



“We Became Rich and We Lost Everything”: Ethnobotany of Remote Mountain Villages of Abruzzo and Molise, Central Italy

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Abstract

Profound socioeconomic changes affected mountains of Central Italy during the last century and many traditional agro-pastoral activities were abandoned. A few ethnobotanical studies in this area have specifically documented local wild plants used decades ago, but without analyzing in-depth how and why Traditional Ecological Knowledge (TEK) has eroded or changed over time. In this study, we 1) document ethnobotanical uses of four high-altitude remote villages of Central Italy, 2) discuss how these uses have changed over time, comparing them with fieldwork that was conducted 40 years earlier; and 3) assess how plant uses have changed across space, particularly whether the remoteness of villages or the occurrence of Sacred Natural Sites (SNS) have affected TEK linked to wild plants. Sixty semi-structured interviews revealed the use of 83 taxa belonging to 35 families. We did not find any relationship between SNS and the richness of TEK, as these SNS were not inhabited by monastic communities that could have shared their scholarly knowledge. There was not a relationship between remoteness and richness of TEK. The common statement emerging from the field, “We became rich and lost everything”, revealed how socio-economic changes resulted in the rapid abandonment of traditional practices, while the ubiquity of pharmacies may have contributed to the erosion of ethnomedicinal knowledge.

Keywords Sacred natural sites · Inner areas · Traditional ecological knowledge · Wild food and medicinal plants · Abruzzo, Latium, and Molise National Park · Apennines

Introduction

The mountainous Apennine region of Central Italy has been shaped over centuries by agricultural, pastoral, and forest practices that changed significantly during the last 100 years (Romano 1995). These complex landscapes represent an invaluable heritage of animal and plant biodiversity and cultural and economic resources (Métailié 2006).

In the last decade, the Italian government has sought to reverse the depopulation and marginalization of rural areas by promoting strategies for reducing hydrogeological instability and triggering development. These measures are grouped

under the overall “Strategy for Inner Areas” that classified each Italian municipality into one of the six categories (from central to ultraperipheral) depending on the distance (in time) to basic services, including hospitals, regional railway stations, and schools. In Abruzzo, 70% of the municipalities are classified as inner areas, being mainly intermediate (between 20 and 40 min from central municipality services), while there are approximately 150 peripheral municipalities (between 40 and 75 min from services) and 24 ultraperipheral municipalities (more than 75 min away). Three National Parks of great biodiversity are located in these inland Abruzzo areas. While Idolo *et al.* (2010) noted the link between biodiversity hotspots and richness of traditional ethnobotanical knowledge (TEK), in relation to the “Strategy for Inner Areas” we hypothesize that very remote contexts such as ultraperipheral municipalities may hold more ethnobotanical knowledge as isolation may have contributed to reducing knowledge erosion (Wezel and Ohl 2005).

We conducted our research in the framework of the BioESSaNS (Biodiversity and Ecosystem Services of Sacred Natural Sites) project and therefore we also sought to assess whether there are differences in TEK richness that can be

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accounted for by proximity to or distance from a sacred natural site (SNS). We selected the SNSs of Madonna di Monte Tranquillo (Pescasseroli, L'Aquila province) and Eremo di Madonna dell'Altare (Palena, Chieti province). Both SNSs are located in isolated and remote areas, the first being on top of the mountains (1600 masl) separating Latium from Abruzzo, and the second lying in an impenetrable area of forest. In previous research in Tuscany we found that SNS managed for long periods of time by monastic communities may contribute to extent of TEK of local residents (Mattalia *et al.* 2019a).

A few studies analysing the correlation between biocultural diversity and Italian SNSs have been published in the last decade (Frascaroli 2013; Frascaroli *et al.* 2014; Schmid *et al.* 2015; Mattalia *et al.* 2019a, b, 2020), and there are none addressing a possible relationship between TEK richness and remoteness. Conversely, since 1975, there are many studies that focus on Abruzzo ethnobotany and in particular ethnomedicine (Tammaro and Pietrocchia 1975; Tammaro 1976, 1977; Chichiriccò *et al.* 1980; Guarrera 1987; De Simoni and Guarrera 1994; Guarrera 2003; Leporatti and Corradi 2001), wild plants for food preparations (Manzi 1999), and ethno-veterinary uses (Manzi 1989), as well two on the ethnobotany of Abruzzo, Latium, and Molise National Park (D'Andrea 1982; Idolo *et al.* 2010) and four on the Molise region (Menale *et al.* 2006; Guarrera *et al.* 2008; Di Tizio *et al.* 2012; Di Renzo 2015; Fortini *et al.* 2016).

