



## Contribution to the knowledge of the pharmaceutical ethnobotany of La Segarra region (Catalonia, Iberian Peninsula)

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### Abstract

An ethnobotanical survey was carried out in the region known as La Segarra, situated at the north east of the Iberian Peninsula, in the inner plains of Catalonia, with an area of 720 km<sup>2</sup> and a population of 17 000. Working with 29 people, data on uses of 142 species belonging to 54 botanical families were obtained and presented, of which 13 uses corresponding to nine plant species were previously unreported. © 1997 Elsevier Science Ireland Ltd.

*Keywords:* Ethnobotany; Catalonia; Medicinal plants; Folk medicine

### 1. Introduction

Man has used plants as medicine and food, and for many other purposes, since ancient times. In industrialized countries, there has been an important loss of the traditional knowledge of plant uses transmitted from parents to children. There appears to be a consensus that we are now at a critical moment in which the transmission chain is at risk. It is necessary, therefore, to make efforts to avoid the definitive erosion of this knowledge,

not only to preserve a part of cultural heritage, but also to conserve the information on useful plants, because it could be relevant for developing new sources of medicines or other benefits for the population. Because of this situation, and since ethnobotanical studies are, among other things, the first step in an ethnopharmacological research (Croom, 1983; Hedberg, 1993), efforts on pharmaceutical ethnobotany have been carried out in recent years in European countries (Loux and Richard, 1981; Ballero, 1982; Leporatti and Pavesi, 1990; Lieutaghi, 1991; De Feo et al., 1992; De Feo and Senatore, 1993; Ballero and Fresu, 1991, 1993; Ribon, 1993).

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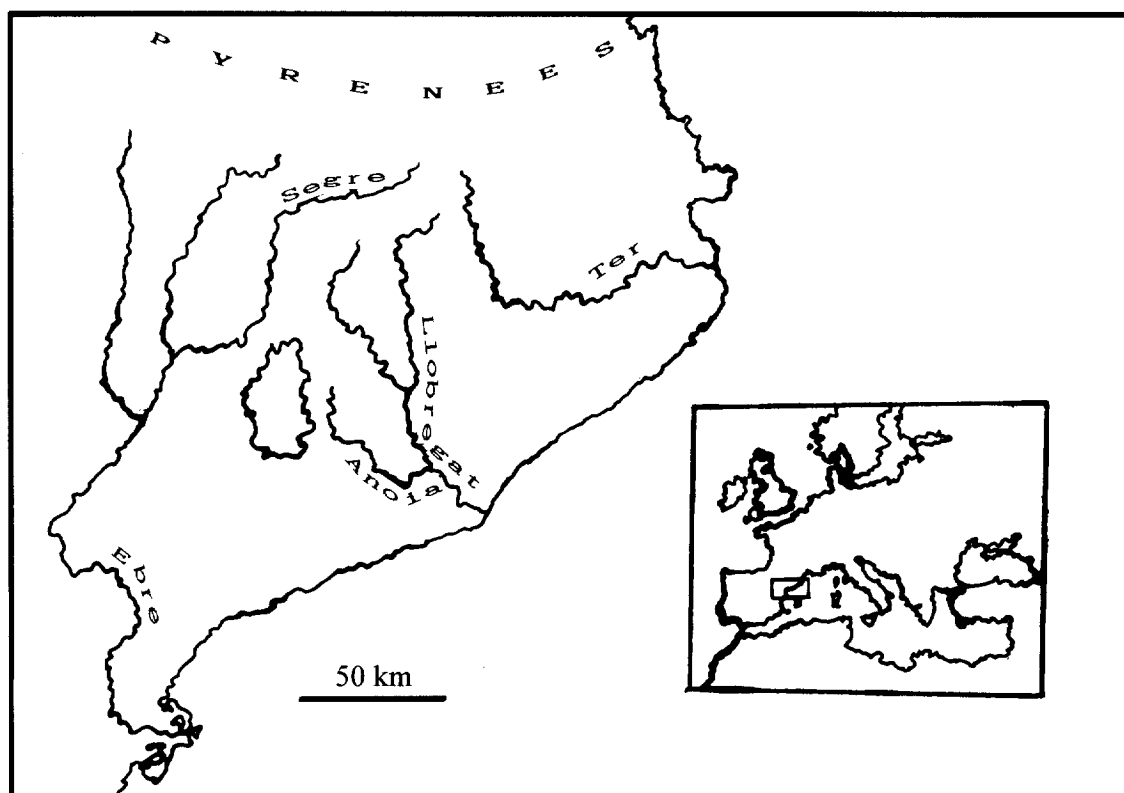


Fig. 1. Location of the territory studied in Europe (inset) and in Catalonia (shaded area).

