Isolated, but transnational: the *glocal* nature of Waldensian ethnobotany, Western Alps, NW Italy

Bellia and Pieroni
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Giada Bellia and Andrea Pieroni*  

Abstract

Background: An ethnobotanical field study on the traditional uses of wild plants for food as well as medicinal and veterinary plants was conducted in four Waldensian valleys (Chisone, Germanasca, Angroina, and Pellice) in the Western Alps, Piedmont, NW Italy. Waldensians represent a religious Protestant Christian minority that originated in France and spread around 1,170 AD to the Italian side of Western Alps, where, although persecuted for centuries, approximately 20,000 believers still survive today, increasingly mixing with their Catholic neighbours.

Methods: Interviews with a total of 47 elderly informants, belonging to both Waldensian and Catholic religious groups, were undertaken in ten Western Alpine villages, using standard ethnobotanical methods.

Results: The uses of 85 wild and semi-domesticated food folk taxa, 96 medicinal folk taxa, and 45 veterinary folk taxa were recorded. Comparison of the collected data within the two religious communities shows that Waldensians had, or have retained, a more extensive ethnobotanical knowledge, and that approximately only half of the wild food and medicinal plants are known and used by both communities. Moreover, this convergence is greater for the wild food plant domain. Comparison of the collected data with ethnobotanical surveys conducted at the end of the 19th Century and the 1980s in one of studied valleys (Germanasca) shows that the majority of the plants recorded in the present study are used in the same or similar ways as they were decades ago. Idiosyncratic plant uses among Waldensians included both archaic uses, such as the fern Botrychium lunaria for skin problems, as well as uses that may be the result of local adaptions of Central and Northern European customs, including Veronica allionii and V. officinalis as recreational teas and Cetraria islandica in infusions to treat coughs.

Conclusions: The great resilience of plant knowledge among Waldensians may be the result of the long isolation and history of marginalisation that this group has faced during the last few centuries, although their ethnobotany present trans-national elements. Cross-cultural and ethno-historical approaches in ethnobotany may offer crucial data for understanding the trajectory of change of plant knowledge across time and space.

Keywords: Ethnobotany, Wild food plants, Medicinal plants, Alps, Italy

Introduction

Ethnobotanical studies of minority and diasporic groups are of crucial interest in contemporary ethnobiology to help identify those cultural and/or social factors which affect the perceptions and uses of plants and to understand how traditional plant knowledge evolves [1-8].

Moreover, diverse analyses conducted in Europe during the last decade have pointed out that a broad range of factors influence the resilience of ethnobotanical knowledge and are able to slow or accelerate its erosion, including environmental changes, internal (urbanisation) and external migrations, self-perception and that of others’ identities, language, religion, as well as economic or political externalities [9-16].

On the other hand, the Alps have been shown to still represent an important reservoir of local, folk plant knowledge, both in touristic [17,18] and especially in “peripheral” valleys [19-22], which have been less affected by the mass tourism industry.

Along these theoretical trajectories, our ethnobotanical research in recent years has focused on a number of
linguistic “isles” and cultural boundaries in mountainous areas of Italy and the Balkans; especially in the latter cultural region, we have also observed the effect that religious affiliation has on the vertical transmission of folk plant knowledge, as it remarkably shapes kinship relations within multi-lingual and multi-religion communities [23].

In order to further assess the role that religion plays in shaping folk plant knowledge, we decided to investigate the local ethnobotany of the Waldensian community and that of their Catholic neighbours in the Western Alps, NW Italy. Waldensians represent a religious Christian (and later Protestant Christian) minority that originated in France during the 12th Century which spread around 1,170 AD to the Italian side of the Cottian (Western) Alps. Harassed for centuries, Waldensians went through a long and dramatic history of persecutions, migrations and relocations, and, despite the isolation and marginalisation of their valleys, they built important ties to Protestant countries, notably England, the Netherlands, and Switzerland [24].

Nowadays, approximately 20,000 believers (Provençal/Occitan, Piedmontese and standard Italian speaking) still survive in these valleys, increasingly mixing with their Catholic neighbours.

The specific aims of this study were:

1. to record the local names and specific uses of wild food plants, as well as wild and non-wild plants for medicinal and veterinary practices in four Waldensians valleys;
2. to compare the ethnobotany of members belonging to the two faiths (Waldensians and Catholics); and
3. to diachronically compare the current data with those from the historical North Italian ethnobotanical data.

**Methods**

**Selected sites**

Figure 1 shows the location of the study sites, which were represented by four Waldensian valleys (Chisone, Germanasca, Angrogna, and Pellice) located in the Western Alps, Piedmont, NW Italy.

The valleys are characterized by chestnut (*Castanea sativa* Mill.), beech (*Fagus sylvatica* L.), and larch (*Larix decidua* Mill.) forests, with some Scots pine (*Pinus sylvestris* L.); the climate is alpine, with relevant annual precipitations (1000–2000 mm/year).

In particular, the following villages were visited: Fenes-trelle (1,138 m.a.s.l.), Montoulles (1,046 m.a.s.l.), Villaretto (986 m.a.s.l.), Pomaretto (619 m.a.s.l.), Campo La Salza (1,140 m.a.s.l.), Massello (1,187 m.a.s.l.), San Martino (1,063 m.a.s.l.), Villasecca (832 m.a.s.l.), Angrogna (582 m.a.s.l.), and Bobbio Pelice (762 m.a.s.l.).

All villages officially report a few hundred inhabitants (normally 300–500), but the actual figures are largely overestimated, as a significant portion of the current resident

![Figure 1](image-url)
populations lives in the lowland Piedmontese centres and Turin and comes back to the villages only during the summer or on the weekends.

The local economy, since a few decades, is no longer based on agro-pastoral activities, and the elderly inhabitants live off of their pensions and in their free time manage some home-gardens and/or small-scale agricultural activities. Young and mid generations work instead in the main lowlands centres and in Turin.

Mass tourism is absent, although some eco-touristic initiatives have been growing in recent years.

The original Waldensian inhabitants have increasingly mixed with their Catholic neighbours in the last few decades, and in most cases intermarriage leads to a family’s change of faith (from Waldensian to Catholic).

Nowadays the language spoken within the domestic arena is increasingly a mixture of the original Provençal/Occitan language with the Piedmontese variety of Italian. All inhabitants also speak standard Italian.

Field study
In the years 2010–2014, forty-seven elderly informants (nineteen Catholics and twenty-eight Waldensians, aged between 58 and 78 years) were selected, among those locals who could be identified as Traditional Knowledge holders (normally elderly small-scale farmers and shepherds), employing snowball sampling techniques. These individuals then were interviewed after Prior Informed Consent was verbally obtained.

The focus of the interviews, which were conducted in standard Italian, was the folk knowledge (name and use) of wild food plants and wild and non-wild medicinal and veterinary plants.

The Code of Ethics of the International Society of Ethnobiology [25] was strictly followed.

The wild plant species mentioned by the informants were collected, when available, identified according to Flora d’Italia [26], and finally stored at the Herbarium of the University of Gastronomic Sciences.

Plant family assignments follow the current Angiosperm Phylogeny Group designations [27].

The reported folk plant names were transcribed using the rules of the Provençal/Occitan and standard Italian languages.

Data analysis
We compared the data gathered among local Waldensians with those collected among Catholics in the same study sites.

Moreover, we compared our findings with those observed in two ethnobotanical field studies conducted in the same areas (Val Germanasca) at the end of the 19th Century and in the 1980s [28-30]. In particular, the first work represents one of the very first ethnobotanical studies in Italy as well as the whole of Europe, which was conducted by a Waldensian botanist working as a secondary school teacher, who died from an infectious disease in Uruguay, where he immigrated one year after the publication of his investigation [31].

Results and discussion
Wild food plants
Table 1 shows the recorded uses of the wild food and semi-domesticated plant taxa.

The collection of the young aerial parts of the following wild vegetables is still common in the study area: Borago officinalis, Primula spp., Lapsana communis, Chenopodium bonus-henricus, Rumex acetosa, Tragopogon pratensis, Urtica dioica, Silene vulgaris, Humulus lupulus, and Taraxacum officinale.

The above confirms what we already know about wild food plant consumption in Italy and in particular NW Italy, where the very common consumption of the young shoots of Humulus lupulus and Tragopogon pratensis can be considered a cultural marker of Piedmontese cuisine. While all these data confirm the observations reported nearly one century ago by Giovanni Mattirolo in his review of the wild plants of Piedmont [32], it appears that the practice of gathering and consuming the leaves/young shoots of Valerianella locusta, Phyteuma spp., Persicaria bistorta, and Aruncus dioicus continued only until the recent past and/or is less common today. The latter three species (in soups or boiled) in particular represent an important part of the slowly disappearing North Italian Alpine culinary “traditions” [17,33].

