

WILD FOOD PLANTS TRADITIONALLY USED IN THE PROVINCE OF MADRID, CENTRAL SPAIN¹

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Tardío, Javier, Higinio Pascual (*Instituto Madrileño de Investigación Agraria, Finca El Encín, Apdo. 127, E-28800 Alcalá de Henares, Madrid; e-mail: javier.tardio@imia.madrid.org*), and **Ramón Morales** (*Real Jardín Botánico de Madrid, Plaza de Murillo 2, E-28014 Madrid*). WILD FOOD PLANTS TRADITIONALLY USED IN THE PROVINCE OF MADRID, CENTRAL SPAIN. *Economic Botany* 59(2):122–136, 2005. This paper reports an ethnobotanical investigation, performed between 1999 and 2002, to determine the wild food plants traditionally used in the province of Madrid (central Spain). One hundred and twenty-three vascular species belonging to 31 families were at one time used as vegetables, wild fruits, in the making of beverages, as seasonings, or as other preparations. Wild vegetables formed the largest group, with *Scolymus hispanicus*, *Silene vulgaris*, and *Rumex pulcher* the most frequently cooked vegetables, and *Rorippa nasturtium-aquaticum* and *Montia fontana* the most commonly used in salads. Also common was the consumption of asparagus and several species of climbing plants such as *Bryonia dioica*, *Tamus communis*, and *Humulus lupulus*. Ethnobotanical novelties included *Sonchus crassifolius*, the young sprouts of which were used in salads, and *Inula salicina*, used to make herbal tea. Some ecological and cultural aspects of the collection of wild plants for food are discussed, as well as the relationships between the food and medicinal uses of some species.

PLANTAS SILVESTRES ALIMENTARIAS USADAS TRADICIONALMENTE EN LA PROVINCIA DE MADRID, CENTRO DE ESPAÑA. *En este trabajo se exponen los resultados obtenidos en un estudio etnobotánico, realizado entre 1999 y 2002, sobre las plantas silvestres usadas tradicionalmente en la alimentación en la región de Madrid, en el centro de España. Se ha registrado el uso de 123 especies vasculares, pertenecientes a 31 familias, incluyendo verduras, frutos silvestres, plantas utilizadas para elaborar bebidas, condimentarias y otros usos alimentarios de menor entidad. El grupo de verduras es el más numeroso, destacando por su mayor frecuencia de uso Scolymus hispanicus, Silene vulgaris y Rumex pulcher como verdura cocinada, así como Rorippa nasturtium-aquaticum y Montia fontana para elaborar ensaladas. Igualmente está bastante extendido el consumo en espárragos de diversas especies de plantas trepadoras, como Bryonia dioica, Tamus communis y Humulus lupulus. Entre las novedades etnobotánicas destacamos el consumo en ensalada de los brotes tiernos de Sonchus crassifolius y de Inula salicina como infusión digestiva. Se discuten finalmente algunos aspectos ecológicos y culturales de la recolección de plantas silvestres, así como la relación entre los usos alimentarios y medicinales de algunas especies.*

Key Words: Ethnobotany; wild food plants; Madrid; Spain.

The Province of Madrid lies at the center of Spain and harbors the nation's capital (Fig. 1). It has a surface area of nearly 8,000 km² and a population of some 5,500,000 inhabitants. The majority (91%) live in the city of Madrid and the surrounding towns.

Though not very large in size, the region is not topographically, geologically, or climatologically uniform. The north and west of the region

is mountainous, the peak known as Peñalara reaching 2,430 m. These mountains form part of Spain's Central Range, which runs from the middle to the west of the Iberian Peninsula. The remainder of the province has an average altitude of 600 m. Geologically, the north and west of the region has oligotrophic soils developed on plutonic (granite) or metamorphic rocks (gneiss, quartzite, and slate), while eutrophic soils developed on basic rocks (limestone, marl, or gypsum) are found in the east and southeast. The climate of the entire province is Mediterranean,

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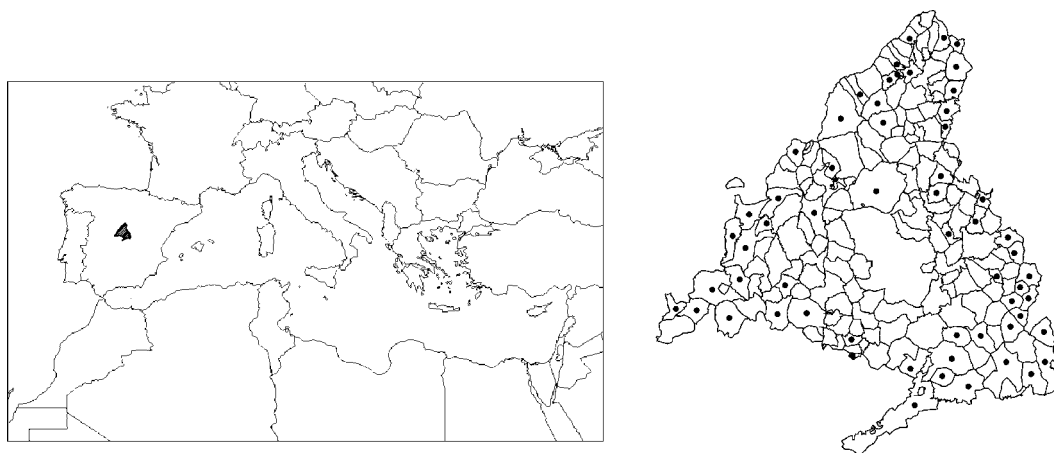


Fig 1. Location of the Province of Madrid and of the villages where interviews were held.

with a characteristic drought period coinciding with the higher temperatures of summer. However, strong variations exist between different areas in terms of annual rainfall, temperature, and the duration of the drought period. Mean annual rainfall ranges from more than 1,000 mm in some of the more mountainous areas to less than 400 mm in the southeast. The higher temperatures and the longest drought period are also seen in this part of the province.

