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The importance of traditional uses and nutraceutical aspects of some edible wild plants in human nutrition: the case of Umbria (central Italy)

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Abstract
This study aimed to show how the importance of edible wild plants regards not only a question of uses linked to folk traditions but also their value in human nutrition. Data on the use of 50 species were collected through informed consent semi-structured interviews with local informants. They were eaten raw in salads (43%), boiled (35%), as ravioli filling (10%), fried without or with eggs (8%) and in vegetable soup (4%). Furthermore, the nutraceutical analysis centred on four of the commonly used wild edible plants demonstrates how these species contain many of the so-called minor nutrients, such as antioxidising vitamins and polyphenols, which were highest in Sanguisorba minor L.

Keywords: Antioxidant properties, edible wild plants, ethnobotanical analysis, traditional use

Introduction

The concept of “food as medicine” (Hippocrates, 400 B.C.) has existed since ancient times, and man has lived in close relationship with his environment for thousands of years, learning how to recognise, gather and use the products of the earth not only as food but also for medicinal purposes. Indeed, gathering wild edible plants and hunting were primitive man’s means of survival right from the earliest of times (Bermúdez et al. 2005).

Wild plants have been object of numerous studies as many possess new and unusual therapeutic and nutritional properties (Etkin & Ross 1982; Etkin 1994; Moreno-Black et al. 1996; Pieroni 1999; Vitalini et al. 2006; Pardo de Santayana et al. 2007), and the beneficial effects of the Mediterranean diet on human health are well documented, such as high fibre content, vitamins with an antioxidant function, total polyphenols, vitamins and minerals (see Cao et al. 1993; Guerrero Guil et al. 1999; Grivetti & Ogle 2000; Simopoulos 2004, Schaffer et al. 2005; Ranfa et al. 2011; Vanzani et al. 2011). Defining the content of these components is essential because of their antioxidant functions (Luterotti et al. 1998; Redi 1999), indeed at present, oxidant stress is known to be responsible for some forms of cancer (Cohen et al. 2000), as well as for degenerative pathologies such as those affecting the cardiovascular system (hypertension, atherosclerosis, heart attack and stroke; Polidori et al. 1998; Yang et al. 2001) and the autoimmune system (Iborra & Palacio Martinez 2005), with repercussions on the central nervous system thus leading to Alzheimer’s and Parkinson’s disease (Linert & Jameson 2000; Sudha et al. 2003).

A renewed interest in the use of edible wild plants is closely linked to the rediscovery of local traditions (Hadjichambis et al. 2008), food habits and the role that these species have played in different cultures or ethnic groups (Ladio & Lozada 2003; Leonti et al. 2006). Recently, they have become the subject of local fairs and markets (Figure 1(A)) where they are sold as culinary specialities and also of thematic courses, field trips and specialist exhibitions to satisfy the curiosity of the general public (see Figure 1(B)–(E)).

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In Italy, the first ethnobotanical studies were carried out in the second half of the twentieth century. Then from the 1970s, a large amount of research was done in various regions of Italy, focalising mainly on the use of wild plants in folk medicine, human consumption, magic rituals and ethno-veterinary practices (Caneva et al. 1997; Guarrera et al. 2005; Guarrera et al. 2006; Ghirardini et al. 2007; Guarrera & Leporatti 2007; Camangi et al. 2009; Cornara et al. 2009; Guarrera et al. 2009).

In Umbria, few authors have looked into these questions, and those who have done so have dealt mainly with the rediscovery of local traditional medicinal and nutritional uses of some wild plants (Menghini et al. 1975; Leporatti et al. 1985; Nardelli 1987; Pezzotta 1994; Moreno-Black et al. 1996; Dalla Ragione & Dalla Ragione 2003; Ranfa 2004; Parziani et al. 2005; Ranfa 2005; Ranfa et al. 2011).

This study takes the point of view that the rediscovery of traditional uses of edible wild plants is an important facet of the reappraisal of local origins and underlines how a renewed interest in their nutritional uses has arisen, given their high nutraceutical properties. Indeed, the main objective was to demonstrate the importance of edible wild plants as a reserve of genetic resources capable of satisfying both present and future biotechnological and agro-industry needs as well as of improving daily diet and preventing degenerative processes, thanks to their high antioxidant nutrient content.