Among the wild plants exploited for seasoning, the use of Carum carvi, Thymus serpyllum, Juniperus communis, and Tanacetum vulgare is predominant. In particular, the common use of the leaves of the last species (Figure 2) – which has been widely reported not only in the Piedmont region but also recently in Occitan/Provençal and Alpine Ligurian areas [17,22,34,35] – as a crucial seasoning ingredient in omelettes, soups, and a home-made liqueur called arquebuse may be better investigated from a historical perspective. In fact, this species has a long history of folk use in Britain, especially in omelettes consumed during the fish-based diet of Lent [36], and Waldensians, even in the poorest villages, have maintained for many centuries intense cultural ties to Britain, due to the historical and theological proximity between the Protestant/Anglican and Waldensian faiths [23].

As in other areas of NW Italy ([17], and references therein), wild Artemisia genipi, A. glacialis, and A. umbelliformis flowering tops (genepi), Gentiana acaulis flowers (Figure 3) and roots, and G. lutea roots are commonly gathered and used for making home-made hydro-alcoholic macerates/digestive liqueurs.
| Botanical taxon/family and voucher specimen code | Recorded local names | Plant part(s) | Local culinary use(s) | Wal | Cat | Citations | Notes |
|------------------------------------------------|----------------------|--------------|-----------------------|-----|-----|-----------|-------|
| *Achillea* erba-rotta All. Asteraceae UNISGV/LACH | Routto Ruta di montagna | Aerial parts | Home-made liqueurs | + | * | C | |
| *Achillea* millefolium L. Asteraceae UNISGVGB025 | Primmoflour | Leaves | Soups | + | * | P | |
| *Alchemilla* xanthochlora Rothm. Rosaceae UNISGVGB030 | Leaves | Soups | + | + | * | P | |
| *Allium* schoenoprasum L. Amaryllidaceae UNISGV/LALL | Aiet | Leaves | Seasoning (salads) | + | * | C | |
| *Allium* ursinum L. Amaryllidaceae UNISGV/LALU | Amarenchie | Fruits | Eaten raw | + | * | P | |
| *Angelica* sylvestris L. Apiaceae UNISGVGB002 | Angelica Roots | Home-made liqueurs | + | * | C | |
| *Anthriscus* sylvestris (L.) Hoffm. Apiaceae UNISGV/LANT | Chafoulhét | Leaves | Salads | + | * | P | |
| *Arctostaphylus uva-ursi* (L.) Spreng. Ericaceae UNISGV/LARC | Pan dé vouëlp Pinmerlés | Fruits | Jams | + | + | * | P |
| *Arctium* lappa L. Asteraceae UNISGVGB034 | Grattéquioué Very young leaves | Soups | + | * | P | |
| *Artemisia* genipi Weber ex. Stechm., A.glacialis L., A. umbelliformis Lam. Asteraceae UNISGV/LAGE UNISGV/LAGL UNISGV/LARU | Genepi Génépi fumél (A. umbelliformis) Génépi macle (A.genipi) | Flowering tops | Home-made liqueurs | + | * | C | |
| *Artemisia* vulgaris L. Asteraceae UNISGVGB038 | Arsemizë Eisente Ersmízo | Leaves Seasoning soups or omelettes | + | * | C | |
| *Aruncus* dioicus (W.)F. Rosaceae UNISGVGB040 | Glaudia | Shoots | Boiled | + | + | ** | P |
| *Asparagus* tenuifolius Lam. Asparagaceae UNISGV/LASP | Aspèrge selvagge | Shoots | Boiled | + | + | * | P |
| *Bellis* perennis L. Asteraceae UNISGV/LAL007 | Magritin Margaritín | Leaves and flowers | Salads, soups, omelettes, risotto | + | * | C | |
| *Beta* vulgaris L. Berberidaceae UNISGV/LBER | Pittou | Fruits | Jams | + | + | ** | P |
| *Beta* vulgaris L. Amaranthaceae | Bléo | Leaves | Cooked | + | * | C | |
| *Borago* officinalis L. Boraginaceae UNISGV/L013 | Bouraës Bourai Bural | Leaves and flowers | Soups, salads, omelettes | + | + | *** | C |
| *Campanula* rapunculus L. Campanulaceae UNISGV/LCAM | Rampoun | Leaves and roots | Salads | + | * | C | |
| *Capsella* bursa- pastoris (L.) Medik. Brassicaceae UNISGV/LCAP | Young leaves | Omelettes | + | * | P | |
| *Carlina* acutis L. Asteraceae UNISGV/LCAR | Chardouso | Flowers | Macerated in olive oil, the resulting oil used as seasoning | + | + | * | C |
| *Carum* carvi L. Apiaceae UNISGV/LCAU | Chiréli Cummel | Fruits | Seasoning, home-made liqueurs | + | + | ** | C |
Table 1 Local wild or semi-domesticated food plant uses recorded in the studied area (Continued)

