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PLANTS EMPLOYED IN TRADITIONAL VETERINARY MEDICINE BY THE CRIOLLOS OF THE NORTHWESTERN ARGENTINE CHACO

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ABSTRACT: Scarpa, G. F. 2000. Plants employed in traditional veterinary medicine by the criollos of the Northwestern Argentine Chaco. *Darwiniana* 38(3-4): 253-265.

A total of 81 uses of a veterinary nature were recorded for 61 native and exotic plant species belonging to 54 genera and 37 botanical families, among the peasants of the Argentine Semiarid Chaco. The scientific and vernacular names, parts employed, forms of preparation and administration, and specimens examined are listed for each of the taxa involved. Half the plant remedies referred to are used as vulneraries, oxitocics, purges, antidiarrhetic, and expectorants. Cows, horses, and dogs receive the greatest attention. Veterinary uses of plants show that these people's therapy involves different approaches to treatment: the ancient Hippocratic medicine, magical procedures and Christian religious practices.

Key words: Ethnobotany, Medicinal plants, Veterinary medicine, Semiarid forest, Chaco.

RESUMEN: Scarpa, G. F. 2000. Plantas empleadas en la veterinaria tradicional de los criollos del Chaco Noroccidental argentino. *Darwiniana* 38(3-4): 253-265.

Se registraron un total de 81 usos de tipo veterinario para 61 especies nativas y exóticas, correspondientes a 54 géneros y 37 familias botánicas, entre los campesinos del Chaco Semiárido argentino. Los nombres científicos y vernáculos, las partes usadas, las formas de preparación y administración y el material examinado son incluidos en una lista para cada uno de los taxones consignados. La mitad de los remedios vegetales referidos se emplean como vulnerarios, oxitócicos, purgantes, antidiarreicos y expectorantes. Vacunos, caballos y perros reciben la mayor atención. El uso de las plantas en su veterinaria tradicional evidencia una combinación de diferentes técnicas terapéuticas: antigua medicina hipocrática, procedimientos mágicos y prácticas religiosas cristianas.

Palabras clave: Etnobotánica, Plantas medicinales, Medicina veterinaria, Bosque semiárido, Chaco.

INTRODUCTION

The criollos of the northwestern Argentine Chaco represent a folk society dedicated to extensive cattle-breeding. Their lives gravitate around caring for their cattle, which constitute their greatest capital and are a symbol of social prestige. As is the case with the majority of pastoral communities, caring for their cattle as well as the therapy and prevention of their diseases is of the greatest importance to them.

Studies on traditional veterinary medicine in Argentina are very rare, if one keeps in mind the extremely important position cattle-breeding has always held in the lives of this country's peasants. Among those studies we can point out the papers of Lombardero (1948); Ambrosetti (1976), and Bartolomé (1968) on the Argentine pampas, Jiménez de Puparelli (1984) for the coastline of the Paraná River, and Daoud (1954; 1955) for the western Chaco. These studies approach the subject from a purely anthropological or folkloric viewpoint, without any specific references to the plants employed in veterinary medicine.

Apart from being quite an infrequent aspect of traditional ethnobotanical studies, the plants involved in healing animals gain special importance due to their contribution to explore the mechanisms through which a community develops its pharmacognosy. In fact, very little is known as yet regarding the part played by domestic animals in the trial-and-error tests with plants which are carried out by a specific community before incorporating them into its traditional medicine. Furthermore, the confrontation between the veterinary and human medical uses of plants gives us the opportunity of analysing the way in which both types of practices can be interrelated as regards the health systems of pastoral communities.

The use of plants by a given people is a reflection and a support of their technological, ideological, and cultural peculiarities (Bates, 1985). Thus, the approach employed here to describe the veterinary uses of plants is one that fits them into the sociocultural context in which their use actually take place (Arenas 1986; Alexiades & Wood Sheldon, 1996). On this basis, the bibliography used to confront the particular uses of these plants is restricted to studies on traditional veterinary medicine for the area in question or adjoining areas.

The great variety of folk diseases referred to cattle, together with the numerous procedures and vegetable, animal and mineral elements involved in their therapeutics, reveal the importance of this aspect for the Criollo people of the semiarid Chaco. The object of this research is to record the employment of plant species in the treatment of cattle diseases in its precise cultural context. This paper is part of a broader project destined to summarize the lore and practices of the criollos of the northwestern Chaco in relation to their plant environment, and to study the multiple roles played by plants in their lives.

THE STUDY AREA

The study area lies in NW of Argentina, in the province of Formosa, between lat. 23º 15' to 24º 15' S, and long. 61º 30' to 62º 30' W. The surveys were carried out in the rural settlements of Pozo de Maza, Pescado Negro, El Quebracho, Vaca Perdida, El Chañaral, and La Rinconada, in the Bermejo district; and in Campo Grande and Fortín Belgrano in the Matacos district (Fig.1).

This area is located in the western district of the Chaco's phytogeographical province, Neotropical Region. Its vegetation consists of almost continuous xerophitic deciduos forest, alternating with halophilous steppes in flooded areas of the marshlands, some palm groves, and edaphic savannahs which are sometimes induced by fires or land-clearing (Cabrera, 1971; Cabrera & Willink, 1980). The principal tree communities of the region belong to the "quebrachal - palo santal" [dominated by *Schinopsis lorentzii* (Anacardiaceae) and *Bulnesia sarmientoi* (Zygophyllaceae)], to be found between river courses, and the "algarrobales" [dominated by *Prosopis* sp. (Fabaceae)] in the middle and low areas of the altitudinal gradient.