**Material and methods**

The study was conducted in Umbria, Central Italy, a region where natural and semi-natural areas still survive in which many edible wild plants can be found, and where, in small rural communities, traditional uses of these species are still very much alive (see Figure 1 – Study area).

This study began with an ethnobotanical analysis by means of an *ad hoc* semi-structured interview involving 138 females and 68 males, with median age of 76 years. They were selected from among the elderly population in rural areas who still retain knowledge of traditional uses, having spent their lives as farm workers, thus acquiring survival skills and practical knowledge by gathering, preparing and eating wild plants throughout the year. Some informants were able to provide citations on various wild plants. Most of the interviewees belonged to the female group, which still retains the most information concerning the heritage of domestic remedies. Quite often, the interviews were conducted in the fields. For species not available at the moment of the interview, informants were asked to recognise these species by means of a plant atlas. They were asked to provide information on the local names, the alimentary use, the parts used and the traditions connected with the commonest wild plants in the region.

The nutraceutical research centred on four of the most commonly used wild edible species in Umbria which belong to different botanical families and have different nutraceutical properties: *Bellis perennis* L., *Bunias erucago* L., *Chondrilla juncea* L. and *Sanguisorba minor* Scop (Figure 2(A)–(D)), respectively.

These four species were chosen because they belong to the Compositae, Cruciferae and Rosaceae families which are among the most representative and well known in traditional folk recipes and are the best known and most widely used, both raw and
cooked, in Umbria (see Table I) (Ranfa 2004, 2005; Marioli 2010; Ranfa et al. 2011).

Various samples of the four species were collected, and were analysed with a Stereomicroscope SX45 and were determined according to the Checklist of the Italian Vascular Flora (Conti et al. 2005, 2007). The authors’ names were standardised according to Brummitt and Powell (1992). All the *exsiccateae* of the aforementioned species are preserved in the “Erbario PERU” of the Università degli Studi di Perugia.

To determine the nutraceutical aspects, the various determinations were carried out in triplicate on a pool of fresh samples for each of the four species collected in Spring and Autumn in Umbria, using the traditional methods described in literature, Official Methods of Analysis of Association of Official Analytical Chemists (AOAC) INTERNATIONAL 1990 or ISTISAN 1996/34, and the most recent analytical techniques (Luterotti et al. 1998; Redi 1999; Burini & Coli 2003).

In this way, apart from the classical chemical percentage composition, the other so-called minor components were determined which have been difficult to define until recently. Particular attention was paid to defining the principal components with antioxidant functions and total antioxidant capacity using the ORAC method (Oxygen Radical Absorbance Capacity, USDA; Ou et al. 2001).

The mineral content was determined with the system of flame sampling by the atomic emission spectrographic method (as described in AOAC method, 2006, 953.01) using the PFP7 Flame Photometer, Jenway Techne Inc., (Jemway Techne Inc., Burlington, NJ, USA), and by atomic absorption spectrophotometer (AA-6800, Shimadzu Corporation, Chyoda – Ku, Tokyo, Japan), according to the AOAC method, 2006, 975.03. All data were processed using the Star version 4.10 software package and, where necessary, some integration corrections were made manually. The statistical analysis of the data was carried out using the Statistical Analysis System (release 8.1, SAS Institute Inc., Cary, NC, USA).

**Results**

**Ethnobotanical analysis**

The analysis revealed that the most well-known and widely used edible wild plants in Umbria belong mainly to the Compositae family, followed by the Cruciferae family. The main use was as food (73%), followed by medicinal (12%) and veterinary (2%) according to local habits and customs handed down from one generation to the next.

The plants were mainly used in raw salad (43%), boiled (35%), as side dishes or in ravioli fillings (10%), fried without or with eggs (8%) or in vegetable soup (4%). In most cases, it was uncommon to find the use of a single species, as a mixture was preferred to balance the different flavours (Figure 3).

The data collected during the interviews provided information on the use of 50 species among the most common edible wild plants in Umbria, as well as local names (Table I).