The diversity of environmental conditions has helped confer a very rich flora and widely varied vegetation on the province. Indeed, the area boasts 2,233 species of vascular plant (Morales 2003), representing some 25–33% of the entire flora of the Iberian Peninsula and Balearic Islands. Although the whole region belongs to the Mediterranean floristic region and is dominated by evergreen forest, especially holm oak (*Quercus ilex* subsp. *ballota* (Desf.) Samp.), differences in climate and soil define three phytogeographical provinces. In the north and west of the region, in the highest areas, forests of *Pinus sylvestris* L. grow. At slightly lower altitudes, deciduous forests of *Quercus pyrenaica* Willd. can be found. The rest of the region, though nowadays quite deforested, is dominated by *Q. ilex* subsp. *ballota*, although there are differences in the accompanying vegetation as a result of different soil types. On calcareous soils in the southeast and east, *Q. coccifera* L. and *Q. faginea* Lam. can also be found. Scrub with *Thymus* spp., *Rosmarinus officinalis* L., and *Salvia lavandulifolia* Vahl, or esparto grassland with *Stipa tenacissima* L. (sometimes also cultivated),

can also be found as successional vegetation. However, on neutral and sandy soils in the center of the province, there are forests of *Quercus ilex* and large areas of scrub with *Cistus ladanifer* L. as successional vegetation. Finally, in the southwest, with its milder temperatures, there are large areas of *Pinus pinea* L. and *P. pinaster* Aiton, which can also be associated with holm oak.

Central Spain has been inhabited since ancient times. Man has transformed the landscape, felling much of its original forest to make way for agriculture and stock raising. The floral diversity of the territory and the different ways in which its inhabitants have exploited the natural resources available have engendered a rich popular knowledge of the use of plants. Yet hardly any ethnobotanical studies have been carried out in this region. Only one paper exists, and this deals with the ecological knowledge of livestock farmers, including their knowledge of the plants used by livestock (Barrios et al. 1992).

Although the traditional Spanish staple diet is based on agricultural and livestock products, until recently many wild plants were used as supplementary foods. They were probably an important source of vitamins and minerals, played an important role in times of scarcity, and were sometimes used as medicines. Presently, however, with the great development of agricultural and marketing techniques, it is easy to find fruits and vegetables in markets throughout the year. As a result, traditional knowledge of wild food plants is quickly disappearing and, in most cases, survives only with the elderly. The aim of

this work was to record which wild food plants were traditionally consumed in this region and to determine what their uses were.

MATERIAL AND METHODS

Ethnobotanical information was obtained by interviewing 132 people (age range 31–94 years, mean 68 years) from 60 outlying villages of the Province of Madrid (Fig. 1). Since our intention was to collect as much data as possible on almost-forgotten plant uses, the selection of informants was biased. Nearly all were aged individuals with an empirical knowledge of plants who had lived and worked in the rural environment. Almost all interviews were conducted during field walks. The interviews were not structured and involved no closed questionnaire. However, an outline of subjects to discuss was prepared. Conversations were directed with general and open questions to preserve interviewee spontaneity. All interviews were held during the years 1999, 2000, 2001, and 2002.

Whenever possible, conversations were taped. This was important to record the original expressions of the informants, including, for example, the local names of plants. Completed records of the interviews are held in a sound archive at the *Instituto Madrileño de Investigación Agraria* (IMIA; the Madrid Institute for Agricultural Research). A specimen of almost all the plants reported was collected and pressed, and voucher herbarium specimens were prepared. These were deposited at the IMIA and the Herbarium of the *Real Jardín Botánico de Madrid* (MA; the Madrid Royal Botanical Gardens). Photographs of the mentioned species were also taken.

In taxonomy and plant nomenclature, *Flora iberica* (Castroviejo et al. 1986–2003) was followed for the families included in it, and *Flora Europaea* (Tutin et al. 1964–1980) for the remaining families, except for the genus *Matricaria*, where the criterion was based on Bremer and Humphries (1993).

RESULTS AND DISCUSSION

Table 1 lists the wild plants recorded as traditionally used as foods; it shows the species ordered alphabetically by families, the most common local names used, the popular use of the plant with its frequency of citation, and the part(s) of the plant employed in each food use.

A total of 123 species of vascular plants be-

longing to 31 plant families were recorded, representing 5.5% of the species of the Madrid flora. In terms of number of species, the most important family was the *Asteraceae* with 31 mentioned. These were mainly used as wild vegetables and for making beverages. The *Rosaceae*, with 17 species, were mostly used as wild fruits or for liqueurs, whereas 12 species of the *Lamiaceae* were used for seasoning and making beverages.

Most of the mentioned plants are native to the Iberian Peninsula, with some notable exceptions such as *Castanea sativa*, *Prunus cerasus*, and *Prunus dulcis*, introduced from Eastern Europe and Southwest Asia, and *Robinia pseudoacacia* and *Bidens aurea*, from North and Central America respectively. These were more or less extensively grown in the past and nowadays are occasionally feral in the areas around villages.

Seven categories of food uses (i.e., consumption as vegetables, fruits, beverages, condiments, flowers, roots, and sap) were used to help analyze the results. Some species were included in more than one category. For example, the young shoots of *Rubus ulmifolius* allowed this species to be included among the vegetables, but also in the category of fruits. Therefore, the total number of species used for food was 123, but the sum of all the species with their categories was 143.

Regarding reliability of information, the frequency of citation allows us to distinguish among usages that have been more important in the rural life of Madrid from minor plants whose uses have not been so widespread. However, it should be noted that a number of usages are cited by only one informant. Although sometimes records of this kind have not been taken into account, many of them were considered for different reasons. First, some species are very rare in the province and therefore used infrequently. That is the case of wild *Apium graveolens*, *Sorbus torminalis*, or *Ziziphora hispanica*. Another important reason is that today a real loss of popular knowledge makes it difficult to find a person who knows certain minor uses of plants. We have considered the uses cited by only one informant when they have been reported from another region for the same or other closely related species. That is the case, for instance, of the consumption of rhizomes of *Cynodon dactylon*, the use of flowers of *Scolymus hispanicus* as a con-

TABLE 1. WILD FOOD PLANTS TRADITIONALLY CONSUMED IN THE PROVINCE OF MADRID.