The climate in this region is noted for its scant annual rainfall, that does not exceed 700 mm, and is concentrated during the summer months. The temperature regime is megathermal, although frosts sometimes occur during the months of July and August (Ledesma, 1973; Barbona et al., 1990). The land-forms of the region are notably flat, and are shaped mainly by the fluvio-morphological activity of the Pilcomayo and Bermejo rivers, which defines numerous river bends and tributary streams in different parts of the area (Adámoli et al., 1972). At present, most of this area has been degraded due to cattle-breeding and tree-felling. Owing to overgrazing, former pastures have often been replaced by dense thickets of woody species and by columnar and trailing Cactaceae.

THE CRIOLLOS OF THE SEMIARID CHACO FOREST

The Criollos of the northwestern Chaco are descendants of the first Spanish-Quichua settlers who arrived to the region at the beginning of this century. The criollo way of employing plants was influenced by three cultural currents: the hispanic traditions inherited from the former spanish settlers arriving at the northwest of Argentine; the Andean cultures with which they were in contact since the beginning of the 16th century, and the different Chaco ethnic traditions they encountered during their progress eastwards. The Spanish-Quichua characteristics predominate, and are manifest in every aspect of their daily lives: food habits, economics, settlement patterns, housing, social connections and local plant names, among others. The criollos practice the Roman Catholic faith, and, to a lesser degree, rituals and beliefs linked to the Andean cultural traditions.

The majority of the criollos carry out a particular type of extensive cattle breeding. This consists in letting the cattle wander freely through the forests and marshes (which are not fenced) with periodical trips around the area to verify the cattle's general condition. These activities require a very reduced technological investment, and the husbandry patterns have not changed very much with the passage of time.

Due to their isolated situation and their conservative ways, the criollos of the northwestern Chaco still preserve rich knowledge as regards the vegetation surrounding them. Preliminary studies

Fig. 1.- Locations of the rural settlements in northern Argentina where surveys were carried out.

(Sturzenegger, 1987; Scarpa, ms.) show that the criollos of this region can be considered bearers of the oldest traditions of the Western Argentine Chaco's criollo culture. Nonetheless, at the present time this valuable knowledge is being lost owing to cultural changes closely linked to urban life.

FARM ANIMALS

The animals treated with the traditional criollo veterinary medicine belong in their entirety to animals of extra-american origin, such as cows, horses, goats, sheep, pigs, hens and dogs. Cows, horses, and dogs receive the greatest attention. In fact, the condition and number of their cows and horses represent the bulk of the criollo's greatest wealth, and give them the most prestige within their social circle.

The beef cattle (*Bos taurus*, Bovidae) are bovids of Iberian origin, and were introduced into the region at a very early date (about the middle of XVIth century). As Inchausti & Tagle (1980) point out, they belong to the "criollo" type, and are well adapted to life in the forest on account of their toughness and resistance to disease. Their chief characteristics are: small in size (1.35 m. in height), relatively long legs, not much width of hip, low

precocity, and a weight of between 250 kg and 400 kg, reached with very little improvement needed (Inchausti & Tagle, 1980).

Horses still form the criollo's principal method of transportation. Even though they do not generally own more than five of these animals –and sometimes not even one- the care they lavish on them amply surpasses that given to any other animal. This is clearly demonstrated by the disproportion between the numerous veterinary practices they are subjected to and their limited number. As regards goats, pigs, and to a minor degree, sheep, are also fairly common in this area. Goats are specially cared for by criollos of a low social standing, as they represent the only way these people have to be a stock farmer. Finally, dogs also receive special attention; criollos usually train one of their dogs to watch their home, and the rest as herd dogs to look after their flocks.

Due to the characteristics of this type of cattle-breeding and to the forest's low capacity of forage supply, the general health conditions of these animals are very poor. The most widely spread diseases in this area, according to the Rural Society of the town of Ing. G. N. Juárez, are skin myasis, acute metritis, carbuncle, keratitis, neonatal diarrhea, horn's fly [ectoparasitism due to *Haematobia irritans*, Muscidae (Romano & Ferrari, 1993)], and "tristeza" [tick fever or piroplasmosis (Mayer, 1993)].

MATERIALS AND METHODS

The ethnobotanical data were obtained during six field trips carried out during July and December 1996, July 1997, February and September 1998, and March 1999. A total of 83 informants provided to semistructured interviews, during which they were interrogated on the uses of plants in general and on traditional veterinary medicine in particular. A "base interview" was drawn up in advance using the bibliographical reviews on the subject, which served as a methodological tool for carrying out this research. The surveys were recorded on tapes and/or set down in field books. These documents are filed in the CEFYBO archives.

The ages of the informants ranged from 50 to 90 years old; 47 were men, and 36 women. Surveys were especially aimed at distinguishing the nature of the different folk diseases for which the plants were used. The scientific equivalents of each folk disease are approximate terms; they were obtained with the help of descriptions given by the informants, and through the book by Mayer (1993).

