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Chinese functional foods and nutraceuticals: plants and products commercialized in the Ciudad Autónoma de Buenos Aires, Argentina

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ABSTRACT

Knowledge linked to the traditions of different groups of immigrants in the large cities is a central issue for Urban Ethnobotany, and they constitute a starting point for the discipline approach. This article contributes to the study about local botanical knowledge within the pluricultural context of Buenos Aires-La Plata Metropolitan Area, in particular, the botanical knowledge about plants and its products introduced by Chinese immigrants in the Ciudad Autónoma de Buenos Aires. The registered functional food and nutraceutical plants products marketed by these immigrants (that belong to the Traditional Chinese Phytotherapy) are locally employed for the treatment of some ailments usually linked to the urban lifestyle, such as hypercholesterolemia, anxiety, depression, sexual dysfunction, among others. In this sense, the work contributes to the understanding of the local biocultural diversity (both plants and its associated knowledge). The research followed usual qualitative ethnobotanical methods and techniques, especially semi-structured and free interviews to 250 qualified informants, prior informed consent. In addition, a bibliographic review about species biological activity and studied effects were realized, in order to compare it with the locally assigned uses. An inventory of plant products of 52 vascular plants (vegetables, legumes, fruits, condiments) locally recognized as functional foods was obtained. Plants products belonging to 30 of the 52 treated taxa are commercialized only within the restricted commercial circuit of the Chinese immigrants. Therefore, these taxa are considered “invisible” for the majority of local inhabitants. Plants products of the 22 remaining taxa are marketed in both the restricted Chinese circuit and the general commercial one. Then, these taxa are “visible” for all residents. Local botanical knowledge is evaluated from the circulation of plant products in local trade circuits. “Invisible” taxa may become “visible” when entering the general commercial circuit. This “visualization process” of plants products and its associated knowledge express the local botanical knowledge dynamics.

Keywords: Ethnobotany; Urban Pluricultural Context; Local Botanical Knowledge; Chinese Immigration; Argentina.

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INTRODUCTION

1. Urban Ethnobotany

In the last years, various contributions to Urban Ethnobotany, in different parts of the world, refer to the knowledge linked to the traditions of different immigrant groups and have constituted starting points for the approach of the discipline. In several works, the contribution of the ethnobotanical study in the evaluation of different medicinal plants and products, and its associated knowledge, introduced by immigrants in their new urban context was highlighted. In this framework, ethnomedical studies recorded among immigrants from different urban areas where demonstrated the value of ethnobotanical studies in the analysis of how the Western medical system and other practices of diverse cultures interact in urban pluricultural contexts (Balick et al., 2000; Balick and Lee, 2001; Reiff et al., 2003; Pieroni et al., 2005). Other works evaluate how immigrants adapt to a new cultural context, studying the way of using the medicinal plants linked to the pharmacopeias of their respective countries, recording which ones are still used, which not, and which are the new species incorporated in the urban local scenario (Sandhu and Heinrich, 2005; Ceuterick et al., 2008; Pieroni and Vandebroek, 2009; Volpato et al., 2009; Monteiro et al., 2010; Medeiros et al., 2012; Abreu et al., 2015, among others).

In Buenos Aires-La Plata Metropolitan Area, the Laboratorio de Etnobotánica y Botánica Aplicada (LEBA) has conducted studies on different plants and plant products that are entered into the local urban context by several immigrants segments, analyzing the composition and dynamics of local botanical knowledge (Pochettino et al., 1997, 2008, 2012; Arenas et al., 2011, 2015; Hurrell and Puentes, 2013, 2017; Hurrell et al., 2013, 2015a, b, 2016, Puentes and Hurrell, 2015; Puentes, 2016, 2017).

2. Theoretical-methodological framework

The theoretical-methodological framework of this research based on a broad concept of Urban Ethnobotany understood as the study of the relationships between people and plants in urban pluricultural contexts (Hurrell, 2014; Hurrell and Pochettino, 2014). Urban pluriculturality it is enriched by the increasing presence of diverse immigrants segments which introduce plants and plant products, and its associated knowledge into the local scenario, i.e., respectively “tangible” and “intangible” components (Ladio and Albuquerque, 2016).

The urban botanical knowledge (UBK) constitutes a complex set of knowledge and beliefs about plants, parts thereof, and derivative products. The UBK includes 1) *nontraditional* knowledge: the taught and learned in educational systems, and the knowledge transmitted by the mass media, specially the Internet (including the scientific knowledge); 2) *linked to traditions* knowledge: mainly origin traditions of the segments of immigrants, a kind of knowledge that cannot be considered "traditional" because it corresponds to homogeneous cultural contexts (Hurrell, 2014; Hurrell and Pochettino, 2014).

The theoretical-methodological frame also assumes that the UBK is not accessible in a direct way, but can be extrapolated from the “actions” that this knowledge orients, like discourses, practices, strategies of selection, use and consume of plants and its products. At the same time, those actions become evident through the circulation of plant products within the local commercial circuits

that include the “general” circuit and the “restricted” circuits of diverse immigrants segments. Plant products that circulate inside the general commercial circuit are "visible" for all local urban dwellers (including all the immigrants). Plant products circulating within the restricted commercial circuit of each immigrants segment are visible to members of that particular segment and also some urban residents (non-immigrants and immigrants from others segments) interested in specific plants products. However, the exclusive products of the commercial circuit of a particular immigrants segment are "invisible" for the majority of the inhabitants of local pluricultural context.

At times, some invisible plant products and their associated knowledge become "visible" by entering the general commercial circuit. This becoming is called here "visualization process”. This begins when a product of a species restricted to the commercial circuit of the immigrant segments (invisible) is present in the general commercial circuit, especially in health food stores (locally called "dietéticas"). These shops install the product and encourage its consumption, and transmit information about its characteristics, uses and modes of employment (associated knowledge). This first knowledge diffusion is enhanced by the media, the Internet in particular, which plays a fundamental role in knowledge transmission because it acts in a fast way and into multiple directions at the same time. In this context, the media and the “dietéticas” act as true “visualization agents” (Hurrell, 2014; Hurrell and Pochettino, 2014). The distinction between invisible and visible plant species, for the majority of the local urban dwellers, constitutes not only a conceptual distinction but also a methodological tool to address the study of the visualization process, i.e., the local urban botanical knowledge dynamics (Hurrell and Puentes, 2017; Puentes, 2017).

The presence of plant products in local commercial circuits, the general one and the restricted to the immigrants, allows specifying the visibility or invisibility of plant species, and also the visualization of certain species over time. However, although commercial circuits are necessary to assess the invisibility and visibility of plant products, the economic processes and marketing are not sufficient to explain the ethnobotanical context in which “invisibility” or “visibility” has its meaning. In a more complex framework, the commercial circuits are circulation paths of plant products (tangible elements) and, at the same time, these circuits act as communication systems where plant products carry their associated knowledge (intangible elements) that gives them meaning.

3. Chinese immigration

This contribution presents the results of ethnobotanical research about functional plant foods introduced and commercialized by Chinese immigrants in the Ciudad Autónoma de Buenos Aires, Argentina. All the species here presented belong to the Traditional Chinese Phytotherapy, in this sense this contribution complements the results obtained in a previous work on that issue (Hurrell and Puentes, 2017). The segment of Chinese immigrants was selected because it is one of the groups of immigrants with the most outstanding presence in the study area, and at present is one of the fast-growing immigrant groups in the country.

From the ethnobotanical point of view, Chinese immigration constitutes an important source of new plant products (food and medicine), especially in the last twenty

years, which enrich the local botanical knowledge composition.

Argentina received "massive" immigratory waves in the mid-nineteenth century and the first half of the twentieth century. Most of those immigrants were of European origin, especially Italians and Spaniards that settled in a large part of the country. This migration flow has 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, a new kind of immigration called "recent" occurred, not massive and localized in the Buenos Aires Metropolitan Area. The Chinese immigration, looking for better economic conditions, is framed into the context of this recent immigration process (Bogado Bordazar 2003; Hurrell and Pochettino, 2014; Hurrell and Puentes, 2017; Puentes, 2017).

4. Functional foods and nutraceuticals

Plants for "eating and healing" (Etkin and Ross, 1982; Pieroni and Price, 2006; Chen, 2009) are usually considered functional foods and nutraceuticals. "Functional foods" are foods consumed as a source of nutrients and to maintain health or reduce the risk of diseases, with or without knowledge of how or why they have such benefits (Kalra, 2003).

"Nutraceuticals" are functional foods used for the prevention and treatment of diseases, and the consumers know how or why are beneficial to health, e.g., the orange juice. In this context, what it is a functional food for one consumer can act as a nutraceutical for another (Kalra, 2003; Pochettino et al., 2012; Hurrell et al., 2016).

5. Research objectives

The basic objective of this contribution is to present for the first time the inventory of species considered functional foods introduced and marketed by Chinese immigrants in the Ciudad Autónoma de Buenos Aires. This inventory represents a descriptive approach that is relevant in that is the necessary condition for an interpretative evaluation of the visibility and invisibility of the Chinese functional foods and their associated knowledge within the local pluricultural context. The study of visualization process implies an original methodological tool with usefulness confirmed in several works carried out in the LEBA in recent years. In this sense, this contribution provides a new background to the urban ethnobotany research and show the importance of immigrant groups in the study of local botanical knowledge.

This contribution includes plant products recognized as functional food and nutraceuticals, some of those taxa are visible to local inhabitants and others are invisible for most of them. In both cases, the new taxa imply a rise in the biocultural diversity within the urban pluricultural context. The research included: 1) an update of the plant products marketed in both commercial circuits, general and restricted to immigrants, and the visibility of the respective species; 2) the registration of the locally assigned uses, both food and medicinal; 3) the information about biological activity and effects studied in the academic field. The first point aims to answer these research questions about the useful species and products: What is the current inventory of the plant species surveyed? Which species are invisible and which are visible? The second and third points aim to answer the questions about the knowledge

associated with the species: What are the locally assigned uses of the plant species surveyed? Do the assigned uses correspond to the academic research about effects and biological activity of treated species? In short, it is about contributing to the composition and dynamics of local botanical knowledge.

MATERIAL AND METHODS

1. Study area and involved actors

Buenos Aires-La Plata Metropolitan Area has a total area of about 5,000 square kilometers, in which live about 15,000,000 inhabitants (as of 2014). This metropolitan area is the largest in Argentina in both size and population, and the second in South America (after São Paulo Metropolitan Area, Brazil). In this frame, the Ciudad Autónoma de Buenos Aires has 202 square kilometers and about 3,000,000 inhabitants, according to the 2010 National Census (INDEC, 2018). Also according to this census, about 12,000 immigrants were registered for the whole country, about 9,000 from the People's Republic of China, and about 3,000 from Taiwan. Of the total Chinese immigrants in Argentina, 44% lives in Buenos Aires city, and about 39% in Buenos Aires province, about 83% for the Buenos Aires-La Plata Metropolitan Area (Hurrell et al., 2015b; Hurrell and Puentes, 2017).

The most visible presence of Chinese immigrants centered in a sector of Belgrano neighborhood called "Barrio Chino" (Chinatown), where five large supermarkets, various restaurants, and shops were installed, and also cultural events related to Chinese festivities are organized. These characteristics replicate the profile of the Chinatowns in other metropolitan areas of the world (Porterfield, 1951; Sassone and Mera, 2007; Cerrutti, 2009, Hurrell and Pochettino, 2014; Grimson et al. 2016). The five supermarkets offer plant products for the Chinese segment, other immigrants, and also for local residents looking for new products. Towards 2000, the Barrio Chino received about 15,000 visitors every weekend (Bogado Bordazar 2003). Those supermarkets introduce diverse plant products and constitute true dissemination centers for both products and their associated knowledge.

2. Field works

2. 1. Ethnobotanical techniques

The ethnobotanical fieldwork focused on the five large supermarkets in the Barrio Chino (the total of Chinese outlets) to analyze the commercial circuit of immigrants, and 120 health food stores (locally called “dietéticas”) of the general commercial circuit to evaluate the visibility of plant species in the local scenario. In total 125 outlets were studied without interruption since 2005. Four visits per year, one for each season, were made to cover all fresh products. The selection of the health food stores started at random and continued until the saturation of information about the investigated plant elements.