Family/Species/Voucher No.	Local Names	Part Used	Popular Use (frequency of citation)
APIACEAE			
<i>Apium graveolens</i> L. (1954RM)	apio silvestre	leaves and stems	vegetable soups (1)
<i>Apium nodiflorum</i> Lag. (207JT)	berra, berrera	leaves and stems	salads (9)
<i>Eryngium campestre</i> L. (161JT)	cardo setero, cardicuca	bottom of stems	raw as a snack (2)
<i>Foeniculum vulgare</i> Miller (158JT)	hinojo	stems	seasoning for olives (38), to preserve dried figs (3), for aromatizing "té de roca" (1)
		tender leaves and stems	raw as a snack (18), salads (1), stewed (1)
<i>Scandix australis</i> L. (15JT)	quijones, hijones	tender leaves and stems	raw as a snack (20)
ASTERACEAE			
<i>Andryala ragusina</i> L. (33JT)	—	latex	as a chewing gum (1)
<i>Anthemis arvensis</i> L. (1948RM)	magarza, gamarza	flowers	herbal teas (2)
<i>Arctium minus</i> Bernh. (209JT)	lampazo, hierba de los pegotes, verdolobo	basal leaves, peeled	raw as a snack (4), stewed (2)
		basal leaves	stewed (2)
		stems peeled	raw as a snack (1)
<i>Bidens aurea</i> (Aiton) Sherff (226JT)	té, té moruno	flowered aerial parts	herbal teas (3)
<i>Carduus tenuiflorus</i> Curtis (99JT)	cardo	basal leaves, peeled	stewed (2)
		stems peeled	salads (1)
<i>Chamaemelum nobile</i> All. (146JT)	manzanilla, manzanilla amarga	flowered aerial parts	herbal teas (21)
<i>Chondrilla juncea</i> L. (1937RM)	ajonjera, sonjera, ljonjera, ajunjera, escobas	young shoots, basal leaves	salads (28), raw as a snack (5)
		basal leaves	stewed (2)
		tender stems and leaves	stewed (1)
		basal leaves	stewed (8), salads (5), drink (coffee substitute) (2), raw as a snack (1)
<i>Cichorium intybus</i> L. (1941RM)	achicoria, salmerón	young shoots	salads (5)
		basal leaves	stewed (2), salads (1)
		galls, basal leaves	raw as a snack (2)
<i>Crepis vesicaria</i> L. (1859RM)	achicoria	flowered aerial parts	herbal teas (1)
<i>Hypochoeris glabra</i> L. (48JT)	lechera	flowered aerial parts	herbal teas (7)
<i>Inula montana</i> L. (2076RM)	té de caliza	flowered aerial parts	herbal teas (6)
<i>Inula salicina</i> L. (1893RM)	té, té de campo, té silvestre	flowered aerial parts	herbal teas (2)
<i>Jasania glutinosa</i> DC. (227JT)	té de roca	flowered aerial parts	
<i>Jasonia tuberosa</i> DC.	té	flowered aerial parts	

TABLE 1. CONTINUED.

Family/Species/Voucher No.	Local Names	Part Used	Popular Use (frequency of citation)
<i>Lactuca serriola</i> L. (222JT)	lecheras	basal leaves	salads (1)
<i>Mantisalca salmantica</i> Briquet & Cavillier (208JT)	escoba, pan de pastor	basal leaves peeled	stewed (3), raw as a snack (1)
<i>Marricaria aurea</i> (Loefl.) Schultz Bip. (1935RM)	manzanilla	flowers flowered aerial parts	herbal teas (11)
<i>Marricaria recutita</i> L. (1837RM)	manzanilla, manzanilla dulce	flowers	herbal teas (16)
<i>Marricaria discoidea</i> DC. (1947RM)	manzanilla dulce	flowered aerial parts	herbal teas (1)
<i>Onopordum acanthium</i> L. (111JT)	alcachofa salvaje, cardo borriqueño, cardo ruso	basal leaves peeled	stewed (2)
<i>Onopordum nervosum</i> Boiss. (1891RM)	toba	Stems or basal leaves, peeled	raw as a snack (3)
<i>Scopolymus hispanicus</i> L. (2081RM)	cardillo	basal leaves, peeled	stewed (70), salads (2), raw as a snack (1)
<i>Scorzonera laciniata</i> L. (18JT)	berbaja, tetas de vaca	flowers	condiment (saffron substitute) (1)
<i>Silybum marianum</i> Gaertner (1932RM)	cardincha, cardo borriquero, cardo	tender leaves and stems	salads (6), raw as a snack (5), stewed (1)
		bottom of inflorescences	raw as a snack (5)
		basal leaves, peeled	stewed (23), raw as a snack (2), salads (1)
		tender parts of inflorescence	raw as a snack (12), salads (1)
		tender stems near inflorescence, peeled	raw as a snack (10), stewed (2)
		young shoots peeled	salads (1), raw as a snack (1)
		seeds peeled	raw as a snack (1)
<i>Sonchus asper</i> Hill (44JT)	lechiterma, cardo lechero	basal leaves, peeled	salads (2), stewed (1)
<i>Sonchus crassifolius</i> Pourret ex Willd. (42JT)	blanquilla, borraja	young shoots	salads (5), raw as a snack (2)
<i>Sonchus oleraceus</i> L. (1914RM)	lecheras, lecheros	basal leaves	stewed (1), raw as a snack (1)
<i>Taraxacum erythrospermum</i> Andr. ex Besser (202JT)	picapollo, salmerón	peduncle of inflorescence	raw as a snack (3)
<i>Taraxacum obovatum</i> (Willd.) DC. (1993RM)	pajitos	basal leaves	salads (1)
<i>Taraxacum officinale</i> Weber (16JT)	achicoria, lechuguillas, pajito	peduncle of inflorescence	salads (1)
<i>Taraxacum sp.pl.</i>	achicoria, majitos, canutos	basal leaves	raw as a snack (4)
<i>Tragopogon porrifolius</i> L. (94JT)	—	peduncle of inflorescence	raw as a snack (1), salads (1)
BETULACEAE		basal leaves	raw as a snack (3), salads (1)
<i>Corylus avellana</i> L. (2033RM)	avellano	basal leaves	salads (4), stewed (1)
		fruits	eaten raw or dried (5)

TABLE 1. CONTINUED.

