



Medicinal and aromatic species of Asteraceae commercialized in the conurbation Buenos Aires-La Plata (Argentina)

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Abstract

The present contribution includes 50 species of Asteraceae whose products are marketed with therapeutic and aromatic purposes in the conurbation Buenos Aires-La Plata, the largest metropolitan area of Argentina. For each species, the scientific and vernacular names, types of products and samples are given. The plant products comprise fresh plants or parts thereof, herbal products, tinctures, and dietary supplements, among others. The uses assigned and the effects scientifically studied are indicated. Also, the ethnobotanical value of the diverse plant products and their commercial circulation are discussed. Circulating products and their uses were studied, both in the restricted context of immigrant segments (Bolivian and Chinese), and in the broader context of general commercial circuit (health food stores, named locally 'dietéticas'). Botanical knowledge of immigrants segments is considered linked to their traditions, and botanical knowledge of general commercial circuit is regarded nontraditional. Research conducted is framed within the urban ethnobotany context. Specially, it addresses some relevant theoretical and methodological topics within discipline: composition of botanical knowledge in urban pluricultural scenarios (linked to traditions, nontraditional), the embodiment of this knowledge in actions (such as selection of products to consume), and the dynamic of changes in urban botanical knowledge (dispersion of products and uses in the commercial circuit and media).

Keywords: *Urban ethnobotany – Asteraceae – Conurbation Buenos Aires-La Plata, Argentina*

Introduction

This contribution presents partial results obtained from a research line about urban ethnobotany, carried out at the Laboratorio de Etnobotánica y Botánica Aplicada (LEBA), Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Argentina. This research line addresses the study of composition and dynamics of the urban botanical knowledge, a central issue of urban ethnobotany because that knowledge guides the selection of plants, parts thereof and products derived from them in urban pluricultural contexts. The study area comprises the conurbation Buenos Aires-La Plata, the largest metropolitan area of Argentina both in extension and population. It includes two contiguous urban agglomerations: one emerged around Buenos Aires, the capital city of the country, the other around La Plata, the capital city of Buenos Aires province.

The results presented here correspond to 50 species of Asteraceae marketed as medicinal and/or aromatic in the conurbation. Asteraceae is the family of flowering plants with greater diversity worldwide: 1,600 genera and 23,600 species, distributed in all continents, except Antarctica (Stevens 2013), and its economical and medicinal importance has been widely described (Heywood et al. 1977). Asteraceae is the largest plant family in Argentina, with 227 genera and around 1,400 native and adventitious species (Katinas et al. 2007), also it has the greatest number of native taxa used in popular medicine in this country (more than 270 species), followed by Leguminosae and Solanaceae (Barboza et al. 2009).

Framework

Ethnobotany is the study of the complex relations between people and plants, based on the theoretical context of ecology (Albuquerque and Hurrell 2010; Hurrell and Albuquerque 2012). An aspect related to those relationships has acquired a special development: studies about *botanical knowledge* (BK), that it is defined as an ensemble of knowledge and beliefs that people have about the vegetal elements of their surroundings: plants, parts thereof, or products deriving from them (Hurrell et al. 2011a). The BK orients diverse behaviors, like agricultural practices in rural contexts, or selecting vegetal elements consumed in urban scenarios. When we say: 'knowledge orients the actions', we mean that knowledge is embodied in diverse behaviors that become adaptive. In the ethnobotanical work is expected to extrapolate the underlying knowledge from the actions. For example: Why a plant is used in one way and not another? Or: Why a particular use may change over time? The called *embodiment of knowledge* (Martínez 2008; Varela 1990) is a complex concept. In our theoretical framework, we assume that knowledge generates actions, but we also must consider that, in turn, the actions feeds back on knowledge, which generates new patterns of action, and so on. So, the human-plant system evolves. This is a basic premise for ongoing investigations.

Most of the researches on BK are oriented to *traditional botanical knowledge* (TBK), the knowledge and beliefs of culturally homogeneous contexts where there is a direct link between production and consumption: 'those who consume, produce'. The BK of urban agglomerations is considered *nontraditional* in opposition to the TBK: it corresponds to pluricultural contexts where there is an indirect link between production and consumption: 'those who consume do not produce'. This type of BK is likewise adaptive, because it guides the election of the products to consume, while others are discarded (Pochettino et al. 2012a). But *urban botanical knowledge* (UBK) is more than nontraditional knowledge. UBK is a whole composed of different knowledges about plants and its derived products that coexist and interact within the

same pluricultural frame. The entire population of the metropolitan areas is highly heterogeneous, and brings together local inhabitants as well as diverse groups of immigrants from different origins and residence time in the area. Local inhabitants have a mostly nontraditional BK (including scientific knowledge), although many retain certain knowledge linked to their own family traditions. The different segments of immigrants preserve knowledge associated with their traditions of origin. The BK of these segments is linked to traditions, but it does not strictly a TBK, because it is readapted to a new cultural context. While some ethnobotanical researches deal with plants product used by the average consumer segment in urban scenarios (Arenas et al. 2011; Ladio and Molares 2010; Pochettino et al. 2008), most of the papers are devoted to groups of immigrants that preserve a BK linked to their native traditions (Ceuterick et al. 2008; Pieroni et al. 2005; Pochettino et al. 2012a; Sandhu and Heinrich 2005; Volpato et al. 2009).

Consequently, urban ethnobotany must to give answers to two key questions: 1. How is the UBK *composition*? That is: linked to traditions, nontraditional. 2. How is the UBK *dynamics*? That is how the transmission of knowledge about vegetal elements and their uses take place in the urban pluricultural context. Several plants, their parts and products are *visible* for everyone and belong to the general commercial circuit, and their uses are widespread by the mass media. Other plants and products remain restricted to immigrant segments or family traditions, and they are *invisible* for the majority of the local population. Nevertheless, some of these invisible vegetal elements become visible when they enter the general commercial circuit. In terms of the UBK dynamics, a restricted component (linked to traditions) spreads, and it gets generalized through a *visualization process*, in which the mass media play a relevant role (Hurrell et al. 2011a; Pochettino et al. 2012a).

Study area/Involved actors

The conurbation Buenos Aires-La Plata includes the Greater Buenos Aires, an urban agglomeration emerged around Buenos Aires city (Federal District) and the Greater La Plata, a contiguous agglomeration emerged around La Plata city (**Figure 1**). Greater Buenos Aires comprise the Federal District and 24 districts of the Buenos Aires province. Its total area is 3,833 km² (AABA 2013; Gemini 2003). Buenos Aires city has 2,891,082 inhabitants (in an area of 202 km²), while the 24 districts of Buenos Aires province have a total of 9,910,282 inhabitants (INDEC, 2013). In population, Greater Buenos Aires is the largest agglomeration in Argentina, the second in South America (after the metropolitan area of São Paulo, Brazil), the third in Latin America (after the metropolitan areas of Mexico and São Paulo), the fifth of America and the seventeenth worldwide (Forstall et al. 2004). The Greater La Plata is an urban agglomeration constituted by three districts of the Buenos Aires province: La Plata (which includes La Plata city), Berisso and Ensenada. Its total area is of 1,162 km², and its population of 793,365 inhabitants (INDEC 2013).

This conurbation is heterogeneous, and it comprises at least three different spaces: 1. Urban areas themselves; 2. Non-urbanized areas with native vegetation (some sectors correspond to protected natural areas); 3. Periurban areas considered transitional zones between urban and non-urbanized areas, characterized by moving boundaries which fluctuate according to the rhythms of urbanization. In the periurban area an intense horticultural activity is developed, whose production supplies fresh vegetables and fruits to the inhabitants of the conurbation and other urban areas of the country (Barsky 2005, 2010; Hurrell et al. 2011b). The set of homegardens and productive orchards is called *horticultural belt* (Pochettino et al. 2012b).

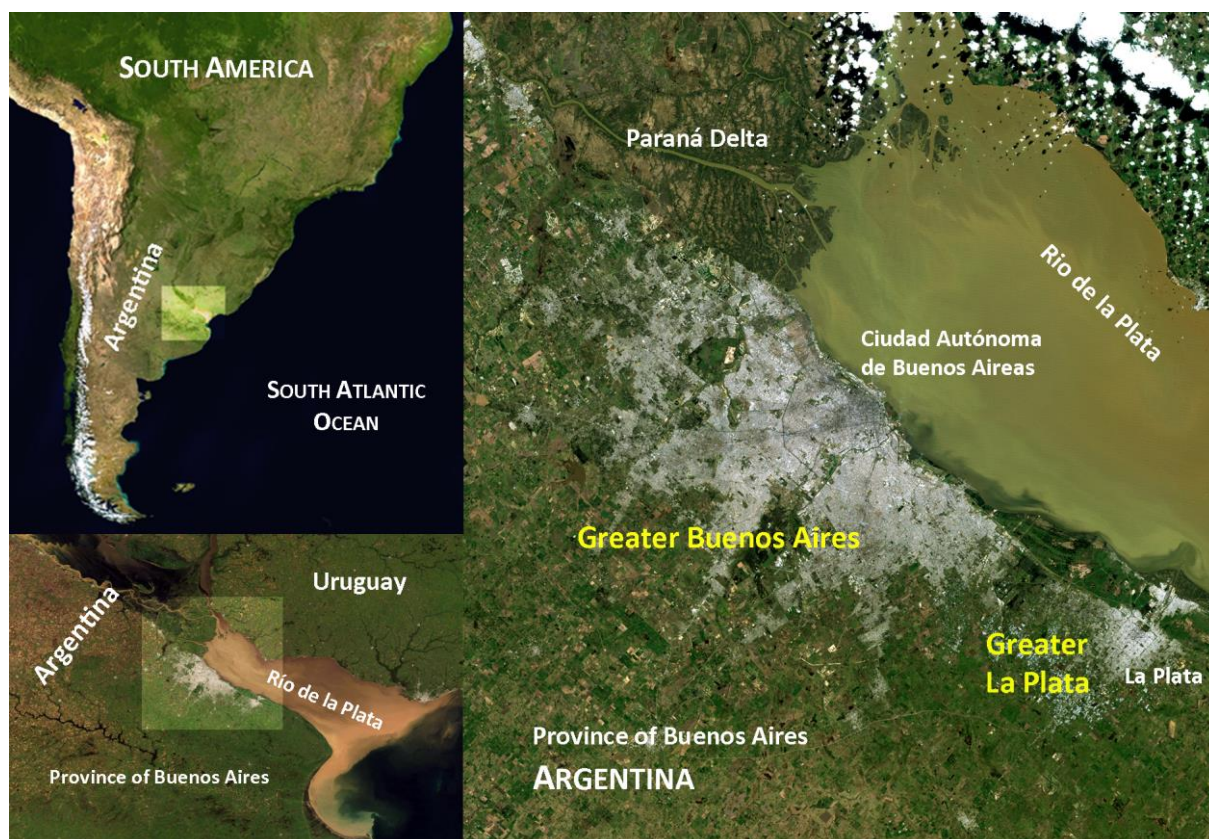


Figure 1. Conurbation Buenos Aires-La Plata, comprising the urban agglomerations of Greater Buenos Aires and Greater La Plata (satellite images from NASA).