| Plant Name                        | Young leaves | Fruits | Salts | Spices | Plants | 
|-----------------------------------|--------------|--------|-------|--------|--------|
| *Centaurea scabiosa* L. Asteraceae | Young leaves | Soups  | ++    | +      | P      |
| *Cerinthe* sp. (?) Boraginaceae   | Anhaoû grô   | Leaves | Boiled| +      | P      |
| *Chenopodium album* L. Amaranthaceae | Sénicle     | Leaves | Soups, boiled, omelettes | + | + | * | P |
| *Chenopodium bonus-henricus* L. Amaranthaceae | Orla Parch | Leaves | Soups, omelettes, boiled | + | + | *** | C |
| *Cichorium intybus* L. Asteraceae | Sicorio      | Young leaves | Roots | Salads Roasted and grounds as coffee substitute | + | + | * | C |
| *Corylus avellana* L. Betulaceae   | Seeds        | Consumed raw | + | * | P |
| *Daucus carota* L. Apiaceae       | Carotto      | Roots  | Salads | + | * | C |
| *Dryas octopetala* L. Rosaceae    | Leaves and flowers | Consumed raw as a snack | + | * | P |
| *Fragaria vesca* L. Rosaceae      | Maiússa      | Leaves | Fruits | Soups, salads | + | + | ** | C |
| *Gentiana acaulis* L. Gentianaceae | Braio d’cucuc | Roots, flowers | Home-made liqueurs | + | + | ** | C |
| *Gentiana lutea* L. Gentianaceae   | Argensiana   | Roots  | Home-made liqueurs (or wine macerates) | + | + | *** | C |
| *Humulus lupulus* L. Cannabaceae   | Lüvèrtin     | Shoots | Omelettes, boiled | + | + | *** | C |
| *Juniperus communis* L. Cupressaceae | Génèbbre     | Galbules | Seasoning | + | + | *** | C |
| *Lapsana communis* L. Asteraceae   | Jalino graso | Young leaves | Soups, omelettes, boiled | + | + | *** | C |
| *Laurus nobili* L. Lauraceae       | Loriè        | Leaves | Seasoning | + | * | C |
| *Leontodon japonicus* (L.) (Asteraceae) | Plissa     | Leaves | Salads, soups | + | * | P |
| *Leontopodium nivale* (Ten.) Huet ex Hand-Mazz. Asteraceae | Stela alpina | Flowering tops | Home-made liqueurs | + | * | C |
| *Lonicera caerulea* L. Caprifoliaceae | Èrza d’loup | Flowers | Eaten raw as a snack | + | * | P |
| *Malva sylvestris* L. Malvaceae    | Måëvè Malvo | Leaves | Soups | + | + | * | C |
| *Mentha longifolia* (L.) L. Lamiaceae | Méntatré    | Leaves | Seasoning (esp. soups and omelettes) | + | * | P |
| *Nasturtium officinale* R.Br. Brassicaceae | Creisoun | Leaves | Salads | + | + | *** | C |
| *Origanum vulgare* L. Lamiaceae    | Origano      | Leaves | Seasoning | + | * | C |
| *Oxalis acetosella* L. Oxalidaceae | Érbo dà cucuc | Leaves | Salads | + | * | C |
| *Parietaria officinalis* L. Urticaceae | Pan-chaoudêt | Leaves | Soups | + | * | P |
| *Pedicularis foliosa* L. Orobancheaceae | Creisoun | Flowers | Sucked as a snack (by children) | + | * | P |
| *Pennisetum bistorta* L. Polygonaceae | Albubuine Arparô | Young leaves | Soups | + | + | ** | C |
| Plant Name                  | Family          | Scientific Name       | Habitat       | Uses                                                                 | Notes                          |
|-----------------------------|-----------------|-----------------------|---------------|----------------------------------------------------------------------|--------------------------------|
| Pinus cembra L.             | Pinaceae        | Pinus cembra L.       | Seeds         | Consumed raw                                                          | + ** P                          |
| Pinus sylvestris L.         | Pinaceae        | Pinus sylvestris L.   | Seeds         | Consumed raw                                                          | + * P                           |
| Plantago major L.           | Plantaginaceae  | Plantago major L.     | Leaves        | Soups                                                                | + + ** P                        |
| Physalis alkekengi L.       | Solanaceae      | Physalis alkekengi L. | Fruits        | Jams                                                                 | + * P                           |
| Phyteuma spicatum L.        | Campanulaceae   | Phyteuma spicatum L.  | Young leaves  | Soups                                                                | + * P                           |
| Polypodium vulgare L.       | Polypodiaceae   | Polypodium vulgare L. | Roots         | Consumed raw as a snack and as a seasoning for home-made beverages | + + *** C                       |
| Portulaca oleracea L.       | Portulacaceae   | Portulaca oleracea L. | Young leaves  | Salads                                                               | + * P                           |
| Primula heliobor (L.) Hill, | Primulaceae     | Primula heliobor (L.)| Young leaves  | Salads, soups, omelettes                                             | + + *** C                       |
| Prunus avium (L.)           | Rosaceae        | Prunus avium (L.)     | Fruits        | Consumed raw or in jams                                              | + * P                           |
| Prunus brigantina Vill.     | Rosaceae        | Prunus brigantina Vill.| Fruits       | Consumed raw or in jams                                              | + + * P                         |
| Prunus spinosa L.           | Rosaceae        | Prunus spinosa L.     | Fruits        | Jams                                                                 | + + ** P                        |
| Ribes alpinum L. L.         | Grossulariaceae | Ribes alpinum L.     | Fruits        | Consumed raw or in jams                                              | + + ** P                        |
| Ribes uva-crispa L.         | Grossulariaceae | Ribes uva-crispa L.  | Fruits        | Consumed raw or in jams                                              | + * P                           |
| Robinia pseudoacacia L.     | Fabaceae        | Robinia pseudoacacia L.| Flowers     | Deep-fried (in batter)                                               | + * C                           |
| Rosa canina L.              | Rosaceae        | Rosa canina L.        | Fruits        | Jams                                                                 | + + *** C                       |
| Rubus ulmifolius L.         | Rosaceae        | Rubus ulmifolius L.   | Young leaves  | Soups                                                                | + * P                           |
| Rubus idaeus L.             | Rosaceae        | Rubus idaeus L.       | Fruits        | Jams                                                                 | + + ** C                        |
| Rumex acetosella L.         | Polygonaceae    | Rumex acetosella L.   | Stems         | Consumed raw as a snack (stems); salads, soups, omelettes, boiled   | + + *** C                       |
| Rumex alpinus L.            | Polygonaceae    | Rumex alpinus L.      | Leaves        | Soups                                                                | + + * P                         |
| Salvia pratensis L.         | Labiatae        | Salvia pratensis L.   | Young leaves  | Soups                                                                | + + ** P                        |
| Sambucus nigra L. and S.    | Adoxaceae       | Sambucus nigra L.     | Flowers       | Deep fried (in batter) or seasoning home-made beverages             | + + *** C                       |
| Silene vulgaris (Moench.)   | Caryophyllaceae | Silene vulgaris (Moench.) | Fruits      | Jams                                                                |                                 |
| Tanacetum vulgare L.        | Asteraceae      | Tanacetum vulgare L.  | Leaves        | Seasoning soups (esp. a local bread-based soup [suppo barbetta]), home-made liqueurs, omelettes | + + *** C                       |
Among wild fruits, the gathering of the fruits/pseudo-fruits of *Rosa canina*, *Sambucus nigra* (and rarely *S. racesmosa*), and *Vaccinium myrtillus* is still commonly practiced.

Finally, the frequent use of the aerial parts of *Veronica* species (esp. the local *Veronica allionii*) as recreational teas in the study area, which has also been recorded in adjacent valleys [17], could be the result of cultural “contamination” from British and Northern/Central European customs. Waldensians, for example, have introduced in their valleys, and continue to practice today, the English custom of taking afternoon tea, which is extremely uncommon among the autochthonous Catholics in the study area as well as other areas of Italy.

In place of exotic and expensive colonial teas, the poor villagers may have opted for a “cheap”, local substitute, which may explain the use of the aerial parts of *Veronica* spp. even today. This tea – sometimes locally and more recently called “Occitan tea” - became in the last decade in the study area and also among the entire Occitan/Provençal community living in the Western Italian Alps an important cultural marker and seems to represent there one of the distinctive signs of the local identity.

On the other hand, the use of *Veronica officinalis* tea was very spread in France, Switzerland, and Northern Europe in the 19th Century [37].

### Medicinal plants

Table 2 reports the locally recorded medicinal plant uses.

The most common wild medicinal plant-based remedies, which are used externally, comprise the flowers of *Arnica montana*, the aerial parts of *Artemisia absinthium*, the resin of *Abies alba*, and the fresh latex of *Chelidonium majus*. Apart from the last species, this finding confirms the recent

### Table 1 Local wild or semi-domesticated food plant uses recorded in the studied area (Continued)

| Scientific Name | Common Name | Use | Notes |
|-----------------|-------------|-----|-------|
| *Taraxacum officinale* (L.) Weber | Girasole | Leaves | Salads, soups |
| Asteraceae | Moprousins | Roots | Roasted and ground as a substitute of coffee |
| *Thymus serpyllum* L. Lamiaceae | Serpoul | Flowers and leaves | Seasoning (also for cheese and a local bread-based soup [suppa barbetta]), home-made liquors |
| *Tragopogon pratensis* L. Asteraceae | Barbabouc | Young leaves | Soups, omelettes, boiled |
| *Trifolium* spp. Fabaceae | Fioun | Flowers | Deep fried (in batter) |
| *Tussilago farfara* L. Asteraceae | Pimpetta | Young leaves | Salads |
| *Urtica dioica* L. Urticaceae | Urtia | Leaves | Salads, omelettes, risotto |
| *Vaccinium myrtillus* L. Ericaceae | Erzaie | Fruits | Jams, syrups |
| *Vaccinium vitis-idaea* L. Ericaceae | Panféino | Fruits | Jams |
| *Valerianella locusta* (L.) Laterr. | Saladêt | Leaves | Salads |
| *Veronica allionii* Vill. Plantaginaceae | Érbë d’èt Giaspertere | Leaves and flowers | Recreational tea |
| *Veronica officinalis* L. Plantaginaceae | Érbë d’èt Tè svizzero | Leaves and flowers | Recreational tea |
| *Viburnum fontana* L. Adoxaceae | Tatoulie | Fruits | Consumed raw |
| *Viola tricolor* L. Violaceae | Violette | Leaves and flowers | Salads, soups |
| *Unidentified taxon* | Sparsi | Leaves and flowers | Salads, soups, omelettes |

(Wal: use recorded among Waldensians; Cat: use recorded among Catholics. Notes: C: current use; P: past use. Citations: *quoted by 10% of the informants or less; **quoted by 11-39% of the informants; ***quoted by 40% of the informants or more.)
The most frequently mentioned local herbal infusions are instead prepared with plants that are commonly used throughout Italy and Europe: *Equisetum arvense, Hypericum perforatum, Parietaria officinalis, Malva sylvestris, Matricaria chamomilla, Thymus serpyllum, Tilia cordata, Viola tricolor, and Cetraria islandica*. The use of the last species is peculiar, however, as it is frequently found, in Italy, in the herbalism-based standardized phytotherapy, but not often in the local folk medical systems.

The remarkable tradition of gathering and using this wild lichen in Waldensian valleys may be, once again, the result of the historical ties that these communities retained with Central and Northern European customs.

The same lichen, gathered from the wild, is also nowadays one of the pillars of the resurgence of the traditional Waldensian cuisine, where it is sometimes used to prepare desserts in a few of the new restaurants in the area [40].

Finally, it is worth mentioning that the unusual herbal folk uses of *Cetraria islandica* and *Botrychium lunaria* find parallelisms in the Alpine Catalan ethnobotany [41,42], showing in this way interesting commonalities between the Catalan and Occitan ethnobotanies of the Alpine communities.

