

A review of plants used in folk veterinary medicine in Italy as basis for a databank

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Abstract

We report folk veterinary phytotherapy in Italy collected from ethnobotanical scientific literature of the second half of the 20th Century. References are cited together with unpublished data gathered recently in the field by the authors. The data have been placed in two databases: one organized by the names of the plant species (>260) and the other organized by bibliographic references. This represents the basis for the first national databank for ethnoveterinary botany in Europe. Plants not yet sufficiently studied in pharmacology and veterinary phytotherapy were also identified.

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1. Introduction

The recent return to “natural medicine” in Italy has emphasized the importance of gathering information about medicinal plants traditionally used to treat animals. As in other branches of folk botany, reference to remedies for animals are often only side comments (Mathias-Mundy and McCorkle, 1989). Specific references from outside Italy include Mathias-Mundy and McCorkle (1989), McCorkle and Mathias-Mundy (1992), Goud and Pullaiah (1996), Lans and Brown (1998a,b), Pieroni (1999a), Lans et al. (2000), Lopez and Aguilar (2001), and Villareal Quintanilla (2001).

In Italy, many plants were used to treat cows, sheep, poultry, horses and pigs, and these traditions have survived in some areas. Many of these remedies were handed down by word of mouth (Guarrera, 1994; Viegi et al., 1999; Viegi and Pieroni, 2000a,b; Pieroni et al., 2002a,b).

The aim of this paper is to gather information on the present status of folk veterinary knowledge in Italy. The information on plant remedies for domestic animals and other effects of plants on various animals, gathered here, was mostly brief notes in folk botanical literature concerned prin-

cipally with human therapy. Folk veterinary information collected in various regions of Italy is reported and discussed.

2. Materials and methods

All references available in Italian folk botanical literature (Caffaro Corti and Gastaldo, 1980) since 1950 up to now were examined for reports on remedies for animals. We also cite some earlier publications, the oldest of which, on *Helleborus*, goes back to 1878 (Padula).

The data, extrapolated by rigorous botanical studies (to ensure correct determination of plants), was placed in two databases, one for the taxa used in folk veterinary medicine and the other for the respective references, so as to create the basis for a databank. Plant nomenclature (scientific names) is largely according to Pignatti (1982), Tutin et al. (1964–1980, 1993), and Greuter et al. (2000).

We then handled and elaborated the data region by region. We examined and added preliminary unpublished data obtained in the field by interviews in Tuscany, Liguria, Campania, Calabria, Apulia and Lucania (De Fine, Guazzi, Maccioni, Marchini, Menale, Muoio, Pieroni and Rizzo, personal communication). The voucher herbarium specimens are available from the authors and in PI (Herbarium of the Department of Botanical Science, University of Pisa).

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Pharmacological properties and active compounds were checked in Gastaldo (1987), Schauenberg and Paris (1977), Hänsel et al. (1999), in the Italian pharmacopoeia (F.U.I., 2002) and in the on-line databank MEDLINE (2003). Methods are following Waller (1993).

3. Results and discussion

3.1. Data obtained

More than 280 plants (different taxa: species, subsp., var., and undetermined species) corresponding to 256 species, belonging to 71 families among the Fungi, Pteridophyta, Gymnospermae and Angiospermae, have been used in folk veterinary medicine in Italy (Tables 1 and 2). The family with the most medicinal plants is Asteraceae (11% with respect to the total number of taxa), followed by Lamiaceae (7.1%), Ranunculaceae (5.2%), Fabaceae, Apiaceae and Rosaceae (4.9% each), Liliaceae (4.5%), Poaceae (4.1%) and Euphorbiaceae (3.4%) (Table 3). Comparison with data in the folk botanical literature confirmed the preponderance of Asteraceae (Agelet and Valles, 1999; Barbini et al., 1999; Fossati et al., 1999). Like the Poaceae, this family contains many species that adapt to a wide range of ecological conditions, including contexts such as ruins environments, and are therefore widely available.

The regions of Italy most studied from this point of view are Tuscany, Abruzzo, Latium, Marches, Liguria, Sicily, Calabria and Umbria. Less folk veterinary data exists for the other regions (Fig. 1).

Table 4 shows number of taxa used in different parts of Italy in folk veterinary medicine, compared with the data given in Gastaldo (1987) for Italian medicinal flora and with numbers given in Italian flora of Pignatti (1982). Southern Italy turns out to be the area least known from this point of view, followed by Sicily and Sardinia Islands. Comparison of the percentages of each family with respect to Gastaldo gives rise to the following interesting observations. Although most of the families containing medicinal plants reach high percentages, Euphorbiaceae, Liliaceae and Poaceae have a greater potential in folk veterinary practice than the others cited, with respect to the number of known medicinal plants employed to cure animals (even though the species used on a popular basis do not always coincide with those listed in Gastaldo, 1987).

Among the plants documented in folk veterinary practice in Italy, there are well-known genera (e.g. *Allium*, *Artemisia*, *Clematis*, *Echium*, *Euphorbia*, *Fraxinus*, *Hedera*, *Helleborus*, *Malva*, *Mercurialis*, *Salix*, *Urtica*, *Verbascum*) and also unusual species as well as species and whole (genera), relatively unknown from the medicinal viewpoint (such as *Berula*, *Coriaria*, *Cynoglossum*, *Kicxia*, *Micromeria*, *Muscari*, *Pulicaria* and *Scorpiurus*) (Tables 1 and 2).

The various animals cured with plants were in order cattle, sheep, horses, poultry, pigs, dogs and rabbits (Fig. 2). Some of the remedies are also known for humans.

The most widely used remedies are derived from leaves, aerial parts, roots, whole plant and fruits, followed by branches, bark, bulbs, rhizomes, tubers, seeds, flowers, juice, resin and latex (Fig. 3).

Many of the species are common plants (e.g. cultivated plants, plants colonizing abandoned lands and weeds). The remedies are generally administered quite simply as decoctions or liquid in which the plants have been steeped, others are given as food supplements (more than 100 references each).

The complaints most commonly treated concerned the digestive system (96 plants) and skin (82 plants); 53 plants were used for wounds and inflammations caused by harness or yoke and 49 as digestives, 23 against diarrhoea, 20 for respiratory ailments, 16 in connection with labour and delivery, and 15 as laxatives and purgatives (Table 5). Internal use was more common than external (56% versus 42%).

For widespread species, similar uses were found in different regions. For example, *Allium sativum* for worms and as antiinflammatory (Corrain and Zampini, 1961; Martini, 1981; Chiavoni and Raffo, 1994; Guarrera, 1994; Ciccodicola, 1995; Maccioni and Marchini, 1999); *Fraxinus ornus* against parasites and as disinfectant and mild laxative (Cappelletti et al., 1981; Guarrera, 1987, 1995); *Linum usitatissimum* as digestive and laxative (Bandini, 1961; Bellomaria, 1982; Nardelli, 1987; Renzetti and Taiani, 1988; Manzi, 1989; Uncini Manganelli and Tomei, 1995; Viegi et al., 1999; Uncini Manganelli et al., 2001); *Malva* sp.pl. for tympanites (Guarrera, 1987, 1994; Manzi, 1989; De Simoni and Guarrera, 1994; Uncini Manganelli and Tomei, 1995; Viegi et al., 1999; Uncini Manganelli et al., 2001).

3.2. Medicinal plants used to treat animals and humans

Some medicinal plants have been used to treat humans and animals. For example, *Foeniculum vulgare* is given to cows after calving to stimulate milk production (Tuscany) (Uncini Manganelli and Tomei, 1999a; Uncini Manganelli et al., 2001), and is also considered to stimulate milk production in nursing mothers (Schauenberg and Paris, 1977). Various species of *Urtica* are regarded as refreshments for man and animals in many regions of Italy (Maccioni and Marchini, 1998a; Guarrera, 1987; Viegi et al., 1999).

3.3. Prevention

Plants given for preventive purposes are a much lower percentage in comparison with all uses. Certain uses regard lactation: the aerial parts of *Artemisia absinthium* (containing bitter substances) is given as a decoction to calves to aid digestion of cow's milk. In the Marches, calves were known to die if this remedy was not given (Guarrera, 1981). The

Table 1
Plant species cited for ethnoveterinary use in Italy

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Abies</i> sp.	Pinaceae	GI	–	C	Barbini et al. (1999)
<i>Achillea ligustica</i> All.	Asteraceae	AP	sh	C	Guarrera et al. (1984)
<i>Achillea millefolium</i> L.	Asteraceae	SK	ct	C	De Bellis (1986, 1988), Amici (1992)
<i>Aconitum</i> sp.	Ranunculaceae	AP	–	C	Renzetti and Taiani (1988)
<i>Adiantum capillus-veneris</i> L.	Adiantaceae	RP	–	C	De Bellis (1986), Guarrera (1987)
<i>Aesculus hippocastanum</i> L.	Hippocastanaceae	GI	ho	C	Guarrera (1994)
		RE	ho	C	De Capite and Menghini (1973)
<i>Agave americana</i> L.	Agavaceae	SK	–	C	Barbagallo et al. (1979b)
<i>Agrimonia eupatoria</i> L.	Rosaceae	SK	–	C	Bellomaria and Della Mora (1985), Tammaro (1984)
		RP	–	C	Catanzaro (1970)
<i>Agropyron repens</i> (L.) Beauv.	Poaceae	SK	as	O	Zampiva (1981)
		GI, SK	do, ho	C, O	Guarrera (1994)
		OT	ct, sh	C	D'Andrea (1982)
<i>Alchemilla</i> sp.	Rosaceae	RP	–	O	Renzetti and Taiani (1988)
<i>Allium cepa</i> L.	Liliaceae	GI	ch, sh	C	Corrain and Zampini (1961), De Simoni and Guarrera (1994)
		RP, GI, AP	ch, tu	O, C	Guarrera (1994)
		AP	pi	C	Guarrera (1987)
		OT	pi	C	Manzi (1989)
		SK, LA	–	C	Amico and Sorge (1997)
<i>Allium sativum</i> L.	Liliaceae	GI, AP	ch, ct	C	Corrain and Zampini (1961)
		LA	–	C	Martini (1981)
		AP	sh	C	Chiavoni and Raffo (1994), Guarrera (1994), Ciccodicola (1995), Maccioni and Marchini (1998a)
		SK	–	C	Ferri (1977)
		NE, KI, RE, AP, SK	–	C	De Capite and Menghini (1973)
		GI	ch	C	Nardelli (1987), De Simoni and Guarrera (1994), Guarrera (1994)
<i>Allium vineale</i> L.	Liliaceae	SK	–	C	Cappelletti (1985)
<i>Allium</i> sp.pl.	Liliaceae	LA	as, ho	C	Manzi (1989)
<i>Alnus glutinosa</i> (L.) Gartner	Betulaceae	AP	ch	C	Corsi et al. (1981)
		RE	ct	C	Guarrera (1987)
<i>Althaea officinalis</i> L.	Malvaceae	SO	ct	C	Corrain and Zampini (1961)
		SK	ct	C	Tomei and Gaspari (1981), Manzi (1989), Guarrera (1994)
		NE	ct	C	Manzi (1989)
<i>Amaranthus</i> sp.	Amaranthaceae	AP	–	O	Picchi (1999)
<i>Anagallis arvensis</i> L.	Scrophulariaceae	SK	ct	C	Manzi (1989)
		SO	–	C	Barbagallo et al. (1979a)
<i>Angelica sylvestris</i> L.	Apiaceae	KI, SK	–	P, C	Tomei and Gaspari (1981)
		FS	pi, sh	O	Guarrera (1990)
<i>Anthemis altissima</i> L.	Asteraceae	GI	–	C	Martini (1981)
<i>Anthemis cotula</i> L.	Asteraceae	AP	–	P, C	Picchi (1999)
<i>Apium nodiflorum</i> (L.) Lag.	Apiaceae	GI	–	C	De Bellis (1988)
		GI, AP	ct	C	Corsi et al. (1981)
<i>Arctium lappa</i> L.	Asteraceae	AL	–	C	Guarrera (1994)
<i>Arctium</i> sp.pl.	Asteraceae	OT	sh	C	Guarrera (1990)
<i>Aristolochia rotunda</i> L.	Aristolochiaceae	OT	sh	C	Guarrera (1990)
<i>Artemisia absinthium</i> L.	Asteraceae	RP, AP	–	P, C	Picchi (1999)
		GI	–	C	Renzetti and Taiani (1988), Guarrera (1994)
		GI	ct	P, C	Guarrera (1981, 1987)
		OT, GI	ct	C	Bellomaria and Della Mora (1985)
		OT	ct	C, O	Guarrera (1987)
		AP	ch, ct	P, C	Guarrera (1987, 1994), Nardelli (1987), De Simoni and Guarrera (1994)
<i>Artemisia arborescens</i> L.	Asteraceae	OT	–	C	Barbagallo et al. (1979a)
<i>Artemisia vulgaris</i> L.	Asteraceae	GI	–	C	Renzetti and Taiani (1988)
		AP	–	C	Guarrera (1994)
<i>Arum italicum</i> Miller	Araceae	FS	ch	P	Pomini (1959)

Table 1 (Continued)

