



## Ethnobotanical and phytomedicinal knowledge in a long-history protected area, the Abruzzo, Lazio and Molise National Park (Italian Apennines)

Marisa Idolo\*, Riccardo Motti, Stefano Mazzoleni

Laboratorio di Ecologia Applicata, Dip. to Ar.Bo.Pa.Ve, Facoltà di Agraria, Università degli Studi di Napoli Federico II, Via Università 100, I-80055 Portici (NA), Italy

### ARTICLE INFO

#### Article history:

Received 24 May 2009

Received in revised form 10 October 2009

Accepted 19 October 2009

Available online 27 October 2009

#### Keywords:

Central Italy

Ethnobotany

Medicinal plant

National Park

Phytotherapy

Traditional plant use

### ABSTRACT

**Aims of the study:** This study reports on the ethnobotanical and phytomedicinal knowledge in one of the oldest European Parks, the Abruzzo, Lazio and Molise National Park (Central Italy). We selected this area because we judged the long history of nature preservation as an added value potentially encouraging the survival of uses possibly lost elsewhere.

**Methodology:** In all, we interviewed 60 key informants (30 men and 30 women) selected among those who, for their current or past occupation or specific interests, were most likely to report accurately on traditional use of plants. The average age of informants was 65 years (range 27–102 years).

**Results:** The ethnobotanical inventory we obtained included 145 taxa from 57 families, corresponding to 435 use-reports: 257 referred to medical applications, 112 to food, 29 to craft plants for domestic uses, 25 to veterinary applications, 6 to harvesting for trade and another 6 to animal food. The most common therapeutic uses in the folk tradition are those that are more easily prepared and/or administered such as external applications of fresh or dried plants, and decoctions. Of 90 species used for medical applications, key informants reported on 181 different uses, 136 of which known to have actual pharmacological properties. Of the uses recorded, 76 (42%) concern external applications, especially to treat wounds. Medical applications accounted for most current uses. Only 24% of the uses we recorded still occur in people's everyday life. Species no longer used include dye plants (*Fraxinus ornus*, *Rubia tinctorum*, *Scabiosa purpurea*, *Rhus coriaria* and *Isatis tinctoria*) and plants once employed during pregnancy, for parturition, nursing, abortion (*Asplenium trichomanes*, *Ecballium elaterium*, *Juniperus sabina* and *Taxus baccata*) or old magical practices (*Rosa canina*).

**Conclusions:** Our study remarked the relationship existing between the high plant diversity recorded in this biodiversity hotspot of central Apennines and the rich ethnobotanical knowledge. The presence of some very experienced young informants was related to the opportunities offered by living in a major protected area. However, to counter the disappearance of local ethnobotanical culture it would be important to incorporate its preservation among nature reserve activities.

© 2009 Elsevier Ireland Ltd. All rights reserved.

### 1. Introduction

In the last decades, ethnobotanical studies among surviving rural populations in industrialized countries have received ever growing attention (Agelet and Vallès, 2001; Amico and Sorge, 1997; Antonone et al., 1988; Camangi and Tomei, 2003; De Feo and Senatore, 1993; De Feo et al., 1992; Lentini and Aleo, 1991; Lentini and Raimondo, 1990; Leporatti and Pavesi, 1989; Pieroni, 2000; Uncini Manganelli and Tomei, 1999; Uncini Manganelli et al., 2000, 2001). Territories within nature reserve boundaries are especially interesting from the ethnobotanical point of view because it is especially there that both residual plant biological diversity and

culture of rural communities survive, potentially resulting in effective preservation of traditional use (Scherrer et al., 2005).

The Abruzzo, Lazio and Molise National Park (hereafter abbreviated as PNALM) is one of the oldest National Parks of Europe, dating back to 1923. Historically, plant species occurring in this area of central Italy have received a great deal of attention. Formerly part of the Realm of Naples, this region was the subject of many classical botanical studies, also covering medical use or the economical value of a few species (Briganti, 1842; Grande, 1904; Pasquale and Pasquale, 1901; Petagna, 1796; Tenore, 1820, 1823). Recent work mainly focused on its flora (Anzalone and Bazzichelli, 1958–1960; Conti, 1998; Tammamo, 1998).

Most other areas of central Apennines have undergone a dramatic depopulation process due to land abandonment (MacDonald et al., 2000); this phenomenon was somewhat less important in the Park, where rural communities have survived, and in some cases

\* Corresponding author. Tel.: +39 081 7754850; fax: +39 081 7760104.

E-mail address: [maridolo@unina.it](mailto:maridolo@unina.it) (M. Idolo).

prospered, thanks to the development of ecotourism. Although in the study area the main economy largely shifted from rural activities to ecotourism, the long history of nature conservation may have implied a process of cultural ethnobotanical preservation. Before the ecotourism developed, these mountainous areas had been long isolated from the main urban areas. The seasonal movements of sheep flocks from Abruzzo to Puglia and back (transumanza) strongly influenced local human culture, and most probably plant use because it implied the seasonal migration of shepherds and flocks between areas characterized by different floras.

Despite the long tradition of biodiversity studies carried out at the Park, the ethnobotanical value of this area has received by far less attention, only a few studies being set in small areas, or focusing on specific issues (D'Andrea, 1982; Di Vito, 1979; Guarrera, 2003, 2005; Leporatti and Corradi, 2001; Manzi, 2001; Rovesti and Rovesti, 1934; Tammamo and Pietrocola, 1975; Tammamo, 1984). So far, no study has quantitatively assessed the ethnopharmacobotanical importance of this area, as typically done in modern ethnobotany (Cotton, 1996; Cunningham, 2001; Höft et al., 1999; Martin, 2004).

To fill this gap, in this study we analyzed local traditional use (for medicinal, veterinary, domestic and food purposes) of wild plants in the PNALM area. Specifically, we aimed to compile an ethnobotanical inventory of both past and current uses, assuming that cultural and biological diversities are strongly interrelated and that people living in a nature reserve could still retain traditional uses disappeared elsewhere (e.g. Bonet and Vallés, 2007; Camejo-Rodriguez et al., 2003; Scherrer et al., 2005).

## 2. Materials and methods

### 2.1. Study area

A first form of protection of this region took place in 1872 and concerned several towns (Pescasseroli, Opi, Villavallelonga, Collelongo, Lecce dei Marsi, Gioia dei Marsi, Balsorano and Castellafume). A game reserve was set for the Savoia Royal Family, especially to hunt brown bears *Ursus arctos marsicanus* (Pratesi, 1998; Tassi, 1994). No-one else was allowed to hunt or exploit natural resources of the region, except local communities for their basic needs. Apart from the infrequent hunting trips of the Royal Family, a several-thousand acre territory was practically long left undisturbed and constantly protected by rangers. The actual Park foundation took place only with a 1923 Royal Decree (Rovesti and Rovesti, 1934). Ever since, the Park constantly increased its surface, up to its present 50,000 ha, plus 60,000 ha of buffer zone.

With 24 urban centres, mostly small mountain villages (Fig. 1), today the Park hosts a human population of 28,277 inhabitants: 13,661 men and 14,616 women (Istat 2001). Three main mountainous areas, part of the southern Apennines, are included, delimited by rivers Sangro and Liri: (1) the eastern Marsican mountains (highest peak Mt. Marsicano, 2245 m a.s.l.) dividing the Sangro valley from the Sagittario basin; (2) the central mountains (highest peak Mt. Schiena Cavallo, 1981 m a.s.l.), running NW-SE from the Fucino Plan to Valcallano hill; (3) the south-east Park mountains, reaching heights of ca. 2000 m a.s.l. (highest peak Mt. Meta, 2241 m a.s.l.) (Burri et al., 1998; Tassi, 1994).

Humans have inhabited the area for the last 40,000 years or more. Transhumance—found in several areas of the world (e.g. Ladio and Lozada, 2004a,b) and, in the Mediterranean, over 3000 years old (Blondel and Aronson, 1999), has long taken place in the region corresponding to the current Park boundaries. Sheep flocks were moved from summer pastures in the mountains to low-elevation, milder winter quarters. So important was this seasonal migrations of humans and domestic animals that a network of trails

developed. This linked the Abruzzo territory with wintering areas in the south-eastern plans of Capitanata in Apulia, with significant implications for cultural exchange (Tassi, 1998). In the beginning of last century, an overall development of about 3000 km of tratturi existed. The major trail connecting the town of Pescasseroli, in our study area, with Candela, in Apulia, was 211 km long; it was walked by shepherds with their flocks at an average speed of 15 km/day (Agostini et al., 1998).

Pastoral activity and agriculture have profoundly diminished in the territory, where land abandonment has taken place as in most Mediterranean Europe (Blondel and Aronson, 1999). Today human settlements and activities mainly occur at ca. 1000 m a.s.l. (Tassi, 1998); some farming is still practiced. No doubt, the major change for the economy has been represented by the ecotourism and other activities linked with the National Park development (Agostini et al., 1998).

### 2.2. Methodology

Fieldwork was conducted in 2005–2007 in the following areas: Alto Sangro, Fucino plane, Lazio and Mainarde territories. The main villages in the PNALM and its buffer zone that we surveyed included Alfedena, Alvito, Barrea, Bisegna, Cardito, Civitella Alfedena, Gioia dei Marsi, Lecce dei Marsi, Opi, Ortona dei Marsi, Pescasseroli, Picinisco, San Biagio Saracinisco, San Donato Val di Comino, Scanno, Settefrati, Vallerotonda, Villavallelonga and Villetta Barrea.

For interviews, we selected local experts (key informants) (Martin, 2004) who, because of their elder age, job, family tradition, or personal interests were most likely to have retained ethnobotanical knowledge. These included several elderly people who had formerly worked as farmers or shepherds. We applied a snowball sampling approach (Scherrer et al., 2005), i.e. we asked them to indicate further people experienced in traditional plant use. To encourage communication and memory flow, we carried out a semi-structured interview. Local assistants often helped us to understand dialect and traditions (Martin, 2004). Two interviewers recorded data independently to avoid all risk of missing information.

For all informants we recorded gender, age, profession and any other information concerning their background. Further data recorded included local names of plants, plant use, parts used, processing, when relevant harvesting time, recipes and even the time of year when plants were used. All ancillary information reported was also recorded (Martin, 2004). As usually done in ethnobotanical surveys, the information collected on plant use was organized in use-reports, each corresponding to a use type as described by an informant (e.g. Camejo-Rodriguez et al., 2003; Parada et al., 2008; Scherrer et al., 2005). For instance, two different preparations concerning a given plant and mentioned by an informant (or the same preparation mentioned by two informants) accounted for two use-reports. For data analysis, we also considered taxonomic citations to species and family levels (each citation being counted as a single taxon mentioned by an informant, which may correspond to one or more use-reports).

In most cases, identity of plants mentioned was checked in the field in presence of the same informants; when needed, plants were sampled for subsequent laboratory identification (Camejo-Rodriguez et al., 2003; De Natale and Pollio, 2007; Scoppola and Scarici, 1998) following published keys (Tutin et al., 1964–1980; Pignatti, 1982). Reference specimens of plants (preserved as *exsiccata* according to standard processing techniques: see, e.g. Scoppola and Scarici, 1998; for reference) reported by informants are available at the herbarium of PNALM Scientific Service located on the Park premises in Pescasseroli (L'Aquila). In accordance with law restrictions and Park regulations, sampling never regarded protected or vulnerable species.



Fig. 1. A sketch map of the Abruzzo, Lazio and Molise National Park illustrating main mountains, rivers, lakes and towns.

### 2.3. Data analysis

We set up a database including *taxon*, uses, parts used, and mode of use. All records were associated with source informant name and features (Giacomini et al., 1999; Martin, 2004). We obtained a checklist of medicinal, food, craft, veterinary and magical plants. Previous records of species occurrence for the study area were also examined following Tutin et al. (1964–1980) and Conti (1998).

We tested whether the number of species reported by informants was influenced by factors such as geographical region (Abruzzo or Lazio), altitude, age and gender of informants. We applied a General Linear Model ANCOVA entering “gender” and “region” as main treatments and the remainder variables as covariates. A Ryan-Joiner test was used to test whether dataset residuals fitted a normal distribution. When necessary, data were log-normalized. Significance was set at  $p=0.05$ . Analysis was carried out with MINITAB rel. 13.

## 3. Results and discussion

### 3.1. Quantitative ethnobotanical analyses

We interviewed 60 informants (30 men, 30 women) whose age averaged ( $\pm$ standard deviation.)  $65.4 \pm 16.0$  years (range 27–102 years). We compiled an inventory of 145 taxa (a full list with remarks is given in Appendix A) from 57 families. In all, 435 use-reports were obtained for all taxa. Use-report number superseded *taxon* number because *taxa* often had more than one use and the

same use could be mentioned by more than one informant. They mostly concerned medicinal applications (257), followed by food (112), craft or domestic uses (29), veterinary treatments (25), harvesting done for trading (6) and food for domestic animals (6) (Fig. 2).