**Veterinary plants**

Nearly all the plants pertaining to the veterinary domain (plants used for both feeding and for curing animals, Table 3) were used primarily in the past, as current uses are sporadic and quotation indexes are very low.

This suggests that the socio-economic shift local communities have faced since the 1960s, in which most inhabitants have abandoned the traditional agro-pastoral activities and animal breeding has decreased, has also...
| Botanical taxon/ family and voucher specimen code | Local names | Status | Plant parts | Preparation and administration | Folk medical use(s) or treated disease(s) | Wal | Cat | Citations | Notes |
|------------------------------------------------|-------------|--------|-------------|--------------------------------|------------------------------------------|-----|-----|-----------|-------|
| Abies alba Mill. Pinaceae UNISGVALABA          | Bigiun Sap  | W      | Buds        | Infusion, syrup                | Cough Skin infections, arthritis, bruises | +   | +   | *** C    |       |
|                                                                                      | Sòp blanc   |        | Resin       | Topical application            |                                         |     |     |          |       |
| Acer pseudoplatanus L. Sapindaceae UNISGVALACE | Plai Plaie  | W      | Leaves      | Infusion                       | Cough, flu                              | +   | +   | * P      |       |
| Achilles erba-rotta All. Asteraceae            | See Table 1 | W      | Aerial parts | Infusion, liquor               | Digestive, fever                        | +   | +   | * C      |       |
| Alchemilla xanthochlora Rothm. Rosaceae        | W           | Aerial parts | Infusion | Topical application         | Anti-inflammatory Dystenorrhea          | +   | +   | ** P    |       |
| Allium ampeloprasum L. Amaryllidaceae          | Pourètto    | C      | Roots       | Decoction                      | To decrease the milk secretion          | +   |     | * P      |       |
| Allium sativum L. Amaryllidaceae               | Alh         | C      | Bulb        | Topical application            | Corns Cough Worms                       | +   | +   | * P      |       |
| Aloysia citriodora Palau Verbenaceae           | Limonella   | C      | Leaves      | Infusion                       | Dysmenorrhea                            | +   |     | * C      |       |
| Atractium lappa L. Asteraceae UNISGVB034       | Grattëquioùe| W      | Roots       | Decoction                      | Respiratory infections, fever, "blood thinner" | +   | +   | ** P    |       |
| Arctostaphylos uva-ursi (L.) Spreng. Ericaceae | See Table 1 | W      | Leaves      | Infusion                       | Diuretic and inflammations of the urinary tract | +   |     | * P      |       |
| Arnica montana L. Asteraceae UNISGWAL003       | Tabacas Tabbacai | W | Flowers | Tincture or macerate in olive oil, externally applied | Rheumatisms, arthrits muscle pains, bruises | +   | +   | *** C |       |
| Artemisia absinthium L. Asteraceae UNISGWAL004 | Ûsenc       | W      | Aerial parts | Infusion                       | Bruises Fever, worms, digestive         | +   | +   | *** P    |       |
| Artemisia ganipí Weber ex. Stechm., A.glacialis L., A. umbelliformis Lam. Asteraceae | See Table 1 | W | Aerial parts | Liquor, infusion | Digestive, cough | +   | +   | *** C    |       |
| Artemisia vulgaris L. Asteraceae UNISGVB038    | Arsenizè Érsèmizo | W | Aerial parts | Infusion                       | Dysmenorrhea Bruises                    | +   | +   | ** P    |       |
| Beta vulgaris L. Amaranthaceae                  | Blèo        | C      | Leaves      | Topical application            | Joint pains, acne                        | +   |     | * P      |       |
| Bosago officinalis L. Boraginaceae             | Bourlaès Bourai | C | Flowers | Infusion                       | Pimples Eczema, psoriasis                | +   | +   | ** P    |       |
| Brassica oleracea L. Brassicaceae              | Chól        | C      | Leaves      | Topical application            | Pimples, acne                            | +   | +   | ** C    |       |
| Botrychium lunaria (L.) Sw. Ophioglossaceae UNISGVALBOT | Èrbo d’l’uo | W | Ripe sporangium | Topical application | Skin wounds Nose bleeding Internal bleeding | +   |     | ** P    |       |
| Brassica rapa L. Brassicaceae                  | Rabbo       | C      | Bulb        | Syrup                          | Cough                                    | +   |     | * C      |       |
| Calendula officinalis L. Asteraceae            | Courtézio   | C      | Flowers     | Infusion                       | Dysmenorrhea, for promoting blood circulation | +   |     | ** C    |       |
| Capsella bursa-postoris (L.) Medik. Brassicaceae| W           | Fruits | Topical application | Skin wounds                  |                                         | +   |     | * P      |       |
| Carum carvi L. Apiaceae                        | See Table 1 | W | Fruits | Infusion, liquor               | Digestive, carminative                   | +   | +   | * C      |       |
| Cetraria islandica L.(Ach.) Parmeliaceae UNISGVALCET | Èrbo d’a vélio Licchia | W | Thallus | Decoction, syrup | Cough, bronchitis | +   | +   | *** C   |       |
Table 2 Local medicinal plant uses recorded in the studied area (Continued)

| Plant Name | Scientific Name | Family | Common Name(s) | Use(s) | Therapeutic Use(s) | Plant Part(s) | Infusion, Decoction, Topical Application, Syrup, Alcohol, etc. | P + C |
|------------|-----------------|--------|---------------|--------|--------------------|---------------|--------------------------------------------------------------------------------|------|
| Chelidonium majus L. | Papaveraceae | Sireunno | Latex | Fresh topical applied | Warts | + | C |
| Conium maculatum L. | Apioideae | Sicutto | Aerial parts | Infusion | Abortive | + | P |
| Crataegus monogyna Jacq. | Rosaceae | Prusét | Aerial parts | Infusion | Hypertensive, venous insufficiency | + | P |
| Cyurus segetum Hill. | Asteraceae | UNISGVGB015 | Flowers | Eyebaths | Conjunctivitis | + | P |
| Cymodon dactylon L. (Pers.) | Poaceae | UNISVALCYN | Roots | Decoction | Diuretic | + | P |
| Datura stramonium L. | Solanaceae | UNISGVALEUR | Leaves | Inhalation (dried powdered leaves) | Asthma | + | P |
| Equisetum arvense L. | Equisetaceae | UNISGWAL020 | Sterile stem | Decoction | Topical application | Diuretic, to prevent prostatic cancer, Skin inflammations | + | C |
| Erica carnea L. | Ericaceae | UNISGVALERI | Aerial parts | Infusion | Urinary tract infections, diarrhea | + | P |
| Euphrasia alpina L. | Orobanchaceae | UNISGVALEUP | Flowers | Eyebaths | Conjunctivitis | + | P |
| F. excelsior L. | Oleaceae | UNISGVGB022 | Leaves | Infusion | Venous insufficiency, hypertension | + | P |
| Fragaria vesca L. | Rosaceae | UNISGVALEUP | Leaves | Topical application | Pimples, acne | + | P |
| Gentiana acaulis L. | Gentianaceae | UNISGVALA018 | Whole plant | Liquor, infusion | Appetizing, digestive | + | * |
| Gentiana lutea L. | Gentianaceae | UNISGVGB031 | Roots | Liquor, macerated in wine | Appetizing, digestive | + | P |
| Hypericum perforatum L. | Hypericaceae | UNISGWAL018 | Flowering aerial parts | Macerate in oil | Skin inflammations, burns, arthritis | + | ** |
| Hyssopus officinalis L. | Lamiaceae | UNISGVGB031 | Aerial parts | Infusion | Cough | + | P |
| Juniperus communis L. | Cupressaceae | UNISGVALEUP | Fruits | Infusion, liquor | Digestive | + | C |
| Lamium album L. | Lamiaceae | UNISGVALA018 | Aerial parts | Infusion | Dysmenorrhea | + | P |
| Larix decidua Mill. | Pinaceae | UNISGVGB031 | Sprouts, Resin, Pine cones | Infusion, Topical application, Syrup | Expectorant, Skin inflammations (remove splinters), Respiratory infections | + | C |
| Laurus nobilis L. | Lauraceae | UNISGVGB031 | Leaves, Fruits | Infusion | Digestive | + | P |
| Leontopodium nivale (Ten.) Huet ex Hand.-Mazz. | Asteraceae | UNISGVGB031 | Flowering tops | Infusion | Digestive | + | P |
| Linum usitatissimum L. | Linaceae | Lin | Seeds | Poultice, externally applied | Respiratory infections, Urinary infections, constipation | + | ** |
Table 2 Local medicinal plant uses recorded in the studied area (Continued)

