the leaves are also eaten raw; – d: *Myrrhis odorata*, seeds are used to aromatize "grappa"; – e: *Chenopodium bonus-henricus*; – f: *Rumex alpinus*, young leaves are boiled and sautéed; – g: *Ranunculus hybridus*, dry leaves are used as pepper; – h: *Carlina acaulis*, the receptacles are used raw or cooked.

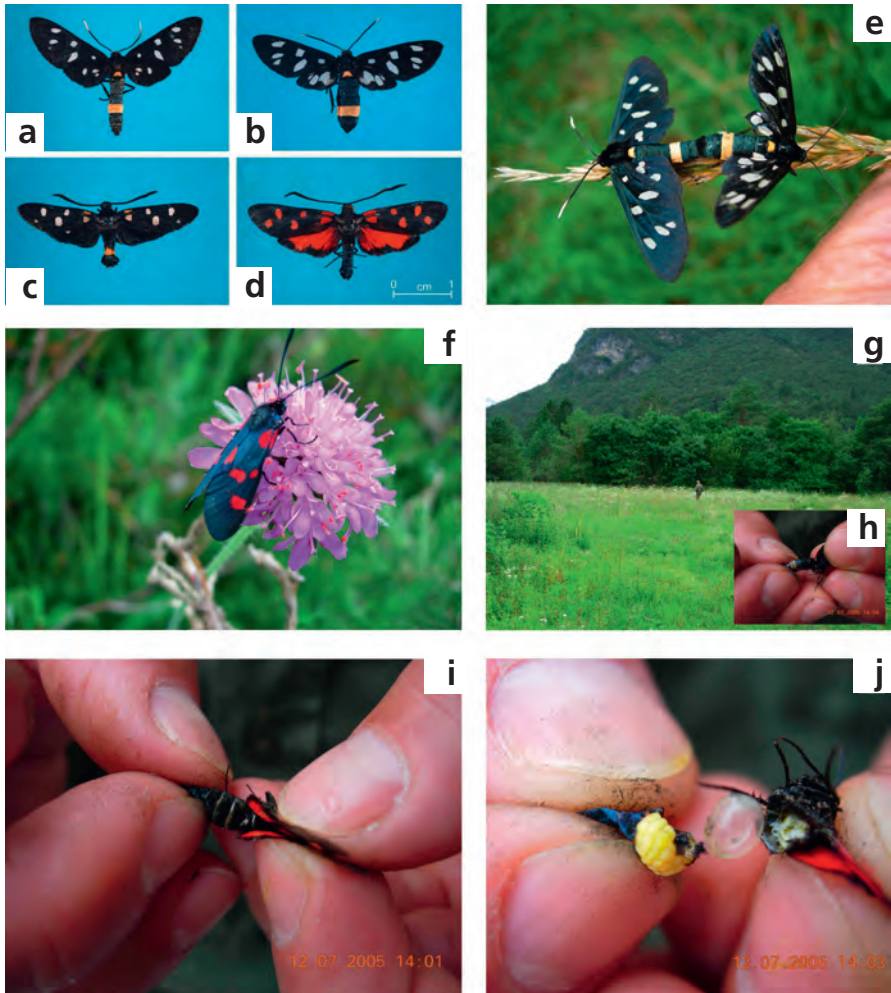


Fig. 10. Some insect utilized as snaks. – a, b, e: *Syntomis phegea* male and female; – c: *Zygaena ephialtes*; – d, f: *Zygaena transalpina*; – g: environment in which the butterflies were collected in summer; – h, i, j: obtaining the ingluvies (transparent pockets) containing nectar that was sucked.

feeding the turkeys, they would often eat at least the very prominent hind femurs raw.

Also snails such as *Helix pomatia* LINNAEUS, 1758 and *Arianta arbustorum* (Linnaeus, 1758) were collected, frogs like *Rana temporaria* LINNAEUS, 1758 and several but not too many different mushrooms. Appreciated was the river shrimp, *Austropotamobius pallipes* (LEREBoullet, 1858).