While our overall objective in this study is documenting the use of wild and semi-domesticated plants for food, medicinal and veterinary, and handicraft purposes in high-altitude remote villages of Central Italy, our specific objectives are:

1. to compare our regarding the folk use of wild and semi-domesticated plants with an ethnobotanical study conducted in the same area 40 years ago by D'Andrea (1982);
2. to discuss whether the remoteness of the selected study sites (classified according to the “Strategy for Inner Areas”) affects their TEK related to wild plants;
3. to discuss whether TEK is influenced by distance from SNSs.

Material and Methods

We selected four villages with fewer than 800 inhabitants located over 1000 masl in Abruzzo and Molise (Fig. 1 and Table 1). Two, Opi and Barrea, are located within the Abruzzo, Latium, and Molise National Park, founded in 1923 as the National Park of Abruzzo, but changed in 2001 when it was extended to include some areas of Latium and Molise. The landscape of the Park is a mosaic of beech forests, dry grasslands, and abandoned pastures (Fig. 1).

Pescopennataro village is famous as a site of important woodlands, including on side of the village Turkey oak, silver fir, and beech woods (Allegrezza and Biondi 2008), while on the other side there are some abandoned pastures and a few agricultural fields. Gamberale village lies in an upland area with some agricultural fields, abandoned pastures, and beech forests. All the villages are characterized by an agro-pastoralist economy that lasted until the Second World War when there was significant emigration to Northern Italy and Europe, and such traditional activities were almost entirely abandoned. Pastoralism has had the greatest influence on Central Apennine landscapes, especially transhumance patterns characterized by seasonal movements of sheep flocks from temperate flat areas to higher mountainous areas in late spring and early autumn. Indeed, many changes, including industrialization and rural emigration, have resulted in a rapid decline of traditional activities that are now practiced to a very limited extent. Nevertheless, the traditional transhumance movements between the Apennines and Northern Apulia date back to the second century BC (Colecchia 2015). Local informants noted that at the time of WWI there were around 40,000 sheep in the area. Depopulation has been a common phenomenon with more than 25% of the inhabitants leaving between 1971 and 2001, as has population aging. Centres (as in the “Strategy for Inner Areas”) are approximately an hour's drive away in the best travel conditions. In wintertime, our study villages are often isolated due to heavy snowfall.

The climate is classified as Cfb according to the Köppen-Geiger system, which denotes a temperate oceanic climate characterized by the coldest month averaging above 0 °C, and at least four months averaging above 10 °C. The average yearly temperature is around 9 °C, with temperatures averaging around 0–1 °C in January and February and 24–25 °C in July and August. Annual rainfall is around 800 mm, evenly spread throughout the year.

In summer 2017, we conducted 60 interviews among elderly villagers. We selected 15 participants from each of the four villages using the snowball technique. The focus of the semi-structured interviews was on folk knowledge of wild and semi-domesticated plants used for both medicinal and food purposes, although other areas of plant use were also discussed. We define semi-domesticated plants as those species that have been cultivated and then abandoned, thus returning to a wild state (such as fruit trees). Prior informed consent was obtained verbally before each interview and the Code of Ethics of the International Society of Ethnobiology (ISE 2008) was strictly followed. Thirty voucher specimens were collected with the help of our interviewees and identified according to the Flora d'Italia (Pignatti 1982), and subsequently stored at the Herbarium of the University of Gastronomic Sciences, Pollenzo, Italy. We collected vouchers only from herbaceous plants, not trees. For nomenclature we used “The Plant List” database (The Plant List 2013), while

