INTERNATIONAL CONGRESS OF ETHOBOTANY, ESTAMBUL, 2006.

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Proceedings of the IVth International Congress of Ethnobotany (ICEB 2005), 2006, XX-XX

Gathering and circulation of medicinal plants in a pluricultural context (Misiones, Argentina)

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This research is being carried out among two M*byá-guaraní* communities, settled in Kuña Piru valley in the province of Misiones, Argentina. The area of study is located in the so called Paranaense rainforest, which is characterized by its high biodiversity. The ethnic and cultural variability of the population living in Misiones stands out, and is the result of the migratory flow that arrived in our country from Europe, Asia and bordering countries in the late 19th and early 20th centuries. The contact situations in intercultural and interethnic contexts propitiate the exchange of knowledge and practices, which causes adjustments in the relationships between the Mbya and their environment. A wide range of alternatives derives from this situation, regarding both gathering ways and the circulation of plant resources for therapeutic use. In the last years the commercial value of these resources has led to an increase in the demand on the part of herbal establishments that provide medicinal plants to the national market. As a result of that, the gathering of medicinal plants by the Mbya has widened, to include species whose therapeutic uses are not known by the members of these communities. We will present in this paper the wild plants gathered which are meant for commercialization, considering gathering places, ways of use and purposes. We will discuss how a traditional activity –gathering– has become inserted in new contexts and is now regulated by market conditions.

Key words: Gathering, marketing, medicinal plants, Mbya-Guarani, Northeastern Argentina

The settlements of the Mbya, which are one of the ethnic groups of the Tupi-Guarani linguistic family, are scattered along the province of Misiones (Argentina) as well as in the neighboring countries of Paraguay and Brasil, shaping a sort of circuit, as a result of the constant moving of the members of these communities (Crivos et al. 2002), which show differences in terms of population and degrees of acculturation (Bartolomé 1978). At present, there are about 700 Mbya families (3500 people), within the Misiones territory (Amable Dohman and Rojas 1996).

Our research is being carried out in two Mbya communities –Ka´aguy Poty and Yvy Pyta–, which are settled on 6144 hectares belonging to the Universidad Nacional de La Plata, in the departments of Libertador General San Martín and Cainguás (Fig. 1).

The area, from the biogeographic point of view, belongs to the Mixed Forest District within the Paranaense Phytogeographical Province of Amazonic domain —a transition area between the Brazilian "Planalto" and the District of the "Campos" (Cabrera 1971).

This forest presents a crown canopy 20-30 meters high, and varies according to its location- along high or low gradients- its proximity to streams and soil composition, and to the differences in their use stories.

The communities we studied are inhabited-according to the 2003 census carried out by the authors- by 277 people on the whole. Each settlement is made up of about 25 dwellings distributed along clearings opened in the forest (Fig. 2) at the side of Provincial Route N° 7, which connects these communities with the neighboring towns.

As far as social-political organization, the highest authority is the "cacique". Besides, the "Opyguã" -the group's religious authority- is also recognized. He runs all ceremonies taking place in the temple "opy" and participates in the diagnosis and treatment of illnesses.

Fig. 1. Location of the study area

Gathering in the context of Mbya subsistence activities

Present subsistence activities among the Mbya include horticulture by means of the "slash and burn" system (Cadogan 1960; Martínez, Pochettino and Arenas 2003; Martínez Crovetto 1968) as well as hunting, fishing and gathering, though the Mbya recognize a decrease in these activities. The decrease in traditional undertakings at present is due to the depletion of the forest, besides the fact that

Fig. 2. Local dwellings in a clearing in the forest

Fig. 3. Corn cultivation in a "chacra", becoming "capuera" as weeds grow

many young and adult people are being employed as part time workers for the manual harvest of yerba mate and tobacco at the "colonos" productive units (Chase Sardi 1971). The term "colonos" is given to the descendants of European and Asian immigrants who came to Argentina after the second half of the XIX century in order to exploit the land transferred by the government for the development of agriculture and farming activities.

