Emir. J. Food Agric. 2011. 23 (3): 222-236
http://ejfa.info/

Food and medicinal value of some forest species from Buenos Aires (Argentina)

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Abstract: To effectively use wild trees as food or active principles sources, we must to know their characteristics, as well as proper collection and preparation methods. In Argentina indigenous forest tree species provide goods and services such as firewood, fruits, timber, poles, fodder, environmental protection and amenities. The native forests of Buenos Aires province (Argentine) are strictly confined to the coastal strip of Río de la Plata (marginal forests and talares forests. Fig. 1) and to the Western region (caldén forests). Tree species found in the Talares and marginal forest include *Celtis tala (tala), Scutia buxifolia (coronillo), Jodina rhombifolia* (*sombra de toro*), *Schinus longifolius (molle), Sambucus australis (sauco), Erythrina crista galli, Sesbania punicea (acacia mansa), Phytolacca tetramera (ombusillo) and Parkinsonia acculeata* (*cina cina*), *Salix humboldtiana (sauce), Citharexylum montevidensis* (*espina de bañado*) between others. This species has different traditional and industry (medicinal, food, etc.) uses. There is little information on the biology and propagation systems of these native tree species. The different purposes they could be used for and the genetic variation between and within the species. This lack of knowledge could lead to irreversible loss of genetic diversity even before any study on variability and bioprospection is made. At the CEPROVE (Experimental Center of vegetative propagation, Faculty of Agronomy and Forestry, La Plata University) we are developing a germoplasm bank and research works in forest native species from "Talares" and marginal forest using several tools, including biotechnology. The final objective is domesticated and put under culture of wild trees to obtain different products.

Key words: vegetative propagation, bioprospecting, genetic conservation, indigenous trees, Talares.

القيمة الغذائية والطبية لبعض أصناف أشجار الغابات ببوينس آيرس (الأرجنتين)

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الملخص:لاستخدام الأشجار البرية كأغذية أو مصادر للعناصر النشطة بفعالية لابد من التعرف على خصائصها والطرق المثلى لجمعها وإعدادها. توفر أصناف أشجار الغابات المستوطنة في الأرجنتين العديد من السلع والخدمات (مثل الحطب والفواكه والأخشاب ، والحماية ، والعلف ووسائل الراحة). الغابات الأصلية في اقليم بوينس آيرس (الأرجنتين) توجد على الشريط الساحلي لريو دي لا بلاتا (الغابات الهامشية والغابات talares. والمنطقة الغربية (الغابات caldén). أنواع الأشجار في الغابات وTalares الهامشية تشمل *Celtis* تالا (تالا) ، *buxifolia Scutia* (coronillo)، *rhombifolia Jodina* (دي تورو sombra) ، شجرة الفلفل *longifolius* (رخوة) ، australis خمان ؛ بلسان (ساوكو) ، الحمرية عرف الديك ، *Sesbania punicea* (أكاسيا مانسا) ، *Phytolacca tetramera* (*ombusillo* وParkinsonia acculeata (سينا سينا) ، صفصاف *humboldtiana* (صلصة) ، *Citharexylum montevidensis* (إسبينا دي bañado). لهذه الأنواع المختلفة استخدامات تقليدية وصناعية (طبية، وغذاء ، الخ). تتوفر معلومات محدودة عن طبيعة هذه الأشجار وطرق تكاثرها.وكيفية استخداماتها المختلفة والاختلافات الجينية بين الأنواع المختلفة. عدم توفر المعلومات/ المعرفة قد يؤدي إلى فقد التنوع الوراثي نهائيا حتى قبل أي دراسة. يعمل مركز التكاثر الخضري ، كلية الهندسة الزراعية والغابات ، جامعة لا بلاتا (CEPROVE) على تطوير البنك الأصول الوراثية germoplasm والبحوث في الأنواع الحرجة المحلية من "Talares" الهامشية والغابات باستخدام العديد من الأدوات ، بما في ذلك التكنولوجيا الحيوية. الهدف النهائي استئناس الأشجار البرية لإنتاج منتجات مختلفة.

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Introduction

Millions of households in the developing world depend on food and fodder from forests to supplement their own and their livestock's diets. Although forest foods do not usually provide a complete diet, they do make a critical contribution to the food supply. Forest foods increase the nutritional quality of rural diets; supplement other sources of food -particularly agricultural crops that are only seasonally available; and are used as emergency food supplies during drought, famine and war (FAO, 1992). Forest foods are nutritionally important and are traditionally used as supplements to the staple diet. As well as making a direct contribution to health by improving nutrition, tree products provide the only medicines available to many people in developing countries. Some plants contain high concentrations of chemicals used as the base for modern drugs. Many plants are used traditionally for these medicinal qualities, and others undoubtedly depend on effects not yet exploited in medicine (FAO, 1992).

Edible and medicinal trees can provide healthy alternatives to highly processed foods and pharmaceuticals, bringing greater health into our lives. To effectively use wild trees, we must know their characteristics, as well as proper collection and preparation methods. In Argentina, indigenous forest trees species provide goods and services such as firewood, fruits, timber, poles, fodder, environmental protection and amenities. Argentina is situated in the Southern cone of the American continent, covers 3.761.274 km^2 and hosts approximately 32 million hectares of native forests. Buenos Aires province covers 308.000 km^2, at average latitude of 37-38º L.S in the neo-tropical region, and hosts about 1500 native plant species (Figure 1). Thirty six percent of the Buenos Aires province area is used for agricultural purposes, 53 percent for livestock rising, while 11 percent has no use, although it practically does not harbor any remaining pristine forests

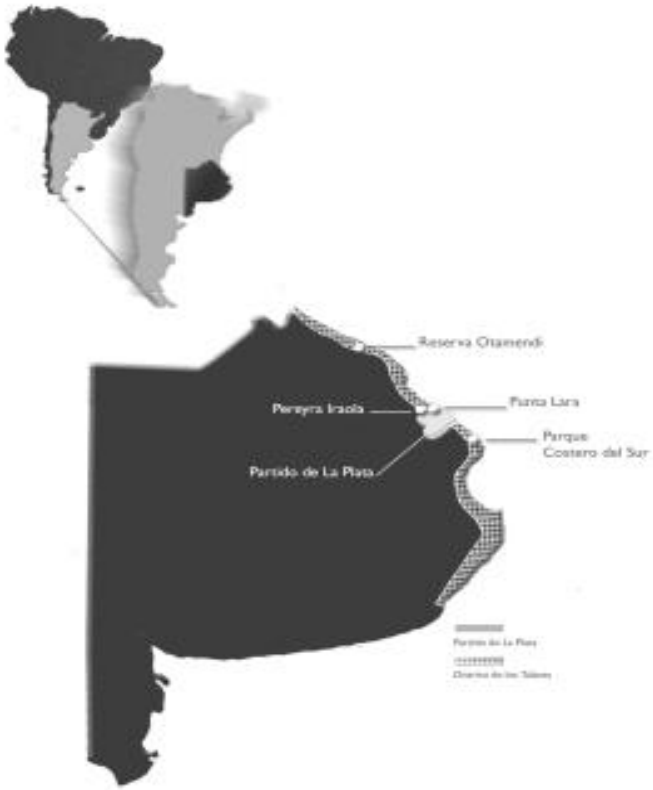

Figure 1. Location of natural forests (Talares) in Buenos Aires Province.