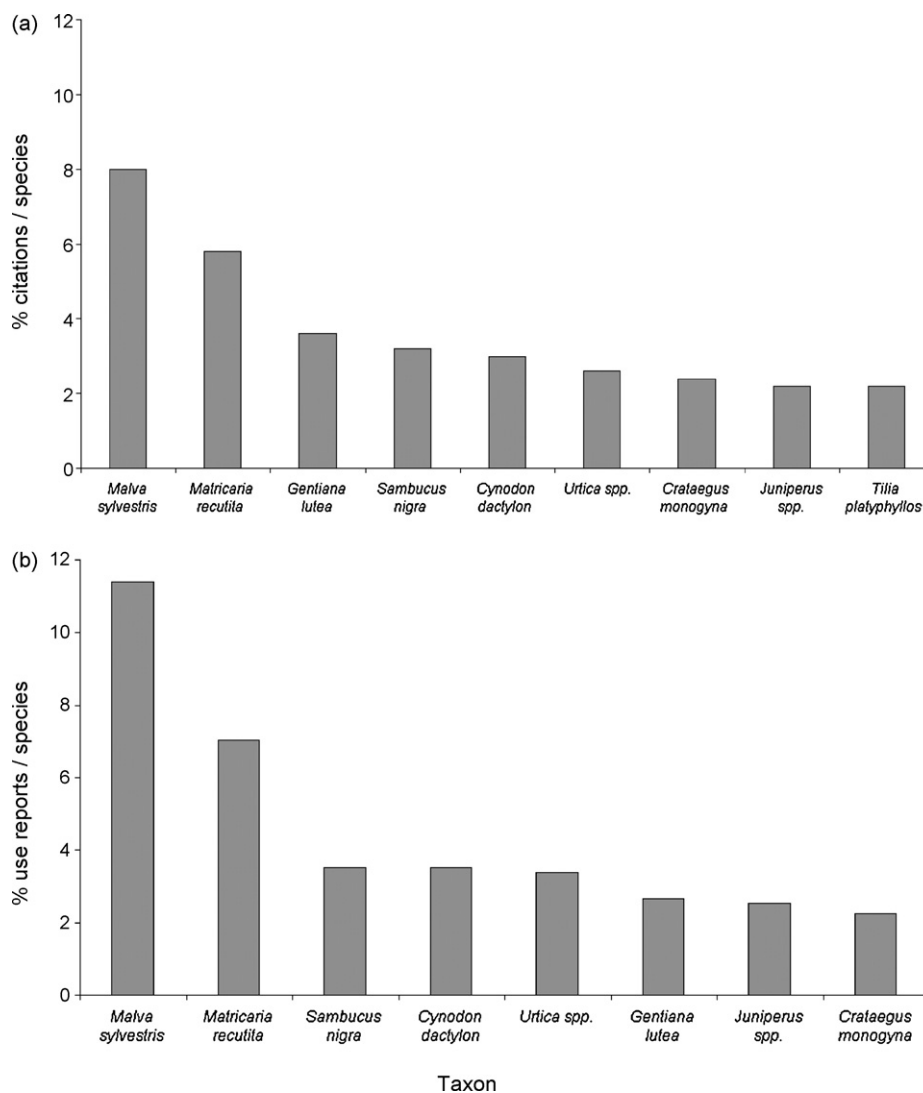
Nine taxa mentioned by key informants accounted for over 2% of total citations (Fig. 2), and eight for over 2% of total use-reports (Fig. 2). In both cases, the species most cited was *Malva sylvestris* L., used only for medical or veterinary scopes.

Key informants mentioned 57 families, 14 of which totalling over 2% of citations (Fig. 3). Rosaceae was the most cited family, including many food species, followed by Asteraceae, Malvaceae and Lamiaceae. All citations concerning the Malvaceae family referred to *Malva sylvestris*, very popular and still largely used. A similar ranking was obtained when use-reports were categorized by family (Fig. 3). On average,  $2.5 \pm 2.2$  uses were reported for each species (range 1–18).

Current uses of plants totalled 105 out of 435 (24.2%), i.e. ca. a quarter of all uses recorded have survived.

### 3.2. Influences on reporting of geography, age, and sex

ANCOVA showed no significant effects on the number of taxa mentioned ( $P>0.05$ ) of geographic area (Abruzzo or Lazio;  $F_{1,55}=0.00$ ), altitude ( $F_{1,55}=0.04$ ) age of interviewees ( $F_{1,55}=0.25$ ) or their gender ( $F_{1,55}=0.45$ ). Taxa mentioned were  $7.9 \pm 5.5$  (range 1–24,  $N=48$ ) and  $9.7 \pm 8.0$  (range 3–28,  $N=12$ ), respectively, for Abruzzo and Lazio. Women mentioned  $7.5 \pm 5.2$  taxa (range 2–19), men  $9.0 \pm 6.8$  taxa (range 1–28,  $N=29$ ).



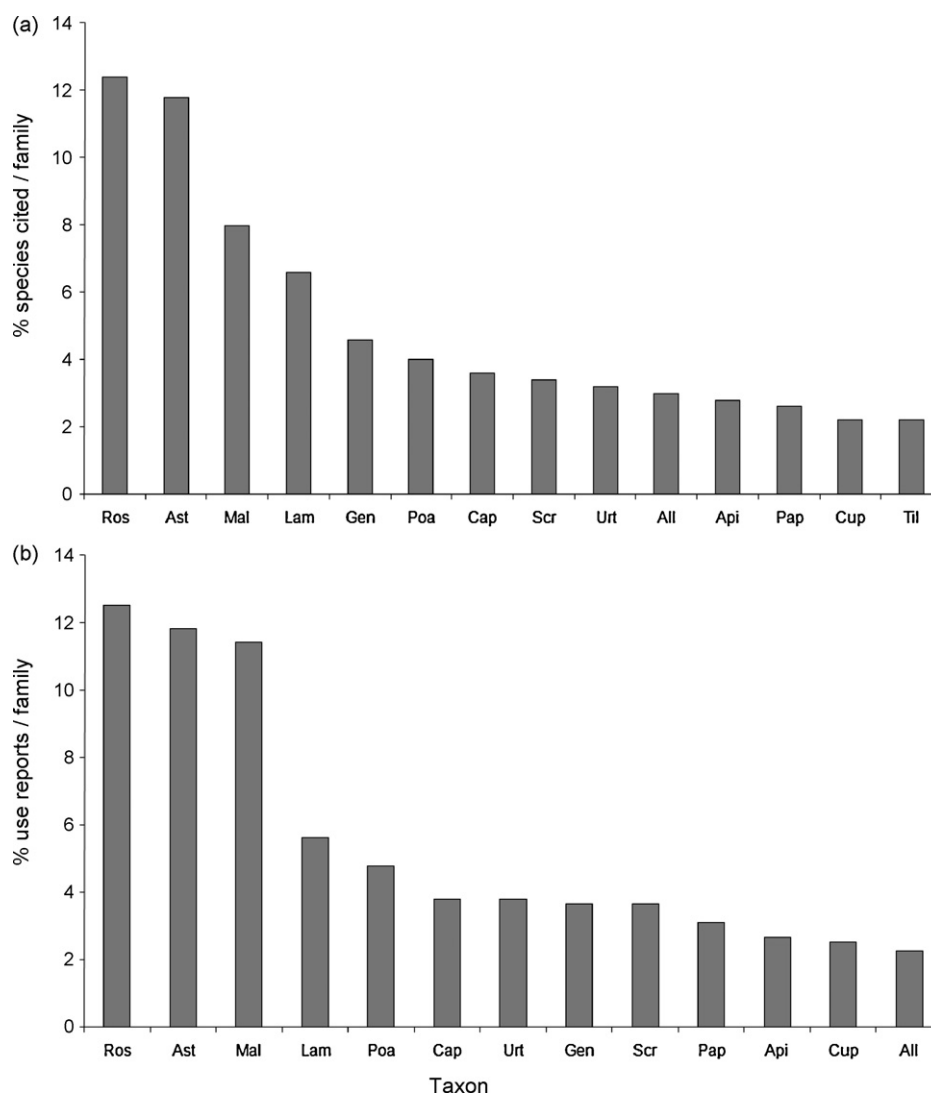
**Fig. 2.** Percent numbers of (a) taxa citation ( $n=501$ ) and (b) use-reports ( $n=710$ ) categorized by species as mentioned by key informants. Only taxa whose value was  $>2\%$  are illustrated.

The absence of differences across geographical areas or elevation at which villages are set is explained in terms of frequent communication between different human settlements in the Park, i.e. it is a clear consequence of the absence of significant geographical barriers separating plant assemblages as well as the ethnobotanical heritage of local communities. Our observations showed consistency in the dominance of some species above others, a fact that has been interpreted by Camejo-Rodrigues et al. (2003) for their own Portuguese case-study and for others in Spain (Blanco et al., 1999) as a sign of territorial continuity.

Ethnobotanical investigations often emphasize the role of elderly people: it is expected that these retain most traditional uses, so key informant selection is biased towards them *a priori* (e.g. De Natale and Pollio, 2007; Guarrera et al., 2005; Jarić et al., 2006; Neves et al., 2009). Although our sampling made no exception, a few young people interviewed exhibited such a deep knowledge that their contribution was overrepresented in the sample, practically masking all age-related difference. We interpret this pattern as a specific cultural effect of living in a nature reserve: such young albeit experienced contributors all worked in fields such as ecotourism or park management (trekking guides, rangers, etc.).

### 3.3. Plant diversity, protection status and ethnobotanical heritage in the Park

As often observed in species-rich regions (González-Rivas et al., 2006), in our analysis the high plant biodiversity of the study area (Conti, 1998) was paralleled by a high number of traditional uses concerning 145 species, including current and past uses that are still remembered. Our inventory featured many more species than lists compiled even for larger areas: for instance, in a similar study in the Cilento and Vallo di Diano National Park, a similar number of key informants (59) reported on the use of only 90 taxa (Scherrer et al., 2005). Mountainous regions of central-eastern Mediterranean such as central Italy Apennines (this study) or isolated massifs in the Balkans (Jarić et al., 2006) host a high plant diversity due to a mix of complex topography and elevation range (i.e. climatic zones), a biogeographical crossroad position and influence of human communities. In more recently established reserves (Jarić et al., 2006; Motti et al., 2009; Scherrer et al., 2005) plant diversity has decreased due to heavy human alteration of ecosystems that took place before protection was ensured. The ancient status of protected area of the region we investigated had the merit to preserve plant diversity more than elsewhere in the Basin, and this may account for the overall rich inventory we compiled. None



**Fig. 3.** Percent numbers of (a) species mentioned ( $n = 501$ ) and (b) use-reports ( $n = 710$ ) categorized by family as mentioned by key informants. Only taxa whose value was  $>2\%$  are illustrated: Ros = Rosaceae; Ast = Asteraceae; Mal = Malvaceae; Lam = Lamiaceae; Gen = Gentianaceae; Poa = Poaceae; Cap = Caprifoliaceae; Scr = Scrophulariaceae; Urt = Urticaceae; All = Alliaceae; Api = Apiaceae; Pap = Papaveraceae; Cup = Cupressaceae; Til = Tiliaceae.

of the species reported even for past uses has gone extinct in the area, and the occurrence of non-native species is minimal (Idolo, pers. obs.).

### 3.4. Most cited species

*Malva sylvestris*, regarded as a real *panacea* since the time of Plinio the Elder (Giancristofaro, 1995), was the most cited species (40 key informants mentioned at least one utilization) totalling the highest number of use-reports: 82, 76 of which to treat human sickness, 6 to cure animals. The pathologies treated with *M. sylvestris* were mainly gastrointestinal diseases (including those of animals), respiratory apparatus affections, urogenital system inflammations, dermatitis, toothache and dental abscesses, in accordance to many other studies (Camejo-Rodriguez et al., 2003; Cornara et al., 2008; Corsi et al., 1981; De Natale and Pollio, 2007; Neves et al., 2009; Guarrera et al., 2005; Jarić et al., 2006; Leporatti and Corradi, 2001; Pieroni et al., 2004; Scherrer et al., 2005; Tammaro, 1984; Viegi et al., 2003). Its emollient, milder and anti-inflammatory effects are brought about by a high mucilage content (Benigni et al., 1951; Boninfante et al., 1997; Capasso and Grandolini, 1996; Classens et al., 1993; Da Legnano, 1973; Di Vito, 1979; Rovesti and Rovesti, 1934).

The second most popular species was *Matricaria recutita* L.: 29 informants reported on at least one use and in all 49 use-reports and six effective uses were mentioned. Although available from industrial production, several informants still collect it in the field. Main pharmacological properties concern sedative and spasmolytic effects (Rovesti and Rovesti, 1934; Benigni et al., 1951; Da Legnano, 1973; Capasso and Grandolini, 1996; Boninfante et al., 1997; Jain and Jain, 1992; Jarić et al., 2006; Neves et al., 2009). Similar uses occur in other areas of Italy (e.g. Guarrera et al., 2005; Scherrer et al., 2005; De Natale and Pollio, 2007; Motti et al., 2009) and also concern veterinary applications (Viegi et al., 2003).

The third most popular species, *Gentiana lutea* L., was mostly used to prepare a liqueur having bitter tonic properties thanks to its glucoside content (Benigni et al., 1951; Da Legnano, 1973). The active principles are extracted from the root, a fact which implies destructive harvesting. Particularly at the onset of the last century, this species was threatened by overharvesting: for example, over one ton of roots was collected in a single year and sent to France (Rovesti and Rovesti, 1934). Limits to exploitation were set by law in the Park since 1920s. The species was then cultivated in other areas of Abruzzo (Tammaro, 1984). Today *G. lutea* is included in Annex V of EC/92/43 Habitats Directive, and in the 1979 Regional Law protecting the Abruzzo flora.