The following is a description of some of the most common uses: in salads, the sweeter herbs such as “grespigni” – sow thistle (*Sonchus L.* s.pl.), “piantaginone” – plantain (*Plantago lanceolata* L.) and “borragine” – borage (*Borago officinalis* L.), mitigate the bitterness of “cicoria” – chicory (*Cichorium intybus* L. s.l.), “pisci cane” – dandelion (*Taraxacum officinale* group) and “erba brusca” – bristly ox-tongue (*Helminthotheca echioides* (L.) Holub).


Many species are used as condiments in pasta and rice dishes, such as “ortica” – stinging nettle (*Urtica dioica* L. subsp. *dioica*), “strigoli” – bladder campion (*Silene vulgaris* (Moench) Garcke s.l.) and “asparago selvatico” – wild asparagus (*Asparagus acutifolius* L.). These species are also used to give a distinctive flavour to omelettes and soups (see Table I).

**Nutraceutical analysis**

All four species analysed showed the presence of all the dietary energetic principles, although in different concentrations. After water, carbohydrates made up the greater part with values that range from 1.0% in *B. perennis* to 6.0% in *S. minor*, intermediate values were found in *C. juncea* and *B. erucago*, which contained 2.0% and 3.0%, respectively (Table II).

Protein content ranged from 1.4% in *B. perennis* to 3.8 g/100 g of edible portion in *S. minor*, with *C. juncea* (1.9 g/100 g) and *B. erucago* (2.2 g/100 g) in an intermediate position. The total fat content was very low in all four species, below 1.0%.

The total water content varied from 76.2% to 87.8% while the total ash content ranged from 1.8 g/100 g in *C. juncea* to 5.3 g/100 g in *B. perennis*. Fibre content ranged from 5.8% in *C. juncea* to 10.5% in *S. minor*.