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Asphodelus microcarpus</i> Salzm. et Viv.	Liliaceae	SK	ho	C	Amico and Sorge (1997)
<i>Asplenium trichomanes</i> L.	Aspleniaceae	GI	sh	C	Corsi et al. (1981)
<i>Atractylis gummifera</i> L.	Asteraceae	AP	–	C	Lentini et al. (1988)
<i>Avena sativa</i> L.	Poaceae	RP	ct	O	Corsi et al. (1981)
		SK	sh	C	Viegi et al. (1999)
<i>Berula erecta</i> (Hudson) Coville	Apiaceae	FS	ct	P	Guarrera (1995)
<i>Betula pendula</i> Roth	Betulaceae	GI	–	C	Renzetti and Taiani (1988)
<i>Borago officinalis</i> L.	Boraginaceae	RE	ct	P	Guarrera (1994)
		SK	sh	C	D'Andrea (1982)
		GI	ct, sh	C	Manzi (1989)
<i>Brassica nigra</i> (L.) Koch	Brassicaceae	LO	ct, ho	C	Uncini Manganelli and Tomei (1999b)
		GI, SK	–	C	De Capite and Menghini (1973)
<i>Brassica oleracea</i> L.	Brassicaceae	LO	–	C	Guarrera (1987)
		SK	ct, sh	C	Manzi (1989)
<i>Bryonia dioica</i> L.	Cucurbitaceae	KI	–	C	Renzetti and Taiani (1988)
<i>Buxus sempervirens</i> L.	Buxaceae	SK	ct	P	Corsi et al. (1981)
<i>Calamintha nepeta</i> (L.) Savi	Lamiaceae	AP	–	P, C	Guarrera (1987)
<i>Calendula arvensis</i> L.	Asteraceae	GI	–	C	Renzetti and Taiani (1988)
<i>Calendula officinalis</i> L.	Asteraceae	GI	ct	C	Tammaro and Pietrocola (1975)
<i>Calendula</i> sp.pl.	Asteraceae	GI	–	C	Tammaro (1976, 1984)
<i>Calluna vulgaris</i> (L.) Hull	Ericaceae	KI	–	C	Bandini (1961)
<i>Cannabis sativa</i> L.	Cannabaceae	LO	ct	C	Picchi (1999)
<i>Capsella bursa-pastoris</i> L. Medik	Brassicaceae	KI	–	C	Renzetti and Taiani (1988)
<i>Capsicum annum</i> L.	Solanaceae	RP	ch	O	Guarrera (1994, 1995)
		OT	–	C	Ciccodicola (1995)
<i>Carduus pycnocephalus</i> L.	Asteraceae	RP	ct, sh	P	Manzi (1989)
<i>Castanea sativa</i> Miller	Fagaceae	OT	pi	P	Guarrera (1994)
<i>Ceterach officinarum</i> Lam. et DC	Aspleniaceae	GI	–	C	Bandini (1961)
		FS	–	O	Gastaldo et al. (1978)
		RP	ct, sh	P, C	Corsi et al. (1981)
<i>Chamomilla recutita</i> (L.) Rauschert.	Asteraceae	RE	ct	C	Corrain and Zampini (1961)
		KI	–	C	Maccioni and Marchini (1999)
		GI, SO	–	C	De Capite and Menghini (1973)
		RP	ct	C	Guarrera (1994, 1995)
		OT	–	C	Guarrera (1981)
		GI	ho	C	Tammaro (1984), De Simoni and Guarrera (1994)
		RE, GI, RP	–	C	Manzi (1989)
<i>Chelidonium majus</i> L.	Papaveraceae	OT	–	O	Guarrera (1994)
		SK	ct, ho	C	Picchi (1999)
<i>Chenopodium vulvaria</i> L.	Chenopodiaceae	OT	tu	P	Tammaro and Pietrocola (1975)
<i>Chrozophora tinctoria</i> (L.) Juss.	Euphorbiaceae	SK	–	C	Tammaro (1984)
<i>Chrysanthemum parthenium</i> Bernh.	Asteraceae	NE	–	C	Bandini (1961)
<i>Cirsium arvense</i> (L.) Scop.		GI	ra	P, C	Viegi et al. (1999)
		SK	ct	C	Amici (1992)
<i>Cirsium eriophorum</i> (L.) Scop.	Asteraceae	GI	–	C	Renzetti and Taiani (1988)
<i>Clematis vitalba</i> L.	Ranunculaceae	SO	sh	C, M	Viegi et al. (1999)
		OT	go	C	Guarrera (1994)
		GI	sh	C, M	Guarrera (1990)
		RE	–	C	Barbagallo et al. (1979b)
<i>Colchicum autumnale</i> L.	Liliaceae	AP	–	C	Coassini Lokar and Poldini (1988)
<i>Conium maculatum</i> L.	Apiaceae	SK	ct, ho	C	Guarrera (1994), Manzi (1989)
		AP	–	C	Bellomaria and Della Mora (1985)
<i>Convolvulus arvensis</i> L.	Convolvulaceae	RE	–	C	Coassini Lokar and Poldini (1988)
		FS	ra	P, C	Guarrera (1990)
		GI	pi	P, C	Tammaro (1984)
		FS, OT	ra	P	Lentini et al. (1988)
<i>Cornus sanguinea</i> L.	Cornaceae	OT	sh	C	Picchi (1999)

Table 1 (Continued)

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Crataegus laevigata</i> L.	Rosaceae	GI	ct	C	Bellomaria and Lattanzi (1982)
<i>Crithmum maritimum</i> L.	Apiaceae	OT	ra	P	Maccioni and Marchini (1998a)
<i>Cucurbita pepo</i> L.	Cucurbitaceae	AP	–	C	Coassini Lokar and Poldini (1988)
<i>Cuminum cyminum</i> L.	Apiaceae	GI	ct	C	Zampiva (1981), Renzetti and Taiani (1988)
<i>Cupressus sempervirens</i> L.	Cupressaceae	GI	pi, ra	C	Corsi and Pagni (1978), Amici (1992)
		OT	ct, ho		Viegi et al. (1999)
<i>Cynara cardunculus</i> ssp. <i>scolymus</i> (L.) Hayek	Asteraceae	GI	ct	C	Guarrera (1994)
<i>Cynodon dactylon</i> Pers.	Poaceae	FS	ho	P	Manzi (1989)
		GI	sh	C	Lentini et al. (1988)
		GI, KI	–	C	Catanzaro (1968)
<i>Cynoglossum creticum</i> Miller (syn. <i>Cynoglossum pictum</i> Aiton)	Boraginaceae	SK	ct	C	De Bellis (1978, 1986, 1988)
<i>Cynoglossum officinale</i> L.	Boraginaceae	SK	ct	C	De Bellis (1978, 1988)
<i>Cytisus scoparius</i> L.	Fabaceae	OT	as	C	Guarrera (1994)
		SK	–	C	De Bellis (1978)
<i>Daphne gnidium</i> L.	Thymelaeaceae	OT	–		Mearrelli and Tardelli (1995), Bruni et al. (1997), Picchi (1999)
<i>Daphne mezereum</i> L.	Thymelaeaceae	AP	–		Cappelletti et al. (1981), Renzetti and Taiani (1988)
<i>Datura stramonium</i> L.	Solanaceae	AP	ch, sh	P, C	Tammaro and Pietrocola (1975), Guarrera (1990), De Simoni and Guarrera (1994)
<i>Ecballium elaterium</i> (L.) A. Rich	Cucurbitaceae	SK	ct	C	Pieroni et al. (2002a)
		GI	mu	C	Lentini and Aleo (1991)
<i>Echinochloa crus-galli</i> Beauv.	Poaceae	FS	bi	P	Viegi et al. (1999)
<i>Echium vulgare</i> L.	Boraginaceae	OT	do, sh	C, M	Tammaro (1976)
		SK, AP, OT	ct	C	Viegi et al. (1999)
<i>Equisetum arvense</i> L.	Equisetaceae	GI	ct	C	Ciccodicola (1995)
<i>Equisetum telmateja</i> Ehrh.	Equisetaceae	SK, OT	–	C	De Capite and Menghini (1973)
<i>Erica arborea</i> L.	Ericaceae	NE	–	C	De Feo et al. (1992)
					De Feo and Senatore (1993)
<i>Eryobotrya japonica</i> (Thunb.) Lindley	Rosaceae	RE	ch	C	Maccioni and Marchini (1998b)
<i>Eucalyptus</i> sp.pl.	Myrtaceae	SK	–	C	Amico and Sorge (1997)
<i>Euonymus europaeus</i> L.	Celastraceae	AP	–	C	De Capite and Menghini (1973), Chichiriccò et al. (1980), Tammaro (1984), Bruni et al. (1997)
<i>Euonymus verrucosus</i> Scop.	Celastraceae	AP	–	P, C	De Feo et al. (1992)
<i>Eupatorium cannabinum</i> L.	Asteraceae	SK	de	C	Picchi (1999)
<i>Euphorbia ceratocarpa</i> Ten.	Euphorbiaceae	SK, OT	–	C	Barbagallo et al. (1979b)
<i>Euphorbia characias</i> L.	Euphorbiaceae	SK, OT	–	C, O	Mearrelli and Tardelli (1995)
		OT	–	O	Bruni et al. (1997)
<i>Euphorbia dendroides</i> L.	Euphorbiaceae	OT	–	O	Chioventa-Bensi (1960), Lentini et al. (1988)
<i>Euphorbia helioscopia</i> L.	Euphorbiaceae	SK, OT	–	C	Barbagallo and Furnari (1967), Barbagallo et al. (1979b)
		AP	–	P	Lentini et al. (1988)
<i>Euphorbia lathyris</i> L.	Euphorbiaceae	GI	ct	C	Corsi et al. (1981), Pieroni (2000)
		AP	–	P	De Bellis (1988), Guarrera (2002)
<i>Euphorbia rigida</i> Bieb.	Euphorbiaceae	SK	–	C	Barbagallo et al. (1979a)
<i>Euphorbia spinosa</i> L.	Euphorbiaceae	GI	–	C	Gastaldo et al. (1978)
<i>Ferula communis</i> L.	Apiaceae	RE	ho	C	Catanzaro (1970)
<i>Ficus carica</i> L.	Moraceae	GI	ct, sh	C	Guarrera (1981, 1994), De Bellis (1988), De Feo et al. (1992), Ciccodicola (1995)
		RE, OT	ct, go, sh	C	Manzi (1989)
<i>Foeniculum vulgare</i> Miller	Apiaceae	RP	ct	P	Uncini Manganelli and Tomei (1997, 1999a,b)
		GI	ct	C	Tammaro (1984), Viegi et al. (1999)
		FS	ra	P	Guarrera (1990)

Table 1 (Continued)

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Fraxinus excelsior</i> L.	Oleaceae	GI	ch, sh	P, C	Ferri (1977), Corsi et al. (1981), Martini (1982), Renzetti and Taiani (1988), Chiavoni and Raffo (1994)
		OT	–	C	Fossati et al. (1999)
<i>Fraxinus ornus</i> L.	Oleaceae	GI	ch, ra	P, C	Bellomaria (1982), Cappelletti et al. (1981), De Bellis (1988), Ferri (1977), Guarrera (1981, 1994), Maccioni and Marchini (1999)
		SK	ch	C	Guarrera (1994), Renzetti and Taiani (1988)
		GI	ch	P	Uncini Manganelli and Tomei (1995, 1999a)
		GI	ch, ct	C	De Capite and Menghini (1973), Uncini Manganelli and Tomei (1996, 1999b), Camangi and Uncini Manganelli (1999)
		AP	ch	P, C	Guarrera (1987, 1995)
<i>Fumaria officinalis</i> L.	Fumariaceae	GI	–	C	Ferri (1961)
<i>Galega officinalis</i> L.	Fabaceae	RP	go, sh	P	De Bellis (1988), Guarrera (1990)
<i>Galium verum</i> L.	Rubiaceae	GI	ca, pi	C	De Bellis (1986, 1988)
<i>Gentiana acaulis</i> L.	Gentianaceae	OT	–	P	Chiovenda-Bensi (1957)
		GI	–	C	Zampiva (1981)
<i>Geranium rotundifolium</i> L., <i>Geranium sanguineum</i> L.	Geraniaceae	GI	ct	C	Gastaldo et al. (1978)
<i>Geum urbanum</i> L.	Rosaceae	SK, GI	–	C	Coassini Lokar and Poldini (1988)
<i>Glechoma hederacea</i> L.	Lamiaceae	AP	ho	C	De Capite and Menghini (1973)
<i>Glycyrrhiza glabra</i> L.	Fabaceae	AP	–	O	Tammaro and Pietrocola (1975)
		GI, RE	as, ho	C	Manzi (1989)
<i>Hedera helix</i> L.	Araliaceae	GI	ct, pi	C	Bandini (1961), Renzetti and Taiani (1988)
<i>Hedera helix</i> L.	Araliaceae	OT	go, sh	O	Corsi et al. (1981)
		SK	ct, mu	C	Tammaro and Pietrocola (1975), Bellomaria and Lattanzi (1982)
		RP	ct	P	Tammaro (1984)
<i>Hedera</i> sp.	Araliaceae	SK, OT	ct	C	De Bellis (1978)
<i>Helianthus annuus</i> L.	Asteraceae	RP	ch	O	Guarrera (1994)
<i>Helichrysum italicum</i> G. Don	Asteraceae	OT	–	O	Chiovenda-Bensi (1960)
		RE	as	C	Benigni et al. (1962), Pieroni (1999b), Uncini Manganelli and Tomei (1995, 1999a)
		GI	ct	C	Nardelli (1987)
<i>Helleborus bocconei</i> Ten.	Ranunculaceae	OT	pi, sh	C	Guarrera (1990), Padula (1878)
		NE	–	C	Leporatti and Pavesi (1989)
		RE	–	C	Lentini and Raimondo (1990)
<i>Helleborus bocconei</i> Ten. subsp. <i>siculus</i> (Schiffer) Merxm. et Podl.	Ranunculaceae	RE	–	C	Raimondo and Lentini (1990)
<i>Helleborus foetidus</i> L.	Ranunculaceae	KI	–	C	Fossati et al. (1999), Uncini Manganelli and Tomei (1998)
		GI, OT	–	C	Bandini (1961)
		OT	ct, do, go, pi, sh	C	Bertagnon (1955), De Bellis (1986), Nardelli (1987), Guarrera (1994), Uncini Manganelli and Tomei (1996, 1999a), Viegli et al. (1999)
		SK	–	C	D'Andrea (1982)
		NE	–	C	Leporatti and Pavesi (1989)
<i>Helleborus niger</i> L.	Ranunculaceae	KI	–	C	Fossati et al. (1999)
<i>Helleborus odorus</i> W. et K.	Ranunculaceae	GI	–	C	Bandini (1961)
		SK	–	C	Camangi and Uncini Manganelli (1999)
<i>Helleborus viridis</i> L.		RP, OT	–	C	Gastaldo et al. (1978)
		SK	–	C	Martini (1982)
		NE, RE,	la	C	Corsi and Pagni (1978), Pagni and Corsi (1979)
		OT	–		
		RP	sh	O	Corsi et al. (1981)
		KI	–		Fossati et al. (1999)
		RE, SK	ct, sh	C	Camangi and Uncini Manganelli (1999)
<i>Helleborus</i> sp.	Ranunculaceae	RE	–	C	Renzetti and Taiani (1988)
<i>Heracleum sphondilium</i> L.	Apiaceae	RP, FS	ct	P	D'Andrea (1982)