The research methodological approach was strictly qualitative, based on usual ethnobotanical techniques like participant observation (interacting with sellers in the plant products survey), free listings, free and semi-structured interviews, applied according to the specific literature (Martin, 1995; Quinlan, 2005; Stepp, 2005; Bernard, 2006; Etkin and Ticktin, 2010; Albuquerque et al., 2014). In particular, semi-structured interviews' questions focused to identify the

food and medicinal uses of plant products, as well as its diffusion level. With prior informed consent, 250 qualified informants were interviewed (two for each outlet). They are sellers of both sexes and different ages (between 25 and 60 years old), and all of them demonstrated knowledge about the properties of the plant products they sell and guide the consumers on the ways of use.

2.2. Products and samples

In all cases, samples were obtained in all the outlets, designated with an alphanumeric code, and deposited in collections of the LEBA. Commercial products, including fragmented plant materials, tinctures, dietary supplements (tablets, capsules), among others, indicate its components in their official labels. When it was necessary, the plant materials were identified based on external morphological characters. For the updated scientific names, The Plant List (2013) and The International Plant Names Index (2015) were consulted. The descriptive and distributional data about the species were obtained from Flora of China (Wu et al., 1995-2013).

Chinese plant products correspond to fruits, vegetables, legumes, and some condiments, whose therapeutic uses belong to the Chinese Traditional Phytotherapy. Except for *Coix lacryma-jobi* L., valued as functional food, cereals were excluded from this survey due to the great diversity of its products, which will address in the near future.

2.3. Locally assigned uses

The “locally assigned uses” (both food and medicinal) were constructed based on data coming from: 1) the interviews; 2) products labels and prospectus; 3) information available in graphic media and Internet, that orients the strategies of selection and consumption of many urban residents interested in obtaining new plant products (Hurrell et al., 2015b; Puentes, 2017). The Information from these sources is mostly coincident and was checked with the available general literature (Zhu, 1998; Yang et al., 2003; Newman, 2004; Hu, 2005; Shi et al., 2005; Hempen and Fischer, 2009; Liu, 2011; Goldberg, 2012; Adams and Lien, 2013; Simoons, 2014; Liu et al., 2015a).

3. Revision work

Field works were complemented by a review of the available literature about biological activity and effects evaluated for each treated species. In this regard, we consult various websites, especially PubMed (2018). The search was carried out by scientific name and when necessary keywords such as "biological activity", and “specific effects” (e.g. "sexual dysfunction") according to the assigned local uses. In cases of several references for the same effect, the most current ones were selected. This kind of revision also performed in previous contributions (e.g., Arenas et al., 2015; Hurrell et al., 2015a,b, 2016; Puentes, 2016, 2017; Hurrell and Puentes, 2017). This review becomes pertinent because it is useful information for knowing what uses has academic support, and what uses require validation studies in that context.

RESULTS AND DISCUSSION

Table 1 summarizes the results obtained for 52 taxa, presented by its scientific name in alphabetical order. For each taxon, the botanical family, geographical distribution, vernacular names, marketed products, and samples were included. The Chinese

vernacular names appear in bold-italic, the Spanish and English names in italic. Samples codes indicated between brackets, the samples from Barrio Chino in bold.

Locally assigned uses included both food (F) and medicinal uses (M). The uses in italic correspond to the Chinese Traditional Phytotherapy. Last, the biological activity and effects studied, as well as the respective references, are indicated.

Table 1. Chinese functional foods and nutraceuticals: plants and products commercialized in the Ciudad Autónoma de Buenos Aires, Argentina.

Species, families, origin, vernacular names, products [Samples]	Locally assigned uses: food and medicinal	Biological activity and evaluated effects
Allium fistulosum L. Amaryllidaceae China ***Cong bai***, *negi, cebolla china, cebolla de verdeo, cebolleta, Japanese bunching onion, scallion, Welsh onion* Fresh plants in bundles **[RF77]** [RF61]	**F**. Raw and boiled bulbs and leaves as vegetable and condiment, for salads, soups, sauces, stewed beef, and chicken dishes. **M**. *Energizing, expectorant, analgesic, antinephritic, diuretic*, cardiovascular protective, hypotensive, depurative, antitumor, anti-insomnia, antidiabetic, digestive, antiseptic, vulnerary, antioxidant.	Antioxidant, anti-aging, anticancer, hypolipidemic, anti-hypertensive, antithrombotic, immunostimulant (Lee et al., 2005; Stajner et al., 2006; Aoyama et al., 2008; H. Ueda et al., 2013), anti-inflammatory, analgesic (Wang et al., 2013), antiviral (Lee et al., 2012), antimicrobial (Sohn et al., 2006), hypoglycemic (Kang et al., 2010), anti-obesity (Sung et al., 2018), hepatoprotective (Hwang et al., 2018), cardiovascular protective (Chen et al., 1999).
Allium schoenoprasum L. Amaryllidaceae Eurasia ***Xi xiang cong***, *cebollín, ciboulette, chives* Fresh leaves in bundles **[B044]** [RF07] Fresh inflorescences in bundles **[RF08]** Dried leaves in packs [C116]	**F**. Raw and cooked leaves and flowers as vegetable and condiment, for salads and stews. Also dried for later use. **M**. *Analgesic, anticefalalgic, anti-inflammatory, sudorific, antiseptic*, hypocholesterolemic, digestive, carminative, antitumor, anthelmintic, antioxidant, vulnerary, antianemic, depurative, hypotensive.	Anticancer (Kucekova et al., 2011; Timité et al., 2013), antioxidant, antimicrobial (Al-Snafi, 2013a) Mnayer et al., 2014), hypotensive, anthelmintic (Singh et al., 2018a), neuroprotective (Singh et al., 2018b), anti-inflammatory (Parvu et al., 2014), hypocholesterolemic, hypolipidemic (Mushtaq et al., 2016), antidiabetic (Roghani et al., 2010), antinociceptive (Roghani et al., 2011).
Allium tuberosum Rottler ex Spreng. Amaryllidaceae Warm Asia ***Jiu cai***, *nira, puerro chino, Chinese chives, Chinese leek* Fresh leaves in bundles **[X034]** Fresh leaves and flower buds in bundles **[F137]**	**F**. Raw and cooked leaves and flowers as vegetable and condiment, for filling dumplings (*jiaozi*), and dishes with flat noodles of eggs and wheat flour (*yimei*). **M**. *Tonic, antispasmodic, emollient, antidisenteric, anti-bematuria, antihemorrhoidal, aphrodisiac: impotence*, antidote, carminative, digestive, depurative, antiseptic.	Anticancer (Park et al., 2007; Lee et al., 2009), anti-obesity, antidiabetic, hepatoprotective (Jung et al., 2016; Tang et al., 2017a), antioxidant, antimicrobial (Mnayer et al., 2014), cardiovascular protective, anti-inflammatory, thrombolytic (Hur and Lee, 2017), sexual enhancer: libido, erectile dysfunction (Tang et al., 2017b), antifungal (Kocevski et al., 2013), insecticide, larvicide (XC Liu et al., 2015; Shi et al., 2015).
Apium graveolens L. ['Secalinum' Group] Apiaceae Eurasia ***Han qin***, *apio chino, Chinese celery, leaf celery* Fresh leaves in bundles **[F182]**	**F**. Raw, steamed or boiled leaves as a vegetable, and fresh or powdered as a condiment, for salads, soups, and stews. **M**. *Diuretic, anti-strangury, hepatic, anticefalalgic, antipyretic, hypotensive*, cardiovascular protective, antitumor, digestive, antispasmodic, anti-arthritic, anti-inflammatory, anti-bronchitis, antioxidant, anticonvulsant, sedative.	Antioxidant, cardiovascular protective, antipyretic, male fertility and spermatogenesis enhancer, hypoglycemic, hypolipidemic, anti-inflammatory, antirheumatic, antimicrobial, antidermatosic, anti-asthmatic, antitumor (Tyagi et al., 2013; Kooti and Daraei, 2017), schistosomicide (Saleh et al., 1985), sedative, diuretic, hypotensive, emmenagogue, galactogogue, antispasmodic, anti-constipation (Bown, 1995; Lust, 2014).

Arctium lappa L. ASTERACEAE Eurasia ***Niu bang gen***, *bardana*, *gobo*, *burdock* Fresh roots in packs **[P325]** Root powder (beverage) **[X003]** Dried aerial parts in packs [H282] Mother tincture [H352]	**F.** Boiled, roasted, pickled or stir-fried roots as a vegetable, for dishes with other vegetables and mushrooms, served with white rice and marinated chicken, also soups, stews, and *tofu* meals. **M.** *Antitussive*, *anticefalalgic*, *anti-inflammatory*, *analgesic*, *anti-edema*, *antihemorrhoidal*, *antidermatosic*, *rectal prolapse*, antirheumatic, anti-arthritic, hepatic, cholagogue, laxative, digestive, emollient, depurative, hypotensive, anti-alopecic, astringent, nephroprotective, diuretic, antisyphilitic, sedative, hypoglycemic, antiseptic, vulnerary.	Anticancer, estrogenic (Feng et al., 2017; Maxwell et al., 2017), anti-hyperlipidemic, hepatoprotective, antidiabetic, anti-atherosclerosis, antioxidant (Liu et al., 2014; Puentes, 2016; Wang et al., 2016; Ahangarpour et al., 2017), anti-inflammatory, anti-arthritic, anti-edema (Maghsoumi-Norouzabad et al., 2016; Carlotto et al.,2016; Gao et al., 2018), testicular protective (Yari et al., 2018), anti-aging (Su and Wink, 2015), anti-allergic (Yang et al., 2016), gastroprotective (Li et al., 2016), anti-hypertensive (Y. Liu et al., 2015b), neuroprotective (Tian et al., 2014), antimicrobial (Pereira et al., 2005), schistosomicide, antiviral (Dias et al., 2017).
Armoracia rusticana P.Gaertn., B.Mey. & Scherb. BRASSICACEAE Eurasia ***La gen***, *rábano picante*, *borseradish*, *krein* Fresh roots **[C131]** Powdered dried roots in packs **[C132]**	**F.** Raw and cooked roots as a condiment, for sauces and various dishes, usually as 'wasabi' substitute [*Wasabia japonica* (Miq.) Matsum.]. **M.** *Diuretic*, *antirheumatic*, *anti-arthritic*, *cholagogue*, *digestive*, urinary antiseptic, analgesic, antitussive, anti-asthmatic, aphrodisiac: impotence.	Anticancer, antioxidant (Weil et al., 2005; Gafrikova et al., 2014), anti-inflammatory (Marzocco et al., 2015), hypocholesterolemic, gastroprotective (Nguyen et al., 2013), antimicrobial, spasmolytic (Dekić et al.,2017), antifungal, insecticide, larvicide (Agneta et al., 2013).
Averrhoa carambola L. OXALIDACEAE India, China, Philippines, Southeast Asia ***Yang tao***, *carambola*, *star fruit* Fresh fruits **[F156]** [F006]	**F.** Raw or boiled fruits, for cakes, juices, jams, pickles, and chicken meals. **M.** *Antitussive*, *anti-asthmatic*, *antidermatosic*, *antipyretic*, *antimalarial*, *diuretic*, antiseptic, antihemorrhoidal, anti-arthritic, hypocholesterolemic, anti-spermatorrhoea, cardiovascular protective, hypotensive.	Anticancer, anti-inflammatory, antioxidant, antiulcer, antifungal, antimicrobial, antimalarial, hypocholesterolemic, analgesic, hypotensive (Dasgupta et al., 2013; Saghir et al., 2013, 2016; Singh et al., 2014; Leivas et al., 2016; Muthu et al., 2016), hypoglycemic, anti-hyperlipidemic (Pham et al., 2017), anti-adipogenic (Rashid et al., 2016).
Benincasa hispida (Thunb.) Cogn. CUCURBITACEAE China, tropical Asia ***Dong gua***, *calabaza china*, *calabaza de invierno*, *wax gourd*, *winter melon* Fresh fruits **[F183]** Canned juice **[B045]** Solid jam in packs **[B046]**	**F.** Boiled ripe fruits as squash, for soups and stuffed with meat, shrimps, and vegetables, also for sauces and confectionery. Raw or pickled young fruits as a cucumber. **M.** *Diuretic*, *antidiarrheal*, *antiulcer*, *expectorant*, *antihemorrhoidal*, *anti-edema*, *anti-inflammatory*, antidiabetic, tonic, antipyretic, anti-asthmatic, hypotensive, cardiotonic, neuprotective: insanity, schizophrenia, anticonvulsant, menstrual disorders, vulnerary, aphrodisiac: impotence.	Antioxidant, anti-inflammatory, analgesic, hypoglycemic, muscle relaxant, gastroprotective, anti-asthmatic, diuretic, nephroprotective, anthelmintic, hypoglycemic, hypolipidemic, antimicrobial, neuroprotective, antidepressant, anticonvulsant, anxiolytic (Al-Snafi, 2013b; X. Jiang et al., 2016), anticancer (Singh et al., 2016), hypotensive (Ghelani et al., 2014), antiandrogenic (Nahata and Dixit, 2014), prostatic hyperplasia inhibitor: erectile dysfunction (Nandecha et al., 2010), anti-aging (Sabale et al., 2011), immunostimulant (Une and Doshi, 2016).
Brassica juncea (L.) Czern. BRASSICACEAE Warm Asia ***Jie cai***, *mostaza china*, *brown mustard*, *Chinese mustard*, *leaf mustard* Fresh leaves in bundles **[F184]** Pickled leaves in bundles **[B048]** Pickled leaves in packs **[B047]**	**F.** Raw, boiled, stir-fried or pickled leaves as vegetable and condiment, for salads and as a dress for various basic meals. Crushed seeds to make mustard. Sprouted seeds for salads. **M.** *Analgesic: sore throat, lung abscess*, *emollient*, anti-bronchitis, anti-asthmatic, anti-allergic, diuretic, anti-arthritic, antitumor, antirheumatic, antioxidant.	Anticancer (Arora et al., 2016; Kwak et al., 2016), antiviral (Lee et al., 2014), antifungal (Oguro et al., 2014), antibacterial (Engels et al., 2012), antioxidant (Cartea et al., 2011), anti-obesity, hypotriglyceridemic, hypocholesterolemic (Lee et al., 2018), antiamnesic, antidepressant (Thakur et al., 2014a,b), antidiabetic (Yadav et al., 2004), antinociceptive (Rahmatullah et al., 2010).
Brassica oleracea L. var. ***albiflora*** Kuntze [=*B. alboglabra* L.H. Bailey] BRASSICACEAE China ***Gai lan***, *brócoli chino*, *kale china*, *quelan*, *Chinese broccoli*, *Chinese*	**F.** Raw, boiled, steamed, stir-fried or fried shoots with leaves and flowers, for various dishes. **M.** *Anti-asthmatic*, *antitussive*, *detoxifying*, *anti-diphtheria*, *analgesic*, neuroprotective, antioxidant, hypotensive, antianémico,	Anticancer, antioxidant, anti-allergic, anti-ophthalmic (Jiao et al., 1998; Liu et al., 2007; Cartea et al., 2011; Anita et al., 2014; Xu, 2018), detoxifying, anti-inflammatory, antidiabetic, antimicrobial (Hu et al.,2004; Abdulkareem et al., 2017), hypocholesterolemic (La et al., 2013).