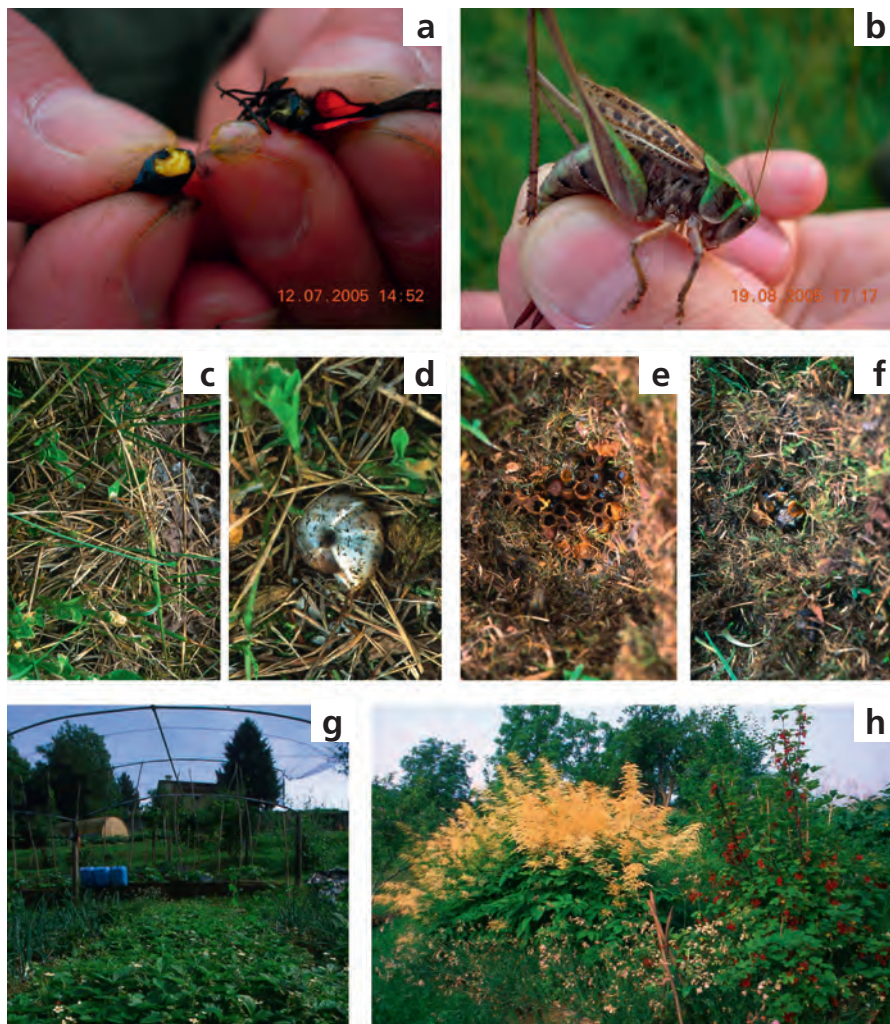


Fig. 11. – a: testing the ingluvies of *Zygaena transalpina*; – b: looking for the "caveletons" (*Decticus verrucivorus*); – c, d: nest of *Osmia* located inside an empty snail shell (*Campylea illyrica*) covered by coniferous needles; – e, f: nests of *Bombus* sp. providing some honey; – g, h: two backyard gardens at Frisanco that are experimenting with domestication of the above wild plants such as *Chenopodium bonus-henricus*, *Aruncus dioicus*, *Fragaria vesca* and *Silene vulgaris*.

## Conclusions

Wild herbs provide carbohydrates, vitamins, minerals, rich antioxidant compounds (Zeghichi & al., 2003) and minor amounts of oils and proteins. Insects are a minor resource in comparison to wild plants (and mushrooms) collected in the countryside. They have, however, been especially exploited for their sweet pockets and/or for pollen (*Osmia* nests). Sugars were rather rare

in pre-industrial times in the Friuli countryside. All these local uses indicate unprecedented knowledge of biodiversity in this very bio-diversity-rich area. Furthermore, these traditions may suggest intelligent semidomestication processes. Local knowledge has to be maintained and promoted for the new generations.

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## Appendix I

List of wild edible plant species used in Friuli-Venezia Giulia.

° = this plant use has been reported by informants from the Dolomites, but it could also be used in Friuli

\* = cited in Paoletti & al. (1995)

