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BASIN, SALTA, ARGENTINA

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Reprinted from HASELTONIA
Yearbook of the Cactus and Succulent Society of America
No. 9, 2002
Made in United States of America

THE UTILIZATION OF CACTI IN THE UPPER RÍO BERMEJO BASIN, SALTA, ARGENTINA

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Summary. We summarize the ethnobotany of seven species of Cactaceae used in the rural communities of the upper basin of the Río Bermejo in Argentina. We also analyze this plant family in the Yungas biogeographic environment. Mentioned or described are the common names, the parts of the plants used, the different ways of preparation, and the assigned use for each. The most important uses of these cacti are related to food and medicine.

Introduction

The Río Bermejo is located on the western slope of the Cordillera Oriental, close to the Bolivian border, in the north of Salta Province, Argentina (Fig.1). The area has a wide altitudinal gradient ranging from 400 to 3800 m above sea level. According to Brown (1995), this region has the highest biodiversity levels and rural population numbers in the Montane Cloud Forest of Argentina.

From a biogeographic point of view, the upper basin of the Río Bermejo has two biomes. The first is the Neotropical Region, or Amazonian Domain, which includes the lowlands up to approximately 2600 m above sea level and corresponds to Yungas Province. This biome can be divided into three environmental units: Submontane Subtropical Forest, Montane Moist Forest and Temperate Cloud Forest (which includes Foggy Grassland) (Cabrera, 1976). The second biome is the Andean-Patagonian Domain, which includes the high mountains up to the summit; it is represented by an ecotone between the High Andean Province and Puna Province (Fig. 2). Cabrera (1976), Hueck (1978) and Brown et al. (1985) give additional data on the floristic composition and structure of these formations. The climate is tropical continental with hot rainy summers and cold dry winters; mean annual temperatures range from 14° to 26.5° C with orographic rains (those that occur by condensation of humidity in the high mountains) concentrated between September and March and ranging from 700 to 1400 mm yearly (Bianchi & Yañez, 1992).

The studied communities are considered part of the Andean cultural world. The inhabitants of these settlements are "criollos";

they speak only Spanish, although many Quechuan expressions are found in their speech. In the past, they migrated periodically, moving with their grazing cattle, and maintained an annual cycle of activities in which they moved among the three described altitudinal zones. Because of living in different environments, the people knew a great variety of useful plant species. At present some people have maintained this lifestyle with few changes, whereas others have abandoned their migratory life and have established sedentary communities in the former intermediate zone (Reboratti, 1996; Hilgert, 2000).

A brief analysis of the regional economy shows the coexistence of shifting agriculture, migration, gathering, nomadic cattle breeding, hunting and fishing, and finally, access to paid work in temporary or permanent jobs.

The variety of traditional plants used in the diet is diminishing because new species coming from other regions are being adopted. With respect to the importance of gathering wild plants for food, the majority of the species gathered do not contribute significantly to the family diet. Gathering as an activity is important in that it is related to other aspects of social life, such as medicine, building, tools, cooking and textile work (Hilgert, 1999). Taking into account the importance of cactus species for local medicine, we include a brief description of this use (see also Hilgert, 2001). The inhabitants of the region practice traditional medicine, and therefore the underlying notion of the origin of a disease is very important for determining diagnosis and treatment. Diseases are attributed to one of three sources: natural, sociocultural, and supernatural. The diseases of natural origin are usually treated within a family context. The "hot and cold theory" in local

