The wild taxa utilized as vegetables in Sicily (Italy): a traditional component of the Mediterranean diet

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Abstract

Background: Wild vegetables in the Mediterranean Basin are still often consumed as a part of the diet and, in particular, there is a great tradition regarding their use in Sicily. In this study, an ethnobotanical field investigation was carried out to (a) identify the wild native taxa traditionally gathered and consumed as vegetables in Sicily, comparing the collected ethnobotanical data with those of other countries that have nominated the Mediterranean diet for inclusion in the UNESCO Representative List of the Intangible Cultural Heritage of Humanity and (b) highlight new culinary uses of these plants.

Methods: Interviews were carried out in 187 towns and villages in Sicily between 2005 and 2015. A total of 980 people over the age of 50 were interviewed (mainly farmers, shepherds, and experts on local traditions). Plants recorded were usually collected in collaboration with the informants to confirm the correct identification of the plants. The frequencies of citation were calculated.

Results: Two hundred fifty-three taxa (specific and intraspecific) belonging to 39 families, and 128 genera were recorded (26 were cited for the first time). The most represented families were Asteraceae, Brassicaceae, Apiaceae, Amaryllidaceae, Malvaceae, and Polygonaceae. Only 14 taxa were cited by 75% of the people interviewed. The aerial parts of wild plants, including leaves, tender shoots, and basal rosettes, are the main portions collected, while the subterranean parts are used to a lesser extent. For some vegetables, more parts are utilized. Most of the reported vegetables are consumed cooked. In addition to the widely known vegetables (Borago officinalis, Beta spp., Cichorium spp., Brassica spp., Carduus spp., etc.), the so-called ancient vegetables are included (Onopordum illyricum, Centaurea calcitrapa, Nasturtium officinale, Scolymus spp., Smyrnium rotundifolium), and some unique uses were described. Comparing the Sicilian findings to those from other countries, a very high number of vegetable taxa were detected, 72 of which are eaten only in Sicily, while 12 are consumed in all the Mediterranean countries examined.

Conclusions: The research shows a high level of Sicilian knowledge about using wild plants as a traditional food source. Wild vegetables are healthy and authentic ingredients for local and ancient recipes, which are fundamental to the revitalization of quality food strictly connected to traditional agroecosystems.

Keywords: Ethnobotany, Biocultural diversity, Traditional knowledge, Rural cultural heritage, Traditional agroecosystems

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Background

The Mediterranean diet represents the dietary pattern usually applied among the populations living closest to the Mediterranean Sea; it has been extensively reported to be a model of healthy eating for its contribution to a favorable health status and better quality of life and has been recognized on the UNESCO Representative List of the Intangible Cultural Heritage of Humanity for Italy, Spain, Portugal, Morocco, Greece, Cyprus, and Croatia [1–4]. Several studies in different populations have established the beneficial roles of the main components of the Mediterranean diet in preventing cardiovascular and chronic degenerative diseases [5–12]. The characteristics of this diet are “abundant plant foods, fresh fruit as the typical daily dessert, olive oil as the principal source of fat, dairy products (principally cheese and yogurt), and fish and poultry consumed in low to moderate amounts, zero to four eggs consumed weekly, red meat consumed in low amounts, and wine consumed in low to moderate amounts, normally with meals” [13, 14]. The daily and abundant consumption of vegetables (including wild ones), fresh fruits, and cereals together with the habitual use of olive oil guarantees a high intake of monounsaturated fatty acids, carotenoids, ascorbic acid and other vitamins, tocopherols, minerals, and several healthy substances, such as polyphenols and anthocyanins [15–17]. Moreover, vegetables are also very important for the intake of dietary fiber, which improves intestinal peristalsis and reduces the glycaemic index of a meal [18]. A high level of vegetable consumption produces an overall positive effect on human health [19–22].

Wild vegetables, those that grow spontaneously without being cultivated (including native species and some introduced taxa that have become naturalized), in the Mediterranean Basin are still widely consumed as part of the diet; they represent a new trend in nutrition in contemporary European cuisine because of their health benefits [23–27]. These plants have been an important part of the common daily diet in the Mediterranean and the Near East for millennia, but only recently has there been an increase in international literature focusing on the identification and the traditional uses of gathered wild vegetables for Mediterranean countries such as Croatia [28–30], Herzegovina [31], Turkey [32–37], Cyprus [38], Greece (including Crete) [39, 40], Italy [41–62], Spain [63–72], and Morocco [73, 74]. In the Mediterranean region, the use of wild vegetables is strictly linked to the traditional cuisine of each country, and it includes the traditional knowledge about cooking methods and the particular events at which they are consumed.

Wild vegetables play a very important role in the diet of the people living in Sicily, an island located in the middle of the Mediterranean region. In the past, people used to go almost daily, especially during the winter and spring, to the countryside and the margins of cultivated fields and woods, looking for wild vegetables to eat. This alimentary habit derived substantially from the situation of poverty in which most of the rural and urban population lived [75]. In the last 40 years, the eating habits of Sicilian people, like those of other populations living in Western countries, have greatly changed, and wild vegetable flavors are almost unknown to young people [75]. The elderly and those who still have strong links with the country follow a strictly Mediterranean-style diet instead. They know the best gathering seasons for the wild vegetables, and they are able to recognize and cook them according to established traditional practices [75]. In recent years, several studies on wild food plants have been carried out to preserve the traditional knowledge linked to their use in Sicily [47–49, 76–96].

In this study, we contribute to this purpose by carrying out an ethnobotanical survey of the wild plants still gathered and consumed as vegetables in Sicily. In several areas of the island, in fact, ancient traditions that allow us to understand the vegetable-based diets remain. The specific aims of this study are (1) to identify and record, through interviews with shepherds, farmers, and people who still have a close relationship with their environment, the edible taxa used as vegetables; (2) to compare the collected ethnobotanical data with the Italian and Mediterranean ethnobotanical international literature; and (3) to highlight possible new or unusual culinary plant uses.

Methods

Study area

Sicily is the largest Italian island (Fig. 1), with an area of approximately 25,500 km² and approximately 1000 km of coastline, rising from sea level to 3340 m (Mount Etna) [97]. The island has diverse geological characteristics, which have shaped different landforms. The territory is hilly in the central and southwestern parts (approximately 61.4%), mountainous, especially in the northern and eastern parts (24.5%), and 14.1% consists of alluvial plains [97].

According to Bazan et al. [98], Sicily is divided into 25 bioclimatic belts (thermotypes and ombrotypes) from lower thermomediterranean low semiarid to lower cryomediterranean upper hyperhumid. This great range of environmental conditions and its complex paleogeographic and human history make the island one of the Mediterranean biodiversity hotspots [99]. The current vascular flora is composed of 3252 specific and subspecific taxa—native, adventive, and naturalized—arranged in 880 genera of 134 families. The richest ones are Asteraceae, with 371 specific and infraspecific taxa, followed by Poaceae (300), Fabaceae (295), Brassicaceae (141), Apiaceae (135), Caryophyllaceae (133), Lamiaceae
Endemic species make up 15.44%, of which 9.90% are exclusive to Sicily, 3.69% are shared with southern Italy, and 1.85% are shared among a limited number of Mediterranean territories. The exotic composition of the flora includes 408 adventive and naturalized taxa (12.55%) [100]. Floristic richness is related to a high habitat diversity expressed in terms of vegetation types. Gianguzzi et al. [101] report 36 types of vegetation for Sicily, 16 of which are related to zonal vegetation (forests, shrublands, garrigues, grasslands communities, etc.), 11 are related to azonal vegetation (chasmophitic, riparian, psammophilous, etc.), and 9 are related to anthropogenic vegetation (arable lands and extensive herbaceous crops, vineyards, olive groves and dry cultivation mosaics, orchards, built-up areas, etc.). Traditional agricultural systems are widespread and are structured as highly diversified land mosaics, which are significant containers of biodiversity, including many wild food plants due to elevated diffuse naturalness [102].

**Data collection**

In the years 2005–2015, 187 towns and villages in Sicily were visited (Fig. 1), and randomly sampled people (54% men and 46% women) between the ages of 50 and 85 years (but primarily 65–75 years) for each town were
interviewed after obtaining prior verbal informed consent (Fig. 2). The focus of the interviews (semi-structured), which were frequently conducted either in Italian or Sicilian dialect, was their folk knowledge (name and use) of the wild vegetables that they still gather or that they ate in the past, especially during the war and post-war periods. The total number of interviewed people was 980: 433 farmers, 148 shepherds, 232 housewives, 38 forest and park guards, 23 woodsmen, and 106 teachers and ethno-tradition experts (Fig. 3). During or after the interview, the cited plants were usually collected together with the informants to confirm the correct identification of the plants. Sometimes, we gathered some specimens and showed them to the informants to confirm their edible uses. The Code of Ethics of the International Society of Ethnobiology was strictly followed [103].

The wild plant species mentioned by the informants were collected, when available, and identified according to Flora d’Italia [104] and stored at the Herbarium of the Museo Naturalistico F. Minà Palumbo (Castelbuono, Italy). Nomenclature follows the standards set by The Plant List database [105], in some cases Italian and Sicilian Checklists [100, 106, 107] and some recent publications [108, 109].

Data analysis
In the present study, we have only considered data concerning the autochthonous plants (native species growing in their natural habitat), archaeophytes, and a few neophytes (introduced species that have been naturalized) traditionally gathered for food use. Following the classification for “food use” reported in Menenedez et al. [63], we have only analyzed the “vegetable” category (subcategories “processed vegetables” and “snacks”) and “flowers and stems” sucked for their sweet nectar (usually consumed to stimulate the appetite), and we excluded other uses (seeds, fruits, beverages, aromatics, seasonings, etc.). All the acquired data were processed, and some reports were drawn up in which for each plant there are (1) the scientific name and the family; (2) the life form sensu Raunkiær [110]; (3) the chorological element, distribution in Sicily, and habitat; (4) the Sicilian vernacular names (the two most common); (5) the edible parts following a modified version of the scheme proposed by Lentini and Venza [47]; (6) the traditional food use raw, cooked, or both; and (7) the estimated frequency of citations for each taxon (see Table 1).

We compared our data with those gathered from the following sources: published Sicilian ethnobotanical surveys considering wild plants traditionally used in local cuisines [47, 48, 75–96]; the recent review concerning wild food plants used traditionally as vegetables in Italy [61] and other international papers [42–60]; ethnobotanical literature in which ethnobotanical studies focusing on wild food plants were conducted in Mediterranean areas and published in international journals, in particular, from Spain [63–72], Turkey [32–37], Morocco [73, 74], Croatia [28–30], Herzegovina [31], Cyprus [38], and Greece [39, 40], countries that have recognized the importance of the Mediterranean diet (see introduction). From these studies, we considered only the plants used as vegetables to make the data comparable with our reports. A multivariate analysis was performed to compare the affinity among the countries [111]. This analysis was carried out at the genus level because the comparisons among species are influenced by phytogeographical characteristics of each flora. A floristic binary matrix of 313 genera × 7 plots was classified through cluster analysis by using chord distance and UPGMA in the SYN-TAX Programme [112].

