



## Review

# The cultural-bound disease “empacho” in Argentina. A comprehensive botanico-historical and ethnopharmacological review



R. Campos-Navarro<sup>a,\*</sup>, G.F. Scarpa<sup>b</sup>

<sup>a</sup> Departamento de Historia y Filosofía de la Medicina, Facultad de Medicina, Universidad Nacional Autónoma de México, Brasil 33, Centro Histórico, Mexico, Distrito Federal 06020, Mexico

<sup>b</sup> Centro de Estudios Farmacológicos y Botánicos, Consejo Nacional de Investigaciones Científicas y Técnicas de Argentina, Argentina

## ARTICLE INFO

## Article history:

Received 26 March 2013

Received in revised form

4 May 2013

Accepted 6 May 2013

Available online 14 May 2013

## Keywords:

Historical sources

Southern America's traditional medicine

*Empacho*

Gastrointestinal disease

Argentina

## ABSTRACT

**Ethnopharmacological relevance:** *Empacho* is one of the most recognized cultural-bound syndromes in Argentina. It is a digestive disorder with many causes, being excessive food intake the most frequent. It is easily diagnosed in household medicine and there are different treatments applied for releasing the obstruction of the gastrointestinal tract. Therapeutics includes the use of medicinal plants and abdominal maneuvers, as well as rituals of magical and/or religious nature. The aim of this work is to analyze the compiled literature, considering documents from the XVIIIth century up to present, related to the employed plant species for the treatment of *empacho*.

**Material and methods:** The bibliographic and journal collections of several Argentinean and foreign libraries and bookstores were consulted, in addition to the comprehensive review of the specific information found online.

**Results:** Ninety (90) primary sources, spanning three hundred years (from 1710 to 2010) were found; most of them included ethnobotanical studies besides others of medical botany, pharmacobotanical and anthropological origin. A total of 152 plant species used to treat *empacho* were found in 360 total quotations, being *Dysphania ambrosioides* (L.) Mosyakin and Clemants; *Alternanthera pungens* Kunth; *Ruta chalepensis* L.; *Clinopodium gilliesii* (Benth.) Kuntze; *Aloysia polystachya* (Griseb.) Moldenke; *Lippia turbinata* Griseb., and *Pluchea sagittalis* (Lam.) Cabrera, the most frequently mentioned. The main therapeutic properties of the medicinal plants cited against *empacho* are stomachic, purgative, antispasmodic, bitter- tonic, carminative, and cholagogue-choleretic.

**Conclusions:** The variety of regions – spanning most of the country – from which the information comes, as well as the great variety of therapeutic strategies used, diversity of plant species and knowledge related to the treatment of *empacho*, is directly associated with the great significance that this disorder has within the system of medical-nosologic representations of the Argentinean popular medicine.

© 2013 Elsevier Ireland Ltd. All rights reserved.

## Contents

1. Introduction.....	349
2. Materials and methods.....	350
3. Results.....	357
4. Discussion and conclusions.....	357
Acknowledgements.....	359
References.....	359

## 1. Introduction

*Empacho* is a cultural-bound syndrome (from now on, CBS) known throughout Latin America (from Mexico to Argentina, including the Caribbean) and among the Hispanic residents in

\* Corresponding author. Tel.: +52 55 56 23 31 21; fax: +52 55 55 26 38 53.

E-mail addresses: [rcampos@unam.mx](mailto:rcampos@unam.mx) (R. Campos-Navarro), [gustavo22et@yahoo.com.ar](mailto:gustavo22et@yahoo.com.ar) (G.F. Scarpa).

the United States and Canada (Campos-Navarro, 2000, 2006, 2007, 2009a, 2009b). It is characterized by a digestive disorder with a halt of undigested food and non-digestible substances, provoking a stagnation of intestinal transit. According to ethnomedical knowledge *empacho* is caused by many reasons, such as excessive food intake, undercooked food, eating unripe fruits, contaminated food or in decomposition process, indigestible substances (chewing gum, paper, threads, hair, etc.), in a disorderly and precipitated manner, or after CBS popularly known as “bilis” (bile); “coraje” (anger) or “susto” (magical fright), among other causes. *Empacho* could be defined as a particular kind of “indigestion” or “dyspepsia”, but the difference among them consists in the sociocultural conceptualization, diagnosis, and treatment, that is why it is considered a CBS, in medical-anthropological terms.

Therefore, *empacho* is considered as a CBS because its interpretation in conceptual, clinical, therapeutic and preventive terms obeys to cultural aspects that exclusively belong to the Iberoamerican population, and these clearly differ from occidental medicine or biomedical criteria. Actually, due to the biomedical system's lack of cultural sense, current medical researches about this nosological entity cannot be found, so its relation to environmental or genetic factors related to it remain unknown.

*Empacho* is mainly related to excessive food intake at once or consuming indigestible substances. These kind of food and nutrition habits could be considered as the main causes of this syndrome, hence, the results from the study of medicinal plants used against *empacho* can contribute to a deeper understanding of this phenomenon, as their therapeutic properties could interact indeed with these diet habits.

As a rule, the diagnosis of *empacho* is home-made, being the mother who recognizes the main clinical data: abdominal pain, nausea, vomit, diarrhea, or constipation; sometimes hyperthermia and malaise are also present. The first healing remedies are performed at home and include religious rituals, massage, special maneuvers, purging medicines, and/or medicinal plants.

In Mexico, Guatemala, Chile, and Argentina it is efficiently cured with abdominal and dorsolumbar massage using fatty and oil products, finishing with the traction of the paravertebral skin until a crack is heard, maneuver known as “quebrar” or “tronar el *empacho*” (to break or to crack the *empacho*) or “tirar del cuerito” (to pull the little leather). Its efficacy is widely accepted and recognized at popular level and even by some academic physicians (sees E. Korn compiled by Campos-Navarro, 2009a). A religious ritual known as “medir con la cinta” (measure with the ribbon), in which the healer makes use of signs and catholic prayers to diagnose and cure *empacho*, it is frequently practiced in and restricted to Cuba, Argentina, and border areas of Uruguay and Paraguay. This extensively performed practice has its origin in Valencian communities of the Iberian Peninsula (Fresquet et al., 2006).

Pharmacopoeia of plant origin to treat *empacho* in Latin America includes a long list of medicinal plants cited in many folkloric, anthropological, ethnobotanical, pharmacobotanical, and historical works.

Although it is well-known that herbalism in Argentinean folk medicine mainly aims at digestive system problems (Scarpa, 2002; Martínez and Planchuelo A.M., 2003; Muiño, 2010), the total amount of botanical identities of plants involved in the treatment of *empacho* are unknown. This is so due to the inexistence of studies that gather and analyze the diversity of uses recorded in the highly heterogeneous, dispersed, and ancient sources. This lack of knowledge is also amazing because *empacho* could be the most recognized popular disease for both rural and urban populations in Argentina.

Researching the plants to treat a rather complex CBS will allow: (a) To know the diversity of strategies developed according to the different plants' therapeutic properties; (b) To have a better understanding of the ideas that Argentinian human groups has

about the environmental and dietary causalities of this syndrome and, in this way, to have a better comprehension about their cultural bounding; and (c) To compare the different conceptions about *empacho* between the people that use medicinal plants and the ones that practice rituals as treatment. In this sense, some etiological and therapeutic patterns could be identified in order to make an accurate evaluation of the cultural component of this syndrome.

Therefore, the aim of this work is to compile, describe, and analyze the applications of herbal pharmacopeia to treat *empacho*, registered since the XVIIIth century up to the present, which are performed either independently or as complements to the ritual and empirical healings.

## 2. Materials and methods

An exhaustive search of historical and contemporary bibliographical materials about *empacho* in Argentina, was accomplished, consulting books, thesis and articles in the National Library of Argentina, Medical Science Library of the Buenos Aires University, the Library of the Ethnographic Museum, Medical Science and Philosophy and Humanities Libraries of the Córdoba University; “Florentino Ameghino” Library of the La Plata National University; Library of the Faculty of Humanities of Salta National University; the Main Library of the National University of Tucuman province, the Historical Archive of Chaco province in Resistencia, and in popular and private libraries from other Argentinean provinces. Some data sources cited here are poorly known by scientists nowadays due to their limited print editions and/or distribution, and because of their scarce conservation (historical material), characteristics that make us consider it as “gray literature”. Information about *empacho* found in Argentinean texts at the national libraries of Spain, Brazil, Chile, Panama, Nicaragua, and Mexico, were also included. A systematic search in virtual libraries online was performed as well: PubMed Central (USA), Lilacs and Scielo (Latin American), Artemisa (México) and Google Scholar. The keywords in all of them were: “*empacho*/disease/Argentina”. It is worth mentioning that the term “*empacho*” is not accepted by the US National Library of Medicine, since when looking for it in the search engine called *Medical Subject Headings* or MeSH, it only accepts “dyspepsia” and “indigestion”, terms that are not accurate equivalents for *empacho*. All the texts having specific references to medicinal plants related to *empacho*, sated, stomach weakness, and indigestions due to overeating were considered within the inclusion criteria. As exclusion criteria, we eliminated all the texts that clearly repeated information coming from previously published sources.

The registered citations about the use of plants to treat *empacho* came from 90 sources with very different origins, including 89 texts from 1710 to 2010, and a few unpublished information obtained directly by the authors. Among the former, there are 34 (thirty four) ethnobotanical works, 23 (twenty three) folkloric and anthropological studies; 18 (eighteen) texts of pharmacobotany and medical botany; 9 (nine) medical and botanical texts from the late XIXth and early XXth century; and 5 (five) works of physicians and explorers from the XVIIIth and beginning of the XIXth century. Most information (69%, 248 data) came from texts in which plant species are identified according to botany science standards; hence, the only modifications to these data were, in some cases, to update their scientific names and/or taxonomic positions. The remainder information, coming from folkloric, anthropological, medical history studies, and physicians and explorers reports, refers to plants which only their vernacular name is mentioned. In order to rescue as much information as possible and, at the same time, to achieve more precision in the identifications, these data were subjected to the following analysis:

- (1) The medicinal (and edible) plants widely distributed cited in medical-academic texts by their commercial names in Spanish

Table 1

Plant species employed to treat empacho in Argentina, modes of utilization and therapeutic properties.