kale Fresh leaves in bundles **[F185]**	hypocholesterolemic, cardiovascular protective, antitumor.	
Brassica rapa L. var. ***chinensis*** (L.) Kitam. BRASSICACEAE China ***Pak choi***, ***bok choi***, ***pai tsai***, ***choy sum***, *chapaichai*, *yuchai*, *col china*, *Chinese cabbage* ['Chinensis' Group] Fresh plantsin bundles: *pak choi* **[RF26]** [R005], *bokchoi* **[R030]**, *paitsai* **[B061]** ['Parachinensis' Group] Fresh plants in bundles: *choy sum* **[B060]**	**F.** Boiled, steamed, stir-fried and pickled leaves as cabbage, for soups, sauces, stews and meat dishes. Raw young leaves for salads. **M.** *Anti-inflammatory*, *anti-constipation*, *digestive*, *diuretic*, *antitumor*, slimming, anti-osteoporosis, antidiarrheal, cardioprotective, hypocholesterolemic, anti-scurvy, antipyretic, antioxidant, antiseptic, antidiabetic.	Anticancer, pulmonary protective, antioxidant, hepatoprotective, cardiovascular protective (Jiao et al., 1998; Rochfort et al., 2006; Al-Snafi, 2015), anti-inflammatory, antiplatelet, antimicrobial, immunostimulant, detoxifying, anti-allergic (Cartea et al., 2011), analgesic, antidepressant (Rahman et al.,2015).
Brassica rapa L. var. ***glabra*** Regel ['Pekinensis' Group] BRASSICACEAE China ***Huang ya bai cai***, *bakusai*, *repollo chino*, *Peking cabbage* Fresh plants **[RF06]** [RF71]	**F.** Boiled, steamed, stir-fried and pickled leaves as cabbage, for soups, stews and meat dishes. Raw leaves for beverages. **M.** *Diuretic*, *digestive*, *anti-constipation*, *anti-edema*, antidiarrheal, cardioprotective, antitumor, anti-inflammatory, anti-stress.	Antioxidant, anticancer, anti-allergic, cardiovascular protective, anti-atherosclerosis, antidiabetic, anti-obesity, anti-inflammatory (Jiao et al., 1998; Cartea et al., 2011; Seong et al., 2016; Joo et al., 2017).
Cinnamomum cassia (L.) J. Presl LAURACEAE China ***Rou gui***, *canela china*, *Chinese cassia*, *Chinese cinnamon* Fragmented dried bark in packs **[B001]** Powdered dried bark in packs **[H454]**	**F.** Bark as a spice, for soups, sauces, stews, and various dishes, also in spice mixtures (Chinese five-spice powder). **M.** *Antispasmodic*, *anti-dyspepsia*, *antinephritic*, *anti-arthritic*, *analgesic*, *menstrual disorders*, *aphrodisiac: impotence*, frigidity, antiulcer, digestive, carminative, antidiarrheal, anti-constipation, antipyretic, hypotensive, anti-edema, antioxidant,anti-enuresis,anti-inflammatory, antidiabetic, anti-spermatorrhoea, anti-infertility.	Anticancer, antioxidant, anti-dyspepsia, antiulcer, antipyretic, cardiovascular protective, antiplatelet, hypotensive, anti-obesity, antidiabetic, antiviral, antimicrobial, osteoblastic, immunomodulatory, anti-inflammatory, antidermatosic, anti-dyslipidemic, hypocholesterolemic, hepatoprotective, nephroprotective, neuroprotective, antidepressant, anxiolytic, anti-dysmenorrhea, estrogenic, sexual enhancer: erectile dysfunction (Puentes, 2016; Hurrell and Puentes, 2017; B.Y. Chang et al., 2018; Yun et al., 2018).
Citrus japonica Thunb. RUTACEAE China ***Jin gan***, *quinoto*, *kumquat* Fresh fruits **[B062]** [F177] Fruits preserved in syrup [RF53] Candied fruits in packs **[H117]**	**F.** Raw and cooked fruits preserved in syrup, chutney, jam, jelly, candies, pickles (acids or sweets), and beverages: liqueurs, infusions. **M.** *Expectorant*, *antitussive*, *anti-fatigue*, *resolutive*, *diuretic*, brain tonic, antitumor, cardiovascular protective, antidiabetic, slimming, anti-inflammatory, antioxidant, anti-aging, antidermatosic.	Anticancer, antioxidant, smooth muscle relaxant, uterine contraction stimulant, hypotensive, antimicrobial antiviral (Zhou et al., 2011; Lim 2012b; Dosoky and Setzer, 2018), anti-inflammatory, antidermatosic (Yang et al., 2010), antitussive, expectorant (Gairola et al., 2010), cardiovascular protective, anti-obesity, antidiabetic (Aruoma et al., 2012).
Citrus maxima (Burm.) Merr. RUTACEAE India, China, Philippines, Southeast Asia ***You***, *pomelo chino*, *pampelmuse*, *shaddock* Fresh fruits **[RF54]**	**F.** Raw pulp in salads also preserved in jams, jellies, and juices. The peel for make marmalade, candied or dipped in chocolate. **M.** *Diuretic*, *anti-constipation*, *digestive*, *detoxifying*, brain tonic, cognitive enhancer: sedative,anti-insomnia, anticonvulsant, antioxidant, anti-asthmatic, antitussive, antiseptic, antispasmodic, antidiarrheal, hypocholesterolemic, hypotensive, cardiotonic, anti-arthritic, antidiabetic.	Antioxidant, anti-inflammatory, anti-arthritic, analgesic, muscle relaxant, antidiabetic, anxiolytic, antidepressant, anticonvulsant, anti-insomnia, antimicrobial, larvicida, antihemorrhoidal, hepatoprotective, hypotensive hypocholesterolemic (Vijaylakshmi and Radha, 2015; Sawant and Panhekar, 2017; Singh and Navneet, 2017), anticancer (Ademosun et al., 2015), cardiovascular protective (Buachan et al., 2014), anti-hyperglycemic, anti-hyperlipidemic (Nwaka et al., 2014).
Citrus medica L. RUTACEAE India, China, Burma ***Xiang yuan***, *cidra*, *citron* Citron and honey for infusions	**F.** Fruits peel (the pulp is usually dry, it is not consumed) for jams, sauces, dressings, marinades, pickles, and spicy pickles, fish dishes, pastry, confectionery, and beverages: juices	Antioxidant, cardioprotective, anti-hypertensive, anticancer, antidiabetic, antimicrobial, anthelmintic, antiviral, diuretic, anticatarrhal, anticefalalgic, anti-constipation, carminative, antiulcer, antispasmodic, anti-arthritic, sedative, antiseptic, analgesic, hypolipidemic,