The native forests of Buenos Aires province are strictly confined to the coastal strip of Río de la Plata (marginal forests and tala forest) and to the Western region (caldén forests). Today, these relic woodlands are known as "Talares" and "Monte Blanco", respectively. In the Talares, the climax vegetation is represented by the dominant trees *Scutia buxifolia* and *Celtis tala* (Rivas et al., 2004). The current status of conservation shows that protection of Tala forest is considered a priority due to their high biodiversity and fragility. Tree species found in the Talares and marginal forest include *Celtis tala (tala), Scutia buxifolia (coronillo), Jodina rhombifolia (sombra de toro), Schinus longifolius (molle), Sambucus australis (sauco), Erythrina crista galli, Sesbania punicea (acacia mansa), Phytolacca tetramera (ombusillo) and Parkinsonia acculeata (cina cina), Salix humboldtiana (sauce), Citharexylum montevidensis (espina de bañado)* between others. This species has different traditional and industry (medicinal, food, etc.) uses. There is little information on the biology of these native tree species, the different purposes they could be used for and the genetic variation between and within the species. This lack of knowledge could lead to irreversible loss of genetic diversity even before any study on variability and active principles is made (Rivas et al., 2004). The bioprospecting, natural products characterization and implementation of in situ and ex situ conservation strategies for native trees are considered absolutely necessary. At the CEPROVE (Experimental Center of vegetative propagation, Faculty of Agronomy and Forestry, La Plata University) we are developing a germoplasm bank and research works in forest native species from "Talares" and marginal forest using several tools, including biotechnology (Abedini et al., 2000; Marinucci et al., 2004; Rivas et al., 2004).

The traditional uses, chemical constituents and description of some forest species from Buenos Aires (Argentina)

Native plant is a term to describe plants endemic (indigenous) or naturalized to a given area in geologic time. This includes plants that have developed, occur naturally, or existed for many years in an area (e.g. trees, flowers, grasses, and other plants). In Buenos Aires (Argentine) a plant is often deemed native if it was present before colonization. Some native trees from "Talares" have adapted to a very limited, unusual environments or very harsh climates or exceptional soil conditions. Although some types of trees for these reasons exist only within a very limited range (endemism), others can live in diverse areas or by adaptation to different surroundings (indigenous plant). Human communities, and particularly rural ones, possess environmental knowledge and beliefs that allow their survival through a particular management of natural resources and these facilitate their integration to natural surroundings (Trillo et al., 2010). This knowledge, defined as Traditional Knowledge (Berkes, 1999), is preserved and transmitted through generations and it includes the consumption of medicinal plants. Health care and maintenance are two of the main concerns for the people, independently of the particularities of the different cultures (García and Jiménez, 1986). Regarding this, in rural communities surrounding vegetation is the main source of resources, including medicinal products (Johns et al., 1990; Hanazaki et al., 2000; Hilgert and Gil, 2006; Weckerle et al., 2006). Many of these plants was used by Native Americans for seasoning foods and beverages and many others were adopted by European colonists, and are still being used today. A brief description of these species is listed below:

Celtis tala Gill. et Planchon. Family: Ulmáceae (Figure 2).

Description

Known as Tala, is a medium size deciduous tree, native to tropical and subtropical South America. With small to medium sized spines, it is one of the main components of the Gran Chaco prairies and certain areas of the Argentinean pampas. The tala tree sometimes reaches 12m high. According to water availability it may become arboreous or

shrubby. It prefers dry or slightly moist, well-drained soil. The trunk is rather tortuous, nearing 40cm in diameter. When shrubby, it produces several branched trunks of 20cm in diameter. Its birch is light colour, gray to brown. The Tala tends to branch abundantly, producing a dense mesh of branches in zigzag patterns, with strong spines in the foliar axis, 1, 5 or more, centimeters long. The leaves are alternate, peciolate and simple, their base rounded and the margin serrated in the apical region. Leaves are trinervate, acuminate, of a dark green colour. This tree flowers in spring, producing inconspicuous yellowish pentamerous flowers. Since it presents hermaphrodite flowers, it is self-fertile. Tala fruit is a small drupe, 1 cm wide that hangs in short clusters (Biloni, 1990).

Traditional use

It produces excellent wood fuel. It is appreciated by lumbers since its wood is tough and rather heavy. The tala rather small trunk allows only small carved objects be obtained. It is used in hand tool handles and small crafts. The“curanderos” [traditional healers] registered the use of tala’s leaves for diverse uses: diarrheal, intestinal anti-inflammatory and cholera (Fernandez Chiti, 2011). Though edible by humans there is no market or habit of consumption, the fruits are mostly part of birds and several insect species diets.

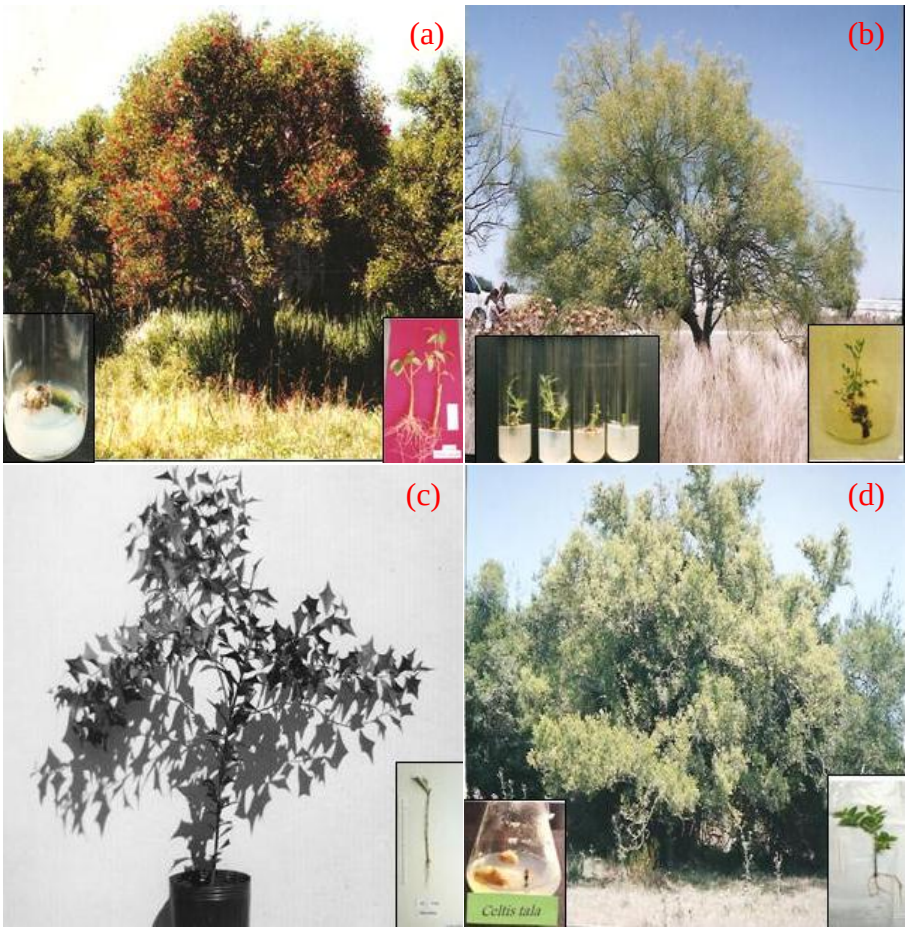

Figure 2. Trees, ecosystem and propagation. (a) *Erythrina crista galli* (b) *Parkinsonia accualeata* (c) *Jodina rhombifolia and (d) Celtis tala.*

Phytochemistry

There are few works in phytochemistry of tala. Some authors cited the presence of mucilage, flavonoids, calcium carbonate in cystoliths (Fernandez Honaine et al., 2005).