Some key informants recalled that *G. lutea* was used to treat malaria—in fact, an ancient use (Giancristofaro, 1995) whose effectiveness has scientific support (Benigni et al., 1951; Di Vito, 1979). Recent studies also show some effects on liver, common to over 30 species of *Gentiana* (Shuping and Lingjie, 1992), perhaps a key property to treat malaria too.

*Urtica* L. sp. pl. was largely popular for its food use, being part of many traditional recipes, and as remedy against hair loss. Some informants reported on the practice of whipping with leafy branches of *Urtica* the body parts affected by rheumatism, an habit from the times of Ancient Rome (Tammaro, 1984; Battista, 2003; La Rovere, 2006). Another version of this treatment consist of rubbing fresh leaves on aching parts, practice still in use in the Park area and elsewhere in the Mediterranean (Cappelletti et al., 1982; Pfendtner, 2004; Pieroni et al., 2004; Scherrer et al., 2005; De Natale and Pollio, 2007; Jarić et al., 2006; Neves et al., 2009) south to Lebanon (El Beyrouthy et al., 2008). Modern pharmacology has confirmed the species' revulsive–rubefacient properties (Da Legnano, 1973; Capasso and Grandolini, 1996). *Urtica* is also commonly mixed with domestic animal food to enrich the latter with proteins and aminoacids (Di Vito, 1979; Cornara et al., 2008; Motti et al., 2009).

### 3.5. Timing of harvest and preparation

Some species (*Sambucus nigra* L. and *Hypericum perforatum* L.) were traditionally harvested at precise times of year. Although such habits may be deemed as superstition, they might be related with the need of collecting plants in their “balsamic time” (i.e. when their active principle is at its peak). Similarly, decoctions of *H. perforatum*, *Gentiana lutea* and *Gentiana dinarica* Beck were ritually left to rest for three clear nights—a tradition probably effective to activate their phytotherapeutic principles (Capasso and Grandolini, 1996; Di Vito, 1979). Interestingly, this matches the ritual selection of odd numbers for days of preparation observed in other Latin-rooted cultures, probably both empirically determined as most effective and also bringing about magical connotations to enhance healing properties (Agelet, 1999; Gavilanes, 1995; Parada et al., 2008).

### 3.6. Commercial use

Until 1960s, large-scale harvesting by local herbalists was conducted in many areas of the Park, particularly by the Rosati brothers from Scanno, who asked their many local co-workers to harvest medicinal species (*Rhamnus alpina* L., *Gentiana lutea*, *Atropa belladonna* L., *Digitalis ferruginea* L., *Verbascum thapsus* L. and *Pimpinella anisum* L.) that he sold to pharmaceutical industries.

A laxative drug was extracted by *R. alpina* bark; *G. lutea* was used for its above-mentioned properties; *A. belladonna* was collected for its action on heart and nervous system; *D. ferruginea* was used as a cardiotonic (as its relative *Digitalis purpurea* L.); *V. thapsus* was used for preparations to cure respiratory diseases; and *P. anisum* was once cultivated in Ortona dei Marsi and sold as an aromatic herb (but, as mentioned by elderly informants, such cultivations were abandoned after a parasite insect spread).

### 3.7. Traditional use of imported plants

The peculiar phenomenon of transhumance, of great anthropological and human ecology interest, had great influence on Abruzzo's rural societies. When travelling with their flocks, shepherds relied on wild plants for most of their basic needs. This led to a major import of traditions, including those concerning plant use, from south-east Italy (Apulia) and Abruzzo (Agostini et al., 1998; Tassi, 1998). We found that *Matricaria recutita* and *Melit-*

*tis melissophyllum* L. used to be partly or totally imported, as it was for almonds (*Prunus dulcis* (Mill.) D.A. Webb.) and liquorice (*Glycyrrhiza glabra* L.)—the former used in cakes, the latter given to children as a treat, but not used for its pharmacological properties, perhaps because people were not very familiar with it. Wild *M. recutita* was harvested in Apulia during transhumance. However, in the outskirts of some villages (Opi, Ortona dei Marsi and especially Villavallelonga), this plant grows abundant and is still harvested. *M. melissophyllum*, still used in the Abruzzo village of Civitella Alfedena, is harvested in the Alvito territory, in the Lazio sector of the Park: in the past, it was also imported from the Apulia areas reached during transhumance. Likewise, *P. dulcis* and *G. glabra* were both collected by shepherds during transhumance.

*M. recutita*, *P. dulcis* and *G. glabra* are nowadays commercially available thanks to large-scale (industrial) production.

Probably a Roman heritage (Santucci, pers. com.), *Ferula* sp. pl. stems were once used to “sign an agreement” between flock owners and shepherds (Appendix A).

Although not directly linked with transhumance, a red seaweed (*Hypnea musciformis* (Wulfen) Lamouroux) locally called *kw'raglina/kruajene* (*corallina*), was clearly collected far from the National Park borders. Once common in the Adriatic Sea, today it is confined to few coastal areas including the Abruzzo town of Vasto. In Abruzzo, it was used as an anthelmintic (Tammaro and Pietrocola, 1975; Tammaro, 1984). Although this use is nowadays recalled only by few people (one of them was son of a famous medicine woman of the town of Pescasseroli), it used to be widespread (Tammaro and Pietrocola, 1975; Tammaro, 1984). The species is known to be used as a vermifuge in other areas of the Mediterranean, Western Europe, North America (Chapman and Chapman, 1980; Hale and Pion, 1972) and Indonesia (Zaneveld, 1959).

### 3.8. Cultivated species

We considered the use of cultivated species when it differed from the “typical” ones (Appendix A). For instance we found that *Allium sativum* L. served as an anthelmintic (Guarrera, 1999; Motti et al., 2009; Parada et al., 2008; Scherrer et al., 2005), a property confirmed by pharmacological studies (Benigni et al., 1951; Boninfante et al., 1997; Capasso and Grandolini, 1996; Da Legnano, 1973). In past times it was given to children and today is used for domestic animals (see also Corrain and Zampini, 1961; Viegi et al., 2003). Past traditions, such as fitting children with clove necklaces to protect them from worms (Guarrera et al., 2005; Tammaro, 1984), were of course ineffective. *Allium cepa* L. was used against cough, a pharmacologically verified effect (Da Legnano, 1973). Likewise, *Brassica oleracea* L. efficacy for treating varicose veins (Tammaro, 1984) is scientifically confirmed (Da Legnano, 1973). As elsewhere (Guarrera et al., 2005; Pieroni et al., 2004; Scherrer et al., 2005; Tammaro, 1984), *Solanum tuberosum* L. is applied in case of burns as a soothing and resolvent remedy, and topical applications of potato slices are used to cure headache (Motti et al., 2009).

A precious spice, *Crocus sativus* L. is cultivated in Abruzzo since XIII sec. A.D. (Manzi, 2001). The calmant, digestive and oral anti-septic uses we recorded are also mentioned in previous work (Tammaro, 1984) and the effectiveness scientifically confirmed (Benigni et al., 1951; Da Legnano, 1973).

*Citrus limon* (L.) Burm. f. is well known for its digestive properties (e.g. Scherrer et al., 2005; Tammaro, 1984), pharmacologically confirmed (Da Legnano, 1973). However, in our study area we recorded a unique use (topically applied slices) to treat headache, or sinusitis (fruit juice was inhaled). Da Legnano (1973) suggests to add coffee with lemon juice to cure cephalalgias.

### 3.9. Past and current uses

Only 24% of uses recorded still occur in people's everyday life. The disappearance of a certain number of plants even from the informant's memories was noticed. These includes dye plants, replaced by industrial textile production: *Fraxinus ornus* L. (D'Andrea, 1982), *Rubia tinctorum* L., *Scabiosa purpurea* Sulak, *Rhus coriaria* L. and *Isatis tinctoria* L. (Tammamaro, 1984; Manzi, 2001), all once used in Abruzzo.

Likewise, popular remedies involving species used during pregnancy, for parturition, nursing, or for abortion, i.e. *Asplenium trichomanes* L. (Dall'Acqua et al., 2009; D'Andrea, 1982); *Ecballium elaterium* (L.) A. Rich. (Tammamaro, 1984), *Juniperus sabina* L. and *Taxus baccata* L. (Rovesti and Rovesti, 1934; Tammamaro, 1984) have disappeared and replaced with hospital treatments.

This phenomenon is also witnessed by the low number of magical practices recorded, by far fewer than those once widespread. For example, a petal decoction of *Rosa canina* L. was once offered to the desired partner by young women looking for an husband (D'Andrea, 1982). Noticeably, most survived uses actually concerned medical applications, probably because of their long-tested effectiveness.

## 4. Conclusions

Our study contributed considerably to the ethnobotanical knowledge of a typical central Apennine area, filling a long overlooked gap. It once more remarked the relationship existing between plant diversity and the degree of ethnobotanical knowledge recorded. The former has been retained thanks to a long history of nature preservation in the study area.

It is worth highlighting that we found some young people to still retain ethnobotanical knowledge or at least express interest towards traditional uses, so that they performed well as key informants. This clearly derives from the cultural and professional opportunities offered by living in a famous protected area where nature is still an important issue for local communities. However, even under these circumstances many uses have disappeared and some forgotten by otherwise experienced informants. We believe that cultural diversity should be seen in a broader sense as part of biodiversity of a region, especially where disentangling human influence and nature is virtually impossible, as typical with the Mediterranean. Traditional knowledge should therefore feature more often in the agendas of nature reserves besides biological richness as a value to preserve for the future.

## Acknowledgements

We thank the many informants who kindly assisted us with our study, and particularly Nadia Boccia, Paola Campana, Germano Palozzi, Pietro Santucci, Ezechia Trella and Lorenzo Vacca for their collaboration during interviews. Special thanks go to the Abruzzo Lazio and Molise National Park, and especially Cinzia Sulli and Roberta Latini (Park Scientific Service) for the valuable help provided. Miriam D'Andrea and Nicola Di Vito both generously shared their knowledge of local ethnobotany. Danilo Russo kindly helped with field work and made useful comments on previous ms versions. Thanks to Luca Cistrone for drawing the sketch map in Fig. 1.

## Appendix A.

Botanical name (and reference specimen code)	Local names	Part used	Popular use
<b>RHODOPHYTA</b>			
<b>Hypnaceae</b>			
<i>Hypnea musciformis</i> (Wulfen) Lamouroux	<i>Kw'raglina; kruajene</i>	Thallus	MED: thallus crushed, eaten as an anthelmintic (PC)
<b>PTERIDOPHYTA</b>			
<b>Equisetaceae</b>			
<i>Equisetum</i> L. sp. pl. ( <i>ramosissimum</i> Desf., <i>hyemale</i> L., <i>fluviatile</i> L., <i>palustre</i> L., <i>arvense</i> L., <i>telmateia</i> Ehrh.)		Aerial part	MED: decoction. Regularly drunk, it would crush kidney stones. Decoction, in association with <i>Matricaria recutita</i> flowers and <i>Capsella bursa-pastoris</i> aerial parts, reduces haemorrhoids if ingested regularly (VV)
<b>Pteridaceae</b>			
<i>Adiantum capillus-veneris</i> L. (PNALM-Idolo et al. ETHNO/001)	<i>Capelvenere; capilventi; capiventi</i> (OR)	Aerial part	MED: decoction drunk to treat menstrual cramps and abdominal pain VET: decoction helps parturition in horses (OR)
<b>Dryopteridaceae</b>			
<i>Polystichum</i> Roth. sp. pl. ( <i>lonchitis</i> (L.) Roth, <i>aculeatum</i> (L.) Roth, <i>setiferum</i> (Forssk.) T. Moore ex Woyn.)	<i>Felce; fèuca</i> (VB)	Leaf	DOM (FOOD): fresh leaves wrapped around cheese to preserve it and enrich its flavour (VB)
<b>CONIFEROPHYTINA</b>			
<b>Pinaceae</b>			
<i>Pinus nigra</i> Arnold subsp <i>nigra</i> (totally implanted, except around Villetta Barrea, where is spontaneous) (PNALM-Idolo et al. ETHNO/002)	<i>Pino</i>	Resin; budlet	MED: resin applied on hand wounds as a vulnerary (CIV). Budlets rich in resin, burnt for inhalation to treat common cold (VB)
<i>Pinus mugo</i> Turra	<i>Pino mugo</i>	Young cone	MED: decoction of cones collected in spring, added with sugar, ingested to treat cough (CIV)
<b>Cupressaceae</b>			
<i>Juniperus</i> L. sp. pl. ( <i>communis</i> L., <i>oxycedrus</i> L., <i>sabina</i> L.) (PNALM-Idolo et al. ETHNO/003-004-005)	<i>Ginepro</i>	Fruit; wood	FOOD: fruits as condiment for roasted meat; macerated in alcohol to prepare liqueurs (Gin); (B,CIV,OP,OR,PC,VV) MED: when the latter is made with fruits harvested in November, may be drunk hot to treat cough and sore throat (CIV). Fruits boiled with bran and <i>Malva sylvestris</i> in one litre of vinegar to obtain a mucilaginous paste applied topically to treat sciatica (CAR) DOM: wood used to make fences (OP)