Argentina has received massive immigration waves from the mid nineteenth century and first half of the twentieth century. Most of these immigrants were of European origin: 44.9% Italian and 31.5% Spaniards from the total of immigrants registered until 1940 (Cerrutti 2009). These migration flows have helped to shape the country's cultural heritage, and many current 'family traditions' have their roots in that early immigration. In the second half of the twentieth century was occurred a new recent immigration. It was not massive, and focused in the metropolitan area. These immigrants were oriented towards horticultural practices in periurban areas, as well as towards manufacturing industry, construction and commerce in urban areas themselves. Most of this immigration comes from Paraguay and Bolivia (respectively, 21.22% and 15.24% from all foreigners in 2001). Bolivian immigrants are an example of the pattern that connects the periurban areas (production) with the strictly urban areas (consumption). Immigrants dedicated to horticulture provide food for the urban sector, where other Bolivian immigrants commercialize the products: eg, at Bolivian traditional market of Liniers, a neighborhood of Buenos Aires city (for a specific description of this traditional market nestled in a characteristic urban scenario, see Pochettino et al. 2012a).

Another recent immigration into the conurbation corresponds to Far Eastern countries (Japan, Korea, and China). Asian immigration in 2001 represented almost 2% of all foreigners in the country, meager value compared to 67.96% coming from American countries and 28.22% from European countries (INDEC 2013). In the first half of the twentieth century Chinese immigration was low and settled in periurban areas, dedicated to horticulture (such as Bolivian immigrants). In the late twentieth century, these immigrants exceeded in number the Japanese and the Koreans ones,

who previously dominated in the urban sector. At present, the Chinese community in Buenos Aires city has several restaurants, shops and supermarkets concentrated in the named *Barrio Chino*, a sector of neighborhood of Belgrano (Bogado Bordazar 2003). The Chinese supermarkets constitute a center for disseminating its BK linked to their traditions towards the local urban residents. *Barrio Chino* is not a traditional market, such as the Bolivian traditional market of Liniers, but it acts as a relevant visualization agent for the UBK dynamics comprehension.

Materials and Methods

The Bolivian and Chinese immigrants were considered as reference groups for the study of UBK linked to traditions. This knowledge can be extrapolated from the analysis of plants or plant products circulating at the traditional market of Liniers (named *Bolivian market* for the people that does not belong to the immigrant segment), and at *Barrio Chino* supermarkets of Belgrano. Exclusive elements at those markets indicate that are invisible for most of the conurbation inhabitants. On the contrary, plants or plant products found in general commercial circuit stores, or sold via Internet, are visible elements that are linked to nontraditional UBK. Also, if an element is found in those reference markets, and also in general commercial circuit, although less frequently, it is considered as an element *in process of visualization*. From these distinctions, the information about plants and/or their derived products was evaluated.

The ethnobotanical data collection followed the usual qualitative techniques and methods (Albuquerque and Lucena 2004; Alexíades and Sheldon 1996; Martin 2004), such as participant observation, free listings, open-ended and semi-structured interviews. For the Bolivian market, criteria were adjusted according to the studies in traditional markets (Cunningham 2001; Macía et al. 2005).

The partial results presented here correspond to the plant family Asteraceae, comprising numerous species (mostly contain essential oils) used as therapeutic and aromatic (specially as a food and beverage flavoring). In all cases, samples were obtained from plants and their products, which were deposited in the LEBA, and herbarium specimens are found in the Herbarium of Museo de La Plata (LP). The samples were examined according to their characteristics. Plants and parts thereof (such as roots and seeds) were identified from external morphological traits. The dry materials, fragmented or powdered, were identified through the micrographic analysis of external and internal morphological features. From this analysis, possible adulterations will be shortly evaluated.

The field surveys were conducted in diverse outlets of plant products. The procedures always were performed with the consent of the informants. The sellers have been considered as 'qualified informants', they are people of both sexes and different ages that demonstrated their knowledge about the properties of the plant products they sell. All of them showed a positive attitude to provide the requested data. In Bolivian market, 30 premises and street stalls (all the outlets) have been visited and 50 sellers have been interviewed. Up to now, the studies in *Barrio Chino* were developed into the 3 major supermarkets, with 12 sellers interviewed. For the general commercial circuit, the main outlets surveyed were the health-food stores, locally called *dietéticas*: 52 of them were relieved and 100 sellers were consulted. In total, 58 outlets surveyed and 162 qualified informants interviewed.

The *dietéticas* are places that concentrate the interest on plants that contribute to health, and are privileged sites chosen by the local people for the supply of healthy food, dietary supplements, mother tinctures, and herbal products for therapeutic

purposes. Decades ago, the sale of herbal products was the patrimony of herbalist shops (called *herboristerías*), but at present these places are almost extinguished, and herbal products are usually sold in *dietéticas* (also in some pharmacies). These shops are furthermore true dispersal centers for plant products (expansion that also enhanced by the mass media). In the surveyed *dietéticas*, the presence of different products coming from the restricted frame of the immigrant segments, both Bolivian and Chinese, has been confirmed (Arenas et al. 2011; Hurrell et al. 2013). Once in the *dietéticas*, those *invisible* products gain the general commercial circuit and become *visible*. In this sense, the *dietéticas* are true visualization agents.

The available literature about the observed species and their uses was revised (in particular: Alonso and Desmarchelier 2005; Barboza et al. 2009; Burgstaller 1968; Freire and Urtubey 1999a,b, 2000a,b,c; Hieronymus 1882; Martínez Crovetto, 1981; Sorarú and Bandoni 1978; Zardini 1984a,b). Also, the information from printed and electronic labels, leaflets and advertisements belonging to many products was evaluated (because it guides people in the selection of products to be consumed). Both the data of these additional sources as those from the literature, together with the obtained in the field work, provide the repertoire of uses assigned for the species under study. Once identified these uses, the biological activity and effects registered in different investigations were explored, in order to make comparisons.

Results and Discussion

Table 1 includes information about 50 species of Asteraceae commercialized as medicinal and aromatic in the study area. Each species is indicated by its scientific name (in alphabetical order). In the first column, its local names, geographical origin, type of products, and samples obtained were also included. The products comprise: dietary supplements (DS), essential oil (EO), fresh plants (FP), fresh roots (FR), herbal products (HP), mother tinctures (MT), ointment (OI); powdered materials (PW), seeds (SE), tea bags (TB) and tea bags with mixture of herbs for medicinal infusions (TM). Second column contains the uses reported from interviews, the data from labels, leaflets, advertisements, catalogs, and the available literature. Besides medicinal (M) and aromatic (A) uses, other recognized local uses are added (O). Third column includes the therapeutic effects and biological activity registered in scientific investigations (the bibliographic sources are indicated in each case). The particular information for each species that emerges from the table is complemented by the main following remarks to get an overview.

Species/Products: The variety of observed products shows the diversity of forms of consumption. For some species also shows their high degree of diffusion and uses (visibility), eg *Matricaria chamomilla*, *Smallanthus sonchifolius*, *Stevia rebaudiana*. Herbal products are most widespread vegetal elements (43 species: 86% of the total), mainly employed to prepare therapeutic infusions. The abundance of these products also is justified because is the cheapest sold material. Herbals are followed by mother tinctures (50% of the species), likewise used for medicinal reasons. Those tinctures are more expensive than herbal products, but its consumption is easier. The ease in the form of consumption is an important selection criterion for many people when selecting what product is to be used. The same applies for dietary supplements (10% of the species), even more expensive but easier to consume (this product is the most widespread by the massive media). One species is only marketed as a dietary supplement, *Hieracium pilosella* L., however its diffusion is wide because it is sold mostly through the Internet.

Table 1. Medicinal and aromatic Asteraceae commercialized in the study area.