The consensual criteria employed in order to validate the information obtained was that at least two informants had to report the same use of the same part of the same plant species. Data on veterinary uses stated here were compared solely with bibliography on the uses of plants found in the cultural area in question and its adjoining areas, so that the comparisons would be plausible from an ethnobotanical point of view.

The vegetable matter was gathered in the company of qualified rural informants, and the local names given to the plants were recorded at the same time. The collections were identified by the author, except for a few cases in which he consulted experts (i.e., fungi). Voucher herbarium specimens have been deposited in the Herbarium of Useful Plants at CEFYBO under the "BACP" abbreviation (Holmgren et al., 1981).

RESULTS

A total of 81 uses of a veterinary nature were recorded for 61 native and exotic species belonging to 54 genera and 37 botanical families. In Appendix 1 the plant species employed for veterinary purposes are classified by their botanical family. Each one is given its local name, parts utilized, the diseases or disorders it cures, and a synthetical description of the manner in which it is prepared and administered.

In Table 1 there is a list of the species referred to for each veterinary use.

A great majority of the veterinary uses of plants is made up of vulneraries, oxitocics, purges, antidiarrheics, and expectorants. The considerable use of vulneraries is due to the many injuries caused by cactus thorns and other thorny plants, to a lesser degree, for disinfecting navels after removing the umbilical cord, and for injuries caused by skin myasis. The considerable use of oxitocics would show a high percentage of placenta retention in the bellies, produced by uterine atony. The latter disorder, according to Mayer (1993) is caused by out-of-term parturition, dystocial parturition or is due to undernourishment, owing to the poor quality of fodder in the area. It should be pointed out that the majority of antidiarrhetics and purges are administered to calves during the first weeks after birth. Finally, it must be noted that those plants

Table 1.- Number of species referred to for each veterinary use.

Specific use	Number of species	Specific use	Number of species
Vulneraries	14	Against skin myasis	2
Oxitocics	12	Internal parasiticides	2
Purges	9	As preventive fumigations	2
Antidiarrhetics	7	Against hypothermias	2
Expectorants	6	Febrifuges	1
Galactactogenous	4	Digestives	1
Emetics	4	Against hematuria	1
Cicatrizants	3	Against insolation	1
Against canine distemper	3	Against keratitis	1
Instruments	3	To remove thorns	1
Diuretics	3		

having emetic and galactogenous qualities, as reported by the informants, are consumed spontaneously by the domestic animals.

The preparation of veterinary remedies includes, apart from plants, numerous items of animal or mineral origen. There is a marked use of grease made from different wild animals, and table salt, which is widely diffused. As also occurs with traditional human medicine, the remedies are made by the decoction, maceration and incineration of different parts of plants. They are usually administered orally, and less frequently by being applied directly, through bathing, inhalations or by dipping and rubbing. As occurs in most folks medicines, the prescribed doses are not stipulated with precision, and when they are needed, there is no actual agreement on the exact amounts.

Animal healing is not a specialized activity in this community. As occurs with most folk knowledge, it is mainly socialized among the population. Nonetheless, there is a clearly-defined division of tasks as regards animal husbandry; the women attend to, and heal, goats and sheeps, while the men see to the cows and horses.

The analysis of the veterinary uses of plants, the ways of preparing and administering them, and the opportunity for using them should be interpreted from the viewpoint of the health system corresponding to the cultural context of the communities where this takes place. It has been possible to identify two differents therapeutical approaches in curing animals with plants: the "hot-cool" syndrome, and religious and magical techniques.

The "hot-cool" syndrome derives from the Hippocratic humoral theory and is still in force in the traditional folk medicine of numerous Spanish American peasant groups (Foster, 1953; Currier, 1966; Goldwater, 1983; Girault, 1987). According to the latter, health is conceived as the equilibrium between a "hot" nature and a "cool" nature, and the loss of this balance causes the disease. In this manner, the etiology of many diseases is characterized by an excess of what is "hot" or of what is "cool". Thus, the healing plants are classified as "hot" or "cool" as opposed to the nature of the diseases for which they are prescribed. Among the plant medicines considered "cool" we find those prepared with *Baccharis salicifolia* (Asteraceae) and *Capparis tweediana* (Capparidaceae), and which are used to cure anuria, acute indigestion and fever, which are all complaints of a "hot" type. Likewise, "hot" remedies such as those prepared with *Clematis montevidensis* (Ranunculaceae) and *Pectis odorata* (Asteraceae) are administered in order to cure acute adenitis and placenta retention respectively, that is to say, "cool" disorders.