In the Iberian countries, modern pharmaceutical ethnobotany started with Dr Pius Font i Quer (Camarasa, 1984), who, on his floristic expeditions in the Iberian Peninsula, the Pyrenees, the Balearic Islands and North Africa, picked up a great deal of information on popular uses of medicinal plants (Font, 1961). In the last 10 years, there has been a renaissance of ethnobotanical activities in this part of southern Europe (Blanché and Vallès, 1994; Morales, 1992; Vallès and Bonet, 1996). Research groups dealing with ethnobotany and, particularly, pharmaceutical ethnobotany, are now especially active in the Universities of Barcelona (Agelet and Vallès, 1996; Bonet, 1993, 1994; Bonet et al., 1992; Muntané, 1994; Raja, 1995; Vallès et al., 1996), Córdoba (Casana, 1993; Galán, 1993), Granada (González-Tejero, 1985, 1989; Guzmán, 1986; Martínez, 1993; González-Tejero et al., 1992,

1995a,b; Martínez et al., 1996), Murcia (Obón and Rivera, 1991; Rivera and Obón, 1992; Rivera et al., 1994), Valencia (Mulet, 1987, 1991; Peris and Stubing, 1993) and Perpignan (Cauwet-Marc, 1994) and also in some centres of the Spanish Consejo Superior de Investigaciones Científicas, such as the Instituto Pirenaico de Ecología de Jaca (Palacín, 1983; Villar, 1984; Villar et al., 1992) and the Real Jardín Botánico de Madrid (Blanco, 1995).

The present study was carried out in the region ('comarca') of La Segarra, situated in Catalonia's inner plains (Fig. 1), conveying an area of 720 km<sup>2</sup> with a population of 17 000. It is a plateau somewhat lower than 400 m, with several mountain ranges reaching 1000 m. The climate is low-altitude continental mediterranean, progressively more arid towards the central portion; a rainfall of about 360 mm/year and a mean temperature

that oscillates between 5°C (December, January) and 25°C (July, August). The vegetation belongs to the dominion of the holm-oak [*Quercus ilex* L. subsp. *rotundifolia* (Lam.) T. Morais] forest, but this is highly modified because of the abundance of cultivated fields.

The population is moderately decreasing, which is clearly evident in small rural settlements or isolated farms (named 'masos' or 'masies'), which are being abandoned in favour of larger villages. All settlements are well communicated with each other and with other parts of the country, particularly, Lleida and Barcelona. The region is an important agricultural area, specializing in cereals, mainly barley and wheat. The industry is limited to the food and furniture sectors.

## 2. Methodology

Information was obtained through general conversations without asking direct questions, so as not to coerce the informants and diminish their degree of spontaneity. Whenever possible, the conversations were recorded with the consent of the interviewers. A total of 29 elderly people (mean age, 65 years; 65.52% women, 34.49% men) were interviewed. In some cases, more than one interview session was carried out. Informants were not scientifically literate and were born in the region, where they have lived most of their lives.

Voucher herbarium specimens were prepared and deposited in the Herbarium of the Laboratory of Botany, Faculty of Pharmacy, University of Barcelona (BCF). Complete records of the interviews are also kept in this laboratory. Further details of the interviews are given in the pharmacy degree thesis of the first author (Bonet, 1991; Raja, 1995). For plant nomenclature, the work of Bolòs et al. (1993) was followed.

New findings were established through consultation of the Iberian and other European ethnobotanical treatises cited in the introduction and, in addition, the following: Garnier et al. (1961), Piquer (1963), Usher (1974), López (1975), Morton (1977, 1981), Williams (1981), Fernández and Nieto (1982), Duke and Ayensu (1985), Boukef

(1986), Duke (1986), Palevitch et al. (1986), Van Hellemont (1986), Bézanger-Beauquesne et al. (1986, 1990), Le Grand and Wondergem (1987), Tyler (1987), Pérez de Paz and Medina (1988), Bartrolí (1989), Erichsen-Brown (1989), Arnold-Apostolides (1991), Bellakhdar et al. (1991), Fleurentin et al. (1991), Glasby (1991), Sezik et al. (1991, 1992), Tang and Eisenbrand (1992), Arteché et al. (1993), Batlle (1993), Boulos (1993), Cortés et al. (1993), Ferrández and Sanz (1993), Iwu (1993), Yesilada et al. (1993), Bisset (1994) and Peris and Stubing (1993).