SCIENTIFIC/LOCAL NAMES. GEOGRAPHICAL ORIGIN PRODUCTS [SAMPLES]	USES REPORTED (INTERVIEWS, LEAFLETS, LABELS, ADVERTISEMENTS, CATALOGS, LITERATURE)	BIOLOGICAL ACTIVITIES AND EFFECTS RECORDED (BIBLIOGRAPHICAL REFERENCES)
<i>Acanthospermum australe</i> (Loefl.) Kuntze TAPECUÉ America HP [H218] OI [P159(*)]	M: Hepatic, astringent, antidiarrheal, antiulcerative, antitumor, diuretic, anti-inflammatory, antirheumatic, antiarthritic, febrifuge, antimalarial, sudorific, depurative, sedative, hypnotic, analgesic, antidermatitis, vulnerary, antiseptic, antigonorrheal, contraceptive, abortifacient.	Antitumor (Mirandola et al. 2002), antiviral (Rocha Martins et al. 2011), antifungal (Portillo et al. 2001), antimalarial (Carvalho and Krettli 1991), antioxidant (Desmarchelier et al. 1994), inhibiting fertilization (Barboza et al. 2009).
<i>Acanthostyles buniifolius</i> (Hook. ex Arn.) R.M. King & H. Rob. [= <i>Eupatorium buniifolium</i> Hook. & Arn.] ROMERILLO Southern South America HP [H201] MT [H349]	M: Hepatic, choleric, digestive, tonic, antirheumatic, antinephritic, anti-inflammatory, analgesic, sedative, hypnotic, antiseptic. O: Tinctorial, insect repellent.	Immunomodulatory (Fernández et al. 2002), antioxidant (Soria et al., 2008), antimicrobial (Muschiatti et al. 2005; Sülsen et al. 2007), antiviral (HIV) (Hnatyszyn et al. 1999), anti-inflammatory (Muschiatti et al. 2001), antinociceptive (Miño et al. 2005), hypnotic, amnesic (Miño et al. 2007).
<i>Achillea millefolium</i> L. MILENRAMA-AQUILEA Europe and Western Asia HP [C001] MT [H348]	M: Astringent, antispasmodic, carminative, digestive, anthelmintic, laxative, antidiarrheal, cholagogue, choleric, hepatic, antihemorrhoidal, diuretic, antinephritic, hypotensive, sedative, anxiolytic, emmenagogue, febrifuge, expectorant, anti-influenza, anti-inflammatory, antirheumatic, antiseptic, vulnerary. [<i>Matricaria chamomilla</i> L. adulterant]. A: Beverage flavoring, perfumery. O: Ornamental, edible (leaves).	Antitumor (Csupor-Löffler et al. 2009), cytoprotective, anti-inflammatory (Zaidi et al. 2012), analgesic (Pires et al. 2009), antioxidant, antimicrobial (Falconieri et al. 2011; Vitalini et al. 2011), hypotensive (Souza et al. 2011), vasoprotective (Dall'Acqua et al. 2011), bronchodilatory (Khan and Gilani 2011), antispasmodic and hepatoprotective (Yaesh et al. 2006), choleric (Benedek et al. 2006), anxiolytic (Baretta et al. 2012).
<i>Achyrocline satureoides</i> (Lam.) DC. MARCELA Southern South America HP [C020] [C139] [H097] MT [H345] TM [H412]	M: Hepatic, carminative, stomachic, tonic, digestive, antispasmodic, antiulcerative, antidiarrheal, anthelmintic, stimulant, febrifuge, antidiabetic, emmenagogue, sedative, antitumor, expectorant, antitussive, antiasthmatic, hypocholesterolemic, anti-inflammatory, analgesic, antiseptic, vulnerary, slimming. A: Beverage flavoring. O: Insect repellent.	Cytotoxic (Ruffa et al. 2002), immunomodulatory (Cosentino et al. 2008), antimicrobial (Casero et al. 2013), antiviral (Sabini et al. 2012), anti-inflammatory (Barioni et al. 2013), analgesic (Rondina et al. 2008), antioxidant (Gugliucci and Menini 2002), hypoglycemic (Heng et al. 2010), hypocholesterolemic (Espiña et al. 2012), antiulcerative (Santin et al. 2010), muscle relaxant (Hnatyszyn et al. 2004), hepatoprotective (Kadarian et al. 2002), antispasmodic and hypotensive (Petenatti et al. 2004b).
<i>Ambrosia elatior</i> L. [= <i>A. artemisiifolia</i> L.] ALTAMISA America HP [P149]	M: Anthelmintic, purgative, emetic, antispasmodic, stomachic, digestive, appetizer, carminative, astringent, antidiarrheal, choleric, antitussive, febrifuge, antirheumatic, antiarthritic, antidote, antiallergic, analgesic, antineuralgic, anticephalalgic, antinephritic, antilithic, stimulant, emollient, antitumor, antidermatitis, vulnerary, antiseptic, emmenagogue, postpartum recovery, contraceptive, abortifacient. O: Oil (seeds), insecticide.	Antitumor (Spjut 2005), cytotoxic, analgesic, anti-inflammatory (Yukes & Balick 2010), antiallergic, immunomodulatory (Broide 2009), antimicrobial (Chalchat et al. 2004), contraceptive (Mats et al. 1987).

<p><i>Arctium lappa</i> L. BARDANA Eurasia HP [H282] [H363] MT [H352] FR [H6880(**)]</p>	<p>M: Diuretic, antinephritic, antilithic, hepatic, cholagogue, cholaretic, digestive, antispasmodic, astringent, antidiabetic, anti-inflammatory, antiulcerative, antitumor, depurative, vulnerary, antidermatitis, antiaging, antiseborrheic, antialopepic. O: Edible (roots).</p>	<p>Antitumor (Machado et al. 2012), antioxidant (Song et al. 2010), anti-inflammatory (Lee et al. 2012), antiulcerative (Silva et al. 2013), gastroprotective (Dos Santos et al. 2008), hypoglycemic (Chan et al. 2011), antispasmodic (Almeida et al. 2013), antiviral (Hayashi et al. 2010).</p>
<p><i>Arnica montana</i> L. ÁRNICA Europe HP [H141] MT [H355]</p>	<p>M: Vulnerary, antidermatitis, anti-inflammatory, analgesic, antiarthritic, antirheumatic, cardi tonic, antiseptic, immunostimulant, astringent, antispasmodic. A: Beverage flavoring, perfumery.</p>	<p>Antitumor, antimicrobial, analgesic, anti-inflammatory, antihistamine (Vanaclocha and Cañigueral 2003; Stanciuc et al. 2011), antioxidant (Craciunescu et al. 2012), antiarthritic (Widrig et al. 2007).</p>
<p><i>Artemisia absinthium</i> L. AJENJO Eurasia and Northern Africa HP [C005] [P144] MT [H356] FP [H165(*)]</p>	<p>M: Anthelmintic, antispasmodic, appetizer, digestive, stomachic, carminative, antiemetic, cholagogue, hepatic, tonic, antimalarial, febrifuge, diuretic, cardi tonic, hypotensive, hypocholesterolemic, antirheumatic, emmenagogue, mnemonic, hypnotic, antiseptic, aphrodisiac, abortifacient. A: Beverage flavoring. O: Insecticide, insect repellent.</p>	<p>Antitumor, cytotoxic (Shafi et al. 2012; Wegiera et al. 2012), antimicrobial (Stanciuc et al. 2011), antimalarial (Irshad et al. 2011), anthelmintic (Tariq et al. 2009), hepatoprotective (Amat et al. 2010), antioxidant (Craciunescu et al. 2012), cognitive disorders (Howes et al. 2003), neuroprotective (Bora and Sharma 2010).</p>
<p><i>Artemisia dracuncululus</i> L. ESTRAGÓN North America and Eurasia HP [C025] [C103] PW [C117]</p>	<p>M: Hepatic, stomachic, carminative, appetizer, anthelmintic, antiscorbutic, antidiabetic, diuretic, emmenagogue, anti-inflammatory, antigout, hypnotic, antiepileptic. A: Condiment, beverage flavoring, perfumery.</p>	<p>Antimicrobial, antioxidant (Benli et al. 2007; Lopes-Lutz et al. 2008), hepatoprotective, anti-inflammatory (Obolskiy et al. 2011), hypoglycemic (Ribnicky et al. 2006), antiplatelet (Tognolini et al. 2006), anticonvulsant (Sayyah et al. 2004).</p>
<p><i>Artemisia vulgaris</i> L. ARTEMISA Eurasia and Northern Africa HP [C089] [H072] MT [H347]</p>	<p>M: Antispasmodic, carminative, appetizer, digestive, anthelmintic, cholagogue, cholaretic, diuretic, febrifuge, expectorant, antiasthmatic, astringent, emmenagogue, antiseptic, tonic, anticonvulsant, antidepressant. A: Condiment, beverage flavoring. O: Insecticide, insect repellent.</p>	<p>Antitumor (Abdelhamed et al. 2013), antimicrobial (Poiată et al. 2009), antiviral (Meneses et al. 2009), antispasmodic, bronchodilatory (Khan and Gilani 2009), antioxidant (Temraz and El-Tantawy 2008), anti-inflammatory (Tigno and Gumila 2000), analgesic (Pires et al. 2009).</p>
<p><i>Baccharis articulata</i> (Lam.) Pers. CARQUEJA Southern South America HP [P143] MT [H346] FP [B416(*)]</p>	<p>M: Digestive, hepatic, cholagogue, antispasmodic, hypocholesterolemic, antiarrheal, anthelmintic, laxative, diuretic, febrifuge, tonic, cardi tonic, depurative, antidiabetic, against urinary and respiratory infections, antirheumatic, vulnerary, antiseptic, antiulcerative, against male impotence and female infertility; aphrodisiac, contraceptive. A: Beverage flavoring.</p>	<p>Antioxidant (Verdi et al. 2005), antimicrobial (Simoniato et al. 2008), antiviral (Torres et al. 2011), anti-inflammatory (Gené et al. 1992), hypoglycemic (Kappel et al. 2012).</p>
<p><i>Baccharis crispa</i> Spreng. CARQUEJA- CARQUEJA CRISPA Southern South America HP [H362] MT [H342]</p>	<p>M: Digestive, hepatic, cholagogue, anti-icteric, antilithic, antispasmodic, anthelmintic, tonic, antiasthmatic, antidiabetic, diuretic, antirheumatic, depurative, febrifuge, aphrodisiac, against male impotence and female infertility, antiulcerative, antiseptic, vulnerary, antiacne, antiseborrheic, antidandruff. A: Beverage flavoring.</p>	<p>Antioxidant, antimicrobial (Verdi et al. 2005), antiviral (Mangiaterra 2005), anti-inflammatory (Gené et al. 1992).</p>