Family/Species/Voucher No.	Local Names	Part Used	Popular Use (frequency of citation)
BORAGINACEAE			
<i>Anchusa azurea</i> Miller (205JT)	chupamiel, chupamieles, alcaicuz	flowers	sucked (16)
<i>Echium plantagineum</i> L. (43JT)	chupamieles, oreja mula	basal leaves flowers	stewed (5) sucked (1)
BRASSICACEAE			
<i>Capsella bursa-pastoris</i> Medicus (212JT)	pan y quesito blanco	flowers	eaten raw (1)
<i>Diplotaxis catholica</i> DC.	pan y quesito amarillo, barelos	flowers	eaten raw (1)
<i>Raphanus raphanistrum</i> L.	pan y quesito blanco, rabanillo	flowers	eaten raw (1)
<i>Rorippa nasturtium-aquaticum</i> Hayek (206JT)	berros	young leaves and stems	salads (58)
<i>Sisymbrium crasifolius</i> Cav. (41JT)	tamarilla	young shoots	stewed (3)
CANNABACEAE			
<i>Humulus lupulus</i> L. (1922RM)	espárrago de zarza, espárrago de ortiga, lupios, zaramangón	young shoots	stewed (26)
CARIOPHYLLACEAE			
<i>Silene vulgaris</i> (Moench) Gareke (86JT)	collejas, conejuelas	leaves and young stems	stewed (70), salads (3)
CHENOPODIACEAE			
<i>Beta maritima</i> L. (12JT)	acelga silvestre, espinaca, acelguilla	basal leaves	stewed (8)
CISTACEAE			
<i>Cistus ladanifer</i> L. (228JT)	jara	seeds	eaten raw (4)
CUCURBITACEAE			
<i>Bryonia dioica</i> Jacq. (95JT)	espárrago de nuez, espárragos	young shoots with leaves	stewed (45)
CYPERACEAE			
<i>Scirpus holoschoenus</i> L. (1944RM)	junco, unco	basal part of stems	raw as a snack (8)
DIOSCOREACEAE			
<i>Tamus communis</i> L. (1921RM)	lupios, espárrago de culebra, espárragos de lupia	young shoots	stewed (32), raw as a snack (1)
ERICACEAE			
<i>Arctostaphylos uva-ursi</i> (L.) Sprengel (231JT)	gayuba	fruits	eaten raw (1)
EUPHORBIACEAE			
<i>Euphorbia serrata</i> L. (87JT)	lechiterna	latex	to curdle milk (1)

TABLE 1. CONTINUED.

Family/Species/Voucher No.	Local Names	Part Used	Popular Use (frequency of citation)
FABACEAE			
<i>Glycyrrhiza glabra</i> L. (1890RM)	paloduz, paluluz	rhizomes	chewed, sucked (9)
<i>Lathyrus cicera</i> L. (127JT)	almorta silvestre, alcaballares, titos	immature seeds	raw as a snack (10)
<i>Medicago sativa</i> L. (93JT)	mielga, alfalfa	leaves and stems	stewed (4)
<i>Robinia pseudoacacia</i> L. (100JT)	acacia, pan y queso	flowers	eaten raw (13)
<i>Trifolium pratense</i> L. (207IRM)	trébol, chupador	flowers	sucked (3)
<i>Vicia lutea</i> L. (122JT)	alverja, alverjana	immature seeds	raw as a snack (11)
<i>Vicia sativa</i> L. (121JT)	veza, alverjana, alverja, alverjones	immature seeds	raw as a snack (2)
<i>Vicia villosa</i> Roth. (1910RM)	alverja de culebra, alverjana, alver- jón	immature seeds	raw as a snack (6)
FAGACEAE			
<i>Castanea sativa</i> Miller	castaño	fruits (chestnuts "castañas")	eaten raw, dried (4), roasted (2)
<i>Fagus sylvatica</i> L.	haya	fruits (beech nuts "hayucos")	eaten raw (3)
<i>Quercus coccifera</i> L. (96JT)	maraña, carrasca	galls	raw as a snack (1)
<i>Quercus faginea</i> Lam. (88JT)	roble, quejigo, rebollo	fruits	roasted (1)
<i>Quercus ilex</i> subsp. <i>ballota</i> (Desf.) Samp. (1913RM)	encina, chaparra	fruits (acorns "bellotas")	eaten raw, dried (19), roasted (7)
<i>Quercus pyrenaica</i> Willd. (2070RM)	roble, rebollo	fruits	roasted (1), eaten raw (1)
GERANIACEAE			
<i>Erodium cicutarium</i> (L.) L'Hér. (214JT)	alfileres, alfileritos, tenedorcitos	bottom of immature fruits	raw as a snack (3)
<i>Erodium ciconium</i> (L.) L'Hér. (1928RM)	alfileres, alfileritos, acucillos	bottom of immature fruits	raw as a snack (1)
GROSULARIACEAE			
<i>Ribes uva-crispa</i> L. (2082RM)	uva espino, uva de coril	fruits	eaten raw (5)
LAMIACEAE			
<i>Mentha arvensis</i> L. (1953RM)	té del río	flowered aerial part	herbal teas (1)
<i>Mentha pulegium</i> L. (1001RM)	poleo	flowered aerial part	herbal teas (14)
<i>Mentha spicata</i> L.	hierbabuena	leaves and stems	to season soups (2), herbal teas (2)
<i>Mentha suaveolens</i> Ehrh. (1874RM)	hierbabuena de borrico, hierbabuena silvestre	leaves and stems	to season stewed potatoes (1)
<i>Origanum virens</i> Hoffmanns. & Link. (1862RM)	orégano	flowered aerial part	to season pork (18), herbal teas (1)
<i>Rosmarinus officinalis</i> L. (92JT)	romero	aerial part, leaves	seasoning for olives, stews (4)
<i>Salvia lavandulifolia</i> Vahl (1605RM)	sietva, salvia	leaves	seasoning for olives (2)
<i>Satureja cuneifolia</i> Ten. subsp. <i>intricata</i> (Lange) López & Muñoz (2047RM)	tomillo salsero	aerial part, leaves	seasoning for olives (3)

TABLE 1. CONTINUED.