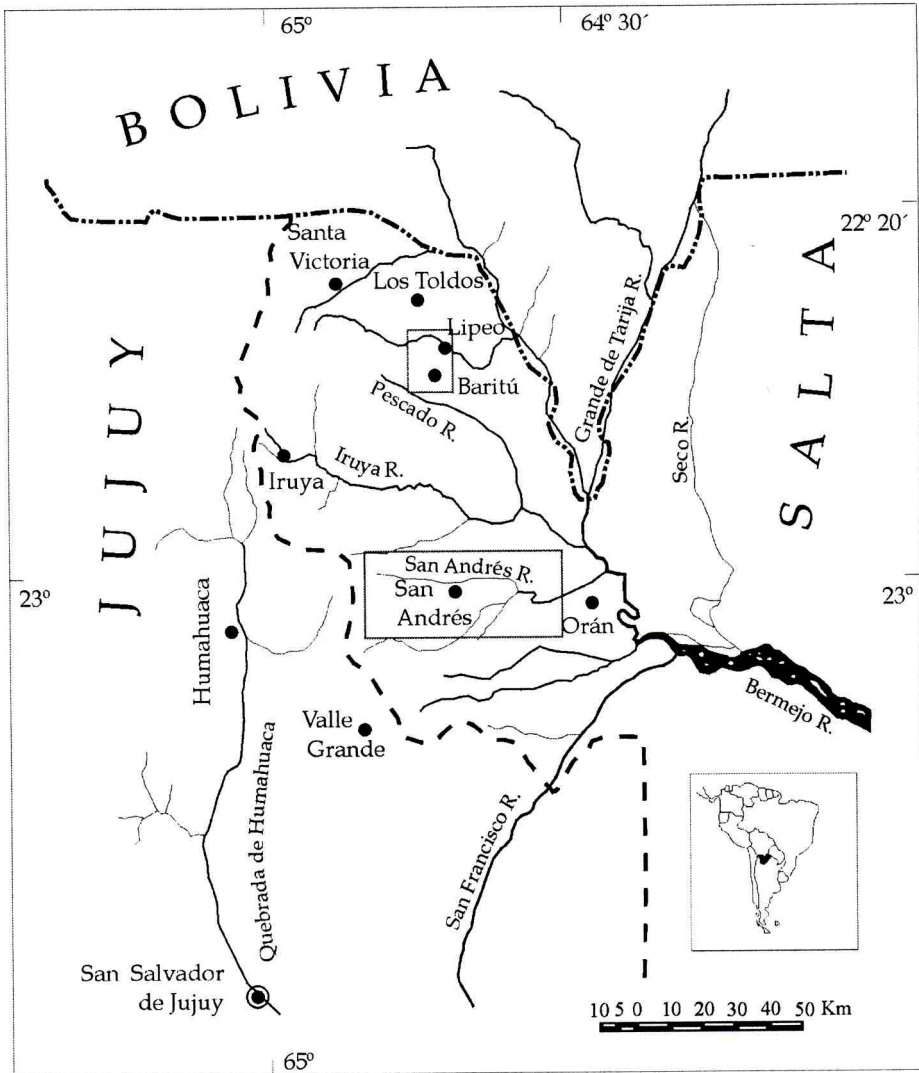


Figure 1. The studied area.

medicinal lore considers a healthy body to have a certain corporal temperature that can be altered by the influence of external factors, e.g., wind or sun, or as a result of eating "warm" or "cold" food in excess. Against such "cold" and "hot" ailments, plants with an opposite condition are used. However, on many occasions, beverages considered neutral are prepared for hot or cold afflictions to avoid the shock of administering a remedy for the opposite condition. Cold and hot diseases are considered to be of natural origin. Apart from being illnesses themselves, they can promote other illnesses. Any complications are treated by the *curandero* if home remedies fail. For example, according to local lore, an earache is produced by two very different causes. The ache can be

caused by an infection or by cold, which facilitated the entrance of "air" into the ear.

Materials and Methods

Information was obtained in the course of several field trips between 1994 and 2001. The ethnobotanical investigation dealt with all the aspects involving rural life. Interviews were conducted in 61% of the families (a total of 115 informants). The oldest member of each family was interviewed. During the visits different semistructured, specially prepared surveys were used as a guideline. The interviews were registered in field notebooks and tape-recorded; the material is kept at the Delegación Regional Nordeste, Administración de Parques