Botanical name (and reference specimen code)	Local names	Part used	Popular use
<b>MAGNOLIOPHYTINA</b>			
<b>Salicaceae</b>			
<i>Salix alba</i> L. (PNALM-Idolo et al. ETHNO/006)	<i>Salice; vetica</i> (CIV)	Bark, leaf; bough	MED: decoction of bark against flu (CIV) (Opi inhabitants also used leaves) DOM: boughs used to make baskets and fences SU (OP)
<i>Salix caprea</i> L. (PNALM-Idolo et al. ETHNO/007)	<i>Salicone</i>	Branch	DOM: to mark boundaries ( <i>fratte</i> ) of cultivated fields. SU (CIV)
<b>Juglandaceae</b>			
<i>Juglans regia</i> L.	<i>Noce</i>	Leaf	MED: fresh leaves applied to refresh feet (PC)
<b>Corylaceae</b>			
<i>Corylus avellana</i> L.	<i>Nocciolo; avllàn</i> (CIV)	Branch	DOM: to mark boundaries ( <i>fratte</i> ) of cultivated fields SU. Largest branches were used to make shepherd walking sticks (CIV)
<b>Fagaceae</b>			
<i>Fagus sylvatica</i> L. (PNALM-Idolo et al. ETHNO/008)	<i>Faggio</i>	Fruit; wood	FOOD: fruits eaten by young people (but it seems that overconsumption led them to feel befuddled) (PC) DOM: use known as <i>còcina</i> : strips of wood ( <i>squanue</i> ) interwoven with strips of hide, to make baskets (called <i>spara</i> ) (VIL); wood used to make ox-bows and collars for cow bells (OP) SU
<i>Castanea sativa</i> Mill.	<i>Castagno</i>	Leaf	MED: infusion applied topically against dandruff. SU (SB, SE)
<i>Quercus cerris</i> L. (PNALM-Idolo et al. ETHNO/009)	<i>Cerro</i>	Bark	MED: decoction applied topically to treat haemorrhoids. SU (OP)
<i>Quercus robur</i> L. (PNALM-Idolo et al. ETHNO/010)	<i>Farnia</i>	Bark	MED: decoction applied topically to treat haemorrhoids. SU (OP)
<i>Quercus pubescens</i> Willd. (PNALM-Idolo et al. ETHNO/011)	<i>Roverella</i>	Bark	MED: decoction applied topically to treat haemorrhoids. SU (OP)
<b>Ulmaceae</b>			
<i>Ulmus</i> L. sp. pl. ( <i>minor</i> Miller, <i>glabra</i> Huds) (PNALM-Idolo et al. ETHNO/012-013)	<i>Olmo</i>	Bark; wood	MED: bark applied to wounds as an haemostatic and ointment (AV). Bark decoction applied to haematomas; same decoction also applied externally to treat haemorrhoids (SE) DOM: wood used to make linen chests (VV)
<b>Moraceae</b>			
<i>Ficus carica</i> L.	<i>Fico</i>	Fruit	FOOD: dried fruits to sweeten decoctions. MED: decoction made with ½ water litre, 5 dried fruits, 4 <i>Laurus nobilis</i> leaves and a peeled apple, used as an antiseptic for the urinary tract, as bronchi expectorant and to lower blood pressure. SU. Decoction made with dried fruits, lemon peel and <i>Laurus nobilis</i> leaves regulates blood stream. SU (VV). Decoction to treat cough: <i>Ficus</i> fruits, honey and seed pod capsules of <i>Papaver rhoas</i> (OP). Decoction with dried fruits and unpeeled almonds against abdominal pain. SU (CIV)
<b>Cannabaceae</b>			
<i>Humulus lupulus</i> L. (PNALM-Idolo et al. ETHNO/014)	<i>Luppolo</i>	Female inflorescences	FOOD: fried or boiled with lemon juice (AV)
<b>Urticaceae</b>			
<i>Urtica</i> L. sp. pl. ( <i>dioica</i> L., <i>urens</i> L.) (PNALM-Idolo et al. ETHNO/015-016)	<i>Ortica; ardica</i>	Aerial part; leaf, young leaf; root;	MED: aerial parts crushed are topically applied in case of dislocation or painful joints (PC); decoction of whole plant rubbed on head against hair loss (CA,PC,VV), but also to lighten hair (VB). Root left in ½ litre of wine for a week: this liquid applied to hair against dandruff (VV). Same function also played by an infusion of <i>Urtica</i> and <i>Origanum</i> (SB, SE). Whole plants used to whip the body part affected by rheumatism to mitigate pain (OR, PC). Leaves rubbed in case of rheumatism to calm pain (CAR). Plant decoction drunk to purify blood (VV) and cure abdominal pains (OR) FOOD: young leaves are ingredient for soups, omelettes, "risotto", pies (AV, BA, PIC, VV). A.FEED: aerial parts crushed to feed chicks (VV,B); also boiled and mixed with flour as tonic food for turkey chicks (VB)
<i>Parietaria</i> L. sp. pl. ( <i>officinalis</i> L., <i>judaica</i> L.) (PNALM-Idolo et al. ETHNO/017-018)	<i>Erba vetriola</i> (VV); <i>erba pelusella</i> ; <i>pilosella</i> (CA); <i>palatalia</i> (OR)	Aerial part; whole plant	DOM: aerial part rubbed to clean bottles and glasses. SU (VV). MED: decoction of whole plants lowers blood pressure (CA); a poultice of aerial parts is applied to painful parts. SU (OR)
<b>Loranthaceae</b>			
<i>Viscum album</i> L.	<i>Vischio</i>	Fruit	DOM: put in a jar and covered with dung to melt, to obtain a sticky poultice. This sort of "glue" was smeared on branches to catch birds; nowadays illegal (CAR)



Botanical name (and reference specimen code)	Local names	Part used	Popular use
<b>Polygonaceae</b>			
<i>Rumex acetosella</i> L. (PNALM-Idolo et al. ETHNO/019)	Acetosella (AV, CAR); Fàv'ce; fav'ze; falsi limoni; dente di leone (OP)	Leaf	FOOD: in salad. SU (AV, CAR, OP).
<i>Rumex acetosa</i> L. (PNALM-Idolo et al. ETHNO/020)	Acetosa (CAR); erba dei pastori (AV); erba del pastore (SB)	Leaf	FOOD: 6-7 leaves sucked to calm the thirst (it has a lemon taste) (AV); in salad. SU (CAR, PIC, SB).
<i>Rumex alpestris</i> Jacq. (PNALM-Idolo et al. ETHNO/021)	Rabarbaro montano	Leaf	FOOD: in salad or boiled: SU (CAR).
<b>Chenopodiaceae</b>			
<i>Chenopodium bonus-henricus</i> L. (PNALM-Idolo et al. ETHNO/022)	Orapi	Stem; leaf	FOOD: <i>Orapi</i> are eaten, also in restaurants, boiled, as soups, pottage (AS), as salad (LAZ) SU
<i>Chenopodium album</i> L. (PNALM-Idolo et al. ETHNO/023)	Spinacio selvatico; farinaccio	Leaf	FOOD: boiled. SU (AV)
<b>Portulacaceae</b>			
<i>Portulaca oleracea</i> L. (PNALM-Idolo et al. ETHNO/024)	Portulaca; porcaccia (AV)	Steam; leaf	FOOD: in salad. SU (AV)
<b>Caryophyllaceae</b>			
<i>Silene vulgaris</i> (Moench) Garcke (PNALM-Idolo et al. ETHNO/025)	Verzulini	Leaf	FOOD: in salad. SU (OP)
<b>Ranunculaceae</b>			
<i>Helleborus foetidus</i> L. (PNALM-Idolo et al. ETHNO/026)	Munn'; u' Munu (CIV); erba lupara (B)	Aerial part	DOM: bunches of aerial parts used to clean house chimneys, stoves and wood ovens: SU (CIV, VV); oil lamp wicks (VV). MED/VET: decoction used to clean wounds of animals, and, when no better option was available, of humans (B)
<i>Clematis vitalba</i> L. (PNALM-Idolo et al. ETHNO/027)	Vitalba (CAR);	Shoot: frattacchi (B)	FOOD: in omelettes. SU (AV, B, CAR, M)
<b>Berberidaceae</b>			
<i>Berberis vulgaris</i> L. (PNALM-Idolo et al. ETHNO/028)	Crespino (CAR); uva cecca (OP)	Leaf; fruit	MED: leaves decoction is depurative and calms fever. FOOD: sometimes fruits were eaten by young people (because they have a slightly acid taste, some informants believed them to be toxic but in fact they are edible) (OP)
<b>Clusiaceae</b>			
<i>Hypericum perforatum</i> L. (PNALM-Idolo et al. ETHNO/029)	Erba di S. Giovanni (CAR); iperico (VV)	Aerial part; latex; flower; leaf	MED: tinctures and massage oil to treat lombalgia, sciatics and rheumatism. In association with <i>Salvia</i> rubbed on body parts to calm bone pain. SU (VV). Flower decoction is a digestive. Latex on wounds as vulnerary. Leaves decoction to wash wounds accelerates healing. SU (CAR)
<b>Lauraceae</b>			
<i>Laurus nobilis</i> L. (PNALM-Idolo et al. ETHNO/030)	Alloro; l'uro (VV, OR)	Leaves	MED: see <i>Ficus carica</i> (VV); decoction to cure abdominal pains (OR) SU. FOOD: a largely used aromatic herb
<b>Papaveraceae</b>			
<i>Papaver rhoeas</i> L. (PNALM-Idolo et al. ETHNO/031)	Papavero, paparelle (PC, OP); papagna (CIV); cucuccilli (OR); veccia (OP)	Seed pod capsule; leaves	MED: capsules dried in a shady place used to obtain a decoction to treat bronchial disease and applied externally to treat conjunctivitis; same use, infusion with <i>Matricaria</i> and <i>Sambucus</i> (PC). Decoction administered as a beverage to babies to favour sleeping (OP,OR), also with <i>Sambucus</i> . An infusion to treat cough obtained with <i>Papaver</i> leaves, <i>Tilia</i> leaves and <i>Matricaria</i> flowering tops (CIV). See <i>Ficus carica</i> (OP) A.FEED: to feed pigs and rabbits (B,OP)
<i>Chelidonium majus</i> L. (PNALM-Idolo et al. ETHNO/032)	Celidonia (VV, B, OR); bocca di leone (PC)	Latex; leaves; plant	MED: latex is applied externally to warts as keratolytic (B,OP,OR,PC). Fresh leaves are applied to tired eyes. Alcohol-leaf macerate drunk to treat liver diseases (VV). In case of tooth decay, plant was applied to aching teeth, which break up (B). Plant decoction is an abortifacient (OR). VET: the same decoction given to cattle to expel placenta (B,OP,OR,PC)
<b>Brassicaceae</b>			
<i>Nasturtium officinale</i> R. Br. (PNALM-Idolo et al. ETHNO/033)	Crescione; prcàcch (CAR, AV); schiavoni (OP)	Foglie	FOOD: in salad (AV, CAR) or soups (OP). SU
<i>Capsella bursa-pastoris</i> (L.) Medicus (PNALM-Idolo et al. ETHNO/034)		Plant	MED: plant alcohol macerate ingested to treat liver diseases. See <i>Equisetum</i> (VV)
<i>Brassica nigra</i> (L.) W. D. J. Koch	Senape	Seeds	MED: pulverized seeds mashed with hot water and spread on a gauze to obtain the so-called "carta senapata" (mustard plaster) used as a sinapism. This was applied externally to the body in case of bronchial affections, pneumonia, muscle pains, contusions, muscle strains (PC) FOOD: aromatic herb
<i>Brassica oleracea</i> L. (var <i>botrytis</i> L., <i>capitata</i> L., <i>sabauda</i> L.)	Cavolo/Verza	Leaves	MED: leaves softened and warmed with hot iron applied to legs to reduce swelling and treat varicose veins (VV) SU