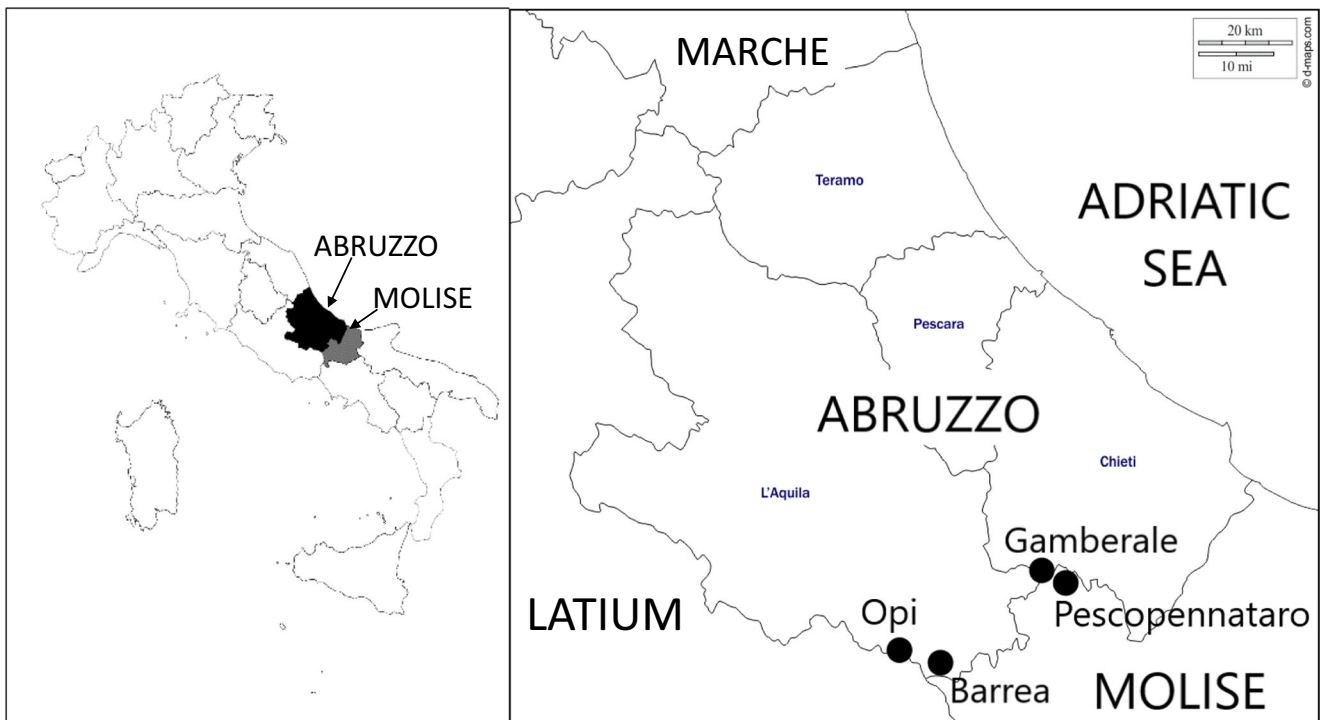


Fig. 1 Map of the study area

for family assignments we followed the Angiosperm Phylogeny Group designations (Stevens 2001). In cases where it was not possible to collect voucher specimens, we identified taxa according to the name(s) and descriptions provided by the interviewees.

We reviewed ethnobotanical studies conducted in Abruzzo and Molise to verify whether previous studies coincided with our study area. While we did not find any previous ethnobotanical research in Gamberale and Pescopennataro, we did find two publications (Idolo *et al.* 2010; D'Andrea 1982) regarding Opi and Barrea and more generally the Upper Sangro Valley. In order to discuss the data diachronically, we selected the study by D'Andrea since it allows a comparison with data gathered some 40 years ago. Unfortunately, since its main aim was to update the floral inventory of Abruzzo National Park,

the methodology was not discussed. Therefore, we were limited to a qualitative comparison.

Results and Discussion

We recorded 83 taxa belonging to 35 families (see Appendix). Sixteen taxa were common to all the villages and eight of them were mentioned by at least 20% of interviewees in each village. The most relevant taxa included forest fruits (*Fragaria vesca* L. and *Rubus ulmifolius* Schott), wild and semi-domesticated fruits (*Malus sylvestris* Mill., *Prunus domestica* L., and *Pyrus* spp.), green wild plants (*Taraxacum campylodes* G.E. Haglund. and *Chenopodium bonus-henricus* L.) as well as a single medicinal plant (*Malva* spp.). The most