| Plant Name                      | Common Name | Part Used | Preparation | Uses                                             | Rating |
|---------------------------------|-------------|-----------|-------------|--------------------------------------------------|--------|
| Malva sylvestris L. Malvaceae   | Malvo       | Whole plant | Decoctions  | Urinary and genital tract inflammations, digestive | +      |
| Marrubium vulgare L. Lamiaceae  | Marëfi      | Whole plant | Infusion    | Digestive                                        | +      |
| Matricaria chamomilla L. Asteraceae | Caramilho   | Flowers   | Infusion, externally applied in poultices Oleites | Urinary tract infections Bronchitis Earaches | +      |
| Melissa officinalis L. Lamiaceae | Melissa     | Leaves    | Infusion    | Neurorelaxant                                    | +      |
| Menta longifolia (L.) Huds. Lamiaceae | Méntatre    | Leaves    | Infusion    | Digestive                                        | +      |
| Myristica fragrans Houtt. Myristicaceae | Noce moscata | Seeds    | Grinded and ingested with sugar | Dysmenorrhoea                                 | +      |
| Ononis spinosa L. Fabaceae      | Ratabuou    | Roots     | Decoction   | Cystitis, in the prevention of prostate cancer    | +      |
| Origanum vulgare L. Lamiaceae   | Oouriënt    | Leaves    | Infusion    | Digestive                                        | +      |
| Parietaria officinalis L. Urticaceae | Pan-chaoudêt | Aerial parts | Infusion Urinary tract infections and for prevention prostate cancer | +      |
| Pelargonium zonale (L.) L'Hér. ex Aiton Geraniaceae | Geranio    | Leaves    | Topically applied (fresh) | Skin cuts, hamatomas, wounds | +      |
| Pilosella officinarum Vaill. Asteraceae | Èrbo dâ runh Ourellë d'rattë | W Leaved | Topical ly applied (fresh) | Skin cuts and wounds | +      |
| Pinus cembra L. Pinaceae        | Èlvou       | Cones, Sprouts | Syrup, Decoction | Expectorant Wounds | +      |
| Pinus mugo Turra, P. sylvestris L. Pinaceae | Pin        | Cones, Sprouts | Syrup, Decoction | Cough, bronchitis | +      |
| Plantago major L., P. lanceolata L. Plantaginaceae | Plantanh Plantônhe | W Leaves | Infusion Baths Topically applied (fresh) | Urinary and genital infections To prevent prostate cancer Bruises and haematomas | +      |
| Polygonum bistorta L. Polygononaceae | Èrparà     | Aerial parts | Infusion | Diuretic                                         | +      |
| Polypodium vulgare L. Polypodiaceae | Èrgaliso Rizouzettë | Roots | Decoction | Cough, digestive                                  | +      |
| Potentilla reptans L. Rosaceae  | Èrbo d’a sinquénò | Whole plant | Decoctions Baths | Urinary infections To prevent prostate cancer | +      |
| Primula heliotro (L.) Hill, P. veris L., P. vulgaris Huds. Primulaceae | See Table 1 | Flowers and roots | Infusion/Decoction | Diuretic, cough                                  | +      |
| Prunus avium (L.) L.            | See Table 1 | Stems | Infusion Topically applied | Diuretic Sprains | +      |
| Prunus domestica L. Rosaceae    | Dalmeizinie  | Resin    | Topically applied | Skin cuts and sprains                           | +      |
Table 2 Local medicinal plant uses recorded in the studied area (Continued)

| Plant Name                  | Author | Common Name | Part Used | Use | Medicinal Properties |
|-----------------------------|--------|-------------|-----------|-----|----------------------|
| Prunus dulcis (Mill.) D.A. Webb Rosaceae | Amandoulie | Seeds | Fresh eaten | Galactagogue | + * P |
| Rhododendron ferrugineum L. Ericaceae UNISGVGB035 | Brousé | Gall | Oleolite | Muscle pains | + * C |
| Rosa canina L. Rosaceae UNISGVGB018 | Bosou Agoulénsia | Fruits | Jam Decoction Infusion, in external applications on the eyes | Intestinal astringent | + + ** P |
| Rosa centifolia L. Rosaceae | Ruse | Petals | Infusion | Sore throat | + * C |
| Rosmarinus officinalis L. Lamliaceae UNISGWAL030 | Rousmarin | Leaves | Infusion | Digestive | + + * C |
| Rubus ulmifolius L. Rosaceae UNISGWAL038 | Rounzo | Leaves | Infusion | Sore throat and hoarseness, Acne and pimples, cicatrizing | + + ** P |
| Rumex acetosa L. Polygonaceae | See Table 1 | Leaves | Topically applied (fresh) | Insect bites | + * P |
| Rumex alpinus L. Polygonaceae | Lavaso | Leaves | Infusion | Cough | + * P |
| Salix alba L. Salicaceae | Gourie | Leaves | Infusion | Fever | + * P |
| Salvia officinalis L. Lamliaceae | Salvio | Leaves | Infusion | Oral disinfectant and antibacterial, headaches, digestive | + + ** C |
| Sambucus nigra L. Adoxaceae | See Table 1 | Flowers Fruits | Infusion Applied (fresh) in the mouth Jam | Hypertension Tooth abscess "Blood cleanser" | + + ** P |
| Satureja montana L. Lamliaceae | Séréa | Flowers | Infusion | Dysmenorrhea | + * P |
| Sempervivum montanum L. Crassulaceae UNISGVGB029 | | Aerial parts | Topically applied (fresh) | Skin cuts and burns | + * P |
| Silphium marianum (L.) Gaertn. Asteraceae UNISGVSYL | Pugn | Leaves Roots | Infusion Decoction | Diuretic, dysmenorrhea | + * P |
| Symphytum officinalis L. Boraginaceae UNISGVSYM | Èrbo dà panariss | Roots | Topically applied (fresh) | Muscle pains and skin infections | + * P |
| Tamacetum vulgare L. Asteraceae UNISGWAL006 | Tanao | Aerial parts | Infusion | Dysmenorrhea | + * P |
| Tanacetum officinalis L. Asteraceae UNISGWAL010 | Girasole Morpoursin | Roots | Decoction | Diuretic "blood cleansing" | + + * P |
| Teucrium chamaedrys L. Lamliaceae UNISGVGB019 | Calamandréo | Aerial parts | Infusion | Hypertension, dysmenorrhea | + + ** P |
| Thymus serpyllum L. Lamliaceae UNISGWAL029 | Sérpoul | Aerial parts | Infusion | Digestive | + + *** C |
| Tilia cordata Mill. Malvaceae UNISGVALTIL | Télh Tieul | Flowers | Infusion | Respiratory tract inflammations | + + *** C |
| Trigonella caerulea (L.) Ser. Fabaceae | Thé d’hi’ort | Aerial parts | Infusion | Digestive | + * C |
| Tussilago farfara L. Asteraceae | See Table 1 | Aerial parts | Infusion | Respiratory tract inflammations, fever | + + ** P |
produced a dramatic loss of Traditional Knowledge concerning veterinary practices.

**Waldensian versus Catholic ethnobotany: the possible role of cultural isolation from neighbours**

Figure 4 illustrates the overlap between the ethnobotany of Waldensians and that of their Catholic neighbours in the three analysed domains (folk wild plant foods, medicines, and veterinary food plants and remedies).

The comparison shows that Waldensians had, or have retained, a more extensive ethnobotanical knowledge, and that approximately only half of the recorded wild food and medicinal plants are known and used by both communities. Moreover, this convergence is more marked for the wild food plant domain.

Despite the fact that Waldensians nowadays live together with Catholics, intermarriage between the two religious communities did not exist until a few decades ago. Given the fact that vertical transmission (from grandmother to mothers and from mothers to daughters) of ethnobotanical knowledge is related to kinship networks and these are determined by religious affiliation, this factor may explain the divergence of the two ethnobotanies.

Moreover, the fact that the plant knowledge among Waldensians appears to be more extensive than among the Catholic population may be related to a less marked erosion of the traditional customs and the strong sense of identity Waldensians retain. The historical isolation of the Waldensian community, which survived for many centuries cut off from the rest of their neighbours but at the same time fostered strong ties to Central and Northern Europe, may have facilitated unique patterns of plant perception and use.

However, in the last few decades intermarriage between members of the two communities has become more common (generally bringing the new family into the Catholic faith), and this will probably further hybridize the ethnobotany of the two groups.