Botanical name (and reference specimen code)	Local names	Part used	Popular use
<b>Crassulaceae</b>			
<i>Sempervivum</i> L. sp. pl. ( <i>arachnoideum</i> L., <i>tectorum</i> L.) (PNALM-Idolo et al. ETHNO/035-036)	Sempervivum (VV); semprevivo (CAR,OP)	Leaves; latex; aerial part	MED: fresh leaves applied to insect bites (VV); latex applied externally to warts as keratolytic (CAR); defoliated aerial part mashed and applied to haematomas (OP) SU
<b>Grossulariaceae</b>			
<i>Ribes rubrum</i> L. (PNALM-Idolo et al. ETHNO/037)	Ribes	Fruits	FOOD: jam, liqueur (CIV, PC). Eaten fresh (PC) SU
<i>Ribes uva-crispa</i> L. (PNALM-Idolo et al. ETHNO/038)	Uva spina (CIV, PC, OP); p'urcin (CIV)	Fruits	FOOD: eaten fresh, or in jam (CIV, PC), liqueur (OP, PC), syrup (PC) SU
<b>Rosaceae</b>			
<i>Rubus idaeus</i> L. (PNALM-Idolo et al. ETHNO/039)	Lamponi	Leaves; fruits	MED: depurative decoction made with leaves (VV) FOOD: fruits eaten fresh, used to prepare liqueur and jam (PC) SU
<i>Rubus ulmifolius</i> Schott (PNALM-Idolo et al. ETHNO/040)	Rovo/More; ruv (VV)	Leaves; fruits	MED: crushed fresh leaves applied to wounds, as a vulnerary and to reabsorb pus (PC,VV)FOOD: fruits for jam (CIV) SU
<i>Rosa</i> L. sp. pl. (cultivated varieties)	Rosa	bud, flower	MED: buds decoction used to treat cough and cold; SU (OR). Fresh petals decoction applied as a hot pack to treat reddened and tired eyes (OP) SU
<i>Rosa canina</i> L. (PNALM-Idolo et al. ETHNO/041)	Rosa; quarègl (CIV); uva raja (OP)	Leaves; fruits; fresh flowers	MED: leaves collected on May 22nd (Saint Rita's day) and dried used to make an infusion applied to treat conjunctivitis and redden eyes (PC, OP) SU. FOOD: fruits eaten fresh, or in jam. Some informants knew fruits are rich in vitamin C (OP,CIV,PC) SU
<i>Fragaria</i> L. sp. pl. ( <i>vesca</i> L., <i>viridis</i> Duchesne)	Fragola	Fruits	FOOD: fruits eaten fresh, or used to make a widespread liqueur called "fragolino", or in jam (CAR, CIV,OP,PC,VB) SU
<i>Cydonia oblonga</i> Miller	Cotogno; melocotogno	Fruits; seeds	FOOD: liqueur made with fruits or seeds SU (VV)
<i>Pyrus communis</i> L.	Pere selvatiche	Fruits	FOOD: fresh fruits eaten. A.FEED: used to feed sheep (OP) SU
<i>Malus sylvestris</i> (L.) Mill.	Melo; melo selvatico	Fruits	MED: see <i>Laurus</i> . FOOD: fruits often used to sweeten decoctions, eaten fresh or oven-dried (VB) SU
<i>Sorbus aucuparia</i> L. (PNALM-Idolo et al. ETHNO/042)	Sorbo degli uccellatori	Fruits	FOOD: eaten fresh (CIV), jam (AV) SU
<i>Sorbus aria</i> (L.) Crantz. subsp <i>cretica</i> (Lindl.) Holmboe (PNALM-Idolo et al. ETHNO/043)	Sorbo farinaceo; farinaccio; azizza (PC)	Fruits	FOOD: eaten fresh. (CIV,PC) SU
<i>Crataegus monogyna</i> Jacq. subsp <i>monogyna</i> (PNALM-Idolo et al. ETHNO/044)	Biancospino frutti: ghiugghiare (CIV, VV); ciciuott (VV); cacapranz (CIV); sprilli (OP)	Fruits; flowers; leaves	MED: decoction made with ripe fruits harvested by October, or infusion made with flowers and leaves (CAR,CIV,OP,VB,VV), or flowers only (VV,CAR,OP), used to lower blood pressure. SU FOOD: fresh fruits eaten (CAR,CIV,OP,VB,VV)
<i>Prunus dulcis</i> (Mill.) D. A. Webb.	Mandorlo	Fruits	MED: see <i>Ficus carica</i> (CIV). During transhumance almonds where harvested in Apulia as ingredients of cakes (PC) DOM: branches used to clean flue chimneys (CIV) MED: fruits are eaten to stop diarrhoea (CIV). FOOD: fruits are eaten fresh, or dried in oven, to make liqueur and jam (CIV,PC). Liqueur also made with seeds crushed with stones (SB) SU
<i>Prunus spinosa</i> L. (PNALM-Idolo et al. ETHNO/045)	Spino; prugnolo Atrìgnl (PC)	Branches; fruits; seeds	FOOD: fruits are eaten fresh, or dried in oven, to make liqueur and jam (CIV,PC). Liqueur also made with seeds crushed with stones (SB) SU
<i>Prunus domestica</i> L.	Susino; pruno	Fruits	FOOD: fruits are eaten fresh or dried; or in jam (CAR,VV), or to sweeten decoctions (CAR) SU
<i>Prunus avium</i> L. (PNALM-Idolo et al. ETHNO/046)	Ciliegio selvatico	Fruits; fruit pedicels	FOOD: jam made by using whole cherries and sugar cooked in a bain-marie (CIV) SU MED: decoction of fruit pedicels is expectorant (CAR) SU; the same decoction also used as laxative (OR)
<i>Prunus cerasus</i> L.	Visciole; amarene	Fruits; seeds; leaves	FOOD: fruits are ingredients for a very popular liqueur named "ratafia" (AV,CIV,VB,PC), also used to make jams; liqueur made with seeds or leaves (CIV) MED: a decoction with dried sour cherries to cure abdominal pains (CAR) SU
<b>Fabaceae</b>			
<i>Laburnum</i> Fabr. sp. pl. ( <i>anagyroides</i> Medik., <i>alpinum</i> (Mill.) Bercht. & J. Presl.) (PNALM-Idolo et al. ETHNO/047-048)	Maggiociondolo	Wood	DOM: wood is used to make fences, stakes, barns (OP) SU
<i>Glycyrrhiza glabra</i> L.	Liquirizia	Root	FOOD: mainly chewed. During transhumance liquorice was harvested in Apulia in May (PC)
<i>Lupinus albus</i> L. (PNALM-Idolo et al. ETHNO/049)	Lupino	Fruits	FOOD: fruits eaten, according to some informants to reduce blood pressure (CAR)
<i>Trigonella foenum-graecum</i> L. (PNALM-Idolo et al. ETHNO/050)	Fieno greco	Leaves; fruit	VET: leaves and fruits are used in a decoction given to ruminants to treat bloat (OR)
<b>Linaceae</b>			
<i>Linum usitatissimum</i> L.	Lino	Seeds	MED: seeds heated up in a pot with milk or <i>Malva</i> infusion. Used for compresses to drain abscesses (PC)
<b>Euphorbiaceae</b>			
<i>Euphorbia helioscopia</i> L. (PNALM-Idolo et al. ETHNO/051)	Tutmaja; tutumaja (CIV); titmaja (PC)	Latex	MED: latex applied externally to warts as a keratolytic (CIV, PC)

Botanical name (and reference specimen code)	Local names	Part used	Popular use
<b>Rutaceae</b>			
<i>Ruta graveolens</i> L. (PNALM-Idolo et al. ETHNO/052)	Ruta	Leaves; aerial part; whole plant	VET: plant or its parts mixed with lard were given to cows to treat slow rumen; as an anthelmintic, an odd number of small balls made of crushed plants mixed with lard and garlic were given to calves (OR), or aerial parts were simply added to their forage (OP). MAG: plant was hung to doors to keep witches away (OR)
<i>Citrus limon</i> (L.) Burm. f.	Limone	Fruit	MED: a bandaging with lemon slices was made to cure headache (PC). Filtered juice inhaled to cure sinusitis; see <i>Ficus carica</i> (VV). Lemon infusion administered in case of nausea or vomit (AV) SU
<b>Aceraceae</b>			
<i>Acer</i> L. sp. pl. ( <i>platanoides</i> L., <i>campestre</i> L., <i>pseudoplatanus</i> L.) (PNALM-Idolo et al. ETHNO/053-054-055)	Acero; lanna (VV)	Wood	DOM: wood used to make linen chests (VV), ox-bows and cow bell collars (OP) SU
<b>Celastraceae</b>			
<i>Euonymus europaeus</i> L. (PNALM-Idolo et al. ETHNO/056)	Fusaggine	Whole plant; fruit	VET: plant decoction rubbed on horses coat repels flies. Infusion administered to horses in case of abdominal diseases. DOM: fruits are threaded together to make necklaces (OP) SU
<b>Rhamnaceae</b>			
<i>Rhamnus</i> L. sp. pl. ( <i>alpina</i> L., <i>fallax</i> Boiss.) (PNALM-Idolo et al. ETHNO/057-058)	Ramno; cerasella (PC)	Bark	TRADE: a herbalist called Rosati ordered the harvesting of huge amounts of this and other plants. They were carried to towns (Avezano or Rome) for the extraction of active ingredients. <i>Rhamnus</i> bark was collected to extract a laxative (PC)
<b>Tiliaceae</b>			
<i>Tilia platyphyllos</i> Scop. (PNALM-Idolo et al. ETHNO/059)	Tiglio	Flowers; leaves	MED: flower infusion or decoction administered to treat bronchitis, cold, cough (CIV,OP,PC,SB,VB,VV); in VB only “mature” flowers are used, collected in mid-July and preserved for winter; in CIV, used to treat cough (see <i>Papaver</i> ). Flower decoction or infusion used to favour sleep and to calm (CIV,OP,PC,SB,VV); in CIV to favour sleep (see <i>Papaver</i> ). SU, but less widespread.
<b>Malvaceae</b>			
<i>Malva sylvestris</i> L. (PNALM-Idolo et al. ETHNO/060)	Malva; màua (CIV,VV); màleua (VV); màlua (CAR,OR)	Leaves and flowers; aerial part; whole plant	MED: leaves and flower decoction has a soothing effect on bronchitis, cold, sore throat, cough (CIV,LAZ,OR,PC,VV); to treat cough, also in association with sambucus (CIV,OP, VV); as an expectorant (see <i>Ficus</i> ) (CIV). Decoction of aerial parts either used for personal cleanliness, or drunk as a disinfectant of urinary tract, and to treat cystitis (PC,VV) and kidney diseases (LAZ,OR). Aerial part, either applied to aching teeth as analgesic, or to treat gum diseases (CIV,PC also in OP but with crushed leaves); plant decoction used as a mouthwash (CIV,OP,VV). To drain an abscess (see <i>Linum</i> ) (PC). The whole plant, fresh or dried, preserved for the winter, used to make decoctions with depurative or laxative effects, or cure abdominal pains and colics. (CAR,LAZ,OP,OR,PC,VB,VV). To treat colics, also boiled with oil and drunk (OP). Compresses made of crushed fresh plants (green parts or roots) applied externally to the stomach in case of pain, or for labour pains (OR). Aerial part decoction drunk against stomach ache and indigestion (LAZ,OP,OR); also drunk to counter headache (CIV) or favour sleep (LAZ,OP). Plant boiled to make compresses used to treat rheumatism (OR). In case of sciatica, see <i>Juniperus</i> (CAR). Aerial parts, mixed with pork fat or butter, used to obtain an anti-wrinkle cream; plant decoction or flowers softened with butter, a cream was used to treat chapped hands (VV). To treat stomach ache, aerial parts were left soaking for three nights along with <i>Cynodon dactylon</i> (CAR) VET: whole plant decoction administered to livestock to treat colics (OP, PC in the former village also boiled with oil). Plant crushed and applied externally to drain abscesses. Decoction made of <i>Malva</i> plant and <i>Matricaria</i> administered to unblock rumen (OR). (Most uses are still widespread)
<b>Violaceae</b>			
<i>Viola odorata</i> L. (PNALM-Idolo et al. ETHNO/061)	Viola	Aerial part	MED: decoction used to treat cold and cough (CIV)