°° = achenes in sausages such as pitina

Family, Genus and species	edible portion used	preparation adopted
<b>Equisetaceae</b>		
<i>Equisetum arvense</i> L.	sterile leaves	cooked in the spring mixture, eliminated if too hard
<i>Equisetum telmateja</i> EHRH.	sterile leaves	cooked in the spring mixture, eliminated if too hard
<b>Polypodiaceae</b>		
<i>Polypodium vulgare</i> L.	rhizomes	raw
<i>Asplenium ruta-muraria</i> L.	leaves	cooked with corn flour to obtain fregole and eaten with milk
<b>Pinaceae</b>		
<i>Abies alba</i> MILLER	sprouts	elixir
<i>Pinus mugo</i> TURRA	sprouts and unripe cones	elixir
<b>Cupressaceae</b>		
<i>Juniperus communis</i> L.	galbulus	as spice for meat dishes
<b>Taxaceae</b>		
<i>Taxus baccata</i> L.	arils	raw
<b>Aristolochiaceae</b>		
<i>Aristolochia lutea</i> DESF.	sprouts	cooked in the spring mixture
* <i>Aristolochia pallida</i> WILLD.	sprouts	cooked in the spring mixture
<b>Ranunculaceae</b>		
* <i>Clematis vitalba</i> L.	sprouts	cooked in the spring mixture
* <i>Ranunculus ficaria</i> L.	leaves	raw in salads; cooked in the spring mixture
<i>Ranunculus hybridus</i> BIRIA	leaves	dried spice as pepper substitution
* <i>Ranunculus repens</i> L.	leaves	cooked in the spring mixture
<b>Berberidaceae</b>		
<i>Berberis vulgaris</i> L.	sprouts, leaves and fruits	raw
<b>Papaveraceae</b>		
<i>Papaver rhoeas</i> L.	young plants	cooked in the spring mixture
* <i>Papaver somniferum</i> L.	young plants; leaves of stem	cooked in the spring mixture; also with others herbs later in the season
<b>Ulmaceae</b>		
<i>Celtis australis</i> L.	fruits	raw
<b>Cannabaceae</b>		
<i>Humulus lupulus</i> L.	sprouts	cooked in the spring mixture or consumed alone with eggs
<b>Urticaceae</b>		
* <i>Urtica dioica</i> L.	sprouts, leaves	cooked in the spring mixture; more recently in soups, risotto and pasta

Family, Genus and species	edible portion used	preparation adopted
<i>Parietaria officinalis</i> L.	sprouts, leaves	cooked in the spring mixture
<b>Fagaceae</b>		
* <i>Fagus sylvatica</i> L.	young leaves, fruits	both are eaten raw
<i>Castanea sativa</i> MILLER	fruits	roasted or boiled
<b>Betulaceae</b>		
<i>Corylus avellana</i> L.	fruits	raw after drying
<b>Chenopodiaceae</b>		
* <i>Chenopodium album</i> L.	young plants, leaves	cooked in the spring mixture; cooked with other herbs later in the season
* <i>Chenopodium bonus-henricus</i> L.	young plants, leaves	cooked, in great demand after snow melting and very appreciated
* <i>Chenopodium polyspermum</i> L.	young plants, leaves	cooked in the spring mixture; cooked with other herbs later in the season
<b>Caryophyllaceae</b>		
* <i>Stellaria media</i> (L.) VILL.	young plants,	cooked in the spring mixture
* <i>Silene dioica</i> (L.) CLAIRV.	sprouts, leaves	cooked in the spring mixture
* <i>Silene alba</i> (MILLER) KRAUSE	sprouts, leaves	cooked in the spring mixture
* <i>Silene vulgaris</i> (MOENCH) GARCKE	sprouts, leaves	cooked in the spring mixture
<b>Polygonaceae</b>		
* <i>Polygonum persicaria</i> L.	sprouts, leaves	cooked in the spring mixture; cooked with other herbs later in the season
* <i>Rumex acetosa</i> L.	inflorescence; sprouts, leaves	raw; raw or cooked in the spring mixture
<i>Rumex alpinus</i> L.	sprouts, leaves	cooked in the spring mixture
* <i>Rumex obtusifolius</i> L.	sprouts, leaves	cooked in the spring mixture
<i>Rumex scutatus</i> L.	sprouts, leaves	raw
<i>Polygonum viviparum</i> L.	bulbils eaten raw <sup>o</sup>	
<b>Malvaceae</b>		
<i>Malva neglecta</i> WALLR.	leaves	cooked in the spring mixture; cooked with other herbs later in the season
<i>Malva sylvestris</i> L.	leaves	cooked in the spring mixture; cooked with other herbs later in the season
<b>Violaceae</b>		
<i>Viola arvensis</i> MURRAY	young plants	cooked in the spring mixture
* <i>Viola reichenbachiana</i> JORDAN ex Boreau	young plants	cooked in the spring mixture
<b>Brassicaceae</b>		
<i>Cardamine amara</i> L.	leaves	raw to improve salads
* <i>Cardamine hirsuta</i> L.	young plants	cooked in the spring mixture
* <i>Cardamine flexuosa</i> WITH.	young plants	cooked in the spring mixture
* <i>Cardaminopsis halleri</i> (L.) HAYEK subsp. <i>ovirensis</i> (WULFEN) THELL.	young plants	cooked in the spring mixture
* <i>Cardaminopsis halleri</i> (L.) HAYEK subsp. <i>halleri</i>	young plants	cooked in the spring mixture
<i>Capsella rubella</i> REUTER	young plants	cooked in the spring mixture
* <i>Capsella bursa-pastoris</i> (L.) MEDICUS	young plants	cooked in the spring mixture
<i>Diplotaxis tenuifolia</i> (L.) DC.	leaves	raw to improve salads
<i>Crambe tataria</i> SEBEOK	sprouts, leaves	raw
<b>Ericaceae</b>		
<i>Arctostaphylos uva-ursi</i> (L.) SPRENGEL	flowers and fruits	raw