Furthermore, as occurs in traditional human medicine, the religious and magical techniques existing in their folk veterinary medicine are of considerable importance. We were told of an analogy between the phases of the moon and the enlargement or reduction of an injury, so that the cure should be performed during the waning of the moon. It is also very usual for plant parts to be employed which face east ("from the sun rises"), and the numbers 5, 7, 9 and particulary number 3, for the amounts of plant

parts used or doses administered. In some of the cures, magic by contagion and by resemblance were identified in the Argentine folk veterinary medicine by Bartolomé (1968) and by Jiménez de Puparelli (1984). Examples of these latter kinds of cures are to be found in the treatment for skin myasis and for canine distemper. Against the first one, only treatments with *Synandrospadix vermitoxicus* (Araceae) and *Capparis speciosa* (Capparidaceae) were mentioned (see Appendix 1). However, the majority of criollos resort to certain individuals (endowed with a gift known as "el secreto") that carry out a special therapy by invoking supernatural forces. These techniques are performed with rituals called "cura de palabra" (healing by words) and "cura por el rastro" (healing through traces), which involve magical and/or religious elements such as spells, prayers, or invocations to God and/or the saints. Canine distemper is cured with necklaces made of corn cobs; this is clearly a treatment through magic. It consists in throwing corn cobs on lighted embers, and then cutting them into 3 or 7 pieces; a hole is bored lengthwise into each of these pieces, which are then strung together on a red thread. This necklace is hung round the dog's neck; the informants say that when the necklace falls off, so will the sickness "fall off". The same technique was also found in Andalucía, Spain (González Tejero et al., 1999).

The practices referred to in this paper take place together with those connected with current academic veterinary medicine. For several decades now, many criollos have access to remedies and vaccines for treating their animals' diseases, and thus the surveys show a tendency to reduce the use of traditional remedies.

DISCUSSION

It is significant that a large number of the names of diseases, etiologies, ways of administering the remedies and specific therapeutics are identical, for veterinary purposes and for traditional human medicine (see Scarpa, ms.). The 60 % (49) of the reports stated as therapeutic have an identical correlation in human medicinal therapy [a high correlation between plant uses in human and animal folk medicine is also referred by Blanco et al. (1999) for the NW of Spain, and by Lans et al. (2000) for Trinidad and Tobago]. Also, the health criteria previously described are valid in all their facets both for veterinary medicine as well as for traditional human medicine. All these similarities make it perfectly clear that a close relationship between veterinary medicine and traditional medicine exists, both of which respond to a similar conception of disease, health and cures, that is to say, the same health system.

One of the differences observed between both types of uses is that in veterinary medicine, salt and/or oil are part of the same plant preparations used to treat human ailments. Regarding medicinal plants, our informants declare that "if they are good for human beings, then they should also be good for animals". This seems to suggest that medical knowledge is more frequently used as an experiment in veterinary practices, and not the other way around. This supposition is consistent with the enormous superiority of medicinal uses over veterinary uses (see Scarpa, ms.), and with the large number of coincidences between both types of use.

CONCLUSIONS

Plants play an outstanding part in the folk veterinary medicine of these people. A total of 81 reports were recorded, in which 61 plant species participate in the therapeutics of 20 types of animal ailments.

Veterinary uses of plants, their forms of preparation, administration and correct time of employment show that these people's therapy involves different approaches to treatment: the ancient Hippocratic medicine, magical procedures and Christian religious practices.

Traditional veterinary medicine is not an isolated aspect of the culture of northwestern Argentine Chaco's peasants, but one more manifestation of a health system conceived by its people. This is evident in the high degree of coincidence between the veterinary and human medicinal uses of plants, in the notable homology between the ways of preparing and administering them and in the therapeutic criteria involved in both types of health practices.

The results of this study emphasize the high degree of refinement of these people's empirical knowledge of plants, as well as of how greatly they value their farm animals.

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Apendix 1.- Plants used in traditional veterinary medicine by the peasants of Northwestern Chaco. References: [1]. ST: stalk; LE: leaf; AP: aerial part; BK: bark; TV: tuber; NU: nutgalls; RT: root; FL: flower; FR: fruit; DU: duramen; STG: stigma; SE: seed; BU: bulb; SP: spore; MR: cob. [2]. (*): Therapeutic uses with an identical function in human traditional medicine. Dec.: decoction; Int.: ingested or inhaled; Ext.: used externally. [3]. All the specimens examined belong to the province of Formosa, Argentine Republic.