Scientific names	Vernacular name	Part used <sup>a</sup>	Plant type <sup>b</sup>	Data sources <sup>c</sup>	Modes of preparation and administration <sup>d</sup>	Therapeutic properties
<b>Acoraceae</b>						
<i>Acorus calamus</i> L.	Calomel	Rh	EP	(26)	Infusion or decoction ingested	Carminative, bitter-tonic
<b>Alstroemeriaceae</b>						
<i>Alstroemeria</i> sp.	Liuto	Tu	N	(1)	Grinded tubers are eaten	Purgative
<b>Amaranthaceae</b>						
<i>Guilleminea densa</i> (Humb. and Bonpl. ex Schult.) Moq.	Yerba del pollo	Ro	N	(2)(3)(4)	To take baths with its infusion (C)	Laxative, antispasmodic
<i>Alternanthera pungens</i> Kunth	Yerba del pollo, yerba del empacho	Ro	N	(3)(5)(6)(7)(8)(9)(10)(11)(12)(15)(64)(67)(90)	Decoction of three previously grinded pieces is ingested (C)	Purgative, stomachic, antispasmodic
<b>Anacardiaceae</b>						
<i>Lithrea molleoides</i> (Vell.) Engl.	Molle, molle blanco, molle dulce	Ap	N	(2)(16)(17)	Ingested infusion	Stomachic
<i>Schinus fasciculata</i> (Griseb.) I.M. Johnst.	Molle colorado, molle hembra	Fl	N	(74)	Ingested decoction.	Hepatic, purgative
<i>Schinus molle</i> L.	Aguaribay, molle, molle de beber	Lf	N	(2)(4)(13)(16)(17)(18)	Ingested infusion. Sometimes mixed with <i>Senna corymbosa</i> ., <b>Rosmarinus officinalis</b> and <i>Ruta chalepensis</i> (H)	Laxative, purgative
<i>Schinus myrtifolia</i> (Griseb.) Cabrera	Molle, molle negro, molle pispito	Res	N	(13)(14)	Raw ingestion	Stomachic
<b>Apiaceae</b>						
<i>Anethum graveolens</i> L.	Eneldo	Ap	EP	(23)	Ingested decoction mixed with <i>Malva</i> sp., <i>Matricaria recutita</i> ; <i>Parietaria</i> sp., honey, salt and oil (H)	Carminative, bitter-tonic
<i>Apium graveolens</i> L.	Apio	Ap	EC	(6)	Ingested infusion	Carminative
<i>Cyclospermum leptophyllum</i> (Pers.) Sprague	Apio cimarrón, culandrillo	Lf	N	(7)	Infusion or decoction ingested	Carminative
<i>Foeniculum vulgare</i> Mill.	Hinojo	Ro	EC	(8)(24)(25)	Ingested decoction	Laxative, antispasmodic
<i>Pimpinella anisum</i> L.	Anís	Fr	EP	(13)(19)(20) (21)(22)	Ingested decoction (H)	Carminative
<b>Apocynaceae</b>						
<i>Marsdenia cundurango</i> Rchb.f.	Condurango	Ba	EP	(26)	N/D	Stomachic, bitter-tonic
<i>Morrenia odorata</i> (Hook. and Arn.) Lindl.	Doca, tasi	FrRa	N	(29)(30)	They are eaten cooked under the ashes	Antidiarrheal
<b>Araceae</b>						
<i>Philodendron bipinnatifidum</i> Schott ex Endl.	Güembé, gua(e)mbé	Fr	N	(23)(31)(32)	Ingested decoction	Purgative
<b>Asteraceae</b>						
cf. <i>Achyrocline satureioides</i> (Lam.) DC	Marcela, alquitrán	Ap	N	(19)(26)	Ingested infusion. (H)	Carminative, bitter-tonic, digestive, antispasmodic, antidiarrheal
<i>Artemisia abrotanum</i> L.	Abrótano	Lf	Ad	(11)	Ingested infusion	Bitter-tonic
<i>Artemisia absinthium</i> L.	Ajenjo, ajenjo macho	ApFl	EC	(5)(12)(15) (34)	Ingested decoction. (H)	Bitter-tonic
<i>Artemisia mendozaana</i> DC. var. <i>mendozaana</i>	Ajenjo blanco	ApFl	N	(36)	Ingested infusion	Stomachic, hepatic, carminative, cholagogue
<i>Baccharis articulata</i> (Lam.) Pers.	Carqueja, carqueja blanca, carqueja gris	St	N	(7)(19)(35)	Ingested decoction. (C)	Bitter-tonic, hepatic, digestive, cholagogue, antidiarrhea
<i>Baccharis gaudichaudiana</i> DC	Carqueja	St	N	(12)	N/D (C)	Bitter-tonic, hepatic, digestive, antidiarrheal
<i>Baccharis sagittalis</i> (Less.) DC	Carqueja	St	N	(11)	Infusion or decoction ingested	Hepatic, antidiarrheal, digestive
<i>Baccharis salicifolia</i> (Ruiz and Pav.) Pers	Chilca, suncho	Ap	N	(37)	Ingested infusion. (H)	Cholagogue, stomachic, antidiarrheal
<i>Baccharis trimera</i> (Less.) DC	Carqueja, carqueja crespa	St	N	(12)	N/D (C)	Cholagogue, bitter-tonic, digestive, hepatic
<i>Baccharis ulicina</i> Hook. and Arn	Yerba de la oveja	Ap	N	(4)	Ingested infusion	Cholagogue
<i>Calendula officinalis</i> L.	Caléndula	Ap	EC	(1)	Ingested decoction mixed with <i>C. bonariensis</i> and <i>Dysphania ambrosioides</i>	Antispasmodic, cholagogue, bitter-tonic
<i>Dasyphyllum diacanthoides</i> (Less.) Cabrera	Palo blanco, palo santo, trevo	Ba	N	(25)	Ingested infusion	Antispasmodic
<i>Matricaria recutita</i> L.	Manzanilla, manzanilla común	Ap	Ad	(4)(8)(9)(38)(39)		Hepatic

Table 1 (continued)

Scientific names	Vernacular name	Part used <sup>a</sup>	Plant type <sup>b</sup>	Data sources <sup>c</sup>	Modes of preparation and administration <sup>d</sup>	Therapeutic properties
<i>Pectis odorata</i> Griseb	Manzanilla del campo o del agua, comino del campo	Lf	N	(5)(13)(15)(16)(17)(40)	Ingested infusion. Also in rubbings with chicken grease and leaves of <i>Ruta chalepensis</i> . (H) Ingested decoction with salt and oil. (H)	Emetic, purgative, digestive, carminative
<i>Pluchea microcephala</i> R.K. Godfrey <i>Pluchea sagittalis</i> (Lam.) Cabrera	Cuatro cantos, lucera, yerba lucera, yerba del lucero, yacaré caá	Lf	N	(5)(8)(15)(16)(18)(29)(34)(90)	Ingested decoction. (H)	Purgative, digestive, stomachic Purgative, bitter- tonic, stomachic, hepatic, antispasmodic, digestive, carminative, cholagogue
<i>Psila</i> sp.	Pichana	Ap	N	(33)	N/D	N/D
<i>Tagetes mendocina</i> Phil.	Chinchivil, chin chil, suico	Ap	N	(33)	N/D	Stomachic
<i>Tagetes minuta</i> L.	Suico, chinchilla, manzanillo silvestre	Ap	N	(2)(3)(4)(41)	Ingested infusion. (H)	Stomachic, carminative, purgative, digestive, antispasmodic
<i>Tanacetum parthenium</i> (L.) Sch. Bip.	Altamisa	Ap	N	(4)	Ingested decoction	Antispasmodic, bitter- tonic
<i>Tessaria absinthioides</i> (Hook. and Arn.) DC	Pájaro bobo, suncho negro	Lf	N	(64)	Ingested infusion	N/D
<i>Trixis divaricata</i> (Kunth) Spreng. subsp. <i>discolor</i> (D. Don) Katinas	Contrayerba	Ro	N	(4)	Ingested decoction with toasted sugar	Stomachic
Bignoniaceae						
<i>Adenocalymma marginatum</i> Cham.) DC	ychypó	N/D	N	(42)	N/D	Digestive
Boraginaceae						
<i>Heliotropium procumbens</i> Mill.	Pungapewua, cola de gama	Ap	N	(74)	Ingested decoction with sugar	N/D
Brassicaceae						
<i>Brassica</i> spp.	Mostaza	Se	EC	(43)	In warm baths	Revulsive
<i>Brassica oleracea</i> L.	Col	Ap	EC	(80)	Boiled with bull blood. It is used as a stomach plaster	Revulsive
<i>Cardamine bonariensis</i> Pers.	Berro	Ap	N	(1)	Ingested decoction mixed with <i>C. officinalis</i> and <i>Dysphania ambrosioides</i>	Bitter- tonic
<i>Lepidium didymum</i> L.	Quimpe, quimpi, mastuerzo	Ap	N	(7)	Infusion or decoction ingested. (H)	Hepatic
Buddlejaceae						
<i>Buddleja tucumanensis</i> Griseb.	San Juan cora, yerba de San Juan	Ap	N	(44)	Ingested decoction. (H)	Hepatic
Capparaceae						
<i>Anisocapparis speciosa</i> (Griseb.) Cornejo and Iltis	Bola verde, sacha naranja	Ap Fl	N	(5)	Ingested decoction mixed with <i>Capparicordis tweediana</i> and <i>Ziziphus mistol</i> . (H)	Digestive
<i>Capparicordis tweediana</i> (Eichler) Iltis and Cornejo	Hoja redonda, sacha membrillo	Lf Fl	N	(5)	Ingested decoction. (H)	Purgative
<i>Capparis atamisquea</i> Kuntze	Atamisque, atamiski, matagusanos	Lf	N	(13)(16)(17)	Ingested decoction. (H)	Carminative, digestive, anticiad
Celastraceae						
<i>Moya spinosa</i> Griseb.	Abriboca, moya negra, raíz colorada	Ro	N	(74)	Ingested decoction	Hepatic
Celtidaceae						
<i>Celtis brasiliensis</i> (Gardner) Planch	?	Lf	N	(3)	Ingested infusion	Purgative
<i>Celtis chichape</i> (Wedd.) Miq.	Tala, tala pispita, tala negra	Lf	N	(3)(5)(15)(16)	Ingested decoction three times a day. (H)	Purgative, antidiarrheal, digestive
<i>Celtis ehrenbergiana</i> (Klotzsch) Liebm.	Tala amarillo, tala pispito	Lf	N	(3)(4)	Infusion or decoction ingested	Digestive, purgative, antidiarrheal
<i>Celtis iguanaea</i> (Jacq.) Sarg.	Tala gateador, tala trepador	Lf	N	(3)	Ingested infusion. (H)	Purgative, antidiarrheal
Chenopodiaceae						
<i>Beta vulgaris</i> L.	Acelga	Lf	EC	(46)(60)	Ingested decoction or as stomach plaster	Stomachic
<i>Chenopodium mandonii</i> (S. Watson) Aellen	Arca yuyo, yerba larca	Ap	N	(47)(48)(49)(50)(51)	Ingested decoction	Antispasmodic, stomachic, antidiarrheal
<i>Chenopodium murale</i> L.	Labép uné, quinoa negra Paico	Ap	N	(52)	Infusion or decoction ingested.	Antispasmodic
		Ap	N	(25)	Ingested infusion	Stomachic