From Mbya viewpoint it is possible to identify three micro-environments delimited by their subsistence activities. The "chacras" or "kokue" in Mbya language constitute the spaces where horticulture takes place. They are distributed in the settlement, next to the dwellings. "Capuera" or "kokue-re" is the term used to designate deforested areas, characterized by the presence of secondary floral colonizers of disturbed environments (Fig. 3). Shrubby species and small trees are commonly found in the capuera. "Monte" ("ka´aguy") is the name given to the forest area with a predominance of trees of considerable height and an abundance of vines and epiphytes as well as a great diversity of animal species. There is a correlation between the biodiversity characteristic of the "monte" areas and the environmental diversity recognized by the indigenous communities, which they explore in the course of their subsistence practices of hunting, fishing, and gathering (Fig. 4) (Crivos et al. 2004; Pochettino, Martinez and Crivos 2002).

Gathering is done all year long in different places, mainly in the "monte". Both men and women of different ages are involved in this activity. In addition to food resources, wood, bark, fibers, leaves, roots and fruits are gathered and utilized

Fig. 4. Gathering in the "monte"

for various purposes (medicinal practices, handicraft activities, preparation of weapons, traps, fishing poisons and shelter construction). Some of the resources used as the raw material for handicrafts, which are sold at little stands made up at the side of the route (Fig. 5), or else by intermediaries who sell them in urban centers. In the last years, collection of medicinal plants has also become a commercial activity.

Fig. 5. Stands along the route to sell handicrafts and plants

According to the information provided from chronicles travelers, and anthropologists, horticulture and hunting are the activities which provide the largest amount and variety of resources the Mbya need for their subsistence (Bartolomé 1978; Schaden 1998). In this way, gathering is underestimated or considered secondary when it comes to their description and analysis. (Bartolomé 1978; Burri 1998; Chase Sardi 1989; Schaden 1998). Although it is a kind of activity that could be considered unsystematic and casual, it is becoming increasingly important as a source of provisioning for a great variety of natural resources. These resources are the raw materials for producing goods whose commercialization integrates these groups to the market's economic circuit. Therefore, gathering has become very important among the subsistence activities of the group.

The aim of this paper is to present the wild medicinal plants gathered to be sold, and also to explain the new gathering modalities according to the market's increasing demands.

Methodology

In our ethnographic research we deal with the relationship of the man and environment by taking as a reference unit the subsistence activities performed in the domestic sphere. As stated by Lave (1995: 190), everyday activities in the domestic environment, defined by their routine character, generated by expectances developed over time, and performed in settlements designed and organized by these same activities, offer an adequate starting point from which to consider material, social and symbolic aspects of human ways of life in different settings.

Since 1996, ethnographic data collection has been carried out, which allowed us to access to relevant information for the characterization of the spaces where activities for obtaining of natural resources are developed.

The information on which this paper is based comes from semi-structured and open-ended interviews to adult individuals of both sexes, as well as from systematic observations in the different spaces where group activities goes by. As long as possible, walks were performed accompanying people's moves while they perform different activities. The informal nature of these interactions

made it possible for the researchers to gather spontaneous comments and observations from our occasional guides, as regards what was considered by our informants to be the most outstanding aspects of the places we walked by. In this way we obtained more precise information about certain organoleptic and functional characteristics of certain species when it was possible to stop in front of them and even collect samples for our ethnobotanical research. In this sense, the walk turned out to be a privileged strategy for the recording of information about the conceptions the Mbya have of their environment and about their intervention on this environment.

Gathering and trading of medicinal plants

By means of the methodology already described, we recorded a total of 19 medicinal plants collected for commercial purposes. Twelve of those species are collected in the "monte", 5 in the "capueras" and 2 in the "chacras". Most of these species are well known and used by the Mbya as therapeutic elements (14), but there are three of the species collected whose use is not known by the local population.