Table 1 Main characteristics of the studied villages * according to the “Strategy for Inner Areas”

| Study site | No. of inhabitants | Altitude (m asl) | Distance from a centre (minutes) and classification* | Location in relation to the selected SNS | Park present in its territory |
|--------------------|--------------------|------------------|--|--|---|
| Opi (O) | 406 | 1250 | 69 (Avezzano) Peripheral | Close (Madonna di Monte Tranquillo) | National Park of Abruzzo, Latium and Molise |
| Barrea (B) | 705 | 1060 | 65 (Sulmona) Ultrapерipheral | Distant (Madonna di Monte Tranquillo) | National Park of Abruzzo, Latium and Molise |
| Gamberale (G) | 293 | 1343 | 55 (Isemia) Ultrapерipheral | Close (Madonna dell'Altare) | Majella National Park |
| Pescopennataro (P) | 285 | 1237 | 52 (Isemia) Peripheral | Distant (Madonna dell'Altare) | |

well-represented families were Asteraceae (14 taxa), Rosaceae (12 taxa), and Lamiaceae (7 taxa).

As recorded in other Italian contexts (Mattalia *et al.* 2019b), fewer wild plants are used for medicinal purposes than for food uses, probably because people have been relying on the National Health System for a long time now (Table 2). The most recorded food uses were “boiled (and stir fried),” “soup,” and “raw” for green leafy plants, and “jam,” “liquor,” and “raw” for fleshy fruits. However, a few more complex recipes were also reported, for instance, as dumpling filling or pasta sauce.

Residents in the National Park have a long tradition of foraging, not only for home-consumption as in the other villages, but also for gathering medicinal plants for sale to pharmaceutical companies (Archival documents of the Parco Nazionale d’Abruzzo, Lazio e Molise). Indeed, an aged interviewee reported having rented a donkey to harvest different varieties of *Gentiana* spp. and *Atropa belladonna* L. for sale.

The Relevance of Wild Fruits

Over 20% of the recorded taxa were wild fruits, which were for the most part eaten raw and processed as jam, followed by liquors, and some medicinal teas. Preserves were particularly important in the past as for a few months in wintertime the ground is covered with metres of snow and consequently no fresh wild plants are available. Most of those fruits belong to the Rosaceae family and four of them to the genus *Prunus*. Many interviewees, particularly within the National Park, recalled the use (mainly in the past) of melucce and perucce, wild apples and pears, respectively. They were often used in salty recipes such as preserved in salt and vinegar (and then in salad), vinegar and olive oil, salt and water, but also baked in a woodstove (after bread has been baked) and preserved with wine and sugar to be eaten after a fermentation process in the cellar. Some informants reported having matured fruits in straw when they used to cultivate wheat.

The survival of ecosystems that produce such fleshy fruits are crucial not only for the maintenance of ethnobotanical knowledge of local populations but also for sustaining *Ursus arctos marsicanus*, a bear endemic to Central Italy that

survives in a small population at high risk of extinction (Morini *et al.* 2017) and bases its diet on many of the wild fruits listed by local inhabitants. Indeed, Opi inhabitants observed that wild pears and apples “were so good, but maybe it [the decline of the bear population] was due to hunger” and so now “we leave wild pears and apples to the bears.”

Moreover, an informant in Pescopennataro provided a recipe for bronchitis using pomegranate skin, dry figs, apple, sugar, bay leaves, and barley boiled together, which is similar to ones reported in Calabria (Mattalia *et al.* 2020).

The Unbreakable Bond Between “Orapi” and Shepherding

Orapi (*Chenopodium bonus-henricus*) was reported in all the study sites, but especially in Opi where 100% of the interviewees mentioned it. This wild plant was often referred to in two narratives. The first one concerned changes in the pastoral landscape and the second one the revival and economic importance of the landscape for young local foragers.

Many local inhabitants reported that orapi grows abundantly in places where sheep stop (stazzi) or graze as their manure greatly contributes to its growth. Indeed, many villagers noted that the disappearance of sheep herding, which characterized the area for many centuries, resulted in a decrease of orapi, thus confirming the findings of Guarrera and Manzi (2005).

At the same time, both local and outside factors have encouraged local young people to forage for orapi to sell in the market (for 10 € per kilo), including the need for more specialized foragers as it is more difficult to find it today, an ageing population, as well as the increasing popularity of this wild plant and growing demand for supply to local restaurants. However, some locals consider the revival of this plant “weird” as “until few years ago, no one wanted to eat it because it comes from sheep feces.”