<i>Chenopodium oblancheolatum</i> (Speg.) Giusti						
<i>Dysphania ambrosioides</i> (L.) Mosyakín and Clemants	Paico, paico macho, caá neé, té de los jesuitas, pichín	Ap	N	(4)(7)(8)(11)(15)(18) (27)(28)(29)(33) (34)(37) (44)(45)(48)(49)(53)(54) (67) (89)(90)	Ingested decoction. Sometimes mixed with <i>Ziziphus mistol</i> . (H)	Antispasmodic, carminative, purgative, digestive
<i>Dysphania chilensis</i> (Schr.) Mosyakín and Clemants	Paico	Lf	N	(3)(4)	Ingested infusion	Digestive, antispasmodic
<i>Dysphania multifida</i> (L.) Mosyakín and Clemants	Paico, paico chico, paiquillo	Ap	N	(4)(11)(37)	Ingested infusion	Carminative, digestive, antispasmodic,
Convolvulaceae						
<i>Dichondra microcalyx</i> (Hallier f.) Fabris	Bashé umpatpát, oreja de ratón, oreja de gato	Lf	N	(52)	Ingested decoction	Digestive
Cucurbitaceae						
<i>Citrullus lanatus</i> (Thunb.) Matsum. and Nakai subsp. <i>vulgaris</i> (Schr.) Fursa	Sandía	Fr	EC	(8)	Ingested decoction of the rind. (H)	Antidiarrheal
<i>Cucurbita maxima</i> Duchesne	Zapallo, zapallo criollo	Se	EC	(38)	Toasted seeds are chewed before breakfast	Purgative
Cyperaceae						
<i>Kyllinga odorata</i> Vahl	Capií catí, caá píí catí payé	Rh	N	(8)	Ingested infusion	Antispasmodic, digestive, antidiarrheal
Ephedraceae						
<i>Ephedra americana</i> Humb. and Bonpl. ex Willd.	Pingo pingo, tramontana	St	N	(3)(10)(51)	Ingested infusion. (H)	Stomachic
<i>Ephedra chilensis</i> C. Presl	Tramontana, pingo pingo	Ap	N	(3)	Ingested infusion. (H)	Stomachic
<i>Ephedra frustillata</i> Miers	Barba de chivo, tramontana, pingo pingo	Ap	N	(3)(54)	Ingested decoction. (H)	Stomachic
<i>Ephedra ochreate</i> Miers	Fruta del quirquincho, solupe, yerba del bicho	Ap	N	(3)(55)	N/D (H)	Stomachic, antidiarrheal
<i>Ephedra rupestris</i> Benth.	Tramontana, pingo pingo	Ap	N	(3)	Ingested infusion. (H)	Stomachic
<i>Ephedra triandra</i> Tul.	Pico de loro, pico de gallo	St	N	(3)(56)(57)	Ingested infusion. (H)	Stomachic, antidiarrheal
<i>Ephedra tweediana</i> Fisch. and C. A. Mey.	Pingo pingo, pico de loro	Ro Lf	N	(3)(9)(51)	Ingested infusion. (H)	Stomachic
Erythroxylaceae						
<i>Erythroxylum coca</i> Lam.	Coca	Lf	EP	(19)(49)	Ingested decoction. (H)	Stomachic
Euphorbiaceae						
<i>Ricinus communis</i> L.	Ricino, tártago	Se Lf	N	(3)(7)(8)(58) (59)	The seed's oil is drunk. Their leaves are used in stomach plaster. (C)	Laxative, purgative
Fabaceae						
<i>Bauhinia forficata</i> Link subsp. <i>pruinosa</i> (Vogel) Fortunato and Wunderlin	Pezuña de vaca, pata de vaca, pata de buey	Lf	N	(11)(19)(60)	Infusion or decoction ingested	Digestive
<i>Myroxylon peruiferum</i> L.f.	Palo de quina, quina quina	Se	N	(61)(62)	An infusion of its grinded seeds is drunk. (H)	Antispasmodic, stomachic
<i>Otholobium glandulosum</i> (L.) J.W. Grimes	Culén, culé	Lf Ba	EC	(3)(56) (78)(79)	Ingested infusion	Antidiarrheal
<i>Rhynchosia diversifolia</i> Micheli var. <i>diversifolia</i>	Raíz amarilla, porotillo	Ro	N	(74)	Ingested decoction	Hepatic, purgative
<i>Senna alexandrina</i> Mill.	Sen de la palta	Lf	EP	(63)	It is ingested as syrup.	Laxative
<i>Senna corymbosa</i> (Lam.) H.S. Irwin and Barneby	Sen, sen del campo, caña fistula	Lf	N	(2)(3)(4)	Ingested infusion	Laxative, purgative
<i>Spartium junceum</i> L.	Retama, retama amarilla	N/D	Ad	(33)	N/D	Emetic, purgative
<i>Tamarindus indica</i> L.	Tamarindo	Fr	EC	(65)	Ingested decoction	Laxative
Gentianaceae						
cf. <i>Gentiana lutea</i> L.	Genciana, genciana mayor	Ro	EP	(26)(58)(66)	It is ingested as infusion or macerated in wine	Bitter-tonic
<i>Gentianella multicaulis</i> (Gillies ex Griseb.) Fabris	Nencia	Ap	N	(33)(61)(67)	Its infusion is ingested twice a day	Bitter-tonic, hepatic, stomachic, digestive
<i>Gentianella riojae</i> (Gilg) Fabris ex J.S. Pringle	Nencia	Ap	N	(61)(62)	Ingested infusion. (C)	Bitter-tonic, hepatic
Lamiaceae						
<i>Clinopodium gilliesii</i> (Benth.) Kuntze	Muña muña, mulla mulla, oreganillo	Ap	N	(9)(10)(38)(68)(69)(70) (71)	Ingested infusion. (H)	Antiacid, stomachic, purgative, laxative
<i>Hedeoma multiflora</i> Benth.	Tomillo serrano, peperina	Ap	N	(2)(3)	Ingested infusion. (H)	Antispasmodic, hepatic
<i>Marrubium vulgare</i> L.	Yerba del sapo, malvarrubia	Ap	Ad	(36)(37)	Ingested infusion.	Purgative
<i>Melissa officinalis</i> L.	Torongil, melisa	Lf	Ad	(19)(25)(72)	Ingested infusion. (H)	Carminative, laxative
<i>Mentha</i> spp.	Yerba buena, menta	Lf	EC	(8)(23)(26)	Ingested infusion	Antispasmodic, carminative, stomachic

Table 1 (continued)

Scientific names	Vernacular name	Part used <sup>a</sup>	Plant type <sup>b</sup>	Data sources <sup>c</sup>	Modes of preparation and administration <sup>d</sup>	Therapeutic properties
<i>Mentha spicata</i> L.	Menta, yerba buena	Lf	Ad	(5)(15)	Ingested infusion with toasted sugar. (H)	Antispasmodic, stomachic
<i>Mentha x rotundifolia</i> (L.) Huds.	Yerba Buena, menta	Lf	EC	(3)	Ingested infusion. (H)	Antispasmodic, stomachic
<i>Minthostachys verticillata</i> (Griseb.) Epling	Peperina, peperita	Ap	N	(2)(3)	Ingested infusion. Sometimes is mixed with <i>Tagetes minuta</i> .	Antispasmodic, stomachic
<i>Origanum vulgare</i> L.	Orégano	Ap	EC	(37)	Ingested infusion. (H)	Carminative
<i>Rosmarinus officinalis</i> L.	Romero	Lf	EC	(2)(72)	Ingested decoction. (H)	Carminative, stomachic
<b>Lauraceae</b>						
<i>Nectandra angustifolia</i> (Schrad.) Nees and Mart.	Laurel amarillo, laurel blanco	Lf Ba	N	(73)	N/D	Digestive, purgative
<b>Liliaceae</b>						
<i>Allium cepa</i> L.	Cebolla	Bu	EC	(35)(43)(66)	Stomach plaster is made mixing smashed bulbs with yeast, wine and grease. (H)	Revulsive
<b>Lythraceae</b>						
<i>Heimia salicifolia</i> Link	Quiebra arado, yerba de la vida	Ro	N	(2)(4)(5)(8)(30)(67)(74)	Ingested decoction. (H)	Laxative, stomachic
<b>Malvaceae</b>						
<i>Malva parviflora</i> L.	Malva	Ap	Ad	(33)(75)	Enema is made with its decoction mixed with salt and oil. (C)	Emollient, laxative
<i>Malva sylvestris</i> L.	Malva, malva real	Lf	Ad	(16)(26)(70)	Same recipe as above.	Emollient, laxative
<i>Sida spinosa</i> L.	Escoba dura, afata	Lf	N	(35)(74)	Ingested decoction	Emollient, antidiarrheal
<b>Menispermaceae</b>						
<i>Jateorhiza palmata</i> (Lam.) Miers	Colombo	Ro	EP	(43) (58)	N/D	Laxative, bitter-tonic
<b>Monimiaceae</b>						
<i>Peumus boldus</i> Molina	Boldo	Lf	EP	(19)(22)(35)	Ingested decoction.	Cholagogue
<b>Musaceae</b>						
<i>Musa paradisiaca</i> L.	Banano	Lf	EC	(21)(38)	Stomach plaster is made with smashed corn grains and vinegar, adding the mixture over their leaves	Revulsive
<b>Myrtaceae</b>						
<i>Eucalyptus</i> sp.	Eucali to	Lf	EC	(75)	Ingested decoction. (H)	Antispasmodic
<i>Hexachlamys edulis</i> (O. Berg) Kausel and D. Legrand	Ubajay	Fr	N	(76)	Ingested raw	Hepatic
<i>Luma apiculata</i> (DC.) Burret	Arrayán	Lf	N	(11)	Ingested infusion	Laxative, stomachic, antidiarrheal
<i>Psidium guajava</i> L.	Guayabo, arazá	Lf Ba	N	(38)(77)	Ingested decoction. (H)	Antispasmodic, antidiarrheal, stomachic
<i>Psidium salutare</i> (Kunth) O. Berg. var. <i>mucronatum</i> (Cambess.) Landrum	Charcal	Lf	N	(2)(4)	Ingested infusion	Digestive, antidiarrheic, carminative
<b>Onagraceae</b>						
<i>Fuchsia magellanica</i> Lam.	Chilco, silque	Ba	N	(25)	Ingested infusion	Purgative
<b>Oxalidaceae</b>						
<i>Oxalis lasiopetala</i> Zucc.	Culle, culén	Tu	N	(11)	Its macerated is ingested	Stomachic, emetic
<b>Papaveraceae</b>						
<i>Papaver somniferum</i> L.	Amapola	La	EP	(43)(81)	Few drops of opium tincture are ingested	Antispasmodic
<b>Phyllanthaceae</b>						
<i>Phyllanthus sellowianus</i> (Klotzsch) Müll. Arg.	Sarandí blanco	Ap	N	(19)	Ingested decoction	Purgative, antidiarrheal
<b>Phytolaccaceae</b>						
<i>Petiveria alliacea</i> L.	Calajchín, pipí	Ap	N	(5)(15)(16)	Its decoction is used as baths for children and it is ingested in adults. (H)	Antispasmodic, laxative
<b>Plantaginaceae</b>						
<i>Plantago tomentosa</i> Lam.	Llantén	Ro	N	(8)	Ingested decoction. (C)	Laxative, emollient, stomachic
<b>Poaceae</b>						
<i>Arrhenatherum elatius</i> (L.) P. Beauv. ex J. Presl and C. Presl	Rapilhuechhua, fromental	Ap	N	(11)	Ingested decoction	N/D
<i>Cymbopogon citratus</i> (DC.) Stapf	Cedrón pasto, cedrón paraguayo	Lf	EC	(8)(29)	Ingested decoction. (C)	Stomachic
<i>Paspalum distichum</i> L.	Pasto miel, pasto dulce	Ap	N	(8)	Ingested decoction	Hepatic
<i>Saccharum officinarum</i> L.	Caña de azúcar	St	EC	(70)	Ingested decoction	Emetic