Family/Species/Voucher No.	Local Names	Part Used	Popular Use (frequency of citation)
<i>Thymus mastichina</i> (L.) L. (104JT)	mejorana, tomillo blanco, tomillo	aerial part, leaves	seasoning for olives, meat (10)
<i>Thymus vulgaris</i> L. (98JT)	tomillo de a pie, tomillo	aerial part, leaves	seasoning for olives, rabbit stews, roasted lamb cutlets (7)
<i>Thymus zygis</i> Loefl. ex L. (1938RM)	tomillo salsero, tomillo, tomillo	aerial part, leaves	seasoning for olives, meat or po- tatoes stews (38)
<i>Ziziphora hispanica</i> L. (772RM)	sansero	flowered aerial parts	herbal teas (1)
LILIACEAE			
<i>Allium ampeloprasum</i> L. (103JT)	ajo porro, ajo puerro	bulb and bottom of stems	stewed (11), raw as a snack (7), seasoning (5), salads (1)
<i>Asparagus acutifolius</i> L. (34JT)	espárrago triguero, espárragos, es- parraguera	young shoots	stewed (53), raw as a snack (1)
<i>Asparagus officinalis</i> L. (223JT)	espárrago de jardín	young shoots	stewed (10)
<i>Muscari neglectum</i> Guss. et Ten. (197JT)	matacandiles, maricandiles, jacinto, pipirigallo	peduncle of inflorescence	raw as a snack (1)
MALVACEAE			
<i>Malva neglecta</i> Wallr. (216JT)	malva	immature fruits	raw as a snack (1)
<i>Malva nicaensis</i> All. (102JT)	malva, panar	immature fruits	raw as a snack (1)
<i>Malva parviflora</i> L. (147JT)	malva	immature fruits	raw as a snack (1)
<i>Malva sylvestris</i> L. (150JT)	malva, panecitos (frutos)	immature fruits	raw as a snack (20)
PAPAVERACEAE			
<i>Papaver rhoeas</i> L. (204JT)	amapola	tender leaves and stems	stewed (1), salads (1)
PINACEAE			
<i>Pinus pinea</i> L. (1368RM)	pino piñonero	mature seeds (pine nuts "piñones") immature seeds	eaten raw, dried (4) raw as a snack (1)
PLUMBAGINACEAE			
<i>Armeria arenaria</i> subsp. <i>segoviensis</i> (Gand. ex Bernis) Nieto Feliner (1870RM)	pan de cigüeña, patitas de digüeña, cabecilla	peduncle of inflorescence (tender part near flowers)	raw as a snack (4)
POACEAE			
<i>Cynodon dactylon</i> Pers. (203JT)	grama	rhizomes	raw as a snack (1)
<i>Stipa gigantea</i> Link (2083RM)	esparteras, berceo	basal part of stems	raw as a snack (1)

TABLE 1. CONTINUED.

Family/Species/Voucher No.	Local Names	Part Used	Popular Use (frequency of citation)
POLYGONACEAE			
<i>Rumex acetosa</i> L. and <i>Rumex papillaris</i> Boiss. & Reuter (143JT)	acedera	basal leaves	raw as a snack (21), salads (10)
<i>Rumex crispus</i> L. (123JT)	romaza, arromalgas, azaderones	basal leaves	stewed (3)
<i>Rumex induratus</i> Boiss. & Reuter (1916RM)	acedera, acedera de conejo, acederones, acerones	tender leaves and stems	raw as a snack (14), salads (5)
<i>Rumex intermedius</i> DC. (97JT)	vinagreras	tender leaves and stems	raw as a snack (1)
<i>Rumex pulcher</i> L. (89JT)	romanza, romaza, pucharaca	basal leaves	stewed (28)
PORTULACACEAE			
<i>Montia fontana</i> L. (50JT)	corujas, perifollo, pamplina	leaves and stems	salads (31), raw as a snack (1)
<i>Portulaca oleracea</i> L. (215JT)	verdolaga	leaves and stems	stewed (5), salads (4)
RHAMNACEAE			
<i>Rhamnus alaternus</i> L. (118JT)	maraña fina, carrasca fina	fruits	eaten raw (1)
ROSACEAE			
<i>Crataegus monogyna</i> Jacq. (2031RM)	espino, majuelo	fruits ("majuelas or majoletas")	eaten raw (47)
<i>Fragaria vesca</i> L. (229JT)	fresa silvestre, mayetas	leaves	raw as a snack (1)
<i>Malus sylvestris</i> Miller (1873RM)	mafllo, maello	fruits	eaten raw (8)
<i>Prunus avium</i> L. (141JT)	morrino, cerezo silvestre	fruits ("maillas")	eaten raw (7), raw after stored (5), spirits (2)
<i>Prunus cerasus</i> L. (1846RM)	guindo	fruits	eaten raw (6), spirits (1)
<i>Prunus dulcis</i> (Miller) D. A. Webb (219JT)	almendro	fruits	eaten raw (5), spirits (2)
<i>Prunus insititia</i> L. (46JT)	ciruelo silvestre, ciruelo borde	fruits	dried (6)
<i>Prunus spinosa</i> L. (2068RM)	endrino	fruits ("endrinás")	eaten raw (6)
<i>Rosa canina</i> L. (1934RM)	zarza escarambujera, zarza escaramujera, zarza triguera	young shoots peeled	spirits (19), eaten raw (12), raw after stored (8)
<i>Rosa pouzini</i> Tratt. (120JT)	zarza escarambujera	fruits	raw as a snack (2)
<i>Rosa sp. pl.</i>	Escaramujo, tapacluos, espino escarambujero, zarza escarambujera	fruits	eaten raw (1)
<i>Rubus caesius</i> L. (1964RM)	zarza, zarza triguera	fruits	eaten raw (1)
<i>Rubus castellarnau</i> Pau (1966RM)	zarza	fruits	eaten raw (20), spirits (1)
<i>Rubus idaeus</i> L.	frambuesa, frambueso	young shoots peeled	raw as a snack (6)
		fruits	eaten raw (6)
		fruits	eaten raw (3)
		fruits	eaten raw (7), jams (1)

TABLE 1. CONTINUED.