Results and discussion

Data on the plants recorded in Sicily
The data obtained after collecting information from the 980 people interviewed (Fig. 2) are reported in Table 1. There were 253 wild species belonging to 39 families and 128 genera used as vegetables that were recognized in our study, representing 7.78% of the Sicilian flora. The most represented were Asteraceae, with 39 genera and 94 taxa (37.15%); Brassicaceae, with 26 genera and 45 taxa (17.78%); Apiaceae, with 10 genera and 14 taxa (5.53%); Amaryllidaceae, with 2 genera and 8 taxa (3.16%); Malvaceae and Polygonaceae, with 7 taxa (2.76%) and 1 genus for each family; Plantaginaceae, with 1 genus and 6 taxa (2.37%); and Asparagaceae, Boraginaceae, and Caryophyllaceae, with 5 taxa and 1, 3, and 2 genera, respectively (Table 1).
Considering life forms (Fig. 4), there were mainly hemicyryptophytes (43.03%), therophytes (36.25%), and geophytes (9.16%). The main contingent of the taxa belongs to the Mediterranean chorotype (62.9%), 25 taxa (10%) are endemic and subendemic to Italian flora of which there are 10 endemic Sicilian taxa (Fig. 5). These wild vegetables commonly grow in uncultivated land, in the margins of cultivated fields or infesting them, and in pastures, garriques, dry meadows, road edges, etc.; some can be gathered in the woods, ruins, cliffs, and slopes (Table 1).

The food uses of 26 plants were recorded for the first time in our present study (Table 2). The aerial parts of wild plants, including leaves (43.4%), tender shoots (43%), and basal rosettes (27.5%), are mainly utilized as vegetables, whereas the subterranean parts as a whole account for 6.4% (Fig. 6). For some vegetables, more parts are utilized (see Table 1).

Regarding the frequency of citation, only 13 taxa were cited by 75% or more of the interviewed people (VVC); 101 vegetable taxa were commonly gathered and consumed (VC and C), while 126 (49.8%) were rarely cited—ranging from 5 to 20% of informants (R category)—and 13 were very rarely cited (Tables 1 and 2). Among the taxa infrequently cited as vegetables, there are some Apiaceae believed to be toxic by our informants in some areas, some endemic species and other plants frequently used for other parts such as *Rubus ulmifolius* (for fruits). Another plant rarely cited is *Rumex crispus* that in some areas, it used as a vegetable, while in Villarosa-Enna, it is utilized for cigarette coatings [95]. Most of the reported vegetables are consumed cooked (238), with 159 only cooked and 79 both cooked and raw, whereas 94 are eaten raw and 15 are only eaten raw, generally used as snacks (*Chamaerops humilis,*...
| Taxa                          | Family       | Life form | Chorotype | Habitat and distribution frequency | Vernacular names                  | Edible parts | Food use | Frequency of citations |
|------------------------------|--------------|-----------|-----------|------------------------------------|-----------------------------------|--------------|----------|------------------------|
| * Agave americana L.         | Agavaceae    | P caesp   | C-America | Uncultivated land, road edges both cultivated and spontaneous—C | Zabbara, Zamara                    | t-s          | Co       | R                      |
| Alliaria petiolata (M. Bieb.) | Brassicaceae | H scap    | Paleotemp.| Nitrophilous woods—C                | Agghiabò, Pedi d’asini              | bu, le       | Ra/Co    | R                      |
| Allium ampeloprasum L.       | Amaryllidaceae| G bulb    | Eurimed.  | Dry uncultivated land, edges of gardens—C | Punetìta, Porrù savaggia           | bu, le, t-s  | Ra/Co    | WC                     |
| * Allium nigrum L.           | Amaryllidaceae| G bulb    | Stenomed. | Fields, vineyards and olive-groves—C | Agghiur d’t siminati, Porrà         | bu           | Ra/Co    | VC                     |
| * Allium pendulimum Ten.     | Amaryllidaceae| G bulb    | W-Stenomed.| Woods, wet and shady ground—C     | Agghiur savaggia                    | le           | Ra/Co    | VC                     |
| Allium rosu L.               | Amaryllidaceae| G bulb    | Stenomed. | Garigue, dry meadows—VC            | Agghiur savaggia, Porrù             | bu           | Ra/Co    | C                      |
| Allium subhirsutum L.        | Amaryllidaceae| G bulb    | Stenomed. | Dry meadows, uncultivated ground, and garigue—VC | Agghiur savaggia                    | bu           | Ra/Co    | C                      |
| Allium triquetrum L.         | Amaryllidaceae| G bulb    | W-Stenomed.| Shady ground—C                     | Agliotta, Panora                    | bu, le       | Ra/Co    | C                      |
| Allium uniuum subsp. ucrainicum Kleespaw & Cowler | Amaryllidaceae| G bulb    | Eurimed.  | Beech-woods—NC                     | Agghiur ucrainu, Giauddu di serpi   | bu, le       | Ra/Co    | R                      |
| Amaranthus retroflexus L.    | Amaranthaceae| T scap    | America   | Ruins, debris, a weed in summer crops in dry and soft ground—C | Lippia                             | t-s          | Co       | R                      |
| * Ammi majus L.              | Apiaceae     | T scap    | Eurimed.  | Uncultivated land, ruins, hoed fields—C | Enneri, Shera                      | le           | Ra/Co    | R                      |
| Anacyclus clavatus (Desf.)   | Asteraceae   | T scap    | Stenomed. | Dry meadows, uncultivated land—VC   | Panipanaussu                       | t-s          | Ra/Co    | R                      |
| Anthemis arenaria L. subsp. arenaria | Asteraceae | T scap    | Stenomed. | Cereal fields, pastures and uncultivated land—VC | Cacumidda Brett, Giumidda savaggia | le           | Ra/Co    | R                      |
| Apium graveolens L.          | Apiaceae     | H scap    | Paleotemp.| Cultivated and wet uncultivated land—NC | Acia savaggia, Acia                 | t-s          | Ra/Co    | C                      |
| Apium nodiflorum (L.) Lag.   | Apiaceae     | H scap    | Eurimed.  | Ditches, ponds—C                   | Scàvàni, Scàvàni                   | le, t-s      | Ra/Co    | C                      |
| * Arabis collina Ten.        | Brassicaceae | H scap    | Medit.-Mont.| Grazing lands, cliffs, walls—C    | Rassì savaggì                      | t-s          | Ra/Co    | R                      |
| * Arabis hirsuta (L.) Scop.  | Brassicaceae | H bienn   | Europ     | Dry meadows, bushes, grazing lands, cliffs, road edges, walls—C | Rassì                              | t-s          | Ra/Co    | R                      |
| * Arabis turrita L.          | Brassicaceae | H bienn   | S-Europ.-Sudib. | Grazing land, deciduous, stony slopes and cliffs—R | Macàridda duci, Cavullidda          | t-s          | Ra/Co    | R                      |
| Arctium minus (H.B.) Berth.  | Asteraceae   | H bienn   | Stenomed. | Uncultivated land, hedges, road edges, banks—NC | Barràna                           | le, t-s      | Ra/Co    | R                      |
| Asparagus acutifolius L.     | Asparagaceae | NP        | Stenomed. | Scrubland, holm oak, hedges Scrubland, holm oak, hedges—VC | Sparacì di rizzògna, Sparacògna    | t-s          | Ra/Co    | WC                     |
| Asparagus albus L.           | Asparagaceae | NP        | W-Stenomed.| Dry slopes, particularly in clayey ground and limestone—WC | Sparacìu janca, Sparacìu spinosu   | t-s          | Ra/Co    | VC                     |
| Asparagus ophyllus L.        | Asparagaceae | Ch frut   | S-Stenomed.| Dry and sunny slopes, hedges—VC    | Sparacìu nìuru                      | t-s          | Ra/Co    | C                      |
| Asparagus hami L.            | Asparagaceae | NP        | S-Stenomed.| Walls, hedges, garigue—NC          | Sparacìu saràcà, Sparacògna saràcà | t-s          | Ra/Co    | C                      |
| Asparagus officinalis L.     | Asparagaceae | G rhiz    | Eurimed.  | Meadows and marshes—NC             | Sparacìu manzu, Sparacìu Impèrdìlì | t-s          | Ra/Co    | C                      |
| Asphodeline lutea (L.) Rchb. | Xanthorrhoeaceae | G rhiz | Eurimed.  | Dry meadows—VC                      | Garàlì, Pudìchìu                   | t-s          | Ra/Co    | C                      |
| Asphodelus ramosus L. subsp. ramosus var. ramosus [100] | Xanthorrhoeaceae | G rhiz | Stenomed. | Uncultivated dry ground, meadows—VC | Porràzzu, Pàlùzzi ramosu            | 10           | Co       | R                      |
| Taxa | Family | Life form | Chorotype | Habitat and distribution frequency | Vernacular names | Edible parts a | Food use b | Frequency of citations c |
|------|--------|-----------|-----------|------------------------------------|----------------|----------------|-----------|------------------------|
| * Asphodelus ramosus subsp. ramosus var. afric anus Z. Díaz & Valdés [100] | Xanthorrhoeaceae | G rhiz | Stenomedit. | Uncultivated clayey land—VC | Agghiù porru, Purazzu | ro | Go | R |
| * Barbarea vulgaris R. Br. | Brassicaceae | H scap | Cosmop. | Wet muds, brook’s banks—R | Gaulèddi di crape, Lassana | t-s | Go | C |
| * Bellis annua L. | Asteraceae | T scap | Stenomedit. | Meadows, uncultivated land—C | Erva di prima xiuri, Jancazzu | b-r | Ra/Go | C |
| * Bellis perennis L. var. perennis | Asteraceae | H ros | Europ.-Caucas. | Uncultivated land, meadows, disturbed sinantropic localities—C | Erva di prima xiuri, Jancazzu | b-r | Ra/Go | C |
| * Bellis perennis var. hybrida (Ten.) Fiori [100] | Asteraceae | H ros | Stenomedit. | Meadows—R | Erva di prima xiuri, Jancazzu | b-r | Ra/Go | R |
| * Bellis perennis var. strobliana Bég. [100] | Asteraceae | H ros | Endem. Sic. | Mountain meadows—R | Erva di prima xiuri, Jancuzzu | b-r | Ra/Co | R |
| Beta vulgaris L. subsp. vulgaris | Chenopodiaceae | H scap | Eurimedit. | Wild on the coasts and commonly cultivated—C | Giri, Salachi | — | VC | VVC |
| Beta vulgaris subsp. maritima (L.) Arcang. [100, 106] | Chenopodiaceae | H scap | Eurimedit. | Wild on the coasts—VC | Giri, Zarchi | — | VC | VVC |
| * Biscutella maritima Ten. | Brassicaceae | T scap | Endem. Sic. | Uncultivated land, pastures, olive-grove—C | Erva di primu xiuri, Jancuzzu | b-r | Ra/Co | R |
| Beta vulgaris L. subsp. maritima (L.) Arcang. [100, 106] | Chenopodiaceae | H scap | Eurimedit. | Wild on the coasts and commonly cultivated—C | Giri, Salachi | — | VC | VVC |
| Beta vulgaris L. subsp. maritima (L.) Arcang. [100, 106] | Chenopodiaceae | H scap | Eurimedit. | Wild on the coasts and commonly cultivated—C | Giri, Salachi | — | VC | VVC |