On the other hand, a stronger overlap of the ethnobotanies of two culturally distinct groups in the specific wild food domain has also been observed in other mountainous regions of Europe, and may be regarded as a common strategy for coping with the food security-centred struggles that marginalised Alpine populations had to face in the past [1].

**The Waldensian ethnobotany during the last century: a historical analysis**

Table 4 illustrates the overlap of ethnobotanical data collected at the end of the 19th Century and in the 1980s in one of the study valleys (Germanasca Valley) [28-30] with our current data.

Although few plants were reported in the ethnobotanical study published in 1900 [28,29] and few taxa were reported with their local names in the survey published in 1984 [30] (thus suggesting maybe a sampling based mainly on trained herbalists), more than half of these species recorded in these two studies are used in the same of similar ways today.
| Botanical taxon/ family and voucher specimen code # | Local name (folk taxon/generic) | Status Plant part(s) | Preparation and administration | Folk veterinary use(s) or treated disease(s) | Treated animals | Val Cat | Citations | Notes |
|---------------------------------------------------|---------------------------------|-----------------------|--------------------------------|--------------------------------------------|----------------|--------|-----------|-------|
| *Achillea erba-rotta* All. Asteraceae              | See Table 1                     | Aerial parts          | Infusion                       | Rumination disorders                       | CA + + * P      |        |           |       |
| *Aconitum napellus L.* Ranunculaceae               | Erbo toro                       | Whole plant           | Eaten fresh                    | Abortive                                   | CA + * P        |        |           |       |
| *Alcea rosea* L. Malvaceae                        | Malvone                         | Aerial parts          | Infusion                       | Rumination disorders                       | CA + * P        |        |           |       |
| *Artemisia absinthium L.* Asteraceae               | See Table 2                     | Aerial parts          | Fodder or in infusions         | Rumination disorders                       | CA, RA + + ** P |        |           |       |
| *Avena sativa* L. Poaceae                         | Avéno                           | Aerial parts          | Fodder (fresh)                 | Post-partum depurative                     | CA + * P        |        |           |       |
| *Calendula officinalis* L. Asteraceae              | Courtézio                       | Flowers               | Infusion                       | To facilitate pregnancy                     | CA + * P        |        |           |       |
| *Cerastia islandica* (L.) Ach. Parmeliaceae        | See Table 2                     | Thallus               | Decoction                      | Stomach disorders                          | CA + * P        |        |           |       |
| *Equisetum arvense* L. Equisetaceae                | See Table 2                     | Aerial parts          | Footbath                       | Infections of the paws                     | SH + * P        |        |           |       |
| *Euphorbia cyparissias* L. Euphorbiaceae          | UNISGVGB009                     | Fruits                | Fodder (dried)                 | Infections (esp. in the oral cavity)       | CA, PO, SH + * P |        |           |       |
| *Fagopyrum esculentum* Moench. Polygonaceae        | Granéét                         | Aerial parts          | Dried                          | Fodder                                      | CA, PO, PI + * P |        |           |       |
| *Festuca ovina* L. Poaceae                        | Grasoun                         | Aerial parts          | Dried                          | Fodder                                      | CA + * P        |        |           |       |
| *Foeniculum vulgare* Mill. Apiaceae               | UNISGVGB012                     | Aerial parts          | Fodder (fresh)                 | Galactagogue                                | CA + * P        |        |           |       |
| *Fraxinus excélio* L. Oleaceae                    | See Table 2                     | Leaves                | Fresh                          | Fodder                                      | CA + * P        |        |           |       |
| *Galium verum* L. Rubiaceae                       | UNISGVGALGAL                    | Flowering tops        | Dried                          | As rennet                                   | + * P           |        |           |       |
| *Gentiana lutea* L. Gentianaceae                  | See Table 1                     | Roots                 | Decoction                      | Rumination disorders                        | CA, SH + * P    |        |           |       |
| *Heracleum sphondylium* L. Apiaceae               | Plaoutasino                     | Aerial parts          | Fresh or dried                 | Fodder                                      | PO, RA + * P    |        |           |       |
| *Juniperus communis* L. Cupressaceae              | See Table 1                     | Fruits                | Fodder                         | To improve the skin health (making it shiny)| CA + * P        |        |           |       |
| *Laburnum alpinum* (Mill) Bercht. & J.Presl. Fabaceae | UNISGVGB037                | Leaves                | Fresh or dried                 | Fodder                                      | RA + * P        |        |           |       |
| *Larix decidua* Mill. Pinaceae                    | See Table 2                     | Resin                 | Topically applied              | Bruises, sprains, wounds                    | CA + + * C      |        |           |       |
| *Linum usitatissimum* L. Linaceae                 | See Table 2                     | Seeds                 | Fodder                         | “Blood cleansing”                            | CA + * P        |        |           |       |
| *Malva sylvestris* L. Malvaceae                   | See Table 2                     | Whole plant           | Decoction                      | Depurative during the menstrual cycle       | CA + * P        |        |           |       |
| Plant Name                  | Family       | Part Used | Preparation | Use                  | Efficacy | CA | SH | C  |
|----------------------------|--------------|-----------|-------------|----------------------|----------|----|----|----|
| **Marrubium vulgare** L. Lamiaceae | See Table 2 | Whole plant | Infusion | Ruminations disorders | CA + * | P  |
| **Matricaria chamomilla** L. Asteraceae | See Table 2 | Flowers | Infusion | Ruminations disorders | CA (calves) + * | P  |
| **Medicago sativa** L. Fabaceae | Luzerno | Aerial parts | Fresh or dried | Fodder | CA + + ** | C  |
| **Onobrychis vicifolia** Scop. Fabaceae | Jalét | Aerial parts | Fresh or dried | Fodder | CA + * | P  |
| **Ononis spinosa** L. Fabaceae | See Table 2 | Roots | Decoction | Depurative during the menstrual cycle | CA + * | P  |
| **Oxalis acetosella** L. Oxalidaceae | See Table 2 | Leaves | Eaten fresh or dry | Fodder | PO, RA + * | P  |
| **Parietaria officinalis** L. Urticaceae | See Table 1 | Aerial parts | Fresh | Fodder | PO + * | C  |
| **Pilosella officinarum** Vaill. Asteraceae | Ero bo ña runh | Whole plant | Fodder | Ruminations disorders | CA + * | P  |
| **Plantago major** L. P. lanceolata L. Plantaginaceae | See Table 2 | Leaves | Fresh or dried | Fodder | PI + * | P  |
| **Polyporus officinalis** Fries. Poliporaceae | Panouflo | Fruiting body | Fodder (ground) | Ruminations disorders | CA + + ** | P  |
| **Quercus petraea** (Matt.) Liebl. Fagaceae | Roure | Leaves | Fresh or dried | Fodder | GO + * | P  |
| **Secale cereale** L. Poaceae | Séel | Seeds→Flour | Fodder | Galactagogue | CA + + * | P  |
| **Sedum album** L. Crassulaceae | Picoulump | Leaves | Fresh | Fodder | PO + * | P  |
| **Silene vulgaris** (Moench) Garcke Caryophyllaceae | Eiclopèt | Leaves | Fresh or dried | Fodder | PO, RA + * | P  |
| **Stellaria media** (L.) Vill. Caryophyllaceae | Pavarino | Leaves | Fresh | Fodder | PO + * | P  |
| **Silybum marianum** (L.) Gaertn Asteraceae | Pugn | Roots | Decoction | Depurative during the menstrual cycle | CA + * | P  |
| **Tanacetum vulgare** L. Asteraceae | See Table 1 | Aerial parts | Infusion | Ruminations disorders | CA + * | P  |
| **Taraxacum officinalis** F.H.Wigg. Asteraceae | See Table 1 | Aerial parts | Fresh or dried | Fodder | PO + * | P  |
| **Thymus serpyllum** L. Lamiaceae | See Table 1 | Aerial parts | Topically applied in the mouth | Ruminations disorders, infections of the oral cavity | CA, SH + + * | P  |
| **Trifolium alpinum** L. Fabaceae | Fioun | Aerial parts | Fresh or dried | Fodder | CA + * | P  |
| **Triticum vulgare** Vill. Poaceae | Frounént | Aerial parts | Fresh or dried | Fodder | CA + + * | P  |
| **Ulmus glabra** Huds. Ulmaceae | Ouelme | Leaves | Fresh or dried | Fodder | PI + * | P  |
However, possible different research methods used in the current and past field studies make a detailed comparison very problematic, as in both of the past considered surveys, which were conducted by botanists, an exact description of the utilized sampling and ethnographic methods and, paradoxically, even an indication of collected plant vouchers are completely missing. The comparative analysis shows in any case a remarkable degree of resilience of traditional plant uses in the study area, despite the tremendous socio-economic changes that occurred during the last 120 years; other diachronic analyses recently conducted in the Balkans have also confirmed the survival of 19th Century folk plant uses to today [16,43].