Family/Species/Voucher No.	Local Names	Part Used	Popular Use (frequency of citation)
<i>Rubus lainzii</i> H. E. Weber (1965RM)	zarza	fruits	eaten raw (1)
<i>Rubus</i> sp. pl.	zarza, zarzamora	fruits young shoots peeled	eaten raw (27), jams (6) raw as a snack (25), stewed (1), salads (1)
<i>Rubus ulmifolius</i> Schott (2030RM)	zarza, zarzamora	fruits young shoots peeled	eaten raw (12), jams (1) raw as a snack (5)
<i>Sorbus aria</i> Crantz (1849RM)	peral silvestre, amostazo, mostazo	fruits	eaten raw (5), spirits (1)
<i>Sorbus torminalis</i> Crantz (1900RM)	gasajo	fruits	eaten raw after natural fermentation (1)
SCROPHULARIACEAE			
<i>Digitalis thapsi</i> L. (126JT)	chupadores, chupaperlas	flowers	sucked (1)
VIOLACEAE			
<i>Viola odorata</i> L.	violeta	flowers	sucked (1)

diment, or the latex of *Andryala ragusina* as a chewing gum.

Finally, it should be stressed that there was some ethnobotanical information that could not link with a single species, but with a group of different species of the same genus. In some cases the informants did not differentiate among species of several complicated genera (*Taraxacum*, *Rosa*, and *Rubus*) and used them in the same way. This has been reflected in Table 1 as different species of the same genus, "species pluribus" (sp. pl.), but has not been taken into account for the numerical analysis.

WILD VEGETABLES

Wild vegetables, with 66 species (54%), formed the most important group. This group also included the consumed unripe fruits or seeds (eaten raw as a snack) of four species of *Malva*, two species of *Erodium*, and the immature seeds of several Fabaceae, such as *Vicia lutea* and *Lathyrus cicera*. We also recorded the use of the immature seeds of *Pinus pinea*, which has also been indicated for other Spanish provinces such as Segovia (Blanco 1998) and Albacete (Sánchez López et al. 1994). The tender leaves and stems of *Scandix australis* and *Foeniculum vulgare* were used as snacks because of their characteristic aniseed flavor. Other "finger foods" quite frequently eaten were the tender and peeled stems (near the inflorescence) of *Silybum marianum*, the stems of several species of *Taraxacum*, and the peeled young shoots of different species of *Rubus* and *Rosa*.

Besides watercress (*Rorippa nasturtium-aquaticum*), the two species most frequently used in salads were *Montia fontana* and *Chondrilla juncea*. The first is an aquatic plant that lives in streams and springs in areas with non-calcareous soils in the north and west of the region. Its small leaves and stems are very much appreciated in many regions from the west of the Iberian Peninsula (Blanco 1998; Blanco and Cuadrado 2000; Granzow de la Cerda 1993). Another species of this genus, *M. perfoliata*, is cultivated and consumed in salads in North America (Facciola 2001). The second, *Chondrilla juncea*, is a widespread perennial species that very frequently lives as a weed among cereal crops. When a plant is cut, young white shoots sprout from the roots. The blanched sproutings and leaves were collected and traditionally eaten as salads when cereal crops were

weeded in early spring. This species was also consumed in the same way in other provinces of Central Spain (Blanco 1998; Blanco and Cuadrado 2000; Sánchez López et al. 1994). Another wild vegetable of the same family, and with a very similar use to *C. juncea*, was *Sonchus crassifolius*, an endemic species of Central Spain that lives in limy and rather saline soils. The use of this species in the southeast of the Province of Madrid (and, as also ascertained, in the nearby provinces of Cuenca and Toledo) has never before been reported.

Among the most frequently used wild vegetables in Central Spain are species that are eaten cooked. *Espárrago triguero*, *Asparagus acutifolius*, is a wild asparagus whose young shoots are usually eaten in omelettes or with scrambled eggs. We also recorded the traditional and widespread use of another three species popularly considered to be wild asparagus (it should be remembered that *asparagus* means “young shoot” in Latin): *Bryonia dioica*, *Tamus communis*, and *Humulus lupulus* (all climbing species), belonging to three different families but consumed in the same way and with similar names (variations of *espárragos*). According to Font Quer (1990), the young shoots of the first two species were used both as food and for their medicinal properties as early as the days of Dioscorides (1st century A.D.). In recent times, the same uses have been also reported for *Bryonia* (Blanco 1998; Blanco and Cuadrado 2000; Bonet and Vallès 2002; Fajardo et al. 2000; Mulet 1991; Verde et al. 2001; Villar et al. 1987), and for *Tamus* (Blanco and Cuadrado 2000; Casana 1993; Fajardo et al. 2000; Mesa 1996) in other regions of Spain. The first of these species is also similarly used in Italy (Pieroni 1999), while the second is used in France, Italy, and Turkey (Coupland 1989; Facciola 2001).

However, the most popular species in the Province of Madrid, as shown by their high frequency of citation (Table 1), were *Scolymus hispanicus* (*cardillo*) and *Silene vulgaris* (*colleja*). The peeled basal leaves of the former were boiled and then fried lightly in olive oil with garlic to be served as a garnish for *cocido*, a traditional Spanish dish with stewed chickpeas, potatoes, and meat. They were also consumed lightly fried with garlic and cured ham and sometimes with hard-boiled or scrambled eggs. This species is eaten in a similar way across much of Spain (Blanco 1998; Blanco and Cuad-

rado 2000; Casana 1993; Galán 1993; Granzow de la Cerda 1993; Guzmán 1997; Martínez-Lirola et al. 1997; Mesa 1996; Sánchez López et al. 1994; Triano et al. 1998) and in other Mediterranean countries such as Morocco (Tanji and Nassif 2002) and Italy (Arcidiacono et al. 1999). The consumption of its cooked fleshy roots has also been reported (Bailey 1933; Facciola 2001), and it has been employed as a coffee substitute (Kunkel 1984). The leaves and young stems of *Silene vulgaris* were traditionally eaten in omelettes or with scrambled eggs and also as a garnish for *potaje*, another typical Spanish dish with stewed chickpea, beans, rice, and cod, often consumed during Lent. The use of this species has been also reported in other regions of Spain (Blanco 1998; Blanco and Cuadrado 2000; Casana 1993; Galán 1993; Guzmán 1997; Martínez-Lirola et al. 1997; Mesa 1996; Mulet 1991; Sánchez López et al. 1994; Triano et al. 1998; Verde et al. 1998; Villar et al. 1987) and in other Mediterranean countries (Arcidiacono et al. 1999; Cerne 1992; Ertug 2000; Pieroni 1999). Though not as frequently as *Silene vulgaris*, *romaza* (*Rumex pulcher*) was also stewed in *potaje* in some villages of the east of the Province of Madrid.