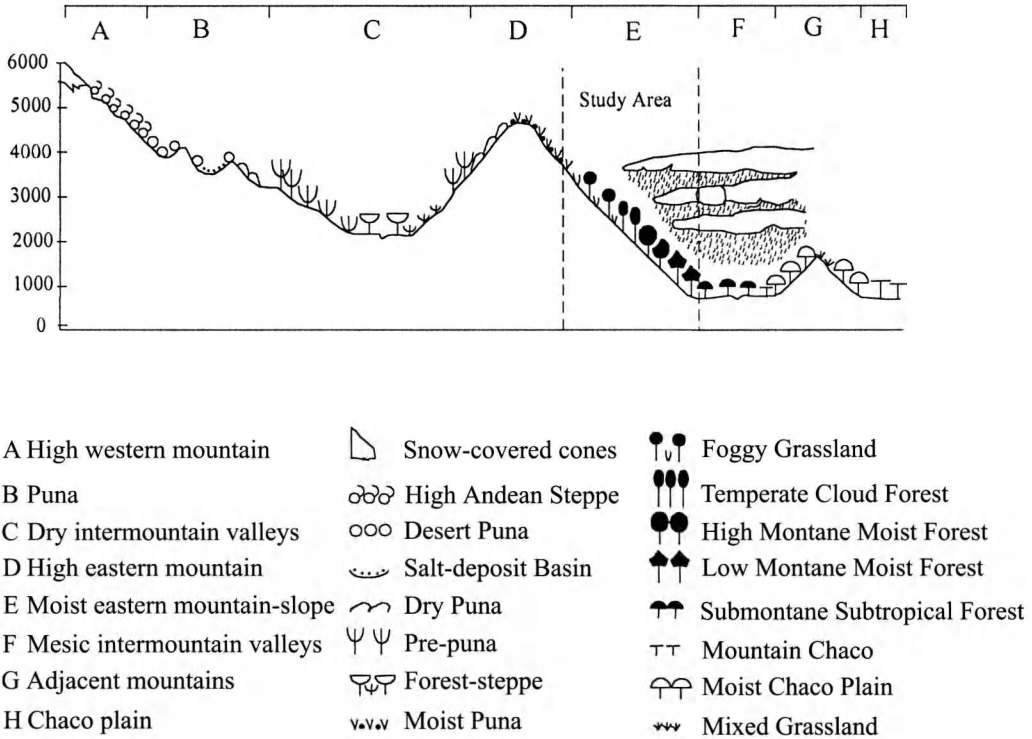


Figure 2. Schematic section of the area.

Nacionales. Plants were either collected during field trips together with the informants or bought at the market in the city of Orán (Salta Province, Argentina) and/or at the municipal market of the city of Bermejo (state of Tarija, Bolivia). The material was identified by the authors, and voucher specimens were deposited at the herbarium of Museo de Ciencias Naturales de Salta, Universidad Nacional de Salta (MCNS) and at the herbarium of IBODA (SI).

Cactaceae in the Argentine Yungas

In the Yungas biogeographic province in Argentina, 17 species of cacti are found in the transition between the High Andes Province and Puna Province; there are two more taxa belonging to a single species. Of these 20 taxa, 7 are endemic, 2 of them having been found only in Jujuy Province, although one is also cultivated in Salta.

According to Castellanos (1925) and Kiesling (1999a), the following species can be found in the area inhabited by the studied communities along the altitudinal gradient:

In the Submontane Subtropical Forest: *Cleistocactus ferrarii* Kiesling, *Opuntia brasiliensis* (Willd.) Haw., *O. ficus-indica* (L.) Mill. (introduced), *Trichocereus thelegonoides* (Speg.) Britton et Rose (*Echinopsis thelegonoides*

(Speg.) Friedrich & Rowley), and *T. arboricola* Kimmach (*Echinopsis arboricola* (Kimmach) Mottram).

In the Montane Moist and Temperate Cloud Forest: *Echinopsis ancistrophora* Speg., *E. mamillosa* Gürke, *Opuntia brasiliensis* (Willd.) Haw., *O. ficus-indica*, *Parodia chrysacanthion* (K. Schum.) Back., *P. nivosa* Back., *Rebutia fabrisii* Rausch, *Rhypsalis baccifera* (Mill.) Stern, *R. floccosa* Pfeiffer subsp. *tucumanensis* (F.A.C. Weber) Barth. & Taylor, *R. lorentziana* Griseb., *R. lumbricoides* (Lem.) Lem. ex Salm-Dyck, *R. monacantha* Griseb., *Trichocereus arboricola* Kimmach, *Trichocereus fabrisii* Kiesling (*Echinopsis fabrisii* (Kiesling) Rowley), *T. schickendantzii* (Weber) Britton & Rose (*E. schickendantzii* Weber), and *T. thelegonoides* (Speg.) Britton & Rose.