Wild therapeutic elements obtained by means of gathering for their later trade are presented on Tables 1 and 2, with both their common and their scientific names, the microenvironments where they are obtained, their usage and final destination.

Regarding the people devoted to this activity, it should be enhanced that it is not a general practice. The gathering of therapeutic elements for commercialization has only been recorded in one of the communities ("Ka'aguy Poty") up to now. In this community we found only two adult males and their extended family members involved in that venture. According to their own statements, the main reason for this undertaking would be the obtaining of money when they have no resources coming from other subsistence activities. Nevertheless, other informants –not participating in the gathering of medicinal plants – pointed out that those performing this activity are the people who have an special tendency to tasks related to local vegetal resources and, in consequence, greater knowledge about plants.

In agreement with the results from previous research on traditional medicine and social activity networks (Teves et al. 2002), these two adults recognize themselves and are recognized as "experts" in plant resources in general and, particularly in phytotherapy, because of their wide knowledge about the "monte". These people also performed political and religious duties by being invested with the highest hierarchies –"cacique" and "opygua"- in the community. In that sense they are part of a wide network of political and economical relationships with people and institutions outside the community, which has favored the development of their personal undertakings.

Although those who practice gathering and selling of medicinal plants have special botanical knowledge, this does not take part in the selection of the species. That is, the wholesaling enterprise orders from these people a certain number of species according to the possibilities they have for commercialization and the Mbya collect those plants only to fill the enterprise demand. However, some local knowledge is necessary to identify and locate such plants, as well as to perform the gathering in the areas they consider more convenient and by means of appropriate techniques. Given that they are asked to collect species not used in local therapy, and some which do not even have a name in the vernacular language (Mbya-Guarani), entrepreneurs show the plants they want *in situ*. The plants collected are well known in the herbal market and are used in different preparations, either alone or in combination with other herbs. Nevertheless, the Mbya community members involved into this trade, do not know about the destination and uses the therapeutic elements they collected.

> *"(...) there are different kinds of amambai* (and do they have a different name?) *No, just amambai* (and how did they ask for it, which name did they use?) *well ... fern, but they came and they showed …there are a lot of kinds of fern* (and do you know what they want it for?) *surely for something …we don't use (...)"* (S.C. male, 50-year- old *Ka´aguy Poty*, 2003)

Due to the recent introduction of medicinal plant gathering for their commercialization, no quantitative studies have been made yet about the impact of this practice. Even so, it is possible to

Table 1. Therapeutical species gathered to be marketed

Local name		Scientific name	Gathering place	Part of the plant used	Local use	Use in herbal products
Mbya	Others					
	Vira vira	*Gamochaeta simplicicaulis* (Willd. ex Spreng.) Cabrera (Asteraceae)	Chacra	aerial part	No	Menstruation regulator To prevent ageing
	Achicoria	*Cichorium intybus* L. (Asteraceae)	Chacra	aerial part	Yes	Not recorded
	Pata de vaca	*Bahuinia forficata* Link. ssp. *pruinosa* (Vogel) Fortunato & Wunderlin (Fabaceae)	Capuera	leaves	Yes	Diabetes
Kokú		*Allophyllus edulis* (St. Hil. Juss. & Cambess.) Radlk. (Sapindaceae)	Monte	branches with leaves	Yes	Liver intoxication
	Pitanga	*Eugenia uniflora* L. (Myrtaceae)	Monte	leaves	Yes	Diarrhoea
Tajy	Ceibo	*Erythrina falcata* Benth. (Fabaceae)	Monte		Without data	
	Lapacho	*Tabebuia heptahylla* (Vell.) Toledo (Bignoniaceae)	Monte	bark	Yes	Depurative, diuretic, rheumatism, tonic, aperitive, refreshing, astringent
Yacaré-ruguay	Carqueja	*Baccharis* sp. (Asteraceae)	Capuera	aerial part	Yes	Liver and kidney diseases, colagoge, depurative
Ysypó mil hombres	Mil hombres	*Aristolochia* sp. (Aristolochiaceae)	Monte	vine	Yes	Against pains, arthritis, depurative
	Llantén	*Plantago* sp. (Plantaginaceae)	Chacra / capuera	aerial part	Yes	Against cough, expectorant, angina
Yvyra pire ro	"Candelón" (canelón) Palo amargo	Not collected	Monte		Yes	Not recorded
Amambai	Helecho	*Thelypteris dentata* (Forsk.) E. St. John (Thelypteridaceae)	Capuera/ Monte bajo		No	Menstruation regulator
Amambai mirí		Not collected	Monte		Yes	Not recorded
Tapycha ovy		Not identified (material stéril)	Capuera/ Monte bajo	aerial part	No	Not recorded
	Calaguala	*Phyllitis brasiliensis* (Sw.) Kuntze var. *brasiliensis* (Aspleniaceae)	Monte	whole plant	Yes	Menstruation regulator
Yvyrá rapó jú	Cangorosa	*Maytenus ilicifolia* Reiss. (Celastraceae)	Monte		Yes	Stomach, heart Slimming mixtures
Yvyra pyta		*Peltophorum dubium* (Spreng.) Taub. (Fabaceae)	Monte	wood and bark	Without data	Not recorded
	Cedrillo	*Trichillia pallida* Sw. (Meliaceae)	Monte	wood and bark	Yes	Not recorded
	Culantrilla	*Adiantum* sp. (Pteridaceae)	Monte	whole plant	Yes	Not recorded