Botanical name	Local name(s)	Part used [1]	Veterinary uses, modes of preparation and administration [2]	Specimens examined [3]
FUNGI				
LYCOPERDACEAE				
Calvatia fragilis (Vitt.) Morg.	Flor de la tierra	SP	Cicatrizant*. Its spores are sprinkled on any type of injury. Ext.	*Dpto. Matacos*: Fortín Belgrano, 1-III-1998, *Scarpa s.n.* (M-BACP 1262).
TULOSTOMATACEAE				
Battarrea stevenii (Libos.) Fr.	Flor de la tierra	SP	Cicatrizant*. Ditto the above. Ext.	*Dpto. Matacos*: Campo Grande, 20-II-1998, *Scarpa s.n.* (M-BACP 1260).
PHANEROGAMAE				
AMARANTHACEAE				
Amaranthus viridis L.; *Amaranthus quitensis* Kunth	Ataco	AP	For horse hematuria*. Dec., int.	*A. viridis*. *Dpto. Bermejo*: La Rinconada, 10-XII-1996, *Scarpa 185* (BACP); *A. quitensis*. *Dpto. Matacos*: 5 km. al este de Ing. G. N. Juárez, 5-IV-1999, *Scarpa 352* (BACP).
ANACARDIACEAE				
Schinus fasciculata (Griseb.) I.M. Johnst. var. *fasciculata*	Molle pispito	AP	Oxitocic*. For uterine atony in goats and cows. For when the placenta is not expelled after giving birth. Dec. int.	*Dpto. Bermejo*: El Pelícano, 20-VII-1996, *Scarpa 103* (BACP); *Dpto. Matacos*: Campo Grande, 5-II-1998, *Scarpa 288* (BACP).
APOCYNACEAE				
Aspidosperma quebracho-blanco Schltdl.	Quebracho blanco	ST	Vulnerary. A decoction is made with pieces of its alburnum to bathe animal's injuries. A similar use is noted by Ávila (1960:86) for Santiago del Estero.	*Dpto. Bermejo*: Pozo de Maza, 30-III-1999, *Scarpa 387* (BACP).
Vallesia glabra (Cav.) Link	Ancoche	LE	Vulnerary*. After the previous operation, the myasis is bathed. Dec. ext. The same use is quoted by Villafuerte (1961:54) for the province of Catamarca.	*Dpto. Matacos*: Santa Rita, 7-X-1998, *Scarpa 306* (BACP).
		ST	Small spatulas are made with its wood to remove maggots when curing skin myasis. Ext.	
AQUIFOLIACEAE				
Ilex paraguariensis A. St.-Hil.	Yerba	AP	Purgative*. Infusion with oil and salt for acute constipation in horses. Int.	
		AP	Expectorant. For acute adenitis. By burning incense with *Clematis montevidensis* and sulphur placed in a "quirquincho's" (*Chaetophractus villosus*, Dasypodidae) shell. Ext.	
ARACEAE				
Synandrospadix vermitoxicus (Griseb.) Engl.	Sacha col, pelamano	TU	Vulnerary and for skin myasis. A hole is made in the tuber with a knife, and the liquid it contains is allowed to fall on the injury. Ext. The same use is cited by Villafuerte (1961: 265).	*Dpto. Matacos*: Campo Grande, 20-II-1998, *Scarpa 62* (BACP).

Botanical name	Local name(s)	Part used [1]	Veterinary uses, modes of preparation and administration [2]	Specimens examined [3]
ASCLEPIADACEAE				
Funastrum gracile (Decne.) Schltdl.	Tramontana	AP	Galactagog for cows. On occasions it is gathered as fodder or they consume it on the spot. The reason for its employment would be associated to this plant's milky latex for magic by resemblance.	*Dpto. Matacos*: Fortín Belgrano, 1-III-1998, *Scarpa 65* (BACP).
ASTERACEAE				
Ambrosia tenuifolia Spreng.	Altamisa	AP	For horses' insolation*. Its branches are put under the saddle, in contact with the animal's hide. Ext. Internal parasiticide* for horses. Dec. int.	*Dpto. Bermejo*: 5 km al norte de La Rinconada, 8-XII-1996, *Scarpa 43* (BACP); *Dpto. Matacos*: Campo Grande, 5-III-1998, *Scarpa 289* (BACP).
Baccharis salicifolia (Ruiz & Pav.) Pers.	Suncho	AP	Vulnerary. Its leaves are boiled and then left to cool. It is applied directly on to injuries. Dec. ext.	*Dpto. Bermejo*: Pescado Negro, 31-V-1996, *Arenas 3550* (BACP).
		AP	Diuretic*. Against horse anuria. Dec. left to cool, int.	
		AP	Expectorant* against horse acute adenitis. Inhalations are made with a decoction of the aerial part of this plant, slivers of *Bulnesia sarmientoi* and salt.	
Pectis odorata Griseb.	Manzanilla del campo	AP	Oxitocic*. For uterine atony in goats and cows. For when the placenta is not expelled after giving birth. Dec. int.	*Dpto. Bermejo*: El Pelícano, 20-VII-1996, *Scarpa 119* (BACP).
Pluchea sagittalis (Lam.) Cabrera; *Pluchea microcephala* R.K. Godfrey	Cuatro cantos	AP	Vulnerary*. For bathing wounds. Dec. ext.	*P. sagittalis*. *Dpto. Matacos*: Campo Grande, 1-II-1998, *Scarpa 63* (BACP); *P. micocephala*. *Dpto. Bermejo*: La Rinconada, 9-XII-1996, *Scarpa 173* (BACP)
		AP	Antidiarrhetic*. Against neonatal diarrhea. Dec. int.	
Tessaria integrifolia Ruiz & Pav.	Bobo, palo bobo	ST	Stick used to stop up the inside of goat's horns after treatment against tick fever ("horn's fly") (see text).	*Dpto. Bermejo*: Pescado Negro, 27-VII-1996, *Scarpa 136* (BACP); La Rinconada, 10-II-1996, *Scarpa 197* (BACP).
CACTACEAE				
Opuntia quimilo K. Schum.	Quimil	ST	Its mucilage is applied externally to remove thorns from horses.	*Dpto. Bermejo*: 4 km al sur de Pozo de Maza, 25-III-1999, *Scarpa 393* (BACP).
CAPPARIDACEAE				
Capparis speciosa Griseb.	Bola verde, palo verde	BK	Vulnerary* and for skin myasis. It is ground over the sores. Ext.	*Dpto. Bermejo*: Pozo de Maza, 5-IV-1999, *Scarpa 370* (BACP).
Capparis tweediana Eichler	Hoja redonda, mata burro	LE	Antidiarrhetic*. Against neonatal diarrhea. Dec. with leaves of *Celtis chichape*. Dec. int.	*Dpto. Bermejo*: Pozo de Maza, 20-VII-1996, *Scarpa 39* (BACP).
CELTIDACEAE				
Celtis chichape (Wedd.) Miq.	Tala, tala pispita	LE	Antidiarrhetic*. Against neonatal diarrhea. Dec. with leaves of *Capparis tweediana*. Dec. int.	*Dpto. Matacos*: Campo Grande, 28-II-1998, *G. Scarpa 71*, (BACP); *Dpto. Bermejo*: El Pelícano, VII-1996, *Scarpa 77* (BACP).
		LE	Emetic. Dogs spontaneously eat its leaves when they suffer from indigestion.	