Orapi is generally boiled, stir-fried, prepared in soups, pasta such as gnocchetti, or as dumpling filling, and sometimes frozen for later consumption. Orapi is characterized by quite a strong taste that does not require further seasoning. Due to its (decreasing) availability in mountain pastures (up to 2000 masl), orapi was also reported to be eaten by shepherds, thus

Table 2 Distribution of recorded taxa among the four selected sites (*past uses)

| | No. OF TAXA | | No. OF MEDICINAL TAXA | No. OF FOOD TAXA | No. OF FOOD -MEDICINAL TAXA |
|----------------|----------------|----------------|-----------------------|------------------|-----------------------------|
| | CURRENTLY USED | NO LONGER USED | | | |
| OPI | 32 | 7 | 8 (+4*) | 21 (+3*) | 3 |
| BARREA | 38 | 15 | 5 (+8*) | 30 (+7*) | 3 |
| GAMBERALE | 34 | 8 | 6 (+1*) | 27 (+7*) | 1 |
| PESCOPENNATARO | 46 | 7 | 10 (+3*) | 30 (+4*) | 6 |

representing one of the elements of the local pastoral diet. Informants reported that it is possible to buy not only orapi but also fragoline (*Fragaria vesca*), which is widely used for liquor making. Casselle (*Bunias erucago* L.), wild leafy plants prepared like orapi, was also reported to be an important resource in all the study sites except Opi.

In order to prevent the overexploitation of wild resources, and due to their location within an important conservation area, the park administration imposed some limitations on forest and pasture foraging for personal use by local inhabitants. Specifically, these regulations, applied to some areas, restricts the harvest of *Fragaria vesca* and *Rubus idaeus* L. to 0.3 kg per family per day, and of *Rubus ulmifolius*, *Asparagus acutifolius* L., *Juniperus communis* L., *Cichorium intybus* L., *Taraxacum campyloides*, and *Chenopodium bonus-henricus* to 1 kg per family per day. Moreover, despite being widely utilized locally, the harvest of any part of a species belonging to the genus *Gentiana* spp. is forbidden (Ente Autonomo Parco Nazionale D’Abruzzo, Lazio E Molise 2011).

Ethnobiological Traces of Centuries-Long Pastoral Activity

In addition to orapi, other species were mentioned in relation to pastoral activities, and in particular three products: escargot, wine, and artichoke-like plants.

Escargots - locally called *ciammarughe* - were often referred to as a typical pastoral meal as they were collected during grazing time, preserved in jars until they could be cleaned, and then boiled with some wild herbs such as *Clinopodium nepeta* (L.) Kuntze, *Origanum vulgare* L. or *Thymus* spp. Many interviewees reported this tradition but also claimed that they do not prepare such food anymore. However, the use of these gastropods is still vivid in the local collective ethnobiological memory and several interviewees recounted: “we celebrated when shepherds brought the snails from the mountains (and especially from Monte Greco),” and also the proverb “in the months with ‘r’ snails should not be eaten” as they are hard and not tasty. Moreover, many people reported the preparation methods as indeed “*la lumaca s’ha da curà*”, meaning that the escargots have to be prepared and in particular by feeding them large leaves and washing them with water and salt twice, and then with water and vinegar, before cooking them with *Clinopodium*. Escargots are also considered a remedy for a styte by applying one locally, and “when the animal dries up the styte will also dry.” Moreover, these gastropods are believed to cure ulcers if they are eaten alive.

Wine (as well as olive oil) was one of the most important products “imported” through Apulian transhumance, brought back by returning shepherds. Specifically, a few interviewees reported that walnut fruits (*Juglans regia* L.) were infused into a carboy of red wine that came from Apulia on Saint John’s

Day (June 24th). The carboy was later exposed to the sun, until it was ready to be drunk as a liqueur. Also, *Gentiana* spp. was reported to be infused in white wine which might also have its origin in transhumant movements. This shows the crucial importance of transhumance for the local culture (Pratesi and Tassi 1998) and the possible osmosis of knowledge and practices between Abruzzo and Apulia.

Interviewees reported three different wild artichokes, a typical pastoral food, including *Carlina acanthifolia* All. subsp. *acanthifolia*, whose buds were eaten raw, *Centaurea calcitrapa* L., whose whorls were boiled, and *Dipsacus fullonum* L., whose young aerial parts were boiled with chili or eaten raw with vinegar during times of famine (for instance, after the Second World War). Such records bear witness to past uses of local resources that were often encountered by chance during agro-pastoral activities. Their consumption generally ceased with the decline of those traditional practices. Informants also highlighted the paramount importance of sheep in the past and provided a number of medicinal remedies using sheep products, such as the topical application of a wool cloth for toothache and earache, and the application of the entrails of a sheep partly eaten by a wolf on the abdomen of a pregnant woman to prevent miscarriage.