[B049]	and infusions (as a lemon substitute). **M**. *Tonic*, *hepatic*, *antitussive*, *expectorant*, *antispasmodic*, *analgesic*, *antiemetic*, antidote, carminativo, antihemorrhoidal, anthelmintic, antirheumatic, antiseptic.	hypocholesterolemic, astringent, antidiarrheal, anti-ophthalmic, hepatoprotective, contraceptive, estrogenic, neuroprotective, cognitive enhancer (Chhikara et al., 2018).
Citrus* × *microcarpa Bunge [= × *Citrofortunella microcarpa* (Bunge) Wijnands; *C. reticulata* Blanco × *C. japonica* Thunb.] RUTACEAE China, Philippines ***Jin Ju***, *calamansi*, *lima calamansi*, *calamondin* Fruits in yogurt **[X020]**	**F**. Fruit peel to flavor various dishes, beverages and infusions. Squeezed pulp for making lemonade, cocktails, ice cream, yogurt, and jams. **M**. *Energizing*, *antidepressant*, *detoxifying (hangover)*, *antacid*, *digestive*, *emollient*, antioxidant, hypocholesterolemic, antidiabetic, slimming.	Antioxidant, antimicrobial, anti-aging, hepatoprotective, anti-hyperglycemic, antidiabetic, nephroprotective,anti-inflammatory, anti-atherosclerosis, anticancer, cardiovascular protective, anticoagulant (Casimiro et al., 2010; Semaming et al., 2015; Al-Snafi, 2016; M.H. Chen et al., 2017; Lou and Ho, 2017).
Coix lacryma-jobi L. POACEAE India, Bhutan, Nepal, Sri Lanka, China, Southeast Asia, Philippines, New Guinea ***Yi yi ren***, *lágrimas de Job*, *Job's tears* Dried seeds in packs **[H307]**	**F**. Boiled seeds as beans, for soups and dishes with rice, cakes, sweets, and snacks, also to making liqueurs and infusions. **M**. *Diuretic*, *spasmolytic*, *anti-dysuria*, *antidiarrheal*, *anti-arthritic*, *antirheumatic*, *antipyretic*, antitumor, anti-inflammatory, anti-fatigue, hypocholesterolemic, anti-obesity.	Antioxidant, immunostimulant, antidiabetic, hypolipidemic, anti-obesity, anticancer, anti-allergic, anti-inflammatory, anti-fatigue, antinociceptive, antimicrobial, antiviral, nephroprotective, diuretic, hypouricemic, antiprogestogenic, abortive, antiemetic, antisyphilitic, gastroprotective, hepatoprotective, anti-dysmenorrhea (Hurrell and Puentes, 2017; Son et al.,2017).
Colocasia esculenta (L) Schott ARACEAE India, China, Southeast Asia ***Yu tou***, *taro*, *dasheen* Fresh tubers **[RF58]** Frozen fragmented tubers **[B050]** Tubers and coconut milk (beverage) **[B051]**	**F**. Baked, boiled, steamed, roasted, stir-fried or fried tubers, for soups, stews andvarious dishes, beverages, puddings and a food paste called *poi*. **M**. *Spleen tonic*, *emollient*, *antidiabetic*, *detoxifying*, *laxative*, *antidermatosic*, *vulnerary*, *anti-fatigue*, anti-dyspepsia, hepatic, antispasmodic, antitumor, astringent, anti-inflammatory, cardiotonic, anti-alopecic, anti-allergic, immunostimulant.	Anticancer, antimicrobial (Kim et al.,2010; Kundu et al., 2012; Park et al., 2013; Pawar et al., 2018), hypolipidemic (Boban et al., 2006), hypocholesterolemic, antioxidant, hypoglycemic, anti-inflammatory, cardiotonic (Simsek and Nehir, 2015; Lim, 2015; Krishnapriya and Suganthi, 2017), testosterone and testicular parameters increasing (Ribeiro et al., 2018), vulnerary (Gonçalves et al., 2013), immunomodulatory, hematopoietic (Pereira et al., 2015).
Cucumis melo L. [= *C. melo* var. *makuwa* Makino] ['Makuwa' Group] CUCURBITACEAE India, East Asia ***Tian gua***, *chamoe*, *melón coreano*, *Korean melon* Fresh fruits **[B052]** Fresh sliced fruits in packs **[B053]**	**F**. Peeled and sliced fruits for salads, desserts, ice creams, and dishes with rice, meat, and spices. The seeds are eaten roasted and contain edible oil. **M**. *Diuretic*, *anti-stranguria*, *antidisenteric*, *digestive*, *sedative*, depurative, analgesic, anti-arthritic, antirheumatic, anti-inflammatory, antipyretic, antidiabetic, antidermatosic, vulnerary, slimming.	Antidiabetic (Chen and Kang, 2013), anticancer (Kim et al., 2009, 2012), antioxidant, anti-inflammatory, analgesic, antiulcer, diuretic, gastroprotective, hepatoprotective, anti-obesity, hypolipidemic, hypocholesterolemic, anti-atherosclerosis, cardioprotective, antiplatelet, anti-hyperglycemic, anti-hyperthyroidism, mnemonic, neuroprotective, antimicrobial, anthelmintic (Asif et al., 2014).
Curcuma longa L. ZINGIBERACEAE Warm Asia ***Jiang huang***, *curcuma*, *turmeric* Fresh rhizomes **[X011]** Fragmented dried rhizomes in packs [C136] Powdered rhizomes in packs [C036] Capsules [P326]	**F**. Fresh (more aromatic) or dried (fragmented or powdered) rhizomes, as a condiment and food coloring, for various meals and pastry. It is an important constituent of the curry powder. Young rhizomes can be eaten fresh as a spicy vegetable. **M**. *Antispasmodic*, *emollient*, *analgesic*, *anti-arthritic*, *blood tonic*, *menstrual disorders*, anti-inflammatory, antirheumatic, hepatic, digestive, carminative, hypocholesterolemic, anti-asthmatic, antitussive, cardioprotective, antitumor, antidiabetic, antioxidant, antidermatosic, neuroprotective, antidepressant, slimming, aphrodisiac: libido, impotence.	Anti-inflammatory, antioxidant, anticancer, antidiabetic, vulnerary, cardiovascular protective, anti-obesity, anti-atherosclerosis, hypolipidemic, hypocholesterolemic, hepatoprotective, hypotensive, nephroprotective, neuroprotective, anti-arthritic, anti-ophthalmic, anti-osteoporosis, anti-dysmenorrhea, testicular protective, antidermatosic, anti-aging (Noorafshan and Ashkani-Esfahani, 2013; Hurrell et al., 2015b; Sundar Dhilip Kumar et al. 2018, Wojcik et al., 2018), antimicrobial (Gupta et al., 2015), cognitive enhancer: mnemonic (Yu et al., 2013), anticonvulsant (Akula and Kulkarni, 2014), anxiolytic, antidepressant (Ceremuga et al., 2017), sexual enhancer: erectile dysfunction (Abdel Aziz et al., 2012).
Cymbopogon citratus (DC.) Stapf	**F**. Raw or cooked young plants as a	Anticancer, antimicrobial, antiviral, antioxidant,

POACEAE Warm Asia and Africa ***Xiang mao***, *citronela*, *pasto limón*, *lemon grass* Fresh young plants in bundles **[R022]** [RF08] Fragmented young plants in packs **[P240]** [H171]	condiment, for salads, soups, sauces, marinades, stews, pork or chicken dishes, pastry, and confectionery, also for spices mixtures and infusions. **M**. *Antirheumatic*, *analgesic*, *vulnerary*, *anticefalalgic*, *antidiarrheal*, *digestive*, *antacid*, *carminative*, analgesic, anti-inflammatory, anti-arthritic,depurative, hypotensive, hypocholesterolemic, anti-insomnia, anticonvulsant, anxiolytic, sedative, antiseptic, antipyretic, antitumor, detoxifying.	detoxifying, analgesic, anti-rheumatic, anti-inflammatory, cardioprotective, expectorant, anti-flu, antitussive, astringent, diuretic, antiseptic, antiplatelet, hypotensive, anti-arrhythmia, anti-constipation, gastroprotective, antipyretic, anti-obesity, antidiabetic, antimalarial, hypocholesterolemic, anti-atherosclerosis, anti-dyslipidemic, anticonvulsant, anti-insomnia, sedative, anxiolytic, antidepressant, anti-tuberculosis, insecticide, repellent (Avoseh et al., 2015; Ekpenyong et al., 2015; Hurrell et al., 2015b; Mohamad et al., 2018).
Dimocarpus longan Lour. SAPINDACEAE India, Sri Lanka, China, Philippines, Southeast Asia, New Guinea ***Long yan***, ***long yan rou***, *longan*, *ojo de dragón*, *dragon eye* Fresh fruits **[B042]** Canned juice **[X004]** Dried fruits in packs **[RF74]** Arils preserved in syrup **[F101]** Arils powder (beverage) **[X025]**	**F**. Fresh aromatic arils for desserts, sweet-and-sour dishes, soups, stews, snacks, preserved in syrup, juices, and liqueurs, also dried as raisins, in Chinese sweet dessert soups. **M**. *Anti-inflammatory*, *anti-fatigue (physical and mental)*, *analgesic*, *cardiotonic*, *bloodtonic*, *anti-insomnia*, *anxiolytic*, *sedative*, *mnemonic*, vasoprotective, antipyretic, antiseptic, antitumor, anti-aging, vulnerary, slimming, anthelmintic, immunostimulant.	Anticancer, immunomodulatory, antioxidant, antidiabetic (Meng et al., 2014), hypouricemic (Sheu et al., 2016), anti-osteoporosis (S. Park et al., 2016), antimicrobial, antimalarial (Sudjaroen, 2013; Tseng et al., 2014), anti-inflammatory (Kunworarath et al., 2016), antidiarrheal, analgesic, anticonvulsant, sedative, anxiolytic (Okuyama et al.,1999; Ripa et al., 2014), anti-fatigue (Zheng et al., 2010), anti-insomnia (Ma et al., 2009), mnemonic (Park et al., 2010).
Dioscorea japonica Thunb. DIOSCOREACEAE China, Korea, Japan ***Ri ben shu yu***, *yamaimo*, *ñame*, *Japanese Yam* Fresh tubers **[B043]**	**F**. Boiled and steamed tubers as a vegetable, for salads, soups, rice meals, and various dishes, as a potato substitute. **M**. *Astringent*, *antidiarrheal*, *anti-asthmatic*,*antitussive*, *antidiabetic*, *antinephritic*, anti-inflammatory, anti-arthritic, hepatic, tonic, sedative, anti-osteoporosis, antipyretic, anti-spermatorrhoea, estrogenic.	Antioxidant, anti-inflammatory, anticancer, cardioprotective (C.T. Chen et al., 2017; Tsukayama et al., 2018), immunomodulatory (Lin et al., 2009), probiotic, gastrointestinal enhancer (Hsu et al., 2006), hypoglycemic (Ivorra et al., 1989), estrogenic (Wu et al., 2005), hypocholesterolemic (Kusano et al., 2016), neuroprotective, mnemonic, antidepressant (Lee et al., 2013; Jeon et al., 2014).
Diospyros kaki Thunb. EBENACAE China ***Shi***, ***shi di***, *caqui*, *persimmon* Fresh fruits **[B054]** [RF75] Dried fruits in packs **[RF76]**	**F**. Fresh and dried fruits, for jams, ice creams, cakes, jellies, juices, and liqueurs. **M**. *Expectorant*, *antitussive*, *anti-asthmatic*, *antidiarrheal*, *antidisenteric*, *hypotensive*, *anti-stranguria*, *antitumor*, *anti-constipation*, *anti-hematuria*, *antidiabetic*, astringent, antipyretic, anti-dyspepsia, antihemorrhoidal, sedative, anthelmintic, anti-arrhythmia, slimming, anti-fertility, contraceptive.	Anticancer, anti-inflammatory (Cho et al., 2016; Direito et al., 2017; Park et al., 2017), hypolipidemic, hypocholesterolemic, antidiabetic, hypotensive (Butt et al., 2015), antioxidant (Matsumura et al., 2016), anti-obesity (G.N. Kim et al., 2016), antimicrobial (Morita et al., 2016), antiviral (K. Ueda et al., 2013), anticoagulant (Lu et al., 2012), anti-allergic, anti-constipation (Kim et al., 2013), neuroprotective, mnemonic, anti-aging (Yokozawa et al., 2014; Forouzanfar et al., 2016).
Glycine max (L.) Merr. LEGUMINOSAE East Asia ***Huang dou***, *soja*, *soy*, *soybean* Dried seeds **[X023]** [L019] Dried seeds in packs **[X031]** Fried seeds in packs [R051] Textured soy **[X021]** [H314] Soy lecithin [H368] Soy sauce (*jiang you*) **[H392]** [H370] [H521] Soy oil (*dou you*) **[P244]** Soy flour **[X028]** [H063] [H383]	**F.** Boiled or toasted seeds, for salads, soups, stews, and various dishes. Flour for pasta and meat substitutes. Soy milk (*dou nai*) provides proteins and serves to make cheese (*tofu*). From seeds, it is obtained lecithin, and by fermentation the soy sauce. **M**. *Tonic*, *diuretic*, *antidiarrheal*, *digestive*, *antispasmodic*, antitumor, hypocholesterolemic, antiseptic, anti-dysmenorrhea, anti-osteoporosis, antidiabetic, antipyretic, antioxidant, slimming.	Antioxidant, anti-inflammatory, anticancer, neuroprotective, anti-hypertensive, osteoprotective, menopause symptoms, anti-estrogenic, hypocholesterolemic, anti-dyslipidemic, hepatoprotective, antidiabetic, anti-obesity, anti-asthmatic, anti-infertility, anti-ophthalmic, antimicrobial, antiviral (Arenas et al., 2015; Hurrell et al., 2016; Ganesan and Xu, 2017; Juritsch and Moreau, 2018).
Illicium verum Hook. f. ILLICIACEAE China, Vietnam	**F**. Dry fruits as spice and mixtures of spices (Chinese five-spice powder), for soups and various dishes, also pastries	Antioxidant, anti-inflammatory, analgesic, antimicrobial, sedative, anticancer (Wang et al., 2011; Ritter et al., 2014; Asif et al., 2016; Sun et al., 2016), anti-