Botanical name	Local name(s)	Part used [1]	Veterinary uses, modes of preparation and administration [2]	Specimens examined [3]
CHENOPODIACEAE				
Chenopodium ambrosioides L.	Paico	AP	Antidiarrhetic*. Against neonatal diarrhea. Dec. with oil and salt. Int.	*Dpto. Bermejo*: El Chañaral, 19-XII-1996, *Scarpa 46* (BACP).
		AP	Internal parasiticide* for horses. Dec. int.	
		AP	Oxitocic*. For uterine atony in goats and cows. For when the placenta is not expelled after giving birth. Dec. int.	
CONVOLVULACEAE				
Ipomoea carnea Jacq. subsp. *fistulosa* (Choisy) D.F. Austin	Mandiyona	LE	Vulnerary*. Its leaves are boiled and left to cool. Applied directly on the wounds. Ext.	*Dpto. Matacos*: Campo Grande, 28-II-1998, *Scarpa 76* (BACP).
ERYTHROXYLACEAE				
Erythroxylum coca Lam. var. *coca*	Coca	LE	Oxitocic*. For uterine atony in goats and cows. Helps to expel the placenta after birth. Dec. with *Phoradendron liga*. Int.	*Dpto. Matacos*: Ing. G.N. Juárez, 1-IV-1999, *Scarpa s.n.* M-BACP 1271).
EUPHORBIACEAE				
Jatropha hieronymi Kuntze	Piñón, pelamano	FR	Purgative*. For acute constipation in horses. Dec. from its fruit divided into sections. Int.	*Dpto. Bermejo*: La Rinconada, 10-XII-1996, *Scarpa 193* (BACP); *Dpto. Matacos*: Campo Grande, 20-II-1998, *Scarpa 64* (BACP).
Sapium haematospermum Müll. Arg.	Lecherón	ST	Stick used to stop up the inside of goats' horns after treatment for tick fever ("hom's fly") (see text).	*Dpto. Bermejo*: Pozo de Maza, 31-III-1999, *Scarpa 385* (BACP).
		LE	Vulnerary*. For bathing wounds. Dec. ext.	
FABACEAE				
Acacia albicorticata Burkart	Espinillo	LE	Vulnerary*. Dec. ext.	*Dpto. Matacos*: Bolsa de Palomo, 25-IX-1998, *Scarpa 293* (BACP).;
Acacia aroma Gillies ex Hook. & Arn.	Tusca	LE BK	Vulnerary*. For bathing wounds. Dec. ext.	*Dpto. Bermejo*: La Rinconada, 1-IV-2000, *Scarpa 409* (BACP).
Geoffroea decorticans (Gillies ex Hook. & Arn.) Burkart	Chañar	BK NU	Oxitocic*. For uterine atony in goats and cows. For when the placenta is not expelled after giving birth. The nutgalls employed are those that have an echinulate surface. Dec. int.	*Dpto. Matacos*: Santa Rita, 9-X-1998, *Scarpa 312* (BACP).
Prosopis alba Griseb.	Algarrobo blanco, Árbol	FR	Galactagog for cows. On occasions it is gathered for fodder, or consumed immediately.	*Dpto. Bermejo*: 2 km al sudoeste de La Rinconada, 20-XII-1996, *Scarpa 48* (BACP); *Dpto. Matacos*: Campo Grande, 10-X-1998, *Scarpa 314* (BACP).
		LE	Purgative. Against acute constipation in horses. A decoction of leaves is employed together with one of yerba, oil and salt.	
Prosopis ruscifolia Griseb.	Vinal	FR	Galactagog for cows. It is consumed spontaneously.	*Dpto. Matacos*: Campo Grande, 10-X-1998, *Scarpa 313* (BACP).
		LE	Vulnerary*. Dec. with salt. Int.	
Senna morongii (Britton) H.S. Irwin & Barneby	Pita canuto	LE	Vulnerary*. For bathing all kinds of wounds. Dec. ext.	*Dpto. Bermejo*: Pozo de Maza, 17-VII-1996, *Scarpa 19* (BACP).