Traditional Knowledge Erosion

Myriam D’Andrea conducted research between 1977 and 1979 in the then Abruzzo National Park entitled “The official plants of Abruzzo National Park and their folk uses in the Upper Sangro Valley” that included the villages of Opi and Barrea for which she recorded the use of 53 wild plant taxa for food, medicinal, and veterinary purposes, approximately half of which we also identified in our study (D’Andrea 1982). We also observed that medicinal uses of multifunctional taxa (having both food and medicinal purposes) were no longer in use and the loss of knowledge regarding veterinary remedies. Our informants reported that *Cichorium intybus*, *Gentiana dinarica* Beck., *Juglans regia*, *Juniperus communis*, *Prunus spinosa* L. and *Rubus ulmifolius* are used only as food although D’Andrea (ibid.) reported their additional medicinal uses. Moreover, none of our informants listed the five taxa (*Borago officinalis* L., *Elymus repens* (L.) Gould, *Juglans regia*, *Juniperus sabina* L. and *Marrubium vulgare* L.) she reported as used for veterinary treatments.

The shared uses we recorded included *Chelidonium majus* latex for treating warts, *Crataegus laevigata* as a sedative and a cardiotoxic, *Malva* spp. infusion for abdominal pain relief and as a laxative, *Matricaria recutita* as a tranquilizer, the flowers of *Sambucus nigra* as a laxative, and *Tilia cordata* infusion as a panacea, and as food *Gentiana* spp., *Prunus spinosa*, *Juniperus communis*, and *Juglans regia*. The erosion of ethnomedicinal knowledge may be due to the availability of cheap and effective medicinal preparations and access to free

medical advice and treatment in every village. The loss of ethno-veterinary knowledge, also observed in other Mediterranean contexts (e.g., Bullitta *et al.* 2007; Benítez *et al.* 2012), may be the consequence of social changes including industrialization and urbanization that resulted in the rapid decline of traditional practices including small-scale animal breeding. We found only common, easily identified and familiar plants remain in use.

Forest Traditional Knowledge

We found seven different categories of wood uses, including firewood, the most common (*Fagus sylvatica* L. is considered good for barbecues), kitchen tools (such as mortars for salt, bottles, ladles, wine vats), building materials (such as tiles, ceiling beams, railway tracks), agricultural tools (pitchforks, shepherd's crooks, animal collars, fencing, etc.), handicrafts (e.g., statues), charcoal for cooking, and furniture (chairs, tables, etc.) (Table 3). Some interviewees reported that many wild strawberries (*Fragaria vesca*) grow in the charcoal making area.

Local sawmills closed around 50 years ago, and current biodiversity policies do not allow significant exploitation of forest resources. The Park administration is responsible for harvesting forest wood, which is used mainly for “uso civico” (“civic use”) such as providing households with reasonably priced firewood.

The Correlation of Remote Locations with TEK

The ethnobotanical data we recorded do not show any correlation between remoteness of the village (according to the classification of the “Strategy for Inner Areas”) and the richness of TEK. In the case of Barrea (ultraperipheral), we recorded a larger number of taxa compared with Opi (peripheral), while conversely in Gamberale (ultraperipheral) we recorded fewer taxa than in Pescopennataro (peripheral). We consider that TEK is affected by many different socioeconomic factors including services available in the village. The classification of the “Strategy for Inner Areas” does not recognize the presence or absence of basic services such as minimarkets, post offices, elementary schools, and pharmacies, but only the distance to a central municipality. We believe that the

presence of these basic services may affect TEK more than the distance to a town.

In addition, TEK includes an important component of practice that is crucial to maintain the knowledge over the time. Currently the practice of foraging for wild food and medicinal plants is no longer necessary for subsistence, even although it would serve to pass on local TEK from the older generation who generally maintain it to younger generations.