It is interesting to note mineral content (see Table III). Iron content, especially in *B. perennis* and *B. erucago*, was much higher than in meat, although
<table>
<thead>
<tr>
<th>Scientific names</th>
<th>Botanical family</th>
<th>Local names</th>
<th>Part(s) used</th>
<th>Preparation</th>
<th>Number of citations</th>
<th>Some medicinal use</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Alliaria petiolata</em> (M.Bieb.)</td>
<td>Cruciferae</td>
<td>Alliaria comune, erba alliaria</td>
<td>Leaves, young and seed</td>
<td>Raw-salad, boiled</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><em>Cavara &amp; Grande</em></td>
<td></td>
<td>Aglio napoletano</td>
<td>Leaves, bulbs</td>
<td>Raw-salad</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><em>Allium triquetrum</em> Ten.</td>
<td>Liliaceae</td>
<td>Aglio angolare, aglio trigono, aglio selvatico</td>
<td>Leaves, bulbs</td>
<td>Raw-salad, boiled</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><em>A. acutifolius</em> L.</td>
<td>Liliaceae</td>
<td>dei boschi</td>
<td>Young shoots</td>
<td>Fried in fat, without or with beaten eggs (&quot;Frittata&quot;), boiled</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><em>B. perennis</em> L.</td>
<td>Boraginaceae</td>
<td>Borragine, boragine</td>
<td>Leaves, young shoots, flowers</td>
<td>Raw in salads, boiled, radice cruda in insalata</td>
<td>9</td>
<td></td>
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<tr>
<td><em>C. rapunculus</em> L.</td>
<td>Compositae</td>
<td>Calamento, mentuccia comune, neptitella selvatica</td>
<td>Young leaves and flowers</td>
<td>Raw in salads, boiled</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><em>Cardamine hirsuta</em> L.</td>
<td>Cruciferae</td>
<td>Borsa di pastore, borsacchina, capsella</td>
<td>Young leaves</td>
<td>Raw in salad, vegetable soup</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><em>C. bursa-pastoris</em> subsp. <em>bursa-pastoris</em></td>
<td>Cruciferae</td>
<td>Cicoria, cicorietta, radicchio selvatico</td>
<td>Leaves, whole aerial parts, young shoots</td>
<td>Raw in salads, boiled, vegetable soup</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><em>C. juncea</em> L.</td>
<td>Compositae</td>
<td>Valeriana rosa</td>
<td>Young leaves</td>
<td>Raw in salad, boiled</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><em>C. intybus</em> L. s.l.</td>
<td>Compositae</td>
<td>Mastrici, piioletta, pioli Cicoria, ciorietta, radicchio selvatico, radici amare</td>
<td>Leaves, whole aerial parts, leaves stalks, young shoots</td>
<td>Boiled, raw in salads, ravioli filling</td>
<td>8</td>
<td>Digestive properties</td>
</tr>
<tr>
<td><em>Clematis vitalba</em> L.</td>
<td>Ranunculaceae</td>
<td>Clematide, vitabie Crepide, dolcetta, radichia di terrameta Cota, crepide vesicosa, radichia vesicosa, radichia scolletato</td>
<td>Young leaves</td>
<td>Fried in fat, without or with beaten eggs (&quot;Frittata&quot;)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><em>Diplotaxis erucoides</em> (L.) DC.</td>
<td>Compositae</td>
<td>Carota selvatica</td>
<td>Young leaves</td>
<td>Raw in salads, boiled</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><em>D. carota</em> L. s.l.</td>
<td>Compositae</td>
<td>Maraioule, ruchetta violacea, ruchettone</td>
<td>Young leaves</td>
<td>Raw in salads, boiled</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><em>D. erucoides</em> (L.) DC.</td>
<td>Compositae</td>
<td>Rucola, rucolotta, ruoletta di campo, ruchetta selvatica</td>
<td>Leaves</td>
<td>Raw in salads, vegetable soup</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><em>H. achiotes</em> (L.) Holub</td>
<td>Compositae</td>
<td>Leaves</td>
<td>Boiled</td>
<td></td>
<td>3</td>
<td></td>
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<tr>
<td>Scientific names</td>
<td>Botanical family</td>
<td>Local names</td>
<td>Part(s) used</td>
<td>Preparation</td>
<td>Number of citations</td>
<td>Some medicinal use</td>
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<tr>
<td>Hyoseris radiata L. subsp. radiata</td>
<td>Compositae</td>
<td>Trenette, trinciattella, radicchio selvatico Costole d’asino, costolina guanciolina, ingrassaporci</td>
<td>Young leaves</td>
<td>Raw in salads, boiled</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hypochaeris radicata L.</td>
<td>Compositae</td>
<td>piattello</td>
<td>Young leaves</td>
<td>Raw in salads, boiled</td>
<td>5</td>
<td>Infusions for the relief of heartburn and indigestion</td>
</tr>
<tr>
<td>Lactuca muralis (L.) Gaertn.</td>
<td>Compositae</td>
<td>Lattuga dei boschi</td>
<td>Young leaves</td>
<td>Raw in salads, vegetable soup</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lactuca perennis L. subsp. perennis</td>
<td>Compositae</td>
<td>Lattuga perenne, lattuga rupestre</td>
<td>Young leaves</td>
<td>Raw in salads, boiled</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>L. serriola L.</td>