Botanical name	Local name(s)	Part used [1]	Veterinary uses, modes of preparation and administration [2]	Specimens examined [3]
LAMIACEAE				
Ocimum basilicum L.	Albahaca	SE	For keratitis* in cows. The seeds are placed directly in the animal's eyes. Ext.	*Dpto. Bermejo*: El Quebracho, 20-VII-1997, *Scarpa 59* (BACP).
LAURACEAE				
Laurus nobilis L.	Laurel	LE	Preventive. Used to fumigate the stock pens together with lemon peel, when the cattle die for no known reason.	
LILIACEAE				
Allium sativum L.	Ajo	BU	Expectorant. Against acute adenitis in horses. The bulbs are ground and put in the animal's nose together with oil and vinegar.	
		BU	Against canine distemper. It is ground and mixed with milk, and fed to the dogs.	
		BU	For hypothermia* caused by spider bites or malaria. The animal's hides are rubbed down or bathed with the decoction. The same use is referred by Daoud (1954:32) and Bartolomé (1968:89).	
Aloe vera L.	Penca 'e sábila, sábila	LE	Febrifuge*. For fever caused by spider bites in horses and dogs. The leaves' mucilage is dissolved in water. Int.	*Dpto. Bermejo*: Pozo de Maza, 17-VII-1996, *Scarpa 21* (BACP).
		LE	Purgative. Against acute constipation in horses. The leaves' mucilage is dissolved in water together with salt, and sometimes with whey. Int.	
		LE	Cicatrizant*. Its mucilage is applied directly on the wound. Ext.	
		LE	Antidiarrhetic. Against neonatal diarrhea. Its mucilage is dissolved in water. Int.	
LORANTHACEAE				
Struthanthus angustifolius (Griseb.) Hauman	Liga del mistol	AP	Oxitocic*. For uterine atony in goats and cows. For when the placenta is not expelled after giving birth. Dec. int.	*Dpto. Bermejo*: La Rinconada, 10-XII-1996, *Scarpa 187* (BACP); *Dpto. Matacos*: Santa Rita, 17-II-1998, *Scarpa 258* (BACP).
Tripodanthus acutifolius (Ruiz & Pav.) Tiegh.	Corpo o liga del palo santo	AP	Oxitocic*. Ditto the above.	*Dpto. Bermejo:* La Rinconada, 1-IV-2000, *Scarpa 412* (BACP).
LYTHRACEAE				
Heimia salicifolia (Kunth) Link	Quiebrarao, enchullador	RT	Antidiarrhetic*. For neonatal diarrhea. Dec. int.	*Dpto. Bermejo*: La Rinconada, 20-XII-1996, *Scarpa 50* (BACP).
MYRTACEAE				
Eucalyptus tereticornis Sm.	Eucalito, ucalito	LE	Expectorant*. Against acute adenitis in horses. Dec. for inhalations. Int.	*Dpto. Bermejo*: El Quebracho, 17-VII-1997, *Scarpa 67* (BACP).
OLACACEAE				
Ximenia americana L. var. *argentinensis* De Filipps	Pata	FR	Galactagog for cows. It is consumed spontaneously.	*Dpto. Matacos*: Bolsa de Palomo, 25-IX-1998, *Scarpa 298* (BACP).

Botanical name	Local name(s)	Part used [1]	Veterinary uses, modes of preparation and administration [2]	Specimens examined [3]
PHYTOLACCACEAE				
Petiveria alliacea L.	Calajchín, calauchín	LE	Against canine distemper. Dec. with milk. Int.	*Dpto. Matacos*: Pozo de Piedra, 18-II-1998, *Scarpa 68* (BACP)
POACEAE				
Cynodon dactylon (L.) Pers. var. *pilosus* Caro & E.A. Sánchez	Bramilla	AP	Emetic. Dogs spontaneously eat its leaves when they suffer from indigestion.	*Dpto. Bermejo*: La Rinconada, 9-XII-1996, *Scarpa 167* (BACP); 4 km al norte de El Quebracho, 28-VII-1997, *Scarpa 240* (BACP).
Zea mays L.	Chacra, máiz	MR	Against canine distemper. A collar is made with the cobs which is hung round the dog's neck (see text). The same use is quoted by Daoud (1954:32).	*Dpto. Bermejo*: El Pelícano, 20-VII-1996, *Scarpa 97* (BACP); La Rinconada, 12-XII-1996, *Scarpa 208* (BACP).
		STG	Diuretic* for horses. Dec. int.	
		FL	Oxitocic*. For uterine atony in horses. For when the placenta is not expelled after giving birth. Dec. with white soap and oil. Int.	
POLYGONACEAE				
Polygonum punctatum Elliott	Vinagrillo	LE	Vulnerary*. To bathe wounds. Dec. ext.	*Dpto. Bermejo*: Pozo de Maza, 20-VII-1996, *Scarpa 129* (BACP); La Rinconada, 20-XII-1996, *Scarpa 232* (BACP).
Ruprechtia triflora Griseb.	Duraznillo del bordo	LE	Antidiarrhetic*. Against neonatal diarrhea. Dec. int.	*Dpto. Bermejo*: La Rinconada, 20-XII-1996, *Scarpa 51* (BACP); Vaca Perdida, 2-XII-1996, *Scarpa 152* (BACP).
PORTULACACEAE				
Portulaca oleracea L.; *Portulaca* spp.	Verdolaga	AP	Purgative. Its consumption has a purging effect for cows.	*P. oleracea*. *Dpto. Bermejo*: Vaca Perdida, 2-XII-1996, *Scarpa 52* (BACP); *Portulaca* spp. *Dpto. Bermejo*: El Pelícano, 20-VII-1996, *Scarpa 116* (BACP); Vaca Perdida, 2-XII19-96, *Scarpa 148* (BACP).
RANUNCULACEAE				
Clematis montevidensis Spreng.	Barba 'e chivato	FR	Expectorant. For acute adenitis in horses. Inhalations of the smoke from burning its fruit (previously ground), together with *Ilex paraguariensis* and sulphur, in the shell of a "quirquincho". Occasionally, only the ground fruit is inhaled. Int.	*Dpto. Bermejo*: Pozo de Maza, 20-VII-1996, *Scarpa 41* (BACP).
RUTACEAE				
Citrus limon (L.) Burm.f.	Limón	FR	Preventive. The peel is used to fumigate the stock pens together with leaves of *Laurus nobilis*, when the cattle die for no known reason.	
SALICACEAE				
Salix humboldtiana Willd.	Sauce	ST	Oxitocic*. For uterine atony in goats and cows. For when the placenta is not expelled after giving birth. Dec. with its coal. Int.	*Dpto. Matacos*: La Ensenada, 8-X-1998, *Scarpa 307* (BACP).
		ST	Purgative*. For dog´s gastric disorders caused by drinking too much blood. Its coal is ground and dissolved in water.	