Table 1 (Continued)

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Hordeum vulgare</i> L.	Poaceae	GI	–	P, C	Ferri (1961)
		GI	–	C	De Capite and Menghini (1973)
<i>Humulus lupulus</i> L.	Cannabaceae	GI	–	C	Fossati et al. (1999)
<i>Hyoscyamus niger</i> L.	Solanaceae	LA	ct, ho	C	Tammaro and Pietrocola (1975)
<i>Hypericum perforatum</i> L.	Guttiferae	SK, OT	ct, do	C	Viegi et al. (1999)
		SK	–	C	Lentini and Aleo (1991)
<i>Hyssopus officinalis</i> L.	Lamiaceae	GI, RP	–	C	Guarrera (1987)
<i>Ilex aquifolium</i> L.	Aquifoliaceae	SK, LA	–	C	Cappelletti et al. (1981)
		SK	–	C	Renzetti and Taiani (1988)
<i>Inula viscosa</i> (L.) Aiton	Asteraceae	SK	ct, sh	C	Tammaro (1984), Viegi et al. (1999)
		LA	ct, sh	C	Viegi et al. (1999)
<i>Inula</i> sp.	Asteraceae	RE, FS	ho	C	Picchi (1999)
<i>Juglans regia</i> L.	Juglandaceae	AP	do, ho	P	D'Andrea (1982), Guarrera et al. (1984), Renzetti and Taiani (1988), Guarrera (1994)
		GI, OT	–	C	Corrain and Zampini (1961)
		AP, RP	–	P	De Capite and Menghini (1973)
		OT	do, ho, tu	C, O	Guarrera et al. (1984), Tammaro (1984)
		LA, SK	ho	C	D'Andrea (1982)
		FS	ra	O	Maccioni and Marchini (1999)
		LA	ct, ho	C	De Bellis (1988)
<i>Juniperus communis</i> L.	Cupressaceae	GI	ra	O	Viegi et al. (1999)
		KI, RP	–	C	De Capite and Menghini (1973)
		FS	ra	P, C	Maccioni and Marchini (1998a)
		LA, AP, SK	sh	C	Mearrelli and Tardelli (1995)
<i>Juniperus oxycedrus</i> L.	Cupressaceae	RP	ct	C	Manzi (1989)
		LA, SK	sh	C	Bruni et al. (1997)
<i>Juniperus oxycedrus</i> L. subsp. <i>oxycedrus</i>	Cupressaceae	LA, SK	sh	C	Bruni et al. (1997)
<i>Juniperus oxycedrus</i> L. subsp. <i>macrocarpa</i> (S. et S.) Ball	Cupressaceae	GI, FS	ra	P	Maccioni and Marchini (1998a)
<i>Juniperus sabina</i> L.	Cupressaceae	RP	ct, ho	C	D'Andrea (1982), Manzi (1989)
		RP	–	C, O	Tammaro (1984), Guarrera (1987)
<i>Juniperus</i> sp.	Cupressaceae	LA	–	C	De Bellis (1978)
<i>Kichxia elatine</i> (L.) Dumort.	Scrophulariaceae	SK	as, do	C	Guarrera and Tammaro (1991), Tammaro (1984)
<i>Laburnum anagyroides</i> Med.	Fabaceae	SK	–	C	Cappelletti et al. (1981)
<i>Larix decidua</i> Miller	Pinaceae	GI	–	C	Barbini et al. (1999)
<i>Laurus nobilis</i> L.	Lauraceae	GI, RP	–	C	Corsi et al. (1981), Guarrera (1981)
		AP, OT	–	P, C	De Capite and Menghini (1973)
		AP	sh	C	Guarrera et al. (1984), Guarrera (1994)
		GI	ct	C	Ciccodicola (1995)
		OT	–	C	Antonone et al. (1988)
<i>Lavatera arborea</i> L.	Malvaceae	OT	ct	C	Guarrera (1990)
<i>Lavatera cretica</i> L.	Malvaceae	GI	ct	C	De Feo et al. (1992), De Feo and Senatore (1993)
<i>Leopoldia comosa</i> (L.) Parl.	Liliaceae	OT	–	C	Casoria et al. (1999)
<i>Linum usitatissimum</i> L.	Linaceae	GI	ct, pi	C	Amici (1992), Bandini (1961), Bellomaria (1982), Guarrera (1987), Nardelli (1987), Renzetti and Taiani (1988), Uncini Manganelli and Tomei (1995), Viegi et al. (1999)
		LA, SK	ct	C	Corrain and Zampini (1961)
		GI, SK	ct	C	Maccioni and Marchini (1999), Manzi (1989)
		GI, RP	ct, pi	P, C	Corsi et al. (1981)
		SK	ct		De Capite and Menghini (1973)
		NE	as, ho	C	Catanzaro (1970), Manzi (1989)
<i>Lolium temulentum</i> L.	Poaceae	NE	as, ho	C	Catanzaro (1970), Manzi (1989)
<i>Lotus corniculatus</i> L.	Fabaceae	GI	ct	C	Tammaro and Pietrocola (1975)
<i>Lupinus albus</i> L.	Fabaceae	AP	do, ct, pi	C	Bellomaria (1982), Bellomaria and Della Mora (1985), Corrain and Zampini (1961), Corsi et al. (1981), Manzi (1989)
		AP	–	C	Guarrera (1994)
		SK	ct	C	Manzi (1989)
<i>Lupinus luteus</i> L.	Fabaceae	AP	–	C	Guarrera (1994)
<i>Lycoperdon</i> sp.	Lycoperdaceae	SK	ct	C	Manzi (1989)

Table 1 (Continued)

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Lycopersicon esculentum</i> Miller	Fabaceae	AP	–	C	Guarrera (1994)
		GI, RP, AP	–	P, C	Guarrera (1987)
<i>Malva neglecta</i> Wallr.	Malvaceae	RP	ct	C	Chimenti Signorini and Fumagalli (1983)
<i>Malva parvifolia</i> L.	Malvaceae	SK	–	C	Atzei et al. (1991)
<i>Malva sylvestris</i> L.	Malvaceae	RP, GI	ct	C	Renzetti and Taiani (1988)
		GI	ct, pi	C	Corrain (1977), Corsi et al. (1981), Guarrera (1981), De Simoni and Guarrera (1994), Nardelli (1987), Uncini Manganelli and Tomei (1995)
		SK	ct	C	Bellomaria (1982), De Bellis (1986), Fossati et al. (1999), Guarrera (1987)
		SK, GI	ct	C	Corrain and Zampini (1961)
		RE, GI	ct	C	Guarrera (1987)
		GI, RP, RE, NE	–	C	Manzi (1989)
<i>Malva</i> sp.pl.	Malvaceae	GI, NE	pi	C	Viegi et al. (1999)
		GI	ct, pi	C	Guarrera (1994)
		OT	–	C	Picchi (1999)
<i>Marrubium incanum</i> Desr.	Lamiaceae	SK	–	C	Tammaro (1984)
<i>Marrubium vulgare</i> L.	Lamiaceae	GI	ct	C	De Bellis (1978, 1988)
		OT	–	O	Mearelli and Tardelli (1995)
		SK	as, ct, ho, mu	C	De Simoni and Guarrera (1994), Tammaro (1984), Pieroni et al. (2002a)
<i>Melilotus</i> sp.pl.	Fabaceae	RP	–	P	Tammaro (1984)
<i>Melissa officinalis</i> L.	Lamiaceae	RP	ct	P	Guarrera (1994)
<i>Melissa romana</i> Miller	Lamiaceae	OT	ct	C	Guarrera (1994)
<i>Mentha pulegium</i> L.	Lamiaceae	RE	–	C	Viegi et al. (1999)
<i>Mentha</i> sp.pl.	Lamiaceae	GI	ct, ho	C	Guarrera (1994)
<i>Mentha x piperita</i> L.	Lamiaceae	SK	–	C	Atzei et al. (1991)
<i>Mercurialis annua</i> L.	Euphorbiaceae	GI	ct	C	Bandini (1961), Tammaro and Pietrococola (1975), Guarrera (1981, 1994), De Feo and Senatore (1993), Maccioni and Marchini (1999), Pieroni et al. (2002a)
<i>Micromeria graeca</i> (L.) Benth.	Lamiaceae	RP, GI	–	C	Corsi et al. (1981)
		GI, RP, AP	ct	C	Manzi (1989)
		SK, LA	–	C	Amico and Sorge (1997)
<i>Morus nigra</i> L.	Moraceae	SK	ct, ra	C	Viegi et al. (1999)
<i>Myrtus communis</i> L.	Myrtaceae	SK, GI	–	C	Atzei et al. (1991)
<i>Nasturtium officinale</i> R. Br.	Brassicaceae	OT	–	C	Renzetti and Taiani (1988)
		SK	–	C	Gastaldo et al. (1978)
		RP	ct	P, C	Guarrera (1994)
<i>Nerium oleander</i> L.	Apocynaceae	AP, SK	–	C	Coassini Lokar and Poldini (1988)
		AP	do	C	Bellomaria and Della Mora (1985), Chiavoni and Raffo (1994)
<i>Nicotiana tabacum</i> L.	Solanaceae	AP	–	C	Guarrera (1995)
<i>Oenanthe crocata</i> L.	Apiaceae	OT	–	O	Chiappini (1985)
<i>Olea europaea</i> L.	Oleaceae	GI, OT	ct	C	Corrain (1977)
		SK, LA	ct	C	Corrain and Zampini (1961)
		OT	–	C	Viegi et al. (1999)
		AP	–	P	Guarrera (1994)
		SK	pi	C	Amici (1992), Guarrera (2002)
<i>Onobrychis viciifolia</i> Scop.	Fabaceae	RP	ct	P, C	Guarrera (1987)
<i>Opuntia ficus-indica</i> (L.) Mill.	Cactaceae	GI	–	C	Catanzaro (1968), Guarrera (1981)
		SK	ho	C	Amico and Sorge (1997)
<i>Origanum heracleoticum</i> L.	Lamiaceae	RE	as	C	Pieroni et al. (2002a)
<i>Oryza sativa</i> L.	Poaceae	GI	–	C	Corsi et al. (1981)
<i>Papaver rhoeas</i> L.	Papaveraceae	SK, OT	–	C	Picchi (1999)
		GI	pi	C, O	Catanzaro (1968), De Bellis (1988)
		RP	ch	P	Guarrera (1994)
		NE	pi	C	Manzi (1989)
<i>Papaver somniferum</i> L.	Papaveraceae	NE	as, ho	C	Manzi (1989)

Table 1 (Continued)

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Parietaria diffusa</i> Mert. et Koch.	Urticaceae	SK, RP RE	– sh	C C	Nardelli (1987) Lentini et al. (1988)
<i>Parietaria judaica</i> L.	Urticaceae	RP SK, RP GI	ct do ct	C C C	Corsi et al. (1981) Nardelli (1987) Guarrera (1994)
<i>Parietaria officinalis</i> L.	Urticaceae	SK, GI KI SK, RP SK GI	– – do as ra	P C C C P, C	Catanzaro (1968) De Capite and Menghini (1973) Nardelli (1987) Manzi (1989) Maccioni and Marchini (1998a, 1999)
<i>Parietaria</i> sp.pl.	Urticaceae	RP	ch	O, C	Guarrera (1994, 1995)
<i>Petroselinum crispum</i> (Miller) A.W.Hill	Apiaceae	GI, OT OT KI	ra – ra	P, C O C	Martini (1981, 1982) Lomagno and Lomagno Caramiello (1970) Corsi et al. (1981)
<i>Peucedanum ostruthium</i> (L.) Koch	Apiaceae	GI	–	C	Coassini Lokar and Poldini (1988)
<i>Phragmites australis</i> (Cav.) Trin	Poaceae	GI	–	C	Tomei and Gaspari (1981), Uncini Manganelli et al. (2001)
<i>Phyllirea latifolia</i> L.	Oleaceae	OT	–	C	Guarrera (1994)
<i>Picris echioides</i> L.	Asteraceae	OT, RP	ch, ct, sh, tu	P, C	Manzi (1989)
<i>Pimpinella anisum</i> L.	Apiaceae	GI	ct, sh	C	Guarrera (1981)
<i>Pinus</i> sp.	Pinaceae	LA	–	C	De Bellis (1978), Barbini et al. (1999)
<i>Pistacia lentiscus</i> L.	Anacardiaceae	OT	–	O	Mearrelli and Tardelli (1995)
<i>Plantago lanceolata</i> L.	Plantaginaceae	SK RP	ct sh	C C	Corrain (1977) Maccioni and Marchini (1999)
<i>Plantago major</i> L.	Plantaginaceae	SK RP RE	bi, ct, ho sh ch	C C C	Amici (1992), Corrain and Zampini (1961), Corsi et al. (1981), Tammaro (1976), Viegi et al. (1999) Maccioni and Marchini (1999) Tammaro (1984)
<i>Plantago</i> sp.pl.	Plantaginaceae	GI SK	ra as	C C	Guarrera (1987) Manzi (1989)
<i>Polygonatum multiflorum</i> All., <i>Polygonatum officinale</i> All.	Liliaceae	RE	ho	C	De Capite and Menghini (1973)
<i>Polygonum aviculare</i> L.	Polygonaceae	OT	ra	C	Corsi et al. (1981), Guarrera (1990)
<i>Polygonum bistorta</i> L.	Polygonaceae	OT	ho	C	Picchi (1999)
<i>Populus alba</i> L.	Salicaceae	OT	–	C	Fossati et al. (1999)
<i>Populus nigra</i> L.	Salicaceae	OT NE, OT	– –	C C	Picchi (1999), Fossati et al. (1999) De Capite and Menghini (1973)
<i>Populus</i> sp.	Salicaceae	GI, OT	ct, ho, ra	P, C	Guarrera (1987), Viegi et al. (1999)
<i>Potentilla reptans</i> L.	Rosaceae	KI	ct, sh	C	Viegi et al. (1999)
<i>Prunus avium</i> L.	Rosaceae	GI RP	– ct	C O	Guarrera (1987) Corsi et al. (1981)
<i>Prunus cerasus</i> L.	Rosaceae	KI	–	C	De Capite and Menghini (1973)
<i>Pteridium aquilinum</i> (L.) Kuhn	Hypolepidaceae	RP	ct	C	Guarrera (1987, 1994), Manzi (1989)
<i>Pulicaria dysenterica</i> (L.) Bernh.	Asteraceae	AP	do	C	Guarrera (1994)
<i>Pulicaria odora</i> (L.) Rechb.	Asteraceae	RE	–	C	Raimondo and Lentini (1990)
<i>Quercus cerris</i> L.	Fagaceae	SK	–	C	Guarrera (1994)
<i>Quercus cerris</i> L., <i>Quercus pubescens</i> Willd.	Fagaceae	SK	as, mu	C	Tammaro (1976, 1984)
<i>Quercus pubescens</i> Willd. subsp. <i>pubescens</i>	Fagaceae	SK, OT	–	C	De Capite and Menghini (1973)
<i>Quercus pubescens</i> Willd.	Fagaceae	LA, SK, OT GI	as –	C C	Guarrera (1994) Guarrera (1981)
<i>Quercus robur</i> L.	Fagaceae	SK	as, mu	C	De Simoni and Guarrera (1994)
<i>Quercus suber</i> L.	Fagaceae	SK	– go	C C	Fossati et al. (1999) Mearrelli and Tardelli (1995)