Family, Genus and species	edible portion used	preparation adopted
<i>Vaccinium myrtillus</i> L.	fruits	raw, jam, elixir
<i>Vaccinium uliginosum</i> L.	fruits	raw, jam, elixir
<i>Vaccinium vitis-idaea</i> L.	fruits	raw, elixir
<b>Primulaceae</b>		
* <i>Primula vulgaris</i> HUDSON	leaves and flowers	cooked in the spring mixture
<i>Primula veris</i> L. subsp. <i>veris</i>	leaves and flowers	cooked in the spring mixture
<i>Primula veris</i> L. subsp. <i>columnnae</i> (TEN) LUDI	leaves and flowers	cooked in the spring mixture
<b>Crassulaceae</b>		
<i>Sempervivum tectorum</i> L.	leaves	raw
<i>Sedum maximum</i> (L.) SUTER	leaves	cooked in the spring mixture
<b>Rosaceae</b>		
* <i>Aruncus dioicus</i> (WALTER) FERNALD	sprouts	cooked in the spring mixture or alone
* <i>Filipendula vulgaris</i> MOENCH	sprouts	raw; cooked in the spring mixture
<i>Rubus caesius</i> L.	sprouts; fruits	cooked in the spring mixture; raw
<i>Rubus idaeus</i> L.	fruits	raw, jams
* <i>Rubus ulmifolius</i> SCHOTT	sprouts; fruits	cooked in the spring mixture; raw, jams
<i>Rubus saxatilis</i> L.	fruits	raw
<i>Rosa canina</i> L.	fruits	after first winter freezing as decoction or raw
<i>Potentilla erecta</i> (L.) RAUSCHEL	roots	elixir
<i>Fragaria moschata</i> DUCHESNE	leaves; fruits	cooked in the spring mixture; raw or jams
* <i>Fragaria vesca</i> L.	leaves; fruits	cooked in the spring mixture; raw or jams
<i>Duchesnea indica</i> (ANDREWS) FOCKE	fruits	raw
<i>Malus sylvestris</i> MILLER	fruits	raw
<i>Sorbus aria</i> (L.) CRANTZ	fruits	raw
<i>Sorbus chamaemespilus</i> (L.) CRANTZ	fruits	raw
<i>Amelanchier ovalis</i> MEDICUS	fruits	raw
<i>Crataegus monogyna</i> JACQ.	fruits	raw
<i>Prunus cerasifera</i> EHRH.	fruits, resin	both raw
<i>Prunus cerasus</i> L.	fruits, resin	both raw
<i>Prunus spinosa</i> L.	fruits	raw, elixir
<i>Prunus avium</i> L.	fruits, resin	both raw
<i>Prunus persica</i> (L.) BATSCH	fruits, resin	both raw
<b>Fabaceae</b>		
<i>Gleditsia triacanthos</i> L.	pods	raw
<i>Robinia pseudoacacia</i> L.	young shoots; flowers	raw; fried
<i>Hippocrepis comosa</i> L.	inflorescences	decoction
<i>Lotus corniculatus</i> L.	inflorescences	decoction
<b>Cornaceae</b>		
<i>Cornus mas</i> L.	fruits	raw, fermented in water to produce an alcoholic vine and vinegar
<b>Rhamnaceae</b>		
<i>Rhamnus saxatilis</i> JACQ.	fruits	raw
<b>Vitaceae</b>		
<i>Vitis vinifera</i> L.	shoots	raw
<b>Oxalidaceae</b>		
* <i>Oxalis acetosella</i> L.	leaves	cooked in the spring mixture