Sambucus australis Cham. et Schlecht. ("Sauco"). Family: Caprifoliaceae

Description

Known as "sauco", is an evergreen shrub, grows 2 to 3 m tall, to 5, stems erect, usually without branches, in large groups for an extended and perennial underground rhizome system. Leaves opposite pinnate, 15-30cm long, 5-9 leaflets with foul smell. The stems terminate in corymb 10 to 15cm in diameter with numerous white flowers. Toxic berry fruits, black, small, globose.

Phytochemistry

Flavonoids (rutin, isoquercetina, eldrin), essential oils, mucilage, pectin, tannins, glycosides (sambunigrina), chlorogenic acid, caffeic, citric, malic, tartaric, alkaloids (sambucina), reducing sugars, vitamins A and C Hill, triterpenes, antocianosídeos (crisantemina, sambucianina) as major active compounds. http://www.bonde.com.br/ saude/ sauded.php?id=38LINKCHMdt=20060717]

Traditional uses

It is widely used as a culinary dye. It is used in folk medicine due to their different properties, including decongestants and purgative. It is also used in treatment of coughs, colds and bronchial disorders, in cases of epilepsy, sore throat and inflammation of the vision. The leaves are applied to heal wounds. It is used in cases of rubella, and it also has disinfectant properties. http:// www. guayubira. org.uy/monte/Ciedur7iv.html

Jodina rhombifolia (Hook. & Arn.) Reissek in C. Martius. Family: Santaláceae (Figure 2).

Description

Known as "sombra de toro", it is a small tree or large shrub, elegant, evergreen, up to 5 m hight, spiny, persistent foliage, glossy dark green, simple leaves, rhombic or rhomboidal, with each of the three free vertices is topped by a strong spine, alternative. It has tiny flowers, herbs, apetalous, greenish yellow, stellate, 4-7mm long, shortly pedicellate, in axillary clusters in low numbers. It fruits in spring, the fruits are red.

Phytochemistry

Notwithstanding the wide utilization in different regions of South America, chemical and pharmacological studies of *Jodina rhombifolia* are rather scarce. Extract of its leaves revealed the presence of C-glycosyl flavonoids, extract of its aerial parts revealed the presence of vicenin-2 and C-glycosyl flavonoids as vitexin, orientin and swertisin (Montanha et al., 2009).

Traditional uses

It is a medicinal plant popularly used as an anti-ulcer medicine. An explanation of the prevalence of digestive uses can be searched in the high consumption of fat and alcohol, typical of the rural people of western Argentina. Used mainly by men specifically for the treatment of alcoholism. The hydro ethanol extract inhibit the ulcer formation, their extracts presented similar ranitidine activity (Montanha et al., 2009). Its aerial parts are employed in folk medicine, mainly for the treatment of respiratory disorders and externally to heal skin ulcers and other skin diseases as rash, carcinoma or nasal polyps (D'avila, 1910; Correa, 1969; Simoes et al., 1998).

Phytolacca tetramera Hauman "ombusillo" Family: Phytolaccaceae

Description

It is a shrubby species and endemic in the province of Buenos Aires. The specie has subspatulate juvenile leaves, the rest are ellipsoidal, apex obtuse at base, slightly longer on the petiole, coriaceous or subcrasas, 4 to 15cm long by 2 to 8cm wide. The stem is underground, with numerous cataphylls and buds. Stem arising lot of aerial axes of approximately 2m high. The flowers are unisexual and tetramers. The inflorescences are simple racemes, erect, up the terminal and the remaining axillaries or terminal on lateral branches. The fruits are berries depressed, and the seeds are black, endocarp attached to it. Aerial axes densely foliated and disappear in the fall after fruiting.

Phytochemistry

It is a source of active components and fungicides (Escalante, 2002) and it could also be the source of antiviral, antitumor and bactericidal compounds (Abedini et al., 1997). Monodesmoside saponins (B, E and F phytolaccosides) have been found in the methanolic extracts of its berries, and the first and second of them have shown antifungal activity in the presence of opportunistic fungi which are pathogenic for human beings. These compounds were established as: phytolaccosides: B [3-O-beta-D-xylopiranosyl-phytolaccagenin] E [3-O-beta-D-glucopyranosyl-(1-)4)-beta-D-xylopiranosyl-phytolaccagenin]. and F [3-O-alpha-L-ramnopiranosil-(1 -) 2)-beta-D-glucopyranosyl-(1 -) 2)-beta-D-xylopyranosyl phytolaccagenic acid]. The three belong to the Olean type triterpenoid saponins with 28 to 30 dicarboxilic groups and an olefinic double bond at C- 12 (Escalante, 2002).

Traditional uses

The saponines are characterized by their properties of hemolyzing, surfactants, foaming agents, emulsifiers, irritate the mucous membranes and they produce intestinal relaxation. Thus they are used as a diuretic and urinary tract disinfectant (Chifa and Ricciardi, 1998).

Salix humboldtiana "sauce criollo", sauce colorado, sauce amargo, sauce chileno, treique, cheique, reique, huayao (from wayaw quechua language). Family: Salicaceae

Description

Tree 15-20m tall, in age, the short trunk possibly reaching 1m in diameter; treetop rounded and deciduos. Leaves are light green, alternate, petiolate and simple; linear lanceolate, no hair, from 3 to 10cm length, 0,5 a 1,5cm width, dentate serrate leaf shape. Flowers in pendulous catkins. Male flowers with 2 to many stamens filaments filiform, free or united; to connate; anthers 2(or 4) -loculed, dehiscing longitudinally. Female flowers with 1 pistil sessile; ovary superior, 1- or 2-loculed; ovules several to many, anatropous, with a 1 integument. Brownish capsule dehiscing by 2-4 (or 5) valves. Cottony seeds 4 to numerous.

Phytochemistry

The different parts of the plant contain salicin (Líate and Hurrell, 1994).

Traditional uses

The bark is used in folk medicine as a quinine substitute (it contains glucosides). The decoction of this bark is used "against intermittent fever" (rubber). The bark is bitter and has febrifugal, tonic, sedative and spasmodic properties. It is also astringent (Líate and Hurrell, 1994).