Table 1 (Continued)

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Quercus</i> sp.	Fagaceae	GI	ct	C	Corrain and Zampini (1961)
<i>Ranunculus acris</i> L.	Ranunculaceae	LA	–	C	Gastaldo et al. (1978)
<i>Ranunculus bulbosus</i> L.	Ranunculaceae	LA	–	C	Gastaldo et al. (1978)
		SK	–	C	Barbagallo et al. (1979a)
<i>Ranunculus ficaria</i> L.	Ranunculaceae	SK	ct	C	Guarrera (1994)
<i>Ranunculus lanuginosus</i> L.	Ranunculaceae	LA	–	C	Gastaldo et al. (1978)
<i>Raphanus raphanistrum</i> L.	Brassicaceae	RP	–	P	Gastaldo et al. (1978)
<i>Ricinus communis</i> L.	Euphorbiaceae	SK	–	C	Corrain and Zampini (1961)
<i>Robinia pseudacacia</i> L.	Fabaceae	OT	ra	C	Viegli et al. (1999)
<i>Rosa canina</i> L.	Rosaceae	RP	–	O	Renzetti and Taiani (1988)
		OT	–	C	Guarrera (1994)
<i>Rosmarinus officinalis</i> L.	Lamiaceae	GI	sh	C	Corsi et al. (1981)
<i>Rubia peregrina</i> L.	Rubiaceae	RP	–	C	De Bellis (1986), Guarrera (1994)
<i>Rubia tinctorum</i> L.	Rubiaceae	RP	ct	O	Bertagnon (1955)
<i>Rubus fruticosus</i> L.	Rosaceae	SK	sh	C	De Simoni and Guarrera (1994)
		GI	ct	C	Tammaro (1984)
<i>Rubus ulmifolius</i> L.	Rosaceae	RE, OT	–	C	De Capite and Menghini (1973)
<i>Rubus</i> sp. pl.	Rosaceae	GI	sh	C	Manzi (1989)
<i>Rumex crispus</i> L.	Polygonaceae	SK	ca	C	Bandini (1961)
		GI	–	C	Guarrera (1981)
<i>Rumex</i> sp.	Polygonaceae	FS	du, gs	O	Viegli et al. (1999)
		GI	ct, ho	C	Guarrera (1994)
<i>Ruta chalepensis</i> L.	Rutaceae	SO	sh	C	Maccioni and Marchini (1999)
		GI	do	C	Bellomaria and Lattanzi (1982)
<i>Ruta graveolens</i> L.	Kutacean	GI	ca, ch, ct	C	Tammaro (1976), Guarrera (1994), Maccioni and Marchini (1999), Picchi (1999)
		AP	ch, ct, ho	C	Guarrera (1987, 1994, 1995), Amici (1992), Ciccodicola (1995)
		AP	ho	P	Guarrera (1987)
		LA	ca	C	Ciccodicola (1995)
<i>Saccharomices cerevisiae</i> Rees	Saccharomicetaceae	GI	ct	C	Viegli et al. (1999)
<i>Salix alba</i> L. subsp. <i>alba</i>	Salicaceae	GI	ct, sh	C	Corsi et al. (1981), Tomei and Gaspari (1981), Guarrera (1981, 1987, 1994), Guarrera and Tammaro (1991)
		SK, GI	ct	C	Bellomaria (1982)
		GI, OT	sh	C	Guarrera (1981)
<i>Salix alba</i> L.	Salicaceae	GI	ct	C	Manzi (1989)
<i>Salix viminalis</i> L.	Salicaceae	GI	ct	C	De Bellis (1978)
<i>Salix</i> sp.	Salicaceae	AP, GI	ct	C, O	Corrain and Zampini (1961)
		GI	ct	C	De Bellis (1988), Viegli et al. (1999)
<i>Salvia verbenaca</i> L.	Lamiaceae	SK	pi	C	De Simoni and Guarrera (1994)
<i>Sambucus ebulus</i> L.	Loniceraceae	AP	–	P	Zampiva (1981)
<i>Sambucus nigra</i> L.	Loniceraceae	GI	ct, do	C	Corrain (1977), De Capite and Menghini (1973), Nardelli (1987)
		RP, SK	ct	C	Corsi et al. (1981)
		AP	ch	P	Cappelletti (1985)
		SK	ct	C	Guarrera (1987, 1994, 2002), Viegli et al. (1999)
		LA	ct	C	Nardelli (1987)
		RE	–	C	Guarrera (1987, 1994)
		AP	–	O	Manzi (1989)
<i>Sambucus</i> sp.	Loniceraceae	SK	–	C	De Bellis (1978)
<i>Sanguisorba minor</i> Scop.	Rosaceae	RP	–	P	Guarrera (1994)
<i>Santolina marchii</i> Arrigoni	Asteraceae	GI	ct	C	Guarrera (1987)
<i>Satureja montana</i> L.	Lamiaceae	LA	ct	C	Tammaro (1976)
		SK	ct	C	Tammaro (1984)
<i>Scorpiurus subvillosus</i> L.	Fabaceae	RP	sh	P	Tammaro and Pietrocola (1975)
<i>Scrophularia canina</i> L.	Scrophulariaceae	SK	ct, sh	C	Chichiricò et al. (1980), Guarrera (1987, 1994), Guarrera and Tammaro (1991)
		SK, RP	as, ct, mu, sh	C	Manzi (1989)
<i>Scrophularia nodosa</i> L.	Scrophulariaceae	KI	–	C	De Feo and Senatore (1993)

Table 1 (Continued)

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Secale cereale</i> L.	Poaceae	GI, RP	ca, pi	C	Corsi et al. (1981)
<i>Sedum</i> sp.pl.	Crassulaceae	SK	as, ho	C	Manzi (1989)
<i>Sempervivum tectorum</i> L.	Crassulaceae	GI	ct, sh	C	Guarrera (1981), Bellomaria (1982), Maccioni and Marchini (1999), Viegi et al. (1999)
		GI	–	P	Ferri (1961)
		GI, OT	ch	C	De Bellis (1988)
<i>Smilax aspera</i> L.	Liliaceae	SK	–	C	Guarrera (1994)
<i>Solanum melongena</i> L.	Solanaceae	SK	–	C	Amico and Sorge (1997)
<i>Solanum nigrum</i> L.	Solanaceae	OT	–	O	Chiavoni and Raffo (1994)
		GI	–	C	Pieroni (2000)
		NE	–	C	Picchi (1999)
<i>Solanum tuberosum</i> L.	Solanaceae	RP	ch	O	Corrain and Zampini (1961)
		GI	do	C	Guarrera (1994)
<i>Sonchus asper</i> L.	Asteraceae	GI	bi, pi	C	Picchi (1999)
<i>Sonchus oleraceus</i> L.	Asteraceae	SK, RP	ct	C	Manzi (1989)
<i>Sorbus domestica</i> L.	Rosaceae	GI	sh	C	Manzi (1989)
<i>Sorbus</i> sp.pl.	Rosaceae	GI	–	C	Guarrera (1981)
<i>Stachys germanica</i> L.	Lamiaceae	SK	as, ho	C	Manzi (1989)
<i>Stachys officinalis</i> (L.) Trev.	Lamiaceae	SK	–	C	De Bellis (1978, 1988)
<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	RP	ch	O	Bellomaria (1982)
<i>Tamarix gallica</i> L.	Tamaricaceae	OT	–	C, M	Raimondo and Lentini (1990)
<i>Tamus communis</i> L.	Dioscoreaceae	SK	ct	C	Bellomaria (1982), Guarrera (1994)
<i>Tanacetum vulgare</i> L.	Asteraceae	AP	do	P	Cappelletti (1985), Picchi (1999), Zampiva (1981)
<i>Teucrium chamaedrys</i> L.	Lamiaceae	OT	–	O	De Bellis (1978)
		LA	ct, ho	C	De Bellis (1988)
		RP	ct	C	Manzi (1989)
		GI	ct	C	Bellomaria (1982)
<i>Thymus pulegioides</i> L.	Lamiaceae	GI	ct	C	Tammaro (1975)
		OT	ct	C	Gastaldo et al. (1978)
<i>Thymus vulgaris</i> L.	Lamiaceae	OT	ct	C	Cappelletti et al. (1981)
<i>Thymus</i> sp.	Lamiaceae	RE	ct	C	Renzetti and Taiani (1988)
		GI	–	C	Tammaro (1984)
<i>Triticum aestivum</i> L.	Poaceae	GI	ct	C	Corsi et al. (1981), Viegi et al. (1999)
		LA, SK,	–	C	Guarrera (1994)
		RP	–	C	Guarrera (1994)
		SK	mu	C	Guarrera (2002)
		OT	ct, ho	C	Viegi et al. (1999)
<i>Triticum durum</i> Desf.	Poaceae	GI	sh	C	Manzi (1989)
<i>Ulmus minor</i> Mill.	Ulmaceae	RP	–	P	Fossati et al. (1999)
		GI	ct, ra	C	Viegi et al. (1999)
		SK	as	C	Guarrera (1981, 1994, 2002)
		RP, GI	ct, sh	P, M	Manzi (1989)
<i>Ulmus</i> sp.	Ulmaceae	GI	ct	P	Corrain and Zampini (1961)
<i>Urginea maritima</i> (L.) Baker	Liliaceae	AP	–	P, O	Lentini et al. (1988), Lentini and Aleo (1991)
		SK	–	C	Lentini (1987)
<i>Urtica dioica</i> L.	Urticaceae	RP, OT	sh	P, O	Maccioni and Marchini (1998a, 1999)
		OT	tu	P	De Bellis (1988), Fossati et al. (1999)
		GI	ct	C	Corsi et al. (1981)
		RP	ct, sh, tu	C	Manzi (1989), Nardelli (1987)
		RP	ch, do	O	Bruni et al. (1997), Tammaro and Pietrocola (1975)
		SK, OT	ho	O	Tammaro (1984)
		RP, GI	ct	C	Guarrera (1987)
<i>Urtica membranacea</i> Poiret	Urticaceae	RP	ch	O	Lentini et al. (1988)
		GI	–	P, C	Viegi et al. (1999)
<i>Urtica urens</i> L.	Urticaceae	OT	tu	P, O	De Bellis (1988), Fossati et al. (1999)
		RP	–	O	Nardelli (1987)
		AP	–	C	Tammaro and Pietrocola (1975)
<i>Urtica</i> sp.pl.	Urticaceae	RP	ct	P	Guarrera (1994)
		RP	ch	O	Catanzaro (1968), Guarrera (1994)
		OT	ch, chs	P	Tammaro (1984), Guarrera (1994)

Table 1 (Continued)

Botanical taxon	Botanical family	Veterinary use	Animals	Cat.	References
<i>Valeriana officinalis</i> L.	Valerianaceae	NE	ch, do	C	De Capite and Menghini (1973), Guarrera (1987)
<i>Veratrum album</i> L.	Liliaceae	SK	mu	C	Guarrera (2002)
		OT	pi	C	Corrain and Taiani (1961)
		OT	–	O	Lomagno and Lomagno Caramiello (1970)
<i>Veratrum album</i> L. subsp. <i>lobelianum</i> (Bernh.) Arcang.	Liliaceae	AP	Sh	C	D'Andrea (1982), Tammaro (1984)
		SK, OT	ct, sh	C	Guarrera (1994)
<i>Veratrum nigrum</i> L.	Liliaceae	AP	sh	C	Guarrera (1994)
<i>Veratrum</i> sp.	Liliaceae	AP	sh	C	Renzetti and Taiani (1988), Guarrera (1995)
<i>Verbascum densiflorum</i> Bert.	Scrophulariaceae	SK	sh	C	Barbagallo et al. (1979a)
<i>Verbascum mallophorum</i> L.	Scrophulariaceae	SK, LA	mu	C	Tammaro (1976)
<i>Verbascum pulverulentum</i> Vill.	Scrophulariaceae	OT	–	O	Mearelli and Tardelli (1995)
<i>Verbascum sinuatum</i> L.	Scrophulariaceae	OT	sh	C	De Bellis (1988)
		SK, LA	ho, mu, sh	C	Catanzaro (1970), Tammaro (1984)
<i>Verbascum thapsus</i> L.	Scrophulariaceae	SK	ct	C	Bellomaria (1982)
		SK, LA	mu	C	Tammaro (1984)
		GI	pi	C	Corsi et al. (1981)
		OT	–	O	Mearelli and Tardelli (1995)
<i>Verbascum</i> sp.pl.	Scrophulariaceae	SK	do	C	Guarrera and Tammaro (1991)
<i>Verbena officinalis</i> L.	Verbenaceae	SK	–	C	Amici (1992)
<i>Vicia ervilia</i> (L.) Willd.	Fabaceae	FS	bi, sh	O	Guarrera (1990)
<i>Vicia faba</i> L.	Fabaceae	GI, OT	ca, pi, sh	C, P	Manzi (1989)
<i>Vitex agnus-castus</i> L.	Verbenaceae	OT	–	C	Picchi (1999)
<i>Vitis vinifera</i> L.	Vitaceae	SK	ho		Viegi et al. (1999)
		OT, RP	sh		Nardelli (1987), Maccioni and Marchini (1999)
		LA	chs	C	Amici (1992), Guarrera (1994)
		FS	–	P, C	Guarrera (1994)
		GI	pi, sh	C	De Bellis (1988), Bellomaria (1982)
		SK	–	C	Guarrera (1981)
		OT, AP, LA	–	C	Guarrera (1994)
		SK	ca	C	Corsi et al. (1981)
		GI	ho, mu	C, M	Guarrera (1987)
		RP	sh	O	Manzi (1989)

Animals: ass, asses; ca, calves; ch, chickens; chs, chicks; ct, cattle; de, deers; do, dogs; du, ducks; go, goats; gs, geese; ho, horses; la, lambs; mu, mules; pi, pigs; ra, rabbits; sh, sheeps; tu, turkeys.