## 3. Results

Data was gathered on 142 plant species belonging to 54 families, in which *Asteraceae*, *Lamiaceae*, *Fabaceae* and *Rosaceae* predominate. Of these, plants 91 taxa were claimed to have medicinal properties, 22 used for human food or to produce alcoholic beverages, three for animal medicine, 12 for animal food and 12 were said to be toxic. In addition, 41 species were used for other purposes and 15 were mentioned as weeds in cultivated-fields.

Aerial parts, leaves and flowers (including flowering tops), were, in decreasing order, the parts of the plants most used. Internal uses largely predominate over external and, in both cases, decoction and infusion in water were the main preparation forms used, followed by poultices. Most reported medicinal uses were related to the treatment of the digestive, cardiovascular and bronchopulmonary pathologies, which represent almost 50% of the total uses. Other frequent uses relate to dermatological, analgesic, antipyretic, sedative, diuretic and antiinflammatory effects.

In Table 1, uses of 17 species cited by at least three independent informants are reported, following the reliability criterion of Le Grand and Wondergem (1987) and Johns et al. (1990). In Table 2 we present the nine species with unreported medicinal uses, irrespective of the number of informants who cited them. In these tables, plants are listed grouped by families in alphabetical order. The catalogue of the ethnoflora of the territory studied is given in Raja (1995).

Table 1  
Plants with folk medicinal uses reported by at least three informants in Segarra, Catalonia

Scientific name (voucher specimen)	Local Catalan names	Parts used	Popular uses	Preparation	Administration	Frequency of mention/citation
<i>Asteraceae</i>						
<i>Jasione saxatilis</i> (Lam.) Guss. (BCF 39 847)	Te de roca	Aerial part	Anticatarrhal	Decoction	Oral	4
<i>Matricaria recutita</i> L. (BCF 39 757)	Camamilla	Flower head	Ocular antiseptic	Decoction/Infusion	External	3
			Carminative	Infusion	Oral	6
<i>Caprifoliaceae</i>						
<i>Sambucus nigra</i> L. (BCF 39 758)	Sauic Sauiquer	Floral tops	Anti-catarthal	Decoction Distillation	Oral Fume	5 3
<i>Fabaceae</i>						
<i>Medicago sativa</i> L. (BCF 39 796)	Alfals	Aerial part	Anti-inflammatory	Poultice	External	4
	Melda Melgó Ufals	Fresh plant				
<i>Lamiaceae</i>						
<i>Lavandula latifolia</i> Medic. (BCF 39 794, 39 839)	Espigol	Flowering tops	Anti-catarthal	Distillation	Vapor	3
<i>Salvia officinalis</i> L. subsp. <i>lavandulifolia</i> (Vahl) Gams (BCF 39 747)	Barballó Sàlvia	Leaf Leaf	Sedative Anti-hypertensive	Decoction Decoction/Infusion	Oral Oral	3 5
<i>Sideritis hirsuta</i> L. (BCF 39 779)	Herba blanca	Aerial part Aerial part	Vasotonic Anti-hypertensive	Decoction Decoction	Oral Oral	5 3
	Herba de Sant Antoni Ortiga blanca Timó					
<i>Thymus vulgaris</i> L. (BCF 39 811)	Timó mascle	Aerial part	Anti-inflammatory Buccal antiseptic	Decoction/ poultice Decoction	External Collutory	5 6
	Farigola					
<i>Malvaceae</i>						
<i>Malva sylvestris</i> L. (BCF 39 764)	Malva	Flower, leaf Aerial part	Anticatarrhal Stomachic	Infusion/Decoc- tion Decoction	Oral Oral	4 3
<i>Myrtaceae</i>						
<i>Eucalyptus globulus</i> Labill. (BCF 40 052)	Eucaliptus Caliptus	Leaf, fruit	Anti-catarthal	Distillation	Vapor	5