| * Biscutella maritima Ten. | Brassicaceae | T scap | Endem. Sic. | Uncultivated land, pastures, olive-grove—C | Erva di primu xiuri, Jancuzzu | b-r | Ra/Co | R |
| Borago officinalis L. | Boraginaceae | T scap | Endem. Sic. | Uncultivated land, ruins—VC | Varana, Bormania | f/finfl, t-s | Go | VC |
| Brassica fruticulosa Cirillo | Brassicaceae | H scap | W-Stenomedit. | Uncultivated land, walls, debris—VC | Gaulèddu, Qualìddu | b-r, f/finfl | Go | VC |
| Brassica incana Ten. | Brassicaceae | H scap | Medit. | Wild on the coasts and commonly cultivated—C | Giri, Zarchi | — | VC | VVC |
| * Brassica nigra (L.) W. D. J. Koch | Brassicaceae | T scap | Endem. Sic. | Uncultivated land, pastures, olive-grove—C | Gaulèddu, Qualìddu | b-r, f/finfl, t-s | Go | C |
| Brassica rapa subsp. campestris (L.) A. R. Clapham | Brassicaceae | T scap | Medit. | Fields, uncultivated land, road edges—VC | Snappè, Qualìddu | b-r, f/finfl, t-s | Go | VC |
| * Brassica rupestris Raf. subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| * Brassica rupestris subsp. rupestris | Brassicaceae | Ch suffr | Endem. Sic. | Limestone cliffs—NC | Galuèddu, Ciàppiru | — | Ra/Co | R |
| Taxa                                      | Family          | Life form | Chorotype | Habitat and distribution frequency | Vernacular names                      | Edible parts | Food use | Frequency of citations |
|-------------------------------------------|----------------|-----------|-----------|------------------------------------|---------------------------------------|--------------|----------|------------------------|
| * Capparis spinosa subsp. spinosa var. canescens Cosson | Capparidaceae   | NP        | Medit.-Turan. | Gypsum and sulphur cliffs, calanque—VC | Chiappara sarbaggiu, Chiappara | f, t, r | Ra/Co   | VC                     |
| Capsella bursa-pastoris (L.) Medik.        | Brassicaceae    | H bienn   | Eurimedit. | Uncultivated land—VC               | Blaura di pietra, Mastazzu sarvaggiu | l e         | G o      | R                      |
| Cardamine hisuta L.                       | Brassicaceae    | T scap    | Endem.    | Cultivations, uncultivated land, grassland—VC | Arauciliotta sarvaggiu, Cresiuneddu d’mura | t-s         | G o      | R                      |
| Cardus argyros Biv.                       | Asteraceae      | T scap    | Endem.    | Uncultivated land, pastures, roadides—VC | Gacasa, Napolai d’acqua | t-s         | G o      | R                      |
| Cardus corymbosus Ten.                    | Asteraceae      | T scap    | Endem.    | Uncultivated dry ground, debris, roadides—VC | Gacunaddu sarvaggiu | t-s         | G o      | R                      |
| Cardus py exchanged subsp. glabrum (Arcang.) Meusel & Käster | Asteraceae | H bienn   | Eurimedit.-Turan. | Uncultivated land, road edges—VC | Scaddi | l e         | G o      | R                      |
| Carlina gummifera (L.) Less.              | Asteraceae      | H ros     | S-Stenomedit. | Garigue, dry meadows—VC | Mastiçàgna, Gacuccidda | f/th     | Ra/Co  | R                      |
| * Carlina hispanica subsp. globosa (Arcang.) | Asteraceae | T scap    | Stenomedit. | Uncultivated land, pastures, garigue—C | Mazzacugghiuna, Mazzacani | t-s         | G o      | R                      |
| Carlina sicula Ten.                       | Asteraceae      | H scap    | Endem. Sic. | Uncultivated land, dry meadows, roadides—C | Carлина сицилиа, Panòlàdu | t-s         | G o      | R                      |
| * Carithria annua (L.) DC.                 | Brassicaceae    | T scap    | Stenomedit.-Turan. | Uncultivated dry ground—R | Mastazzu sarvaggiu | t-s         | G o      | R                      |
| Carthamus tinctorius L. subsp. tinctorius | Asteraceae      | H scap    | Eurimedit. | Clay-limestone ground—VC | Vaxamazzi, Carduni ‘mfinistatu o ri spina | t-s         | Ra      | R                      |
| Carthamus pinnatinus Desf.                | Asteraceae      | H ros     | SW-Eurimedit. | Uncultivated land, pastures, garigue—C | Cardunaddu | b-r         | G o      | R                      |
| Centaurea calcitrapa L.                   | Asteraceae      | H bienn   | Eurimedit. | Uncultivated dry ground, vineyards, roadides—VC | Apròcchi ni piacarca, Sciacubba | b-r         | G o      | C                      |
| * Centaurea napofo L.                      | Asteraceae      | T scap    | SW-Stenomedit. | Fields, uncultivated land, pastures hedges—VC | Lucia | b-r         | G o      | C                      |
| Centaurea scola L.                        | Asteraceae      | H scap    | SW-Stenomedit. | Uncultivated land, roadides—C | Apròcchiu, Buturi d’aru | b-r, l e | G o      | R                      |
| Centaurea solstitialis subsp. schinii (DC) Castell | Asteraceae | H bienn   | Subendem. | Uncultivated land, vineyards, roadides—C | Apròcchiu ‘mmiradda, Gattaredda | l e         | G o      | R                      |
| Centranthus ruber (L.) DC.                 | Valerianaceae   | Gh suffr  | Stenomedit. | Cliffs, old walls—VC | Baddariténa russa, Giummu di carrabbinera | l e         | Ra/Co  | R                      |
| Cenchrus major L. subsp. major             | Boraginaceae    | T scap    | Stenomedit. | Uncultivated land, vineyards edges and olive-grove, roadides—VC | Susambri, Vrischi di api | l e         | Ra/Co  | C                      |
| Chaenomeles fuscatus (Brot.) Vasc.         | Asteraceae      | T scap    | W-Medit.-Mont. | Meadows and uncultivated wet ground—C | Gacumidda, Panti cavaddu | t-s         | Ra/Co  | R                      |
| Chamaerops humilis L.                     | Arecaceae       | P scap    | W-Stenomedit. | Limestone cliffs and slopes on garigue Coastal belt—VC | Giummanna, Scopazzu | t-s         | R a      | R                      |
| Chenopodium album L.                      | Chenopodiaceae  | T scap    | Europa E-Asia | Uncultivated ground, ruins, a weed of cultivations—VC | Enna fiorente, Innissa | l e, t-s | G o      | R                      |
| Chondrilla juncea L.                      | Asteraceae      | H scap    | S-Eurap.-Sudarb. | Uncultivated land and dry meadows—VC | Gur i suggi, Cutulidda | l e, t-s | G o      | C                      |
| Cichorium intybus L. var. intybus [100, 106] | Asteraceae | H scap    | Paleotemp. | Roadides, in uncultivated land and ruins, a weed also in gardens—VC | Cicòria, Cicoira | b-r, l e | Ra/Co  | WC                    |
| Taxa                           | Family            | Life form | Habit and utilization frequency | Vernacular name                  | Edible parts | Food use | Frequency of citations |
|-------------------------------|-------------------|-----------|---------------------------------|----------------------------------|--------------|----------|-----------------------|
| * Cichorium intybus var.     | Asteraceae        | H scap    | Medit. Mountain grasslands      | Cicòria, Cicoira                | b-r, le      | Ra/Co    | C                     |
| * Cichorium pumilum          | Asteraceae        | T scap    | Stenomedit. Ruins, uncultivated land | CINirvia sarvaggia              | C            | C        | VC                    |
| * Clematis vitalba           | Ranunculaceae     | P lian    | Europ.-Caucas. Sub-Mediterranean deciduous woods, hedges | Liàra, Mutarva                 | t-s         | Co       | VC                    |
| * Clinopodium nepeta        | Lamiaceae         | H scap    | Orof. S-Europ. Dry meadows, uncultivated land, walls | Nipitedda, Niputeddra          | b-r, le      | Co       | VC                    |
| * Crepis bursifolia         | Asteraceae        | H scap    | Subendem. Uncultivated land, dry meadows | Ricuttedda, Rizzaredda         | b-r         | Co       | VC                    |
| * Crepis leontodontoides    | Asteraceae        | H ros    | W-Medit.-Mont. Forests, bushes, glads | Rizzaredda                     | b-r         | Co       | C                     |
| * Crepis neglecta subsp.    | Asteraceae        | T scap    | Subendem. Uncultivated land, vineyards, roadsides | Radicchiedda                    | b-r         | Co       | VC                    |
| Crepis sprengelii           | Asteraceae        | H ros    | Endem. Sic. Fields, meadows and hedges | Radicchiedda siciliana          | R           | Co       | R                     |
| * Crepis vesicaria          | Asteraceae        | T scap    | Eurimedit.-Subatl. Uncultivated land, vineyards, roadsides | Cicoria missinìsa, Cicoria vessicaria | b-r, le      | Co       | VC                    |
| * Crepis vesicaria subsp.   | Asteraceae        | T scap    | Endem. Sic. Uncultivated land and roadsides | Cicòria vessicaria, Cicuriuni | b-r         | Co       | C                     |
| Crepis vesicaria subsp.     | Asteraceae        | T scap    | Endem. Sic. Uncultivated land, vineyards, roadsides | Luciazzi                        | b-r         | Co       | VC                    |
| Crepis vesicaria subsp.     | Asteraceae        | T scap    | Endem. Sic. Uncultivated land, vineyards, roadsides | Cicoria amara, Lattuchedda di lu Signuri | b-r, le      | Co       | C                     |
| Crepis vesicaria subsp.     | Asteraceae        | T scap    | Endem. Sic. Uncultivated land, vineyards, roadsides | Luciazzi                        | b-r         | Co       | VC                    |
| Crepis vesicaria subsp.     | Asteraceae        | T scap    | Endem. Sic. Uncultivated land, vineyards, roadsides | Cicoria amara, Lattuchedda di lu Signuri | b-r, le      | Co       | C                     |
| Crepis vesicaria subsp.     | Asteraceae        | T scap    | Endem. Sic. Uncultivated land, vineyards, roadsides | Luciazzi                        | b-r         | Co       | VC                    |
| Crepis vesicaria subsp.     | Asteraceae        | T scap    | Endem. Sic. Uncultivated land, vineyards, roadsides | Cicoria amara, Lattuchedda di lu Signuri | b-r, le      | Co       | C                     |
| Crepis vesicaria subsp.     | Asteraceae        | T scap    | Endem. Sic. Uncultivated land, vineyards, roadsides | Luciazzi                        | b-r         | Co       | VC                    |
| Crepis vesicaria subsp.     | Asteraceae        | T scap    | Endem. Sic. Uncultivated land, vineyards, roadsides | Luciazzi                        | b-r         | Co       | VC                    |
| Crepis vesicaria subsp.     | Asteraceae        | T scap    | Endem. Sic. Uncultivated land, vineyards, roadsides | Luciazzi                        | b-r         | Co       | VC                    |