Erythrina crista-galli ceibo. Family: Fabaceae (Figure 3).

Description

It is a small tree, the girth of its trunk measuring upto 50cm (20 in). Normally it grows 5–8m (16–26ft.) tall. The root is a taproot with nodules produced by nitrogen fixing bacteria. The tree's trunk is woody with irregular, spiny branches. The red flower, arranged in inflorescences of the raceme type, is pentameric, complete, and of bilateral symmetry. Its calyx is gamosepalous, like a little red thimble. The corolla, like that of other legumes like common beans, is butterfly-shaped; however, the largest petal, called the "standard", is arranged in the lower part. The two of the petals called "wings" are so small that they are practically hidden within the calyx. The remaining two petals partially fuse together on occasion and form the flower's keel or "carina"; this protects its reproductive organs. The flowers are rich in nectar and get visited by insects, which usually have to crawl underneath the carina and thus pollinate the flowers. The tree's fruit is monocarpic and dry, of the legume type, and no more than a few centimeters in length. The chestnut-brown seeds are cylindrical in form and are arranged sparsely throughout the seedpod's interior. The seed germ contains hypogeous cotyledons - the seeds stay underground upon germination.

Phytochemistry

It contains mellein, nectriapyrone, 4-hydroxymellein, scyoalone, tyrosol, clavatol, mevinic acid, and mevalonolactone.

Traditional uses

It has several important pharmacological uses. It is an astringent and a sedative to heal wounds (3% of bark decoction). It is anti-hemorrhoidal and used for vaginal lavage in candidiasis cases (bark). It is disinfectant and deodorant, it has cicatrizing properties and it is ahemostatic, emollient for colds, coughs, catarrh, bronchitis and asthmatic pains (the leaves are smoked in a pipe or rolled up like a cigar). It has narcotic, sedative and hypnotic properties: this is attributed to the most inner part of the bark when it is used in an infusion (it contains several alkaloids). This plant is also used for muscular and rheumatic pains (a balm prepared with its bark and flowers in 70% of alcohol). The leaves are used as antihemorrhoidal for external use and they are antiseptic and astringent. (Redko, 2010) http://www.docstoc.com/docs/26590578/Ficha-de-Plantas-Medicinales-Autóctonas

The wood contains an alkaloid with powerful narcotic and purgative effects used as anti-inflammatory and for treatment of wounds. It is used like insecticide, fish poison, medicine, and sleep aid. The tender shoots of the stem is used as food.

Cytharexylum montevidense (Spreng.) Mold "Tarumá" Espina de bañado". Family: Verbenaceae

Description

It is a tree that reaches 8m high (rarely 12m), spiny, globular glass. Persistent foliage, dark green, twigs runs, and two spines per node. Leaves simples, opposite, elliptic to obovate, toothed or entire, 5-11cm long, apex acute, base cuneate, petiole 9-12mm long. Flowers in spikes, cylindrical, tubular, yellow, very fragrant, blooming in spring. Drupe fruit red, spherical, 7-9mm in diameter, bears fruit in autumn.

Phytochemistry

Its fruit is used for respiratory diseases and the infusion made with its bark, as a diuretic. Several iridoid and lignan glucosides (Balazsa et al., 2002) have been isolated from the fruits of other *Cytharexylum* species (caudatosides A-F (2-7), 5-deoxypulchelloside, 7 - - O – O-de lamiide acetate, lamiide, lamiidoside, duranterectoside C, 8–Epiloganin and (+)-lyonirenisol– glucopyranoside). Extracts from this type of plants have been used for the treatment of schistosomiasis (Manal et al., 2004). No reports on the *Cytharexylum montevidense* species research have been found; therefore it is important to make progress in understanding its reproductive biology and the analysis of active principles.

Traditional uses

C. montevidense is cultivated in parks and squares. Its fruit is used for respiratory diseases and the infusion made with its bark, as a diuretic. Although it is a valuable species for its wood and its ornamental role, it also has a promising use as a medicinal species.

Scutia buxifolia Reiss. -"Coronillo." Family: Rhamnaceae

Description

It is a corpulent, spinous and a persistent dark green foliage tree that reaches a maximum height of 6m and usually grows on river banks and sierras in Uruguay, Southern Brazil and Argentina. The leaves are oval, simple and with entire or slightly dentate edges, 2-4cm long. The spines, opposite and decussate, have roughly the same size. Flowers appear small, jaundice greenish that can be appraised in primrose. The fruit measures of 3 to 5mm of diameter, it is drupaceous and globes, and it appears a dark color when it reaches the maturity. The light to reddish brown wood is hard, strong and exceptionally durable which makes it particularly appreciated as firewood. This species is characterized by a very slow growth – 2mm a year – which implies that specimens with a 20cm wide trunk are about 100 years old. As a combination of this trait and intensive logging, *Scutia* trees might become extinct in Argentina and Uruguay shortly, unless strict conservation laws are applied.

Biochemistry

The isolation and characterization of several cyclopeptide alkaloids with 14-membered rings (scutianines A,B, C, D and E)

from the methanolic extract of the bark of *Scutia buxifolia* has been described in previous publications (Morel et al., 1998, 2005). New components, the peptide alkaloid 3,4,28-tris-epi-scutiaene E, 28-epi-scutianene E and scutianene L , was isolated later (Maldaner et al., 2011).

Traditional uses

Their spines are used in decoction to treat arrhythmias. Its wood lasts and heavy, is very appreciated by its high caloric power. Its roots are used like purifying tonic. Their leaves and crust have tension and diuretics properties. It is forage for bird species.

Schinus longifolius. (Lindl.) Speg "incienso molle". Family: Anacardiaceae

Description

Dioecious tree, sometimes evergreen shrub 2-5m tall (exceptionally 8m) and 3m in diameter, branched near the base. Trunk is grayish brown, tortuous, 2-4dm, terminal branches are transformed into spines (ending in a spine). Leaves simple, alternate or clustered, coriaceous, glabrous, base cuneate, apex acute to obtuse, petiole minimum of 3-5mm long, entire or with lobes or teeth, especially in young leaves, dark green beam, clear back verdosao and inconspicuous ribs, 2-7cm x 0.5 to 1.6cm, highly polymorphic, lanceolate to oblong. Flowers whitish yellow, 4-5mm in diameter in clusters of 1 cm long, 4-5 sepals and petals (male with 10 stamens, 5 more than the others, the female with staminodes and 3 styles).

Phytochemistry

Its active principles are tannins and oleoresins (Arrillaga de Maffei, 1969).

Traditional uses

It is an extremely tough and rustic species. It is an ornamental plant that has medicinal uses. The resin found in its stem is used as a laxative and for antirheumatic purposes. Its bark is used for hysteria and antitussive lung diseases. Its decoction is used as an astringent and the hot infusion of its bark for bronchitis, cough and asthma. (Arrillaga de Maffei, 1969) (http://www.guayubira.org.uy/monte/Ciedur7iv.html).

Parkinsonia aculeata L. Jerusalem thorn. Family: Fabaceae (Figure 2).