Categories: C, curative use; eu, external use; iu, internal use; M, magic use; O, other uses; P, preventive use.

Veterinary use: AP, antiparasitics and repellents; FS, food supplement; GI, gastrointestinal complaints; KI, kidney disorders; LA, ailments affecting the locomotor apparatus; NE, nervous system disorders; OT, other ailments; RE, respiratory ailments; RP, reproductive disorders; SO, ailments of the sensory organs; SK, problems of the skin and wounds.

same use of this plant, given as a food supplement, is also known in Tuscany (Pieroni, personal communication).

Many folk veterinary practices relate to labour and delivery. In the southeast Murges (Apulia) (Maccioni and Guazzi, personal communication) a decoction of *Capsella bursa-pastoris* is given to pregnant livestock against (hemorrhaging) (tannins, tyramine, alkaloids, saponins). The fern *Ceterach officinarum* is used as a depurative for cows and ewes after calving and lambing (Tuscany) (Corsi et al., 1981). The plant contains emollient mucilage and astringent tannins. A common depurative before labour and delivery is *Linum usitatissimum* (Tuscany) (Corsi et al., 1981), a plant rich in mucilage but no longer readily available today. *Malva sylvestris*, which also contains mucilages, is still quite widely used: for example, in Umbria, a decoction of *Malva* leaves with flour is given as an enema to bitches about to whelp (Nardelli, 1987). *Malva* infusions are also given as refreshings after labour and delivery (Polesine,

Trentino-Alto Adige) (Corrain, 1977; Renzetti and Taiani, 1988) or to favour expulsion of the placenta (Abruzzo) (Manzi, 1989).

Infusion of *Hedera helix* leaves (containing saponins, chlorogenic and caffeic acid, hederacoside) was given to cows after calving in Trentino-Alto Adige (Renzetti and Taiani, 1988), whereas in Abruzzo leaves of the plant were added to fodder to facilitate delivery (Tammaro, 1984).

Certain attributes were ascribed to plants fed to animals daily in their fodder; *Castanea sativa* was used to make pigs more robust (Guarrera, 1994). In Sicily rabbits lacking appetite were given *Convolvulus arvensis* in Sicily (Lentini et al., 1988) and in Piedmont and Liguria *Petroselinum crispum* (Martini, 1981, 1982), though the latter plant is contraindicated in pregnant rabbits because it is abortifacient.

Various species of nettle, especially *Urtica dioica*, were given to chickens and turkeys to promote weight

Table 2
Personal communications on plant species reported for ethnoveterinary use in some regions of Italy

Taxon	Family	Region	Part used	Use modality	Veterinary use/animals	Cat.	Personal communication
<i>Allium sativum</i> L.	Liliaceae	Tuscany	bu	iu	GI (ca)	C	Maccioni and Marchini
<i>Anemone hortensis</i> L.	Ranunculaceae	Calabria	ap	eu	SK (do)	C	De Fine
<i>Apium nodiflorum</i> (L.) Lag.	Apiaceae	Tuscany	ap	Decoction, iu	GI	C	Pieroni
<i>Artemisia absinthium</i> L.	Asteraceae	Tuscany	ap	iu	GI (ca)	C	Pieroni
<i>Avena sativa</i> L.	Poaceae	Campania	bu	Fresh plant, iu	RP (ct)		Menale and Muoio
<i>Capsella bursa-pastoris</i> (L.) Medicus	Brassicaceae	Apulia	ep	Decoction, iu	RP (ct)	P	Maccioni and Guazzi
<i>Cistus monspeliensis</i> L.	Cistaceae	Apulia	le	Cataplasms, eu	SK (ho)	C	Maccioni and Guazzi
<i>Cyclamen repandum</i> S. et S.	Primulaceae	Calabria	ep	iu	RP (pi)	C	De Fine
<i>Cynara cardunculus</i> subsp. <i>scolymus</i> (L.) Hayek	Asteraceae	Liguria	le	Macerate, iu	GI (ct, tu)	C	Maccioni and Marchini
<i>Daphne gnidium</i> L.	Thymeleaceae	Calabria	ba	eu	SK (papillomas)	O	De Fine
<i>Datura stramonium</i> L.	Solanaceae	Calabria	le, se	Hung eu in the cowsheds	OT	M	De Fine
<i>Equisetum telmateja</i> Ehrh.	Equisetaceae	Calabria	ep	eu	OT (litter—ct, sh, ho)	O	De Fine
<i>Fraxinus ornus</i> L.	Oleaceae	Tuscany	ba	Macerate in water, iu	GI (to prevent intestinal diseases) (chs); RP (to increase the output of eggs) (ch)	P, O	Pieroni
<i>Fraxinus oxycarpa</i> Bieb.	Oleaceae	Tuscany	iba	iu	GI (ch)	C	Maccioni and Guazzi
<i>Helichrysum italicum</i> (Roth) Don	Oleaceae	Tuscany	ap	Fumigations, eu	RE (go)	C	Pieroni
<i>Helleborus bocconei</i> Ten. subsp. <i>siculus</i> (Schiffer) Merxm. et Podl.	Ranunculaceae	Calabria	Basal le, pe	Inserted on the back of the ear or under the fur of the neck, eu	RE	C, M	De Fine
<i>Helleborus foetidus</i> L.	Ranunculaceae	Tuscany	ap	Decoction, eu	Antiseptic (animals just born)	P, C	Pieroni
<i>Helleborus viridis</i> L.	Ranunculaceae	Tuscany	ro	Inserted under the skin, eu	Tumors (sh, pi); RE (ho)	C	Maccioni and Guazzi
<i>Helleborus viridis</i> L.	Ranunculaceae	Tuscany	rh	Inserted under the skin, eu	RE (pi, ct)	C	Maccioni and Marchini
<i>Malva sylvestris</i> L.	Malvaceae	Campania	ap	Boiled with <i>Urtica dioica</i> and bran of oats, iu	RP(ct)	C	Menale and Muoio
<i>Quercus pubescens</i> Willd.	Fagaceae	Tuscany	ybr	Hydrolyte, eu	SK (do)	C	Maccioni and Guazzi
<i>Urginea maritima</i> (L.) Baker	Liliaceae	Calabria	ep	With broad beans, eu	To take away the parasites in granaries, in silos, etc.	O, P	De Fine
<i>Urtica dioica</i> L.	Urticaceae	Tuscany	ap	iu	OT(ch)	C	Pieroni
<i>Verbascum thapsus</i> L.	Scrophulariaceae	Tuscany	ro	With <i>Allium sativum</i> , iu	GI (ca)	C	Maccioni and Marchini

Animals: ass, asses; ca, calves; ch, chickens; chs, chicks; ct, cattle; de, deers; do, dogs; du, ducks; go, goats; gs, geese; ho, horses; la, lambs; mu, mules; pi, pigs; ra, rabbits; sh, sheeps; tu, turkeys. Categories: C, curative use; eu, external use; iu, internal use; M, magic use; O, other uses; P, preventive use.

Part(s) used: ap, aerial parts; ba, bark; bu, buds; ep, entire plant; fr, fruits; iba, internal bark; le, leaves; pe, petiole; rh, rhizomes; ro, roots; se, seeds; ybr, young branches.

Veterinary use: AP, antiparasitics and repellents; GI, gastrointestinal complaints; KI, kidney disorders; LA, ailments affecting the locomotor apparatus; NE, nervous system disorders; OT, other ailments; RE, respiratory ailments; RP, reproductive disorders; SO, ailments of the sensory organs; SK, problems of the skin and wounds.

Table 3
Botanical classification of taxa reported for ethnoveterinary use in Italy

Fungi	Ferns	Gymnosperms	Angiosperms			
			Dicots			Monocots
Saccharomycetaceae (1)	Adiantaceae (1)	Cupressaceae (5)	Amaranthaceae (1)	Crassulaceae (2)	Papaveraceae (3)	Agavaceae (1)
Lycoperdaceae (1)	Aspleniaceae (2)	Pinaceae (3)	Anacardiaceae (1)	Cucurbitaceae (3)	Plantaginaceae (3)	Araceae (1)
	Equisetaceae (2)		Apiaceae (13)	Ericaceae (2)	Polygonaceae (4)	Cactaceae (1)
	Hypolepidaceae (1)		Apocynaceae (1)	Euphorbiaceae (10)	Primulaceae (2)	Dioscoreaceae (1)
			Aquifoliaceae (1)	Fabaceae (14)	Ranunculaceae (14)	Liliaceae (14)
			Araliaceae (2)	Fagaceae (6)	Rosaceae (15)	Poaceae (12)
			Aristolochiaceae (1)	Fumariaceae (1)	Rubiaceae (3)	
			Asteraceae (30)	Gentianaceae (1)	Rutaceae (2)	
			Betulaceae (2)	Geraniaceae (2)	Salicaceae (6)	
			Boraginaceae (4)	Hippocastanaceae (1)	Scrophulariaceae (9)	
			Brassicaceae (5)	Juglandaceae (1)	Solanaceae (7)	
			Buxaceae (1)	Lamiaceae (21)	Tamaricaceae (1)	
			Cannabaceae (2)	Lauraceae (1)	Thymelaeaceae (2)	
			Caryophyllaceae (1)	Linaceae (1)	Ulmaceae (2)	
			Celastraceae (2)	Loniceraceae (3)	Urticaceae (8)	
			Chenopodiaceae (1)	Malvaceae (7)	Valerianaceae (1)	
			Cistaceae (1)	Moraceae (2)	Verbenaceae (2)	
			Clusiaceae (1)	Myrtaceae (2)	Vitaceae (1)	
			Convolvulaceae (1)	Oleaceae (5)		
			Cornaceae (1)			
Total taxa number: 2	6	8		242		30

Families with five or more taxa number are indicated in bold.

gain, growth and development in various regions (Emilia-Romagna, Tuscany, Umbria) (Fossati et al., 1999; De Bellis, 1988; Uncini Manganeli et al., 2001; Nardelli, 1987). Greater weight gain has been documented in fowl fed with nettle compared to those fed with synthetic feed (Nardelli, 1987). Species of the genus *Urtica* are rich in aminoacids, proteins, minerals and vitamins, but they also contain tannins, formic acid and salicylic acid (Guarrera, 1994). *Urtica* is a polyvalent genus. Indeed in Tuscany, nettle (*Urtica dioica*) is given in the feed to cure diseases of fowl (Pieroni, personal communication). In Abruzzo, nettle boiled for a few minutes given to pigs would protect them from contagious diseases; in the same region, to cows were given a decoction consisting of one part of *Urtica dioica* tips and two parts of *Malva sylvestris* and bran (nutritious,

astringent and mildly laxative), 24 h after calving (Guarrera, 1987). *Urtica dioica* in Sardinia (Bruni et al., 1997) and Abruzzo (Tammara and Pietrocola, 1975), *Urtica membranacea* in Sicily (Lentini et al., 1988), *Urtica urens* in Emilia-Romagna (Fossati et al., 1999) and similar species in Latium (Guarrera, 1994) were given to stimulate hens to lay. *Allium cepa*, *Capsicum annum*, *Helianthus annuus* and *Papaver rhoeas* (Latium) (Guarrera, 1994), *Fraxinus ornus* (Tuscany) (Pieroni, personal communication), *Stellaria media* (Marches) (Bellomaria, 1982), *Solanum tuberosum* (Polesine) (Corrain and Zampini, 1961) were also used for this purpose.