Conclusions
Local plants have played, and still partially play, an important role in the context of food security and emic, domestic pathways of the management of human and animal health in the Western Alps.

A marked persistence of local knowledge regarding these plants among Waldensians confirms the importance of studying enclaves as well as cultural and linguistic “isles” in ethnobotany, which may represent both crucial reservoirs of folk knowledge and bio-cultural refugia [44].

On the other hand, the findings of this study indicate that a proper conservation of the bio-cultural heritage,
| Botanical taxon and family | Local uses recorded in 1900 [27,28] | Local uses recorded in 1984 [29]* | Local uses nowadays (current study) |
|---------------------------|--------------------------------------|-----------------------------------|-----------------------------------|
| Allium cepa L. (Amaryllidaceae) | NR | Decoction of the bulbs a diuretic | NR |
| Amelanchier ovalis Medik. (Rosaceae) | Fruits consumed as a snack by boys | NR | = |
| Anemone hepatica L. (Ranunculaceae) | Leaves externally applied on women breast for treating inflammations | NR | NR |
| Arctium lappa L. (Asteraceae) | NR | Infusion of the dried roots, as a depurative | = |
| Arnica montana L. (Asteraceae) | Alcoholic macerate of the flowers externally applied for treating cuts, rheumatism, and muscle pains | = |
| Artemisia genipi Weber ex Stechm. (Asteraceae) | NR | Aerial parts in infusion or alcoholic macerate (liquor) as a digestive | = |
| Beckwithia glacialis (L.) Á. Löve & D. Löve (Ranunculaceae) | Flowers in decoction, drunk as a diaphoretic | Decoction for treating toothaches | NR |
| Calendula officinalis L. (Asteraceae) | NR | Infusion of the dried flowers as a depurative | = |
| Campanula spicata L. (Campanulaceae) | NR | Fresh leaves, crashed, externally applied for treating cuts | NR |
| Cetraria islandica (L.) Ach. (Parmeliaceae) | NR | Decoction of the thallus as a digestive and expectorant | = |
| Chelidonius majus L. (Papaveraceae) | Latex externally applied on warts | NR | = |
| Crataegus ribidophylla Gand. (Rosaceae) | Fruits consumed | NR | ≠ |
| Gentiana acaulis L. (Gentianaceae) | NR | Whole plant or roots in infusion/decoction or wine macerate as appetizing and digestive | = |
| Hypericum perforatum L. (Hypericaceae) | Hung behind the house door, to prevent witcheries | Oil macerate of the fresh flowers as a cicatrizing | (as in 1984) |
| Laburnum anagyroides Medik. (Fabaceae) | Bark decocted and externally used for treating lice in cows and calves | NR | ≠ |
| Larix comosa officinalis (Vill) Kotl. & Pouzar (Fomitopsidaceae) | NR | The fruiting body, powdered, in infusion as a digestive | NR |
| Lathyrus sylvestris (Fabaceae) | Remedy (?) for cows when they calve | NR | NR |
| Lilium candidum L. (Liliaceae) | NR | Oil macerate of the fresh flowers as a cicatrizing | NR |
| Linum usitatissimum L. (Linaceae) | The seeds (in compresses?) as anti-rheumatic | NR | = |
| Malva sylvestris L. (Malvaceae) | Infusion of the leaves (?) as emollient, both for humans and animals | NR | = |
| Nasturtium officinale R.Br. (Brassicaceae) | Leaves consumed raw in salads | Leaves consumed raw in salads or in soup, as a depurative | NR |
| Onobrychis vicifolia Scop. (Fabaceae) | Fodder | NR | = |
| Oxalis acetosella L. (Oxalidaceae) | Leaves consumed raw in salads | NR | = |
| Papaver rhoes L. (Papaveraceae) | Flowers in decoction, drunk for treating toothache | NR | NR |
such as the ethnobotanical one, requires strategies, which carefully consider natural landscapes and resources as well as cultural and religious customs, since plant folk knowledge systems are the result of a continuous interplay between these two domains over centuries.

Finally, these neglected local plant resources may represent a key issue for fostering a sustainable development in an area of the Alps, which has been largely untouched by mass tourism and is looking with particular interest at eco-touristic trajectories.

### Competing interests

The authors declare that they have no competing interests.

### Authors’ contributions

AP conceived the study; GB gathered the data in the field in the Germanasca and Chisone valleys, while AP gathered the data in the Pellice

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Table 4 Comparison of the local plant uses recorded in the Germanasca Valley in 1900 and 1984 with those collected in the current study (Continued)

| Plant Taxa | 1900 Plant Use | 1984 Plant Use |
|------------|----------------|----------------|
| Parietaria officinalis L. (Urticaceae) | Decoction of the dried aerial parts, as a diuretic and depurative | ≈ |
| Polygonum aviculare L. (Polygonaceae) | Infusion of the dried aerial parts (?) as an astringent | NR |
| Rosa canina L. (Rosaceae) | Flowers consumed as a snack by boys | Infusion of the flowers externally applied for treating eye inflammations | ≈ (as in 1984) |
| Rosa centifolia L. (Rosaceae) | Petals (not clarified how) for treating eye inflammations | NR | ≠ |
| Rubus idaeus L. (Rosaceae) | Fruits consumed; leaves as fodder | NR | = |
| Rubus ulmifolius Schott (Rosaceae) | Fruits consumed | NR | = |
| Sorbus aria (L.) Crantz (Rosaceae) | Fruits consumed as a snack by boys | NR | ≠ |
| Tanacetum vulgare L. (Asteraceae) | Fresh aerial parts consumed in salads as a depurative | = |
| Thymus serpyllum L. (Lamiaceae) | Infusion of the flowering tops as a digestive and anti-tussive | ≈ |
| Tilia x europea L. (Malvaceae) | Flowers in diaphoretic decoctions; leaves as fodder | NR | = |
| Trifolium spp. (Fabaceae) | Fodder | NR | = |
| Tussilago farfara L. (Asteraceae) | Crashed fresh leaves, externally applied, as a suppurative | ≠ |
| Urtica dioica L. (Urticaceae) | Young aerial parts consumed in soups as a depurative; dried roots and leaves, decocted, for treating alopecia; dried leaves used as fodder for hens for increasing the egg production | = |
| Verbascum phlomoides L. (Scrophulariaceae) | Decoction of the flowers for treating catarrhs | = |
| Verbena officinalis L. (Verbenaceae) | Fresh aerial parts, crashed and mixed with pork fat, externally applied for treating cuts | ≠ |
| Veronica prostrata L. (Plantaginaceae) | Infusion for treating catarrhs and inflammations | = |
| Viola biflora L. (Violaceae) | Infusion of the dried flowers for treating coughs and as an intestinal anti-inflammatory; mixed with milk and bread, externally applied, as a suppurative | NR |
| Viola calcarata L. (Violaceae) | Leaves consumed in soups | Infusion of the dried flowers for treating coughs and as an intestinal anti-inflammatory; mixed with milk and bread, externally applied, as a suppurative | ≈ (as in 1984) |
| Viola tricolor L. (Violaceae) | Not specified, the resulting preparation (decoction of the aerial parts?) considered good for those women, who had given a baby | Infusion of the dried flowers for treating coughs and as an intestinal anti-inflammatory; mixed with milk and bread, externally applied, as a suppurative | ≠ |

*We considered folk uses referred only to those plant taxa, for which local names were reported.

(?): hypothesized plant use details.

NR: not recorded; = same use; = similar use; ≠ different uses.
and Angrogna valleys; AP and GB analysed the collected data; AP drafted the manuscript. Both authors read and approved the final manuscript.

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Author details
1 Via del Pino 108, Pinerolo (Torino) I-10064, Italy. 2 University of Gastronomic Sciences, Piazza Vittorio Emanuele 9, Bra/Pollenzo I-12060, Italy.