Description

It is a small, spiny tree 4-10m high, with a short and often crooked trunk up to 40cm in diameter, often branching near the ground with a very open crown of spreading branches and very thin drooping foliage; green throughout the year, although appears leafless after leaflets fall; bark of trunk, branches and twigs smooth, yellow-green or blue-green and slightly bitter; twigs slender, slightly zigzag, finely hairy when young, often with spines, 3 or 1 remaining at nodes, including 2 short spines. Leaves specialized, alternate, bipinnately compound, consisting of very short axis ending in spine 1-2cm long, and 1 or 2 pairs of long, yellow-green drooping side axes, strips or streamers 20-30cm long and 3mm broad, flat and slightly thickened; each strip with 20-30 pairs of thin, oblong, green, small leaflets 3-5mm long, which shed early; strips resembling a blade of grass continue functioning as leaves after leaflets fall. Flower clusters 7.5-20cm long at leaf bases, unbranched; flowers several on long, slender stalks, irregular and slightly pea shaped, fragrant, showy, golden yellow, 2cm or more across; calyx a short tube with 5 narrow yellow-brown lobes turned back; corolla of 5 nearly round petals 10-13mm long, yellow tinged with orange and hairy at base; upper petal slightly larger, red spotted and turning with withering; 10 green stamens with brown anthers; reddish tinged pistil with hairy, 1-celled ovary and slender style. Pods nearly cylindrical, 5-10cm long, 6mm or more in diameter, narrowed between seeds, long pointed; seeds 1-5, beanlike, oblong, 1cm long, dark brown; flowers and pods all year.

Phytochemistry

Alkaloids, flavonoids, tannins, steroids, and reducing sugars are present. Deciduous stems and roots contain saponins, peroxidases and bitter principles.

Traditional uses

The edible fruit pulp is sweet (up to 60% sugar). Its seeds have in the past been used in Mexico for food. Fodder: Foliage and pods are browsed by livestock. Young branches are

lopped to feed goats and sheep. The large, fragrant, golden yellow flowers easily attract bees. Fuel: Sapwood yellowish and thick, and heartwood light or reddish-brown; wood moderately hard and heavy (specific gravity 0.6), fine textured, brittle; burns well and is used for firewood and charcoal. The heavy timber (833 kg/m³) is generally too small for sawn applications but finds use as light poles and posts. Leaves have been reported in Paraguay as toxic, at times containing hydrocyanic acid. Leaf, fruit and stem decoctions are taken orally to treat fever, malaria and as an abortifacient. Flower and leaf extractions in alcohol are applied as a poultice to treat rheumatism. The crust with sugar and lemon is used for cough. It has great value for livestock for their protein content. Used as wood, honey, medicines and ornamental. From the ethnobotanical point of view, leaves are used like infusion, and their medicinal properties are considered diaphoretic, antipyretic, antiepileptic and abortive (Burkart, 1952, Ratera and Ratera, 1980, Boeri and Abedini, 1997). Verettoni (1985) argues that the flowers and seeds are used to relieve intermittent fevers that the young branches and leaves are used to relieve the dysmenorrhea. According to Hieronymus (1882), leaves, flowers and seeds are febrifuge and sweat infusion, malaria and restorative, the bark and leaves are used to fatten the nursery. The Toba (ethnic group of the Gran Chaco, Argentina and Paraguay) use the decoction of the leaves as antirheumatic (Martinez-Crovetto, 1964). The infusion of young branches have emenagogas properties and flowers and seeds are used for the treatment intermittent fever the raw and cooked seeds are rich in proteins.

Sesbania punicea. Red sesbania, Coffee weed, Rattle-pod, Sesban, Red seine bean, Brazil rattlebox, Coffee of the coast, tame acacia, False poinciana. Family: Fabaceae

Description

It is a woody shrub that can grow up to 15 feet in height. The bark is covered with lenticels and is gray to reddish brown in color. Leaves are alternate, compound, 5 to 7 inches long. There are 7 to 16 pairs of small, oppositely arranged, elliptical 1 inch long leaflets. The fruit and flowers of rattlebox are characteristic of those in the legume family. Flowers are ½ to 1 inch long, are orange-red in color, and hang in clusters. Seed pods are 3 to 4 inches long and dark brown with longitudinal wings. There are 3 to 9 seeds per pod and make a rattling sound when shaken.

Phytochemistry

Contains tannins, essential oils and sesbanimide. Leaf fodder for livestock, edible flowers, and leaves are also cooked as a vegetable.

Traditional uses

Leaves, flowers and seeds are all known to be poisonous. Used as ornamental, source of fuelwood, fibre and pulpwood extraction. The flowers are used as aromaticas. The bark is used in infusion and as an astringent to treat diarrhea in washing heridas. The decoction is used as active emetico. *Sesbania punicea* is widely used as an ornamental plant for its attractive compound leaves, bright red flowers and persistent winged fruit. As with many invasive ornamentals, rattlebox has found its way out of cultivation and into natural areas. It favors moist, wet environments and is often found along river banks and wetlands. *Sesbania punicea* is native from South America. All parts of *Sesbania* are poisonous, particularly the seeds.

Prosopis alba (Griseb)"Algarrobo","Algarrobo Blanco", "Ibope", "Igope","árbol blanco" Family: Mimosaceae

Description

It is a tree 5–15m tall. It has a short trunk possibly reaching 1 m in diameter; treetop rounded; branchlets drooping; spines scarce and small, only on strong shoots, 2–4cm long, geminate. Leaves are large, uni- to trijugate, glabrous; petiole (including the rachis) 0.5– cm long; pinnae 6–14cm long, with 25 to 50 pairs of leaflets, these linear, acute or subacute, in some forms nearly obtuse, 0.5–1.7cm long x 1–2mm broad, scarcely nerved below, approximate, 1.5–6mm between pairs.

Racemes spikelike as in similar species, 7–11cm long; florets greenish-white to yellowish, small; calyx 1 mm long, puberulous; corolla 3–3.2mm; stamens 4.5mm; pistil 5mm long. Legume falcate to ring-shaped, linear, compresses with parallel margins, straw-yellow, stipitate and acuminate, 12–25cm long x 11–20mm broad x 4–5mm thick, with 12 to 30 subquadrate endocarp segments broader than long, ca 0.6 x 1cm (Burkart, 1976).

Phytochemistry

Per 100 g, the pericarp only (of *P. alba* and *P. velutina*) is reported to contain 4g H_2O, 10g protein, 40g sugar, and 19g fiber. "Patay" is the sweet floury paste of the pods, ground up and dried, serving as the basis for many popular Argentine dishes. Patay contains 9.6% water, 6.7% ash, 43.9% sugar, 10.4% starch, 5.9% cellulose (we need it), 4.3% protein, 1.2% fats, and 3.5% pentosans. While it is high in calories, the patay is deficient in certain proteins, vitamin A, C, and D (Burkart, 1943). Like *P. chilensis*, this species contains apigenin 8-glucoside, apigenin 6-glucoside, quercitin 3-glucoside, quercitin 3-rhamnoside, quercitin 3-rutinoside, and traces of myricetin 3-rhamnoside, luteolin, kaempferol-3-OMe quercetin, and quercitin 3-OMe (Simpson, 1977). Pipecolic and 4-hydroxy pipecolic acid also occur in both, but varying concentrations of pipecolic acid and proline are interpreted as reflecting a plastic response to changing environmental conditions. The consistent patterns of flavonoid distributions in several species groups, on the other hand, apparently reflects genetic fixation independent of known environmental factors (Simpson, 1977). Pods contain ca 7–11% protein, 25–28% sugar (Simpson, l977; Burkart, 1943).