After *Urtica*, the genus *Fraxinus* is attributed the highest percentage of preventive uses: to prevent or cure diseases of fowls, in Trentino-Alto Adige (Renzetti and Taiani, 1988),

Table 4
Number of taxa reported for ethnoveterinary use in various parts of Italy and number of taxa of the most represented families, compared with number reported either in Gastaldo (1987) for the Italian medicinal flora or in Pignatti (1982) for the Italian Flora

Families	Number of taxa of various part of Italy				Total number (this paper)	Number, Gastaldo (1987)	Number Pignatti (1982)
	Northern Italy	Central Italy	Southern Italy	Islands			
Apiaceae	3	9	0	2	13	60	223
Asteraceae	12	19	1	3	30	116	688
Euphorbiaceae	4	3	1	5	10	12	73
Fabaceae	3	11	0	0	14	51	394
Lamiaceae	2	15	1	2	21	74	194
Liliaceae	3	5	2	2	14	27	176
Poaceae	4	14	0	3	12	18	443
Ranunculaceae	8	5	3	3	14	46	172
Rosaceae	4	10	0	1	15	49	238

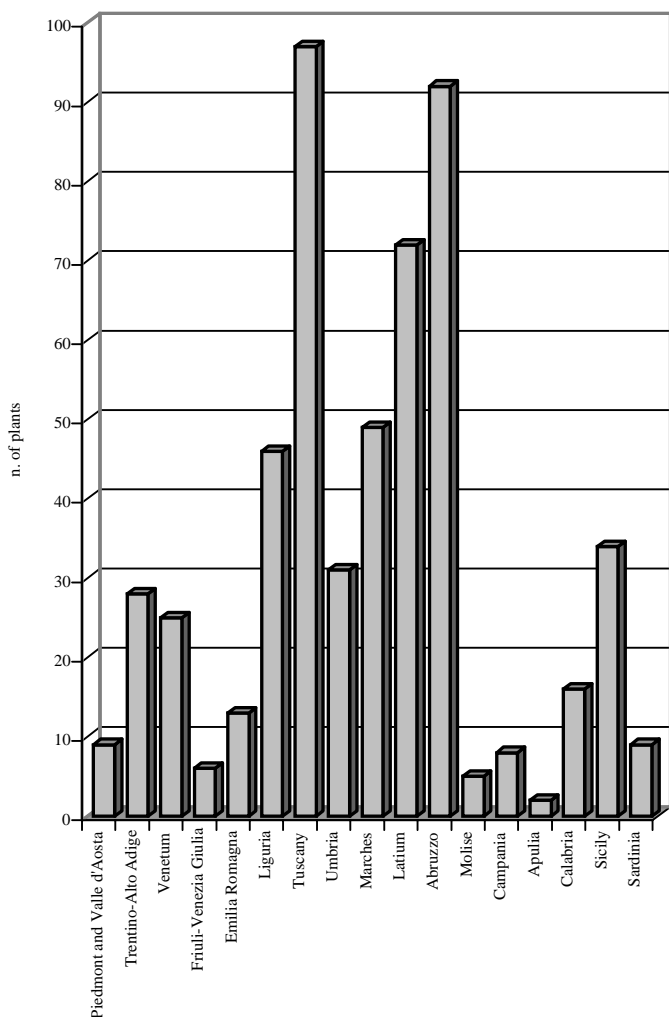


Fig. 1. Number of plants used in folk veterinary medicine in the regions of Italy.

Tuscany (Ferri, 1977; Corsi et al., 1981) and (Liguria (Martini, 1982), bark of *Fraxinus excelsior* was placed in the drinking water (or decoction or infusion was given); *Fraxinus ornus* was used for the same purpose (intestinal disinfectant, active compounds cited in Section 3.9) in

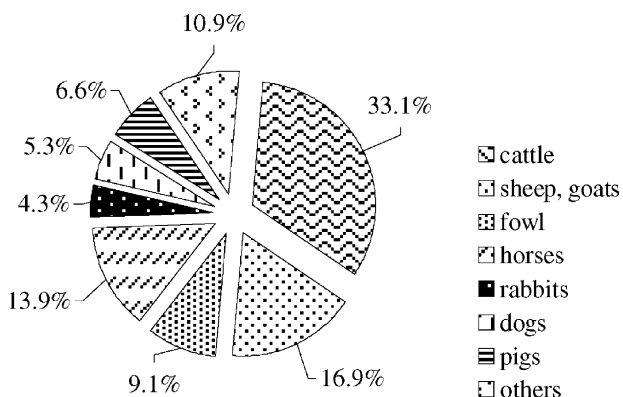


Fig. 2. Animals treated with plants in Italian folk veterinary medicine.

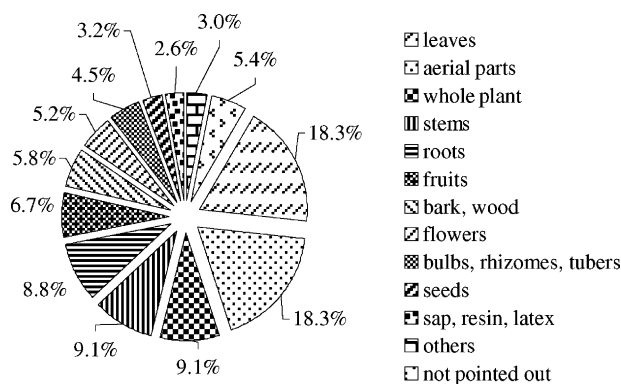


Fig. 3. Parts of plants used in Italian folk veterinary medicine.

Tuscany (Ferri, 1977; De Bellis, 1988; Uncini Manganelli and Tomei, 1995, 1999a; Uncini Manganelli et al., 2001; Pieroni, personal communication), Marches (Guarrera, 1981; Bellomaria, 1982) and Latium (Guarrera, 1994). A variant in Grosseto province (Tuscany) was lymph of *Fraxinus excelsior* obtained from incisions in the trunk, mixed with chicken mash (Chiavoni and Raffo, 1994); in Alta Garfagnana (Tuscany) *Fraxinus ornus* bark macerated in water was used to prevent diseases in newly hatched chicks (Corsi et al., 1981).

3.4. Therapeutic uses: main veterinary complaints cured with plants

Therapeutic uses recorded in the census were in a high percentage by comparison with the total uses. Plants were exploited for the following properties, in decreasing order of frequency: as digestives (e.g. tympanites of cows treated with *Cynara cardunculus*, *Salix alba*) (Guarrera, 1994; Corsi et al., 1981) and vulneraries (e.g. *Conium maculatum*, *Plantago major*) (Guarrera, 1994; Viegi et al., 1999), regulators of reproductive function, repellents and so forth (Table 5). Besides well known medicinal plants used also for humans (such as various species of the genera *Allium*, *Artemisia*, *Chamomilla*, *Clematis*, *Echium*, *Euphorbia*, *Fraxinus*, *Hedera*, *Helleborus*, *Linum*, *Malva*, *Mercurialis*, *Ruta*, *Salix*, *Urtica*, *Verbascum*), there were also species less known for their medicinal properties (Table 6).

The main complaints treated by folk veterinary medicine in Italy are summarized below.

3.4.1. Wounds and other problems of the skin

Fifty-three plants are described for vulnerary or cicatrizing purposes, 12 for eczema and dermatosis, 10 for pimples and abscesses, 3 for warts, 2 for snake bite and various individual plants for other problems. Many plants were used for inflammation or abrasion caused by the yoke or pack-saddle. In Latium, for example, a cicatrizing decoction was prepared with two handfuls of *Quercus cerris* bark (tannin) and shoots of *Smilax aspera* (1:1) in 10l of water, boiled down to 2l (Guarrera, 1994). In Abruzzo, *Quercus pubescens*

Table 5

Use of plants in the Italian folk veterinary medicine (% of reports)

Antiinflammatory/digestive/antiparasitic/vulnerary	>10%
Antidiarrhoea/post partum problems/antiseptic/purgative and laxative/egg production/vermifuge	5–10%
Antieczchymosis/appetiser/eutrophic/galactagogue/sedative	3–5%
Antitussive/carminative/diuretic	2–3%
Abortifacient/analgesic/dropsy/arthritis/antipyretic/respiratory diseases/antiviral/skin diseases/ aphrodisiac/hemostatic/ophthalmic/rubefacient	1–2%
Toothache/snake bite/antitumoural/detergent/emollient/stimulant/antirheumatic/antigalactagogue/diseases of reproductive system/rectal prolapse/kidney stones	<1%

bark with powdered wood charcoal and alum were used (Tammaro, 1976, 1984). In some regions (Latium, Marches), inflamed necks of work animals were massaged with berries of *Tamus communis* (Guarrera, 1994; Bellomaria, 1982). *Tamus communis* contains antiinflammatory analgesic phytoosterols (Capasso et al., 1983a,b) and is also a rubefacient due to a high calcium oxalate content (Paris and Moyses, 1967). A combination of ingredients was sometimes used. In the Maremma area of Latium and Tuscany (Amici, 1992; De Bellis, 1978, 1986, 1988) a cream was made for inflammation caused by the yoke. It contained well known vulneraries such as *Achillea millefolium* (leaves and stems) (azulene, flavones, sesquiterpenic lactones, acetylenic compounds, phytoosterols), *Cirsium arvense* (leaves) (essential oil, bitter compounds), beeswax and olive oil, or leaves of *Cynoglossum creticum* (or *Cynoglossum officinale*) (tannins, cynoglossin, consolidin) fried in olive oil and beeswax and sprigs of *Cytisus scoparius* and *Sambucus nigra*. Some species were regarded as hemostatic only in human folk medicine (*Cirsium arvense*) (Bellomaria, 1982; Bellomaria and Della Mora, 1985; Guarrera, 1981); moreover, *Cytisus scoparius* contains vasoconstrictors (Gastaldo, 1987) and

Sambucus nigra (pith) is used in human folk medicine to soothe burns (it contains triterpenes and ursolic acid). A fungus of the genus *Lycoperdon* has also been used for yoke abrasions (Manzi, 1989).

Some plants are used also for wounds in regions distant from each other, for example, *Verbascum sinuatum* in Abruzzo (Tammaro, 1984) and in Sicily (Catanzaro, 1970) (mucilage, saponine, aucuboside) and *Hypericum perforatum* in Tuscany (Viegi et al., 1999) and Sicily (Lentini and Aleo, 1991) (flavone and polyphenol derivatives, hyperoside). The latter plant was used to prevent scarring.

Plants used for dermatosis and eczema (whose ways of action are not actually known) are reported mainly from Trentino-Alto Adige (*Ilex aquifolium*, *Allium vineale*, *Fraxinus ornus*, *Laburnum anagyroides*) (Cappelletti et al., 1981; Cappelletti, 1985; Renzetti and Taiani, 1988) and southern Italy (*Urginea maritima*, *Nerium oleander*) (Lentini, 1987; De Fine, personal communication). Abscesses were treated with species of the genus *Euphorbia* (*Euphorbia ceratocarpa*, *Euphorbia helioscopia* in Sicily) (Barbagallo et al., 1979a,b; Barbagallo and Furnari, 1967), and warts with *Stachys germanica*, *Ranunculus ficaria* and *Solanum*

Table 6

Plant species of folk veterinary remedies fairly or not yet investigated so far in phytopharmacology and phytotherapy

Species	Family	References
<i>Achillea ligustica</i> All.	Asteraceae	Guarrera et al. (1984)
<i>Apium nodiflorum</i> (L.) Lag.	Apiaceae	De Bellis (1978), Corsi et al. (1981), Pieroni, unpublished data
<i>Artemisia arborescens</i> L.	Asteraceae	Barbagallo et al. (1979a)
<i>Asphodelus microcarpus</i> Salzm. et Viv.	Liliaceae	Amico and Sorge (1997)
<i>Asplenium trichomanes</i> L.	Aspleniaceae	Corsi et al. (1981)
<i>Ceterach officinarum</i> Lam. et DC.	Aspleniaceae	Bandini (1961), Gastaldo et al. (1978), Corsi et al. (1981)
<i>Chrozophora tinctoria</i> (L.) Juss.	Euphorbiaceae	Tammaro (1984)
<i>Convolvulus arvensis</i> L.	Convolvulaceae	Tammaro (1984), Coassini et al. (1988), Guarrera (1990)
<i>Lavatera cretica</i> L.	Malvaceae	De Feo et al. (1992), De Feo and Senatore (1993)
<i>Lotus corniculatus</i> L.	Fabaceae	Tammaro and Pietrocola (1975), Tammaro (1984), Guarrera (1987)
<i>Micromeria greca</i> (L.) Benth	Lamiaceae	Amico and Sorge (1997)
<i>Muscari comosum</i> Miller	Liliaceae	Casoria et al. (1999)
<i>Onobrychis viciifolia</i> Scop.	Leguminosae	Guarrera (1987)
<i>Phragmites australis</i> (Cav.) Trin	Poaceae	Tomei and Gaspari (1981)
<i>Pulicaria dysenterica</i> (L.) Bernh.	Asteraceae	Guarrera (1994)
<i>Pulicaria odora</i> (L.) Rchb.	Asteraceae	Raimondo and Lentini (1990)
<i>Scorpiurus subvillosus</i> L.	Fabaceae	Tammaro and Pietrocola (1975)
<i>Scrophularia canina</i> L.	Scrophulariaceae	Chichiricò et al. (1980), Tammaro (1984), Guarrera (1987), Guarrera and Tammaro (1991), Guarrera (1994)
<i>Scrophularia nodosa</i> L.	Scrophulariaceae	De Feo and Senatore (1993)
<i>Sempervivum tectorum</i> L.	Crassulaceae	Ferri (1961), De Bellis (1978), Guarrera (1981), Bellomaria (1982), Maccioni and Marchini (1999), Viegi et al. (1999)

melongena (Manzi, 1989; Guarrera, 1994; Amico and Sorge, 1997). Snake bite was treated with root of *Polygonum bistorta* rich in tannins (Alps) (Picchi, 1999), or the bite whipped with a branch of *Rosa canina* (Latium) (Guarrera, 1994) to draw out the venom. Necrotic tissue was eliminated with proteolytic latex of *Euphorbia rigida* (Sicily) (Barbagallo et al., 1979a,b), and infection of wolf bite in cows and sheep was prevented in Latium with a poultice of oil and boiled rhizome of *Veratrum album* subsp. *lobelianum*, a known germicide (Guarrera, 1994).

3.4.2. Gastrointestinal complaints

A total of 96 plants are described for therapy of digestive problems, especially tympanism (49 plants), when rumination is blocked by overingestion of alfalfa and other fresh plants. Remedies include *Artemisia absinthium* (essential oil with thujon, thujol, artabsin, absinthin; proazulene) (Trentino-Alto Adige; central Italy) (Renzetti and Taiani, 1988; Guarrera, 1981, 1987, 1994; Pieroni, personal communication), *Linum usitatissimum* (mucilages) (central Italy) (Uncini Manganelli and Tomei, 1995; Viegi et al., 1999; Uncini Manganelli et al., 2001) and *Cynara cardunculus* subsp. *scolymus* (cynarin, cynaropicrin, flavonoids, chlorogenic and caffeic acids) (Latium, Liguria) (Guarrera, 1994; Maccioni and Marchini, personal communication). The digestive properties of some herbs are suggested by their names in dialect, for example, *Helichrysum italicum* (“erba rumine” in the Marches), *Santolina marchii* (“jerva de lu rume” in Abruzzo) (Guarrera, 1987) and *Sempervivum tectorum* (“rume”) in Tuscany and Marches (Guarrera, 1981). Active principles include bitter substances (many Asteraceae), glucosides (e.g. salicin in *Salix alba*), essential oils (*Helichrysum italicum*, *Santolina marchii*) and mucilage (*Linum usitatissimum*, *Malva sylvestris*). The practice known as “ròmico” arises from the need to reactivate rumination: it involves giving the animal to chew a branch of *Salix alba* (central Italy) (Corsi et al., 1981; Tomei and Gaspari, 1981; Manzi, 1989; Guarrera, 1987, 1994; Guarrera and Tammaro, 1991), *Fraxinus excelsior* (Tuscany) (Corsi et al., 1981; Uncini Manganelli et al., 2001) or shoots and sprigs of *Ficus carica* (Tuscany, Latium, Marches) (De Bellis, 1988; Guarrera, 1981, 1994). Yeast (*Saccharomyces cerevisiae*) is also used for this purpose (Viegi et al., 1999).