Table 2. Local use of the species mentioned in Table 1

Common name		Scientific name	Part of the plant used	Way of administration	Use
Mbya	**Others**				
	Achicoria	*Cichorium intybus* L. (Asteraceae)	root	Infusion (combinated with other elements)	Fever
	Pata de vaca	*Bahuinia forficata* Link. ssp. *pruinosa* (Vogel) Fortunato & Wunderlin (Fabaceae)			Tooth ache
Kokú		*Allophyllus edulis* (St.Hil. Juss. & Cambess.) Radlk. (Sapindaceae)	branches with leaves	Infusion With *Ilex* paraguariensis infusión	Fever
Añanga piry	Pitanga	*Eugenia uniflora* L. (Myrtaceae)	leaves	Infusion	Stomach ache "pierasy" Parasites
Tajy Ta a chí Ka a y	Lapacho	*Tabebuia heptahylla* (Vell.) Toledo (Bignoniaceae)	corte	Concoction combinated with other elements Infusion	Contraceptive Menstruation Biliary vesicle
Yacaré-ruguay	Carqueja	*Baccharis* sp. (Asteraceae)		Infusion	Gripe
Ysypó mil hombres	Mil hombres	*Aristolochia* sp. (Aristolochiaceae)		Concoction combinated with other elements	Biliary vesicle
	Llantén	*Plantago* sp. (Plantaginaceae)	aerial part flowers		Kidney
Yvyra pire ro	Palo amargo	~~No recolectada~~ Not collected			Fever
Amambai mirí	Helecho	Not collected	rhizome		Cough
	Calaguala	*Phyllitis brasiliensis* (Sw.) Kuntze var. *brasiliensis* (Aspleniaceae)	leaves	Concoction	Fever Stomach ache
Yvyrá rapó jú	Cangorosa	*Maytenus ilicifolia* Reiss. (Celastraceae)	leaves	Concoction Baths	Diarrhoea Blood Stomach ache Rheumatism Head Post delivery Parasites
	cedrillo	*Trichillia pallida* (Sw.) (Meliaceae)	bark	With *Ilex* paraguariensis infusion	Waist ache Stomach ache
	culantrilla	*Adiantum* sp. (Pteridaceae)	aerial part	Concoction (baths)	Head ache Fever Diarrhoea

perform some observations. From what the interviewed dwellers said it has become apparent that plant prices are not uniform and the most expensive species are the rarest or the most difficult to find. That is why the sale can be done according to the weight or by specimen. Consequently, collection intensity also varies according to price, and the biggest efforts are aimed at obtaining the rare species. This situation leads us to questioning about the sustainability of medicinal plant collection, which is a traditional activity inserted in new contexts and regulated by market conditions.