Traditional uses

Burkart (1943) describes several beverages made from the fruits, including a coffee substitute made from toasted pods. A very important tree in arid lands, similar in value to *Prosopis chilensis*, *P. nigra*, or *P. pallida*. In northeastern Argentina, native people frequently call it "el arbol", the tree, because of its usefulness and abundance. It is cultivated to a limited extent. In the Chaco it furnishes timber of high value for construction, doors, pre-manufactured houses, etc. Trees with straight trunks 8 to 10m occur, but these are becoming extremely rare, from being cut in preference to the other shorter ones. Thus a negative, artificial selection is taking place, which should be counteracted by genetic up-building of the best lines in experimental plots (Burkart, 1976). Streets of Buenos Aires are lined with these trees in the belief that they subdue vehicular noises (Burkart, 1943). The fruit is milled into baking flour for human consumption. Though it is difficult to work, the wood is used for flooring, paving blocks, shoe lasts, and wine casks. Sawdust, like the fruits is used for tanning. It has been reported that it is astringent, lithontriptic, and tonic. The white algarrobo is a folk remedy for ophthalmia. The “quemadillo” obtained from stems, is adds to many medicines. Leaves are mixed with ashes and put into water overnight. This preparation is used for stomach ache (Scarpa, 2002).

Conclusions and future prospects

A Germoplasm Bank of native tree species

The Faculty of Agricultural and Forestry Sciences of La Plata National University proposed the creation of a Germoplasm Bank for the conservation of native forest genetic resources from Buenos Aires (Figure 3).

To implement this initiative, the active involvement of concerned agencies (including the Environmental Policy Secretariat of the Buenos Aires Province, and the Experimental Centre of Vegetative Propagation (C.E.Pro.Ve.) of the Faculty of Agricultural and Forestry Sciences) was obtained. The Centre works in plant propagation since 1983, mainly with forestry species, through conventional methods (macro propagation, seed technology) and biotechnology. The project was declared a provincial level project; it is supported by the Secretariat of Natural Resources and Sustainable Development. Since 1999, data on target species are collected in a number of natural areas, including the “Talares” ecosystem.

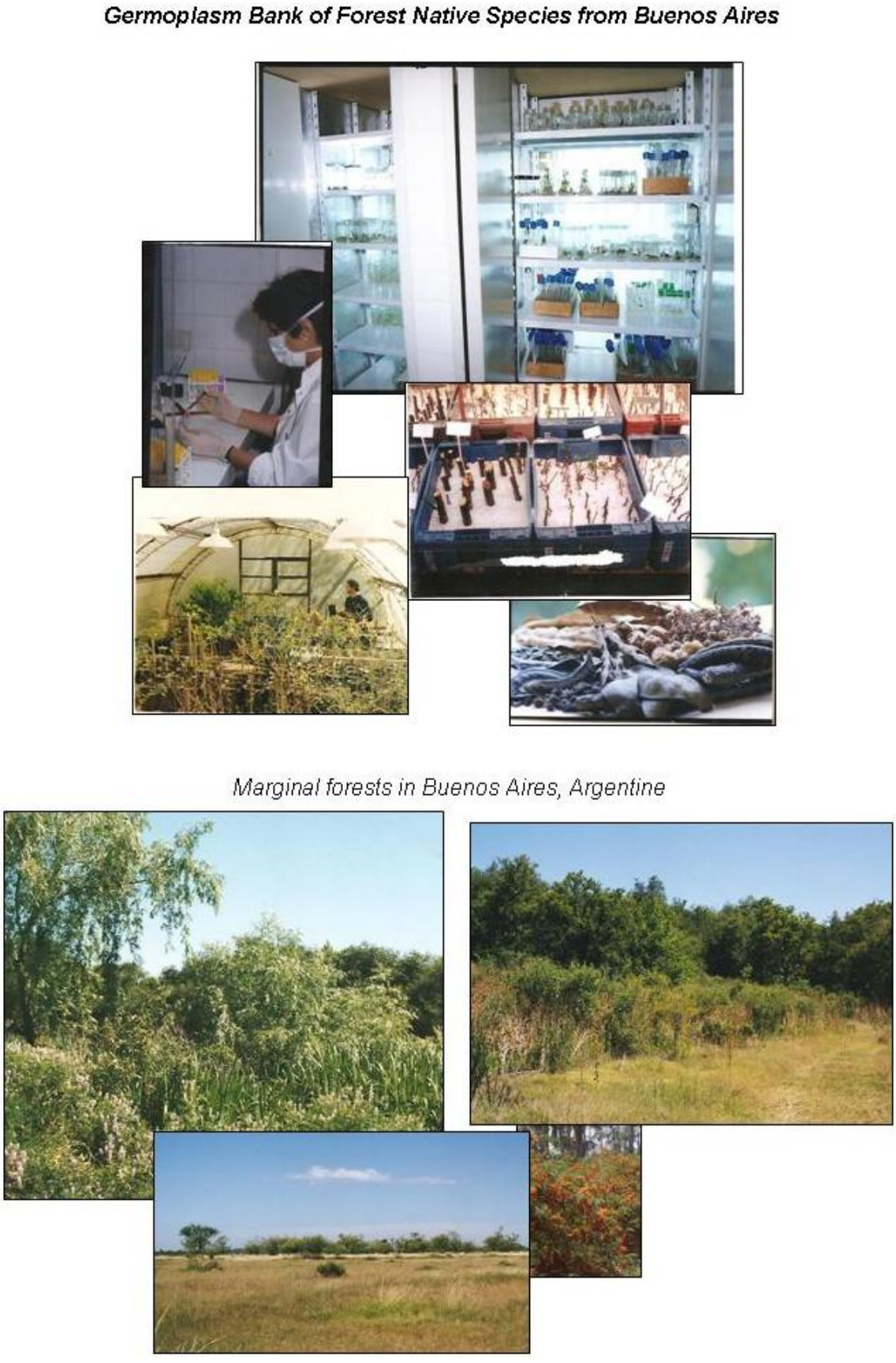
Germoplasm Bank of Forest Native Species from Buenos Aires
Marginal forests in Buenos Aires, Argentine

Figure 3.

Trees and seed-producing stands have been selected and marked, while material has been collected for the herbarium. Most of the samplings are used to develop the propagation protocols and analyze the seeds. On the other hand, we work together with other SILAE labs (LABRAM; CEPROCOR) in a continuing search for biologically active natural products from this native forest (bioprospecting). In recent years, bioprospecting has grown into an important business. Genetic engineering depends on natural genetic material as the raw material from which to design and manufacture new pharmaceutical products and crops. The rich but relatively unknown diversity of Buenos Aires forest systems in particular has attracted a lot of attention as a likely source of potentially valuable genetic material. Bioprospecting can bolster both economic and conservation goals while underpinning the medical and agricultural advance needed to combat disease and sustain growing human population.