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*Table 1: The list of wild vegetable plants used in the study area (Continued)*
| Taxa | Family       | Life form | Chorotype | Habitat and distribution frequency                                                                 | Vernacular names                        | Edible parts | Food use | Frequency of citations |
|------|--------------|-----------|-----------|------------------------------------------------------------------------------------------------------|------------------------------------------|--------------|----------|------------------------|
| Echium italicum subsp. italicum | Boraginaceae | H bienn   | Mediterr. | Dry mountain meadows—VR                                                                            | Acchiappà muschi, Lingua di voi         | le           | Go       | R                      |
| *   | Echium italicum subsp. siculum (Lacaita) Greuter & Burdet | Boraginaceae | H bienn   | Endem. Sic.                                                                                           | Acchiappà muschi, Lingua vipersina      | le           | Go       | R                      |
| Echium plantagineum L. | Boraginaceae | T scap    | Euromedit. | Uncultivated land and dry meadows—VC                                                                     | Lapazza, Lingua di voi                    | le           | Go       | R                      |
| Erucia vesicaria subsp. sativa (MILL.) Thell. | Brassicaceae | H scap    | Subendem. | Ruins, gardens—C                                                                                       | Asa, Asa sarvaggia                       | le, t-s      | Ra/Go    | C                      |
| Erucastrum virgatum U. & C. Predl. C. Presl | Brassicaceae | H scap    | Subendem. | Ruins and uncultivated land, pastures—R                                                                | Snapi, Gialulu sarvaggìa               | le, t-s      | Go       | R                      |
| Eryngium campestre L. | Apiaceae     | H scap    | Endem. Sic. | Uncultivated land, dry meadows—VC, gardens—C                                                           | Panicausa, Nisalata du diavulu           | le           | Ra       | R                      |
| Fedia graciliflora Fisch. & C. A. Mey. | Valerianaceae | T scap    | Stenomed. | Uncultivated land, roadsides and in gardens—C                                                           | Peri ciocca, Lattucedda di San Giuseppi  | le           | Ra/Go    | C                      |
| Faenicula vulgaris Mill. subsp. vulgaris | Apiceae | H scap    | Subendem. | Uncultivated land, dry and sandy ground along the coast and roadsides—VC                               | Iscu' janzuca, Gavvente jëppi           | le, t-s      | Ra/Go    | WC                     |
| Galactites elegans (All.) Soldano (100, 106) | Asteraceae | H bienn   | Endem. Sic. | Uncultivated dry and sandy ground along the coast and roadsides—VC                                      | Iscu' janzuca, Gavvente jëppi           | le, t-s      | Ra/Go    | WC                     |
| *   | Gladiolus communis L. subsp. byzantinus (MILL.) A. P. Ham. (100, 106) | Iridaceae | G bulb   | Stenomed. | Cereal fields—C                                                                                         | Spatuliddra                             | st-j         | Ra       | R                      |
| *   | Gladiolus communis L subsp. communis | Iridaceae | G bulb   | Stenomed. | Cereal fields—C                                                                                         | Spatuliddra                             | st-j         | Ra       | R                      |
| Gladiolus italicus Mill. | Iridaceae | G bulb   | Endem. Sic. | Cereal fields—C                                                                                         | Spatuliddra                             | st-j         | Ra       | R                      |
| Glebionis coronaaria (L.) Spach | Asteraceae | T scap    | Stenomed. | Fields, vineyards, olive-grove, uncultivated land—VC                                                  | Sciù di maio, Ciù di cacanu           | t-s          | Go       | R                      |
| Hedypnois cretica (L.) Dum-Cours. | Asteraceae | T scap    | Stenomed. | Uncultivated land garigue, dry meadows—VC                                                              | Eru caicciola                           | t-s          | Go       | R                      |
| Hedypnois sahagadulae (L.) F. W. Schmidt | Asteraceae | T scap    | Stenomed. | Uncultivated land garigue, dry meadows—VC                                                              | Eru caicciola                           | t-s          | Go       | R                      |
| Helminthotheca echinoidea (L.) Holub | Asteraceae | T scap    | Stenomed. | Hedges, road sides, dry meadows, ruins—VC                                                               | Spìridda, Aspèridda                      | le           | Go       | R                      |
| Himantoglossum robertianum (Loisel.) P. Delinge | Orchidaceae | G bulb   | Stenomed. | Dry meadows, garigue and small bushes—VC                                                               | Patàtura, Gaddùzzi                      | bu, ra       | Go       | R                      |
| Hirschfeldia incana (L.) Larg.-Foss. | Brassicaceae | H scap    | Stenomed. | Ruins, uncultivated land, along the roads—VC                                                            | Lassini, Muzzareddi                      | fVinf, le, t-s | Go     | VC                     |
| Hyoseris radiata L. | Asteraceae | T ros    | Stenomed. | Uncultivated dry ground, near the coast—NC                                                             | Occhi di pimenti, Ciuuri               | b-r          | Go       | VC                     |
| *   | Hyoseris sambra L. | Asteraceae | T ros    | Stenomed. | Uncultivated dry ground, near the coast—NC                                                             | Ciuuri, Erba duci                       | b-r          | Go       | C                      |
| Hypochaeris aphyrophorus L. | Asteraceae | T scap    | Stenomed. | Uncultivated land and dry meadows—VC                                                                  | Costa di vecchia, Ciuura lingua di jatta | b-r, le      | Go       | VC                     |
| Hypochaeris cretensis (L) Bary & Chauks | Asteraceae | H scap    | NE-Medit-Mont. | Dry and stony slopes, mountain pastures—C                                                              | Oluli duci                              | b-r, le      | Go       | C                      |
| Taxa                   | Family      | Life form | Chorotype | Habitat and distribution frequency | Vernacular names | Edible parts | Food use | Frequency of citations |
|------------------------|-------------|-----------|-----------|-------------------------------------|------------------|--------------|----------|-----------------------|
| **Hypochaeris glabra** | Asteraceae  | T scap    | Eurimedit.| Uncultivated dry ground, pastures—C | Costi vecchia     | b-r, le     | Co       | VC                    |
| **Hypochaeris liraevata** (L.) Ces. | Asteraceae  | H ros    | SM-Medit-Mont.| Cliffs, stony pastures—C | Razzo         | b-r, le     | Co       | VC                    |
| **Hypochaeris radicata** L. | Asteraceae  | H ros    | Europ-Caucas.| Sands, dry meadows, uncultivated land—C | Cicoria furcicata, Splinti | b-r, le     | Co       | VC                    |
| **Iris tuberosa** L.  | Iridaceae   | G rhiz    | N-Stenomedit.| Uncultivated land, hedges, and olive groves—VC | Buttini di jaddu, Castagnotto | ro         | Co       | C                     |
| **Juncus acutus** L.  | Juncaceae   | H caesp   | Eurimedit.| Wet salt sandy ground, embankments, clayey ground—VC | Juncu, Junci di vari | t-s       | Co       | R                     |
| **Kundmannia sicula** (L.) DC. | Apiaceae    | H scap    | Stenomedit.| Dry uncultivated land, pastures—C | Padi di nigli, Atrusa sarvaggiu | le         | Co       | VR                    |
| **Lactuca muralis** (L.) Gaertn. | Asteraceae  | H scap   | Europ-Caucas.| Woods—C | Cardedda di muru | le         | Ra/Co   | C                     |
| **Lactuca serriola** L. | Asteraceae  | H bienn  | S-Euro.-Sudib.| Uncultivated land, vineyards, roadsides—VC | Lattuca sarbaggia, Lattùca spinusa | le | Ra/Co | C                     |
| **Lactuca viminea** (L.) J. & C. Preal. | Asteraceae  | H bienn  | Europ-Caucas.| Dry and stony slopes—VC | Lattugheddà di Signuri, Erva di Scusseri | le | Ra/Co | C                     |
| **Lamium flexuosum** Ten. | Lamiaceae  | H scap   | NW-Medit-Mont.| Stony ground, wet cliffs, scrubland—R | Ninelli | st-j | Ra | R                     |
| **Lapsana communis** L. | Asteraceae  | T scap    | Paleotemp.| Broadleaf woods and fresh disturbed localities—C | Lassani raci, Erva pi li minni | t-s | Ra/Co | R                     |
| **Lathyrus annuus** L. | Fabaceae    | T scap    | Eurimedit.| Fields, pastures, uncultivated land—C | Rosuli sarvaggiu | t-s | Co | R                     |
| **Lathyrus sylvestris** L. | Fabaceae    | H scand   | Europ-Caucas.| Dry meadows, hedges—C | Cesuauusu, Fasòla sarvaggiu | fi | Ra | R                     |
| **Leontodon cichoraceus** (Ten.) Sanguin. | Asteraceae  | H scap    | Stenomedit.| Uncultivated dry ground, pastures, hedges—R | Ciceruddà | b-r | Co | VC                    |
| **Leontodon intermedius** Huter, Porta & Rigo | Asteraceae  | H ros    | Endem.| Limestone cliffs—C | Ciceruddà | b-r | Co | C                     |
| **Leontodon muelleri** (Sch. Bip.) Fiont. | Asteraceae  | T scap    | S-Stenomedit.| Pastures and uncultivated wet ground—R | Occhii di pinnici | b-r | Co | C                     |
| **Leontodon siculus** (Guss.) Nyman | Asteraceae  | H ros    | Endem.| Beech and Turkey oak woods—R | Lattugheddà di montagna | b-r | Co | C                     |
| **Leontodon tuberosus** L. | Asteraceae  | H ros    | Stenomedit.| Dry meadows, olive-grove, glades in scrublands—VC | Occhii di pinnici, Lattugheddà | b-r | Co | C                     |
| **Leopoldia comosa** (L.) Parl. | Hyacinthaceae | G bulb   | Eurimedit.| Fields, uncultivated dry ground—VC | Gigudazzà, Agghióra niusu, | bu | Co | R                     |
| **Lepidium draba** L. | Brassicaceae | G rhiz   | Gimaica. | Uncultivated land along the roads, rains—VC | Aruchedda, Erva pipirina | t-s | Co | R                     |
| **Lepidium graminifolium** L. | Brassicaceae | H scap   | Europ-Caucas.| Road sides, rains—VC | Mattariu sarvaggiu | t-s | Co | R                     |
| **Lepidium latifolium** L. | Brassicaceae | H scap   | Subendem.| Uncultivated dry baren ground—R | Erva pipirina, Erva mustanda | t-s | Co | R                     |
| **Lobelia maritima** (L.) Desv. subsp. maritima | Brassicaceae | H scap   | Stenomedit.| Uncultivated dry ground, cliffs, walls—VC | Qualiddazzà profunrati, Càvi bêrnhàcu | t-s | Co | R                     |
| **Lycium europaeum** L. | Solanaceae  | NP       | Eurimedit.| Cultivated for hedges and grown wild along interpoderal roads—C | Spinassanta, Tammuscedddu | t-s | Co | C                     |
| Taxa            | Family          | Life form | Chorotype | Habitat and distribution frequency | Vernacular names | Edible parts | Food use | Frequency of citations |
|-----------------|-----------------|-----------|-----------|------------------------------------|------------------|--------------|----------|-----------------------|
| Taxa | Family | Life form | Chorotype | Habitat and distribution frequency | Vernacular names | Editable parts | Food use | Frequency of citations |
|------|--------|-----------|-----------|------------------------------------|-----------------|---------------|----------|-----------------------|
| *Plantago serraria L.* | Plantaginaceae | H ros | Stenomedit. | Uncultivated dry ground mainly on the coastland—C | Tuonachi, Chichi di panini | b-r | Co | C |
| *Portulaca oleracea L.* subsp. oleracea | Portulacaceae | T scap | Subcosmop. | Fields, gardens, uncultivated ground—VC | Pecùddana, Pucciddana | le, t-s | Ra/Co | VC |
| *Primula vulgaris Huds.* | Primulaceae | H ros | Europ.-Caucas. | Broadleaf woods—C | Contebra sicilana, Scutri a scarca | b-r | Ra/Co | R |
| *Raphanus raphanistrum L.* subsp. raphanistrum | Brassicaceae | T scap | Eurimedit. | Ruins, gardens, often also a weed of cultivations—VC | Rusa rudd, Lapatru | le, t-s | Co | VC |
| *Raphanus raphanistrum subsp. landra* (DC.) Bonnier & Layens | Brassicaceae | T scap | Eurimedit. | Ruins and fields—VC | Mazzaredda, Raza | le, t-s | Co | VC |
| *Raphanus raphanistrum subsp. maritimus* (Sm.) Thell. | Brassicaceae | T scap | Eurimedit. | Ruins and fields near the sea—C | Ràfanu sarvaggiu, Aràzzu | le, t-s | Co | C |
| *Rapistrum rugosum subsp. orientale* (L.) Arcang. | Brassicaceae | T scap | Eurimedit. | Degraded scrubland, bushes, and hedges—VC | Gamsaica, Rua savagia | t-s | R | R |
| *Rosa canina L.* | Rosaceae | NP | Paleartemp. | Uncultivated dry land, grazing, road edges—C | Cacìaleppu, Curòta | b-r | Co | VC |
| *Rosa sempervirens L.* | Rosaceae | NP | W-Medit.-Mont. | Thermo-Meso-Mediterranean woods and scrublands—C | Rusidda spinusa, Rusidda di San Giovanni | t-s | R | R |
| *Rubus ulmifolius Schott* | Rosaceae | NP | Eurolittor. | Manured and mown meadows—RC | Amureddu, Rivettu | t-s | R | R |
| *Rumex diplotaxis* L. | Polygonaceae | H scap | Circumbor. | Uncultivated dry ground, walls, road-sides—VC | Rariuca savagia | b-r, le | Co | R |
| *Rumex bucephalophorus L.* subsp. bucephalophorus | Polygonaceae | T scap | Eurimedit.-Macaron. | Uncultivated dry ground mainly on the coastland—VC | Achìstafa, Agri-duci a' fogghi picciriddi | t-s | R | R |
| *Rumex cristatus L.* | Polygonaceae | H scap | Subcosmop. | Uncultivated and cultivated ground, ruins—C | Aìru addu, Lapatàsu | t-s | Co | VR |
| *Rumex intermedicus DC.* | Polygonaceae | H scap | NW-Stenomedit. | Uncultivated ground—R | Achìstazu | t-s | R | R |
| *Rumex pulcher L.* subsp. pulcher | Polygonaceae | H scap | Eurimedit. | Uncultivated land, ruins, meadows and semi-humid ground—VC | Lapàzza, Lapažëddu ruzzu | t-s | R | R |
| *Rumex scutatus L.* | Polygonaceae | H scap | S-Europ.-Sudib. | Limestone stony and uncultivated land—VC | Achìstula di sciòra, Chùlidda | le, t-s | R | R |
| *Salvia officinalis L.* | Lamiaceae | Ch suffr | N-Medit.-Mont. | Only rarely naturalized, and always in disturbed habitats—RC | Savia | le | R | C |