In the transition between the High Andes Province and Puna Province: *Rebutia fiebrigii* (Gürke) Britton et Rose, *Lobivia chrysochete* (Wederm.) Wessner var. *chrysochete* and var. *minutiflora* Rausch.

Results

Cacti are commonly used in all the studied locations. In some cases, they are cultivated in domestic plots, but wild resources are most frequently utilized. There are only scattered

Table 1.

Scientific name	Vernacular name	Use
<i>Echinopsis ancistrophora</i>	“chutucón”	food
<i>Opuntia ficus-indica</i>	“tuna”	food, medicine, pottery
<i>Tunilla soebrensis</i> var. <i>soebrensis</i>	“airampo”	medicine, food
<i>Rhipsalis floccosa</i> subsp. <i>tucumanensis</i>	“rienda-rienda”, “calaguala”, “huasca-huasca”	food, medicine, personal hygiene
<i>Rhipsalis lorentziana</i>	“peinquillita”, “huasca-huasca”	food, medicine, personal hygiene
<i>Trichocereus arboricola</i>	“cardón”, “cardón blanco”	food, medicine
<i>Trichocereus thelegonoides</i>	“apache”, “cardón del cerro”	food

data about the use of cacti in the local literature, floristic studies, and in research in applied botany and ethnobotany. Moreover, most information that is available is very sketchy. We found almost no previous data about the species dealt with in this paper. Data on the distribution of the species and uses formerly reported are included here. Useful species of the Yungas, their common names, and the main headings under which their

reported uses can be included, are listed in Table 1. Details about how they are used and about related practices are given below.

***Echinopsis* Zucc.**

According to Kiesling (1971), this genus is native exclusively to South America. It comprises a total of 58 species, 9 of which are found in Argentina (Kiesling, 1999a). In the Yungas, *E. ancistrophora* (Fig. 3) was found



Figure 3. “Chutucón” (*Echinopsis ancistrophora*) was cultivated in family plots for its edible fruits. This use of this species has now been practically discontinued.

cultivated in family plots in the upper level of the Temperate Cloud Forests; the juicy funiculus and the seeds are used as food.

***Rhipsalis* Gaertner**

Rhipsalis comprises about 50 species distributed in America along the Andean region and in the Amazon basin; it has also been introduced to Madagascar and Africa (Barthlott & Taylor, 1995). According to Diguet (1928), this genus is exclusively American; it was accidentally spread around the world with the firewood being transported by ship. In Argentina there are 9 species, 5 of which are found in the Yungas of Argentina and Bolivia, all of them in Montane Moist and Temperate Cloud Forest environments (Kiesling, 1999a, 1999b; Ibisch et al., 2000, although the generic limits considered in the latter are different from those used here).

In the Yungas, the fresh fruits of *Rhipsalis floccosa* subsp. *tucumanensis* (Fig. 4) and *R. lorentziana* are eaten whole. These species are used interchangeably as medicines, but whenever possible a piece of the stem of each species is included; in all cases all parts of the succulent stem are used. From the point of view of "hot and cold" medicine, these are "cold" species. They are crushed in water for bathing babies or to wash a person's head when it is hot, or when he or she has an earache.

Both species are also used for personal hygiene. Women apply water of "huasca-huasca", "peinquillita", or both, to their hair after washing it with soap and rinsing it with an ash mixture and then with *Rhipsalis* water. The ash mixture is prepared by adding handfuls of ashes from a fire to lukewarm water; the mixture is left to settle and only the liquid is used. The water from *Rhipsalis* spp. is obtained by macerating the plant in cold water and then percolating it. We have been told that the latter preparation has a similar effect to that of a hair conditioner, leaving the hair soft and shiny. Some women also think that it helps hair growth.

No previous data have been found on the use of the species dealt with in this study. Hieronymus (1930) assigned the common name of "huasca-huasca" to *R. pentaptera* (surely an incorrect identification for other *Rhipsalis* species), and indicated that it had no known use.