Botanical name	Local name(s)	Part used [1]	Veterinary uses, modes of preparation and administration [2]	Specimens examined [3]
SAPOTACEAE				
Sideroxylon obtusifolium (Roem. & Schult.) T.D.Penn.	Molle	RT AP BK	Oxitocic*. For uterine atony in goats and cows. Dec. with 3 segments of the plant "from the side facing the rising sun" with salt and oil. Int.	*Dpto. Bermejo:* 2 km al norte de La Rinconada, 21-XII-1996, *Scarpa 53* (BACP).
		RT	Purgative. For acute indigestion in calves. Dec. with salt. Int.	
SOLANACEAE				
Capsicum chacoënse Hunz.	Ají del monte	FR	For anuria in horses. The fruit is rubbed on the glans of the horse's penis. Ambrosetti (1976: 134) quotes the use of another species of *Capsicum* for the same motive.	*Dpto. Bermejo:* Vaca Perdida, 5-XII-1996, *Scarpa 56* (BACP); El Pelícano, 20-VII-1996, *Scarpa 123* (BACP).
Nicotiana tabacum L.	Tabaco	LE	Against hypothermias* in horses caused by spider bites or malaria. It is rubbed on the animal's hide, or its decoction is used for bathing. Ext.	
Physalis viscosa L.	Pocote ´e perro	AP	Emetic. Dogs spontaneously eat its leaves when they suffer from indigestion.	*Dpto. Bermejo*: La Rinconada, 10-XII-1996, *Scarpa 182* (BACP); Pozo de Maza, 30-III-1999, *Scarpa 382* (BACP).
Solanum conditum C.V. Morton	Pocote	AP	Emetic. Ditto the above.	*Dpto. Bermejo*: Vaca Perdida, 2-XII-1996, *Scarpa 54* (BACP); El Quebracho, 28-VII-1997, *Scarpa 242* (BACP).
URTICACEAE				
Parietaria debilis G. Forst.	Paletaria	AP	Purgative for fighting roosters. They are fed before fighting to obtain a better performance. Int.	*Dpto. Bermejo*: Pescado Negro, 31-V-1996, *Arenas 3573* (BACP).
VERBENACEAE				
Aloysia polystachya (Griseb.) Moldenke	Burrito, poleo de la casa	AP	Digestive*. For acute indigestion in goats and cats. Dec. int.	*Dpto. Bermejo*: Vaca Perdida, 5-XII-1996, *Scarpa 165* (BACP).
Phyla reptans (Kunth) Greene	Mosko yuyo	AP	Vulnerary*. For bathing wounds. Dec. ext.	*Dpto. Bermejo*: 3 km al norte de La Rinconada, 10-XII-1996, *Scarpa 181* (BACP).
VISCACEAE				
Phoradendron hieronymi Trel.	Liga, liguilla	AP	Oxitocic*. For uterine atony in goats and cows. For when the placenta is not expelled after giving birth. Dec. int.	*Dpto. Bermejo*: El Quebracho, 15-VII-1997, *Scarpa 60* (BACP); *Dpto. Matacos:* Campo Grande, 1-X-1998, *Scarpa 316* (BACP).
Phoradendron liga (Gillies ex Hook. & Arn.) Eichler	Liga, liga del árbol	AP	Oxitocic*. Ditto the above. It is the species most employed for these purposes. Sometimes *Erythroxylon coca* leaves are added to the decoction.	*Dpto. Bermejo*: Pozo de Maza, 17-VII-1996, *Scarpa 22* (BACP).
ZYGOPHYLLACEAE				
Bulnesia sarmientoi Lorentz ex Griseb.	Palo santo	DU	Expectorant*. Against acute adenitis in horses. Inhalations are practised with its chips, branches of *Baccharis salicifolia* and salt.	*Dpto. Bermejo*: La Rinconada, I-IV-2000, *Scarpa 413* (BACP).