Ba jiao hui xiang, *anís estrellado*, *star anise* Dried fruit in packs **[X006]** [C056] Powdered fruits in packs **[X007]** [C112]	and liqueurs (as anise substitute). **M**. *Analgesic*, *antirheumatic*, *anti-inflammatory*, *antispasmodic*, *antinepbritic*,diuretic, digestive, antidiarrheal, carminative, anti-insomnia, sedative, anti-fatigue, expectorant, emmenagogue, galactogogue, antioxidant.	hyperlipidemic, anti-atherosclerosis (Park et al., 2015), neuroprotective (Rabelo et al., 2015), galactogogue (Wang et al., 2015), antidermatosic (Sung et al., 2012a), central nervous system depressant, anxiolytic (Chouksey et al., 2013), antiviral: HIV (Song et al., 2007).
Ipomoea aquatica Forssk. CONVOLULACEAE India, Pakistan, Bangladesh, Nepal, Sri Lanka, China, Philippines, Southeast Asia, New Guinea, Australia, Pacific Islands, Africa, South America ***Kong xin cai***, ***weng cai***, *espinaca china*, *espinaca de agua*, *water spinach* Fresh leaves in bundles **[F187]**	**F**. Raw, boiled, steamed and stir-fried leaves, for saladsand dishes with vegetables, noodles, meat, fish or seafood. **M**. *Diuretic*, *emollient*, *anti-bematuria*, *detoxifying*, *antibemorrbagic*, *anti-bemoptisis*, anti-icteric, anti-constipation, hepatic, anticonvulsant, antidiabetic, anthelmintic, purgative, hypolipidemic, hypotensive, vulnerary, antiseptic.	Antioxidant, antidiabetic, anti-obesity, hepatoprotective, anti-ophthalmic, anticancer, diuretic, antimicrobial, anti-inflammatory, anti-arthritic, antiulcer, diuretic, antidote, hypolipidemic, hypocholesterolemic, cognitive enhancer: memory and learning, anxiolytic, anticonvulsant (Meira et al., 2012; Manvar and Desai, 2013; Malakar and Choudhury, 2015), hypotensive (Khayungarnnawee et al., 2018).
Kaempferia galangal L. ZINGIBERACEAE India, China, Southeast Asia ***Shan nai***, *galanga*, *aromatic ginger*, *kencur* Dried rhizomes in packs **[B033]** **[X012]**	**F**. Fresh or cooked rhizomes as vegetable and as a condiment, for various dishes. Powdered rhizomes with rice flour for an herbal beverage. **M**. *Anti-asthmatic*,*antitussive*, *digestive*, *spasmolytic*, *anti-inflammatory*, *hypotensive*, *analgesic*, *antiodontalgic*, antidiarrheal, carminative, anti-constipation, antihemorrhoidal, antiseptic, vulnerary, antidermatosic, antirheumatic, anticefalalgic, antipyretic, antitumor, antidepressant, sedative, anti-insomnia, anti-stress, anxiolytic, slimming.	Antioxidant, anti-inflammatory, analgesic, anticancer, diuretic, anti-hypertensive, anticoagulant, cardiotonic, anthelmintic, anti-constipation, antispasmodic, digestive, carminative, antipyretic, anti-tuberculosis, antimicrobial, antiviral, anti-allergic, antidiabetic, vulnerary, anti-hyperlipidemic, hypocholesterolemic, expectorant, antitussive, antidermatosic, anti-obesity, insecticide, repellent, larvicida, antimalarial, bone protector, antirheumatic, anticefalalgic, antiodontalgic, sedative, anti-insomnia,anxiolytic (Amuamuta et al., 2017; Hurrell and Puentes, 2017; Kim et al., 2018).
Lablab purpureus (L.) Sweet [= *Dolichos lablab* L.] LEGUMINOSAE Africa and Asia ***Bian dou***, *chaucha japonesa*, *poroto de Egipto*, *hyacinth bean*, *lablab bean* Fresh legumes in paks **[F188]** [B404]	**F**. Boiled unripe fruits (legumes) and boiled seeds (beans) for various dishes. Sprouted seeds in salads. **M**. *Digestive*,*antidiarrheal*, *anti-dyspepsia*, *diuretic*, *anti-fatigue*, antitumor, antispasmodic,carminative, anthelmintic, antipyretic, antidiabetic, aphrodisiac.	Antioxidant, anti-inflammatory, antinociceptive, hypolipidemic, hypocholesterolemic, anticancer, antidiabetic, hepatoprotective, antianemic, antimicrobial, antimalarial, antiparasitic (Lim, 2012a; Hurrell et al., 2016; Al-Snafi, 2017).
Lactuca sativa L. var. ***angustana*** Irish ex Bremer ['Asparagina' Group] ASTERACEAE China ***Wo ju***, *lechuga china*, *lechuga de tallo*, *stem lettuce* Fresh plants in bundles **[F189]** Pickled stems in packs **[P328]**	**F**. Raw, boiled, roasted, stir-fried or pickled stalks and leaves for salads, stews, and dishes with fish, chicken, rice, and eggs. **M**. *Diuretic*, *detoxifying*, *antidote*, *galactogogue*, *emollient*, anti-inflammatory, antispasmodic, antitumor, analgesic, digestive, antioxidant, antianemic, sedative, anti-insomnia.	Antioxidant, anti-inflammatory, hypocholesterolemic, anticancer, antidiabetic (M.J. Kim et al., 2016), galactogogue, antispasmodic, digestive, diuretic, antipyretic, antirheumatic, analgesic, antitussive, sedative, anti-insomia, anxiolytic (Duke and Ayensu, 1985; Bown, 1995; Lust, 2014).
Litchi chinensis Sonn. SAPINDACEAE China, Philippines, Southeast Asia, New Guinea ***Li zhi***, *litchi*, *lychee* Arils preserved in syrup **[RF98]** Canned juice **[R134]**	**F**. Raw and cooked arils for syrup, jams, desserts, sauces, pickles, ice cream, and wine. **M**. *Analgesic*, *antispasmodic*, *liver*, *stomach*, *testicles and hernia pain*, antitussive, anti-inflammatory, antidiabetic, anti-obesity, antidiarrheal, antioxidant, anti-dysmenorrhea, antitumor, anti-aging.	Anticancer, anti-inflammatory, analgesic, immunomodulatory, antimicrobial, antiviral, anti-obesity, antidiabetic, antipyretic, antioxidant, hepatoprotective (Ibrahim and Mohamed, 2015; Emanuele et al., 2017; Man et al., 2017), cardiovascular protective (Y. Chen et al., 2017), antithrombotic (Sung et al., 2012b).
Luffa aegyptiaca Mill. [= *L. cylindrica* (L.) M. Roem.] CUCURBITACEAE South and Southeast Asia ***Si gua***, *esponja vegetal*, *pepino*	**F**. Raw or cooked unripe fruits as a cucumber, for salads, soups, curries, and various dishes. Ripe fruits (*si gua luo*) are bitter and very fibrous, not edible. Roasted seeds are edible and	Antioxidant, anti-inflammatory, anticancer, uterine contraction inducer (childbirth), antimicrobial, immunostimulant, bronchodilator, anti-asthmatic, antitussive (Partap et al., 2012; Azeez et al., 2013; Sharma et al., 2015; Hlel et al., 2017; Garai et al., 2018),

esponja, Egyptian cucumber, sponge gourd Fresh fruits **[F190]**	contain edible oil. **M**. *Expectorant, antitussive, anti-asthmatic, galactogogue, emollient, antipyretic, anti-inflammatory, diuretic*, hepatic, antihemorrhoidal, antitumor, astringent, laxative, analgesic, uterine contraction, spasmolytic, antirheumatic, cardiotonic, antidermatosic, antiseptic, emmenagogue.	antiviral: HIV (Ng et al., 2011), anti-ophthalmic (Dubey et al., 2015), antiulcer, antidiarrheal (Naidu et al., 2014), antidermatosic, anti-allergic (Ha et al., 2015), hypolipidemic, hypocholesterolemic (Thayyil et al., 2011), hepatoprotective, vulnerary, hypoglycemic, analgesic (Sanjaya Kumar and Acharya, 2016).
Lycium barbarum L. SOLANACEAE China ***Gou qi zi***, *goji, Chinese wolfberry* Dried fruits in packs **[R169]** [D001] Red tea with goji in packs **[X014]**	**F**. Fresh ripe fruits preserved in jams, creams, yogurt, and juices, also for soups, vegetables and meat dishes. Dried fruits as raisins, for infusions and alcoholic beverages. **M**. *Liver and kidney tonic, depurative, anti-ophthalmic, anti-arthritic, male infertility, anti-spermatorrhoea, anti-insomnia*, antidermatosic, emollient, antianemic, anti-aging, analgesic, anticefalalgic, antidiabetic, antitussive, vulnerary, antioxidant, adaptogen, aphrodisiac: impotence.	Adaptogen, cognitive enhancer: memory and learning, anxiolytic, antidepressant, neuroprotective, antioxidant, hypocholesterolemic, hypolipidemic, cardioprotective, anti-atherosclerosis (Hurrell et al., 2013, 2015a,b; Hu et al., 2018), anticancer, nephroprotective, hepatoprotective, retinal protector, antidiabetic, anti-obesity, anti-osteoporosis,anti-arthritic, anti-inflammatory, immunomodulatory, anti-aging, male fertility enhancer, sexual enhancer: erectile dysfunction (Puentes, 2016; Gao et al., 2017; Hurrell and Puentes, 2017; Shi et al., 2017; J.S. Chang et al., 2018).
Momordica charantia L. CUCURBITACEAE Pantropical ***Ku gua***, *pepino amargo, bitter cucumber, bitter melon, bitter gourd, leprosy gourd* Fresh fruits **[F191]**	**F**. Boiled, fried, smoked or stir-fried ripe fruits, for soups and dishes with vegetables, legumes and meats, also pickles and for making infusions. **M**. *Antidisenteric, antipyretic, anti-ophthalmic, antiseptic, antidermatosic, detoxifying, anti-inflammatory, anti-obesiy, emollient,* antiviral, antitumor, antidiabetic, antihemorrhoidal, anti-constipation, anthelmintic, anti-anorexy, immunomodulatory, anti-fertility, hypocholesterolemic, anti-aging.	Antioxidant, anti-inflammatory, antimicrobial, thrombolytic (Hussain et al., 2018), anticancer (Qiu and Jia, 2014; Ali et al., 2018; Farooqi et al., 2018), hypolipidemic, hypoglycemic, antidiabetic, anti-obesity (Yin et al., 2008; Zhou et al., 2016; Jones et al., 2018), anti-arthritic (Soo May et al., 2018), antiviral, immunomodulatory, anthelmintic, hepatoprotective, antilipolytic, antiulcer, anti-fertility (Jia et al., 2017), neuroprotective (Chen et al., 2018), anti-aging (Cao et al., 2018).
Nelumbo nucifera Gaertn. NELUMBONACEAE Siberia, Korea, Japan, China, Nepal, Bhutan, India, Sri Lanka, Pakistan, Philippines, Southeast Asia, Australia. ***Lian***, ***lian zi***, *loto sagrado, sacred lotus* Fresh rhizomes in packs **[D148]** Rhizomes powder (beverage) **[X001]** Rhizomes and almonds powder (beverage) **[X015]** Dried seeds in packs **[BH20]** Seeds paste in packs **[R028]**	**F**. Boiled, fried, stir-fried or pickled rhizomes as vegetables, for soups, stews, fish meals, and various dishes. Raw, boiled, toasted, steamed or pickled seeds for soups, sauces, creams, and desserts. **M**. *Tonic, diuretic,antidiarrheal, anticancer, anti-inflammatory, antidiabetic, antidermatosic, antidote, astringent*, antiemetic, hepatoprotective, anti-dyspepsia, hipolipidémico, anti-anorexy, antidisenteric, antinephritic, anti-leukorrhea, anti-spermatorrhoea, anti-hematuria, anti-arrhythmia, anti-obesity, hypotensive, anti-aging, antitussive, antipyretic, mnemonic, anti-insomnia, anxiolytic, aphrodisiac: impotence.	Anticancer, antioxidant, anti-aging, antipyretic, antimicrobial, antiviral: HIV, immunomodulatory, anti-inflammatory, anti-arthritic, anti-atherosclerosis, antithrombotic, anti-arrhythmia, hypotensive, diuretic, antidiarrheal, anti-asthmatic, anti-pulmonary fibrosis, neuroprotective, cognitive enhancer: memory and learning, anxiolytic, anticonvulsant, antidepressant, sedative, anti-insomnia, gastroprotective, hepatoprotective, antidiabetic, hypocholesterolemic, hypolipidemic, anti-obesty, anti-fertility, sexual enhancer: erectile dysfunction (Yang et al., 2008; Jiang et al., 2011; Zhou et al., 2013; Paudel and Panth, 2015; Puentes, 2016; Hurrell and Puentes, 2017; Kumaran et al., 2018).
Nephelium lappaceum L. SAPINDACEAE Philippines, Southeast Asia ***Hong mao dan***, *rambután, rambutan* Arils preserved in syrup **[F121]**	**F**. Fresh arils in salads, also preserved in syrup, jellies, jams, compotes. **M**. *Astringent, antidiarrheal, anti-dyspepsia, antidisenteric, detoxifying, antidiabetic, antidermatosic, energizing*, antipyretic, digestive, anti-constipation, anthelmintic, antiseptic, anti-flu, antibacterial, sedative, hypotensive, cardioprotective, slimming.	Anticancer (Yuvakkumar et al., 2015), antibacterial (Yuvakkumar et al., 2014), antiviral (Abdul Ahmad et al., 2017), anti-obesity (Chung et al., 2018), anti-arthritic (Kumar et al., 2012), antioxidant, anti-allergic, sedative, anxiolytic, antidepressant (Nethaji et al., 2015; Hernández et al., 2017), analgesic, anti-inflammatory, antidiabetic, hypocholesterolemic, larvicide, immunomodulatory, antidiarrheal (Sukmandariet al., 2017).