Family, Genus and species	edible portion used	preparation adopted
<i>Oxalis corniculata</i> L.	leaves	cooked in the spring mixture
<b>Geraniaceae</b>		
<i>Erodium cicutarium</i> (L.) L'HÉR	young plants	cooked in the spring mixture
<b>Apiaceae</b>		
<i>Myrrhis odorata</i> (L.) Scop.	achenes; young leaves	elixir; as spices in salads and soups
* <i>Carum carvi</i> L.	shoots; achenes	sprouts raw as spices in salads or cooked in the spring mixture °°.
<i>Peucedanum ostruthium</i> (L.) Koch	rhizome	elixir
<b>Gentianaceae</b>		
<i>Gentiana lutea</i> L. subsp. <i>symphyandra</i> (MURB.) HAYEK	rhizome	elixir
<b>Solanaceae</b>		
<i>Solanum tuberosum</i> L.	leaves	cooked in the spring mixture
<i>Solanum dulcamara</i> L.	rhizome	raw
<b>Convolvulaceae</b>		
<i>Calystegia sepium</i> (L.) R. BR.	shoots	cooked in the spring mixture
<b>Boraginaceae</b>		
<i>Pulmonaria officinalis</i> L.	shoots and leaves	cooked in the spring mixture
<i>Symphytum tuberosum</i> L. subsp. <i>angustifolium</i>	shoots and leaves	cooked in the spring mixture
* <i>Myosotis sylvatica</i> Hoffm.	shoots and leaves	cooked in the spring mixture
<b>Lamiaceae</b>		
<i>Lamium album</i> L.	inflorescences	cooked in the spring mixture
<i>Lamium orvala</i> L.	flowers	sucking nectar from young flowers; recently used for risotto preparations
* <i>Lamium purpureum</i> L.	inflorescences	cooked in the spring mixture
<i>Prunella vulgaris</i> L.	inflorescences	cooked in the spring mixture
<i>Satureja montana</i> L. subsp. <i>variegata</i>	leaves	condiment
<i>Clinopodium vulgare</i> L.	inflorescences	cooked in the spring mixture
* <i>Salvia pratensis</i> L. subsp. <i>pratensis</i>	shoots and leaves	cooked in the spring mixture
<b>Plantaginaceae</b>		
* <i>Plantago lanceolata</i> L.	leaves	cooked in the spring mixture
* <i>Plantago major</i> L.	leaves	cooked in the spring mixture
* <i>Plantago media</i> L.	leaves	cooked in the spring mixture
<b>Scrophulariaceae</b>		
<i>Veronica hederifolia</i> L.	young plants	cooked in the spring mixture
* <i>Veronica beccabunga</i> L.	shoots and leaves	cooked in the spring mixture
<b>Campanulaceae</b>		
<i>Campanula pyramidalis</i> L.	raw roots	roots eaten by children at Venzone, the most western locality of this species in Italy.
* <i>Campanula trachelium</i> L.	shoots and leaves	cooked in the spring mixture
<i>Legousia speculum-veneris</i> (L.) CHAIX	young plants	cooked in the spring mixture
* <i>Phyteuma spicatum</i> L. subsp. <i>spicatum</i>	leaves; inflorescences	cooked in the spring mixture; cooked alone later in the season
<b>Rubiaceae</b>		
<i>Galium aparine</i> L.	shoots	cooked in the spring mixture
* <i>Galium aristatum</i> L.	shoots	cooked in the spring mixture
* <i>Galium mollugo</i> L.	shoots	cooked in the spring mixture
<i>Galium odoratum</i> (L.) Scop.	shoots	elixir

Family, Genus and species	edible portion used	preparation adopted
<b>Caprifoliaceae</b>		
<i>Lonicera caprifolium</i> L.	fruits	raw, known as St John's grapes
<i>Sambucus nigra</i> L.	fruits	syrup
<i>Viburnum lantana</i> L.	fruits	raw, put in hay to mature; elixir
<b>Valerianaceae</b>		
<i>Valerianella locusta</i> (L.) LATERRADE	young plants	raw in salads
<b>Asteraceae</b>		
* <i>Bellis perennis</i> L.	young plants	cooked in the spring mixture
* <i>Erigeron annuus</i> (L.) PERS.	young plants	cooked in the spring mixture
<i>Achillea clavенаe</i> L.	leaves	elixir
<i>Matricaria chamomilla</i> L.	flowers	decoction
* <i>Leucanthemum vulgare</i> LAM.	shoots and leaves	cooked in the spring mixture
* <i>Carlina acaulis</i> L.	receptacles	raw and cooked
<i>Cirsium arvense</i> (L.) SCOP.	shoots and leaves	cooked in the spring mixture
* <i>Cirsium oleraceum</i> (L.) SCOP.	shoots and leaves	cooked in the spring mixture
* <i>Centaurea nigrescens</i> WILLD.	shoots and leaves	cooked in the spring mixture
<i>Cichorium intybus</i> L.	young plants and leaves	cooked in the spring mixture
* <i>Aposeris foetida</i> (L.) LESS	young plants	cooked in the spring mixture; raw mixed with milk serum
* <i>Leontodon hispidus</i> L.	young plants	cooked in the spring mixture
* <i>Hypochaeris maculata</i> L.	young plants	cooked in the spring mixture
* <i>Hypochaeris radicata</i> L.	young plants	cooked in the spring mixture
* <i>Tragopogon pratensis</i> L. subsp. <i>orientalis</i> (L.) CELAK	shoots	cooked in the spring mixture, raw
* <i>Sonchus asper</i> (L.) HILL	young plants	cooked in the spring mixture
* <i>Sonchus oleraceus</i> L.	young plants	cooked in the spring mixture
<i>Lactuca serriola</i> L.	young plants	cooked in the spring mixture
<i>Cicerbita alpina</i> (L.) WALLR.	shoots	cooked in the spring mixture, and oil preserved
* <i>Taraxacum officinale</i> WEBER	young plants	cooked in the spring mixture, raw in salads
* <i>Crepis capillaris</i> (L.) WALLR.	young plants	cooked in the spring mixture
* <i>Crepis vesicaria</i> L. subsp. <i>taraxacifolia</i> (THUILL.) THELL.	young plants	cooked in the spring mixture
<b>Liliaceae</b>		
* <i>Ornithogalum pyrenaicum</i> L.	leaves; inflorescences	cooked in the spring mixture; cooked alone later in the season
<i>Muscari botryoides</i> (L.) MILLER	leaves and inflorescences	cooked in the spring mixture
<i>Allium ursinum</i> L.	leaves	cooked in the spring mixture, raw in salads
<i>Allium vineale</i> L.	leaves	cooked in the spring mixture, raw in salads
<i>Polygonatum verticillatum</i> (L.) ALL.	shoots	raw, cooked in the spring mixture
<i>Asparagus officinalis</i> L.	shoots	cooked generally alone
<i>Asparagus tenuifolius</i> LAM.	shoots	cooked in the spring mixture
* <i>Ruscus aculeatus</i> L.	shoots	cooked generally alone
<b>Iridaceae</b>		
<i>Crocus albiflorus</i> KIT.	bulbs	raw
<b>Dioscoreaceae</b>		
* <i>Tamus communis</i> L.	shoots	cooked in the spring mixture