<i>Zea mays</i> L.	Maíz, chacra	Se Stg	EC EC	(16)(21)(38) (64)	See <i>Musa paradisiaca</i> Ingested infusion mixed with leaves of <i>Alternanthera pungens</i> and <i>Dysphania ambrosioides</i>	Revsulsive Digestive
Polygonaceae <i>Rheum</i> spp.	Ruibarbo	Rh	EC	(43)(59)(66)	Ingested decoction. Sometimes it is mixed with <i>Acorus calamus</i>	Stomachic, purgative
Rhamnaceae <i>Ziziphus mistol</i> Griseb.	Mistol	Lf	N	(5)(15)(16)	Ingested decoction. (H)	Stomachic, emetic, cholagogue, laxative
Rosaceae <i>Margyricarpus pinnatus</i> (Lam.) Kuntze	Perlilla, yerba de la perdiz	Ap	N	(2)(3)	Ingested decoction. (C)	Carminative, purgative, bitter-tonic
<i>Prunus amygdalus</i> Batsch	Almendro	Se	EP	(59)	Almond oil is ingested.	Laxative
<i>Prunus persica</i> (L.) Batsch	Duraznero	Lf	EC	(2)(4)(36)(82)	Ingested infusion. (H)	Stomachic
Rubiaceae <i>Cinchona</i> spp.	Quina	Ba	EP	(58)(66)	Its macerated in wine is ingested.	Bitter-tonic
<i>Coffea arabica</i> L.	Café	Se	EP	(43)	Ingested infusion. (H)	Digestive
<i>Richardia brasiliensis</i> Gomes	Yerba del sapo, yerba del pollo	Ro	N	(39)(83)	Ingested decoction.	Emetic
Rutaceae <i>Citrus reticulata</i> Blanco	Mandarino	Lf	EC	(8)	Ingested infusion. (H)	Stomachic
<i>Ruta chalepensis</i> L.	Ruda ruda macho	Ap	Ad	(9)(13)(16)(17)(36)(45) (84)(85)	Ingested decoction. (H)	Antispasmodic, emetic, stomachic
Salicaceae <i>Azara lanceolata</i> Hook. f.	Corcolén, corcalén	Ap	N	(25)	Ingested infusion	Digestive
Santalaceae <i>Myoschilos oblongum</i> Ruiz and Pav.	Orocoipo, codoipú	Ap Ro	N	(11)(25)	Ingested infusion.	Antispasmodic, hepatic
Sapindaceae <i>Allophylus edulis</i> (A. St.-Hil., A. Juss. and Cambess.) Hieron. ex Niederl.	Chal chal, kokú	Lf	N	(12)	N/D	Hepatic, digestive
Schisandraceae <i>Illicium</i> spp.	Anís estrellado	Fr	EP	(19)(57)	Ingested decoction	Carminative, digestive
Simaroubaceae <i>Picrasma crenata</i> Engl. in Engl. and Prantl.	Palo amargo, quina brava	Ba	N	(12)	Ingested decoction	Stomachic, laxative, bitter-tonic, antidiarrheal, antiacid
<i>Quassia amara</i> L.	Cuasia	St	EP	(43)(58)	Ingested decoction	Stomachic, bitter-tonic
Solanaceae <i>Cestrum parqui</i> L'Hér.	Hediondilla, duraznillo, palqui	Lf Ro	N	(3)(75)(33)	Enema is made with the decoction of its leaves mixed with cow fat and ashes. Sometimes it is ingested the decoction made with the bark of its roots	Purgative, antispasmodic, digestive
<i>Fabiana imbricata</i> Ruiz and Pav.	Palo piche, pichi	Ap	N	(19)(25)(65)	Ingested decoction.	Cholagogue
<i>Grabowskia</i> sp.	pagálayo qoté, burro micuna	Lf	N	(29)	Ingested decoction.	N/D
<i>Solanum sisymbriifolium</i> Lam.	Tutiá, vila vila, espina colorada, tomatillo del campo	Ro	N	(19)(35)(38)	Ingested decoction. (C)	Hepatic
Theaceae <i>Camellia sinensis</i> (L.) Kuntze	Té negro, té común	Lf	EP	(86)	Ingested decoction	Digestive
Urticaceae cf. <i>Parietaria</i> sp.	Parietaria, paletaria	Ap	N	(23)	Ingested decoction mixed with <i>Malva</i> sp., <i>Anethum graveolens</i> and <i>Matricaria recutita</i> . (C)	Emollient, laxative
Verbenaceae <i>Acantholippia salsoloides</i> Griseb.	Rica rica	Ap	N	(9)(61)(62) (69)(70)(87)	Ingested infusion. (H)	Carminative, stomachic, antidiarrheic
<i>Aloysia citrodora</i> Paláu	Yerba luisa, cedrón del monte	Lf	N	(3)(26)(35)	Ingested decoction. (C)	Antispasmodic, stomachic, digestive, carminative
<i>Aloysia gratissima</i> (Gillies and Hook.) Tronc. var. <i>gratissima</i>	Poleo del campo, poleo amarillo, cedrón del monte, romerillo, usillo	Lf	N	(4)(8)	Ingested infusion or decoction	Carminative, stomachic
<i>Aloysia polystachya</i> (Griseb.) Moldenke	Burrito, té de burro, poleo de Castilla	Lf	N	(5)(8)(15)(18) (33)(35)(38) (69)(88)	Ingested decoction. (H)	Antispasmodic, carminative, hepatic
<i>Junellia pappigera</i> (Phil.) N. O'Leary and P. Peralta	Boldo de la Puna	Ap	N	(61)(62)	Ingested decoction	Cholagogue
<i>Lippia alba</i> (Mill.) N.E. Br. ex Britton and P. Wilson	Salvia, salvia macho, salvia del monte, poleo	Lf	N	(5)(8)	Ingested decoction. (H)	Antispasmodic, stomachic, antidiarrheic
<i>Lippia integrifolia</i> (Griseb.) Hieron.	Incauyo, té del inca, yerba del inca, poleo	Lf	N	(3)(10)(30)(38)(51)	Ingested infusion	Antispasmodic, stomachic, bitter-tonic, carminative

Table 1 (continued)

Scientific names	Vernacular name	Part used <sup>a</sup>	Plant type <sup>b</sup>	Data sources <sup>c</sup>	Modes of preparation and administration <sup>d</sup>	Therapeutic properties
<i>Lippia turbinata</i> Griseb.	Poleo, poleo fino, té del país	Lf Ro	N	(4)(8)(13)(16)(17)(33)	Ingested decoction of infusion. (H)	Antispasmodic, stomachic
Violaceae						
<i>Viola odorata</i> L.	Violeta	Rh	EC	(3)(57)	Ingested decoction	Emetic, purgative
Zygophyllaceae						
<i>Porlieria microphylla</i> (Baill.) Descole, O'Donnell and Lourteig	Guayacán, palo cuchara, cucharero	Ap	N	(2)	Ingested decoction	Digestive, stomachic, antidiarrhetic, hepatic

## References:

- <sup>a</sup> **Part used:** Lf: Leaf; St: Stalk; Ap: Aerial part; Rh: Rhizome; Ro: Root; Ba: Bark; Fr: Fruit; Se: Seed; Fl: Flower; Tu: Tuber; Stg: Stigma.
- <sup>b</sup> **Plant type:** N: Native; Ad: Adventitious; EC: Cultivated exotic; EP: Product exotic.
- <sup>c</sup> **Data sources:** (1): Agüero Blanch (1968); (2): Martínez and Planchuelo A.M. (2003); (3): Hieronymus (1882); (4): Martínez (2010); (5): Scarpa (2002); (6): Pochettino and Martínez (2000); (7): Pochettino et al. (1997); (8): Martínez Crovetto (1981); (9): Pérez de Nucci (1988); (10): Ratera and Ratera (1980); (11): Kutschker et al. (2008); (12): Kujawska (2008); (13): Togo et al. (1990); (14): Valle Carrizo et al. (2002); (15): Scarpa (2000); (16): Di Lullo (1929); (17): Di Lullo (1943); (18): Chifa and Ricciardi (2001); (19): Quijano (2004); (20): Bigioni (1973); (21): Acosta (1975); (22): Jiménez de Puparelli (1984); (23): Montenegro (1945); (24): Smolensky (1982); (25): Funes (1999); (26): Simón (1935); (27): Casamiquela (1999); (28): Albornoz et al. (2004); (29): Filipov (1997); (30): Saggese (1928); (31): Lozano (1976); (32): Crisci and Gancedo (1971); (33): Karlin et al. (2006); (34): Kossmann and Vicente (2001); (35): Elizalde et al. (2001); (36): Karlin et al. (2005); (37): Muiño (2010); (38): Acosta, Gómez-Lestani, 1980; (39): Marzocca (1997); (40): Di Lullo (1946); (41): Schulz (1997); (42): Keller (2007); (43): Susini (1879); (44): Mas Serra et al. (2008); (45): Marcus (2007); (46): Sofia (2006); (47): Pelegrin (1984); (48): Pelegrin (2005); (49): Lupo and Echenique (1997); (50): Hilgert (1998); (51): Alonso and Desmarchelier (2005); (52): Martínez Crovetto (1965); (53): Scarpa, 2004b; (54): Haloua Gruneisen (1997); (55): Haloua Gruneisen (1996); (56): Montesano (1913); (57): Koziel (1952); (58): Ibarra (1888); (59): Montesano (1917); (60): Benvenuto and Sánchez (2002); (61): Palma (1973); (62): Palma (1978); (63): Le Roy (1825); (64): Montani et al. (2010); (65): Dimitri (1987); (66): Domínguez (1884); (67): Burgstaller (2005); (68): Bianchetti (1996); (69): Abella (1998); (70): Alonso (2005); (71): Toursarkissian (1980); (72): Equipo de investigación Nueva Era (1996); (73): Sawchuk (1982); (74,75): Scarpa (2012); (76): Gancedo (1916); (77): Comunidad Kolla de Finca Santiago—Iruya, 2006; (78): LEA (2005); (79): Falkner (1774) 1937; (80): De Sosa Revello y Mandouzzi (1878); (81): Codex Medicamentarius (1978); (82): Liberato (1988); (83): Kozel (1973); (84): Avila, 1960; (85): Arenas and Galafassi (1994); (86): Farias (2004); (87): Figueroa (2002); (88): Arenas (2003); (89): Rogé (2003); (90) Pomesa et al. (2003).
- <sup>d</sup> **Modes of preparation and administration:** (C): "Cold" plant; (H): "Hot" plant; "N/D": not data found.