Table 2  
Plant species with unreported uses in Segarra, Catalonia

Scientific name (voucher specimen)	Local catalan names	Parts used	Popular uses	Preparation	Administration	Frequency of citation
<i>Asteraceae</i> <i>Eupatorium cannabinum</i> L. subsp. <i>cannabinum</i> (BCF 39 785)	Lladrecà	Aerial part	Adipsic	No preparation	Mastication of fresh plant	1
<i>Dipsacaceae</i> <i>Knautia arvensis</i> (L.) Coult. (BCF 39 781, 39 849)	Escabiosa Escopiosa	Aerial part	Antipneumonic	Decoction	Oral	1
<i>Fabaceae</i> <i>Calycotome spinosa</i> (L.) Link (BCF 40 082)	Argelaga	Flower	Anticatarrrhal	Decoction	Oral	1
<i>Fagaceae</i> <i>Quercus ilex</i> L. subsp. <i>rotundifolia</i> (Lam.) T. Morais (BCF 39 766, 39 846)	Alzina	Flower	Anti-herpetic	Decoction	External	2
<i>Liliaceae</i> <i>Allium ampeloprasum</i> L. subsp. <i>ampeloprasum</i> (BCF 39 839)	Alzinera	Bark	Anti-anaemic	Decoction	Oral	1
<i>Rutaceae</i> <i>Citrus limon</i> (L.) Burm. (BCF 39 789) <i>Dictamnus albus</i> L. (BCF 40 083)	Porro de bosc Llimoner Lletimó	Aerial part	Anti-diarrhoeal	Decoction	Oral	1
<i>Urticaceae</i> <i>Parietaria officinalis</i> L. subsp. <i>judaica</i> (L.) Béguinot (BCF 39 759)	Rocamorera Roquera	Fruit Aerial part	Anticataract Anti-hypertensive	Decoction Decoction	Ophthalmic bath Oral	1 1
<i>Violaceae</i> <i>Viola alba</i> Bess. subsp. <i>déshardtii</i> (Ten.) W. Becker (BCF 40 084)	Violeta	Aerial part	Vaginal antiseptic Vermicide	Decoction Enema	Vaginal bath External	1 1
			Expectorant and anti-catarrrhal Diuretic	Decoction Decoction	Internal Internal	1 1

Table 3  
Comparison of results of ethnobotanical studies of various Mediterranean territories

Region	Extension (km <sup>2</sup> )	Population	MP <sup>i</sup>	MP/km <sup>2</sup>	Inhabitant	NP <sup>j</sup>	MP/I <sup>k</sup>
Huesca <sup>a</sup>	15 671	222 000	55	0.0035	$2.48 \times 10^{-4}$	—	—
Castelló <sup>b</sup>	6679	385 823	365	0.055	$9.46 \times 10^{-4}$	150	2.34
Granada <sup>c</sup>	12 531	761 734	241	0.019	$3.16 \times 10^{-4}$	—	—
Cabo de Gata <sup>d</sup>	800	20 000	253	0.316	$126.50 \times 10^{-4}$	153	1.65
Cerdanya <sup>e</sup>	1086	23 000	234	0.215	$101.74 \times 10^{-4}$	155	1.53
Vall del Tenes <sup>f</sup>	260	17 969	150	0.577	$83.48 \times 10^{-4}$	28	5.40
Cyprus <sup>g</sup>	9251	639 000	379	0.041	$5.93 \times 10^{-4}$	—	—
Segarra <sup>h</sup>	646	17 040	92	0.142	$5.39 \times 10^{-3}$	29	3.17

<sup>a</sup> Villar et al. (1992).

<sup>b</sup> Mulet (1990).

<sup>c</sup> González-Tejero (1989).

<sup>d</sup> Martínez (1993).

<sup>e</sup> Muntané (1991).

<sup>f</sup> Bonet (1991).

<sup>g</sup> Arnold-Apostolides (1991).

<sup>h</sup> Raja (1995) and present study.

<sup>i</sup> Number of medicinal plants known.

<sup>j</sup> Number of informants.

<sup>k</sup> Number of medicinal plants known per informant.