* *Rorippa sylvestris* (L.) Besser | Brassicaceae | H scap | Eurasiat. | Muds, uncultivated wet ground | Arùca sarvaggia picciridda | VR | Arùca sarvaggia | R |

* *Rhagadiolus stellatus* (L.) Gaertn. | Asteraceae | T scap | Eurimedit. | Uncultivated land, fields, dry meadows—C | Raricchiu sarvaggiu | t-s | R | R |

* *Rosa canina L.* | Rosaceae | NP | Paleartemp. | Uncultivated dry land, grazing, road edges—C | Cacìaleppu, Curòta | b-r | Co | VC |

* *Rosa sempervirens L.* | Rosaceae | NP | W-Medit.-Mont. | Thermo-Meso-Mediterranean woods and scrublands—C | Rusidda spinusa, Rusidda di San Giovanni | t-s | R | R |

* *Rubus ulmifolius Schott* | Rosaceae | NP | Eurolittor. | Manured and mown meadows—RC | Amureddu, Rivettu | t-s | R | R |

* *Rumex diplotaxis* L. | Polygonaceae | H scap | Circumbor. | Uncultivated dry ground, walls, road-sides—VC | Rariuca savagia | b-r, le | Co | R |

* *Rumex bucephalophorus L.* subsp. bucephalophorus | Polygonaceae | T scap | Eurimedit.-Macaron. | Uncultivated dry ground mainly on the coastland—VC | Achìstafa, Agri-duci a' fogghi picciriddi | t-s | R | R |

* *Rumex cristatus L.* | Polygonaceae | H scap | Subcosmop. | Uncultivated and cultivated ground, ruins—C | Aìru addu, Lapatàsu | t-s | Co | VR |

* *Rumex intermedicus DC.* | Polygonaceae | H scap | NW-Stenomedit. | Uncultivated ground—R | Achìstazu | t-s | R | R |

* *Rumex pulcher L.* subsp. pulcher | Polygonaceae | H scap | Eurimedit. | Uncultivated land, ruins, meadows and semi-humid ground—VC | Lapàzza, Lapažëddu ruzzu | t-s | R | R |

* *Rumex scutatus L.* | Polygonaceae | H scap | S-Europ.-Sudib. | Limestone stony and uncultivated land—VC | Achìstula di sciòra, Chùlidda | le, t-s | R | R |

* *Salvia officinalis L.* | Lamiaceae | Ch suffr | N-Medit.-Mont. | Only rarely naturalized, and always in disturbed habitats—RC | Savia | le | R | C |

* *Sambucus nigra L.* | Caprifoliaceae | P caesp | Europ.-Caucas. | Wet woods, glades, hedges—NC | Sommìuccu, Savùcu | f/Vir | Co | R |
| Taxa                        | Family     | Life form | Chorotype | Habitat and distribution frequency                                      | Vernacular names                        | Edible parts | Food use | Frequency of citations |
|-----------------------------|------------|-----------|-----------|------------------------------------------------------------------------|-----------------------------------------|--------------|----------|-----------------------|
| * Sanguisorba minor Scop.   | Rosaceae   | H scap    | Paleotemp. | Dry meadows, garigue, uncultivated ground—NC                          | Pampinèdda di campagna, Pimpinedda      | t-s          | Co       | VR                    |
| Scylla grandiflora Desf.    | Asteraceae  | H scap    | SW-Eurimedit. | Uncultivated land, road edges—VC                                     | Scóddi, Zammuri di campagna             | t-s          | Ra/Co   | VC                    |
| Scylla Hispanica L.         | Asteraceae  | H bienn   | Eurimedit. | Uncultivated dry and sandy ground—VC                                 | Spina bianca, Scóddi                    | t-s          | Ra/Co   | C                     |
| Scylla maculata L.          | Asteraceae  | T scap    | Sternomedit. | Uncultivated clayey ground—VC                                        | Scóddi, Scóddo                         | t-s          | Ra/Co   | C                     |
| Scorzonera cana (C. A. Mey.)| Asteraceae  | H bienn   | S-Europ.-Sudisl. | Clayey and marly ground—C                                           | Benedìsti                               | t-s          | Co       | C                     |
| Scorzonera lachiiata L.     | Asteraceae  | H bienn   | Paleotemp. | Uncultivated land, vineyards, dry slopes—NC                          | Era di gnàgnaru piùsa, Scursunèra       | t-s          | Ra/Co   | R                     |
| Scorzonera laciniata        | Asteraceae  | H bienn   | Medit.    | Vineyards, cultivation edges, ruins—NC                               | Latti di lapi                           | t-s          | Co       | R                     |
| Scorzonera laciniata subsp. | Asteraceae  | G bulb    | SW-Stenomedit. | Uncultivated dry ground—C                                           | Scursunèra                               | b-t, t-a    | Ra/Co   | R                     |
| Scorzonera undulata subsp.  | Asteraceae  | T scap    | Eurimedit. | Uncultivated land near houses and a weed in fields—VC                | Era di li cardiddi, Manzialibbri         | t-s          | Co       | R                     |
| Senecio vulgaris L.         | Asteraceae  | H scap    | Paleotemp. | Uncultivated ground, meadows, scrée—C                               | Arichi i liepu, Erba di pinutarui        | t-s          | Ra/Co   | VC                    |
| Silene vulgaris (Moench)    | Caryophyllaceae | H scap | Paleotemp. | Uncultivated ground, meadows, scrée—C                               | Arichi i liepu, Cannaliddëddi             | t-s          | Ra/Co   | C                     |
| Silene vulgaris subsp.       | Caryophyllaceae | H scap | Paleotemp. | Uncultivated ground, meadows, scrée—C                               | Arichi i liepu, Cannaliddëddi             | t-s          | Ra/Co   | C                     |
| * Silene vulgaris subsp.     | Caryophyllaceae | H scap | Paleotemp. | Uncultivated ground, meadows, scrée—C                               | Arichi i liepu, Cannaliddëddi             | t-s          | Ra/Co   | C                     |
| * Silene vulgaris subsp.     | Caryophyllaceae | H scap | Paleotemp. | Uncultivated ground, meadows, scrée—C                               | Arichi i liepu, Cannaliddëddi             | t-s          | Ra/Co   | C                     |
| Scorzonera cana subsp.       | Caryophyllaceae | H scap | Paleotemp. | Uncultivated ground, meadows, scrée—C                               | Arichi i liepu, Cannaliddëddi             | t-s          | Ra/Co   | C                     |
| Silybum marianum (L.) Gaertn.| Asteraceae  | H bienn   | Eurimedit.-Tuana. | Ruins, hedges, roadsides—VC                                         | Carduggiu, Cardu marianu                | b-r          | Go       | VC                    |
| Sinapis alba L. subsp. alba | Brassicaceae | T scap   | E-Medit.  | Cereal fields, uncultivated land and ruins—VC                       | Làssani, Mazzarèddu                     | f-infl, t-s  | Co       | R                     |
| * Sinapis alba L. subsp. disjuncta (Lag.) Bonnier | Brassicaceae | T scap   | E-Medit-Mont. | Cereal fields, uncultivated land and ruins—VC                       | Sinazzóli di lnu                        | f-infl, t-s  | Go       | R                     |
| Sinapis anemona L.          | Brassicaceae | T scap   | Sternomedit. | Cereal fields, uncultivated land, ruins—VC                           | Làssani, Sinapà savaggià                 | f-infl, t-s  | Co       | R                     |
| * Sinapis pubescens L.       | Brassicaceae | T scap   | Sternomedit. | Cereal fields, uncultivated land, ruins—VC                           | Làssani, Sinapà savaggià                 | f-infl, t-s  | Co       | R                     |
| * Sisymbrium linum L.        | Brassicaceae | T scap   | Paleotemp. | Uncultivated dry ground, cliffs—VC                                   | Sinaazzóli, Sinoppa finiminedda          | f-infl, t-s  | Go       | R                     |
| * Sisymbrium officinalis (L.)| Brassicaceae | T scap   | Paleotemp. | Uncultivated land, ruins, gardens—VC                                 | Làssini di scoppa, Mazzarèddi            | f-infl, t-s  | Go       | R                     |
| Sisymbrium ichnographus      | Brassicaceae | T scap   | Paleotemp. | Antrophophilous on debris and road sides—VC                           | Làssinu di soppa, Mazzarèddi            | f-infl, t-s  | Go       | R                     |
| Sisymbrium officinalis      | Brassicaceae | T scap   | Paleotemp. | Antrophophilous on debris and road sides—VC                           | Làssinu di soppa, Mazzarèddi            | f-infl, t-s  | Go       | R                     |
| * Sisymbrium officinalis     | Brassicaceae | T scap   | Paleotemp. | Antrophophilous on debris and road sides—VC                           | Làssinu di soppa, Mazzarèddi            | f-infl, t-s  | Go       | R                     |
| Smilax aspera L.            | Smilacaceae | NP       | Subtrop.  | Evergreen scrubland, holm oak—VC                                     | Griatta aula, Stràzzacausi               | t-s          | Go       | R                     |
| Smyrnium olusatrum L.       | Apioideae   | H bienn   | Eurimedit.-Subatl. | Wet and shady uncultivated land, hedges, ruins and debris—VC       | Làcchia savaggià, Usòlannaru             | t-s          | Ra/Co   | VR                    |
| Smyrnium phlebóttum L.       | Apioideae   | H bienn   | Eurimedit. | Coppice and uncultivated shady ground—C                              | Usòlannardu                              | t-s          | Ra/Co   | VR                    |
| Smyrnium rotundifolium Mill. | Apioideae   | H bienn   | Sternomedit. | Dry and sunny uncultivated land—C                                    | Casese Casedi                            | t-s          | Ra/Co   | VR                    |
| Solanum americanum Mill.    | Solanaceae  | T scap    | Cosmopol. | Fields, uncultivated land, ruins—VC                                   | Amaçèreddi, Pumaruceddi nutriti        | t-s          | Go       | R                     |
| Taxa | Family          | Life form | Chorotype | Habitat and distribution frequency | Vernacular names                                                                 | Edible parts | Food use | Frequency of citations |
|------|----------------|-----------|-----------|-----------------------------------|-----------------------------------------------------------------------------------|--------------|----------|-----------------------|
| Sonchus asper (L.) Hill subsp. asper | Asteraceae | T scap   | Eurastrat. | Hoed fields, gardens, vineyards—C  | Cardedda spinusa, Cardedda di scc'h | b-r, le    | Co       | WC                    |
| Sonchus asper subsp. glaucocarmin (Jord.) Ball | Asteraceae | T scap   | Eurastrat. | Fields and abandoned fields—VC     | Cardedda bianca, Cardedda fimmimina | b-r, le    | Co       | WC                    |
| Sonchus aleuticus L. | Asteraceae | T scap   | Stenomedit. | Cliffs, fields, uncultivated land, urban habitat—VC | Cardedda di muro, Cardedda scovuola | b-r, le    | Co       | WC                    |
| Sonchus tenerrimus L. | Asteraceae | T scap   | Stenomedit. | Cliffs, fields, uncultivated land, urban habitat—VC | Cardedda di muro, Cardedda scovuola | b-r, le    | Co       | WC                    |
| * Stellaria media subsp. cupaniana (Jord. & Fourr.) Nyman | Caryophyllaceae | T scap   | Medit. | Antropogen vegetation—VC | Cencocchi | le, t-s | Co       | R                     |
| * Stellaria media (L.) VIII. subsp. media | Caryophyllaceae | T rept   | Medit. | Ruderal and a weed, human sites, gardens—NC | Cencocchi | t-s       | Co       | C                     |
| * Sulla coronaria (L.) Medik. | Fabaceae    | H scap   | W-Stenomedit. | Clayey ground—C | Sudda, Suddita | t-s       | Ra/Co | C                     |
| * Taraxacum campylodes G.E.Heglund | Asteraceae | H ros   | Medit. | Hill and mountain meadows—NC | Tarasasa, Denti di liuni | b-r       | Co       | C                     |
| * Taraxacum coronanicum Lajac. | Asteraceae | H ros   | Endem. Sic. | Open fields, disturbed habitat—NC | Tarasasa, Denti di liuni | b-r       | Co       | C                     |
| * Taraxacum saurinum (Presl & Sav.) Turczan. | Asteraceae | H scap   | Endem. Sic. | Mountain open pastures—R | Tarasasa, Denti di liuni | b-r       | Co       | R                     |
| * Taraxacum siccum Soest | Asteraceae | H ros   | Endem. | Wet localities with stagnant water—VR | Denti di liuni siciuln | b-r       | Co       | VR                    |
| * Taraxacum fruticosum L. | Lamiaceae   | NP       | W-Stenomedit. | Limestone cliffs near the sea—VC | Aliveddha, Caca aucèddi | b-r       | Co       | R                     |
| Thapsia p外援ica (L.) | Brassicaceae | T scap  | Paleotemp. | Mountain grasslands—NC | Taraspiu | t-s       | Co       | R                     |
| * Tolpis umbellata Bertol. | Asteraceae | T scap   | Stenomedit. | Uncultivated land, dry meadows—C | Scaleddda | b-r       | Co       | R                     |
| * Tolpis virgata (Desf) Bertol. subsp. grandiflora (Ten.) | Asteraceae | T scap   | Stenomedit. | Uncultivated land, dry meadows—NC | Scaleddda, Erba janca | b-r       | Co       | R                     |
| * Tolpis virgata (Desf) Bertol. subsp. virgata | Asteraceae | T scap   | Stenomedit. | Uncultivated land and dry meadows—NC | Scaleddda, Lattacheddja | b-r       | Co       | R                     |
| Tordylium apulum L. | Apiaceae    | T scap   | Stenomedit. | Dry meadows, cultivated and uncultivated land—VC | Spiculalescia, Tammundulzzi pizziriddi | t-s       | Ra       | VR                    |
| Tragopogon crocatus subsp. nebrodensis (Guss) Raimondo | Asteraceae | T scap   | Endem. Sic. | Uncultivated land, dry meadows, roadides—R | Babbeeblechi, Latti d'acedda | le, t-s | Co       | R                     |
| Tragopogon porrifolius L. subsp. porrifolius | Asteraceae | H bienn  | Eurimedit. | Mountain pastures—VR | Latti d'acedda, Babbeeblechi | le, t-s | Co       | R                     |
| Tragopogon porrifolius subsp. australis (Jord.) Nyman | Asteraceae | H bienn  | Medit. | Uncultivated land, dry meadows, roadides—NC | Erba di gnagna pula, Varva di beccu | le       | Ra/Co | R                     |
| * Tragopogon porrifolius subsp. australis (Jord.) L. Richardson | Asteraceae | H bienn  | Endem. | Dry meadows, uncultivated land, roadides and field edges—NC | Varva di vecchie | le, t-s | Co       | R                     |
| * Umbilicus horizontalis (Guss) DC | Cassulaceae | H rhiz   | Stenomedit. | Wet and shady cliffs, old walls—VC | Paracqua, Aricchia di vecchie | le       | Ra       | R                     |
Table 1 The list of wild vegetable plants used in the study area (Continued)