were contrasted with the Argentinean Codex Medicamentarius (1978), and with international treatises on pharmacognosy (Trease and Evans, 1991; Bruneton, 2001) to review their current botanical identity (e.g. "acoro"; "anis estrellado", "banano"; "calomel"; "cebolla"; "condurango"; "cuasia"; "mostaza"; "opio"; "quina"; "ricino"; "té", etc.); and,

- (2) For the remainder data, the only plants included are: (a) Those which show a demonstrably univocal relationship between its common name and one botanical genus or species, according to phytonomic catalogues of the Argentinean Flora (Burkart, 1979; Giberti, 1981; Dimitri, 1987; Scarpa, 2000; De la Peña and Pensiero, 2004) and, (b) Those which presence in the area of citation may have been previously corroborated with the Flora of the Southern Cone (Zuloaga et al., 2009). In some cases, the common names mentioned in the sources corresponded to generic names, that is, they refer to many botanical species. Only the cases in which these species belong to the same botanical genus, it was decided to include these data under the generic name (e.g. "liuto", *Alstroemeria* sp., "rui-barbo", *Rheum* sp.); otherwise, the data were discarded.

The few unpublished information was obtained during ethnobotanical fieldworks carried out in a *mocovi* indigenous settlement in Southwest of Chaco province (North of Argentina) where plant material was collected in the company of informants. These plants were deposited in the Herbarium of Museo de Ciencias Naturales "Bernardino Rivadavia" (BA) of Buenos Aires, Argentina. Personal permission to freely spread out this information was obtained in an informal manner from *mocovi* people.

In relation to the therapeutic properties of the plants use against *empacho*, the studies by Alonso and Desmarchelier (2005), Del Vitto et al. (1997), Grieve (1998), Lahitte et al. (1998, 2004), and Roig (2002); while for the "hot" or "cold" condition of the plants the papers of García and Jiménez (1986) and Scarpa (2004a) were quoted, in addition to the ones cited above. Finally, just 3 (three) species were categorized as "doubtful identification" or needing a comparison with botanical material (cited with the abbreviation "cf."), since such works do not include plant material for the identification of the specific taxon.

All botanical names were updated using Tropicos.org (2013) database, from the Missouri Botanical Garden (mobot).

The data rejected for referring to plants with a common name that could have corresponded to several species belonging to more than one botanical genus, included about 20 plant entities corresponding to a total of 30 citations. Among them we can mention those which could be Argentinean native plants, such as the "canchalaguas" (herbs with bitter- tonic and cholagogue properties belonging to *Centaurea*, *Schkuhria*, *Gutierrezia*, *Scoparia*, *Sisyrinchium*, and *Veronica* genera, among others)(according to Correa, 2003); "altamisas" (*Ambrosia*, *Artemisia*, *Parthenium* or *Tanacetum* genera according to the region); "contrayerbas" (*Dorstenia*, *Flaveria*, *Trichocline* or *Trixis* genera), "jumes" (*Allenrolfea*; *Heterostachys*; *Sarcocornia*; *Sesuvium* or *Suaeda* genera), "guaycurú" (plants corresponding to *Limonium*, *Galianthe*, *Prosopanche* and *Caesalpinia* genera); "bledos" (several species of *Alternanthera* and *Amaranthus*); "salvias" (*Hyptis*, *Lantana*, *Lippia* and *Salvia* genera) (according to Giberti, 1981), "romerillo" (species of *Aloysia*, *Baccharis*, *Chuquiraga*, *Senecio* and *Solidago*), "yerba meona" (*Amaranthus*, *Euphorbia*, *Heliotropium*, and *Hipericum* genera among others), and "agrimonias" (*Costus*, *Eupatorium* and *Agrimonia* genera), among others. Another type of rejected data include certain plant products of exotic origin used by physicians from the late XIXth and early XXth century, such as "ipecacuanha", "jalapa" or "mechoacán" and "incense", because it was not possible to get a precise identification at the level of botanical genus (usually corresponding to two or more genera). Finally, some data cited



in ancient pharmacobotanical and folkloric sources include botanical identifications of plants that are not growing nowadays in the zones where they are referred to or it is uncertain; that is why most of these data were rejected.

### 3. Results

A total of 360 data have been compiled about the use of 152 plant species for the treatment of *empacho* in Argentina. Most data (42%) come from ethnobotanical works and to a lesser degree from folkloric or anthropological studies (29%), medical and botanical texts from the late XIXth and early XXth century (16%), pharmacobotanical and medical botany (10%), and from works of physicians and explorers from the XVIIIth and beginning of the XIXth century (2%).

In Table 1 the species used to treat *empacho* are listed in alphabetical order according to the botanical family. Vernacular name, category for the Argentinean flora, used part, concise data available about its preparation and/or administration, bibliographical sources of the citation, and therapeutic properties associated with the digestive system for each plant species, is mentioned. The category “therapeutic properties” refers to the plant’s traditional uses as well as the ones listed on several laboratory researches in order to show the different strategies that have been found in the Argentinean popular medicine to treat *empacho*.

Two thirds of the referred plants (102 species) are native from the territory of the Argentinean Republic, 9 species are adventitious, and 41 exotic (27%). About most of the last ones (26 species) there are records of their cultivation in the country, while the rest (15) could have been introduced in the form of dry product and/or tinctures. The species used belong to 54 botanic families, mainly Asteraceae (22 species, 14%); Lamiaceae (10 species, 6.5%); Verbenaceae and Fabaceae (8 species each, 5%), Chenopodiaceae and Ephedraceae (7 species each, 4.5%) and Myrtaceae (6 species, 4%).

The most representative genera were *Ephedra* (7 species); *Baccharis* (6); *Celtis*, *Dysphania* and *Schinus* (4 species each), and *Aloysia*, *Lippia* and *Mentha* (3 species each). The most cited plant remedies to treat *empacho* were cooking the aerial part of *Dysphania ambrosioides* (L.) Mosyakin and Clemants (Chenopodiaceae), the root of *Alternanthera pungens* (Amaranthaceae), and the leaves of *Aloysia polystachya* (Verbenaceae). In Fig. 1 the ten most cited species are shown.

The most frequently used parts are leaves (52 species, 34%) or just the foliated branches (49, 32%), less frequently are used the roots (17, 11%), stalks, and barks (8 species each). Among the forms of preparing plant remedies the most common are decoction (73 species, 48%) and infusion (60 species, 39%). In just a few cases, the use of stomach plasters on the abdomen (5 species); warm baths (3), purging enemas (2), and the preparation of wines and

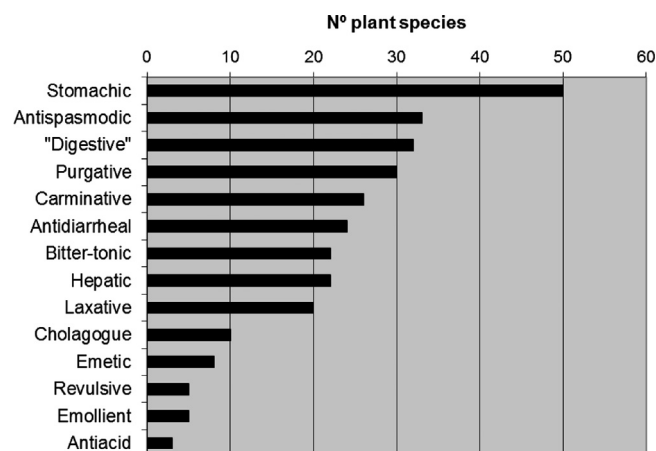


Fig. 2. Herbal species cited for each kind of therapeutic action.

medicinal tinctures (3 species), is cited. The most predominant mode of administration is the internal one (120 species, 93%), mainly the oral route.

The consulted sources classified 65 species (43%) used to treat *empacho* according to the hot–cold syndrome. Most of them (51 species, 78%) were classified as “hot”, and the rest (14) as “cold” or “refreshing”.

In 66% of the total data (240), the human group which performs these practices is mentioned, most of them (38%) belong to the cultural area of Northwestern Argentina (provinces of Jujuy, Salta, Tucumán, Catamarca, La Rioja, Santiago del Estero, West of Formosa, and Chaco); 26% to the Northeast or “Litoral” (Entre Ríos, Corrientes, Misiones, Santa Fe, east of Formosa, and Chaco); 16% to the central and central-east area (Buenos Aires, Córdoba); and 10% to Patagonia (south extreme) and to central-west area of Cuyo (San Juan, Mendoza, and San Luis). It is important to mention that 95.6% of these data refer to Argentinean “mestizo” or “criollo” populations, while just only 4.4% refer to indigenous groups.

In the consulted references, some kind of pharmacological effect associated with the digestive system is cited for 97% of plant species used to treat *empacho*. The number of species for each one of these effects is presented in Fig. 2. It must be taken into account that in several cases more than one of such properties was found for the same species, and in other cases the ultimate effects of some of these applications may overlap among them (i.e. the bitter-tonic action with the stomachic and/or cholagogue or cholagogue one).

### 4. Discussion and conclusions

This research shows that most species (80%) more frequently cited to treat *empacho* (Fig. 1) are aromatic herbs, characteristic that is frequently associated with the therapeutic properties, due to the presence of essential volatile oils in their chemical composition. The most representative botanical families (Asteraceae y Lamiaceae) to which belong the identified plant species to treat *empacho*, correspond to the first two of highest worldwide medicinal importance for extra-Neotropical zones (Moerman et al., 1999). However, this coincidence becomes a little peculiar because most data come from Argentinean regions (Northwest and Northeast) that belong to the Neotropical domain.