As mentioned above, the forest resources in the Northeastern region of Buenos Aires province are under significant threats and require urgent action to halt the perceived loss of forest genetic resources. In spite of the on-going destruction of the native forests, the National University of La Plata and the provincial government of Buenos Aires have started a unique ex situ germplasm conservation programme of native forest species. According to FAO (2000) sources, "Even where parts of the natural forest are lost to agriculture, the genetic loss will depend on the extent of fragmentation of the remaining forest - if it has been broken into small islands, species may be in small groups and therefore could fall below critical mass and eventually disappear.

A global conservation strategy for threatened forest species or those considered of heritage interest therefore requires first and foremost good knowledge of the ecology and the biology of species - a requirement that is seldom met. Maximum attention must be paid to endemic species because of their uniqueness and their limited range, and also to marginal populations. However, maintenance of the adaptive capacities of species through the pressure of selection by necessity requires in situ conservation encompassing dynamic management of the forest landscape. In the province of Buenos Aires (Argentina) there is native xerophilic ecosystems, which are a very important source of new and unique active principles as well as future source of food and ambient support. This Native plants that are under stress from the changing climate and development, must be studied.

References

Abedini, W., C. Rivas and S. Sharry, (En prensa) Estrategias biotecnológicas aplicadas a la conservación de especies forestales nativas bonaerenses. Serie Informe. CICPBA.

Abedini, W. I., P. Boeri, S. Galarco, L. Huergo, S. Lede, L. Marinucci, M. Rivas, M. Ruscitti, and S. Sharry. 1997. Vegetative propagation of native forest species in order to restore degradated ecosystems. International Simposium on Biotechnology of Tropical and Subtropical Species. Australia. Queensland. Brisbane Parkroyal.

Abedini, W. P. Boeri, L. Marinucci, M. Ruscitti and L. Scelzo. 2000. Biotécnicas aplicada a especies forestales nativas. INIA 9(1):31-43.

Arturi, M. 1997. Regeneración de *Celtis tala Gill* ex Planch en el NO de la Provincia de Buenos Aires. Doctorate thesis. Fac. de Cs. Agrarias y Forestales. UNLP.

Arturi, M. F. 2006. Talares Bonaerenses y su conservación. Fundaciòn de Historia Natural Fèlix de Azara.

Arrillaga de Maffei, B. R. 1969. Plantas Medicinales. Montevideo, Nuestra Tierra. Colección Nuestra Tierra n° 31.

Balazsa, B., G. Tothab, H. Duddeckc and S. M. Soliman. 2002. Irinoid and lignan glycosides from *Citharexylum spinosum* L. J. Nat. Prod. 65(11):1621-6.

Berkes, F. 1999. Sacred Ecology: Traditional ecological knowledge and resource management. USA: Taylor & Francis pp. 3-16.

Biavatti, M., V. Marensi, S. N. Leite and A. Reis. 2007. Ethnopharmacognostic survey on botanical compendia for potential cosmeceutic species from Atlantic Forest. Rev. Bras. Farmacogn. 17:640-653.

Biloni José Santos. 1990. Árboles autóctonos argentinos, Buenos Aires: Tipográfica Editora Argentina. ISBN 9505210698.

Burkart, A. 1943. Las leguminosas Argentinas. Acme Agency. Buenos Aires.

Burkart, A. 1952. Las leguminosas Argentinas (silvestres y cultivadas). ACME, 2° Edicion. 569 pág.

Burkart, A. 1976. A monograph of the genus *Prosopis* (Leguminosae subfam. Mimosoideae). J. Arn. Arb. 57(3/4):219–249.

Cabrera, A. and A. Wilkins. 1980. Biogeography of Latin America, Series of Biology Monograph No. 13, Secretaría General de la Organización de los Estados Americanos Programa Regional de Desarrollo Científico y Tecnológico, Washington, DC, 122 pp (ISBN 0-8270-1233-0; in Spanish.

Cabrera, A. L. and E. M. Zardini. 1978. Manual de la flora de los alrededores de buenos aires. 2da Edición. Buenos Aires: ACME.

Chifa, C. and A. Ricciardi. 1998. Estudio fitoquimico de órganos activos en plantas del Chaco argentino: Saponinas. Actas Reunión de Comunicaciones Científicas y Tecnológicas de la UNNE. Volumen 4, pp.117.

Corrêa, M. P. 1969. Dicionário das Plantas Úteis do Brasil e das Exóticas Cultivadas VI. Rio de Janeiro: Instituto Brasileiro de Desenvolvimento Florestal.

D'Avila, M. C. 1910. Da Flora Medicinal do Rio Grande do Sul. Porto Alegre, 155p. Dissertação da cadeira de Historia Natural Medica - Faculdade de Medicina e Pharmacia, Universidade Federal do Rio Grande de Sul.

El Nuevo Libro del Árbol, 1997. Tomo ll. Ed. El Ateneo. “Sauce criollo” pp.104-105.

El nuevo libro del árbol. Tomo I. Ed. El Ateneo. 1997.

Hauenstein, E. 2005. New distribution range limits of Salix humboldtiana willd., salicaceae, in chile. Facultad de Ciencias, Universidad Católica de Temuco, Chile. Ayana Bot. 62(1):44-46.

Escalante, A. M., O. C. Santecchia, S. N. Lòpez, M. A. Gattuso, A. Gutierrez Ravelo, F. Delle Monache, M. Gonzalez Sierra and S. A. Zacchino. 2002. Isolation of antifungal saponins from *Phytolacca tetrámera*, an Argentinean species in critic risk. J. Etnopharmacol. 82(1):29-34.

Fernández Chiti, J. 2011. Hierbas y plantas curativas. Ed. Condorhuasi. 384 p. ISBN 978-987-1372-02.

Fernandez Honaine, M., Z. Alejandro Fabian and L. Osterrieth Margarita 2005. Silica biomineralizations in *Celtis tala* (Celtidaceae). Bol. Soc. Argent. Bot. 40(3-4):229-239.

Forest, Trees and Food. 1992. Food and Agriculture Organization of the United Nations.

García, S. P. and D. Jiménez. 1986. Natural and magic: cold and hot. Actual classification sistems of litoral argentine criollos. Suplemento Antropológico. Universidad Católica, Asunción. Paraguay, Concentratión 21(1):133-45.

Gattuso, M., G, Rodríguez, C. Santecchia, S. López, E. Martínez and S. Zacchino. 1998. Estudios in Vitro actividad antifúngica de Rizomas y frutos de Phytolacca tetrámera Hauman. VI Simposio Argentino de Farmacobotánica. Posadas. p.25.

Gonzalez Sierra, M., O. A. Mascaretti, V. M. Merkuza, E. L. Tosti, E. A. Ruveda and C. J. Chang. 1974. Peptide alkaloids of *Scutia buxifolia*. Phytochemistry 13(12):2865-2869.