## Appendix II

List of wild edible plant species from different regions.

° = this plant use has been reported by informants from the Dolomites, but it could also be used in Friuli

\* = cited in Paoletti & al. (1995)

[A] = archeofita, according to Pignatti (1976) and/or Poldini (2002).

Genus and species	Piemonte (Mattiolo & al. 2001)	Piemonte (Gibelli 2004)	Bergamo (Giardino Botanico 1996)	Toscana (Corsi & Pagni 1979)	Garfagnana (Pieroni 1997)	Liguria (Bisio & Minuto 1997)	Gessopalena, Abruzzo (Manzi 1987)	Scotland (Milliken & Bridgewater 2004)	Cappadocia (Ertug 1997)	Mazandaran, Iran (Shokri & Safaian 1992)
N° of species cited	444	203	52	70	115	38	29	84	42	150
* <i>Aposeris foetida</i> (L.) LESS										
* <i>Aristolochia pallida</i> WILLD.										
* <i>Aruncus dioicus</i> (WALTER) FERNALD			X							
* <i>Bellis perennis</i> L. [A]	X	X	X	X	X					
* <i>Campanula trachelium</i> L.		X			X					
* <i>Capsella bursa-pastoris</i> (L.) MEDICUS [A]	X	X	X						X	
* <i>Cardamine flexuosa</i> WITH.			X							
* <i>Cardamine hirsuta</i> L.			X	X						
* <i>Cardaminopsis halleri</i> (L.) HAYEK subsp. <i>halleri</i>										
* <i>Cardaminopsis halleri</i> (L.) HAYEK subsp. <i>ovirensis</i> (WULFEN) THELL.										
* <i>Carlina acaulis</i> L.		X	X	X	X					
* <i>Carum carvi</i> L.		X								
* <i>Centaurea nigrescens</i> WILLD										
* <i>Chenopodium album</i> L. [A]		X	X	X	X	X		X	X	
* <i>Chenopodium bonus-henricus</i> L.	X	X	X	X	X			X		
* <i>Chenopodium polyspermum</i> L.										
* <i>Cirsium oleraceum</i> (L.) SCOP.										
* <i>Clematis vitalba</i> L.			X	X	X		X			
* <i>Crepis capillaris</i> (L.) WALLR. [A]					X					
* <i>Crepis vesicaria</i> L. subsp. <i>taraxacifolia</i> (THUILL.) THELL. [A]					X	X				
* <i>Erigeron annuus</i> (L.) PERS.										
* <i>Fagus sylvatica</i> L.	X	X			X			X		
* <i>Filipendula vulgaris</i> MOENCH	X									
* <i>Fragaria vesca</i> L.	X	X		X	X			X		
* <i>Galium aristatum</i> L.										
* <i>Galium mollugo</i> L.										
* <i>Hypochaeris maculata</i> L.										
* <i>Hypochaeris radicata</i> L.	X	X		X	X	X				
* <i>Lamium purpureum</i> L. [A]	X	X		X	X					