Botanical name (and reference specimen code)	Local names	Part used	Popular use
<b>Cornaceae</b>			
<i>Cornus mas</i> L. (PNALM-Idolo et al. ETHNO/062)	Corniolo (CIV,B); vrinniàne (CIV); grugnale (OP)	Fruits	FOOD: unripe fruits pickled to be used in salads or as an appetiser; ripe ones used to make jams (B,CIV); fresh fruits eaten or used to make a liqueur or syrup (CIV), or preserved in spirit (OP) SU
<b>Araliaceae</b>			
<i>Hedera helix</i> L. (PNALM-Idolo et al. ETHNO/063)	Edera	Leaves	MED: leaves thinly crushed applied to varicose veins, particularly to external lesions (CIV)
<b>Apiaceae</b>			
<i>Bunium bulbocastanum</i> L. (PNALM-Idolo et al. ETHNO/064)	Ciacià	Bulbs	FOOD: eaten raw or boiled as chickpeas (OP)
<i>Pimpinella anisum</i> L.	Anice; anici (OR)	Seeds	MED: depurative decoction. To obtain the same effect, an infusion was also prepared together with barley seeds and coffee beans (VV). Anise seeds decoction also used to treat stomach ache (VV): SU TRADE: in the past it was cultivated and harvested for trade, as an ingredient for pizza, bread, "focaccia". This was a profitable business until a parasite destroyed all cultivations. FOOD: widespread aromatic herb (OR)
<i>Foeniculum vulgare</i> L. (PNALM-Idolo et al. ETHNO/065)	Finocchio selvatico	Leaf; seed; young stem	MED: leaf decoction used to cure abdominal pains (B); digestive decoction made with seeds and young stems (CAR) FOOD: widespread aromatic herb
<i>Petroselinum</i> Hill sp. pl. ( <i>crispum</i> (Mill) A. W. Hill, <i>segetum</i> (L.) Koch.)	Prezzemolo	Leaf; seed	MED: to treat stomach hyperacidity, seeds in decoctions or chewed. Crushed leaves used as a remedy for insect bites (CAR) Leaves mixed with oil chewed to treat toothache (OP) SU. FOOD: widespread aromatic herb
<i>Angelica sylvestris</i> L. (PNALM-Idolo et al. ETHNO/066)	Angelica	Root; steams; leaf; seeds	MED: root decoction to treat respiratory diseases. MED/FOOD: aperitif and digestive liqueurs made with seeds, leaves and dried stems (AV) SU
<i>Ferula</i> L. sp. pl. ( <i>communis</i> L., <i>glauca</i> L.) (PNALM-Idolo et al. ETHNO/067-068)	Ferla	Stem	DOM: it was used for the so-called "taglia", i.e. a number (in Roman numerals) was carved on a stem section corresponding to the payment due to shepherds leading sheep flocks (the number referred to the due amount of wheat, cheese or other food). The stem was split in two, one part kept by the owner, the other by the shepherd; when joint together, the carved number was readable again. Once the flock was returned to the owner, the two parts were joined together to establish the due payment (CIV)
<i>Pastinaca sativa</i> L. subsp <i>urens</i> (Req.) Celak	Pastinaca	Root	FOOD: eaten raw (CAR) SU
<b>Ericaceae</b>			
<i>Arctostaphylos uva-ursi</i> (L.) Sprengel (PNALM-Idolo et al. ETHNO/069)	Uva ursina	Leaves; fruits	MED: leaf decoction used as an intestinal depurative (PC). Boiled fruits used to make a syrup that, once diluted with hot water, was drunk as tea: it had diuretic properties and was used for treating urinary tract affections and kidney diseases (VB)
<b>Gentianaceae</b>			
<i>Centaureum erythraea</i> Rafn. (PNALM-Idolo et al. ETHNO/070)	Centaurea minore	Flowering top	MED: decoction to treat fever (CAR)
<i>Gentiana lutea</i> L. subsp <i>lutea</i>	Genziana	Root	MED: cold infusion left to rest for three clear nights: used to treat malarial fever and inappetence (PC). Decoction cured sore throat (PC). MED/FOOD: very popular aperitif and digestive liqueur (B,CIV,OP,OR,PC,VB,VV). TRADE: in the past, commercially exploited—it underwent massive harvesting in the wild to produce liqueur (especially by herbalist Rosati—see <i>Rhamnus</i> ) (CIV)
<i>Gentiana dinarica</i> Beck	Genzianella	flower; root; whole plant	MED: the liquid obtained by boiling roots, once sieved and left outside on a cool night was drunk in the morning to prevent haemorrhages; same use, also flowers decoction, which served to promote appetite too (CIV). Plant infusion left resting for 40 days was drunk against inappetence (PC). Same application, infusion made with 1 l of water and 3–4 whole plants, left outside overnight; the same infusion ingested to treat stomach ache (CIV). SU, but by far less popular nowadays.
<b>Rubiaceae</b>			
<i>Galium odoratum</i> (L.) Scop. (PNALM-Idolo et al. ETHNO/071)	Stellina odorosa	Aerial parts with flowers	DOM: bunches of dried flowers are placed in the wardrobes to substitute moth balls. FOOD: liqueur named "grappa" (AV) SU
<b>Boraginaceae</b>			
<i>Pulmonaria</i> L. sp. pl. ( <i>apennina</i> Cristof. & Puppi, <i>saccharata</i> Mill.) (PNALM-Idolo et al. ETHNO/072-073)	Polmonaria	Leaf	FOOD: eaten boiled (AV) SU

Botanical name (and reference specimen code)	Local names	Part used	Popular use
<i>Borago officinalis</i> L. (PNALM-Idolo et al. ETHNO/074)	Borragine	Flowering top; leaf	MED: infusion of flowering tops to cure cold sore (AV). Fresh or dried leaves used to make decoctions and infusions used as gargle (SB,VR)
<b>Lamiaceae</b>			
<i>Melittis melissophyllum</i> L. (PNALM-Idolo et al. ETHNO/075)	Cedrina	Leaf	MED: warm decoction is digestive and also treats cough and sore throat (CIV, SU there, harvested in Alvito or, in the past, in Apulia and brought in Abruzzo by shepherd involved with the transhumance). FOOD: in soup (AV) SU
<i>Lamium purpureum</i> L. (PNALM-Idolo et al. ETHNO/076)	Lamio rosso	Leaf; apical parts	
<i>Melissa officinalis</i> L. (PNALM-Idolo et al. ETHNO/077)	Melissa	Leaf; aerial parts	MED: from aerial parts a decoction is obtained to favour digestion, lower blood pressure and for calming (also in case of emotional illness) (OR) FOOD: an aromatic herb used as a beef condiment (OR) SU
<i>Origanum vulgare</i> L.	Origano; orècano (OR)	Leaf	MED: used against dandruff; see <i>Urtica</i> (SB,SE) SU. FOOD: widespread aromatic herb
<i>Thymus vulgaris</i> L. (PNALM-Idolo et al. ETHNO/078)	Timo	Leaf; whole plant	MED: an expectorant decoction obtained by leaves (CIV). Whole plant macerated in alcohol to obtain a liquid employed for massages to treat bone or joint pains. Syrup obtained by boiling leaves with sugar is used for external applications to swellings and sore muscles. Leaves decoction used to calm babies (VV). From leaves a depurative infusion is derived (CAR). FOOD: fresh or dried as an aromatic herb (CAR). SU FOOD: used as a condiment, particularly for snails (SE). Aromatic herb. SU
<i>Thymus</i> L. sp. pl. ( <i>pulegioides</i> L., <i>longicaulis</i> C. Presl.) (PNALM-Idolo et al. ETHNO/079-080)	Timo selvatico; sarapuglia (SE)	Apical part	
<i>Mentha</i> L. sp. pl. ( <i>arvensis</i> L., <i>pulegium</i> L., <i>suaveolens</i> Ehrh., <i>spicata</i> L.)	Menta; mentuccia (CAR); mentuccia selvatica (OP)	Whole plant; leaf; apical part	MED: whole plant used to obtain a depurative decoction (VV). With dried leaves a digestive decoction is obtained (CAR). DOM: fresh or dried bunches used to repel insects (LAZ). FOOD: aromatic herb (B,OP) SU
<i>Rosmarinus officinalis</i> L.	Rosmarino	Leaf; aerial part; flowering stem	MED: leaf decoction drunk to treat gastritis (CAR). Leaf infusion drunk to cure migraine (AV). DOM: fresh plant, or dried stems, used to repel insects (LAZ) SU FOOD: widespread aromatic herb
<i>Lavandula angustifolia</i> Mill. (PNALM-Idolo et al. ETHNO/081)	Lavanda	Flowering aerial part	DOM: dried bunches used to perfume linen and repel insects (LAZ) SU
<i>Salvia</i> L. sp. pl. ( <i>officinalis</i> L., <i>glutinosa</i> L., <i>pratensis</i> L.)	Salvia; salvia selvatica (B)	Leaf	MED: leaves used to obtain a digestive infusion, administered in case of headache and angina pectoris. With 200 g of leaves per water litre a liquid is obtained and used to wash the skin in case of fevering sweats (PC). Leaf decoction used to treat abdominal pains (B) FOOD: widespread aromatic herb
<i>Ocimum basilicum</i> L.	Basilico	Leaf; aerial part	MED: fresh leaf decoction used to strengthen hair (PIC). Aerial part infusion drunk to calm cough, nausea or vomit (AV) SU. FOOD: widespread aromatic herb
<b>Solanaceae</b>			
<i>Atropa belladonna</i> L.	Belladonna	Fruit; whole plant	MED: fruit macerated in water. Ingestion of this liquid would lower cholesterol level; accelerates healing when applied to contusions (B). TRADE: harvested and sold to a local herbalist (Rosati) or to a pharmaceuticals industry in Rome (CAR,CIV,OP,VV). Nowadays not used in home preparations; in the past too, rarely used because potentially harmful.
<i>Solanum dulcamara</i> L. (PNALM-Idolo et al. ETHNO/082)	Dulcamara	Young branch	MED: decoction acts as a laxative; also treats stomach disease (PC)
<i>Solanum tuberosum</i> L.	Patata	Tuber	MED: potato slices with salt applied to burns to accelerate healing. Also applied (without salt) with bandages to forehead to cure headache (PC).
<i>Solanum lycopersicum</i> L.	Pomodoro	Leaf	VET: leaf decoction given to livestock to treat slow rumen (OR)
<b>Scrophulariaceae</b>			
<i>Verbascum</i> L. sp. pl. ( <i>thapsus</i> L., <i>samniticum</i> Ten., <i>niveum</i> Ten., <i>sinuatum</i> L.)	Tasso Barbasso (PC,VB); cuoppi (PC,B)	Leaf; flower	MED: leaves were placed in typical shepherd shoes ( <i>ciocie</i> ) or applied to feet bladders, with refreshing and cicatrizing effects (PC,B). TRADE: flowers harvested for local herbalist Rosati were used in preparations against cold, cough, bronchitis (PC,VB)
<i>Scrophularia canina</i> L. (PNALM-Idolo et al. ETHNO/083)	Dente di cane; krap'nella (PC); crapnella (OR,OP); (semi: cicirilli) (OP)	Whole plant; root	MED: the whole plant was boiled and the liquid so obtained used to heal wounds, or applied to haematomas (OP). VET: same use for injured livestock (OP). Decoction of whole plant administered to livestock to treat colics (PC). Plant parts were introduced in fissures of breaking hooves of horses and cows to treat them (OP,OR). Veterinary practice SU



Botanical name (and reference specimen code)	Local names	Part used	Popular use
<i>Cymbalaria muralis</i> Gottfr. Gaertn., B.Mey. & Schreb. (PNALM-Idolo et al. ETHNO/084)	Sav'ce della serpa (PC); fàvez dei muri; fàvece (CAR)	Leaf; aerial part	MED: leaves, crushed and mixed with sugar and vinegar, applied externally to dislocations (PC). Salted aerial parts wrapped in oil paper and crushed, applied externally to treat haematomas (OP) SU
<i>Digitalis</i> L. sp. pl. ( <i>ferruginea</i> L., <i>micrantha</i> Roth)	Digitale	Whole plant	TRADE: harvested to be traded for its cardiotonic properties (LAZ)
Plantaginaceae			
<i>Plantago major</i> L. (PNALM-Idolo et al. ETHNO/085)	Piantaggine (VV); cinq'nierv (VV,VB)	Leaf; whole plant	MED: fresh leaves applied to wounds as a vulnerary and to reabsorb pus. Decoction of whole plant to treat cold (VV). VET: fresh leaves applied to treat livestock haematomas (VB).
Caprifoliaceae			
<i>Sambucus ebulus</i> L. (PNALM-Idolo et al. ETHNO/086)	Ebbio	Leaf	MED: placed inside shoes to reduce sweating; leaves produced a protective black coat on feet preventing bladders (CIV)
<i>Sambucus nigra</i> L. (PNALM-Idolo et al. ETHNO/087)	Sambuco; paparozzo (CIV); sammùch (VV,OR)	Flower; fruit	MED: flowers harvested on S. John's day (June 24th), once dried in a shady place (see <i>Papaver</i> ), were used to prepare an infusion to cure bronchial diseases and conjunctivitis (CIV,PC). Flowers harvested in May used in decoctions to favour sleep (see also <i>Papaver</i> ) (CIV). To cure cough see <i>Malva</i> (CIV). Flower decoction has depurative properties (VV) and is expectorant, used to treat cold or against fever (CAR,OR) and abdominal pains (CIV). Fresh flower decoction applied to reddened eyes (OP) SU. FOOD: fruits used to prepare jam (AV,OR,PC,VV) and liqueur (CAR,OP,PC). Flowers buttered and deep-fried, then dressed with salt or sugar (AV) SU. DOM: fruits also used to make ink (B)
Valerianaceae			
<i>Valeriana</i> L. sp. pl. ( <i>montana</i> L., <i>officinalis</i> L.) (PNALM-Idolo et al. ETHNO/088-089)	Valeriana	Rhizome; flower	MED: decoction of rhizome (CAR,PC) or flowers (CAR,SB) to favour sleep or as a sedative SU
Asteraceae			
<i>Bellis perennis</i> L. (PNALM-Idolo et al. ETHNO/090)	Margherite pratoline	Basal rosette	FOOD: leaves eaten in salads before flowering (OP) SU
<i>Achillea</i> L. sp. pl. ( <i>millefolium</i> L., <i>nobilis</i> L.)	Cent pied	Leaves; flowering top	MED: diuretic leaf decoction (CIV); apical parts dried and crushed used as a cicatrizant to treat wounds. VET: same use (CIV)
<i>Matricaria recutita</i> L. (PNALM-Idolo et al. ETHNO/091)	Camomilla; campumilla (CIV); cambumilla (PC); capomilla(OR)	Flowering top	MED: decoction or infusion has sedative properties (CAR,CIV,OP,PC,VB) in the latter, sometimes the liquid was also left resting in a shady place before consumption. Decoction to treat cold diseases (AV,OR)–for its application to treat cough (CIV) and bronchial diseases, see <i>Papaver</i> (PC). For the same affections, also applied externally: flowers were heated in a pot with whipped cream of goat milk and the product was used to soak wool rags to be applied to the chest of patients (PC). To treat colics, warm wool rags were soaked in a decoction of flowering tops and applied to the abdomen or the lumbar region. In the case of abdominal pains, decoction also ingested (CIV,OP,OR,VV). To treat haemorrhoids, see <i>Equisetum</i> (VV). VET: to unblock rumen, see <i>Malva</i> (OR); in CIV, PC, VB <i>Matricaria</i> used to be mainly harvested in Apulia during transhumance (nowadays largely replaced by that from industrial production).
<i>Artemisia</i> L. sp. pl. ( <i>vulgaris</i> L., <i>umbelliformis</i> Lam. subsp. <i>eriantha</i> )	Genepi	Aerial part with flowers Flowering top; leaf	FOOD: liqueur (OP) (nowadays its preparation from wild plants is limited because <i>A. eriantha</i> is a regionally protected species).
<i>Tussilago farfara</i> L. (PNALM-Idolo et al. ETHNO/092)	Farfaro	Flowering top; leaf	MED: emollient decoctions to treat cough and catarrh (CIV)
<i>Petasites hybridus</i> (L.) Gottfr. Gaertn. subsp. <i>hybridus</i> (PNALM-Idolo et al. ETHNO/093)	Farfaraccio; cùppe	Leaf	DOM: large leaves woven together to make baskets used to carry and store materials, snow included (CIV)
<i>Calendula</i> L. sp. pl. ( <i>officinalis</i> L., <i>arvensis</i> L.)	Calendula	Flower; leaf	FOOD: dried flowers covered with vinegar to aromatizing (AV). MED: fresh leaves are externally applied to feet to treat callosities and chilblains SU MED: depurative decoction (CAR)
<i>Arctium lappa</i> L. (PNALM-Idolo et al. ETHNO/094)	Bardana	Root	
<i>Carduus</i> L. sp. pl. ( <i>nutans</i> L., <i>pycnocephalus</i> L.)	Cardo selvatico	Young leaf	FOOD: used in food preparations as an alternative to artichoke (OP) SU
<i>Cynara cardunculus</i> L.	Carciofo	Leaf	MED: leaf decoction is a liver depurative (VV)
<i>Silybum marianum</i> (L.) Gaertn. (PNALM-Idolo et al. ETHNO/095)	Cardo mariano	Leaf	MED: leaf decoction is a liver depurative (CIV)
<i>Carlina</i> L. sp. pl. ( <i>acaulis</i> L., <i>acanthifolia</i> All.)	Carlina	Flower	FOOD: the receptacle, when still soft, was eaten in food preparations as an alternative to artichokes, also raw (CIV). No longer used because it may be harmful.