Another wild vegetable often used in the past, especially in times of shortage, was the well-known milk thistle (*Silybum marianum*). Although different parts of the plant were eaten in different ways, the peeled and cooked basal leaves were the most frequently used parts. This plant was also consumed in other regions of Spain (Galán 1993; Guzmán 1997; Verde et al. 1998) and in other Mediterranean countries (Abu-Rajouh 1996; Facciola 2001).

Armeria arenaria, *Carduus tenuiflorus*, *Erodium ciconium*, *Erodium cicutarium*, *Muscari neglectum*, *Quercus coccifera* (galls), *Rumex intermedium*, *Stipa gigantea* and *Vicia lutea* were also used as wild vegetables, but no references to them could be found in the literature.

WILD FRUITS

This group, with 29 species (24%), is the second largest in terms of the number of species cited. The most frequently eaten fruits in the region were those of *Crataegus monogyna*, and those of different species of the genera *Rubus* and *Rosa*. These fruits are known to have a high vitamin content (Font Quer 1990) and they were probably used for this very reason. Today, with many types of fruit commercially available year-

round, only the fruits of a few species of *Rubus*, mainly *R. ulmifolius*, are collected.

Widespread in Spain, and very important in the past, especially in times of scarcity, is *Quercus ilex* subsp. *ballota*. Its fruits (acorns, known as *bellotas*) were usually consumed raw, although they were sometimes roasted.

Some species, such as *Malus sylvestris* or *Prunus spinosa*, whose fruits are often unpalatable when eaten raw, were stored for several months, a process that allowed them to sweeten. They were then eaten during the winter, when there was not so much fresh fruit as there is today.

The seeds of *Cistus ladanifer* (*jara*) were eaten raw as a snack; this use has also been reported from the west of Spain by Blanco and Cuadrado (2000). According to Facciola (2001), its seeds have been ground into flour and used for making cakes and breads. This last use has also been reported from Morocco (Rivera and Obón 1991).

The fruits of *Quercus pyrenaica*, *Rhamnus alaternus*, *Rubus castellarnau*, and *R. lainzii* were also used, but no references were found in the literature.

BEVERAGES: INFUSIONS AND SPIRITS

Another important group, with 22 species (18%), consists of plants used to prepare beverages, including infusions, liqueurs, and coffee substitutes.

In Madrid, one of the infusions (or herbal teas) most frequently used was *manzanilla amarga*, *Chamaemelum nobile*, but other *manzanillas* were made from *Matricaria recutita* and *M. aurea*. *M. recutita*, the famous camomile tea plant, grows wild in some areas of the region and also can be seen cultivated in gardens. *M. aurea* is an Iberian and North African endemic species more widespread in the center and south of the region.

Té de roca (*Jasonia glutinosa*) was also a very popular herbal tea, not only in Madrid but also in other Spanish regions, such as Aragon and Catalonia. It was often regarded as a tasty, aromatic beverage better than true tea (Blanco 1998; Bonet and Vallès, 2002; Font Quer 1990; Mesa 1996; Mulet 1991; Pardo de Santayana 2003; Sánchez López et al. 1994; Villar et al. 1987). This species grows on calcareous rocks in Spain and at a few sites in France and Morocco.

The use of *Inula salicina* to prepare infusions in the north of the province, and of *Ziziphora hispanica* in the east, has never before been reported.

Among the plants used to prepare liqueurs, the most popular was *Prunus spinosa*. By soaking its fruits in anisette with a few coffee grains, people would prepare *pacharán*, a liqueur very popular in much of Spain. Other *Rosaceae* species whose fruits were used to make liqueurs were *Prunus cerasus*, *Malus sylvestris*, and *Sorbus aria*. No references to this use could be found for the last two species.

Finally, two informants cited the use of *Cichorium intybus* as a coffee substitute. The use of the roasted root of cultivated forms of chicory for this is well known (Coupland 1989; Facciola 2001; Font Quer 1990; Launert 1982), but not of the dry basal leaves, as our informants mentioned.

CONDIMENTS, COLORING, AND PRESERVATIVES

This group, with 12 species (10%), consisted mainly of plants from the *Labiatae* (*Lamiaceae*) family. The most frequently used was *Thymus zygis*, especially to flavor olives, but also to season meat or stewed potatoes. Another species of the same family, *Origanum virens*, was widely used as a condiment for pork, mainly in *chorizo* (spicy dry pork sausage) and in other meat dishes.

The seasoning of olives was a very important activity in rural Spain. There are many different ways to do this and many plants can be used, as shown in Table 1. One of the species most frequently used was *Foeniculum vulgare*. This plant was also said to be used to preserve dried figs (*Ficus carica*). A sack of figs was placed in boiling water containing *F. vulgare* and then quickly removed before it was dried for use as dried fruit.

One informant made reference to the use of *Scolymus hispanicus* flowers as a food condiment and saffron substitute. The same use was reported by Clusius in 1576 from the Province of Salamanca (central Spain), and was also was cited by Niebuhr (1970).

OTHER USES (FLOWERS SUCKED OR CHEWED, ROOTS, LATEX)

The flowers of nine species (7%) were reported sucked or chewed. The flowers of *Anchu-*

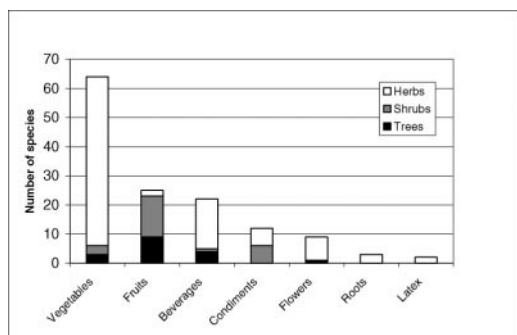


Fig. 2. Number of species of each category of food use and growth habit.

sa azurea were commonly sucked by children to reach their nectar—hence its most common popular name of *chupamiel* (honeysuck). *Viola odorata*, *Trifolium pratense*, *Echium plantagineum*, and *Digitalis thapsi* were reportedly used in the same way, though this is the first time for last two species of this list.