Perilla frutescens (L.) Britton LAMIACEAE India, Bhutan, Korea, Japan, China, Southeast Asia ***Zi su***, ***zi su ye***, *shiso*, *Korean perilla*, *perilla* Fresh leaves in packs **[F149]**	**F.** Fresh leaves for various Chinese and Japanese dishes (*susbi*), noodles, meats, and fishmeal, also to make beverages and as a condiment (as basil substitute). **M.** *Antitussive*, *anti-asthmatic*, *anti-dyspepsia*, *antiemetic*, *anticongestive*, *anticefalalgic*, *antipyretic*, *sudorific*, *antidote*, tonic, hepatoprotective, anti-obesity, antispasmodic, anti-allergic, carminative, antiseptic, slimming, sedative.	Antioxidant, anti-inflammatory, antimicrobial, antiviral: HIV, hepatoprotective, anti-allergic, antitussive, hypotensive, sedative, antidepressant, antipyretic (Zhu, 1998; Igarashi and Miyazaki, 2013; Bachheti et al., 2014; Yu et al., 2017), anticancer (He et al., 2015; Abd El-Hafeez et al., 2018), neuroprotective, cognitive enhancer: memory and learning (Lee et al., 2016a,b), anti-asthmatic (Chen et al, 2015), anti-ophthalmic (J. Kim et al., 2018), anti-adipogenic (M.J. Park et al., 2016), antidermatosic (Komatsu et al., 2016).
Phyllostachys bambusoides Siebold & Zucc. [= *P. reticulata* (Rupr.) K. Koch] POACEAE China, Japan ***Gui zhu***, *bambú*, *bamboo* Fresh sprouts **[F132]**	**F.** Boiled, roasted and pickled shoots, for salads, soups, and various dishes. **M.** *Anti-asthmatic*, *digestive*, *hepatic*, *anti-hematuria*, hypotensive, analgesic, antidiarrheal, antidisenteric, antitumor, anti-inflammatory, anticonvulsant, antioxidant, vulnerary, antiseptic.	Antioxidant, anti-inflammatory, anticoagulant, neuroprotective (Hong et al., 2010), anticonvulsant (Kumar et al., 2011), antibacterial (Kim et al., 2011), antidiabetic, anticancer, hypocholesterolemic, hypolipidemic, cardiovascular protective (Singhal et al., 2013; Panee, 2015).
Phyllostachys edulis (Carrière) J. Houz. [= *P. pubescens* J. Houz.] POACEAE China ***Mao zhu***, *bambú*, *moso bamboo* Dried sprouts in packs **[X005]** Pickled sprouts **[F133]** **[R045]** Fresh fragmented sprouts (*zhu ru*) **[X008]** Fresh fragmented sprouts in packs **[X030]**	**F.** Boiled, fried, roasted and pickled young sprouts, for salads, soups, broths, and various dishes. **M.** *Anticongestive*, *antitussive*, *sedative*, *depurative*, *digestive*, *anti-constipation*, *anti-insomnia*, hypocholesterolemic, anti-atherosclerosis, antianemic, anti-inflammatory, cardiovascular protective, hypotensive, antitumor, antioxidant, vulnerary, anxiolytic, antidepressant, slimming.	Antioxidant, anti-inflammatory, antimicrobial, hypolipidemic, hypocholesterolemic, anticancer, vulnerary (Panee, 2015; Pang and Panee, 2016), anti-hypertensive (J.S.Kim et al., 2008).
Prunus mume (Siebold) Siebold & Zucc. ROSACEAE Korea, Japan, Southeast Asia ***Wu mei***, *ume*, *ciruela china*, *ciruela japonesa*, *ciruela ume*, *Chinese plum* Pickled fruits in packs **[F144]** Dried fruits in packs **[F143]**	**F.** Fresh fruits preserved in jams and juices, also dried and pickled (*umebosbi*) and for make liqueur (*umesbu*). **M.** *Antitussive*, *antidiarrheal*, *anti-hematuria*, *antidisenteric*, *antidiabetic*, *anti-metrorrhagia*, *anthelmintic*, carminative, antispasmodic, laxative, antacid, cholagogue, antipyretic, vulnerary, anti-fatigue, detoxifying, anti-aging.	Anticancer (Jeong et al., 2006; Park et al., 2011), hepatoprotective, anti-inflammatory, antioxidant (Khan et al., 2017), immunostimulant (Tsuji et al., 2011), anti-allergic (Kono et al., 2018), hypouricemic (Yi et al., 2012), gastrointestinal regulator (Lee et al., 2017), antidiabetic (Shin et al., 2013), anti-osteoporosis (Yan et al., 2015), antimicrobial (Mitani et al., 2018), neuroprotective (Park et al.,2009; M.S. Kim et al., 2016), anti-fatigue (S. Kim et al., 2008).
Pyrus pyrifolia (Burm. f.) Nakai ROSACEAE China, Southeast Asia ***Li***, ***xue li***, *pera asiática*, *pera china*, *Asian pear*, *Chinese pear* Fresh fruits **[F157]** [X195] Canned juice **[F158]** Dehydrated fragmented fruits in packs **[X024]**	**F.** Raw or boiled fruits, for salads, sauces, and sweet-and-sour dishes, also preserved in syrup, wine, juices, and jams. **M.** *Antipyretic*, *detoxifying*, *anti-inflammatory*, *antitussive*, *antidiabetic*, *anti-constipation*, hypocholesterolemic, diuretic, astringent, anti-pharyngitis, hypotensive, antiseptic, antitumor.	Antioxidant, detoxifying, anti-hyperlipidemic, hepatoprotective, antidiabetic, anticancer, diuretic, anti-asthmatic, antimicrobial, anti-allergic, cardiovascular protective, anti-hypertensive, anti-inflammatory (James-Martin et al., 2015; G.H. Jiang et al., 2016; Baniwal and Hathan 2017), hypocholesterolemic (Choi et al., 2004), neuroprotective (Yoo and Yang, 2012).
Raphanus sativus L. var. ***longipinnatus*** L.H. Bailey BRASSICACEAE East and Southeast Asia ***Luo bo***, *daikon*, *rábano chino*, *Oriental radish* Fresh roots **[F160]** [F214] Pickled roots in packs **[X035]**	**F.** Raw or boiled roots as vegetables, for salads, soups, and various dishes. **M.** *Digestive*, *diuretic*, *antidiarrheal*, *antispasmodic*, *antihemorrhagic*, *antitussive*, *antidiabetic*, *antidermatosic*, depurative, anti-obsesity, antitumor, antiseptic.	Anticancer, diuretic, antinephritic, antihemorrhoidal, anti-gonorrheal, antisyphilitic, anti-obesity, antiviral, antimicrobial (Hu, 2005; Koyyati et al., 2016), antioxidant (Azuma et al., 1999), antidiabetic (Okada and Okada, 2015), vascular protective, anti-hypertensive, antithrombotic (Kuroda et al., 2018).
Saccharum officinarum L. POACEAE Southeast Asia, Pacific Islands ***Gan zhe***, *caña de azúcar*, *sugarcane*	**F.** Sap from stems as a refreshing beverage, and to make syrup, sugar or molasses. **M.** *Antidiabetic*, *detoxifying*, *anti-*	Antidiabetic, hypocholesterolemic, cardiovascular protective, diuretic, antioxidant, anti-inflammatory, antithrombotic, hepatoprotective, anticancer, analgesic (Gobinath et al., 2010; Pallavi et al., 2012; Bucio-Noble