The distribution of the data by regions where the plant uses to treat *empacho*, it is approximately homogeneous throughout the country. The higher number of data reported for the Northwest and Northeast in relation to the rest of the areas, could be due to the greater number of studies about the folk uses of plants in Argentina that the former have had.

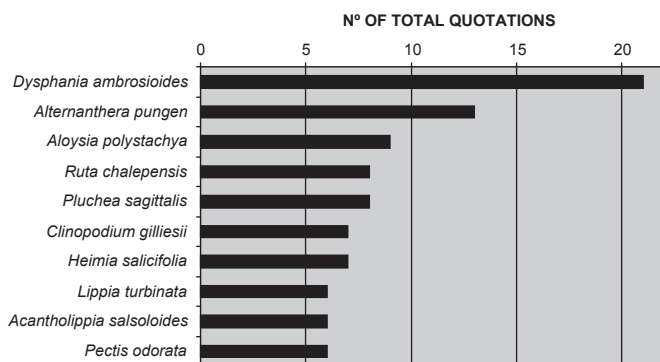


Fig. 1. Most cited species to treat *empacho*.

According to the pharmacological effects recorded for the species used to treat *empacho*, it can be concluded that the plant therapy employed by Argentinean folk medicine includes techniques that may be classified for descriptive purposes as: evacuants; excitants of digestion; revulsive-emollient; and carminative-spasmodic.

The *evacuant therapies* may consist on the ingestion of plants decoctions or infusions with purgative properties (drastic or soft), laxative or emetic, in order to release the obstruction of the digestive system.

The *excitants of digestion* are procured by an oral administration of decoctions or infusions of plants with bitter-tonic properties (that stimulate gastric or hepato-biliary secretion) and others which just have stomachic (exciting activity at gastric level), choleric (at hepatic level), and/or cholagogues effects (at the gallbladder level).

On the other hand, *revulsive therapeutics* (usually accompanied by digestion exciting remedies) consist of applying stomach plasters with pungent and/or vesicant substances over the abdomen. Its purpose (according to folk medicine) would have been to provoke an inflammation and/or vesication process on the superficial tissues, which could have “softened” or “destroyed” the *empacho* or bolus.

The intake of decoctions or plant infusions with carminative properties could be an attempt of neutralizing the fermentative process of the stuck bolus, diminishing flatulence as a consequence. Hence, these remedies would have a spasmodic function over the gastrointestinal smooth muscle increasing intestinal motility (Alonso, 2004). The latter technique is usually accompanied by the intake of purgatives or bitter substances that additionally favor gastrointestinal transit and evacuation.

Estimated relative weights of each one of these therapeutic techniques in the treatment of *empacho* are shown in Fig. 2. Most of used plants (86 species, 56%) have therapeutic properties that stimulate or excite the digestive process. These include species characterized either as stomachic (50, 33%), hepatic (22, 14%), bitter-tonic (22, 14%), or cholagogue (10, 6%). With less plant diversity (50 species, 33%) the evacuant techniques (purgative, laxative and emetic) and those of carminative-spasmodic (carminative and antispasmodic) effect (48 species, 31%), are found. Plants with revulsive-emollient properties are not frequently used (10 species, 6%). “Digestive” category could not be included in any of the therapeutic strategies before listed because its own ambiguity in household medicine, that many times it is thought of as a remedy against any disease of the digestive tract. The relative importance of evacuant techniques recorded, along with the high proportion of remedies characterized according to the hot-cold syndrome, just confirms the influence of humoral medicine on Argentinean folk medicine. Actually, the importance that the triad “purge-enema-bloodletting” tending to “evacuate ills through emunctories” (Laplantine, 1999; Sendrail, 1983) used to have for such school in the past, as well as the role of the hot-cold classification for remedies and diseases in Argentinean folk medicine (Scarpa, 2004a), is plainly recognized. The huge preponderance of hot plants over the cold ones is coherent with the interpretation according to which “hotness” favors food digestion, a process conceived as a “cooking” by the humoral theory. Because of this, the organs of the digestive system were characterized by a slight natural excess of hotness (Foster, 1953), it can be said that the therapeutic criterion used when treating *empacho* according to the syndrome, would be of the homeotherapeutic type because it aims at exciting the natural digestive function of such system (as it has been described for “criollos” of the Argentinean Chaco by Scarpa (2004a)). This also agrees with the most commonly used therapeutic technique (exciting) to treat *empacho* by the Argentinean folk medicine, formerly estimated according to the plant's therapeutic properties (vide supra).

On the other side, this CBS is frequently seen among “mestizos” or “criollos”, much more than in indigenous population. This fact could be explained by the assimilation of European culture that the first groups have. Even the word “empacho”, as well as many rituals (for example, measure with the ribbon -“medir con la cinta”-) and some herbs (such as chamomile, rosemary, or rue, among others) have the same Mediterranean origin.

The results compiled here may be underestimated due to the way that *empacho* has been considered in the Argentinean academic circles. In fact, unlike the manuscripts written by the end of the XIXth and beginning of the XXth century, the texts about the popular plant uses written more recently from the pharmacobotanical, medical botany, and ethnopharmacology point of view, insist on refusing the existence of *empacho* as a clinical entity, since doing it would have been considered a lack of scientific rigor. To replace this name, terms like “acute dyspepsia” or others are used, being all of them unable to encompass completely the etiological and symptomatological scope of this cultural-bound disease. For example, the phytochemical and ethnopharmacological review by Barboza, et al. (2009) about Argentinean flora compiles a big amount of information about the use of medicinal plants; however “empacho” is not even mentioned. Although this might be foreseeable, considering the traditional biomedical training in Argentina, it is difficult to understand when the same attitude is present in ethnobotanical approaches which, by definition, should privilege the point of view of the cultural group we are talking about. In such papers, the specific application of the remedies used against *empacho* are usually replaced (or also translated) by expressions like “digestive”, “to treat indigestion”, “to treat digestive problems”, “stomachic”, “hepatic”, or under the macro-category of “gastrointestinal symptoms” (as it is explicitly stated in Estomba et al., 2006), impoverishing the ethnopharmacological data.

At this point anyone could surely ask: How does the great amount of plants and citations registered for the treatment of *empacho* in Argentina can be explained? First of all, there are cultural reasons (specifically ethnomedical ones). It is well known that folk medicine therapy is mostly symptomatological (Kuschick, 1995); so does it the Argentinean one (Scarpa, 2004b). Is in this sense, that most plant species prescribed against *empacho* are also employed in the treatment of many different symptoms when they are perceived as a particular ailment, such as: constipation; abdomen inflammation; flatulence; stomachache; stomach, hepatic or intestinal indigestion, nausea, etc. *Empacho's* symptomatological complex could be perceived as showing most of them at the same time, so there is not exclusivity at all in the plant remedies referred in the sources but a summatory of medicinal applications against its symptoms. Another reason that might explain the great amount of species and citations found would be the high homogeneity that Argentinean folk medicine shows, determining the acknowledgement of *empacho* as a medical nosologic entity throughout the country (Fig. 2). Taking into account the richness of medicinal plant resources along a territory larger than 2.7 million km<sup>2</sup> with great ecological and phytogeographical diversity, and the fact that digestive ailments are the major target of Argentinean popular therapy, it would be easier to explain the obtained results.

This work, although it is mostly based on bibliographical sources, has no precedent for the study of Argentinean ethnobotanical medicine as a work of synthesis, since there is no previous information on the identification of so many different medicinal plants (as well as sources) associated with the treatment of just one cultural-bound disease. Among them, it might be concluded that *empacho* constitutes the disease for which the largest number of medicinal plants are used in Argentina. The great diversity of source origins, as well as the large variety of therapeutic strategies,

the diversity of plant remedies and knowledge associated with *empacho*, could be directly related to the huge significance this ailment has within the medical-nosologic representation system of Argentinean folk medicine.

Finally, based on these findings, the different etiological and therapeutic representations coming from the use of medicinal plants could be compared in future contributions with those related to the magic and religious rituals used to treat *empacho*. The concordance between them could allow the identification of patterns that will highlight the cultural nature of this CBS.

The comparative analysis among the great diversity of strategies in different regions, countries, and groups, as well as the deeper comprehension of the convergent and divergent processes that conform the scientific, epistemological, and popular construction of the cultural-bound syndromes, remains as a wide field for further research.

## Acknowledgements

Thanks to Consejo Nacional de Investigaciones Científicas y Tecnológicas (CONICET) of Argentina; to Agencia Nacional para la Promoción Científica y Tecnológica (ANPCYT) of Argentina for its financial support. Special thanks to Cecilia Montani, Monika Kujawska, Gustavo Martínez, Cintia Rosso, and Bianca Vargas for their valuable information.