<td>Compositae</td>
<td>Lattuga selvatica</td>
<td>Leaves, leaves stalks</td>
<td>Raw in salads</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Malva sylvestris L. subsp. sylvestris</td>
<td>Malvaceae</td>
<td>Malva Crescione d’acqua, crescione delle fontane, crescione di sorgente</td>
<td>Leaves</td>
<td>Raw in salads</td>
<td>2</td>
<td></td>
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<tr>
<td>Nasturtium officinale R. Br. Subsp. officinale</td>
<td>Cruciferae</td>
<td>Papaver comune, rosolaccio</td>
<td>Young leaves, seed</td>
<td>Raw in salads, seed in bread and cookies</td>
<td>5</td>
<td></td>
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<tr>
<td>Papaver rhoeas L. subsp. roeas</td>
<td>Papaveraceae</td>
<td>Vertiola comune</td>
<td>Young leaves, young shoots</td>
<td>Boiled, vegetable soup</td>
<td>6</td>
<td></td>
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<tr>
<td>Parietaria officinalis L.</td>
<td>Urticaceae</td>
<td>Aspragine comune, erba brusca</td>
<td>Boiled</td>
<td>Vegetable soup</td>
<td>6</td>
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<tr>
<td>Picris hieracioides L. s.l.</td>
<td>Compositae</td>
<td>Plantago, lanciola, lingua di cane</td>
<td>Leaves, whole aerial parts</td>
<td>Raw in salads, boiled</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Portulaca oleracea L. s.l.</td>
<td>Portulaceae</td>
<td>Porcachia, porcellana</td>
<td>Erba cornetta, radicchio lirato, ragagiollo, raggiolo</td>
<td>Boiled, in salads</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Rumex acetosa L. subsp. acetosa</td>
<td>Polygonaceae</td>
<td>Acetosa, romice acetosa</td>
<td>Young leaves, whole aerial parts, flowers, roots</td>
<td>Raw in salads, boiled</td>
<td>16</td>
<td></td>
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<tr>
<td>Rumex acetosa L. s.l.</td>
<td>Polygonaceae</td>
<td>Acetosella, romice acetosella</td>
<td>Young leaves, whole aerial parts, young shoots</td>
<td>Raw in salads, boiled</td>
<td>15</td>
<td>Digestive properties</td>
</tr>
<tr>
<td>S. minor Scop. S.l.</td>
<td>Rosaceae</td>
<td>Pimpinella, pimpinellone</td>
<td>Whole aerial parts, young shoots</td>
<td>Risotto, fried with eggs (Frittata)</td>
<td>8</td>
<td>Insect bites or as a remedy for mouth ulcers</td>
</tr>
<tr>
<td>S. vulgaris (Moench) Garcke s.l.</td>
<td>Caryophyllaceae</td>
<td>Strigoli, stricoli</td>
<td></td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Sonchus asper (L.) Hill s.l.</td>
<td>Compositae</td>
<td>Crespigno spinoso, crespinola Grupspigno, crispino, crispigno, cruspigno, grespigno, creispigno, cruspigno</td>
<td>Young leaves</td>
<td>Raw in salads, boiled</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Sonchus oleraceus L.</td>
<td>Compositae</td>
<td>Pisciacane, piscialletto, sof-fione, dente di leone, dennelion</td>
<td>Leaves, whole aerial parts, young shoots, shaft</td>
<td>Boiled, in salads</td>
<td>12</td>
<td>Remedy for mouth ulcers</td>
</tr>
<tr>
<td>T. officinale (group)</td>
<td>Compositae</td>
<td></td>
<td>Leaves, whole aerial parts, young shoots, shaft, flowers</td>
<td>Boiled, in salads</td>
<td>25</td>
<td>Depurative and diuretic properties</td>
</tr>
<tr>
<td>Scientific names</td>
<td>Botanical family</td>
<td>Local names</td>
<td>Part(s) used</td>
<td>Preparation</td>
<td>Number of citations</td>
<td>Some medicinal use</td>
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<tr>
<td>T. apulum L.</td>
<td>Umbelliferae</td>
<td>Pimpinellone, pimpinella vellutata, zampa d’oca, sapori-tella</td>
<td>Leaves, whole aerial parts</td>
<td>Raw in salads</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Tragopogon pratensis L. s.l. Compositae</td>
<td>Baciapreti, barba di becco comune, barba di prete, salsefica</td>
<td>Roots, young leaves, shaft</td>
<td>Raw in salads, boiled</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tragopogon porrifolius L. s.l. Compositae</td>
<td>Barba di becco violetta, raperonzolo selvatico, salsefica</td>
<td>Roots, young leaves</td>
<td>Raw in salads, boiled</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urospermum dalechampii (L.) F.W. Schmidt Compositae</td>
<td>Ciconia matta, grugno, grugno amaro, grugnola</td>
<td>Leaves, whole aerial parts</td>
<td>Boiled, raw in salads</td>
<td>14</td>
<td>Excellent remedy for dysmenorrhea</td>
<td></td>
</tr>
<tr>
<td>Urtica dioica L. subsp. dioica Urticaceae</td>
<td>Ortica</td>
<td>Leaves, young shoots, roots, whole aerial parts, roots</td>
<td>Boiled, ravioli filling, risotti, fried with eggs (frittata)</td>
<td>6</td>
<td></td>
<td></td>
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</tbody>
</table>
its inorganic form and bioavailability probably make intestinal absorption difficult. Potassium, calcium and magnesium contents were also high, while phosphorus content was very low, as was sodium content, a positive point for its effect on blood pressure (Table III).