Twenty-three plants were used to treat diarrhoea, for example, *Ceterach officinarum*, *Geranium sanguineum*, *Geranium rotundifolium*, *Parietaria officinalis* (Liguria) (Bandini, 1961; Gastaldo et al., 1978; Maccioni and Marchini, 1999), *Myrtus communis* (Sardinia) (Atzei et al., 1991), *Ruta graveolens* (Marches, Calabria) (Bellomaria and Lattanzi, 1982; Picchi, 1999), usually justified by their content of tannins and other astringents. In Tuscany, an interesting plant used to treat diarrhoea in suckling calves and piglets is *Galium verum* (gallotannic acid) (De Bellis, 1986). Another unusual use not justified by any known active principle is that of *Phragmites australis* in Tuscany (Tomei and Gaspari, 1981; Uncini Manganelli et al., 2001).

Fifteen laxatives and purgatives include the well known *Malva sylvestris* (e.g. decoction with oil) (Corsi et al., 1981), and the lesser known *Apium nodiflorum* (mannite) (Tuscany) (Corsi et al., 1981) and *Borago officinalis* (allantoin, mucilage) (Abruzzo) (Manzi, 1989). Toxic plants unsuitable for human use, such as *Ecballium elaterium* (the glucoside elaterine is rather drastic) (Sicily) (Lentini and Aleo, 1991), *Euphorbia lathyris* (Tuscany) (Pieroni, 2000) and *Euphorbia spinosa* (Liguria) (Gastaldo et al., 1978) (latex containing euphorbone), *Hedera helix* (saponosides) (Liguria) (Bandini, 1961) and *Solanum nigrum* (solanine and other alkaloids) (Tuscany) (Chiavoni and Raffo, 1994; Pieroni, 2000), have also been used to treat animals. For example, a concentrated decoction of root of *Opuntia ficus-indica* with oil is given for tympanism in Pantelleria, Sicily (Catanzaro, 1968). Many vermifuges are also described (8) (*Allium sativum*, *Artemisia absinthium*, *Avena sativa*, *Calamintha nepeta*, *Cucurbita pepo*, *Glechoma hederacea*, *Juglans regia*, *Mercurialis annua*), some of them also once indicated in human therapy (Guarrera, 1999). Lack of appetite was treated with *Thymus pulegioides* (essential oil) in Abruzzo (Tammaro, 1976).

3.4.3. Kidney disorders

Eight plants are described as diuretics and four were used to treat cystitis. These species contain above all mineral salts (*Prunus cerasus*, *Parietaria officinalis*), glycosides (*Calluna vulgaris*), essential oils (e.g. *Allium sativum*, *Angelica sylvestris*, *Juniperus communis*, *Petroselinum crispum*) or saponins (*Scrophularia nodosa*). Some plants are also used in human medicine (*Prunus cerasus*, *Allium sativum*, *Calluna vulgaris*, *Cynodon dactylon*, *Juniperus communis*, *Parietaria officinalis*); others, such as *Scrophularia nodosa* (Campania) (De Feo and Senatore, 1993), are only known in veterinary medicine. Use of toxic plants, such as *Bryonia dioica* (Renzetti and Taiani, 1988) and *Helleborus niger* (Fossati et al., 1999), is also documented.

3.4.4. Respiratory ailments

The 20 plants used for respiratory problems mainly have antitussive, emollient and expectorant properties, largely due to balsamic essential oils and mucilage. They include *Glycyrrhiza glabra* (Abruzzo) (Manzi, 1989) and *Ficus carica* (Tuscany) (De Bellis, 1988) (emollients and expectorants) and *Helichrysum italicum* (antiinflammatory) (Benigni et al., 1962; Pieroni, 1999a). Unusual plants used for respiratory ailments include *Origanum heracleoticum* (essential oil) (Lucania) (Pieroni et al., 2002a) and *Sambucus nigra* (antiinflammatory ursolic acid, α -amirin, polyphenols, flavonoids) (Abruzzo, Latium) (Guarrera, 1987, 1994), but particularly *Convolvulus arvensis* (Friuli-Venezia Giulia) (Coassini Lokar and Poldini, 1988) and *Ferula communis* (Sicily) (Catanzaro, 1970). Some plants are potentially toxic: *Aesculus hippocastanum* (escine) (De Capite and Menghini, 1973), *Polygonatum multiflorum*, *Polygonatum officinale* (Umbria) (De Capite and Menghini, 1973)

(glucosides similar to convallarine from lily-of-the-valley) and *Helleborus bocconei* (substances similar to those of *Helleborus niger*) (Sicily, Calabria) (Raimondo and Lentini, 1990; De Fine, personal communication).

3.4.5. Reproductive disorders

Sixteen plants were administered before or after labour and delivery, 13 to increase milk production, 2 to reduce milk production, 9 for mastitis, 7 to promote estrus and 1 for acute orchitis.

Many plants were used in connection with birth, an important event in rural economy. Most were given as feed or tisan for depurative, refreshing and purgative purposes after delivery, for example, *Fumaria officinalis* (Ferri, 1961) and *Laurus nobilis* (Corsi et al., 1981) in Tuscany, or to facilitate expulsion of the placenta, for example, *Lycopersicon esculentum* in Abruzzo (Guarrera, 1987), *Rosa canina* in Trentino-Alto Adige (Renzetti and Taiani, 1988), *Rubia peregrina* in Tuscany (De Bellis, 1986) and Latium (Guarrera, 1994). Some of these plants contain substances that stimulate the uterine musculature, for example, anthraquinone glycosides in *Rubia peregrina* (Uphof, 1968).

Various plants were used to promote milk production in cows about to calve or after calving. They include: in Abruzzo *Carduus pycnocephalus* (Manzi, 1989), *Melilotus officinalis* (Tammaro, 1984), *Onobrychis viciifolia* (Guarrera, 1987), *Picris echioides* (Manzi, 1989) and *Scorpiurus subvillosa* (Tammaro and Pietrocola, 1975), in Tuscany and Marches *Galega officinalis* (De Bellis, 1988; Guarrera, 1990), in Latium *Borago officinalis*, *Melissa officinalis*, *Nasturtium officinale* and *Sanguisorba minor* (Guarrera, 1994) and in Liguria *Raphanus raphanistrum* (Gastaldo et al., 1978). In Abruzzo, aerial parts of *Heraclium sphondylium*, were dried and given to stimulate milk and as a reconstituent during lactation (D'Andrea, 1982). In Liguria, on the contrary, *Plantago major* and *Plantago lanceolata* were considered to reduce milk production (Maccioni and Marchini, 1999). For mastitis, antiinflammatory or emollient plants, such as *Brassica oleracea*, *Avena sativa*, *Anagallis arvensis*, *Linum usitatissimum* and *Scrophularia canina* were used; to prevent mastitis, *Buxus sempervirens* was placed in the litter of the cow stable (Tuscany) (Corsi et al., 1981).

A few plants were used to promote estrus in animals: *Avena sativa* (sprouting seeds) and *Prunus avium* (leaves) in Tuscany (Corsi et al., 1981), *Juniperus sabina* (leaves) and *Zea mays* (seeds and whole plant) in Abruzzo (Guarrera, 1987; Manzi, 1989), *Alchemilla* sp.pl. (leaves) in Trentino-Alto Adige (Renzetti and Taiani, 1988) and *Rubia tinctorum* (aerial parts) in Liguria (Bertagnon, 1955). These plants presumably contain hormonal substances, not yet studied by science. *Avena sativa* is also used in Campania to regulate menstrual flux in cows (Muoi and Menale, personal communication). It contains the alkaloid hordenin, with mild sympathicomimetic properties (Maugini, 1994). A curious custom was to tie sprigs of *Helleborus viridis*

under the tails of ewes which did not come into estrus (Versilia) (Corsi et al., 1981). Documentation exists on treatment with aerial parts of *Rubia tinctorum* for eight consecutive days (Bertagnon, 1955). However, plants such as *Helleborus viridis* and *Juniperus sabina* are potentially toxic, and are feared by shepherds and farmers.

Infusion of *Agrimonia eupatoria* is used in Sicily as an antiinflammatory in cases of acute orchitis (Catanzaro, 1970).

3.4.6. Nervous system disorders

Few plants are reported for these disorders, six are sedatives, seven antipyretics and three antidontalgics. Unusual sedatives were *Chrysanthemum parthenium* (Liguria) (Bandini, 1961) and *Erica arborea* (Campania) (De Feo et al., 1992; De Feo and Senatore, 1993), whereas *Papaver rhoeas* (Pantelleria) was regarded as facilitating assimilation of nutrients (Catanzaro, 1968). One use of *Papaver somniferum* (stupeficient latex) was to calm down particularly lively horses and donkeys before taking them to market (Manzi, 1989). An unusual use of *Lolium temulentum* as sedative (Manzi, 1989; Catanzaro, 1970) described for Sicily and Abruzzo can be attributed to traces of alkaloids, especially perlorline (or temuline) and a mixture of fungi of the genus *Chaetomium* which make it toxic (Gastaldo, 1987; Maugini, 1994). Indeed, cases of poisoning due to mixing seeds of *Lolium temulentum* with wheat flour have been documented. Against toothache, dangerous plants such as *Solanum nigrum* (Picchi, 1999), *Helleborus foetidus* and *Helleborus bocconei* (Leporatti and Pavesi, 1989) were used in Calabria. The anesthetic properties of a similar species, *Helleborus niger*, are known (Gastaldo, 1987; Schauenberg and Paris, 1977). As antipyretics, atypical use of the latter two species is documented, as well as *Helleborus viridis*, used to treat a series of complaints known by local names (Corsi and Pagni, 1978; Guarrera, 1994).

3.4.7. Ailments affecting the locomotor apparatus

Many plants are documented for treating dislocations (seven), contusions (five), inflammation of the hooves (three), fractures (three), lameness (three) and rheumatism (two). Besides the usual plants (*Brassica oleracea*, *Parietaria diffusa*, *Verbena officinalis*) (Guarrera, 1987; De Capite and Menghini, 1973; Nardelli, 1987; Amici, 1992) for dislocations and contusions, also used in human folk medicine, other less known plants such as *Ranunculus acris* (Liguria) (Gastaldo et al., 1978) and *Ranunculus bulbosus* (Sicily) (Barbagallo et al., 1979a) were reported. Many of these plants are rubefacients, for example, *Solanum nigrum* (solanin), *Ranunculus* sp.pl. (protoanemonin) and fruits of *Laurus nobilis*; others are antineuralgics, for example, *Brassica oleracea* (mirosin, mucilages, etc.) and *Verbena officinalis* (verbenalin, verbenin, essential oil). Fractures were immobilized with rudimentary casts made of spiny fruits of *Arctium lappa* (Guarrera, 1990) or wheat flour (Guarrera, 1994). Lameness was treated with *Hyoscyamus niger* and *Satureja montana* (Abruzzo) (Tammaro and

Pietrocola, 1975; Tammara, 1976) or *Juniperus oxycedrus* (Tuscany) (Mearelli and Tardelli, 1995).

3.4.8. Ailments of the sensory organs

Only four plants are documented for eye inflammations; one, *Anagallis arvensis* (“erba i l’occhi” in Sicily), with anti-inflammatory properties (Barbagallo et al., 1979a,b) and one, *Althaea officinalis* (Polesine), a known emollient (Corrain and Zampini, 1961).

3.4.9. Other ailments

Other plants are described for “mal rossino”, an infection due to *Erysipelothrix rhusiopathiae* (*Allium cepa*, *Veratrum album*) (Manzi, 1989; Corrain and Zampini, 1961), for epizootic aphtha (*Thymus pulegioides*, *Thymus vulgaris*, *Agropyron repens*, *Juglans regia*) (Gastaldo et al., 1978; Cappelletti et al., 1981; D’Andrea, 1982; Corrain and Zampini, 1961) and carbuncle (*Vitex agnus-castus*) (Picchi, 1999). The efficacy of these single uses has still to be verified.

3.5. Geography of folk veterinary medicine

The distribution of the data collected can be used to draw a map of folk veterinary remedies in Italy.

In northern Italy, besides species common to the rest of Italy, some medicinal plants with typical distributions for the Alps and northern Apennine were only described. For example, *Gentiana purpurea* (bitter compounds, for preventing various ailments) (Chioventa-Bensi, 1957), *Colchicum autumnale* (colchicine, external use against parasites) and *Peucedanum ostruthium* (essential oil, tonic bitter) (Coassini Lokar and Poldini, 1988). A peculiar cure for indigestion was dried resin of *Larix decidua* mixed with fodder and wrapped in pastry to form so-called “casunziei” (Barbini et al., 1999). Use of aerial parts of *Tanacetum vulgare* (essential oil with tanacetone) as a repellent is known from Venetum (Zampiva, 1981) and southern Italy (Picchi, 1999). *Calluna vulgaris*, a species typical of heathlands of northern Italy (extending in places into central Italy), is documented as a diuretic (arbutin, quercitrin, miritrin) (Bandini, 1961). *Cirsium eriophorum* (bitter compounds, essential oil) and *Betula pendula* (tannins, resins, etc.) (Trentino-Alto Adige) were used to treat diarrhoea (Renzetti and Taiani, 1988).