***Trichocereus* (Berg.) Ricc.**

Forty species are included. The genus extends along the Andean Mountain Range, from southern Ecuador, Bolivia, central and northern Chile to northern Neuquen in Argentina. There are 19 species in Argentina and eight in Bolivia; four of them are common to both countries. However, a revision of the



Figure 4. *Rhipsalis floccosa* subsp. *tucumanensis* is used in the same way as *R. lorentziana*. Both grow in the lowlands of the studied area.

genus is needed in Bolivia because many isolated descriptions have been made that require a global analysis (Kiesling, 1978; 1999a; 1999b). Both species in this study are found from the Submontane Subtropical Forest to the upper part of the Temperate Cloud Forest.

In the Yungas, the fresh fruits of *T. arboricola* and *T. thelegonoides* (the juicy funiculus) are eaten. *T. arboricola* is also used as a medicinal treatment. To treat earaches, additional ingredients are added to the water to be used; for example, the accumulated water in the overlapping leaf base of the "payo" (*Tillandsia australis* Mez, Bromeliaceae) and "laurel" leaves (*Cinnamomum porphyrium* (Griseb.) Kosterm., Lauraceae). The "payo" water is always used in illnesses related to "air"; the origin of this type of earache can then be interpreted as linked to an "air" disease. Once the patient's head is washed, the "cardón" is peeled, briefly boiled or roasted, and placed in slices on his or her forehead and ears. Water for lavages for earache is prepared with "cardón" by adding "mololo" (*Sambucus nigra* L. ssp. *peruviana* (Kunth) Bolli, Caprifoliaceae), "laurel" (*Cinnamomum porphyrium* (Griseb.) Kostern, Lauraceae), "sauco" (*Fagara rhoifolia*



Figure 5. *Opuntia streptacantha* in Tucumán.

(Lam.) Engl., Rutaceae), “verbena” (*Verbena hispidula* Ruiz & Pav. and/or *V. littoralis* Kunth, Verbenaceae), and “quimpy” (*Coronopus didymus* Sm., Cruciferae). This preparation is also used for eardrops, in which case the stem is boiled in water. Occasionally the infusion is supplemented with juice from the crushed aerial part of “oreja de perro” (an introduced plant with succulent leaves, possibly Compositae or Crassulaceae) that has been previously fire-roasted. The former is also used for skin problems or as a poultice for the back. It is applied as compresses, peeled and cut into pieces. In the case of blows or “trauma”, it is mixed with salt to prevent bruising.

The flowers of *Trichocereus arboricola* are frequently inhabited by small insects (not identified). According to local lore, these insects cause human pediculosis. Children are strongly recommended to avoid these plants when they are in bloom. In some families this belief is so firmly established that the fruits of the “cardones” are discarded and not used for fear that some lice remain in the dry flowers or among the stalks of the plant. It is usually heard that the fruits are tasty but that it is better not to get near these “lousy” plants. This negative perception frequently reduces the use of this resource.

For *Trichocereus* species, Kiesling (1978) mentions that the wood is used for building materials and as firewood, and the thorns are used as needles and to make combs. He gives details on different ways of consuming some of the fruits and explains that because of mucilaginous substances, the stems are frequently used to purify turbid waters and as a fixative in lime paints. No uses for *T. arboricola* or *T. thelegonoides* have previously been cited in the literature.

***Opuntia* Mill.**

This genus is composed of 200 to 400 species depending on the taxonomic treatment. It is native to the Americas, ranging from Canada to northern Patagonia, although it has been introduced to other continents. *Opuntia streptacantha* (Fig. 5) and *O. ficus-indica* are successfully cultivated in the Argentine Yungas in all environments; the latter species has not been found in the wild. Due to its widespread geographic distribution, there is a variety of vernacular names; “tuna” is the most widely known in Spanish-speaking countries, including this region.

In the studied area, fresh and raw fruits are used as food. In terms of the “hot and cold” theory of therapeutics, *O. ficus-indica* is considered a cold plant by the people of the region and, as such, it is used in baths and compresses for illnesses caused by heat, such as headaches, earaches and pulmonary problems. In other occasions, it has been documented as a neutral or “cordial” plant (neither hot nor cold). It is combined with hot species and used for illnesses caused by cold, such as pain in the legs or waist.