Genus and species	Piemonte (Mattiolo & al. 2001)	Piemonte (Gibelli 2004)	Bergamo (Giardino Botanico 1996)	Toscana (Corsi & Pagni 1979)	Garfagnana (Pieronì 1997)	Liguria (Bisio & Minuto 1997)	Gessopalena, Abruzzo (Manzi 1987)	Scotland (Milliken & Bridgewater 2004)	Cappadocia (Ertug 1997)	Mazandaran, Iran (Shokri & Safaian 1992)
<i>*Leontodon hispidus</i> L.					X	X				
<i>*Leucanthemum vulgare</i> LAM.	X									
<i>*Myosotis sylvatica</i> HOFFM.										
<i>*Ornithogalum pyrenaicum</i> L.	X	X								
<i>*Oxalis acetosella</i> L.	X	X	X		X			X		
<i>*Papaver somniferum</i> L. [A]	X	X								
<i>*Phyteuma spicatum</i> L. subsp. <i>spicatum</i>	X									
<i>*Plantago lanceolata</i> L. [A]	X	X		X	X	X				X
<i>*Plantago major</i> L. [A]		X	X		X	X				X
<i>*Plantago media</i> L.	X	X								X
<i>*Polygonum persicaria</i> L. [A]										
<i>*Primula vulgaris</i> HUDSON	X	X	X	X	X					
<i>*Ranunculus ficaria</i> L.	X	X	X	X	X	X				
<i>*Ranunculus repens</i> L.										
<i>*Rubus ulmifolius</i> SCHOTT			X					X		
<i>*Rumex acetosa</i> L.	X	X	X	X	X	X		X		X
<i>*Rumex obtusifolius</i> L.	X	X			X					
<i>*Ruscus aculeatus</i> L.	X	X		X			X			
<i>*Salvia pratensis</i> L. subsp. <i>pratensis</i>	X	X	X	X	X					
<i>*Silene alba</i> (MILLER) KRAUSE			X		X					
<i>*Silene dioica</i> (L.) CLAIRV.			X							
<i>*Silene vulgaris</i> (MOENCH) GARCKE	X	X	X	X	X	X			X	
<i>*Sonchus asper</i> (L.) HILL	X	X	X		X		X		X	
<i>*Sonchus oleraceus</i> L.	X	X	X	X	X	X	X			
<i>*Stellaria media</i> (L.) VILL. [A]	X	X	X					X	X	X
<i>*Tamus communis</i> L.	X	X	X							X
<i>*Taraxacum officinale</i> WEBER [A]	X	X	X	X	X	X	X	X		
<i>*Tragopogon pratensis</i> L. subsp. <i>orientalis</i> (L.) CELAK	X	X		X	X					
<i>*Urtica dioica</i> L. [A]	X	X	X	X	X	X		X	X	
<i>*Veronica beccabunga</i> L.	X	X	X	X	X			X		
<i>*Viola reichenbachiana</i> JORDAN ex BOREAU										
<i>Abies alba</i> MILLER										
<i>Achillea clavennae</i> L.										
<i>Allium ursinum</i> L.	X		X					X		
<i>Allium vineale</i> L.	X	X			X					
<i>Amelanchier ovalis</i> MEDICUS										
<i>Arctostaphylos uva-ursi</i> (L.) SPRENGEL	X	X						X		
<i>Aristolochia lutea</i> DESF.										
<i>Asparagus officinalis</i> L.	X	X								
<i>Asparagus tenuifolius</i> LAM.	X	X								
<i>Asplenium ruta-muraria</i> L.										
<i>Berberis vulgaris</i> L.	X	X	X							
<i>Calystegia sepium</i> (L.) R. BR.	X									X