<p><i>Baccharis salicifolia</i> (Ruiz & Pav.) Pers. [= <i>B. glutinosa</i> Pers.] CHILCA America HP [H416]</p>	<p>M: Anti-inflammatory, antirheumatic, analgesic, astringent, antidiarrheal, antidysenteric, antiulcerative, antiacid, digestive, hepatic, anthelmintic, antiseptic, antisyphilitic, against gynecological disorders, diuretic, antitumor, febrifuge, antiallopecic, antidermatitis. O: Insecticide, insect repellent.</p>	<p>Anti-inflammatory (Gonzales Dávalos et al. 2007), antimicrobial (Verástegui et al. 1996), anthelmintic (Salazar et al. 2007).</p>
<p><i>Baccharis trimera</i> (Less.) DC. CARQUEJA-CARQUEJILLA Southern South America HP [C017] FP [B424(*)]</p>	<p>M: Digestive, hepatic, cholagogue, antispasmodic, anthelmintic, tonic, antiulcerative, febrifuge, antidiabetic, diuretic, antirheumatic, analgesic, anti-inflammatory, hypotensive, antiseptic, vulnerary, antinephritic, aphrodisiac, against male impotence and female infertility, emmenagogue, against birth and postpartum ailments, neonatal care, abortifacient. [<i>Baccharis articulata</i> (Lam.) Pers. and <i>B. crispa</i> Spreng. substitute or adulterant].</p>	<p>Antioxidant (Pádua et al. 2010), hepatoprotective, antimutagenic (Verdi et al., 2005), hypoglycemic (Oliveira et al. 2005), antiparasitic (Gianello et al. 2000), immunomodulatory (Paul et al. 2009), antimicrobial, antiviral (Mangiaterra 2005), analgesic, anti-inflammatory (Gené et al. 1992, 1996), vasodilatory (Hnatyszyn et al. 2003).</p>
<p><i>Calendula officinalis</i> L. CALÉNDULA Europe HP [C160] [H200] MT [H341]</p>	<p>M: Emollient, antidermatitis, anti-inflammatory, antiseptic, vulnerary, digestive, antispasmodic, hepatic, cholagogue, choleric, astringent, antihemorrhoidal, febrifuge, anti-atherosclerotic, emmenagogue, hypotensive, depurative. A: Perfumery. O: Ornamental, cosmetics, edible (flowers).</p>	<p>Antitumor (Matić et al. 2012; Wegiera et al. 2012), antimicrobial (Szakiel et al. 2008), antiviral (HIV) (Kalvatchev et al. 1997), antidermatitis (Fonseca et al. 2010), anti-inflammatory (Preethi et al. 2009), hepatoprotective, nephroprotective (Preethi and Kuttan 2009), anti-atherosclerotic (Orekhov 2013), antioxidant (Butnariu and Coradini 2012).</p>
<p><i>Chamaemelum nobile</i> (L.) All. [= <i>Anthemis nobilis</i> L.] MANZANILLA ROMANA Eastern Europe and Northwestern Africa EO [H440]</p>	<p>M: Sedative, anxiolytic, digestive, stomachic, carminative, hepatic, antispasmodic, antiulcerative, antiacid, anthelmintic, appetizer, laxative, antiophthalmic, antiotitis, tonic, antirheumatic, anti-inflammatory, emmenagogue, hypotensive, antiseptic, antidermatitis, vulnerary. [<i>Matricaria chamomilla</i> L. adulterant]. A: Food and beverage flavoring. O: Cosmetics, insect repellent.</p>	<p>Antitumor, antioxidant (Guimarães et al. 2013), antimicrobial (Bail et al. 2009; Duarte et al. 2005), hypoglycemic (König et al. 1998), vasorelaxant (Zeggwagh et al. 2013), anti-inflammatory, sedative (Rossi et al. 1988), anxiolytic (Setzer 2009).</p>
<p><i>Chrysanthemum morifolium</i> Ramat. [= <i>C. grandiflorum</i> (Desf.) Dum. Cours.] CRISANTEMO Eastern Asia HP [H420]</p>	<p>M: Hepatic, carminative, febrifuge, anticephalalgic, expectorant, anti-cold, depurative, antiphlebitis, anti-atherosclerotic, anti-inflammatory, antitumor, sedative, hypnotic, antiophthalmic, antiseptic, vulnerary. A: Food and beverage flavoring. O: Ornamental. Edible (leaves, flowers).</p>	<p>Antitumor (Xie et al. 2009), antiviral (HIV) (Lee et al. 2003), antimicrobial (Akihisa et al. 2005), anti-inflammatory (Ukiya et al. 2001), cardiovascular protective (Lii et al. 2010), antioxidant (Song et al. 2010), neuroprotective (Lin et al. 2010), hypnotic (Kim et al. 2011).</p>
<p><i>Cichorium intybus</i> L. ACHICORIA Eurasia and Northern Africa HP [H129] TM [H410]</p>	<p>M: Hepatic, cholagogue, appetizer, digestive, laxative, antidiarrheal, anthelmintic, anti-icteric, depurative, hipotensive, antimalarial, antidiabetic, anti-inflammatory, antiasthmatic, antisyphilitic, diuretic, antirheumatic, antiophthalmic, vulnerary, slimming. O: Edible (roots, leaves, flowers).</p>	<p>Antitumor (Conforti et al. 2008), antibacterial (Aqil and Ahmad 2007), hepatoprotective (Atta et al. 2010), antioxidant (Lavelli 2008), anthelmintic (Foster et al. 2011), anti-inflammatory (Minaiyan et al. 2012), hypoglycemic (Pushparaj et al. 2007), anti-obesity (Vasudeva et al. 2012).</p>

<p><i>Cnicus benedictus</i> L. [= <i>Centaurea benedicta</i> (L.) L.] CARDO SANTO-CARDO BENDITO Mediterranean and Asia Minor HP [H202] MT [H339] TM [H413]</p>	<p>M: Tonic, carminative, digestive, stomachic, appetizer, emetic, hepatic, cholagogue, astringent, antidiarrheal, diuretic, hypoglycemic, depurative, emmenagogue, anti-inflammatory, antiarthritic, expectorant, febrifuge, antimalarial, antitumor, galactagogue, antiseptic, vulnerary, antidermatitis, contraceptive, abortifacient. A: Condiment, beverage flavoring. O: Oil (seeds), food (inflorescences).</p>	<p>Antitumor, cytotoxic (Steenkamp and Gouws 2006; Tamayo et al. 2000), antimicrobial (Voon et al. 2012), anti-inflammatory (Mascolo et al. 1987), galactagogue (Westfall 2003).</p>
<p><i>Conyza bonariensis</i> (L.) Cronquist YERBA CARNICERA South America HP [H053] MT [H359]</p>	<p>M: Diuretic, antinephritic, hepatic, stomachic, antiacid, antiulcerative, anthelmintic, astringent, antidiarrheal, antihaemorrhoidal, cardiogenic, febrifuge, expectorant, antitussive, antirheumatic, antigout, analgesic, anti-inflammatory, anticephalalgic, antidermatitis, antiseptic, vulnerary.</p>	<p>Cytotoxic (El Zalabani et al. 2012), antimicrobial (Souza et al. 2004), antiviral (Wachsman et al. 1988), anti-inflammatory (Souza et al. 2003), CNS depressant, cardiogenic (Barboza et al. 2009), antioxidant (Shahwar et al. 2012), anticonstipation, antidiarrheal (Bukhari et al., 2013).</p>
<p><i>Cyclolepis genistoides</i> D. Don PALO AZUL Southern South America. HP [H007] MT [H358]</p>	<p>M: Diuretic, antinephritic, anti-inflammatory, antirheumatic, antigout, analgesic, muscle relaxant, hepatic, cholagogue, antispasmodic, antitussive, depurative.</p>	<p>Antitumor (Yasukawa 1991; Pisha et al. 1995), diuretic, anti-inflammatory (Sosa et al. 2007, 2011), analgesic (Rondina et al. 2008).</p>
<p><i>Cynara cardunculus</i> L. [= <i>C. scolymus</i> L.] ALCACHOFA Mediterranean HP [H069] MT [H333] TB [H093(*)] TM [H411] DS [H094]</p>	<p>M: Hepatic, cholagogue, choleric, anti-icteric, antilithic, antispasmodic, appetizer, digestive, stomachic, antiacid, antirheumatic, diuretic, antinephritic, hypocholesterolemic, antidiabetic, depurative, hypotensive, slimming, aphrodisiac. A: Beverage flavoring. O: Edible (leaves, inflorescences), tinctorial.</p>	<p>Antitumor (Conforti et al. 2008; Mileo et al. 2012), antioxidant (Falleh et al. 2008), antimicrobial (Zhu et al. 2004), hypoglycemic (Fantini et al. 2011), antispasmodic (Emendörfer et al. 2005), anti-inflammatory (Kammoun et al. 2010), nephroprotective (Turgut et al. 2008), hepatoprotective (Metwally et al. 2011), hypocholesterolemic (Wider et al. 2009).</p>
<p><i>Echinacea purpurea</i> (L.) Moench ECHINÁCEA North America HP [H229] [H280] MT [H334] DS [A-E1]</p>	<p>M: Tonic, immunostimulant, antiseptic, antidote, antiallergic, expectorant, anti-influenza, anti-inflammatory, antitumor, depurative, antidiarrheal, antigonorrhoeal, skin care, vulnerary, aphrodisiac. O: Ornamental, cosmetics.</p>	<p>Antitumor (Skaudickas et al. 2009; Tsai et al. 2012), immunostimulant, antioxidant (Hudson 2012; Mishima et al. 2004), antimicrobial (Canlas et al. 2010), antiviral (Pleschka et al. 2009), anti-cold (Nahas and Balla 2011), anti-inflammatory (Yu et al. 2013).</p>
<p><i>Flaveria bidentis</i> (L.) Kuntze CONTRAYERBA Central and South America HP [H343]</p>	<p>M: Antidote, febrifuge, antitussive, expectorant, stimulant, tonic, sudorific, diuretic, digestive, stomachic, laxative, anthelmintic, emmenagogue, against leukorrhoea, vulnerary, antiseptic. O: Tinctorial, insecticide.</p>	<p>Anthelmintic (Pastor and Zelada 2006), antibacterial (Bardón et al. 2007), antiviral (Barboza et al. 2009), antithrombotic, anticoagulant (Guglielmone et al. 2012), antioxidant (Dadé et al. 2009).</p>
<p><i>Gaillardia megapotamica</i> (Spreng.) Baker TOPASAIRE Southern South America HP [H148] [P153] MT [H351]</p>	<p>M: Antiallopecic, antiseborrheic, antidandruff, antiseptic, analgesic, antineuralgic, anticephalalgic, digestive, stomachic, expectorant, decongestive, anti-influenza, antiasthmatic, hypotensive.</p>	<p>Antitumor (Bongiovanni et al. 2006), antimicrobial (Rosella et al. 2010), antioxidant, gastroprotective (Barboza et al. 2009; Bucciarelli and Skliar 2007; Petenatti et al. 2004a), analgesic (Rondina et al. 2008).</p>
<p><i>Gnaphalium gaudichaudianum</i> DC. VIRA VIRA Southern South America HP [H250]</p>	<p>M: Digestive, carminative, hepatic, cholagogue, antispasmodic, anti-inflammatory, depurative, antidote, cardiogenic, diuretic, febrifuge, expectorant, antitussive, vulnerary, emmenagogue, anaphrodisiac.</p>	<p>Antimicrobial, antiviral, antispasmodic (Petenatti et al. 2004b).</p>