#### 4. Discussion and conclusions

Members of the families *Asteraceae*, *Lamiaceae*, *Fabaceae* and *Rosaceae* mentioned by the informants in the present study represent, all together, the 43% of the species cited. This percentage is comparable to many other ethnobotanical studies carried out using the same method in the Mediterranean area: 41% in Granada (González-Tejero, 1989), 37% in Cyprus (Arnold-Apostolides (1991) and the River Tenes valley (Bonet, 1993) and 33% in Castelló (Mulet, 1991), Huesca province (Villar et al., 1992) and Cerdanya (Muntané, 1994). Significant difference (20%) was found, however, in the Cabo de Gata region (Martínez, 1993). These different percentages probably reflect of the floristic spectrum of the Mediterranean. On the other hand, they are consistent with the statements of Johns et al. (1990) that the more common a plant is in a territory, the higher is the probability of its popular use. In agreement with that, *Thymus vulgaris* L. is, by far, the most cited species, which is also the most widely used (15 different uses), followed by *Malva sylvestris* L., *Rosmarinus officinalis* L., *Papaver rhoeas* L. and *Salvia officinalis* L. (13, 10, 9 and 8 uses, respectively); all of which

are very common species. Another very frequently cited species, *Matricaria recutita* L., is one of the plants best known to the informants, but with very few different uses.

The degree of ethnobotanical richness of an area may be indicated by the number of plants known and used relative to the size of the territory and the population. Comparison of the data obtained in the present study with those of similar studies in the Mediterranean region (Table 3) leads to the conclusion that, even if the absolute number of medicinal plants used is lower, the relative indices are similar or higher. In this respect, one can consider the values of the U/K index namely, the ratio between the mean number of medicinal and aromatic plants used (U, for use) and the number referred to by the informants (K, for knowledge) (Muntané, 1991). In the present study the U/K value (50%) is comparable to that obtained for other regions, which range from 30 to 70%. This clearly indicates that traditional phytotherapy is still alive in La Segarra. Nevertheless, there is a serious loss of knowledge on plant utilization: 49 species were mentioned only once and, what is worse, for 25 species, our informants were able to report only their popular

names, their uses having been erased from their memory. This means that it is truly urgent to gather the data on folk uses of plants, in view of the fact that, in the present study, new uses for these plants have been reported only by one informant. Such information may be considered unreliable because of their uniqueness, however, it may also be considered to represent the remainder of more widespread uses of the plants in the recent past, where popular phytotherapy was much more common.

The forms of drug preparation most frequently cited (79%) were water decoctions and infusions, with a predominance of the former, which contradicts the opinion of Bisset (1994) who states that infusion is more often used, the normal way in the use of many industrial phytopharmaceuticals. It must be pointed out, however, that it is not easy to separate the two procedures; for the present report the informants' references to 'bullir' (boiling) were assigned to decoction, while references to 'escaldar' (scalding) were assigned to infusion. This finding is in agreement with that of Mulet (1990) and Muntané (1991). Two of the present authors (Blanché and Vallès) also discussed this question in more detail (Bonet et al., 1992). It was also found that a large number of excipients, some of them very little or not reported previously, were used to prepare poultices; this form of external use contains as a basic ingredient, in most cases, crushed *Medicago sativa* (green part), powdered *Verbena officinalis* (green part) and flour of *Linum usitatissimum* L. (grain flour), *Hordeum vulgare*, starch of *Solanum tuberosum* (tuber), bran, chocolate and honey.

As for therapeutic categories, the predominance of remedies for digestive (internal use) and dermatological (external use) troubles agrees with the data from other regions (Mulet, 1991; Muntané, 1991; Bonet et al., 1992). Even though other ailments are treated with traditional phytopharmaceuticals, we believe, as does Reuter (1991), that this kind of medicine is usually limited to mild and chronic diseases. Nevertheless, plants and their active principles can be used much more widely in general medical practice than they are in popular phytotherapy.

The present study found 13 unreported uses, which correspond to nine plant species. This means a low degree of ethnobotanical novelty for the region studied. The NRU/P index, the ratio between the number of unreported uses and the total number of plants used (Muntané, 1991), is only 0.08, while in other neighbouring regions it ranges from 0.23 to 5.08 (Mulet, 1991; Muntané, 1991; Bonet et al., 1992). This difference may be due to (1) the comparatively small area and number of inhabitants studied, (2) the fact that recent studies on nearby regions have increased the documentation on folk-medicinal uses of the plants in the country, and (3) the volume of the literature consulted in comparing and establishing the new uses was much larger in the present study than in the others.

Through comparison of data between the present research and the literature, species with unreported uses and those with similar applications in different territories were identified. Both types of plants, especially those sharing both conditions, may be recommended for phytochemical and pharmacological studies to confirm the validity of the properties attributed to these species. A number of these species are briefly discussed below.