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References
1. Quave CL, Pieroni A. A reservoir of ethnobotanical knowledge informs resilient food security and health strategies in the Balkans. Nat Plants. 2015;1:4021.
2. Pieroni A, Quave CL. Traditional pharmacopeiae and medicines among Albanians and Italians in southern Italy: a comparison. J Ethnopharmacol. 2005;101:258–70.
3. Menendez-Baceta G, Aceituno-Mata L, Molina M, Reyes-García V, Tardío J, Pardo-de-Santayana M. Medicinal plants traditionally used in the northwest of the Basque Country (Biscay and Alava), Iberian Peninsula. J Ethnopharmacol. 2014;152:113–34.
4. di Tito A, Luczaj LJ, Quave CL, Redzic S, Pieroni A. Traditional food and herbal uses of wild plants in the ancient South-Slavic diaspore of Mumdimatar/ Montemorto (Southern Italy). J Ethnobiol Ethnomed. 2012;8:21.
5. Pickr H, Haselmair R, Kuhn E, Schunko C, Vogl CR. Transformation of traditional knowledge of medicinal plants: the case of Tyroleans (Austria) who migrated to Australia, Brazil and Peru. J Ethnobiol Ethnomed. 2012;8:44.
6. Kujavka M, Hilgert NI. Phytotherapy of polish migrants in Misiones, Argentina. Legacy and acquired plant species. J Ethnopharmacol. 2014;153:810–30.
7. Kujavski M, Pieroni A. Plants used as food and medicine by polish migrants in Misiones, Argentina. Ecol Food Nutr. 2015;54:255–79.
8. Pieroni A, Cianfaglione K, Nedelcheva A, Hajdari A, Mustafa B, Quave CL. Resilience at the border: traditional botanical knowledge among Macedonians and Albanians living in Gollobordo, Eastern Albania. J Ethnobiol Ethnomed. 2014;10:131.
9. Ceuterick M, Vandeboek I, Pieroni A. Resilience of Andean urban ethnobotanies: a comparison of medicinal plant use among Bolivian and Peruvian migrants in the United Kingdom and in their countries of origin. J Ethnopharmacol. 2011;136:27–54.
10. Ceuterick M, Vandeboek I, Tony B, Pieroni A. Cross-cultural adaptation in urban ethnobotany: the Colombian folk pharmacopoeia in London. J Ethnopharmacol. 2008;120:342–59.
11. Luczaj L. Changes in the utilization of wild green vegetables in Poland since the 19th century: a comparison of four ethnobotanical surveys. J Ethnopharmacol. 2010;128:395–404.
12. Sökünd R, Kalle R. The use of teatamed in Estonia, 1880s-1990s. Appetite. 2012;59:23–30.
13. Sökünd R, Kalle R. Change in medical plant use in Estonian ethnomedicine: a historical comparison between 1888 and 1994. J Ethnopharmacol. 2011;135:251–60.
14. Pieroni A, Sheik QC, Ali W, Tony B. Traditional medicines used by Pakistani migrants from Mirpur living in Bradford, Northern England. Complement Ther Med. 2008;16:1–6.
15. Pieroni A, Gray C. Herbal and food folk medicines of the Russlanddeutschen living in Künzelsau/Täläcker, South-Western Germany. Phytother Res. 2008;22:889–901.
16. Pieroni A, Reishehi B, Nedelcheva A, Mustafa B, Hajdari A, Kolosova V, et al. One century later: the folk botanical knowledge of the last remaining Albanians of the upper Reka Valley, Mount Korab, Western Macedonia. J Ethnobiol Ethnomed. 2013;9:22.
17. Pieroni A, Giusti ME. Alpine ethnobotany in Italy: traditional knowledge of gastronomic and medicinal plants among the Occitans of the upper Varalta valley, Piedmont. J Ethnobiol Ethnomed. 2009;5:32.
18. Vitalini S, Iriti M, Puricelli C, Ciuchi D, Segale A, Fico G. Traditional knowledge on medicinal and food plants used in Val San Giacomo (Sondrio, Italy) - An alpine ethnobotanical study. J Ethnopharmacol. 2013;145:517–29.
19. Dei Cas L, Pugni F, Fico G. Tradition of use on medicinal species in Valfunva (Sondrio, Italy). J Ethnopharmacol. 2015;163:113–34.
20. Vitalini S, Tomé F, Fico G. Traditional uses of medicinal plants in Valvestino (Italy). J Ethnopharmacol. 2009;121:106–16.
21. Abbert C, Mayor R, Roguet D, Spichiger R, Hamburger M, Potterat O. Ethnobotanical survey on wild alpine food plants in Lower and Central Valais (Switzerland). J Ethnopharmacol. 2014;151:624–34.
22. Mattaila G, Quave CL, Pieroni A. Traditional uses of wild food and medicinal plants among Brigasc, Kylé, and Provençal communities on the Western Italian Alps. Genet Res Crop Evol. 2013;60:587–603.
23. Pieroni A, Giusti ME, Quave CL. Cross-cultural ethnobotany in the western Balkans: medical ethnobotany and ethnobotzoology among Albanians and Serbs in the Plettet Plateau, Sandzak, South-Western Serbia. Hum Ecol. 2011;39:333–49.
24. Tourn G, Valdés I. La singolare vicenda di un popolo-chiesa (1170–2008). Torino: Claudiana, 2008.
25. International Society of Ethnobiology. The ISE Code of Ethics. http://www.ethnobiology.net/what-we-do/core-programs/ise-ethics-program/code-of-ethics/ (2008). Accessed 25 Jan 2015.
26. Pignatti S. Flora d’Italia. Bologna: Edagricole, Bologna; 1997.
27. Stevens PF. Angiosperm Phylogeny Website. Version 13. http://www.mobot.org/MOBOT/Research/PAweb/ (2012). Accessed 12 March 2015.
28. Pons G. Primo contributo alla flora popolare valdese. Boll Soc Ital Bot. 1900;1:101–9.
29. Pons G. Flora popolare valdese, secondo contributo. Boll Soc Ital Bot. 1900;1:216–222.
30. Lomagno Caramelli R, Piervittori P, Lomagno PA, Rolando C. Fitosferapia popolare nelle valli Chisone e Germanasca. Nota prima: Valle Germanasca e bassa Val Chisone. Ann Fac Sci Agr Univ Torino. 1984;XXX:259–98.
31. Pieroni A, Quave CL. Pioneering ethnobotanists in Italy. In: Svanberg I, editors. Pioneers in European ethnobiology. Uppsala: Uppsala Universitet. 2014; p. 263–71.
32. Mattiolo G. “Phytoalimurgia Pedemontana” ossia Censimento delle Specie vegetali alimentari della Flora spontanea del Piemonte. Torino: Bona; 1918.
33. Ghirardini MP, Carli M, del Vecchio N, Rovati A, Cova G, Valigi F, et al. The importance of a taste. A comparative study on wild food plant consumption in twenty-one local communities in Italy. J Ethnobiol Ethnomed. 2007;3:22.
34. Musset D, Dorothy D. La mawe et l’erba bianca. Salagon: Musée départemental ethnologique de Haute-Provence; 2006.
35. Comara L, La Rocca A, Terrizzano L, Dente F, Mariotti MG. Ethnobotanical and phytomedical knowledge in the North-Western Ligurian Alps. J Ethnopharmacol. 2014;155:463–84.
36. Mabey R. Flora Britannica. The definitive new guide to wild flowers, plants and trees. London: Chatsworth & Winds; 1997.
37. Leyel CF. Herbal delights. London: Faber & Faber; 1937.
38. Guarerra PM, Usi e tradizioni della flora italiana. Medicina popolare ed etnobotanica. Roma: Aracne; 2006.
39. Warashina T, Urnheara K, Miyase T. Flavonoid glycosides from Botrychium tennum. Chem Pharm Bull (Tokyo). 2012;60:1561–73.
40. Pizzardi G, Eynard W, La Cucina Valdese. Torino: Claudiana; 2006.
41. Agelet A, Vallès J. Studies on pharmaceutical ethnobotany in the region of Pallars (Pyrenees, Catalonia, Iberian Peninsula). Part III. Medicinal uses of non-vascular plants. J Ethnopharmacol. 2003;84:229–34.
42. Rigat M, Bonet MA, Garcia S, Garnatje T, Vallès J. Studies on pharmaceutical ethnobotany in the high river Ter valley (Pyrenees, Catalonia, Iberian Peninsula). J Ethnopharmacol. 2007;113:267–77.
43. Luczaj L, Dolina K. A hundred years of change in wild vegetable use in southern Herzegovina. J Ethnopharmacol. 2015;166:297–304.
44. Barthel S, Cramley CL, Svedin U. Biocultural refugia: combating the erosion of diversity in landscapes of food production. Ecol Soc. 2013;18:71.