<p><i>Haplopappus rigidus</i> Phil. BAILA BIEN Southern South America HP [H096] MT [H268]</p>	<p>M: Aphrodisiac, against male impotence, hepatic, cholagogue, choleric, digestive, stomachic, carminative, astringent, antidiarrheal, antidyenteric, antiseptic, antitussive, expectorant, antinephritic, antilithic, antirheumatic, emmenagogue.</p>	<p>Cytotoxic, antitumor (Morales et al. 2009), antimicrobial (Morales et al. 2003), vasodilatory (Hnatyszyn et al. 2003), antilithic, hepatoprotective, uterine relaxant (Alonso 2005).</p>
<p><i>Helianthus annuus</i> L. GIRASOL North America SE [H408] [H409]</p>	<p>M: Slimming, tonic, antioxidant astringent, emollient, expectorant, antiasthmatic, febrifuge, antidiabetic, hypocholesterolemic, depurative, cardiotonic, hypotensive, stomachic, anthelmintic, cathartic, diuretic, antirheumatic, anti-inflammatory, immunostimulant, anticephalalgic, neuroprotective, antinephritic, analgesic, antiseptic, against urinary and respiratory infections, vulnerary, antidermatitis. O: Ornamental, oil, edible (seeds).</p>	<p>Antitumor, immunomodulatory (Plohmann et al. 1997), cytotoxic (Bader et al. 1996), antioxidant, antimicrobial (Giada and Mancini-Filho 2009; Subashini and Rakshitha 2012), antiviral (Oliveira et al. 2009), anti-inflammatory (Akihisa et al. 1996), analgesic (Rondina et al. 2008), antiasthmatic (Heo et al. 2008), hypolipidemic (Saini and Sharma 2011).</p>
<p><i>Helichrysum italicum</i> (Roth) G. Don CURRY Mediterranean FP [H439(*)]</p>	<p>M: Expectorant, antiasthmatic, antitussive, antispasmodic, digestive, choleric, hepatic, astringent, diuretic, analgesic, antineuralgic, anticephalalgic, anti-inflammatory, antirheumatic, anticoagulant, sedative, antiallergic, antiseptic, antidermatitis, vulnerary. A: Food flavoring, perfumery. O: Ornamental, insecticide.</p>	<p>Cytotoxic, antimicrobial, antiseptic (Ríos 2008), antiviral (Nostro et al. 2003), anti-inflammatory, antioxidant (Bauer et al. 2010; Sala et al. 2002).</p>
<p><i>Hieracium pilosella</i> L. [= <i>Pilosella officinarum</i> F.W. Schultz & Sch. Bip.] VELLOSILLA Europe DS [H364]</p>	<p>M: Diuretic, antinephritic, slimming, febrifuge, expectorant, antitussive, antiasthmatic, anti-influenza, anti-inflammatory, stomachic, choleric, cholagogue, astringent, depurative, cardiotonic, hypotensive, antihemorrhagic, emmenagogue, antiseptic, vulnerary.</p>	<p>Antitumor (Gawronska-Grzywacz et al. 2011), anti-inflammatory (Gawronska-Grzywacz and Krzaczek 2006), diuretic (Beaux et al. 1999), antimicrobial (Frey and Meyers 2010), antioxidant (Stanojević et al. 2009).</p>
<p><i>Matricaria chamomilla</i> L. [= <i>M. recutita</i> L.] MANZANILLA Eurasia HP [C008] [H089] MT [H357] TB [H016] [H361] FP [B427(*)]</p>	<p>Sedative, anxiolytic, hypnotic, mnemonic, tonic, stimulant, digestive, carminative, antispasmodic, emetic, antidiarrheal, antiulcerative, anthelmintic, anti-inflammatory, analgesic, hypocholesterolemic, emollient, expectorant, antitussive, emmenagogue, antinephritic, hypotensive, cardiotonic, febrifuge, vulnerary, antidermatitis, slimming. [Adulterated with <i>Anthemis cotula</i> L., <i>Chamaemelum nobile</i> (L.) All., <i>Cladanthus mixtum</i> (L.) Chevall., <i>Tanacetum parthenium</i> (L.) Sch. Bip.] A: Beverage flavoring, perfumery. O: Cosmetics.</p>	<p>Antitumor (Srivastava and Gupta 2007), immunomodulatory (Ghonime et al. 2011), antibacterial (Shikov et al. 2008), antifungal (Jamalian et al. 2012), antioxidant, hypoglycemic (Cemek et al. 2008), neuroprotective (Ranpariya et al. 2011), anxiolytic, hypnotic (Sarris et al. 2011), antidepressant (Amsterdam et al. 2012), mnemonic (Adams et al. 2007), antiulcerative (Duarte et al. 2011), anti-inflammatory (Zaidi et al. 2012), nephroprotective (Salama 2012), antiallergic (Chandrashekhara et al. 2011), vulnerary (Nayak et al. 2007).</p>
<p><i>Mikania periplocifolia</i> Hook. & Arn. GUACO Southern South America HP [H254]</p>	<p>M: Diuretic, astringent, antidiabetic, against respiratory and intestinal disorders, expectorant, antitussive, sedative, febrifuge, antirheumatic, antiarthritic, antihydrophobic, antidote, antidermatitis, vulnerary.</p>	<p>Cytotoxic (Barboza et al. 2009), analgesic (Rondina et al. 2008), antioxidant, antifungal (Alonso and Desmarchelier 2005).</p>