*Allium ampeloprasum* (Liliaceae) (Table 2) is claimed to have antidiarrheal effects; the astringent power is also reported for other species of the genus in Murcia (Obón and Rivera, 1991; Rivera et al., 1994).

*Citrus limon* (Rutaceae) (Table 2) is another species with unreported uses. It is said to be useful in case of cataracts and, in connection with this, it is used as a general ocular antiseptic. Lemon's juice is also used to treat eye infections in Campania (De Feo and Senatore, 1993). Arteché et al. (1993) reports its use in diabetic retinopathy and in conjunctivitis. In addition, two other species of the same family *Rutaceae* are used in folk medicine in Israel for the same purpose (Palevitch et al., 1986).

*Dictamnus albus* (Rutaceae) (Table 2) is cited as antihypertensive. Since problems of high blood pressure is prevalent today, it would be desirable to validate this use or to discourage its use if toxicity is found, since a closely related species *D.*



*hispanicus* Webb is known to be toxic, but is used for several purposes in different Iberian regions (Obón and Rivera, 1991; Villar et al., 1992). Another toxic member of the *Rutaceae*, *Ruta graveolens* L., is also used in many different ways, in agreement with Villar et al. (1984).

No report in the literature on the use of *Quercus ilex* L. subsp. *rotundifolia* (Lam.) T. Morais as an antianaemic (Table 2) was found. Its use as an antiherpatic (Table 2), however, is supported by its use in neighboring areas, it has been reported as an external antiseptic in cases of eczemas and ulcers (Villar et al., 1992) except that the parts of plant reported used are leaves and bark, as in our case. In fact, the flowers are also appreciated and claimed to be antidiarrheal (Ferrández and Sanz, 1993). Van Hellemont (1986) and Arteche et al. (1993) report the external use of the bark of *Q. robur* L. for skin infections and mucosities. Another species of the same genus, *Q. suber* L., is known to have antiseptic properties in external use, but, the parts used are the fruits (Mulet, 1991).

No information similar to that obtained in the present research has been found on the remaining species with unreported uses (see Table 2). Among these, the use of the flowers of *Eupatorium cannabinum* L. (Asteraceae), which are masticated to avoid thirst, is remarkable. As for plants with reported uses, *Paronychia argentea* Lam. (Caryophyllaceae) is used as a blood purifier, the same use for other different species of the genus in many other regions of the Iberian Peninsula, as stated by González-Tejero et al. (1995a). The expectorant and antitarrhal use of *Viola alba* Besser. subsp. *dehnhardtii* (Ten.) W. Becker (Violaceae) (Table 2) is coincidental with its use for the same purposes in other regions, as that of *V. odorata* L. and other species of the genus (Erichsen-Brown, 1989; González-Tejero, 1989; Arnold-Apostolides, 1991; Villar et al., 1992; Bonet, 1993). As to its diuretic use, has also been reported for other taxa, such as *V. tricolor* L. (Fernández and Nieto, 1982; Bézanger-Beauquesne et al., 1990), *V. sieheana* W. Becker and *V. parvula* Tineo (Arnold-Apostolides, 1991).

Mention is made once again to plants bearing the name of Lárnica (Bonet et al., 1992; Vallès et

al., 1996). One informant in the present study cited this species as growing in the mountains and not in the territory studied. He was referring of *Arnica montana* L. (Asteraceae), which is absent from the flora of inner Catalonian plains, but common in that of the Pyrenees. On the other hand, two different informants called *Pallenis spinosa* (L.) (Astereceae) Cass. as 'árnica' and attributed to it anti-inflammatory properties, a well-known use for *A. montana*. In the Iberian countries, many other species are identified as 'árnica' (González-Tejero, 1989; Mulet, 1991; Muntané, 1991; Bonet et al., 1992; Villar et al., 1992; González-Tejero et al., 1995b; Vallès et al., 1996). It would be interesting to undertake chemical and pharmacological studies of the Iberian arnicas, which refer to many different genera, but mostly *Asteraceae*, to determine their biological activities, as well as members of the *Liliaceae* (Villar et al., 1992).

Finally, outside of the strictly pharmacological aspect, the use of a large number of plants for magical or religious practices which are linked to their medicinal uses, as prayers (Martí, 1989), or the pre-eminence of number 9 must be considered. This is exemplified by the use of nine parts of the plant or the consumption of the remedies over 9 days (Gavilanes, 1995).

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