Goya, J. K., L. Placci, M. Arturi and D. Brown. 1992. Distribution and structural characteristics of “Los Talares” of the Biosphere Reserve “Parque Costero del Sur”, Revista de la Facultad de Agronomía, La Plata 68:53–64 (in Spanish, with English abstract).

Hanazaki, N., J. Y. Tamashiro, H. Leitao-Filho, A. Begossi. 2000. Diversity of plant uses in two Caiçara communities from the Atlantic Forest coast, Brazil. Biodivers. Conserv. 9:597-615.

Hernández, M. P., W. L. Abedini, G. Delucchi. 1997. Estrategias para la conservación de *Phytolacca tetrámera* Hauman (Phytolaccaceae); especie endémica de la provincia de Buenos Aires. Libro de resúmenes de las Jornadas de Comunicaciones Científicas de la Facultad de Ciencias Naturales y Museo de La Plata (UNLP) Buenos Aires.

Hieronymus, J. 1882. Plantae diaphoricae florae argentinae. Bot. Acad. Nac. Cs. Córdoba 4. Argentina.

Hilgert, N. and G. Gil. 2006. Plants of the Las Yungas Biosphere Reserve, Northwest of Argentina, used in health care. Biodivers. Conserv. 15:2565-94.

Johns, T., J. O. Kokwaro and E. K. Kimanani. 1990. Herbal remedies of the luo of Siaya District, Kenya: establishing quantitative criteria for consensus. Econ. Bot. 44:369-81.

Líate Héctor Blas and Hurrell Julio Alberto. 1994. Flora arbórea de la Isla Martín García nativa y naturalizada. Reserva Natural y Cultural. Provincia de Buenos Aires. República Argentina. Directores: ISSN 0325-1225. Serie informe Nº 47. 27-229.

Liotta, J. 1999. Pautas generales para un sistema de áreas protegidas del NE bonaerense. Convenio Secretaría de Política Ambiental-UNLP.

Maldaner, G., P. Marangon, V. Ilha, M. Balparda, R. A. Burrow, I. I. Dalcol and A. F. Morela. 2011. Cyclopeptide alkaloids from *Scutia buxifolia* Reiss. Phytochemistry 72(8): 804-809.

Manal, A., H. F. Aly, S. A. Aly and Maghraby. 2004. Prophylactic effect of *Pulicaria crispa* and *Citharexylum quadrangylar* Jacq. extracts on some liver enzymes representing different metabolic pathways in *Schistosoma mansoni* infectedmic E304, BioScience - Poster Abstracts.

Marinucci, L. M. Ruscitti and W. Abedini. 2004. Morfogénesis in vitro de leguminosas forestales nativas de la República Argentina. Revista de la Facultad de Agronomía, 105(2):27-36.

Martínez-Crovetto, R. 1964. Estudios etnobotanicos I. Nombres de plantas y su utilidad según los indios tobas del Este del Chaco. Bonplandia, I(4):279.

Martínez Crovetto, R. 1981. Plantas utilizadas en medicina en el NO de Corrientes. Fundaciòn Miguel Lillo. Micelànea 69:1-135.

Menezes, A. S., M. A. Mostardeiro, N. Zanatta and A. F. Morel. 1995. Scutianine-J, a cyclopeptidic alkaloid isolated from *Scutia buxifolia*. Phytochemistry 38(3):783-786.

Montanha, J. A., E. Schenkel, A. Cardoso-Taketa, A. Dresch, A. Langeloh and E. Dallegrave. 2009. Chemical and anti-ulcer evaluation of *Jodina rhombifolia* (Hook. & Arn.) Reissek extracts. Revista Barasileira de Farmacognosia, vol. 19 nº1.

Morel, A. F., E. C. S. Machado, J. J. Moreira, A. S. Menezes, M. A. Mostardeiro, N. Zanatta and L. A. Wessjohann. 1998. Cyclopeptide alkaloids of *Scutia buxifolia*, Phytochemistry 47(1):125-129.

Painting, K., M. Perry, R. Denning and W. Ayad 1993. Guía para la documentación de recursos genéticos. Consejo Internacional de Recursos Fitogenéticos, Rome.

Parodi, L. 1939. Los bosques naturales de la Provincia de Buenos Aires. Ac. Nac. de Ciencias Exactas y Naturales de Buenos Aires. Argentina.

Ratera, E. and M. Ratera. 1980. Plantas de la flora argentina empleadas en medicina popular. Buenos Aires. Hemisferio Sur (eds.).

Redko Flavia 2010. Ficha de Plantas Medicinales Autóctonas. Cátedra de Farmacognosia. Facultad de Farmacia y Bioquímica. UBA. Buenos Aires. http://www.docstoc.com/docs/26590578/Ficha-de-Plantas-Medicinales-Aut?ctonas/

Rivas, C., W. Abedini and S. Sharry. 2004. Propagación y conservación de recursos genéticos forestales en la Provincia de Buenos Aires, Argentina. Rev. Recursos Genéticos Forestales Nro. 31. Italia. FAO.ISSN 1020-444X.

SAGP&A. 1998. Primer Inventario Nacional de Bosques Nativos-Sumario-Argentina.

Sánchez, R., J. A. Ferrer, O. A. Duymovich and M. A. Hurtado. 1976. Integral study of the soils from the Parties of Magdalena and Brandsen (Province of Buenos Aires), Anales del LEMIT (Ministerio de Obras Públicas de la Provincia de Buenos Aires) Serie II No. 310:1–123.

Scarpa, G. 2002. Plantas empleadas contra trastornos digestivos en la medicina tradicional criolla del chaco noroccidental. Instituto de Botánica Darwinion. Dominguezia 18(1):36-50.

Simões, C. M. O., L. A. Mentz, E. P. Schenkel, B. E. Irgang and J. R. Stehmann. 1998. Plantas da Medicina Popular no Rio Grande do Sul. 5a ed. Porto Alegre: Editora da Universidade.

Simpson, B. B. 1977. Mesquite, its biology in two desert scrub ecosystems. Dowden, Hutchinson & Ross, Inc. Stroudsburg, P.

Trillo, C., B. A. Toledo, L. Galetto and S. Colantonio. 2010. Persistence of the use of medicinal plants in rural communities of the Western Arid Chaco [Córdoba, Argentina]. The Open Comp. Med. J. 2:80-89.

Verettoni, H. 1985. Contribucion al conocimiento de las plantas medicinales de la region de Bahia Blanca. Universidad Nacional del Sur. Argentina.

Weckerle, S. C., F. K. Huber, Y. Yongping and S. Weibang. 2006. Plant knowledge of the Shuhi in the hengduan mountains, Sothwest China. Econ. Bot. 60:3-23.

Internet Sources:

http://www.hort.purdue.edu/newcrop/duke_energy/Prosopis_alba.html#*Description*

http://www.fao.org/docrep/006/ad314s/AD314S01.htm#ch1.3

http://www.bonde.com.br/saude/sauded.php?id=38LINKCHMdt=20060717]

http://www.guayubira.org.uy/monte/Ciedur7iv.html

http//www.tusplantasmedicinales.com