In central Italy, the many uses typical of this area (see e.g. Guarrera et al., 1998) include *Datura stramonium* hung in chickenhouses to repel lice (Teramo and Ascoli Piceno) (Tammara and Pietrocola, 1975; De Simoni and Guarrera, 1994) and decoction of aerial parts of *Scrophularia canina*, finely chopped or reduced to ash, to heal wounds (in Abruzzo and the mountains of Latium) (Manzi, 1989; Guarrera, 1987; Guarrera, 1994; Guarrera and Tammara, 1991). On Mt. Amiata (Tuscany) (De Bellis, 1986) and Monti della Tolfa (Latium) (Guarrera, 1994) for the expulsion of the placenta in cows the aerial parts of *Rubia perigrina* in fodder is still favoured; on the Majella (Abruzzo),

a decoction of leaves and roots of *Pteridium aquilinum* was used for the same purpose (Guarrera, 1987) as were sprigs of *Juniperus sabina* which, however, is toxic and abortifacient (sabinene), and is feared by shepherds who endeavored to extirpate it from pastures. Certain uses of *Fraxinus ornus* have been described as preventive. For *Helleborus* sp.pl., widely used in central Italy and elsewhere for certain animal diseases, see the section on toxic plants.

Species used widely in southern Italy and the major islands include *Atractylis gummifera* (against parasites) (Lentini et al., 1988), *Asphodelus microcarpus* (cicatrizing tubers ground and mixed with honey) (Amico and Sorge, 1997), *Muscari comosum* (bulbs with pepper used as revulsives) (Casoria et al., 1999), *Opuntia ficus-indica* (digestive and antiinflammatory) (Amico and Sorge, 1997). Use of *Origanum heracleoticum* as an antitussive is typical of southern Italy (Pieroni et al., 2002a) and the major islands. In Sicily and Calabria, *Urginea maritima* (Lentini, 1987; Lentini et al., 1988; Lentini and Aleo, 1991; De Fine, personal communication) and *Helleborus bocconei* subsp. *siculus* (Raimondo and Lentini, 1990; De Fine, personal communication) are widely used in veterinary folk medicine. In Sicily, inhalation of smoke of *Ferula communis* was used as an expectorant (Catanzaro, 1970). This plant can be poisonous to animals, especially in Sardinia where there is a particular chemical race (toxic coumarins) (Serafini et al., 1990).

3.6. Repellents and antiparasitics

Twenty-four plants with penetrating, sometimes unpleasant odors are documented as repellents, mainly for insects (*Anthemis cotula*, *Artemisia absinthium*, *Calamintha nepeta*, *Juglans regia*, *Laurus nobilis*, *Lycopersicon esculentum*, *Lupinus albus*, *Olea europaea*, *Sambucus ebulus*, *Sambucus nigra* and *Urginea maritima*) (Picchi, 1999; Guarrera, 1987, 1994; Renzetti and Taiani, 1988; De Capite and Menghini, 1973; Corrain and Zampini, 1961; Corsi et al., 1981; Bellomaria, 1982; Bellomaria and Della Mora, 1985; Manzi, 1989; Zampiva, 1981; Cappelletti, 1985; De Fine, personal communication). Some were also regarded as repellent for mice (*Anthemis cotula*, *Euphorbia lathyris*, *Urginea maritima*) (Picchi, 1999; De Bellis, 1988; Lentini and Aleo, 1991) and moles (*Euphorbia lathyris*, *Nerium oleander*) (De Bellis, 1988; De Fine, personal communication), or were used as mouse poison (*Euphorbia dendroides*, *Urginea maritima*) (Chioventa-Bensi, 1960; Lentini et al., 1988). Use of *Euphorbia lathyris* to protect crops against mice and moles is also mentioned in Pignatti (1982). Species most widely used in the different regions of Italy include *Juglans regia* (Trentino-Alto Adige, Umbria, Latium, Abruzzo) (Renzetti and Taiani, 1988; De Capite and Menghini, 1973; Guarrera, 1994; D’Andrea, 1982), *Euonymus europaeus* (central Italy, Sardinia) (De Capite and Menghini, 1973; Bruni et al., 1997), *Lupinus albus* (Venetum, central Italy) (Corrain and Zampini, 1961; Corsi

et al., 1981; Bellomaria and Della Mora, 1985; Manzi, 1989), *Artemisia absinthium* (Piedmont, Latium) (Picchi, 1999; Guarrera, 1994), *Ruta graveolens* (Latium, Abruzzo) (Guarrera, 1987, 1994, 1995), *Sambucus nigra* (Venetum, Abruzzo) (Zampiva, 1981; Manzi, 1989), *Tanacetum vulgare* (Venetum, southern Italy) (Zampiva, 1981; Picchi, 1999) and *Veratrum* sp.pl. (Trentino-Alto Adige, Latium, Abruzzo) (Renzetti and Taiani, 1988; Guarrera, 1995; Tammaro, 1984). The repellent and antiparasitic properties of many species, and their active principles, are described in general (Gabriel, 1987; Lieutaghi, 1974, 1975; Paris and Moyse, 1967, 1971; Klocke, 1989) and specific works (Lans et al., 2000), and in a paper on folk remedies against parasites in central Italy (Guarrera, 1999). The above plants contain essential oils (e.g. *Calamintha nepeta*, *Juglans regia*, *Laurus nobilis*), cyanogenetic glucosides (*Sambucus ebulus* and *Sambucus nigra*), cardiac glucosides (*Nerium oleander*, *Urginea maritima*), euphorbone (*Euphorbia* sp.pl.), tropanic alkaloids (*Lycopersicon esculentum*), and steroid alkaloids (*Veratrum* sp.pl.). A curious use is that of *Cestrum parqui* (“erva fetusa”) planted along hedges in Calabria so that its odour will discourage domestic animals except cows (De Fine, personal communication).

3.7. Toxic plants

Seventy-two plants with some degree of toxicity for humans and animals (Cooper and Johnson, 1984; Debelmas and Delaveau, 1978; Verona, 1984) are documented, consisting of just under 30% of all the plants used. Plants which can be toxic if overabundant in fodder are not considered toxic for the present purposes. Substances responsible for the toxicity of these plants include alkaloids (coniine in *Conium maculatum*, colchicine in *Colchicum autumnale*, atropine, joscine and scopolamine in *Atropa belladonna*), cardiac glucosides and cyanogenetic glucosides present in many Rosaceae. Some antiparasitic plants can be lethal at sufficient doses to small animals: for example, the rat poison *Urginea maritima* (Sicily) (Lentini et al., 1988). Very toxic plants are generally used externally, for example, *Aconitum* sp., *Attractylis gummifera*, *Conium maculatum*, *Colchicum autumnale*, *Daphne mezereum* (antiparasitic) (Renzetti and Taiani, 1988; Lentini et al., 1988; Bellomaria and Della Mora, 1985; Coassini Lokar and Poldini, 1988) and *Conium maculatum* (abscesses and pimples) (Manzi, 1989). It is unclear how the custom arose of attaching various parts of plants of the genus *Helleborus* (*Helleborus bocconei*, *Helleborus foetidus*, *Helleborus viridis*) to the bodies of cows, sheep and pigs to treat various ailments (Padula, 1878; Bertagnon, 1955; Bandini, 1961; Corsi and Pagni, 1978; Pagni and Corsi, 1979; Corsi et al., 1981; De Bellis, 1986; Nardelli, 1987; Leporatti and Pavesi, 1989; Guarrera, 1990, 1994; Lentini and Raimondo, 1990; Uncini Manganelli and Tomei, 1996, 1999a; Fossati et al., 1999; Viegi et al., 1999; Uncini Manganelli et al., 2001; De Fine, Maccioni, Maccioni and Guazzi, Pieroni, personal commu-

nication). A similar use is described for *Pulicaria odora* in Sicily (Raimondo and Lentini, 1990) and for *Salvia verbenaca* in Apurium (De Simoni and Guarrera, 1994).

Use of *Mercurialis annua* as a purgative in Campania and Lucania (De Feo and Senatore, 1993; Pieroni et al., 2002a), and in other parts of central and northern Italy (Bandini, 1961; Guarrera, 1981; Manzi, 1989) should not be encouraged because it contains substances that accumulate in the body (saponine, methylamine, trimethylamine, atractyloside).

Less known toxic plants include *Coriaria myrtifolia* (Maccioni, personal communication), *Laburnum anagyroides* (Cappelletti et al., 1981), *Teucrium chamaedrys* (De Bellis, 1978, 1988; Bellomaria, 1982; Manzi, 1989) and *Tanacetum vulgare* (Zampiva, 1981; Cappelletti, 1985; Picchi, 1999). As far as the Solanaceae, a family containing dangerous alkaloids (e.g. atropine, josciamine), are concerned, no uses are recorded for *Atropa belladonna* and the genus *Mandragora*, whereas *Hyoscyamus niger* is described for external use for lameness in Abruzzo (Tammaro and Pietrocola, 1975) and *Datura stramonium* against lice in the chicken house (Tammaro and Pietrocola, 1975; Guarrera, 1990; De Simoni and Guarrera, 1994). Besides being indicated for external use, some toxic species are also described for internal use, for example, *Solanum nigrum* for toothache (Picchi, 1999) and as purgative (Chiavoni and Raffo, 1994; Pieroni, 2000).

3.8. Other uses

Some plants were used as dietary supplements to give shine to horses' coats: *Agropyron repens* in Venetum (Zampiva, 1981) and Latium (Guarrera, 1994); *Urtica dioica* in Abruzzo (Tammaro, 1984). While *Agropyron repens* contains a mucilaginous compound, triticin, and an antibiotic, agropirene, *Urtica dioica* is rich in dietetic substances (see Section 3.3).

Magic uses represented a low percentage as compared to all other uses. *Clematis vitalba* was wound around the neck of cattle to cure conjunctivitis (Tuscany) (Viegi et al., 1999) and around the abdomen for abdominal problems (Marches) (Guarrera, 1990). *Echium vulgare* was used as a remedy for snake bite in Abruzzo (Tammaro, 1976) perhaps based on the medieval doctrine of the signature, because the mouth of the corolla resembles an open mouth.

Use of *Datura stramonium* (Calabria) (De Fine, personal communication) for animals that feel lonely or are afraid of darkness seems more magic than medical. Some medical uses have magic rituals attached to them. For example, when *Helleborus bocconei* subsp. *siculus* is used in Calabria to cure bronchitis, it should be picked on a Friday (De Fine, personal communication); *Cornus sanguinea*, known as “sanguinello” due to its red colour in autumn, is used to treat “mal del sangue” (Picchi, 1999); *Tamarix gallica* is used in Sicily with the aid of an incantation to treat infections caused by an insect (Raimondo and Lentini, 1990).

3.9. Plants not yet well known in modern phytotherapy

Plants in this category include several species of different families (Table 6).

Achillea ligustica, used to cure sheep scabies in Latium, is relatively unknown in modern pharmacology. Flavonoids and guaianolides have recently been isolated from the aerial parts of this species (Bruno and Herz, 1988; Tzakou et al., 1995), but no phytopharmacological data is available in the literature.

The genus *Asphodelus* is phytochemically not very well known, and only the aerial parts of *Asphodelus fistulosus* have been investigated (where a few anthraquinones and the flavones chrysoeriol and luteolin were found (El-Fattah, 1997)); nothing is known about the vulnerary properties of tubers of the genus *Asphodelus*, which was recorded in the ethnoveterinary practices of Sicily.

Lavatera cretica extracts have recently been found to have anti-insect activity (Pascual-Villalobos and Robledo, 1999), but the use of this species as cholagogue in folk veterinary medicine of Campania merits investigation.

The vulnerary use of *Chrozophora tinctoria* should be better investigated, because other species of the same genus have recently been found to contain interesting diterpene and phenylpropanoid glucosides (Mohamed et al., 1994; Mohamed, 2001).

Micromeria graeca is well known in phytotherapy for its antibacterial activity due to monoterpenes in its essential oil, but the specific antiinflammatory effect emerging from folk veterinary uses requires further investigation, in view of the fact that flavones (acacetin glycosides)—known for a wide range of pharmacological properties—have recently been isolated from the genus *Micromeria* (Marin et al., 2001).

Sempervivum tectorum, used to reactivate rumination in central Italy, is another example of a potentially interesting species for future veterinary phytotherapy. B2 type procyanidins could be major components of the polymeric polyphenol fraction of fresh leaves of *Sempervivum tectorum* (Abram and Donko, 1999); the antioxidant, antimicrobial and antihyperlipidemic effects of its extracts have already been demonstrated (Blazovics et al., 2000 and references therein).

No recent phytochemical or phytopharmacological studies have yet been carried out into the aerial parts of *Apium nodiflorum*, *Asplenium trichomanes*, *Ceterach officinarum*, *Onobrychis viciifolia*, *Lotus corniculatus*, *Phragmites australis*, *Pulicaria* sp.pl., *Scorpiurus subvillosus* or *Scrophularia canina*.

Many other plants used in certain peculiar folk veterinary remedies are not yet much used in clinical phytotherapy, for example, *Fraxinus ornus*, *Marrubium incanum* and *Marrubium vulgare*.

Aerial parts of *Fraxinus ornus* contain compounds belonging to groups of hydroxycoumarins, secoiridoid glucosides, phenylethanoids and flavonoids. Biological studies reveal significant antimicrobial, antioxidative, photody-

namic damage prevention, wound healing, antiinflammatory, immunomodulatory and antiviral activities, explaining use of the bark in folk veterinary medicine (Kostova, 2001 and references therein).

Marrubium incanum and *Marrubium vulgare*, considered to be medicinally equivalent in Lucania, were used against foot and mouth disease in the northern part of this region. *Marrubium vulgare* extracts were analysed in recent phytopharmacological studies and antioxidant, anti-spasmodic, hypotensive, anti-asthmatic and analgesic properties were found (Hänsel et al., 1999), most ascribed to its furanic labdane diterpenes. No other pharmacological studies have yet been done and its folk veterinary properties still have to be investigated.

4. Conclusions

The data gathered will be used to create the first national databank of folk veterinary medicine. Further studies are underway into the veterinary heritage of Tuscany, Liguria, Calabria, Apulia, Lucania (Pieroni, 1999a, 2000, 2002a; Viegi et al., 1999) and Molise (Guarrera, 2002), to complete the databank. The databank, actually in Italian, will be available as soon as possible, in English, to all vets, botanists and pharmacologists interested in the development of alternative therapies or involved in programs of sustainable land use. For less known species, the databank could prompt phytochemical, biological and phytopharmacological research into new therapeutic substances for veterinary drugs.

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