<p><i>Pluchea sagittalis</i> (Lam.) Cabreria LUCERA-YERBA LUCERA Southern South America HP [C045]</p>	<p>M: Tonic, appetizer, stomachic, carminative, laxative, anthelmintic, antispasmodic, hepatic, cholagogue, choleric, antidiarrheal, febrifuge, antidyseric, antitussive, diuretic, expectorant, sedative, antirheumatic, antiphlebitis, antigonorrheal, antiseptic, vulnerary, abortifacient. A: Beverage flavoring.</p>	<p>Antioxidant, antimicrobial (Souza et al. 2004), anti-inflammatory (Pérez-García et al. 1996), antinociceptive, gastroprotective (Figueredo et al. 2011), analgesic (Rondina et al. 2008), vulnerary (Schmidt et al. 2009).</p>
<p><i>Porophyllum ruderale</i> (Jacq.) Cass. QUIRQUIÑA Caribbean, Central and South America FP [B413(*)]</p>	<p>M: Antispasmodic, digestive, anti-inflammatory, antiophthalmic, depurative, hemostatic, sudorific, analgesic, antiseptic, vulnerary. A: Condiment.</p>	<p>Cytotoxic, antimicrobial (Takahashi et al. 2013), antispasmodic (Alves 1996), antinociceptive, anti-inflammatory (Lima et al. 2011; Souza et al. 2003).</p>
<p><i>Schkuhria pinnata</i> (Lam.) Kuntze ex Thell. CANCHALAGUA America HP [H150]</p>	<p>M: Slimming, diuretic, digestive, stomachic, hepatic, depurative, resolutive, against respiratory and urinary tract infections, antimalarial, antidiabetic, anti-inflammatory, antirheumatic, antiseptic, antiacne, antidermatitis. O: Insect repellent.</p>	<p>Antitumor (Rodrigo et al. 2010), anti-inflammatory, antifungal (Barboza et al. 2009), antibacterial, antiacne (Bussmann et al. 2008; Wagate et al. 2010), antimalarial (Muthaura et al. 2007), hypoglycemic (Deutschländer et al. 2009).</p>
<p><i>Senecio eriophyton</i> J. Rémy CHACHACOMA Argentina, Chile HP [P154]</p>	<p>M: Tonic, expectorant, antibronchitis, antitussive, antiasthmatic, digestive, hepatic, antinephritic, hypotensive, cardiogenic, altitude sickness, antiseptic, emmenagogue, sedative, hypnotic, against male impotence. A: Food and beverage flavoring.</p>	<p>Antimicrobial (Barboza et al. 2009), vasodilatory (Hnatyszyn et al. 2003).</p>
<p><i>Senecio filaginoides</i> DC. [= <i>S. albicaulis</i> Hook. & Arn.] MATA MORA- VIRA VIRA South America HP [P150]</p>	<p>M: Expectorant, anticatarrhal, antitussive, febrifuge, sudorific, emmenagogue, analgesic (bone pain), antiseptic, vulnerary. A: Food flavoring.</p>	<p>Antimicrobial (Arancibia et al. 2013).</p>
<p><i>Senecio nutans</i> Sch. Bip. [= <i>S. graveolens</i> Wedd.] CHACHACOMA DE LA PUNA South America HP [H230]</p>	<p>M: Febrifuge, expectorant, antitussive, antiasthmatic, antibronchitis, anti-influenza, digestive, antispasmodic, tonic, altitude sickness, analgesic (bone pain), hypotensive, cardiogenic, sedative, emmenagogue, vulnerary. A: Condiment, beverage flavoring.</p>	<p>Cytotoxic, antioxidant, hemolytic, (Lizarraga et al. 2012), antimicrobial (Pérez et al. 1999), analgesic (Rondina et al. 2008), hypotensive (Alonso and Desmarchelier 2005).</p>
<p><i>Senecio subulatus</i> D. Don ex Hook. & Arn. var. <i>erectus</i> Hook. & Arn. SALVIA DE LA PUNA Argentina HP [H134] MT [H360]</p>	<p>M: Expectorant, against catarrh, chronic bronchitis, dyspnoea, influenza, antitussive, antiasthmatic, digestive, antispasmodic, astringent, antihemorrhoidal, cardiogenic, anticephalalgic, antititis, antisiphilitic.</p>	<p>No data.</p>
<p><i>Silybum marianum</i> (L.) Gaertn. CARDO MARIANO Mediterranean SE [H154] MT [H354]</p>	<p>M: Hepatic (cirrhosis due to chronic hepatitis and alcoholism), choleric, cholagogue, antilithic, anti-icteric, antitumor, digestive, stimulant, anti-inflammatory, tonic, astringent, antihemorrhoidal, diuretic, antidote, expectorant, emmenagogue, galactagogue, vulnerary. O: Oil (seeds), edible (roots, leaves, inflorescences)</p>	<p>Antitumor (Cheung et al. 2010), anti-inflammatory (Sharifi et al. 2013), immunomodulatory, antioxidant (Das and Mukherjee 2012), antiviral (Wagoner et al. 2010), hypoglycemic (Zhan et al. 2011), galactagogue (Di Pierro et al. 2008), nephroprotective (Turgut et al. 2008), hepatoprotective, hypocholesterolemic (Krecman et al. 1998; Shaker et al. 2010).</p>

<p><i>Smallanthus sonchifolius</i> (Poepp. & Endl.) H. Rob. YACÓN South America DS [H286] [H293] HP [H332(**)] MT [H285] FR [H6891(*)]</p>	<p>M: Antidiabetic, stimulant, tonic, antitumor, digestive, stomachic, antidiarrheal, anticonstipation, prebiotic, hypocholesterolemic, antioxidant, anti-atherosclerotic, slimming, diuretic, antinephritic, immunostimulant, hypotensive, improving vision, fortifying bones and teeth (Calcium assimilation), skin antiaging, vulnerary. O: Edible (roots).</p>	<p>Antitumor (Moura et al. 2012), hypoglycemic (Ayvar et al. 2001), hypolipidemic (Habib et al. 2011), antioxidant (Aguilar and Bonilla 2009), antimicrobial (Choi et al. 2010), immunostimulant (Delgado et al. 2012), prebiotic (Pedreschi et al. 2003), hepatoprotective (Valentová et al. 2004), nephroprotective (Honoré et al. 2012), Calcium assimilation (Lobo et al. 2007).</p>
<p><i>Stevia rebaudiana</i> (Bertoni) Bertoni YERBA DULCE-STEVI Southern South America DS [H116] [H118] [H317] HP [H198] [P147] MT [H350] FP [B415(*)]</p>	<p>M: Antidiabetic, emollient, antitussive, appetizer, digestive, anticonstipation, laxative, antiacid, diuretic, cardiogenic, hypotensive, depurative, slimming, vulnerary, antiseptic, skin antiaging, antidermatitis, immunostimulant, anticaries, contraceptive. O: Sweetener.</p>	<p>Antitumor (Yasukawa et al., 2002), antioxidant (Shukla et al. 2009), hypoglycemic (Chen et al. 2005), hypotensive (Liu et al. 2003), nephroprotective (Shivanna et al. 2013), immunomodulatory, anti-inflammatory (Boonkaewwan et al. 2006), antimicrobial (Takaki et al. 1985), antiviral (Oliveira et al. 2013), contraceptive (Gil et al. 2008).</p>
<p><i>Tagetes minuta</i> L. HUACATAY-SUICO America HP [H415] FP [B403(*)]</p>	<p>M: Digestive, carminative, cathartic, antispasmodic, anthelmintic, diuretic, depurative, hypotensive, expectorant, antiasthmatic, against urinary and venereal infections, postpartum ailments, neonatal care, sedative, antidepressant, antidandruff, anti-tick, anti-pediculosis, antiallopecic, anti-inflammatory, analgesic, antitumor, aphrodisiac, antiabortifacient. A: Condiment, beverage flavoring. O: Ornamental, tinctorial, insecticide.</p>	<p>Antitumor (Ickes et al. 1973), antimicrobial (Al-Musayeb et al. 2012; Xu et al. 2012), antiviral (Ghaemi et al. 2004), antioxidant (Tereschuk et al. 1997), hypoglycemic (Ranilla et al. 2010), bronchodilatory, expectorant, spasmolytic, anti-inflammatory, hipotensive (Jawla et al. 2010), analgesic (Rondina et al. 2008), antidepressant (Martijena et al. 1998), anti-tick (Nchu et al. 2012).</p>
<p><i>Tanacetum parthenium</i> (L.) Sch. Bip. SANTA MARÍA Europe HP [H223]</p>	<p>M: Febrifuge, anticephalalgic, anti-inflammatory, antirheumatic, sedative, analgesic, antispasmodic, digestive, carminative, anthelmintic, antiseptic, hypotensive, emmenagogue. [<i>Matricaria chamomilla</i> L. adulterant]. A: Condiment, beverage flavoring. O: Ornamental, insecticide.</p>	<p>Antitumor (Li et al. 2012; Mathema et al. 2012), antioxidant (Fischedick et al. 2012), antimicrobial (Polatoglu et al. 2010), cardiogenic, antispasmodic (Pareek et al. 2011), anti-inflammatory (Williams et al. 1999), anticephalalgic (Vanaclocha and Cañigueral 2003).</p>
<p><i>Tanacetum vulgare</i> L. TANACETO Eurasia HP [H214]</p>	<p>M: Anthelmintic, antispasmodic, tonic, digestive, carminative, febrifuge, hypotensive, diuretic, antinephritic, antirheumatic, anticephalalgic, antidermatitis, mnemonic, sedative, emmenagogue, abortifacient. A: Food and beverage flavoring. O: Ornamental, insecticide.</p>	<p>Antitumor (Spjut 2005), cytotoxic (Wegiera et al. 2012), antibacterial (Smirnova et al. 2012), antiviral (Álvarez et al. 2011), antioxidant (Juan-Badaturuge et al. 2009), immunomodulatory (Xie et al. 2007), hypotensive (Lahlou et al. 2008), anti-inflammatory (Williams et al. 1999).</p>
<p><i>Taraxacum officinale</i> Weber ex F.H. Wigg. DIENTE DE LEÓN-AMARGÓN Europe HP [C087] [H100] MT [H337]</p>	<p>M: Hepatic, cholagogue, antilithic, astringent, laxative, febrifuge, anti-icteric, antihæmorrhoidal, diuretic, antinephritic, expectorant, antitumor, antidiabetic, tonic, antidote, anti-inflammatory, slimming, depurative, hypotensive, emmenagogue, antiophthalmic, antirheumatic, antiarthritic, antiseptic, antidermatitis. A: Food and beverage flavoring. O: Edible (leaves).</p>	<p>Antitumor, cytotoxic, antioxidant (Chun and Kitts 2003; Koo et al. 2004; Sigstedt et al. 2008), immunostimulant (Lee et al. 2012), antimicrobial (Yarnell and Abascal 2009), anti-inflammatory (Jeon et al. 2008), hypoglycemic (Önal et al. 2005), depurative (Modaresi and Resalatpour 2012), hepatoprotective (Mahesh et al. 2010), hypolipidemic (Choi et al. 2010).</p>