Fragmented stems **[F192]**	*constipation*, *emollient*, *antitussive*, anti-fatigue, anti-icteric, immunostimulant, antipyretic, antioxidant, antitumor, antilitic, urinary antiseptic, antihemorrhagic.	et al., 2018), antimicrobial (Williams et al., 2016), anti-obesity, antimalarial, immunomodulatory (Akhtar et al., 2008; Miraj, 2016).
Schisandra chinensis (Turcz.) Baill. SCHISANDRACEAE East Asia ***Wu wei zi***, *eschizandra*, *magnolia berry* Dried fruits in packs **[RF59]** [P208] Fruits and honey for infusions **[B056]** Capsules (mixture) [H323]	**F**. Fresh or dried ripe fruits for desserts, like raisins, and beverages, also pickled and fermented in wine. **M**. *Astringent (pulmonary and intestinal)*, *nephroprotective*, *anti-asthmatic*, *antitussive*, *anti-dyspnea*, *tonic*, *anti-fatigue (physical and mental)*, *antidiarrheal*, *anti-sudorific*, *anti-spermatorrhoea*, *sedative*, *anti-insomnia*, anti-hepatitis, anticefalalgic, antiemetic, anxiolytic, aphrodisiac: premature ejaculation, impotence.	Anticancer, antioxidant, antiviral, antimicrobial, immunomodulatory, anti-allergic, anti- inflammatory, cardiovascular protective,cognitive enhancer: memory and learning, anxiolytic, sedative, anti-insomnia, antidepressant, neuroprotective, anti-asthmatic, antitussive, expectorant, anti-ophthalmic, antidermatosic, antidiarrheal, antidiabetic, adaptogen, sexual enhancer: erectile dysfunction, gastroprotective,uterotonic, anti-obesity, hypocholesterolemic, hepatoprotective, detoxifying (Hurrell et al., 2015a,b; Puentes, 2016; Hurrell and Puentes, 2017; Szopa et al., 2017).
Solanum melongena L. SOLANACEAE India, China, Burma ***Qie zi***, *berenjena*, *eggplant* Fresh ovoid or rounded fruits (black, white, purple) **[B057]** [F172] [F173] [F174] Fragmented dried fruits **[H21]** ['Serpentinum'Group] Fresh long and thin fruits: *Chinese eggplant* **[F194]**	**F**. Boiled, grilled, steamed, fried, roasted or pickledfruits,for soups, purées, stewed with other vegetables, meat or fish and various dishes. **M**. *Depurative*, *carminative*, *antihemorrhoidal*, *antipyretic*, *analgesic*, *anti-inflammatory*, *anti-asthmatic*, antidisenteric, digestive, hypotensive, anti-obesity,antianemic, vulnerary, antirheumatic, antidiabetic, cholagogue, antiseptic, anti-insomnia, antitumor, diuretic, mnemonic.	Antioxidant, anti-inflammatory, analgesic, hypocholesterolemic, hypolipidemic, neuroprotective, cardioprotective, hypotensive, antithrombotic, anti-ophthalmic, immunomodulatory, antimicrobial, anti-asthmatic, antidiabetic, anti-obesity (Das and Barua, 2013; Gürbüz et al., 2018), anticancer (Friedman, 2015), osteoblastic, anti-osteoporosis (Casati et al., 2018), antiviral (Di Sotto et al., 2018), anti-amnestic (Manasa and Raju, 2014).
Syzygium samarangense (Blume) Merr. & L.M. Perry MYRTACEAE China, Southeast Asia, New Guinea ***Yang pu tao***, *manzana de Java*, *Java apple*, *jambu samarang*, *wax jambu* Fresh fruits **[F177]**	**F**. Fresh fruits preserved in sauces, jams, syrups, juice, liqueurs, and wine. **M**. *Anti-inflammatory*, *anti-amnestic*, *anti-scurvy*, *anticatarrhal*, *antiseptic*, *antispasmodic*, *antipyretic*, *antidiabetic*, digestive, diuretic, antitumor, astringent, antidiarrheal, anti-constipation, hypotensive, hypocholesterolemic, carminative, antitussive, slimming.	Anticancer, anti-inflammatory, spasmolytic, anti-hyperglycemic, antidiabetic, hypotriglyceridemic, hepatoprotective, analgesic, neuroprotective, cognitive enhancer: memory and learning (Lim, 2012a; Shen and Chang, 2013; Shen et al., 2013; Zhang et al., 2016), antidiarrheal (Ghayur et al., 2006), antioxidant, antimicrobial (Simirgiotis et al., 2008; Khandaker et al., 2015).
Vigna angularis (Willd.) Ohwi & H. Ohashi LEGUMINOSAE Himalayas, China, Japan ***Chi xiao dou***, ***hong dou***, *aduki*, *poroto adzuki*, *adzuki bean* Dried seeds **[X022]** Dried seeds in packs **[H450]** [BH15] [H060] Canned anko **[X027]**	**F**. Boiled seeds like beans for various dishes, often with rice. A seed paste boiled with sugar (called *anko*) is used for desserts, in confectionery and pastry products. **M**. *Diuretic*, *detoxifying*, *anti-edema*, *anti-stranguria*, *antidisenteric*, *anti-icteric*, *anti-inflammatory*, antitumor, hypocholesterolemic, antidiabetic, slimming.	Antioxidant, anti-inflammatory, hypotensive, hypocholesterolemic, hepatoprotective, anticancer, anti-obesity, antidiabetic, antinephritic, anti-arthritic, anti-osteoporosis, antibacterial, immunomodulatory (Hurrell et al., 2016; Sato et al., 2016; Liu et al., 2017).
Vigna radiata (L.) R. Wilczek LEGUMINOSAE India, Sri Lanka, Pakistan, China, Southeast Asia, Africa ***Lu dou***, *poroto mung*, *mung bean* Dried seeds **[H451]** [H059] Dried seeds in packs **[X032]** "Cellophane" noodles **[R081]** Sprouted seeds (*soybean sprouts*) in packs **[X029]** [R080]	**F**. Boiled seeds for soups, sauces, snacks, ice cream, bread, biscuits, and noodles, also fried with meat or vegetables. Sprouted seeds are sold as *soybean sprouts*. **M**. *Diuretic*, *antidiarrheal*, *anti-inflammatory*, *detoxifying*, *antidiabetic*, antispasmodic, digestive, carminative, laxative, antitumor, hypocholesterolemic, antioxidant.	Antioxidant, cardioprotective, hypotensive, anti-inflammatory, anti-arthritic, neuroprotective, anticancer, hypocholesterolemic, hepatoprotective, antimicrobial, immunomodulatory, antidiabetic, carminative (Hurrell et al., 2016; Hashiguchi et al., 2017; Lopes et al., 2018).
Vigna unguiculata (L.) Walp subsp. ***unguiculata*** LEGUMINOSAE Africa and Warm Asia ***Jiang dou***, *caupi*, *poroto tape*, *black-eyed bean*, *goat pea*	**F**. Boiled, steamed, fried or fermented seeds, for soups, porridges, purées, stews, and various dishes. Sprouted seeds for salads. **M**. *Diuretic*, *antidiarrheal*, *anti-leukorrhea*, *anti-spermatorrhoea*,	Antioxidant, neuroprotective, anti-inflammatory, hypolipidemic, hypocholesterolemic, anti-atherosclerosis,anticancer, antidiabetic, antimicrobial, antiviral, anthelmintic, analgesic, hypotensive, cardiovascular protective, thrombolytic, anti-icteric, anti-constipation, anti-anorexy, anticonvulsant, anxiolytic,

Dried seeds **[H452]** [H017] Dried seeds in packs **[X033]**	*analgesic*, *antigonorreic*, *antidiabetic*, antihemorrhoidal, hypocholesterolemic, antianemic, anthelmintic, galactogogue, sedative, anti-insomnia, anxiolytic, antioxidant.	menstrual disorders (Hurrell et al.,2016; Aduema et al., 2017; Ibrahim Sayeed et al., 2017; Jayathilake et al., 2018).
Zingiber officinale Roscoe ZINGIBERACEAE India, China, Southeast Asia ***Jiang***, ***gan jiang***, *jengibre*, *ginger* Fresh rhizomes **[X013]** [R079] Fresh rhizomes in packs **[X037]** Fragmented dried rhizomes in packs **[X010]** Powdered rhizomes in packs **[X009]** [C053] Fragmented glazed rhizomes [R098] Pickled fragmented rhizomes in packs **[X036]** Rhizomes and honey for infusions **[B058]** Rhizomes powder (beverage) **[X026]** Capsules (mixture) [P170] Tablets [R151]	**F**. Raw, boiled, fried, pickled, stir-fried, dried and powdered rhizomes (more aromatic), as spice and mixtures of spices (Chinese five-spice powder), for salads, curries, chutneys, sauces, snacks, and various dishes, also pastries, candies, icecreams, syrups, beverages (*ginger ale*, *ginger beer*), liqueurs and cocktails. **M**. *Expectorant*, *antitussive*, *anti-dyspnea*, *antiemetic*, *antipyretic*, *antihemorrhagic*, *analgesic*, antispasmodic, anti-inflammatory, antirheumatic, carminative, digestive, anti-flu, antimalarial, antioxidant, antidiabetic, cardiovascular protective, hypotensive, antidermatosic, antitumor, sedative, anti-stress, slimming, aphrodisiac: impotence.	Adaptogen, cognitive enhancer: memory and learning, anxiolytic, antidepressant, anticonvulsant, sedative, neuroprotective (Hurrell et al., 2015a; Choi et al., 2018), hypolipidemic, anti-dyslipidemic, hypocholesterolemic (Hurrell et al., 2015b), nephroprotector (Al Hroob et al., 2018), antidiabetic (Zhu et al., 2018), anticancer (Zheng et al., 2016), antitussive (Gairola et al., 2010), anti-inflammatory (Ezzat et al., 2018), cardiovascular protective (Rastogi et al., 2017), analgesic (Wilson, 2015), anti-obesity (Ebrahimzadeh Attari et al., 2018), antirheumatic (Srivastava and Mustafa, 1992), antimicrobial, antioxidant (Ghasemzadeh et al., 2018), hypotensive (Torabi et al., 2017), male and female anti-infertility (Hosseini et al., 2016; Yilmaz et al., 2018), sexual enhancer: erectile dysfunction (Alhowiriny et al., 2013).
Ziziphus jujube Mill. RHAMNACEAE China ***Hong zao***, ***da zao***, *azufaifo*, *dátil chino*, *jujuba*, *Chinese date*, *jujube* Dried fruits in packs **[H453]** Fruitspowder (beverage) **[X002]** Fruits and honey for infusions **[B059]**	**F**. Raw and cooked fruits for jams, jellies, sauces, soups, juices, cakes, puddings, bread, also dried as dates. **M**. *Tonic*, *anti-fatigue*, *sedative*, *anti-insomnia*, *anti-anorexy*, *antidiarrheal*, *hypotensive*, *antianemic*, *depurative*, *anti-allergic*,diuretic, expectorant, anti-dyspnea, anti-bronchitis, antidote, laxative, gastrointestinal protective, anti-constipation, hepatic, hypocholesterolemic, antipyretic, anxiolytic, mnemonic, slimming, anti-aging, aphrodisiac: impotence.	Antioxidant, anti-inflammatory, immunostimulant, antinephritic, anticancer, anti-dyslipidemic, gastroprotective, anti-constipation, antidiarrheal, hepatoprotective, antidiabetic, anti-obesity, analgesic, hypotensive, hematopoietic, anti-allergic, antimicrobial, antiviral, anti-fatigue,cognitive enhancer: memory and learning, sedative, anti-insomnia, anxiolytic, anticonvulsant, antidepressant, contraceptive, sexual enhancer: erectile dysfunction (Mahajan and Chopda, 2009; J.Chen et al., 2017, Hurrell and Puentes, 2017; Ji et al., 2017; Mesaik et al., 2018).

1. Plants and plant products

The total of 52 species registered corresponds to 24 botanical families (Figure 1). These species correspond to vegetables, legumes, fruits, and condiments that are locally recognized as functional foods. Of the 52 treated taxa, 29 (55.77%) corresponds to vegetables and legumes: *Allium fistulosum, A. schoenoprasum, A. tuberosum, Apium graveolens* 'Secalinum' Group, *Arctium lappa, Benincasa hispida, Brassica juncea, B. oleracea* var. *albiflora, B. rapa* var. *chinensis*, *B. rapa* var. *glabra, Coix lacryma-jobi, Colocasia esculenta, Cucumis melo* 'Makuwa' Group, *Dioscorea japonica, Glycine max, Ipomoea aquatica, Lablab purpureus, Lactuca sativa* var. *angustata* 'Asparagina' Group, *Luffa aegyptiaca, Momordica charantia, Nelumbo nucifera, Perilla frutescens, Phyllostachys bambusoides, P. edulis, Raphanus sativus* var. *longipinnatus, Solanum melongena, Vigna angularis, V. radiata, V. unguiculata* subsp. *unguiculata*.

Fruits correspond to 15 taxa that represent 28.85% of the total: *Averrhoa carambola, Citrus japonica, C. maxima, C. medica, C. × microcarpa, Dimocarpus longan, Diospyros kaki, Litchi chinensis, Lycium barbarum, Nephelium lappaceum, Prunus mume, Pyrus pyrifolia, Schisandra chinensis, Syzygium samarangense,*

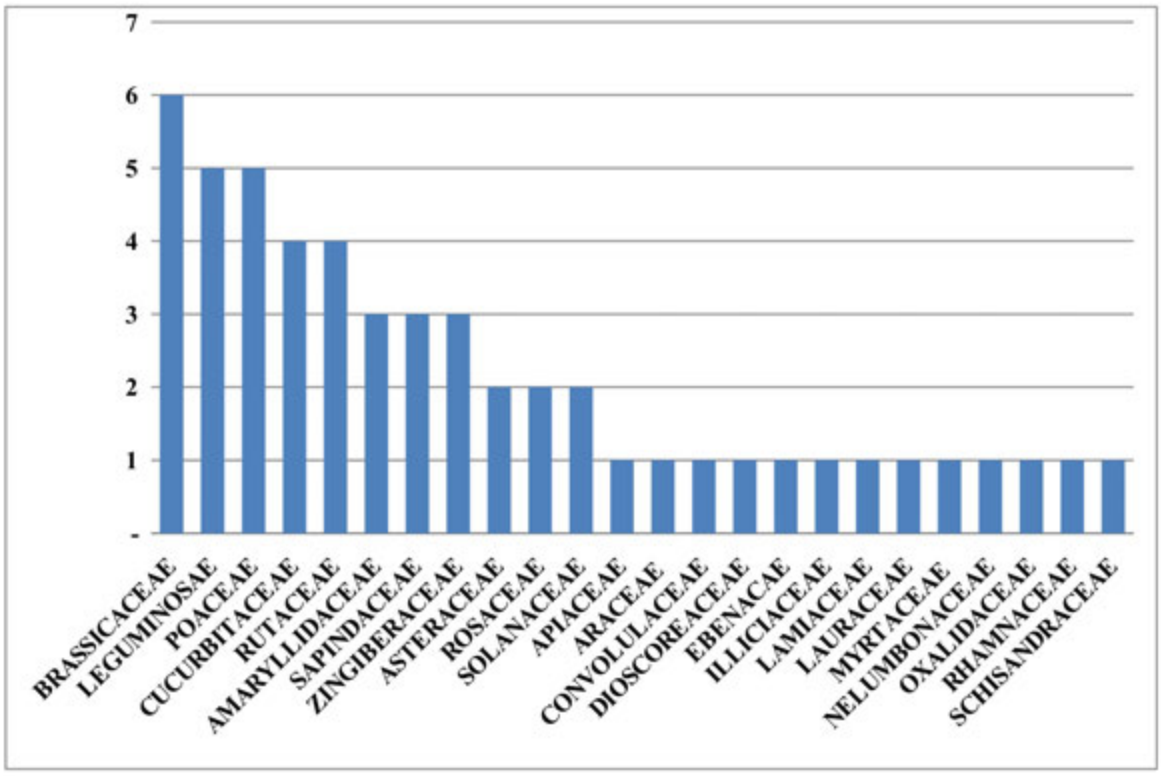

Figure 1. Number of species per botanical families.