## References

- Abella, L. 1998. Flora medicinal andina: plantas aromáticas empleadas en la terapéutica popular. Tesis doctoral Facultad de Ciencias Naturales y Museo. Universidad Nacional de la Plata, La Plata.
- Acosta, E. 1975. Las curanderas y sus recetas para empacho. Mecanoescrito. Museo del Hombre Chaqueño.
- Acosta, E., Gómez-Lestani, E., 1980. El empacho en el área guaraníca argentina. Investigación folklórica/Interpretación científica. Sin editor, Resistencia.
- Agüero Blanch, V.O. 1968. Las remedieras de Malargüe. Instituto de Antropología. Córdoba.
- Albornoz, A.M., et al. 2004. Introducción a la complejidad herbolaria de la medicina tradicional mapuche, Pampa Patagonia argentina: análisis multidisciplinario. (<http://www.unisi.it/ricerca/centri/cisai/Albetal.doc>). Universidad de Siena, Italia.
- Alonso, J., Desmarchelier, C., 2005. Plantas Medicinales Autóctonas de la Argentina. Bases científicas para su Aplicación en Atención Primaria de la Salud. Buenos Aires, Lola p. 663.
- Alonso, J., 2004. Tratado de Fitofármacos y Nutracéuticos. Buenos Aires, Corpus.
- Arenas, P., Galafassi, G.P., 1994. La 'ruda' (*Ruta chalepensis* L., Rutaceae) en la medicina folclórica del norte argentino. Dominguezia 11, 7–31.
- Arenas, P., 2003. Etnografía y alimentación entre los toba-ñachilamoleek y wichí-lhuku'tas del Chaco Central (Argentina). El autor, Buenos Aires p. 562.
- Ávila, M.T., 1960. Flora y Fauna en el folklore de Santiago del Estero. M. Violetto, San Miguel de Tucumán, 254.
- Barboza, G.E., Cantero, J.J., Núñez, C., Pacciaroni, A., Ariza Espinar, L., 2009. Medicinal plants: a general review and a phytochemical and ethnopharmacological screening of the native Argentine flora. Kurtziana 32, 7–365.
- Benvenuto, A., Sánchez, D. 2002. Madres que curan. El uso de plantas medicinales y otras prácticas populares de curación entre las madres de los barrios Vista Alegre, Villa Nocito, Maldonado y 1 de mayo de Bahía Blanca. ([http://www.naya.org.ar/congreso2002/ponencias/adriana\\_benvenuto.html](http://www.naya.org.ar/congreso2002/ponencias/adriana_benvenuto.html)).
- Bianchetti, M.C., 1996. Cosmovisión sobrenatural de la locura. Pautas populares de salud mental en la puna argentina. CONICET, Salta.
- Biglioni, N. 1973. Medicina popular. Provincia de Río Negro. Centro de Investigaciones Científicas. Serie de Estudios y Documentos 6.
- Bruneton, J. 2001. Farmacognosia. Fitoquímica. Plantas medicinales. 2° edición. Acribia, Huesca.
- Burgstaller, J.A., 2005. 700 hierbas medicinales. Sus propiedades terapéuticas. Usos y dosis. Editorial Plus-Ultra. Buenos Aires, S.A.
- Burkart, A. 1979. Flora Ilustrada de Entre Ríos. Colección Científica del Instituto Nacional de Tecnología Agropecuaria. Tomos 1 a 6. Instituto Nacional de Tecnología Agropecuaria, Buenos Aires.
- Campos-Navarro, R. (comp.) 2000. El empacho en la medicina mexicana, Antología (siglos XVI-XX) Instituto Nacional Indigenista. México.
- Campos-Navarro, R. (comp.) 2006. Textos peruanos sobre el empacho (1612–2006) UNAM/AMARES, Lima.
- Campos-Navarro, Roberto (comp.) 2007 Textos cubanos sobre el empacho Cuadernos de Historia de la Salud Pública No. 102, La Habana, Cuba.
- Campos-Navarro, R. 2009a. Medir con la cinta y tirar del cuerito. Textos médicos sobre el empacho en la Argentina. Ediciones Continente/Facultad de Medicina, Universidad Nacional Autónoma de México, Buenos Aires.
- Campos-Navarro, R. 2009b. El empacho en Bolivia. 1612–2009 Viceministerio de Medicina Tradicional e Interculturalidad/ PROHISABA, La Paz.
- Casamiquela, R., 1999. Proyecto etnobotánico de la Patagonia, primer informe. In: Suárez, En, Fortunato, E.Y., Elechosa, R.H., Casamiquela, M.A., Saavedra E., R., Timmermann, B.N. (Eds.), Aspectos técnicos, culturales, políticos y legales de la bioprospección en Argentina. ICBG, Buenos Aires.
- Chifa, C., Ricciardi, A.I.A. 2001. Plantas de uso en medicina vernácula del centro del Chaco argentino. Miscelanea 117: 1–34. Fundación Miguel Lillo, Tucumán.
- Codex Medicamentarius Argentino. 1978. Farmacopea Nacional Argentina. 6° edición. Codex, Buenos Aires.
- Comunidad Kolla de Finca Santiago—Iruya, 2006. Valores y saberes medicinales. Ministerio de Desarrollo Social/ Secretaría de Políticas Sociales/ Instituto Nacional de Asuntos Indígenas, Salta.
- Correa, R.F. 2003. El complejo de las "canchalaguas" en Argentina: Génesis, conformación y etnobotánica. Tesis doctoral, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata.
- Crisci, J.V., Gancedo, O.A., 1971. Sistemática y etnobotánica del Güembe ("*Philodendron bipinnatifidum*") una importante aracea sudamericana. Revista del Museo de la Plata (Nueva Serie) Sección Botánica 11, 285–302.
- De la Peña, M.R., Pensiero, J.F., 2004. Plantas Argentinas. Catálogo de Nombres Comunes. Buenos Aires, Lola p. 373.
- De Sosa Revello y Mandoutti, S. S., 1878. Colección completa de recetas del célebre Dr. Mandoutti. Librería del Madrileño, Montevideo.
- Del Vitto, L.A., Petenatti, E.M., Petenatti, M.E., 1997. Recursos herbolarios de San Luis (República Argentina) primera parte: plantas nativas. Multequina 6, 49–66.
- Di Lullo, O., 1929. La medicina popular de Santiago del Estero. El Liberal. Santiago del Estero, 171.
- Di Lullo, O., 1943. El folklore de Santiago del Estero. El Liberal. Santiago del Estero, 446.
- Di Lullo, O., 1946. Contribución al estudio de las voces santiagueñas. Provincia de Santiago del Estero, Santiago del Estero, 371.
- Dimitri, M.J., 1987. Enciclopedia Argentina de Agricultura y Jardinería. Tercera edición, Tomo 1, 2° volumen. Buenos Aires, Acme p. 480.
- Domínguez, S., 1884. "Empacho" Anales del Círculo Médico Argentino. Imprenta de "La Universidad". Buenos Aires.
- Elizalde V., A. Bernasconi y S. Elizalde, 2001. Medicina popular en el Departamento Uruguay. Una mirada a las prácticas médicas de nuestro pueblo. Ediciones del Clé. Nogoyá, Provincia de Entre Ríos.
- Equipo de investigación Nueva Era, 1996. Plantas que curan. La salud por las hierbas medicinales. Ediciones Continente. Buenos Aires.
- Estomba, D., Ladio, A., Lozada, M., 2006. Medicinal wild plant knowledge and gathering patterns in a Mapuche community from North-western Patagonia. Journal of Ethnopharmacology 103 (2006), 109–119.
- Falkner, Th. [1774] 1937. Descripción de la Patagonia y de las partes contiguas de la América del Sur En: Molinari, J.L., Historia de la Medicina Argentina. Imprenta López, Buenos Aires.
- Fariás, J.R. 2004. Folklore de transmisión oral. Creencias populares. Impresionarte, Presidencia Roque Sáenz Peña, Chaco.
- Figueroa, N. 2002. Medicina autóctona y perviviente del Noroeste Argentino. Facultad de Humanidades y Ciencias Sociales. Universidad Nacional del Jujuy, San Salvador del Jujuy.
- Filipov, A., 1997. La farmacopea natural en los sistemas terapéuticos de los indígenas Pilagá. Parodiiana 10 (1–2), 35–74.
- Fresquet, J., Devesa, F., Pellicer J., Campos-Navarro, R. 2006. L'enfit: una malaltia de la medicina popular. CEIC Alfons El Vell/ Associació per a la Investigació Sanitaria a La Safor. Gandía, España.
- Funes, F. 1999. Estudio etnobotánico del Valle del Río Manso Inferior, Prov. de Río Negro. Tesis de licenciatura en Ciencias Biológicas. Centro Regional Universitario de San Carlos de Bariloche, Universidad Nacional del Comahue.
- Foster, G.M., 1953. Relationships between Spanish and Spanish American Folk Medicine. Journal of American Folklore 66, 201–217.
- Gancedo, A., 1916. Flora arbórea del Territorio Nacional del Chaco y proyecto de ley. Talleres Gráficos de la Penitenciaría Nacional. Buenos Aires p. 237.
- García, S.P., Jiménez, D.I., 1986. Natural y postizo: Frío y caliente. Sistemas clasificatorios vigentes entre criollos del litoral argentino. Suplemento Antropológico 21, 131–146.
- Giberti, G.C., 1981. Las malvas y las salvias de la medicina popular del Noroeste argentino. Parodiiana 1 (1), 31–96.
- Grieve, M., 1998. A Modern Herbal. The medicinal, culinary, cosmetic and economic properties, cultivation and folklore of herbs, grasses, fungi, shrubs and trees with all their modern scientific uses. Tiger Books International, 912, London.
- Haloua Gruneisen, P. 1997. La vegetación patagónica en el yacimiento El Huemul - Koluel Kaike. Argentina. (<https://docs.google.com/viewer?url=http://www.eco-puerto.com/cae/total/Total-HUEMUL.PDF&chrome=true>).
- Haloua Gruneisen, P. 1996. Vegetación del Monte en el Yacimiento Aguada de la Pichana. Total Austral, Buenos Aires, 59–60.
- Kutschker, A., Menoyo, H., Hechem de Bonansea, M.V., 2008. Plantas medicinales de uso popular en comunidades del oeste del Chubut. 2° edición. Bavaria, San Carlos de Bariloche, 139.
- Hieronymus, J., 1882. Plantae Diaphoricae florum argentinae. Buenos Aires p. 404.
- Hilgert, N.I. 1998. Las plantas vinculadas con el ámbito doméstico y la subsistencia de los campesinos de la cuenca del río Zenta, Dpto. Orán, Prov. Salta. Tesis