Table IV shows among antioxidants vitamins, high concentrations of β-carotene (pro-vitamin A) and vitamin E and very low values of vitamin C, except in part for S. minor.

All four species showed excellent β-carotene content; in fact, 100 g of B. perennis, C. juncea and S. minor contained, respectively, 60%, 51% and 80% of the daily recommended intake, while B. erucago exceeded it by about 40%.

There were also notable concentrations of vitamin E: 100 g of B. perennis, B. erucago, C. juncea and S. minor contained 46%, 44%, 42% and 78%, respectively, of daily recommended intake in a diet of about 2000 kcal, with about 17 g of polyunsaturated fatty acids. On the other hand, there was very low vitamin C content (undetermined in two species) except for S. minor, for which the content in 100 g satisfied 20% of daily ascorbic acid requirement.

Total polyphenol content varied greatly from rather low in C. juncea to quite high in the other species, particularly in S. minor (258 mg/100 edible parts), especially when the high water content of these types of samples was taken into consideration.

The ORAC method results are given in Table V. S. minor showed the highest values, followed by B. erucago, C. juncea and B. perennis. Just how important these data are can be seen when considering that these values are similar to, if not at times higher than, those of some cultivated plants such as cabbage, carrots, celery, fennel, lettuce, courgettes and tomatoes.

Discussion

This study showed that gathering and consuming edible wild plants are still very much alive in Umbria as one aspect of an age-old ethnobotanical folk tradition (see Table I), although in most cases their nutritional value is unknown. It was found that the quality and quantity of the various components of the four species under examination could make an excellent contribution to balancing and rationalising diet and preventing metabolic pathologies. This study demonstrates how edible wild plants contain many of the so-called minor nutrients (because they are found in small quantities), such as polyphenols and antioxidising vitamins which can further improve a diet which is already balanced, thus offering protection against degenerative processes. Furthermore, various authors have shown how some species could be exploited in breeding programmes to develop genotypes with putative positive effects on human health, thanks to their high tocopherol, fatty acid and phytosterol contents (Scialabba et al. 2010), not to mention anticancer, antibacterial and antiviral properties with possible applications in the field of medicine (Minutolo et al. 2012). And these new applications are possible thanks to the presence of adequate antioxidant components that can combat...
the effect of free radicals. Since, at present, the amount necessary to maintain this equilibrium is estimated to be about 5000 ORAC units and considering that health authorities recommend the consumption at least five portions of fruit and vegetables a day (Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione 2003), the wild plants dealt with in this study could make a notable contribution towards this objective.

Many of the macro and micro nutrients contained in these wild plants merit more attention, but the lack of an adequate national and regional nutrient database limits available knowledge, which is, at present, much less than that relevant to cultivated species (Vincetti et al. 2008). In addition to antioxidant vitamins, these plants are rich in phenols and other compounds which increase their antioxidant capacity. Therefore, further studies are essential to analyse total antioxidant capacity and promote knowledge about them with a view to commercialisation. With the introduction of new pre-packed foods (Bhattarai et al. 2009), knowledge of traditional uses of edible wild plants is disappearing in many parts of the world. This is why this research aims at focusing attention on these species and their importance for human nutrition, as knowledge and rediscovery of recipes in human and animal diet could represent an economic potential (Guarrera et al. 2006).

It is well known that wild plants continue to make up a significant part of the world food basket and their importance will increase due to increased pressure resulting from greater agricultural production (Bharucha & Pretty 2010).

**Conclusion**

Thanks to their antioxidant properties, it would certainly be worthwhile to foster further study of edible wild plants and to promote commercialisation campaigns, particularly in view of the growing demand for natural antioxidants by the food industry. Human health in general would benefit greatly from a reconsideration of these plants because they represent a naturally occurring, easy to obtain source of powerful vegetable antioxidants.

According to an FAO estimate, wild plants are part of the diet of one billion people worldwide, but as no official markets exist their commercial value has never been evaluated, although their sale represents an important way of integrating income in many countries.

Projects to rediscover traditional foods may increase wild plant consumption. The FAO recognises that nutrition and biodiversity converge...
towards a common goal of food safety and sustainable development and that wild species play a key role in global nutrition safety (FAO 2009).

Furthermore, a renewed interest in edible wild plants would stimulate the study of local flora and spread knowledge to preserve local customs and traditions. More extensive knowledge could lead to improved diet in many areas of the Mediterranean area and the Developing World, and in general encourage and promote the use of these species.

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