<p><i>Tessaria integrifolia</i> Ruiz & Pav. PÁJARO BOBO South America HP [H227] [H335] MT [H340]</p>	<p>M: Febrifuge, astringent, antitussive, antiasthmatic, expectorant, diuretic, antinephritic, hypocholesterolemic, hepatic, laxative, antiallergic, antiseptic (urinary infections), tonic, anti-inflammatory, antirheumatic, analgesic, antidontalgic, depurative, against prostate and uterus ailments, antigonorrhoeal, vulnerary. O: Paper pulp, timber, ashes for making soap.</p>	<p>Antimicrobial (Vivot et al. 2007), antiviral (Romio and Gurni 2007), anti-inflammatory (Peluso et al. 1995), antioxidant (Ono et al. 2000).</p>
<p><i>Trixis divaricata</i> (Kunth) Spreng. subsp. <i>discolor</i> (D. Don) Katinas [= <i>T. antimenorrhoea</i> (Schrank) Kuntze var. <i>discolor</i> (D. Don) Cabrera] CONTRAYERBA South America HP [P146]</p>	<p>M: Antidote, febrifuge, sudorific, tonic, depurative, antidiabetic, expectorant, antitussive, antiasthmatic, rubefacient, hypocholesterolemic, vulnerary, antidermatitis, diuretic, antinephritic, antirheumatic, antiarthritic, against paralysis, antiophthalmic, anti-inflammatory, digestive, antiulcerative, antineuralgic, antiamenorrhoeic, emmenagogue, abortifacient. O: Insecticide.</p>	<p>Antioxidant (Mayhua et al. 2012), antiulcerative (Pereira et al. 2005).</p>
<p><i>Tussilago farfara</i> L. TUSILAGO Eurasia and Northern Africa HP [H215]</p>	<p>M: Emollient, expectorant, antitussive, antiasthmatic, anticatarrhal, against colds, chronic bronchitis, emphysema, chest complaints and other respiratory illness, antiallergic, antispasmodic, astringent, antidiarrheal, stomachic, against gastric diseases, febrifuge, sudorific, depurative, cardiotonic, sedative, antiphlebitis, antirheumatic, anti-inflammatory, stimulant, tonic, antiseptic, antidermatitis, vulnerary, abortifacient. A: Food and beverage flavoring. O: Edible (leaves, inflorescences).</p>	<p>Neuroprotective (Cho et al. 2005), antioxidant (Song et al. 2010), cardiovascular and respiratory stimulant (Li and Wang 1988), antitussive, expectorant (Li et al. 2013), immunostimulant, anti-inflammatory (Hwangbo et al. 2009), antimicrobial (Kokoska et al. 2002).</p>
<p><i>Xanthium spinosum</i> L. CEPA CABALLO Worldwide temperate zones HP [H127] MT [H344]</p>	<p>M: Diuretic, antinephritic, antilithic, digestive, stomachic, antispasmodic, hepatic, choleric, cholagogue, laxative, emetic, antidiarrheal, antidysenteric, febrifuge, antimalarial, antiphlebitis, anti-atherosclerotic, hypocholesterolemic, depurative, resolutive, antirheumatic, anti-inflammatory, antitussive, against measles, mumps, lung diseases and prostate ailments, antihydrophobic, antiophthalmic, anticephalalgic, sedative, analgesic, emollient, vulnerary, antidermatitis, antiseptic, antigonorrhoeal, contraceptive, abortifacient. O: Tinctorial, coffee substitute (seeds).</p>	<p>Antitumor (Bhakuni et al. 1976; Rodrigo et al. 2010), antimicrobial (Davicino et al. 2007; Ginesta-Peris et al. 1994), antiseptic, diuretic (Gutiérrez Gutiérrez Durán et al. 2011).</p>

References:

Products: **DS**, dietary supplement; **EO**, essential oil; **FP**, fresh plant; **FR**, fresh roots; **HP**, herbal product; **MT**, mother tincture; **OI**, ointment; **PW**: powdered material; **SE**, seeds; **TB**, tea bags; **TM**, tea bags with mixture of herbs for medicinal infusions. *Uses:* **A**, aromatic; **M**, medicinal; **O**, others. *Samples:* (*) only in Bolivian traditional market; (**) only in Chinese markets.

Fresh plants or parts thereof (roots) are sold solely in the context of restricted circuit of immigrant segments: 9 species in the Bolivian market (indicated in **Table 1** with *) and 1 species in a *Barrio Chino* supermarket (indicated in **Table 1** with **). The use of these species is related to their origin traditions, eg medicinal and edible roots of *Smallanthus sonchifolius* consumed in the Andean region, and those of *Arctium lappa* employed in China for the same purposes. The case of fresh plants of *Helichrysum italicum* for sale in the Bolivian market is peculiar. Informants report that it is used as a condiment and for medicinal purposes. It was the only place where these uses were registered. For study area, the plant is better known by the urban inhabitants as aromatic ornamental and it is cultivated in gardens.

The ointment of *Acanthospermum australe* and the tea bags of *Cynara cardunculus* are exclusive of the Bolivian market, imported from Bolivia. Regarding the last of these species, it is marketed in *dietéticas* as tea bags, but mixed with other herbs (not Asteraceae) for making hypocholesterolemic infusions. The tea bags are common in the *dietéticas* because consumers choose them for their easy mode of consumption. These products are highly visible within the nontraditional commercial circuit. The tea bags of *Matricaria chamomilla* are the most widely spread because its sedative effects. Other Asteraceae are found in tea bags with mixture of herbs for medicinal infusions: *Achyrocline satureoides* (digestive), *Cnicus benedictus* (against arthritis) and *Cichorium intybus* (hypotensive).

Fifteen species: *Ambrosia elatior*, *Baccharis salicifolia*, *Chrysanthemum morifolium*, *Flaveria bidentis*, *Gnaphalium gaudichaudianum*, *Mikania periplocifolia*, *Pluchea sagittalis*, *Schkuhria pinnata*, *Senecio eriophyton*, *S. filaginoides*, *S. nutans*, *Tanacetum parthenium*, *T. vulgare*, *Trixis divaricata* subsp. *discolor*, and *Tussilago farfara*, are only marketed as herbal products, and they are found only in a few *dietéticas*. Of these species, *Chrysanthemum morifolium*, *Tanacetum parthenium*, *T. vulgare*, and *Tussilago farfara* are not native to Argentina. The two *Tanacetum* species are growing naturalized in the country. *Chrysanthemum morifolium* is often cultivated as an ornamental. The herbal product of *Tussilago farfara* has been found only in one *dietética*, and it is imported. *Chamaemelum nobile* has only been found as essential oil (imported). As powder, only *Artemisia dracunculus* is expended (spice). From *Silybum marianum*, the seeds are mainly marketed (also as mother tincture). From *Helianthus annuus*, only its seeds are sold.

Of the 50 species surveyed, only 7 are included in the *Farmacopea Argentina* (the official Argentine pharmacopoeia): *Baccharis articulata*, *B. trimera*, *Calendula officinalis*, *Cynara cardunculus*, *Matricaria chamomilla*, *Silybum marianum* and *Stevia rebaudiana*. Other 3 species, *Achyrocline satureoides*, *Arnica montana* and *Baccharis crispa*, are recorded as phytomedicines by the ANMAT: Administración Nacional de Medicamentos, Alimentos y Tecnología Médica ('National Administration of Drugs, Food and Medical Technology'). Moreover, the agency referred considers toxic (prohibited) 3 species for the same purposes: *Artemisia absinthium*, *Tanacetum vulgare* and *Tussilago farfara*. The CAA, Código Alimentario Argentino ('Argentine Food Code') includes 9 species: *Artemisia dracunculus*, *Cichorium intybus*, *Cnicus benedictus*, *Cynara cardunculus*, *Helianthus annuus*, *Matricaria chamomilla*, *Smallanthus sonchifolius*, *Stevia rebaudiana* and *Taraxacum officinale*. This code prohibits the use of *Artemisia absinthium*. Also, ANMAT approves the use of *Arctium lappa*, *Calendula officinalis* and *Smallanthus sonchifolius* for dietary supplements produced in the country (ANMAT, 2013). Beyond these specifications, the species products mentioned can be purchased in the conurbation or through the Internet.

Products circulation: The origin of the products is partially clear. Certain products carry a laboratory mark, but it is not explicit the raw materials source. In some cases, herbal products and its tinctures are presumably obtained from wild plants from native species or exotic naturalized (eg *Achillea millefolium*, *Taraxacum officinale*). Others products may come from plants grown in homegardens. According to informants interviewed, plants or parts thereof which are sold fresh in the Bolivian market, come from homegardens located in periurban areas of the conurbation (eg *Baccharis* species, *Stevia rebaudiana*). Bolivian immigrants working in horticultural practices in the periurban sector provide fresh plants to other immigrants of the same origin, which commercialized those plants in the market located in the urban sector. It is registered that *Porophyllum ruderale* and *Tagetes minuta* were cultivated in periurban homegardens from seeds brought from Bolivia (Pochettino et al. 2012a). Furthermore, in the Bolivian market of Liniers different products are entered directly from Bolivia, by land and quickly (48 to 72 hours), to the bus terminal of that neighborhood. Some fresh products could in this way get into the conurbation.

Products imported from Bolivia originally covered the demand for Bolivian and Peruvian communities in Buenos Aires, but in a short time some restricted products to immigrants (invisible) entered the general commercial circuit through the *dietéticas*. The most striking example is that of *Smallanthus sonchifolius*, which in less than a decade (Hurrell et al. 2013), and powered by the mass media, invaded the market with various products, specially dietary supplements. Under this type of product this species got his greatest visibility. *Echinacea purpurea* and *Stevia rebaudiana* are similar cases, but became visible in more than a decade. Other products derived from Asteraceae are visible from a long time in the metropolitan area, including the recent immigrants segments, eg *Achyrocline satureioides*, *Arnica montana*, *Baccharis* species and *Matricaria chamomilla*.

Uses assigned/Effects recorded: **Table 1** presents a wide variety of uses assigned, some with roots in folk medicine, other promoted by the *dietéticas* and the media. It is noteworthy that the diffusion of the products often combines scientific information about the properties evaluated (generally, only some of them) with the nontraditional revaluation of the uses of plants coming from 'millenary traditions'. This combination of *tradition* and *innovation* apparently aims to capture the accessions of a diverse set of consumers, that is, a proper selling strategy for urban areas. An example is *Smallanthus sonchifolius* that stores fructooligosaccharides (polymers of fructose), carbohydrates with fewer calories than saccharose, so they do not increase the levels of glucose in the blood, resulting suitable for diabetics and low-calorie diets. Scientific studies validate its traditional use (against diabetes) while making possible promoting a new urban use (for slimming).