- doctoral, Universidad Nacional de Córdoba-Museo de Ciencias Naturales de Salta. Córdoba, Argentina.
- Ibarra, R.F., 1888. El empacho. Tesis para optar al grado de doctor en medicina y cirugía. Imprenta Europea. Buenos Aires.
- Jiménez de Puparelli, D., 1984. In: Bracht, Fundación Federico Guillermo (Ed.), *Función de la medicina popular en la comunidad entrerriana y su relación con la medicina oficial en Cultura tradicional del área del Paraná medio*. Buenos Aires.
- Karlin, U.; Martinelli, M.; Gaviorno, M.; Díaz, G.; Ordóñez, C. y Comunidad educativa de Balde del Rosario. 2005. *Saberes que sanan. Plantas nativas con uso medicinal en Balde del Rosario*, San Juan, Argentina. Universidad Nacional de San Juan, San Juan.
- Karlin, U.O., Martinelli, M., Damiani, O., Díaz, G., Ordóñez, C., Gaviorno, M., Meglioli, C., Ojeda, M., Coirini, R., Ribas, Y., Hadad, M., Escobar, V., 2006. *Huellas de identidad. Uso y conservación de las plantas en Tucumán, Malimán y Angualasto*. El autor, San Juan p. 72.
- Keller, H.A., 2007. Unidades de vegetación y recursos florísticos en una aldea Mbya Guaraní de Misiones, Argentina. *Kurtziana* 33 (1), 175–191.
- Kossmann, I., Vicente, C.A., 2001. *Sanarnos con plantas. Guía práctica*, Ed. Longseller. Buenos Aires.
- Kozel, C. 1952. *Salud y curación por yerbas*. Editorial de la Misión "La Verdad Presente", San Nicolás.
- Kozel, C., 1973. *Por la senda de la salud*. Editorial de la Misión "La Verdad Presente". Lima/Buenos Aires.
- Kujawska, M. 2008. *Leczenie zamawianiem wśród polaków z Misiones w Argentynie*. LUD 92: 65–86. Wrocław.
- Kuschick, I., 1995. *Medicina popular en España. Siglo XXI*, Madrid, 166.
- Lahitte, H.B., Hurrell, J.A., Belgrano, M.J., Jankowski, Haloua, P., Mehlreter, K., 1998. *Plantas Medicinales Rioplatenses. Plantas nativas y naturalizadas utilizadas en medicina popular en la región del Delta del Paraná, Isla Martín García y Ribera Platense*. Buenos Aires, Lola p. 240.
- Lahitte, H.B., Hurrell, J.A., Belgrano, M.J., Jankowski, Haloua, P., Mehlreter, K., 2004. *Biota Rioplatense II. Plantas Medicinales Rioplatenses. Plantas nativas y naturalizadas utilizadas en medicina popular en la región del Delta del Paraná, Isla Martín García y Ribera Platense*. Buenos Aires, Lola p. 240.
- Laplantine, F., 1999. *Antropología de la enfermedad. Estudio etnológico de los sistemas de representaciones etiológicas y terapéuticas en la sociedad occidental contemporánea*. Del Sol. Buenos Aires.
- Le Roy, 1825. *La medicina curativa o la purga*, Imprenta de la Independencia. Buenos Aires.
- LEA, 2005. *Enciclopedia Práctica de las Medicinas Alternativas*. Buenos Aires, LEA.
- Liberato, J., 1988. *Folklore puntano*. Fondo Editorial Sanluisense, Argentina.
- Lozano, P., 1767. *Historia de la conquista del Paraguay, Río de la Plata y Tucumán*. Colección de obras, documentos y noticias del Río de la Plata. Tomo 1. Andrés Lamas. Buenos Aires 1873–75.
- Lupo, L.C., Echenique, M.R., 1997. *Etnobotánica en la comunidad puneña de Yavi, Jujuy, Argentina. Parte I. Parodiana* 10 (1–2), 19–34.
- Marcus, A. 2007. *Germinación del camino*. Ediciones de la Bruja, Zapala, Neuquén.
- Martínez, G.J., Planchuelo A.M., A.M., 2003. *La medicina tradicional de los criollos campesinos de Paravachasca y Calamuchita, Córdoba (Argentina)*. Scripta Ethnologica XXV, 25. Buenos Aires pp. 83–116.
- Martínez G.J. 2010 *Las plantas en la medicina tradicional de las Sierras de Córdoba. Un recorrido por la cultura campesina de Paravachasca y Calamuchita*. Ediciones del Copista. Córdoba.
- Martínez Crovetto, R.N., 1965. *Estudios etnobotánicos II. Nombres de las plantas y su utilidad según los indios vilelas del Chaco*. *Bonplandia* 2 (1), 1–23.
- Martínez Crovetto, R.N. 1981. *Las plantas utilizadas en medicina popular en el Noroeste de Corrientes (República Argentina)*. *Miscelanea* 69: 1–139. Fundación Miguel Lillo, San Miguel de Tucumán.
- Marzocca, Á., 1997. *Vademécum de malezas medicinales de la Argentina. Indígenas y exóticas*. Editorial Hemisferio Sur. Buenos Aires.
- Mas Serra, M.T.; Verdú González, A.M.; Trillo, C.; Bertero, H.D. 2008. *Plantas silvestres de Santa Victoria Oeste y sus usos*. Norte de la provincia de Salta, Argentina. Universitat Politècnica de Catalunya, Barcelona.
- Moerman, D.E., Pemberton, R.W., Kiefer, D., Berlin, B., 1999. *A comparative analysis of five medicinal floras*. *Journal of Ethnobiology* 19 (1), 49–67.
- Montani, M.C.; Vega Riveros, C.; Ribas, Y.A.; Karlin, U.O.T.; Gaviorno, M.; Hadad, M. A.; Meglioli, P.; Inojosa, M., 2010. *Raíces Huarpes: uso medicinal de plantas en la comunidad de Lagunas del Rosario, Mendoza, Argentina*. Universidad Nacional de San Juan, San Juan.
- Montenegro, P., 1945. [1710]. *Materia médica misionera*. Imprenta de la Biblioteca Nacional. Buenos Aires.
- Montesano, A., 1913. *Plantas medicinales (Extranjeras e indígenas). Obra ajustada al criterio de la medicina natural*. Imprenta Suiza. Buenos Aires.
- Montesano, A., 1917. *Tratado completo de medicina natural. Talleres gráficos de Ferrari hermanos*. Buenos Aires.
- Muñoz, W. 2010. *El uso de las plantas silvestres por la comunidad de Chos Malal (Provincia de La Pampa)*. Tesis doctoral, Facultad de Ciencias Naturales y Museo de la Universidad Nacional de La Plata. La Plata, Argentina.
- Palma, N.H., 1973. *Estudio Antropológico de la Medicina Popular de la Puna Argentina*. Ediciones Cabargon. Buenos Aires.
- Palma, N.H., 1978. *La medicina popular en el Noroeste argentino*. *Huemul*. Buenos Aires.
- Pelegrín M. A., 1984. *Análisis antropológico de la farmacopea popular de la Provincia de Jujuy, República Argentina*. Tesis de Licenciatura Facultad de Filosofía y Letras Universidad de Buenos Aires.
- Pelegrín, M., 2005. *Cuando la salud viene de la tierra. Una visión antropológica de la medicina popular en Jujuy, República de Argentina*. Buenos Aires.
- Pérez de Nucci, A.M., 1988. *La medicina tradicional del noroeste argentino*. Ediciones del Sol. Buenos Aires.
- Pochettino, M.L., Martínez, M.R., 2000. *Aporte al conocimiento actual de las plantas medicinales en Argentina: Estudio etnobotánico en el Departamento de Molinos, Provincia de Salta, Argentina*. En: Aníbal G. Amat (Coordinador). *Farmacobotánica y farmacognosia en Argentina 1980–1998*, 55–86, Ediciones Culturales Argentinas (E.C.A.), La Plata.
- Pochettino, M.L.; Martínez, M.R.; Itten, B., Zucaro, M. (1997). *Las plantas medicinales como recurso terapéutico en una población urbana: estudio etnobotánico en Hernández (Pdo. La Plata, Prov. Buenos Aires, Argentina)*. *Parodiana* 10(1–2): 141–152.
- Ponessa, G., Hernández, R., Daud, C., Alderete, O., Bianchi, J., 2003. *Uso de plantas medicinales en el área operativa Lamadrid, sede de una pasantía rural: abordaje etnobotánico*. *Revista de la Facultad de Medicina* 4 (2), Universidad Nacional de Tucumán.
- Quijano R. (2004). *Curanderos familiares. Métodos para curar el "mal de ojo", "el empacho" y "la culebrilla"* [www.sama.org.ar/com/4.htm](http://www.sama.org.ar/com/4.htm).
- Ratera, E., Ratera, M., 1980. *Plantas de la flora argentina empleadas en medicina popular*. Editorial Hemisferio Sur. Buenos Aires.
- Rogé J.C. 2003. *Color, sabor y picardía en la cultura. Los regionalismos de Mendoza*. Editorial de la Universidad Nacional del Cuyo, Mendoza.
- Roig, F.A., 2002. *Flora medicinal mendocina. Las plantas medicinales y aromáticas de la provincia de Mendoza (Argentina)*. EDIUNC. Mendoza, 305.
- Rosenzvaig, E., 1997. *La Cepa. Arqueología de una cultura azucarera*. Instituto de Investigaciones sobre Cultura Popular/Facultad de Artes/Universidad Nacional de Tucumán. Tucumán 1997.
- Saggese, D., 1928. *Yerbas medicinales argentinas. Breves apuntes de las propiedades de las mismas e indicaciones de su uso*. s/ed. Buenos Aires.
- Sawchuk, B., 1982. *Descripción de árboles medicinales de la selva misionera*. *Lumicop*, Posadas, 169.
- Scarpa, G.F., 2000. *Estudio etnobotánico de la subsistencia de los criollos del Chaco Noroccidental argentino*. Tesis Doctoral Facultad de Ciencias Exactas y Naturales de la Universidad de Buenos Aires. Buenos Aires, 351.
- Scarpa, G.F., 2002. *Plantas empleadas contra trastornos del sistema digestivo en la medicina folk de los Criollos del Chaco Noroccidental argentino*. *Dominguezia* 18 (1), 36–50.
- Scarpa, G.F., 2004a. *El síndrome cálido–fresco en la medicina popular criolla del Chaco argentino*. *Revista de Dialectología y Tradiciones Populares* 59, 5–29, Madrid.
- Scarpa, G.F., 2004b. *Medicinal plants used by the Criollos of Northwestern Argentine Chaco*. *Journal of Ethnopharmacology* 91 (1), 115–135.
- Scarpa G.F., 2012. *Registros del Instituto de Botánica Darwinion*. (<http://datos.sndb.mincyt.gov.ar/portal/welcome.htm>).
- Schulz, A.G., 1997. *Algunas plantas usuales del nordeste argentino*. *Parodiana* 10 (1–2), 211–241.
- Sendrail, M., 1983. *Historia cultural de la enfermedad*. Espasa-Calpe, Madrid, 437.
- Simón, R., 1935. *Manual de plantas medicinales*. Casa Bonald. Buenos Aires.
- Smolensky, E. 1982. *Creencias y prácticas médicas de dos grupos inmigrantes en Buenos Aires: bolivianos y paraguayos*. Tesis de licenciatura. Carrera de Ciencias Antropológicas. Facultad de Filosofía y Letras, Universidad de Buenos Aires.
- Sofía J., (2006). *Creencias Populares. Enfermedades y curas caseras*. Infolobos. Diario digital. Ciudad de Lobos, Provincia de Buenos Aires. <http://www.infolobos.com.ar/Nota.asp?IdNota=98>.
- Susini, T., 1879. *Contribución al estudio de el empacho*. Tesis para optar al grado de doctor en medicina y cirugía Imprenta de "La Pampa". Buenos Aires.
- Tropicos.org. Missouri Botanical Garden. 22 Jan 2013 (<http://www.tropicos.org>).
- Togo, J., Basualdo, M.A., Urtubey, N., 1990. *Aprovechamiento socioeconómico de la flora autóctona de Santiago del Estero (Listado de especies y uso popular más frecuente)*. *Indoamerica* 3 (3), 1–161, Universidad Nacional de Santiago del Estero, Santiago del Estero.
- Toursarkissian, M., 1980. *Plantas medicinales de la Argentina*. Hemisferio sur. Buenos Aires.
- Trease, G.E., Evans, W.Ch. 1991. *Farmacognosia*. 13ª edición. Interamericana, México.
- Valle Carrizo, E., Palacio, M.O, Roic, L.D., 2002. *Plantas de uso medicinal en la flora de los alrededores de la ciudad de Santiago del Estero (Argentina)*. *Dominguezia* 18 (1), 26–35.
- Zuloaga, F.; Morrone, O., Belgrano, M. 2009. *Flora del Cono Sur*. Catálogo de las Plantas Vasculares. Instituto de Botánica "Darwinion". Última actualización: Enero de 2009. (<http://www2.darwin.edu.ar/Proyectos/FloraArgentina/FA.asp>).