When children suffer from pneumonia or other respiratory syndromes, including cough, head cold and fever, it is recommended to prepare a thick cream with a mixture of herbs and to place compresses on the back. The mixture, called “pucha”, is applied and left to dry in place. This process is repeated three times a day until the child gets better. This illness is considered to be a cold condition and thus the remedy helps by taking out the heat accumulated in the lungs and respiratory tract.

The species included in the preparation vary according to the customs of each family and their availability when needed, but basically, apart from the “tuna” cladode, the following parts of other plants are added: “quina” bark (*Myroxylon peruiferum* L. f., Fabaceae, or *Cinchona* sp., Rubiaceae), “tusca” bark (*Acacia cavendishii* (Mol.) Mol., Fabaceae), entire “quimpy” plants (*Coronopus didymus* (L.) Smith, Brassicaceae), “hierba santa” leaves (*Anredera cordifolia* (Tenore) Steen., Basellaceae) and “rosa” fresh or dry petals (*Rosa multiflora* Rusby, Rosaceae). All these materials are ground



Figure 6. *Tunilla soebrisii* is not native to the region, but its seeds (used for medicine) are purchased in markets or obtained through barter with traveling salesmen.

on a stone or in a mortar, and when necessary, pork fat or chicken excrement is used as an agglutinant. For hepatic illnesses, the fruits are either eaten raw, or a cladode is peeled, cut in small pieces, and put in a glass of water overnight. The resulting beverage is drunk the following day after fasting. For wounds, bruises, or pimples, a thick cream (“pucha”) is prepared with chicken excrement, and a cladode is ground, placed over the affliction and covered with a cloth. The treatment is changed every day until the patient gets better.

Cladodes of “tuna” are also used to make candles. They are ground and the resulting paste is mixed with tallow as an agglutinant to make them less fragile and longer lasting. This species is also used to “cure” ceramic objects. Once an object has been baked, the pieces are smeared with a peeled cladode so that the mucilage saturates the surface, producing a polish and covering the pores. Pork fat is sometimes used when “tunas” are not available, but a polished surface is not achieved.

Many uses for “tuna” have previously been cited in the literature. It was exported to Europe in the late XV century (Storni, 1942). The fruits are sold in several American countries (USA, Mexico, Chile, Brazil) and in the Mediterranean area (Spain, Italy, Greece and northern Africa; Russel & Felker, 1987), and it is used in subsistence agriculture and in the

intensive production of fruits in Sicily (Barbera et al., 1992; Galt & Galt, 1978). The species is cultivated in Saudi Arabia (Abulafaith, 1987), and in South Africa it is regarded as an invasive plant, although it is considered useful because it usually constitutes an important cash crop in subsistence economic sectors (Brutsch & Zimmermann, 1993).

More information is available about this species than any other in the region. Both fresh and dried fruits of this plant are consumed, as are juice, liquor, and fermented beverages such as tuna honey, syrup, Xoconoxtle and “colonche” (Hieronymus, 1930; Storni, 1942; Arenas, 1981; Cárdenas, 1989; García Rivas, 1991; Barbera et al., 1992; Asfaw & Tadesse, 2001). In Mexico, “tuna cheese”, a kind of jam, is also prepared (García Rivas, 1991). In Bolivia, the fruits are boiled in water until a creamy product is obtained called “tuna api” or “mazamorra” (Cárdenas, 1989). They can even be fermented to produce ethanol (Hieronymus, 1930; Storni, 1942; Arenas, 1981; Cárdenas, 1989; García Rivas, 1991; Barbera et al., 1992; Asfaw & Tadesse, 2001).

With respect to its use as a medicine, there is abundant literature describing the use of the plant for women’s medicine, digestive, respiratory, urinary and cardiac afflictions, in rheumatic problems and as a healing agent for wounds (Hieronymus, 1930; Pardal, 1937;

Storni, 1942; Manfred, 1947; Ávila, 1952, 1960; Galt & Galt, 1978; Toursarkisian, 1980; San Martín, 1982; Abulafaith, 1987; Correa & Bernal, 1990; Barbera et al., 1992; Sesia, 1992; Pochettino et al. 1997; Balick et al., 2000; Zalles & De Lucca, no date).

This species is also used to rear the "cochinilla" (*Dactylopius coccus*) to obtain carminic acid used to dye fabrics and give color to food and cosmetics (Hieronymus, 1930; García Rivas, 1991; Brutsch & Zimmermann, 1993).