Ziziphus jujuba. Last, condiments and flavorings correspond to 8 taxa, 15.38% of the total: *Armoracia rusticana, Cinnamomum cassia, Curcuma longa, Cymbopogon citratus, Illicium verum, Kaempferia galanga, Saccharum officinarum, Zingiber officinale.* It is important to note that some species considered as vegetables are as well use as a condiment, e.g., *Allium* species, *Brassica juncea, Perilla frutescens*, and some *Citrus* species.

The plant products commercialized by Chinese immigrants are very diverse. Fresh plants and its parts (like leaves, culms, underground organs, and fruits) proceed from orchards (locally called "quintas"), as affirming the interviewed people of Barrio Chino supermarkets. The orchards are located in periurban areas of the Buenos Aires-La Plata Metropolitan Area, mainly in the sector known as “green belt” or “horticultural belt”, near La Plata district. The presence alone of these Chinese crops represents an increase in the metropolitan area agro-biodiversity. In addition, cultivation allows maintaining the knowledge associated with the plants uses (Medeiros et al., 2012). This subject will be a reason for a future contribution. On the other hand, packaged plant products, including fruits and vegetables preserved in syrup, jams, juices and other beverages, also pickled, dried or powdered, are imported from China or other countries. The diversity of products and its associated knowledge represent an increase in local biocultural diversity.

2. Therapeutic uses

Table 1 also shows that the locally assigned uses mainly correspond with the biological activity and effects studied. In part, this correspondence is due to the dissemination of scientific knowledge

through the Internet, which is part of the locally assigned uses construction, what is reflected in the sales arguments of many products (e.g., "The effect of this product is scientifically proven..."). On the other hand, knowledge linked to Chinese tradition is also spread by the Internet as arguments for sale (e.g., “The benefits of this ancestral product....”). Besides, the Traditional Chinese Phytotherapy as a millenary practice has been an important source of research for the Western science, as show the extensive literature on the subject mentioned before (e.g. Adams and Lien, 2013). With some few exceptions, the academic use categories equal or exceed the locally assigned use categories (Figure 2).

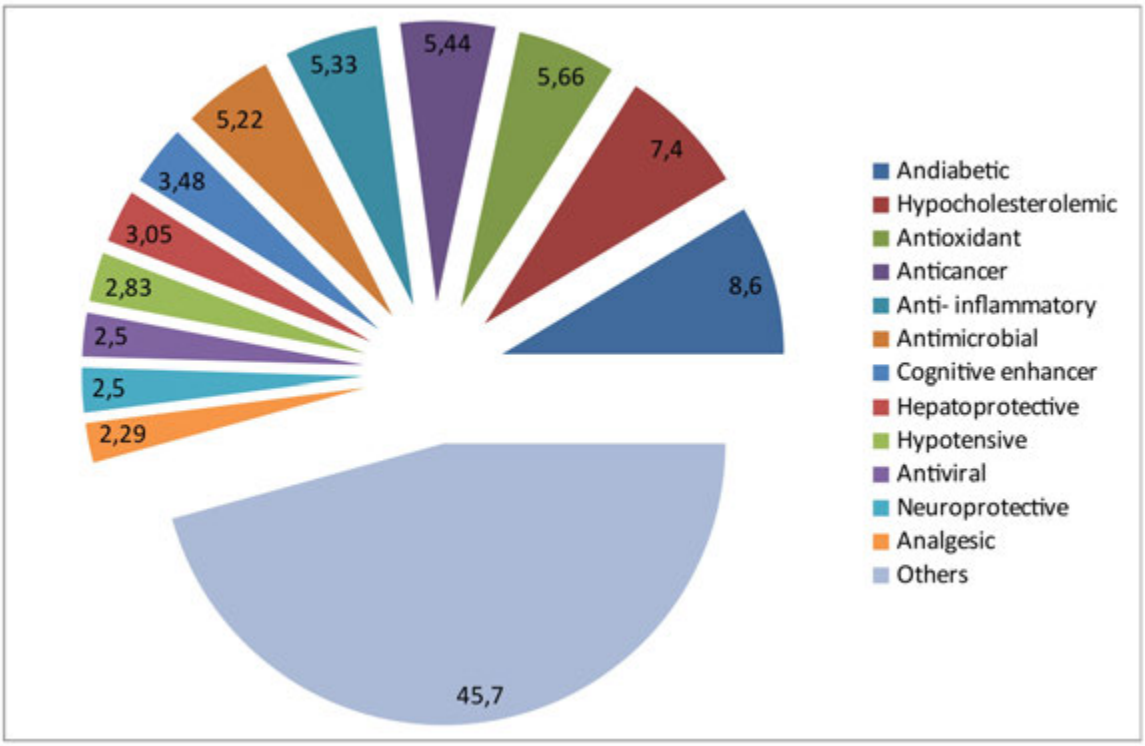

Figure 2. Biological activity and evaluated effects within the academic context.

The relevance of some local uses categories (hypocholesterolemic, anxiolytic, antidepressant, sexual enhancer, among others), reflect the need to respond to health representative problems of the urban lifestyle (Puentes, 2017). In this frame, the academic use categories disseminated by the media (associated with the nontraditional knowledge) guide the selective strategies of plant products by the local urban consumers.

3. Species visibility

Of the total of 52 treated species, 30 (57.69%) are exclusive of the trade circuit of Barrio Chino, i.e., the species are invisible for most of the local inhabitants: *Allium tuberosum, Apium graveolens* ‘Secalinum’ Group, *Armoracia rusticana, Benincasa hispida, Brassica juncea, B. oleracea* var. *albiflora, Cinnamomum cassia, Citrus maxima, C. medica, C.* × *microcarpa, Coix lacryma-jobi, Colocasia esculenta, Cucumis melo* ‘Makuwa’ Group, *Dimocarpus longan,*

Dioscorea japonica, Ipomoea aquatica, Kaempferia galanga, Lactuca sativa var. *angustata* 'Asparagina' Group, *Litchi chinensis, Luffa aegyptiaca, Momordica charantia, Nelumbo nucifera, Nephelium lappaceum, Perilla frutescens, Phyllostachys bambusoides, P. edulis, Prunus mume, Saccharum officinarum, Syzygium samarangense*, and *Ziziphus jujube* (Figure 3). Remaining 22 species (42.31%) have also products in the general commercial circuit, i.e., the species are visible: *Allium fistulosum, A. schoenoprasum, Arctium lappa, Averrhoa carambola, Brassica rapa* var. *chinensis, B. rapa* var. *glabra, Citrus japonica, Curcuma longa, Cymbopogon citratus, Diospyros kaki, Glycine max, Illicium verum, Lablab purpureus, Lycium barbarum, Pyrus pyrifolia, Raphanus sativus* var. *longipinnatus, Schisandra chinensis, Solanum melongena, Vigna angularis, V. radiata, V. unguiculata* subsp. *unguiculata,* and *Zingiber officinale*.

The species "visibility" is a continuum between two extremes: broadly visible (e.g., *Glycine max, Lycium barbarum, Zingiber officinale*) and scarcely visible (e.g., *Brassica rapa* var. *chinensis, B. rapa* var. *glabra, Lablab purpureus*). The case of broad visibility of *Lycium barbarum*, the "goji", is remarkable. Its presence was registered as a medicinal plant in the local "dietéticas" six years ago (Hurrell et al., 2013). Since then, its diffusion was very fast, mainly enhanced by the Internet.

Visibility is an attribute of the species, although some of its products are invisible. For example, *Arctium lappa* has exclusive (invisible) products from the Barrio Chino as a functional food and has therapeutic products (herbal materials, mother tinctures) disseminated in the dietéticas of the general commercial circuit (visible). *Curcuma longa* also has exclusive (invisible) products: the fresh rhizomes from the Barrio Chino, while dried or powdered rhizomes and extract in capsules (dietary supplement) are selling in the dietéticas of the general commercial circuit (visible). In both cases the uses linked to Chinese traditions remain invisible for the majority of local inhabitants; however, the species are visible for the study area context.

The distinction between invisible and visible species products for most of the local inhabitants is a conceptual distinction related to 1) the knowledge "linked to traditions" associated to products of invisible species (circulating in the restricted commercial circuit of Chinese immigrants); and 2) the "nontraditional" knowledge associated to products of visible species (circulating in the general commercial circuit).

The invisible/visible distinction is also a methodological tool, which deals with the study of the visualization process of invisible species that become visible (Hurrell, 2014; Hurrell and Pochettino, 2014; Puentes, 2017). For this contribution, 30 of the 52 taxa treated. This methodological tool also allows evaluating the dynamics of the local botanical knowledge because the visualization implies a contextual change in which the knowledge "linked to traditions" becomes "nontraditional".

CONCLUSIONS

The Ciudad Autónoma de Buenos Aires constitutes a pluricultural context defined by the coexistence of diverse segments of immigrants, as occurs in the great capitals of the world. In Buenos Aires city is remarkable the recent presence of Chinese immigrants who carry out commercial and cultural activities in a specific city sector called "Barrio Chino". In it, five great supermarkets introduce various plant products linked to

Figure 3. Examples of “invisible” species commercialized in the "Barrio Chino". A. *Brassica juncea*, Chinese mustard. B. *Ipomoea aquatica*, water spinach. C. *Lactuca sativa* var. *angustata* 'Asparagine', stem lettuce. D. *Dioscorea japonica*, Japanese yam. E. *Cucumis melo* 'Makuwa', Korean melon. F. *Momordica charantia*, bitter cucumber.

Chinese traditions. In this context, the ethnobotanical research included plants and plant products recognized as functional foods and nutraceutical. The supermarkets of Barrio Chino (restricted commercial circuit) and 120 health food stores (general commercial circuit) were surveyed, with the aim of evaluating the plant products visibility. In total, 52 taxa were found in the Barrio Chino, 30 of which are exclusive to this circuit, and 22 are also marketed in health food stores of the general commercial circuit.

The 52 taxa are represented by plant products that correspond to vegetables, legumes, fruits and condiments, all belonging to the Traditional Chinese Phytotherapy. Food and medicinal locally assigned uses and their biological activity and the studied effects were evaluated. The 30 exclusive taxa of the Barrio Chino are invisible for the majority of local inhabitants. The 22 taxa of both restricted and general trade circuits are visible for all the residents. The methodological tool that implies the distinction between invisible and visible taxa shows that invisible plant products may become visible by entering the general commercial circuit. In this sense, in addition to contributing to the knowledge of new species and their products introduced by Chinese immigrants (that increase the local biocultural diversity), this research contributes to the understanding of the dynamics of local botanical knowledge through the plant products circulation.

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