Genus and species	Piemonte (Mattiolo & al. 2001)	Piemonte (Gibelli 2004)	Bergamo (Giardino Botanico 1996)	Toscana (Corsi & Pagni 1979)	Garfagnana (Pieroni 1997)	Liguria (Bisio & Minuto 1997)	Gessopalena, Abruzzo (Manzi 1987)	Scotland (Milliken & Bridgewater 2004)	Cappadocia (Ertug 1997)	Mazandaran, Iran (Shokri & Safaian 1992)
<i>Capsella rubella</i> REUTER	X									
<i>Cardamine amara</i> L.	X									
<i>Castanea sativa</i> MILLER		X			X					X
<i>Celtis australis</i> L.	X	X								
<i>Cicerbita alpina</i> (L.) WALLR.										
<i>Cichorium intybus</i> L. [A]	X	X	X	X	X	X	X		X	X
<i>Cirsium arvense</i> (L.) SCOP.	X				X					
<i>Clinopodium vulgare</i> L.	X									
<i>Cornus mas</i> L.	X	X	X	X	X					
<i>Corylus avellana</i> L.	X	X			X			X		
<i>Crambe tataria</i> SEBEOK										
<i>Crataegus monogyna</i> JACQ.	X	X	X	X				X		
<i>Crocus albiflorus</i> KIT.	X	X								
<i>Diplotaxis tenuifolia</i> (L.) DC.	X	X			X					
<i>Duchesnea indica</i> (ANDREWS) FOCKE										
<i>Equisetum arvense</i> L.										X
<i>Equisetum telmateja</i> EHRH.										
<i>Erodium cicutarium</i> (L.) L' HÉR									X	
<i>Fragaria moschata</i> DUCHESNE										
<i>Galium aparine</i> L.	X	X						X		
<i>Galium odoratum</i> (L.) SCOP.	X	X								
<i>Gentiana lutea</i> L. subsp. <i>symphyandra</i> (MURB.) HAYEK										
<i>Gleditsia triacanthos</i> L.										
<i>Hippocrepis comosa</i> L.										
<i>Humulus lupulus</i> L.	X	X	X	X	X					X
<i>Juniperus communis</i> L.		X		X	X			X		
<i>Lactuca serriola</i> L. [A]	X	X			X		X		X	
<i>Lamium album</i> L. [A]	X	X			X					X
<i>Lamium orvala</i> L.										
<i>Legousia speculum-veneris</i> (L.) CHAIX [A]										
<i>Lonicera caprifolium</i> L.					X					
<i>Lotus corniculatus</i> L.										
<i>Malus sylvestris</i> MILLER		X						X		
<i>Malva neglecta</i> WALLR. [A]			X							X
<i>Malva sylvestris</i> L. [A]	X	X	X	X	X			X	X	
<i>Matricaria chamomilla</i> L.		X								
<i>Muscari botryoides</i> (L.) MILLER	X	X								
<i>Myrrhis odorata</i> (L.) SCOP.								X		
<i>Oxalis corniculata</i> L.										
<i>Papaver rhoeas</i> L. [A]	X	X	X	X	X	X	X		X	X
<i>Parietaria officinalis</i> L.	X	X								
<i>Peucedanum ostruthium</i> (L.) KOCH										
<i>Pinus mugo</i> TURRA										
<i>Polygonatum verticillatum</i> (L.) ALL.	X									

Genus and species	Piemonte (Mattiolo & al. 2001)	Piemonte (Gibelli 2004)	Bergamo (Giardino Botanico 1996)	Toscana (Corsi & Pagni 1979)	Garfagnana (Pieroni 1997)	Liguria (Bisio & Minuto 1997)	Gessopalena, Abruzzo (Manzi 1987)	Scotland (Milliken & Bridgewater 2004)	Cappadocia (Ertug 1997)	Mazandaran, Iran (Shokri & Safaian 1992)
<sup>o</sup> <i>Polygonum viviparum</i> L.	X	X						X		
<i>Polypodium vulgare</i> L.										X
<i>Potentilla erecta</i> (L.) RAUSCHEL	X									
<i>Primula veris</i> L. subsp. <i>columnae</i> (TEN) LUDI										
<i>Primula veris</i> L. subsp. <i>veris</i>	X	X								X
<i>Prunella vulgaris</i> L.										
<i>Prunus avium</i> L.		X		X	X			X		
<i>Prunus cerasifera</i> EHRH.										
<i>Prunus cerasus</i> L.					X					
<i>Prunus persica</i> (L.) BATSCH		X								
<i>Prunus spinosa</i> L.	X	X		X	X			X		
<i>Pulmonaria officinalis</i> L.	X		X							
<i>Ranunculus hybridus</i> BIRIA										
<i>Rhamnus saxatilis</i> JACQ.										
<i>Robinia pseudoacacia</i> L.	X	X	X	X	X					
<i>Rosa canina</i> L.	X	X		X	X			X		
<i>Rubus caesius</i> L.	X	X						X		
<i>Rubus idaeus</i> L.	X	X	X	X	X			X		
<i>Rubus saxatilis</i> L.								X		
<i>Rumex alpinus</i> L.	X	X								
<i>Rumex scutatus</i> L.	X	X							X	
<i>Sambucus nigra</i> L.	X	X	X	X	X			X		
<i>Satureja montana</i> L. subsp. <i>variegata</i>		X			X					
<i>Sedum maximum</i> (L.) SUTER										
<i>Sempervivum tectorum</i> L.										
<i>Solanum dulcamara</i> L.										
<i>Solanum tuberosum</i> L.										
<i>Sorbus aria</i> (L.) CRANTZ	X	X								
<i>Sorbus chamaemespilus</i> (L.) CRANTZ										
<i>Symphytum tuberosum</i> L. subsp. <i>angustifolium</i>	X	X			X					
<i>Taxus baccata</i> L.					X					
<i>Vaccinium myrtillus</i> L.	X	X		X	X			X		
<i>Vaccinium uliginosum</i> L.	X	X								
<i>Vaccinium vitis-idaea</i> L.	X	X			X			X		
<i>Valerianella locusta</i> (L.) LATERRADE [A]	X	X		X						
<i>Veronica hederifolia</i> L.	X									
<i>Viburnum lantana</i> L.										
<i>Viola arvensis</i> MURRAY [A]										
<i>Vitis vinifera</i> L.										