Tunilla Hunt & Illiff

This genus, segregated recently from *Opuntia*, was formerly known as "series Airampoae Friç" or, commonly, "airampos". These plants are very frequently found from the puna in Salta, Jujuy, and Bolivia to the extreme southeast of Peru (Hunt & Illiff, 2000).

In the studied area, the seeds of *Tunilla soebrensis* (Fig. 6) are found on sale in the markets and shops where herbs are sold in neighboring cities (San Ramón de la Nueva Orán in Salta Province, Argentina, and in Bolivia, in the city of Bermejo in the state of Tarija).

In the Yungas, the use of seeds as a dye for beverages has rarely been reported. Apparently this is no longer a common practice, although formerly an infusion was prepared from the seeds and given to measles patients to reduce fever. This disease is rare now because there is a preventative vaccine. However, the seeds are still used for skin rash or infections, and in such cases an infusion is prepared and the affected part is washed. An infusion prepared with boiling water is also drunk to help expel the "air", a superstitious ailment widely believed in local therapeutics.

Storni (1942), Antúnez de Mayolo (1988), Cárdenas (1989) and Scarpa & Arenas (1996) state that the seeds of *Tunilla soebrensis* are added to the preparation of corn chicha, aloja and cold drinks. These authors also reported that the seeds are used to color pieces of bread given as religious offerings. It is very probable that in the past the inclusion of these species in regional cooking may have been similar to that described in the literature. Antúnez de Mayolo (1988) explains that the seeds are still used in Peru to color beverages, medicines and food.

As a medicinal plant, *T. soebrensis* is used to reduce temperature (Cabrera, 1957; Palma, 1978), in which case it is ingested as an infusion. Other ailments that can be treated with it are conjunctivitis, aphtha (or thrush, cankers in the mouth), measles, and scarlet fever.

Cabrera (1957), Toursarkisian (1980), Antúnez de Mayolo (1988), Cárdenas (1989) and Marzocca (1993) cite the plant's use for

dying; boiling the seeds in water generates a light purple color.

Discussion and conclusions

In the studied communities, 37% of the species of cacti are used in a number of ways, although their principal uses are related to food and medicine.

It is possible that the oldest cultivated cactus in the area is "chutucón" (*Echinopsis ancistrophora*), whose fresh fruits are prized, especially by children. The "tuna" was added later, with the arrival of the Spaniards or perhaps during the XVII or XVIII century. Both species are cultivated in domestic garden plots. The environment where the "chutucón" grows has been practically abandoned although years ago families used to stay at least three months every year in the area (Hilgert, 1998, 2000). At present the area is used for raising cattle, but the families do not live there and the fruits are now scarcely consumed. During our fieldwork, this plant was only observed near one house, although many people told us they knew it and had eaten it in the past. On the other hand, "tuna" is still being cultivated; two or three plants are usually found at each house.

As with "chutucón", the fruits of *Rhipsalis* are mainly consumed by children. In January and February when the fruits are ripe, small tours are organized to the forest to "pallar" (collect) "huasca-huasca" and "peinquillita" fruits. The reason they are rarely eaten by adults is probably because the fruits are very small and it takes a long time to collect a rewarding quantity. Nevertheless, adults do collect and eat the fruits on outings when a plant is within reach.

Hazlett (1986) recorded the use of *Rhipsalis* by Central American groups. He states that the fresh stems are eaten grated as a treatment for abdominal pain. In our studies, all the medicines prepared with these species were for external use.

The fruits of the "cardones" (*Trichocereus* spp.) are undoubtedly the most praised as foods. They ripen in the summer, providing tasty snacks that are large enough to prompt adults to stop and collect them.

Trichocereus thelegonoides grows in the same environment as the "chutucón", and inhabitants of the region use the fruit from both. It is mostly men who eat the fruits of *T. thelegonoides* as they herd cattle to the mountains, and later when they return to check them from time to time. *Trichocereus arboricola*, on the other hand, is widely distributed in the most populated environments.