Effects of Distance from SNSs on Local TEK

The ethnobotanical data we recorded do not show any significant differences between sites located close to or distant from SNSs. Opi, which is located only 6 km away from the SNS of Madonna di Monte Tranquillo SNS (close), reported approximately 26% fewer taxa, including both current and past uses, than Barrea (distant). This may lead us to conclude that the SNS has a negative influence on TEK. However, when we asked our informants about the SNSs in the vicinity, most of the villagers of Opi and Barrea responded with the more distant Shrine of Madonna del Canneto located in Latium, toward which they felt a deep bond, mainly related to the millennial pilgrimages from several Abruzzo and Latium villages. Therefore, the closer site may not have affected TEK because of its irrelevance to the inhabitants of Opi.

The same scenario occurs for Gamberale, which is close to the SNS of Madonna dell'Altare, a hermitage that had a small community some centuries ago. The villagers more often mentioned a local chapel they had recently renovated with local donations and only one informant mentioned the closer SNS. In this case, the number of past and currently used taxa mentioned in Gamberale was around 21% fewer than in Pescopennataro (further from our selected SNS). However, we do not attribute this difference to the distance to the SNS because it was never inhabited by a monastic community that could have introduced scholarly knowledge into the community (Mattalia *et al.* 2019a). Moreover, folk devotion to religious rituals (such as processions, pilgrimages on foot, praying the rosary in rural chapels) is decreasing all over Italy (Pew Research Center 2018), also resulting in a decrease in time spent in contact with “nature.”

Finally, the difference in TEK in Pescopennataro may be due to the large number of elderly inhabitants who moved to Northern Italy (mainly the Milan area) many decades ago but

Table 3 Number of tree taxa reported per category per study site

| | Firewood | Kitchen tools | Building material | Agricultural tools | Handicrafts | Charcoal | Furniture |
|----------------|----------|---------------|-------------------|--------------------|-------------|----------|-----------|
| Opi | 9 | 3 | 1 | 2 | 1 | 0 | 0 |
| Barrea | 18 | 2 | 1 | 4 | 1 | 1 | 3 |
| Gamberale | 9 | 2 | 3 | 2 | 0 | 1 | 1 |
| Pescopennataro | 24 | 4 | 1 | 1 | 1 | 2 | 5 |

still spend the summer in the village and continue to value their local knowledge and identity. The large number of past uses of ethnobotanical resources recorded in Barrea may be due not only to the importance of pastoralism in the area but also to the landscape modification that occurred with the creation of an artificial lake in the 1950s.

Conclusions

The data we gathered from 15 informants in each of four remote high mountain villages of the Central Apennines reveal an on-going erosion of traditional foraging practices but also an increasing interest in a few specific wild plant species such as *Chenopodium bonus-henricus* and *Fragaria vesca*. We recorded some unusual past uses of wild pears and apples that were preserved with vinegar and/or salt, which are now an important food source for endemic bears. In addition, our informants had specific knowledge tree taxa and their uses, especially for firewood, building materials, and agricultural tools. However, the availability of cheap wood products from other regions and the implementation of biodiversity conservation policies have resulted in a decline of such knowledge. Indeed, the long history of the mountain communities is intrinsically connected not only with forests but also with transhumant sheep pastoralism. Despite its current economic marginality, pastoralism has deeply influenced local TEK and specifically ethnobotanical knowledge. The erosion of traditional knowledge and its relationship with socioeconomic changes was described by an elderly woman from Gamberale village who asserted “we became rich and lost everything” while reporting her current use of industrial chamomile powder as opposed to her past practice of harvesting and drying the plant. As also suggested by the comparison with the ethnobotanical data reported in D’Andrea (1982), the ubiquity of pharmacies and the availability of cheap medicinal preparations may have contributed to the erosion of ethnomedicinal knowledge. The current pandemic, which has resulted not only in economic but especially social crises (Van Lancker and Parolin 2020), may encourage current urban dwellers to rethink their relationship with nature and the rural environment, as well as the communities who inhabit it and the knowledge and practices still important to their (elder) inhabitants.

We did not find any correlation between proximity to a SNS and the richness of TEK, probably because the selected sites have not been inhabited by a monastic community that could have provided local inhabitants with scholarly knowledge. Finally, we did not find a relationship between remoteness (according to the classification of the “Strategy for Inner Areas”) and richness of TEK and, therefore, we argue that TEK may be affected by the presence (or absence) of basic services within the village more than by the distance from a

major town. Yet, TEK both as it is currently practiced and as it has been historically should be incorporated in local management plans implementing the “Strategy for Inner Areas” in the Central Apennines.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10745-020-00209-6>.

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Data Availability All data generated or analysed during this study are included in this published article.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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