Discussion on new collecting trends

The contact situations in intercultural and interethnic contexts propitiate the exchange of knowledge and practices, which causes adjustments in the relationships between the Mbya and their environment.

When we analyze the species collected for therapeutic use and the sites where they are found and gathered, the "monte" is the main provisioning area. However, other sites which are the result of human activity, such as "capueras" and "chacras", become important as a source of medicinal plants,

both for domestic consumption and for commercialization.

Those appearing at "capueras" or "chacras" are widely distributed species and their therapeutic uses are not exclusive of the Mbya; in certain cases they are not even locally recognized. If commercial demand of these and other resources (such as those used for handicrafts) continues, gathering practices may surely influence the development of other subsistence activities and, consequently, the spaces assigned to them, which would lead to the modification of the landscape, not only of the "chacras" but also of the "monte". An example of this is that of *Gamochaeta simplicicaulis* ("vira vira"), a weedy species with the same habit as *Ipomoea batatas* ("jety" or "batata"), one of the main horticultural plants (Martínez, Pochettino and Arenas 2003). It will be interesting to observe if the cultivation areas of "jety" remain in the future, or if they restrict themselves to allow the expansion of the medicinal species collected for commercialization purposes.

Considerations about the widening of provisioning areas can be extended to the vegetal therapeutic elements themselves. This will result in the widening of the spectrum of the medicinal plants known. In that sense, we notice that those gathered species whose use is unknown to the population -as the "vira vira"- do not have an ordinary name in the Mbya language or else are only known by a generic name, like "amambai" which is given to all ferns. This takes us back to studies of ethnobiological classification which try to account for the way such classifications have developed and remained through time. These studies show that the groups of plants and animals present themselves to the human observer as series of discontinuities whose structure and content are seen by all human beings in essentially the same ways (Berlin 1992). Nevertheless, any folk biological system only recognizes certain portions of the biological reality found in a local habitat. In our case, we observe that not every species collected has a specific name, which allows us to infer the Mbya have a selective perception according the usefulness of the biological entity. In this sense, future research will make it possible for us to explore the changes in phytotherapeutic knowledge as a result of the increasing commercial demand.

Gathering of medicinal plants with commercialization purposes demonstrates how one of the central subsistence activities –gathering– has changed according to external demand, represented in this case by herbalist enterprises. Although it is important to notice the permanence of the characteristics previously recorded, like the predominance of the "monte" in resource provisioning, the opportunism of gathering and basically the differential knowledge of some of the members of the community about the plant kingdom, we have lately observed the presence of some novel elements, such as species that have never been used before, or the gathering in areas that did not use to be relevant for this activity.

Within the framework of these studies we find it absolutely important to assess the sustainability of traditional activities incorporated in these new contexts and regulated by market conditions. The requirements to achieve this sustainability demand: for all actions and results to be socially and culturally acceptable, economically feasible, environmentally compatible, and having a high degree of participation and equity from the society as a whole (Palma ~~Date~~ 1998). One of the contemporary challenges anthropology has to face is concerned with revitalizing the studies focusing on the relationship between human populations and the environment. Our discipline has pioneered this kind of studies since 19th Century. Nowadays, these studies should be extended to a close collaboration with nature scientists, biologists, ecologists -among others- for the study of the global change phenomena (Arizpe 1993). We emphasize in this framework the relevance of the applied approach of ethnobotany developed in the last years. This approach leads both to strengthen the community's development and to foster the conservation of biocultural diversity (Martin and Hoare 1998).

Acknowledgments

Our special acknowledgment to the members of "Ka´aguy Poty" and "Yvy Pyta" communities, for their invaluable cooperation and warm hospitality during our stay in the field. We also wish to thank the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) and the Universidad Nacional de La Plata for their financial support.

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