If the medicinal use of these plants is analyzed, we can conclude that local herbal medicine is still prevalent. In all the cases the practices described are frequent and well

known. The use of "airampo" (*Tunilla soehrensii*) as a medicine, cited in the literature (Cabrera, 1957; Palma, 1978), coincides with what was found in the present study, except that we could not verify former reports referring to the treatment for "air" in the studied area. In all the cases reported by us, it was used externally. It is considered a "cold" medicine.

Acknowledgments

We wish to dedicate this paper to the inhabitants of the settlements under study in recognition of their valuable cooperation, patience, and goodwill. We thank CONICET and PROYUNGAS for their financial support of Norma Hilgert. Our special thanks to the National Parks Administration and especially to the park rangers of the Baritú National Park, Fernando Dobrotinich and his wife Ximena Garibaldi, to the principals and teachers of the schools we visited for all the support received during our field work, to D. Gernadt for improving our English text, and to the reviewers for their helpful comments.

Appendix

Herbarium Vouchers

Echinopsis ancistrophora Speg.

ARGENTINA, Prov. Jujuy, Dept. El Carmen, ruta Nac. 9, límite con Salta, 14-III-1996, *R. Kiesling & J. Mauseth* 8742 (SI); Prov. Jujuy, Dept. Capital, Termas de Reyes, II-1942, *A. Burkart & N. Troncoso* 14458 (SI).

Observations: the material collected in the study area was badly damaged and had to be discarded. There are photographs that document the presence of the species in Argentina, Salta Prov., Dept. Orán, finca San Andrés, Temporal, 17-II-1997, *N. Hilgert & M.L. Lamas*.

Opuntia ficus-indica (L.) Mill.

ARGENTINA, Prov. Salta, Dept. Orán, finca San Andrés, Temporal, 20-III-1997, *N. Hilgert & M.L. Lamas* 1859 (M-MCNS).

Tunilla soehrensii (Britton & Rose) Hunt & Illiff

BOLIVIA, Dept. Tarija, Bermejo, Mercado Municipal, 25-II-1997, *N. Hilgert & M.L. Lamas* 1637 (M-MCNS).

Rhipsalis floccosa subsp. *tucumanensis* (F.A.C. Weber) Barthlott & Taylor

ARGENTINA, Prov. Salta, Dept. Orán, finca San Andrés, Los Naranjos, 23-VI-1996, *N. Hilgert & C. Hamity* 1370 (MCNS); Dept. Santa Victoria, Parque Nacional Baritú, Lipeo, 04-X-1996, *N. Hilgert & P. Arenas* 1511 (SI); Baritú, 02-XII-1997, *N. Hilgert* 2024 (MCNS); 11-I-1999;

N. Hilgert 2191 (M-MCNS); Los Toldos, 03-VII-1999, *N. Hilgert* 2449 (MCNS).

Rhipsalis lorentziana Griseb.

ARGENTINA, Prov. Salta, Dept. Santa Victoria, Parque Nacional Baritú, Lipeo, road to the thermal springs, 29-IX-1996, *N. Hilgert & P. Arenas* 1462 (MCNS); 04-X-1996, *N. Hilgert & P. Arenas* 1509 (SI).

Trichocereus arboricola Kimmach

ARGENTINA, Prov. Salta, Dept. Santa Victoria, Parque Nacional Baritú, Lipeo, 04-X-1996, *N. Hilgert & P. Arenas* 1510 (SI); 23-VI-1999, *N. Hilgert & G. Gil* 2399 (M-MCNS).

Trichocereus thelegonoides (Speg.) Britton & Rose

ARGENTINA, Prov. Jujuy, Dept. Valle Grande, XI-1973, *R. Kiesling* 337 (SI); Dept. Ledesma Road to Valle Grande, 30-X-1974, *R. Kiesling* 795 (SI); Dept. Valle Grande, Huacanqui, 31-X-1974, *R. Kiesling* 793 (SI); Dept. Capital, Lozano, 24-IV-1975; *R. Kiesling* 1216 (SI). BOLIVIA, Dept. Tarija, between Concepción and Tarija, 22-X-1980, *F. Zuloaga et al.* 1250 (SI).

Observations: the material collected in the study area was badly damaged and had to be discarded. There are photographs that document the presence of the species in Argentina, Prov. Salta, Dept. Orán, finca San Andrés, Lizarazo, 17-II-1997, *N. Hilgert & M.L. Lamas*.

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