Botanical name (and reference specimen code)	Local names	Part used	Popular use
<i>Cichorium intybus</i> L. (PNALM-Idolo et al. ETHNO/096)	Cicoria	Root; leaf	MED: root infusion is administered to children to stop vomit (PC). Leaves eaten because it is believed they may treat diabetes (CAR). FOOD: leaves eaten raw or cooked (B,CAR). SU FOOD: in salads (CIV). SU
<i>Urospermum dalechampii</i> F. W. Schmidt (PNALM-Idolo et al. ETHNO/097)	Casselle fredde	Leaf	FOOD: in salads (CIV). SU
<i>Taraxacum officinale</i> Weber (PNALM-Idolo et al. ETHNO/098)	Cicoriotta selvatica; cicoria amara; m'lierv (CIV); cicoria (CAR,OR,OP); Tarassaco (SB)	Whole plant; basale rosette; root; flower	MED: whole plant infusion is drunk as a diuretic and depurative. SU (SB) FOOD: in the whole Alto Sangro basin, leaves widespread in cooking, eaten in salads, with rice, or once in a typical shepherd soup ( <i>brodo del pastore</i> ) (CAR,CIV,OP,OR,PC,VB) SU
<i>Sonchus</i> L. sp. pl. ( <i>arvensis</i> L., <i>asper</i> (L.) Hill, <i>oleraceus</i> L., <i>tenerrimus</i> L.)	Crespigno; rapientina	Leaf	FOOD: eaten boiled or in salads (OP) SU
<i>Lactuca serriola</i> L.	Scarola; lattuga escariola (SB, CAR)	Leaf	FOOD: in salads (CAR,SB) SU
<i>Lactuca perennis</i> L.	Lattuga selvatica; lattuga fina; lattughella	Leaf	FOOD: in salads (LAZ) SU
<i>Reichardia picroides</i> (L.) Roth (PNALM-Idolo et al. ETHNO/099)	Caccialepre	Leaf	FOOD: boiled or in salads (OR) SU
<i>Crepis</i> L. sp. pl. ( <i>biennis</i> L., <i>vesicaria</i> L.) (PNALM-Idolo et al. ETHNO/100-101)	Cicoriotta selvatica (CIV); cicoriotta di montagna (OP)	Basale rosette	FOOD: one of the ingredients of the once popular shepherd soup <i>brodo del pastore</i> (CIV). Eaten in salads (OP) SU
<b>Melanthiaceae</b>			
<i>Veratrum album</i> L. (PNALM-Idolo et al. ETHNO/102)	Veratro; schiattacapre (AV)	Rhizome	VET: a very concentrated decoction is used to wash cattle hooves to treat infections, and sheep skin for treating scabies (OP). In fact, breeders fear this plant because when animals eat it, the stomach may swell and even lead to death (this pathology is called <i>scapizzo</i> in VV). So, when farmers find this plant, they eradicate it.
<b>Alliaceae</b>			
<i>Allium sativum</i> L.	Agljo	Bulb	MED: administered to children as an infusion or eaten as an anthelmintic (OP,VV). In CAR, children wore a necklace of garlic cloves believed to prevent worm infestations VET: as an anthelmintic, see <i>Ruta</i> (OR). For the same use, garlic cloves crushed and mixed to fodder of domestic animals (OP) The VET uses still survive. FOOD: widespread aromatic herb
<i>Allium cepa</i> L.	Cipolla; cepulla	Bulb	MED: infusion to treat cough (AV) SU. FOOD: widespread aromatic herb
<i>Allium roseum</i> L. (PNALM-Idolo et al. ETHNO/103)	Agljo selvatico	Bulb; leaf	FOOD: aromatic herb (OP,OR) SU
<i>Allium ursinum</i> L. (PNALM-Idolo et al. ETHNO/104)	Agljo ursino	Leaf; flower; bulb	MED: dried leaves mixed with water and honey used as a digestive (AV) SU. FOOD: a condiment, in soups, or deep-fried (AV,CAR,SB,VR) SU
<i>Allium porrum</i> L.	Porro	Juice	MED: to treat abscesses, bread crumbs imbued with fresh juice were locally applied (VC) FOOD: a widespread aromatic herb
<b>Asparagaceae</b>			
<i>Asparagus</i> L. sp. pl. ( <i>tenuifolius</i> Lam., <i>acutifolius</i> L.)	Asparagi selvatici	Turion	MED: eaten as a diuretics (CAR). Decoctions employed to treat flu (AV). FOOD: eaten in salads or boiled, in omelettes, soups–widespread (AS,LAZ)
<b>Asphodelaceae</b>			
<i>Asphodelus</i> L. sp. pl. ( <i>fistulosus</i> L., <i>ramosus</i> L. subsp <i>ramosus</i> , <i>macrocarpus</i> Parl. subsp <i>macrocarpus</i> )	Asfodelo	Apical part	DOM: lamp wicks (VV)
<b>Iridaceae</b>			
<i>Crocus sativus</i> L.	Zafferano	Pistil	MED: the infusion is used as a mouth rinse (AQ). Decoction used as a digestive and sedative (CAR)
<b>Poaceae</b>			
<i>Lolium</i> L. sp. pl. ( <i>perenne</i> L., <i>multiflorum</i> Lam.)	Loglietta	Seed	MED: during harvesting it was separated from wheat and seeds were roasted and grinded. They were then boiled in water and filtered (in some locations, only decoction was made, i.e. seeds were simply water-boiled). The liquid so obtained was ingested for its sedative properties. VET: seeds mixed with fodder for pigs showing abnormal behaviour (locally named “mad” pigs) to calm them (OP).
<i>Hordeum vulgare</i> L.	Orzo	Seed	MED: infusion made with <i>Hordeum</i> seeds, <i>Pimpinella anisum</i> seeds, and grinded coffee beans drunk as a depurative and detoxicant (VV) SU
<i>Triticum aestivum</i> L.	Grano, cama (CIV)	Roughage; ear	MED: bran softened in hot water externally applied to paronychia, warts, and to mitigate itch due to several causes (urticaria, <i>Herpes zoster</i> , etc.) (PC). Warm roughage was applied as a cataplasm to cure muscle and articular sore (CIV). In case of sciatica, see <i>Juniperus</i> . DOM: wheat ears were cover stored snow to preserve it (in the <i>neviere</i> ) (CIV). A.FEED: dogs were fed with roughage balls (CIV)

Botanical name (and reference specimen code)	Local names	Part used	Popular use
<i>Cynodon dactylon</i> (L.) Pers. (PNALM-Idolo et al. ETHNO/105)	Gramigna; gramègna (OR,VV); ramègna (CAR); gramiccia (OR)	Whole plant	MED: decoction used to treat sore throat (VV), as a depurative (OR,VV), to treat abdominal pains (CAR,OR,VV), for personal cleanliness (VV), or drunk as a disinfectant of urinary tract, diuretic, to cure stomach ache (CAR) and kidney diseases and to expel kidney stones (CAR,OR,VV). Decoction also drunk to counter menstrual cramps (OR). Infusion drunk or used to prepare compresses to cure rheumatism (OP) To treat stomach ache, see also <i>Malva</i> (CAR). A.FEED: used to feed animals

A.FEED = animal feeding; DOM = domestic/handcraft; FOOD = food item; MAG = magical use; MED = medical application; TRADE = harvested for trading; VET = veterinary use. SU = still used.

Towns and localities: AQ = surroundings of L'Aquila; AS = all towns of Alto Sangro; AV = Alvito; B = Barrea; CAR = Cardito di Vallerotonda; CIV = Civitella Alfedena; M = Molise; OP = Opi; OR = Ortona dei Marsi; PC = Pescasseroli; PIC = Picinisco; SB = San Biagio Saracinisco; SE = Settefrati; LAZ = all towns in the Lazio area of PNALM; VB = Villetta Barrea; VC = San Donato Val di Comino; VR = Vallerotonda; VV = Villavallelonga.