The consumption of the fried flowers of the North American tree *Robinia pseudoacacia* is well known (Facciola 2001; Pieroni 1999), but in Madrid and other regions of Spain (Blanco 1998; Fajardo et al. 2000; Triano et al. 1998) the flowers were eaten raw. Other species cited were *Capsella bursa-pastoris*, *Raphanus raphanistrum* and *Diplotaxis catholica*. No references were found in the literature for the last species.

The subterranean organs of only three species (2.4%) were consumed: the sweet roots of *Glycyrrhiza glabra*, the bulbs of *Allium ampeloprasum*, and the rhizomes of *Cynodon dactylon*.

Finally, two species (1.6%) were used for their milky sap (latex). The latex of *Euphorbia serrata* was employed to curdle milk and make curd. Shepherds would add a few drops of this plant to hot milk while stirring. This use has also been reported from other regions of Spain, such as Castilla-León, Castilla-La Mancha, and Andalucía (Blanco 1998; Blanco and Morales, 1995; Martínez-Lirola et al. 1997). The milky latex of the roots of *Andryala ragusina* was used as a chewing gum. Although this has never before been recorded, there are some references to other species of the same family (*Asteraceae*), such as *Sonchus oleraceus*, used by the Maoris of New Zealand, and *Tragopogon porrifolius*, used by native Americans of British Columbia (Facciola 2001).

ECOLOGICAL AND CULTURAL IMPLICATIONS OF WILD FOOD GATHERING IN CENTRAL SPAIN

Of the 123 vascular plant species used for food purposes, 70% were herbaceous plants, 19% were shrubs, and 11% were trees. Figure 2 shows most species used as vegetables were herbaceous plants (60), while five were shrubs and only one was a tree (the immature fruits of *Pinus pinea*). Fruits and seeds were gathered mainly from shrubs and trees, but also from two species of herbaceous plant (*Fragaria vesca* and *Silybum marianum*). Beverages, especially herbal teas, were mainly made from herbaceous plants, whereas liqueurs were made from the fruits of trees or shrubs. For food seasoning, only shrubs and herbaceous plants were used, six species of each. Finally, all the flowers, roots, or latex used came from herbaceous plants except the flowers of *Robinia pseudoacacia*.

Most of the species used are found in secondary habitats; only a few live in natural forests. Many are weeds of cereal crops and were usually exploited when crops were hand-weeded. Nowadays, with our modern agricultural techniques such as deep plowing or the use of herbicides, these plants only can live away from cultivated land. They are therefore less abundant than fifty years ago.

As for the cultural implications of wild food plant gathering, not all these species had the same importance in these past diets. The results show that many plants were used as snacks, mainly by children. They were probably a good source of vitamins and minerals, but have become less important now. Some wild fruits (*Rosa*, *Rubus*, *Crataegus*) and vegetables were also eaten raw as snacks (*Scorzonera*, *Taraxacum*, *Scandix*). However, many other species played a significant role as supplementary foods until not so many years ago. They were used to vary cuisine, or to flavor, garnish, or stretch out other foods (see above). Finally, many others were very important as emergency foods in times of scarcity, such as *Silybum marianum* or *Cichorium intybus*. The informants mentioned that some species were only consumed during the years of shortage after the Spanish Civil War, in the 1940s (e.g., the leaves of *Papaver rhoeas* or *Arctium minus*).

RELATIONSHIP BETWEEN FOOD AND MEDICINAL USES

Many wild food plants were also used for medicinal purposes. According to Etkin (1994), "wild foods are consumed not only for caloric value, but also for other nutrient and pharmacologic potential." Several of the species reported by our informants maintained their medicinal uses until not so many years ago, such as *Origanum virens*, *Thymus mastichina*, *Thymus vulgaris*, and *Rosmarinus officinalis*. Other clear examples are those plants used to make infusions or liqueurs. Initially, they were used for their medicinal properties, but in most cases they eventually became considered simply as beverages.

Modern medicine has contributed to the rapid decrease in popular knowledge of medicinal plants. This is probably why many species in the past known as medicinal plants are nowadays known only as wild food. Such is the case of two species quite widely used as wild asparagus in central Spain, *Bryonia dioica* and *Tamus communis*. These have been known to have diuretic properties since ancient times, having been reported by Dioscorides in the first century (Font Quer 1990). Probably, the current use of these young shoots as food stems from this early medicinal use. Etkin (1996) mentions a large number of plants used today as food that were first appreciated for their medicinal qualities.

The food use of *Silybum marianum* seeds, although cited by only one informant in this work, has also been reported in Jordan (Abu-Rajouh 1996). This author reports that the oil of these seeds is rich in linoleic acid and polyunsaturated fatty acids, and thus could be included among the plant oils with dietary and health applications.

As mentioned above, many wild plants were probably a good source of vitamins and minerals for children in the past, when cultivated fruits and vegetables were not so available. Other bitter tasting species such as *Arctium minus* and *Cichorium intybus*, widely consumed in the past, were used to stimulate the appetite and the "functions of the liver."

CONCLUSIONS

This study shows that a rich traditional knowledge of plants lingers on in the Province of Madrid—in fact, much greater than might be

expected for a region with an important major city (Madrid) and many surrounding towns. Until recently, many wild plants were used as supplementary food. However, most of this folk use of wild food plants survives only in the memory of the elderly, and is now in danger of vanishing. This paper, the first of its type for this region, tries to collect record and disseminate this traditional knowledge in order to help maintain local cultural traditions and facilitate research into new food sources.

In the context of increasing interest in the health potential of foods, reflected in the growing literature on "functional food," "pharmafood," or "nutraceuticals" (Etkin 1996), studies on wild food plants, their nutritional and medicinal qualities, and their potential as new alternative crops may be very useful.

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