| Taxa                                             | Family         | Life form | Chorotype | Habitat and distribution frequency                                      | Vernacular names               | Editable parts | Food use | Frequency of citations |
|--------------------------------------------------|----------------|-----------|-----------|--------------------------------------------------------------------------|--------------------------------|----------------|----------|------------------------|
| * Umbilicus rupestris (Salisb.) Dandy             | Crassulaceae   | G rhiz    | Stenomedit.-Atl | Wet and shady cliffs, old walls—VC                                      | Pomponia di uricchia, Uricelletti | le              | Ra          | R                     |
| Urospermum dalechampii (L.) F. W. Schmidt         | Asteraceae     | H scap    | Eurimedit. | Dry meadows, uncultivated land, roadsides—VC                             | Cicoria sanavigia, Guasti i poci | b-r             | le          | Go VC                  |
| Urospermum picroides (L.) F. W. Schmidt           | Asteraceae     | T scap    | Eurimedit. | Uncultivated land, roadsides, olive-grove, vineyards—VC                 | Cardiddza spinosa               | b-r             | le          | Go VC                  |
| Urtica dioica                                     | Urticaceae     | H scap    | Subcosmop. | Nitrophilous habitat, also in wood clearings and riverbeds—C            | Ardiculà fimminedda, Lardìcà sarvaggia | le              | Go          | C                     |
| Urtica denticulata                               | Urticaceae     | T scap    | S-Stenomedit. | Ruins and nitrophilous habitat—VC                                      | Addìcìllà, Ziculìèdda            | le              | Go          | C                     |
| Urtica pilulifera                                 | Urticaceae     | T scap    | S-Stenomedit. | Ruins and nitrophilous habitat—VC                                      | Ardiculà masculina               | le              | Go          | R                     |
| Urtica urens L                                   | Urticaceae     | T scap    | Subcosmop. | In disturbed habitat, nitrophilous and often urophilous species—C       | Ardiculà fimminedda, Lardìcà sarvaggia | le              | Go          | C                     |
| Valeteranella etoacapa Desv.                      | Valerianaceae  | T scap    | Stenomedit. | A weed to sown lands, uncultivated land, pastures—VC                    | Gaddinedda, Peri ciocca           | le, t-s         | Ra/Co       | R                     |
| Valeteranella lucusta (L.) Laterr.                | Valerianaceae  | T scap    | Eurimedit. | Acid meadows—NC                                                         | Gaddinedda, Spezzaquartàri        | le, t-s         | Ra/Co       | R                     |
| Veronica anagallis-aquatica L. var. anagallis-aquatica [100] | Scrophulariaceae | H scap    | Cosmopol. | Ditches, banks—VC                                                        | Criscunià, Erva di triana         | le              | Ra          | R                     |
| * Xanthium strumarium L. subsp. strumarium        | Asteraceae     | T scap    | America    | Ruins, debris, uncultivated dry ground—VC                               | Aggruppa cudi, Bardàna minuiri    | b-r             | Go          | R                     |
| * Xanthium orientale subsp. italicum (Maire) Greuter | Asteraceae     | T scap    | Neurimedit. | Uncultivated land, ruins near the sea—VC                                | Aggruppa cudi, Bardàna minuiri    | b-r             | Go          | R                     |

Asterisk indicates taxa used only in Sicily as vegetable.

*Ch frut* fruticose chamaephytes, *Ch suff* suffrutose chamaephytes, *G bun* bulbous geophytes, *G rad* root-budding geophytes, *G rhiz* rhizome-geophytes, *H bierr* biennial hemicryptophytes, *H caesp* caespitose hemicryptophytes, *H helo* helophytes, *NP nanoph* nanophanerophytes, *PC caesp* caespitose phanerophytes, *PI lian* lianous phanerophytes, *PS cap* scapose phanerophytes, *PS ucc* scapose therophytes, *TS cap* scapose therophytes, *Tr trop* reptant therophytes, *Trop rept* reptant therophytes.

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1 Asterisk indicates taxa used only in Sicily as vegetable.
2 *Ch frut* fruticose chamaephytes, *Ch suff* suffrutose chamaephytes, *G bun* bulbous geophytes, *G rad* root-budding geophytes, *G rhiz* rhizome-geophytes, *H bierr* biennial hemicryptophytes, *H caesp* caespitose hemicryptophytes, *H helo* helophytes, *NP nanoph* nanophanerophytes, *PC caesp* caespitose phanerophytes, *PI lian* lianous phanerophytes, *PS cap* scapose phanerophytes, *PS ucc* scapose therophytes, *TS cap* scapose therophytes, *Tr trop* reptant therophytes, *Trop rept* reptant therophytes.
3 *b Ra*—basal rosettes, bu—bulbs, film—flowers/inflorescences, fl—flowers/buds, fr—portion of the fruits, le—leaves, ro—roots/tubers, st—stem juice and flower juice (nectar), t-s—tender shoots, including aerial parts, tender parts, tender stems, young shoots.
4 *Ra/Co*—cooked, Ra—raw and cooked, Co—cooked
5 *VC*—widely common, cited by more than 75% (n > 735) of the informants; *VC*—Very common, 50–75% (n = 490–735) of the informants; *C*—common, 20–50% (n = 196–490) of the informants; *R*—rare, 5–20% (n = 49–196) of the informants; *VR*—very rare, less than 5% (n < 49) of the informants.
Carthamus lanatus subsp. lanatus, Rubus ulmifolius, salads (Eryngium campestre, Ridoftia segetum, Umbilicus horizontalis, U. rupestris, Rosa canina, R. sempervirens), or for the juice of stems and flowers (Gladiolus communis s.l., G. italicus, Lamium flexuosum, Veronica anagallis-aquatica) (see Table 1).

Some vegetables should be eaten after cooking due to the presence of some thermolabile toxic substances [113] or bristly or stinging hairs or thorns, i.e., Asphodelus ramosus s.l., Asphodeline lutea, Kundmannia sicula, Borago officinalis, Echium italicum subsp. italicum, E. italicum subsp. siculum, E. plantagineum, Opuntia ficus-indica (the skins of the fruit), Dioscorea communis, Leopoldia comosa, Iris tuberosa, Clematis vitalba, Smilax aspera, Lycium europaeum, Solanum americanum, Urtica spp.