## References

- Agelet, A., 1999. *Estudis d'etnobotànica farmacèutica al Pallars*. Doctoral Thesis, Faculty of Pharmacy, University of Barcelona.
- Agelet, A., Vallès, J., 2001. Studies on pharmaceutical ethnobotany in the region of Pallars (Pyrenees, Catalonia, Iberian Peninsula). Part I. General results and new or very rare medicinal plants. *Journal of Ethnopharmacology* 77, 57–70.
- Agostini, S., Morelli, C., Massimi, G., Landini, P., 1998. L'uomo e l'ambiente. In: Pratesi, F., Tassi, F. (Eds.), *Parco Nazionale d'Abruzzo. Alla scoperta del Parco più antico d'Italia*. Carsa Edizioni, Pescara, pp. 103–176.
- Amico, F.P., Sorge, E.G., 1997. Medicinal plants and phytotherapy in Mussomeli area (Caltanissetta, Sicily, Italy). *Fitoterapia* 68, 143–159.
- Antonone, R., De Simone, F., Morrica, P., Ramundo, E., 1988. Traditional phytotherapy in the Roccamonfina volcanic group, Campania, Southern Italy. *Journal of Ethnopharmacology* 22, 295–306.
- Anzalone, B., Bazzichelli, G., 1958–1960. La Flora del Parco Nazionale d'Abruzzo. *Annali di Botanica* 26, 198–295; 335–422.
- Battista, A., 2003. *Salute e bellezza con le piante*. Giunti Demetra, Firenze.
- Benigni, R., Capra, C., Cattorini, P.E., 1951. *Manuale di Fitoterapia*. Inverni e Della Beffa, Milano.
- Blanco, E., Macia, M.J., Morales, R., 1999. Medicinal and veterinary plants of El Caurel (Galicia, Northwestern Spain). *Journal of Ethnopharmacology* 65, 113–124.
- Blondel, J., Aronson, J., 1999. *Biology and Wildlife of the Mediterranean Region*. Oxford University Press, Oxford.
- Bonet, M.À., Vallès, J., 2007. Ethnobotany of Montseny biosphere reserve (Catalonia, Iberian Peninsula): plants used in veterinary medicine. *Journal of Ethnopharmacology* 110, 130–147.
- Boninfante, A., Mascolo, N., Mucci, E., 1997. *Prontuario di Fitoterapia*. Studio Edizioni, Milano.
- Briganti, F., 1842. *Piante Tintorie del Regno di Napoli Distribuite in Tavole Sinottiche*. Tipografia del Tasso, Napoli.
- Burri, E., Massoli Novelli, R., Petitta, M., 1998. Il territorio. In: Pratesi, F., Tassi, F. (Eds.), *Parco Nazionale d'Abruzzo. Alla scoperta del Parco più antico d'Italia*. Carsa Edizioni, Pescara.
- Camangi, F., Tomei, P.E., 2003. Tradizioni etno-farmacobotaniche nella provincia di Livorno: il territorio della Valle Benedetta. *Informatore Botanico Italiano* 35, 41–44.
- Camejo-Rodrigues, J., Ascensão, L., Bonet, M.À., Vallès, J., 2003. An ethnobotanical study of medicinal and aromatic plants in the Natural Park of "Serra de São Mamede" (Portugal). *Journal of Ethnopharmacology* 89, 199–209.
- Capasso, F., Grandolini, G., 1996. *Fitofarmacia. Impiego Razionale Delle Droghe Vegetali*. Springer, Milano.
- Cappelletti, E.M., Trevisan, R., Caniato, R., 1982. External antirheumatic and antineuralgic herbal remedies in the traditional medicine of north-eastern Italy. *Journal of Ethnopharmacology* 6, 161–190.
- Chapman, V.J., Chapman, D.J., 1980. *Seaweeds and Their Uses*. Chapman & Hall, London & New York.
- Classens, B., Amelunxen, F., Blaschek, W., 1993. Analytical and structural investigation of the mucilage of *Malva* species. *Planta Medica* 59, 615.
- Conti, F., 1998. Flora d'Abruzzo. Elenco sistematico delle piante vascolari presenti in Abruzzo. Ente Autonomo Parco Nazionale d'Abruzzo, Luxograph s.r.l., Palermo.
- Cornara, L., La Rocca, A., Marsili, S., Mariotti, M.G., 2008. Traditional uses of plants in the Eastern Riviera (Liguria, Italy). *Journal of Ethnopharmacology*, doi:10.1016/j.jep.2009.06.021.
- Corrain, C., Zampini, P., 1961. Note di Veterinaria Popolare riguardanti il Polesine. *Archivio per l'Antropologia e la Etnologia* XCI, 249–263.
- Corsi, G., Gaspari, G., Pagni, A.M., 1981. L'uso delle piante nell'economia domestica della Versilia collinare e montana. *Atti della Società Toscana di Scienze Naturali e Matematiche. Serie B* 87, 309–386.
- Cotton, M.C., 1996. *Ethnobotany. Principles and Applications*. John Wiley & Sons, Chichester, England.
- Cunningham, A.B., 2001. *Applied Ethnobotany. People, Wild Plant Use, Conservation. People and Plants Conservation Series*. Earthscan, Sterling, VA/London.
- Da Legnano, L.P., 1973. *Le piante medicinali nella cura delle malattie umane*. Edizioni Mediterranee, Roma.
- Dall'Acqua, S., Tomè, F., Vitalini, S., Agradi, E., Innocenti, G., 2009. *In vitro* estrogenic activity of *Asplenium trichomanes* L. extracts and isolated compounds. *Journal of Ethnopharmacology* 122, 424–429.
- D'Andrea, M., 1982. Le piante officinali del Parco Nazionale d'Abruzzo e gli usi popolari nell'Alta valle del Sangro. *Rivista Abruzzese* 35, 155–176.
- De Feo, V., Senatore, F., 1993. Medicinal plants of phytotherapy in the Amalfitan Coast, Salerno Province, Campania, Southern Italy. *Journal of Ethnopharmacology* 39, 39–51.
- De Feo, V., Aquino, R., Menghini, A., Ramundo, E., Senatore, F., 1992. Traditional phytotherapy in the Peninsula Sorrentina, Campania, Southern Italy. *Journal of Ethnopharmacology* 36, 113–125.
- De Natale, A., Pollio, A., 2007. Plants species in the folk medicine of Montecorvino Rovella (inland Campania Italy). *Journal of Ethnopharmacology* 109, 295–303.
- Di Vito, N., 1979. *Le piante officinali del Parco Nazionale d'Abruzzo nell'uso della medicina popolare*. Dissertation thesis, University of Perugia.
- El Beyrouthy, M., Nelly, A., Annick, D.-D., Frederic, D., 2008. Plants used as remedies antirheumatic and antineuralgic in the traditional medicine of Lebanon. *Journal of Ethnopharmacology* 120, 315–334.
- Gavilanes, E., 1995. El número nueve en la medicina popular. *Revista de Dialectología y Tradiciones Populares* 50, 243–262.
- Giacomini, M., Bisio, A., Minuto, L., Profumo, P., Ruggiero, C., 1999. Strutturazione della conoscenza per un database di etnobotanica ligure. *Informatore Botanico Italiano* 3, 156–160.
- Giancristofaro, E., 1995. *Tradizioni Popolari d'Abruzzo*. Newton Compton editori, Roma.
- González-Rivas, B., Tigabu, M., Gerhardt, K., Castro-Marin, G., Odén, P.C., 2006. Species composition, diversity and local uses of tropical dry deciduous and gallery forests in Nicaragua. *Biodiversity and Conservation* 15, 1509–1527.
- Grande, L., 1904. primo contributo alla Flora di Villavallelonga nella Marsica. *Nuovo Giornale Botanico Italiano* (n.s.) 9, 125–140.
- Guarrera, P.M., 1999. Traditional antihelminthic, antiparasitic and repellent uses of the plants in Central Italy. *Journal of Ethnopharmacology* 68, 183–192.
- Guarrera, P.M., 2003. Food medicine and minor nourishment in the folk traditions of Central Italy (Marche, Abruzzo, and Latium). *Fitoterapia* 74, 515–544.
- Guarrera, P.M., 2005. Traditional phytotherapy in Central Italy (Marche, Abruzzo, and Latium). *Fitoterapia* 76, 1–25.
- Guarrera, P.M., Salerno, G., Caneva, G., 2005. Folk phytotherapeutical plants from Maratea area (Basilicata, Italy). *Journal of Ethnopharmacology* 99, 367–378.
- Hale, R.W., Pion, R.J., 1972. Laminaria: an underutilized clinical adjunct. *Clinical Obstetrics and Gynecology* 15, 829.
- Höft, M., Barik, S.K., Lykke, A.M., 1999. Quantitative ethnobotany. Applications of multivariate and statistical analyses in ethnobotany. *People and Plants working paper 6*. UNESCO, Paris.
- Jain, S.C., Jain, R., 1992. Plants acting on gastrointestinal tract. In: Capasso, F., Mascolo, N. (Eds.), *Natural Drug and the Digestive Tract*. EMSI, Roma.
- Jarić, S., Popović, Z., Mačukanovic-Jocić, M., Djurdjević, L., Mijatović, M., Karadžić, B., Mitrović, M., Pavlović, P., 2006. An ethnobotanical study on the usage of wild medicinal herbs from Kopaonik Mountain (Central Serbia). *Journal of Ethnopharmacology* 111, 160–175.
- La Rovere, G., 2006. *Le piante della bellezza L'Airone*, Roma.
- Ladio, A.H., Lozada, M., 2004a. Summer cattle transhumance and wild edible plant gathering in Mapuche community of Northwestern Patagonia. *Human Ecology* 32, 225–240.
- Ladio, A.H., Lozada, M., 2004b. Patterns of use and knowledge of wild edible plants in distinct ecological environments: a case study of a Mapuche community from northwestern Patagonia. *Biodiversity and Conservation* 13, 1153–1173.
- Lentini, F., Aleo, M., 1991. Indagini etnobotaniche in Sicilia. V. L'uso tradizionale delle piante nel territorio di Erice (Trapani). *Atti dell'Accademia di Scienze Lettere ed Arti di Palermo*, 1–30.
- Lentini, F., Raimondo, F.M., 1990. Indagini etnobotaniche in Sicilia. IV. L'uso tradizionale delle piante nel territorio di Mistretta (Messina). *Quaderni di Botanica Ambientale e Applicata* 1, 103–117.
- Leporatti, M.L., Corradi, L., 2001. Ethnopharmacobotanical remarks on the Province of Chieti town (Abruzzo, Central Italy). *Journal of Ethnopharmacology* 74, 17–40.

- Leporatti, M.L., Pavesi, A., 1989. Usi nuovi, rari o interessanti di piante officinali di alcune zone della Calabria. *Webbia* 43, 269–289.
- MacDonald, D., Crabtree, J.R., Wiesinger, G., Dax, T., Stamou, N., Fleury, P., Gutierrez Lazpita, J., Gibon, A., 2000. Agricultural abandonment in mountain areas of Europe: environmental consequences and policy response. *Journal of Environmental Management* 59, 47–69.
- Manzi, A., 2001. Flora popolare d'Abruzzo. Rocco Carabba s.r.l., Lanciano.
- Martin, J.G., 2004. *Ethnobotany: A Methods Manual*. Earthscan, Sterling VA/London.
- Motti, R., Antignani, V., Idolo, M., 2009. Traditional plant use in the Phlegraean Fields Regional Park (Campania, Southern Italy). *Human Ecology*, doi:10.1007/s10745-009-9254-1.
- Neves, J.M., Matos, C., Moutinho, C., Queiroz, G., Gomes, L.R., 2009. Ethnopharmacological notes about ancient uses of medicinal plants in Trás-os-Montes (northern of Portugal). *Journal of Ethnopharmacology* 124, 270–283.
- Parada, M., Carrió, E., Bonet, M.À., Vallès, J., 2008. Ethnobotany of the Alt Empordà region (Catalonia, Iberian Peninsula). Plants used in human traditional medicine. *Journal of Ethnopharmacology*, doi:10.1016/j.jep.2009.04.050.
- Pasquale, G.A., Pasquale, F., 1901. *Elementi di Botanica Ordinati specialmente alla conoscenza delle piante utili più comuni*, vols. 1–2. Eugenio Marghieri, Napoli.
- Petagna, V., 1796. *Delle facultà delle piante Trattato in cui si espongono le virtù delle piante, tanto di quelle addette all'uso medico, quanto di quelle che servono ad altri usi nella civile economia*, vols. 1–3. Gaetano Raimondi, Napoli.
- Pfendner, I., 2004. *Curare in modo naturale con l'ortica*. Macro Edizioni, Cesena.
- Pieroni, A., 2000. Medicinal plants and food medicines in the folk traditions of the upper Lucca Province, Italy. *Journal of Ethnopharmacology* 70, 235–273.
- Pieroni, A., Quave, C.L., Villanelli, M.L., Mangino, P., Sabbatini, G., Santini, L., Bocchetti, T., Profili, M., Ciccio, T., Rampa, L.G., Antonini, G., Girolamini, C., Cecchi, M., Tomasi, M., 2004. Ethnopharmacognostic survey on the natural ingredients used in folk cosmetics, cosmeceuticals and remedies for healing skin diseases in the inland Marches, Central-Eastern Italy. *Journal of Ethnopharmacology* 91, 331–344.
- Pignatti, S., 1982. *Flora d'Italia*, vols. 1–3. Edagricole, Bologna.
- Pratesi, F., 1998. La storia. In: Pratesi, F., Tassi, F. (Eds.), *Parco Nazionale d'Abruzzo, Alla scoperta del Parco più antico d'Italia*. Carsa Edizioni, Pescara, pp. 9–25.
- Rovesti, G., Rovesti, P., 1934. Flora officinale del Parco nazionale d'Abruzzo e della zona limitrofa. *Rivista Italiana Essenze Profumi Piante Officinali* 7, 197–305.
- Scherrer, A.M., Motti, R., Weckerle, C.S., 2005. Traditional plant use in the areas of Monte Vesole and Ascea, Cilento National Park (Campania, Southern Italy). *Journal of Ethnopharmacology* 97, 129–143.
- Scoppola, A., Scarici, E., 1998. La conservazione delle piante (guida alla realizzazione di un erbario). *Erbario della Tuscia 1*. Università degli Studi della Tuscia, Viterbo.
- Shuping, H., Lingjie, M., 1992. Ethnobotanical survey of traditional Chinese medicinal plants used in hepatitis. In: Capasso, F., Mascolo, N. (Eds.), *Natural Drug and the Digestive Tract*. EMSI, Roma.
- Tammaro, F., 1984. *Flora Officinale d'Abruzzo Regione Abruzzo*. Tipolitografia G Fabiani, Pescara.
- Tammaro, F., 1998. *Il Paesaggio Vegetale dell'Abruzzo*. Cogecstre Edizioni, Penne, Pescara.
- Tammaro, F., Pietrocola, L., 1975. Piante nella medicina popolare d'Abruzzo. *Annali di Botanica* 34, 269–290.
- Tassi, F., 1994. *Effetto Parco. Supplemento Straordinario a: Natura Protetta Ente Autonomo Parco Nazionale d'Abruzzo*. III, 9. Almadue Srl, Roma.
- Tassi, F., 1998. La natura. In: Pratesi, F., Tassi, F. (Eds.), *Parco Nazionale d'Abruzzo. Alla scoperta del Parco più antico d'Italia*. Carsa Edizioni, Pescara, pp. 59–100.
- Tenore, M., 1820. *Saggio sulle Qualità Medicinali delle Piante della Flora Napolitana e sul modo di servirsene per surrogarle alle droghe esotiche*. Tipografia del Giornale Enciclopedico, Napoli.
- Tenore, M., 1823. *Flora medica Universale e flora particolare della provincia di Napoli*. Tipografia del Giornale Enciclopedico, Napoli.
- Tutin, T.G., Heywood, V.H., Burges, N.A., Moore, D.M., Walters, S.M., Webb, D.A., 1964–1980. *Flora Europaea*, vols. 1–5. Cambridge University Press, Cambridge, UK.
- Uncini Manganelli, R.E., Tomei, P.E., 1999. Ethnopharmacobotanical studies of the Tuscan Archipelago. *Journal of Ethnopharmacology* 65, 181–202.
- Uncini Manganelli, R.E., Chericoni, S., Baragatti, B., 2000. Ethnopharmacobotany in Tuscany: plants used as antihypertensive. *Fitoterapia* 71, 95–100.
- Uncini Manganelli, R.E., Camangi, F., Tomei, P.E., 2001. Curing animals with plants: traditional usage in Tuscany (Italy). *Journal of Ethnopharmacology* 78, 171–191.
- Viegi, L., Pieroni, A., Guarrera, P.M., Vangelisti, R., 2003. A review of plants used in folk veterinary medicine in Italy as basis for a databank. *Journal of Ethnopharmacology* 89, 221–244.
- Zaneveld, J.S., 1959. The utilization of marine algae in tropical south and east Asia. *Economic Botany* 13, 89–131.