Most scientific studies on the medicinal plants effects correspond to cases in vitro or in vivo in animals, so that clinical studies are required in humans. However, the assessment of potential effects is promise for future studies on the prevention and treatment of various diseases. For example, *Haplopappus rigidus* and *Senecio eriophyton* are commercialized to treat male sexual impotence. The activity of the extracts of these plants in animals was evaluated, and the results seem to validate their folk medicinal use, and like authors say: 'open new ways in the search for natural products with vasodilatory effects' (Hnatyszyn et al. 2003). It has to be highlighted that the results of many studies refers to the *potential* effects on humans, not the *scientifically proven*. In this context, many uses that are affirmed and diffused, specially through the Internet, contain inaccurate information.

According to informants interviewed, the inquiries made by consumers about the products to be used refer to a wide range of possible effects. Many people flock to the *dietéticas* to acquire plant products to treat specific ailments: digestive, hepatic, diuretic, antidermatitis, antiarthritic, antirheumatic, and anti-inflammatory, among others. But also, many informants considered very relevant some plant products that are in high demand, probably due to the excessive media propaganda: slimming, aphrodisiacs and/or sexual performance optimizers, and against stress. These so widespread uses reveal an underlying set of requirements and interests related to living in large metropolitan areas.

Slimming products relate to the aesthetic aspects as well as therapeutic also, in order to treat obesity. Of the 50 Asteraceae species surveyed, 10 (20%) are used for slimming: *Achyrocline satureoides*, *Cichorium intybus*, *Cynara cardunculus*, *Helianthus annuus*, *Hieracium pilosella*, *Matricaria chamomilla*, *Schkuhria pinnata*, *Smallanthus sonchifolius*, *Stevia rebaudiana*, and *Taraxacum officinale*. Of this group only one species, *Cichorium intybus*, has been identified for treatment against obesity (Vasudeva et al. 2012). In the other cases the use as slimming can be linked with other researched effects, eg diuretic, hypoglycemic, and hypolipidemic.

Human sexuality is a complex phenomenon that involves several aspects: biological, psychological, social, cultural. Also, the concept of *aphrodisiac*, as a stimulant of sexual desire, is associated with one or more of these aspects. In general, plant products considered aphrodisiacs are consumed to promote and facilitate sexual unions. Aphrodisiacs are also related with plant products considered sexual performance optimizers, in particular, those who act against male impotence. Of the 50 Asteraceae species surveyed, 8 of them (16%) are used as aphrodisiacs: *Artemisia absinthium*, *Baccharis articulata*, *B. crispa*, *B. trimera*, *Cynara cardunculus*, *Echinacea purpurea*, *Haplopappus rigidus*, *Tagetes minuta*. Of these species, *Baccharis articulata*, *B. crispa*, *B. trimera* and *Haplopappus rigidus* are also used against male impotence. This use is likewise assigned to *Senecio eriophyton*. As mentioned before, only *Haplopappus rigidus* and *Senecio eriophyton* were surveyed about their use related to male impotence. Only one species, *Gnaphalium gaudichaudianum*, is considered anaphrodisiac.

It is noteworthy that sexuality also includes other aspects linked to human reproduction that involve other uses, such as contraceptive, abortifacient, against male and female infertility, against birth and postpartum ailments, postpartum recovery, neonatal care, galactagogue. Uses related to the reproductive organs should be also considered, as emmenagogue, antiamenorrheic, against specific diseases (eg prostate cancer) and venereal infections. This complex system of uses related to human reproduction will be grounds for a future contribution. However, it is remarkable the number of species used as abortifacient and/or contraceptive: *Acanthospermum australe*, *Ambrosia elatior*, *Artemisia absinthium*, *Baccharis articulata*, *Baccharis trimera*, *Cnicus benedictus*, *Pluchea sagittalis*, *Stevia rebaudiana*, *Tanacetum vulgare*, *Trixis divaricata* subsp. *discolor*, *Tussilago farfara* and *Xanthium spinosum* (12 species: 24% of the total). Only for *Ambrosia elatior* and *Stevia rebaudiana* its contraceptive activity was analyzed. One species, *Tagetes minuta*, is considered antiabortifacient.

Stress is the organism's response to situations perceived as threatening or as increased demands that may cause the appearance of functional anomalies and generate emotional dysfunctions, like mood alterations, nervousness, anxiety, insomnia, lost of memory and lack of concentration, among others. In this context, in treating against stress various uses such as sedative, anxiolytic, antidepressant,

hypnotic, and/or mnemonic are included. These uses are assigned to 18 of the 50 Asteraceae species surveyed (36%): *Achyrocline satureoides*, *Helichrysum italicum*, *Mikania periplocifolia*, *Pluchea sagittalis*, *Senecio nutans*, *Tanacetum parthenium*, *Tussilago farfara*, *Xanthium spinosum* (sedative), *Acanthospermum australe*, *Acanthostyles buniifolius*, *Chrysanthemum morifolium*, *Senecio eriophyton* (sedative, hypnotic), *Achillea millefolium*, *Chamaemelum nobile* (sedative, anxiolytic), *Tagetes minuta* (sedative, antidepressant), *Tanacetum vulgare* (sedative, mnemonic), *Artemisia absinthium* (hypnotic, mnemonic), and *Matricaria chamomilla* (sedative, anxiolytic, hypnotic, mnemonic). Of this set of species and uses assigned, the effects have been studied for only 6 species: *Matricaria chamomilla* (sedative, anxiolytic, hypnotic, mnemonic), *Chamaemelum nobile* (sedative, anxiolytic), *Acanthostyles buniifolius* and *Chrysanthemum morifolium* (hypnotic), *Achillea millefolium* (anxiolytic) and *Tagetes minuta* (antidepressant). *Matricaria chamomilla* is the species most widespread and more frequently commercialized for these purposes.

Finally, although it is true that for many of the species assessed there are information about its effects and biological activity (eg *Achyrocline satureoides*, *Matricaria chamomilla*, *Smallanthus sonchifolius*, *Stevia rebaudiana*), for other species would be required different studies to validate the uses assigned to them (eg *Baccharis* and *Senecio* species, *Tessaria integrifolia*, *Trixis divaricata* subsp. *discolor*). In this sense, it is known that the basic ethnobotanical researches make it possible a register of species and its therapeutic uses, to guide the search of new active principles with pharmacological applications. This is valid for both traditional uses and the uses assigned in urban scenarios. Facing the future, some significant effects scientifically recorded for Asteraceae are: antimicrobial (43 species: 86% of the total), antioxidant (38 species: 76%), antitumor and cytotoxic (35 species: 70%), antiviral (20 species: 40%, including anti-HIV: eg *Acanthostyles buniifolius*, *Calendula officinalis*, *Chrysanthemum morifolium*), hypoglycemic and antidiabetic (15 species: 30%), immunomodulatory and immunostimulant (13 species: 26%), hipolipidemic and hypocholesterolemic (6 species: 12%).

Conclusions

This contribution shows results of ongoing research line on urban ethnobotany related to medicinal and/or aromatic Asteraceae in the conurbation Buenos Aires-La Plata, Argentina. **Table 1** itself is a description of the available data on species, its products, uses assigned and effects and biological activity studied. About the species and its products, the data come from fieldwork. Assigned uses are derived from both fieldworks as the literature reviewed and the information presented in different labels, leaflets, catalogs and advertisements. The biological activity and the effects studied come from the literature review.

Data interpretation aims to assess the composition of urban botanical knowledge in relation to plant products circulating. For this, it is assumed that the botanical knowledge guides the selection of those products. The species and products exclusive of the immigrant segments (Bolivian and Chinese) are linked to their traditions of origin, although the same species may be represented in nontraditional commercial circuit through other products. For evaluated Asteraceae, fresh plants or parts thereof of *Arctium lappa*, *Baccharis articulata* or *Matricaria chamomilla* are examples of exclusive products that are related to knowledge linked to traditions (invisible for most of urban population). But herbal products or tinctures derived of those species are frequent plants products into the *dietéticas*, hence are

visible for most of urban population. *Smallanthus sonchifolius* and *Stevia rebaudiana* are examples of species whose very varied products are sold in the general commercial circuit, ie are *visible*. However the presence of fresh products in the Bolivian market (invisible) suggests that species have gained visibility in the urban scenario. From a temporal standpoint, the visualization process is fast in pluricultural contexts: just in one or two decades the products of those species have invaded the general commercial circuit. Its high demand is due to the mass media, including the Internet, that disseminate its uses. On the other hand, some species remain until now invisible, eg *Porophyllum ruderale*, only found in the Bolivian market, despite having active compounds with diverse interesting effects, like antimicrobial, antinociceptive, anti-inflammatory, cytotoxic.

The role of the media is expansive on the botanical knowledge and guides the selection of plant products. But, at the same time, offer new sale arguments (as new uses derived from scientific studies or from traditional uses little known before) and acquire a recursive role: the knowledge guides the consumption which increases the demand, and this feeds back on knowledge, which reorients the consumption. For example, *Smallanthus sonchifolius* was traditionally used for cases of diabetes, and people know now that it also has hypoglycemic effect and may be considered as slimming, as well as a promising phytotherapeutic medicine for antitumor treatments. This recursiveness between knowledge and behavior is at the base of the urban botanical knowledge dynamics, in which ancient uses are resignified and new uses are added into the urban context. Thereby, the botanical knowledge system adapts and evolves.

The Asteraceae family, with so diverse applications, particularly as aromatic and/or medicinal plants, is an interesting reference group to obtain information about the composition and dynamic of urban botanical knowledge. As well as it has the major number of native taxa used in popular medicine in Argentina, also it has the highest number of taxa whose products are marketed in the metropolitan Buenos Aires-La Plata. In connection with the uses assigned and the effects analyzed, although many species have been the subject of several evaluations about its principles with biological activity, even many other species need to be evaluated. Data provided by this contribution may encourage further studies in this direction. Thus it may provide a more solid basis for many uses assigned and above all, avoid misinformation about the medicinal properties of many species.

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