Most of the mentioned vegetables are collected only for family use and are not sold. Some species, on the other hand, are found rather frequently at the stands in the markets in both towns and rural villages, while some other vegetables are found less frequently and are limited to small villages. (Table 2). Wild vegetables are an important component of traditional food systems in Sicily as well as around the world [114]; in particular, they played a significant role in feeding the Sicilian population until the 1960s [75]. Later, with the massive movement of people from the country to towns, these vegetables have gradually been replaced with cultivated ones, whereas the non-cultivated vegetables have been increasingly less utilized in the daily diet. Their consumption represented and still represents the “hidden component” of the Mediterranean diet [24], the style of life that recommends the intake of a large amount of plant food in the diet (see introduction). As evident by the chorology, most of the gathered taxa belong to the Mediterranean element but more than 13% are taxa with wide geographic ranges (cosmopolite, subcosmopolite, paleotemperate, etc.). These latter plants usually grow in anthropogenic environments such as nitrophilous habitats, roadsides, ruins, etc. (Table 1).

The use of vegetables has a strong cultural value because it is linked to traditional Sicilian cooking, which includes preparation methods that enhance organoleptic qualities as well as healthiness. Wild vegetables still represent the main dishes at lunch or dinner (e.g., soups, omelets, salads) or special preparations during traditional festivities (i.e., wild thistles fried in batter for Christmas night or the traditional “manciari di S. Giuseppe” based on mixed vegetables). Moreover, the seasonality of non-cultivated vegetables permits variation of both the preparation of the main meals and the dishes accompanying the second courses. For example, in autumn, the bitter taste of Brassica rapa subsp. campestris (“sinapi accupateddri”) contrasts with the fat and sweet taste of grilled sausages, or Beta vulgaris s.l. leaves (giri) make the “maccu di fave” (fava bean puree) delicious. In the winter, a special dish is represented by Allium ampeloprasum fried bulbs (purrietti), while in the spring, an omelet with the tender shoots of Asphodeline lutea (garafi) is an appreciated main course. These typical dishes with wild vegetables are, therefore, elements of the cultural identity of Sicilian rural communities.

In our investigation, we identified 253 wild taxa utilized as vegetables. This is a very high number, justified by the fact that Sicily has been a crossroad of cultures because of its geographical position, and several historical colonizations by Mediterranean and European peoples, such as the Phoenicians, Greeks, Romans, Turks, Arabs,
Table 2 Summary of the results

| Taxa recorded for the first time in Sicily. | Taxa |
|--------------------------------------------|------|
| Bellis annua, B. perennis var. hybrid, B. perennis var. strobiliana, B. sylvestris, Centaurea napifolia, Cichorium intybus var. glabratum, C. purpureum, Crepis sp., C. vesicaria subsp. bivonana, C. vesicaria subsp. taraxacifolia, L. intermedius, L. muelleri, L. sicula, Tolpis umbellata, Xanthium strumarium subsp. strumarium, X. orientale subsp. italicum, Echium italicum subsp. sicula, Brassica raphanistrum subsp. hispida, Raphanus raphanistrum subsp. maritimus, Silene vulgaris subsp. cammutata, Umbilicus horizontalis, U. rupestris, Gladiolus communis subsp. byzantinus, G. communis subsp. communis, Papaver rhoas var. himerense. |

| Taxa cited by 75% or more of the informant (VVC). | Allium ampeloprasum, Foeniculum vulgare subsp. vulgare, Asparagus acutifolius, Cichorium intybus var. intybus, Reichardia picoidea, Sanchus asper subsp. asper, S. oleraceus, S. tene etinus, Baraga officinale, Brassica rapa subsp. campestris, Beta vulgaris subsp. vulgaris. |

| Taxa rarely cited (VVR). | Narcissus tazetta subsp. tazetta, Kundmannia sicula, Smyrnium ols setrum, S. perfoliatum, S. rotundifolium, Tardonium apulum, Taraxacum sicula, Brassica raphanistrum subsp. hispida, Ronippa sylvestris subsp. sylvestris, Papaver somniferum subsp. setigerum, Rumex crispus, Rubus ulmifolius, Sanguisorba minor subsp. minor. |

| Wild vegetables found frequently in the markets. | Foeniculum vulgare subsp. vulgare, Asparagus acutifolius, Cichorium intybus, Crepis spp., Cynara cardunculus subsp. cardunculus, Hypochaeris spp., Reichardia picoidea, Sanchus spp., Borago officinalis, Brassica rapa subsp. campestris, Erucia vesicaria, Hirschfeldia incana, Raphanus raphanistrum, Capparis spinosa s.l., Beta vulgaris s.l., Ruscus aculeatus. |

| Wild vegetables found less frequently limited to small village markets. | Allium ampeloprasum, A. nigrum, A. roseum, Asphodeline lutea, Centaurea calcitrapa, C. napifolia, Hysorhisa radiata and H. scabra, Leontodon cichoraceus, Onopordum illyricum s.l., Scylmu s grandiflorus, S. hispanicus and S. maizuzus, Taraxacum spp., Urosporum alochampi and U. picoidea, Brassica fruticulosa, B. nigra, Ruscus hypophyllum. |

French, and Spanish, occurred on the island. Every ancient culture brought its own food traditions, which have been passed down through the years. Luckily, although the use of wild vegetables in the diet has been considerably reduced, the long-established cuisine using these vegetables is still quite alive in many rural villages in Sicily, as it occurs in southern Italy [24, 43, 44] and in other Mediterranean countries [31, 32, 73, 74]. In Sicily, the rural areas are still inhabited by a significant number of farmers. Recently, agricultural activities using techniques that are more respectful of both the environment and traditional biodiversity (the use of ancient cultivars of cereal, fruit trees, etc.) have been increasing. This trend allows the maintenance of ancient and well-established food traditions that also consider also wild plants.

Comparing Sicilian data with other areas
Comparing our Sicilian findings with previous studies in other countries within the Mediterranean area (Table 3), we detected 253 vegetable taxa. For Sicily, previous studies by Lentini and Venza [47] and Pasta et al. [48] reported 188 taxa (48 families, 126 genera) and 254 taxa (38 families, 148 genera), respectively. They also included taxa used for edible fruits, seeds, and aromatic uses or seasonings; for this reason, we share 132 taxa with Lentini and Venza [47] and 179 with Pasta et
al. [48]. Recently, in their extensive review, Guerrera and Savo [61] have described 276 taxa (40 family and 161 genera) in Italy, including 11 seasoning plants (such as *Thymus, Mentha, Origanum, and Laurus*, which are excluded from Table 3). The number of taxa detected in Sicily is similar to the overall data reported from several areas in Spain, but it is higher than the number obtained from Turkey and Morocco, as well as from smaller countries in the eastern Mediterranean region. Several families and genera of collected vegetables are shared between Sicily and Italy (82% of families and 77% of genera) and between Sicily and Spain (90% of families and 66% of genera), while less than 50% are in common with other countries (Fig. 7). As expected, the number of shared species decreases significantly, since each region presents its own floristic particularities; in this study, for example, we recorded 25 endemic and subendemic plants (Table 1). Only Agavaceae and Cactaceae are reported in Sicily as naturalized taxa. The use of *Agave americana* was already cited by Lentini and Venza [47], and *Opuntia ficus-indica* was cited [47, 48] for its edible fruit, while we report this taxon for the use of the peel (epicarp and mesocarp) of the fruit as a vegetable (see below). Edible species among the Iridaceae and the Junaceae, apart from in Sicily, were recorded only in Spain and Morocco, respectively.

Considering the total taxa recorded in the other countries (Table 3), only Spain and Italy utilize more plants than Sicily as vegetables—277 and 299, respectively, which represent 3.96 and the 3.89% of their entire floras [106, 115]. In Morocco, the reported taxa reach 4.1% of the flora [73], while in Turkey, only 1.3% was reported [116], which is probably an underestimation, considering the high plant diversity of the Turkish regions. The data obtained from the comparison highlight some differences in the use of taxa both at family and genus levels (Table 4). Some families recorded in the compared Mediterranean countries are not employed in Sicily as vegetables, and there are some edible genera fairly recurrent in other countries that are not recorded in Sicily (Table 4). In some cases, this occurs because some taxa do not belong to the Sicilian flora, i.e., *Neurada procumbens* L. (Neuradaceae), *Sesamum alatum* Thonn. (Pedaliaceae), *Balantides aegyptiaca* (L.), Delile (Zygophyllaceae), *Glossonema boveanum* (Decne.) Decne. (Apocynaceae), *Gymnosporia senegalensis* (Lam.) Loes. (Celastraceae), and *Cistanche phelypaea* (L.) Cout. (Orobanchaceae), gathered in Morocco for various uses [73, 74]. *Cistus ladanifer* L. (Cistaceae) and *Vaccinium myrtillus* L. (Ericaceae) are used in Spain for flower juice [68] and the young shoots [63], respectively. *Zygophyllum fabago* L. (Zygophyllaceae) is used for the flowers in Sardinia [62] and *Linum hirsutum* L. s.l. is used for flower juice in Afyonkarahisar in Turkey [37]. In other cases, although the taxa are also distributed in Sicily, they are not traditionally consumed as vegetables. For example, peeled bulbs of *Colchicum montanum* L. (Colchicaceae) and young shoots of *Vitis vinifera* subsp. *sylvestris* (C.C. Gmel.) Hegi (Vitaceae) are consumed in Spain as well as species belonging to the genera *Aegilops* and *Stipa* of Poaceae that are used as vegetables [68–70]. Among the Crassulaceae, the leaves of *Sedum album* L., *S. sediforme* (Jacq.) Pau are eaten raw as a snack or in salads or stewed in Spain [68]. Also in Turkey, the use of *Sedum* (*S. rubens* L.) as a vegetable is reported [32, 34]. *Bryonia cretica* subsp. *dioica* (Jacq.) Tutin (Cucurbitaceae) is traditionally used in Spain [66, 68, 69] and in Herzegovina [31]. In Turkey, cooked or raw (roasted or in a salad) leaves of *Fumaria officinalis* L. (Fumariaceae) [32, 35, 36] are eaten as well as cooked (stuffed, meal, roasted) leaves of *Arun maculatum* L. (Araceae) [32, 35]. Additionally, in Croatia and Herzegovina, *Arum italicum* Mill. cooked leaves were utilized as famine food during the war era [30, 31], and the traditional use of *Knaautia integrifolia* (Honck. ex L.) Bertol. (Caprifoliaceae) is reported for Krk island in Croatia [30]. Young shoots of

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### Table 3

Comparison among Sicilian data and other Mediterranean countries (only the vegetable use was considered)

|                | Sicily | Italy | Spain | Turkey | Morocco | Croatia/Herzegovina | Cyprus/Greece |
|----------------|--------|-------|-------|--------|---------|---------------------|--------------|
| No. of families | 39     | 40    | 53    | 36     | 37      | 32                  | 23           |
| No. of genera   | 128    | 162   | 158   | 97     | 98      | 74                  | 57           |
| No. of taxa     | 253    | 299   | 277   | 151    | 158     | 98                  | 76           |

Data from (a) [42–62], (b) [63–72], (c) [32–37], (d) [73, 74], (e) [28–31], (f) [38–40]
Lythrum salicaria L. (Lythraceae) are consumed only in the Calabria region (Italy), in which the use of young basal leaves of Reseda alba L. (Resedaceae) is also reported. Oenothera biennis L. (boiled root), Epilobium angustifolium L., and Epilobium montanum L. (young shoots) belonging to the Onagraceae are eaten in the northern Italian region [61]. Although taxa belonging to Erodium, Anchusa, Scandix, and Campanula (growing also in Sicily) are commonly eaten in almost all Mediterranean countries, they were not recognized as wild vegetables by our informants.

Moreover, in our study, we observed that some species thought to be inedible in Sicily are eaten as vegetables in other countries; for example, Mercurialis annua L. is used in a soup in Turkey [32, 35] as well as Euphorbia chamaesyce L. [36] and Euphorbia helioscopia L. [35]. Several species of Euphorbia are also consumed in Morocco (Euphorbia granulata Forssk., Euphorbia balsamifera Aiton, Euphorbia officinarum subsp. echnis (Hook.f. & Coss.) Vindt, Euphorbia regis jubae J.Gay, Euphorbia resinifera O.Berg.). Guarrera and Savo [61] report the use of Chrozophora tinctoria (L.) A. Juss. and Equisetum arvense L. in Italy. In Spain, the edible use of Pteridium aquilinum, assumed to be very harmful to human health in Sicily, is reported. [63, 70]. The use of Ferula communis L. was detected in Morocco [73, 74]. In Sicily, we found a report of the sporadic consumption of inflorescences for the territory of Bronte [48, 89]. The plant is notoriously toxic and dangerous to animals, especially if eaten fresh [117, 118]. Its sporadic use was also confirmed by Biscotti and Pieroni [24] for Apulia (Italy). In our research, none of the interviewed people mentioned a current or previous food use of this plant.

Cluster analysis based on the current state of ethnomedical knowledge of vegetable uses at the genus level shows a clustering reflecting the phytogeographical affinities of floras. The dendrogram depicts four main groups: (1) Spain, the country more investigated for ethnomedical aspects, differs due to the Mediterranean-Atlantic chorological characteristics of its flora; (2) eastern Mediterranean countries; (3) Morocco, characterized by a sub-Saharan component of the flora; and (4) Sicily and Italy, as expected, because Sicily shares the highest number of genera with Italy (Fig. 8). Multivariate analysis revealed that the cultural diversities, in term of traditional uses of plants, are expressions of the biological diversities of the countries.

The families with the highest number of vegetables are Asteraceae, Brassicaceae, and Apiaceae. A great number of taxa of Amaryllidaceae, Malvaceae, Polygonaceae, Plantaginaceae, Asparagaceae, Boraginaceae, and Caryophyllaceae are also collected as vegetables in almost all regions [28–74]. In Sicily, we listed the highest number of Asteraceae and Brassicaceae taxa (species and subspecies), but at the genus level in Spain and Italy, the number is greater for Asteraceae. In Sicily, the contingent of Brassicaceae collected as vegetables was the highest in comparison with all other compared countries, including Italy, while the number of the taxa belonging to the Apiaceae was slightly smaller. For Boraginaceae, we reported...
five species belonging to three genera (see Table 1), but more taxa were recorded in Spain (Anchusa azurea Mill., A. undulata L., Borago officinalis, Buglossoides arvensis (L.) I.M. Johnst., Echium creticum L., E. plantagineum, E. vulgare L., Lithodora fruticosa (L.) Griseb), Morocco (Anchusa azurea, Borago officinalis, Echium plantagineum, Heliotropium crispum Desf., Trichodesma africanaum (L.) Sm., T. calcaratum Coss. & Batt.), and Turkey [Anchusa azurea, A. leptophylla Roem. & Schult. subsp. leptophylla, A. undulata subsp. hybrida (Ten.) Bég., Borago officinalis, Cerinthe major L. subsp. major, Echium italicum, Paracaryum aucheri (DC. & A.DC.) Boiss., Trachystemon orientalis (L.) D.Don]. Amaryllidaceae, Asparagaceae, and Polygonaceae comprise several species traditionally collected and eaten by people, but they only belong to one or two genera in Sicily (Table 1) as well as in the compared Mediterranean areas. For Capparaceae, the case of Morocco is remarkable, where there are five edible taxa belonging to four different genera (Cadaba farinosa Forssk., Capparis spinosa L. subsp. spinosa, C. decidua (Forssk.) Edgew., Cleome amblyocarpa Barratte & Murb., Maerua crassifolia Forssk.).

Among the species reported in Table 1, 72 are eaten only in Sicily (marked with an asterisk*), while 12 are collected and eaten in Sicily and in all the investigated countries (Table 4). Twelve are very commonly collected in Sicily and in five other compared countries, while 23 are commonly collected in Sicily and in four other compared countries (Table 4).

Comparing the data collected for Sicily with those of a study on gathered Mediterranean food plants [119] in which 16 species (Allium ampeloprasum, Arbutus unedo L., Asparagus acutifolius, Borago officinalis, Cichorium intybus, Chondrilla juncea, Crataegus monogyna Jacq., Foeniculum vulgare, Malva sylvestris, Nasturtium officinale, Rubus ulmifolius, Papaver rhoes, Portulaca oleracea, Scolymus hispanicus, Silene vulgaris, and Sonchus oleraceus) were considered of widespread use (>33% of 62 zones), we noted that 14 are also utilized in Sicily as vegetables, with the exception of Arbutus unedo and Crataegus monogyna whose fruits, however, are harvested and consumed. In Herzegovina, wild plants are still an important source of nutrition for many people during the spring, and the resilience of the knowledge and use of wild vegetables is rather high (69–86%) [31]. Among the most commonly used vegetables, some taxa are also frequently collected in Sicily (Dioscorea communis, Sonchus spp., Allium spp., Papaver roehas), while different taxa of the genus Silene are eaten with respect to those consumed in Sicily. In various regions of Croatia, as in Sicily, Asparagus acutifolius, Crepis spp., Cichorium intybus, Dioscorea communis, Sonchus spp., Allium ampeloprasum, Picris echioideae, Foeniculum vulgare, Taraxacum officinale, Urospernum picroides, Beta vulgaris, are the best-known vegetables, and together with Bunias erucago, Papaver rhoes, and Urtica spp., they are commonly sold in the markets; some are sold mixed, others in separate bunches (Asparagus,
Dioscorea, Foeniculum) [28–30]. Although in Spain the greatest number of species used as vegetables belongs to Asteraceae, Nasturtium officinale (sub Rorippa nasturtium-aquaticum (Moench) Beck) is the species whose consumption was cited most often [67]. Also very popular are Asparagus acutifolius, Scolymus hispanicus, Silene vulgaris, Cichorium intybus, Foeniculum vulgare, Portulaca oleracea, and Montia fontana L., Urtica dioica in the Madrid Province [66]. Peeled young shoots of Rubus ulmifolius are eaten as snacks as well as in Sicily, and in the Basque area, Pteridium aquilinum (L.) Kuhn is also consumed [63]. In Turkey, the rich biological and cultural diversities affect the traditional use of plants and are reflected in the rich Turkish cuisine [32]. In the Aegean region of Turkey, Rumex and Erodium (not cited by our informants for Sicily) are the most represented genera, while the best represented families are Asteraceae and Boraginaceae (19 taxa), and the use of several taxa of Malva has been reported as well in Sicily [32]. The most frequently consumed “greens” and the favorite food in the Bodrum area [34] are very similar to what we detected in Sicily: Allium ampeloprasum, Foeniculum vulgare, some Brassicaceae (Sinapis, Brassica, Raphanus), Asparagus acutifolius, Dioscorea communis, Smilax aspera, Scolymus hispanicus, and Onopordon illryicum. In Morocco, the consumption of wild plants is linked with the seasonality, the regional variability, and urban-rural differences. Several vegetables are commonly sold in local markets and on roadsides, such as Asparagus spp., Malva spp., Portulaca oleracea, and Scolymus hispanicus [73, 74]. These taxa are frequently eaten in Sicily but rarely found in local markets, except for Asparagus turions (see Table 2). The greatest affinity between Sicilian reports and those from Italy is shown in the dendrogram (Fig. 8), even if only 139 out of the 253 Sicilian vegetables are cited on the Italian list [61]. Smilax aspera, Cyperus esculentus, and several species of Malva and Leonto- don were not reported for Italy. Among the most cited Italian taxa, Cichorium intybus, Sonchus spp., and Reichardia picroides were also very commonly cited by people in Sicily. Taraxacum campylodes G.E. Haglund was the most cited in Italy but not in Sicily. More similarity resulted with vegetable uses between Sicily and southern Italy [24].

In Sicily and other Mediterranean countries, the maintenance of the traditional market system, where people can find wild vegetable, is useful to preserve the habitual consumption of traditional food [74]. Moreover, the livelihood of rural people may depend not only on agricultural activity but also on the utilization of natural resources as wild vegetables that play a significant role in the human diet [33].

Peculiarities of the use of some species in Sicily
Among the surveyed species, some have a particular use and are limited to small local contexts, i.e., Smyrnium rotundifolium (Fig. 9), Opuntia ficus-indica (peel of the fruit), Kundmannia sicula, Carlina gymnifera, Centaurea calcitrapa, Onopordum species, and Allium triquetrum (Fig. 10). In particular, in Sicily, Smyrnium rotundifolium is gathered and consumed only in the village of Isnello (approximately 2000 inhabitants, in the Madonie mountains near Palermo), where it is stored after being boiled in water and vinegar and eaten as an appetizer or used for flavoring salads. The use of this taxon was only also reported in Sardinia [120]. An uncommon use limited to some small rural communities of the Madonie Mountains (Palermo) is that of the peels of the prickly pear fruit (Opuntia ficus-indica), which are sun-dried and used during the winter, after being boiled, floured, and fried in extra-virgin olive oil. The consumption of Kundmannia sicula is restricted to a few villages of the Nebrodi and Madonie areas, where it is boiled together with other non-cultivated vegetables.
Wild vegetables in Sicily still represent an important resource, as they can enrich the table with strong (bitter) or delicate flavors that give a unique taste and experience: rustic, primitive, rough but genuine, and able to reconcile “man with nature.” In addition to the vegetables well-known by the population (borage, wild beets, chicory, thistles, etc.), some vegetables are almost unknown to most people, i.e., the so-called ancient vegetables, including *Onopordum* sp., *Centaurea calcitrapa*, *Nasturtium officinale*, *Scolymus* spp., and *Smyrnium rotundifolium*.

Wild vegetables, with the traditions, customs, and practices surrounding them, are a part of the Sicilian cultural heritage, which unfortunately every day is at risk of disappearing under the pressure of globalization. This situation may, in a few decades, lead to the loss of the knowledge acquired throughout the centuries by generations of farmers, herders, foresters and other people who lived closely together with nature (our main informants, see Fig. 3). Such a loss would be very heavy because it would deprive the population of a food source of considerable interest from a qualitative point of view. Non-cultivated vegetables are rich in nutritional components that are often present in smaller quantities in species of cultivated varieties, which are selected for their high manufacturing yields. In times of possible food shortages, the population would no longer be able to identify the food resources available.

In recent years, there has been a renewed interest in non-cultivated vegetables, for both cognitive and consumption reasons, because of the growing demand for healthy foods related to a specific territory that is connected to identity. Wild vegetables are, in fact, the best ambassadors of the site in which they live. They are able to please tourists through the many local culinary preparations, expressing a solid and layered cultural tradition. The latter represents the real added value of a raw material that is obtained in an environment unique in its biological characteristics, soil, climate, and history, and which can be considered as the most expressive and symbolic cradle of the Mediterranean diet.
The research adhered to the Code of Ethics of the International Society of Ethnobiology (ISE 2008). Prior oral informed consent was obtained from all study participants. No ethical committee permits were required. No permits were required to collect voucher specimens. Consent for publication Not applicable. This manuscript does not include images, nor videos relating to informants.

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