4.1.4 Ethnobotany of the Shipibo-Konibo

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Abstract

This chapter is on the ethnobotany of the Shipibo-Konibo (SK) native group of the Ucayali Valley, Peruvian Amazon.

It is divided in two parts.

The first part presents the Ucayali Valley natural setting, several important concepts of the SK on their vegetal world. Jacques Tournon is the author of this first part. The human and the natural settings are presented. Important SK concepts about the plant world are explained.

The second part is based on ethnobotanical qualitative and quantitative investigations in two Shipibo-Konibo communities of the Ucayali. It presents the results of botanical and ethnobotanical inventories of four hectare plots representative of different forest ecosystems present in the SK community lands. This part is the result of a team work from 1991 to 1996, with J. Tournon, Francisco Enocaise, Rafael Urquia Odicio, Rita Riva Ruiz, and six students of the Universidad Nacional del Ucayali in Pucallpa: Samuel Caúper Pinedo, Catalino Cumapa, Carlos Etene Etene, Grober Panduro Pisco, José Sanchez Choy, Marcos Tenazoa Vela.

Keywords: Shipibo-Konibo, Peruvian Amazon, cultural concepts, medicinal plants, tree resources

Introduction

The Ucayali, one of the major western tributaries of the Amazon, is a white water river with variations in water level from 9 to 10 meters between high and low waters. Its waters are neutral and rich in minerals in suspension, which has two effects:

1. Abundance of aquatic life;
2. Abundance of fertile sediments deposited by the Ucayali waters when the water level decreases.

At present, various native groups, among them the Shipibo-Konibo with about 35 000 speaking individuals, live in the valley of the Ucayali and its main tributaries, in the town of Pucallpa – Yarinacocha and the "Canta Gallo" district in Lima.

The SK ethnobotany has been studied by a number of investigators (Tessmann, 1928; Arévalo Valera, 1994; Tournon, 1980, 2002, 2006). Many plant species known and used by this native group have been identified and studied. However, it is surprising to see that field ethnobotanists may still find new or little described plant species that are important in the SK culture and daily life. One reason could be that the floodable ecosystems, "tahuampa" in local Spanish, *taxbá* in the SK language, are difficult to prospect, another reason is that many vines are important for the SK, but their botany and taxonomy are less known than those of other life-forms such as trees and herbs (A. Daza, pers. comm.).

Another opened research domain is the activity and the toxicity of the majority of the SK medicinal plants and active plants.

In the habitat of the Shipibo-Konibo, several factors may determine the vegetation structure and biodiversity. The characteristics of the forest ecosystems to which the SK have access depend on three factors:

https://doi.org/10.11118/978-80-7509-881-8-0078

1. The duration of flooding by the Ucayali, in the rainy season, which in general extends from November to April;
2. The type of soil, if it flooded it can be with more silt or sand;
3. The history of the forest, if it is a primary or secondary forest.

In this chapter, plants will be presented with their local names in Shipibo-Konibo language in italics, and in local Spanish. They are classified by botanical families, genus and species in alphabetical order.

First Part

This first-part treats of the Shipibo-Konibo cultural concepts in the plant world.

Plant Nomenclatures

The Peruvian Amazon is a multilingual region and two plant nomenclatures were utilized by our informants (Tournon, 2002, 2006).

1. Shipibo-Konibo nomenclature:

The SK language belongs to the "pano" language family, together with Cashinahua, Cashibo-Cacataibo, Sharanahua. Some 20 pano languages are known (A. M. d'Ans, P. Deléage, Ph. Erikson, P. Valenzuela).

Our inventories have been done mostly with the cooperation of SK speaking "comuneros". We found that they could name almost all the trees of these plots in their language.

2. Local Spanish nomenclature

Moreover, many SK informants also know trees by the local Spanish names which are used by the rural population, foresters and loggers. These local names are formed with Spanish, Quechua and Tupi word roots.

Plant Classification Systems

Such systems can be put in evidence by a questionable set of inclusions and exclusions in the questions of the ethnobotanist to the informant.

Brent Berlin (1992) underscores nomenclatural and classification systems based on plant morphologies. They are arborescent systems with at least three taxonomic levels: lifeforms, folk genera, and folk species. Some systems have been described with five levels, with an intermediate level between life form and popular genus. B. Berlin shows that there is an additional popular variety level included in the popular species level for very important agricultural plants as maize, cereals, peas, manioc, bananas. He also shows that each level has its morpho-linguistic characteristics.

An ethnobotanical classification system based on morphology as the ones described by B. Berlin was found in the case of the Shipibo-Konibo.

The three classical life-forms are:
Shobi or herb,
Jiwi or tree,
Nishi or liana.

Two additional life-forms have been proposed (Tournon, 2002, 2006):
Nepax for floating plants as nympheas, water hyacinth (*Eichhornia crassipes*).
Manish for big herbaceous plants that may grow under trees, in general the big Monocotyledona: Aracee, Musaceae, Zingiberaceae, and also spiny Dicotyledona. *Manish* connotes vegetation difficult to walk in, as is illustrated in many SK narrations, where the hero loses his way in *manish* (Tournon, 2013).

Specialized Classification Systems

Other plant classification systems can be found, which are not based on morphology but on other criteria such as the types of uses.

Rao is an important word in the SK language. Its first meaning is "medicinal plant", but its semantic field is broader and includes not only the curative plants, but also toxic plants, psychotropic, ethotropic[14] and "magical" ones, in general all products that have a power, a biological or cultural activity (Arévalo Valera, 1994; Tournon, 1983, 1984, 1986, 1995, 2002, 2006). The rao play an important role in the SK life and culture since they are not only therapeutic and etiologic but are also used to change and control human behaviors.

The Rao: A Unique Substance and Several Modes

We can say that *rao* plants have one substance and two modes:

1. A material mode, a biological being with roots, leaves, chemical and pharmacological properties and activities.
2. A spiritual mode with a rao spirit or yoshin, which can have a therapeutic or an etiologic effect on human beings and appears to the onanya or the meraya, literally the one who knows and the one who meets the spirits.

The Rao and Its Material Mode

The rao in their great majority are of vegetal origin, however a few are of animal or mineral origin. Several studies and inventories of *rao* have been published. The number of vegetal *rao* identified at least at the taxonomic level of family and genus is estimated at 350 (Tournon, 2006).

The Rao and Their Spiritual Mode

Rao spirits may affect human beings and their well being, whether therapeutic or etiological. Health symptoms can be attributed to etiological spirits.

An example is that several big trees which have a negative power, have *koshi yoshinbo* which can affect human health.

It is the case of catahua or *aná* (*Hura crepitans*). It can cure Leishmaniasis, poison fish or kill enemies.

The giant tree (*Ceiba pentandra* (L.) Gartn., Bombacaceae), in local Spanish lupuna, in SK *xóno, is a* "master plant" or *ibo jiwi*. Its spirit has hallucinogenic powers and knowledge. When taking its bark juice with tobacco, it is necessary to diet. The lupuna has special powers: it is thought that walking nearby is dangerous, so that a father must pronounce the phrase: "Do not take the *yoshin* of my son."

Aya huma or *ino xatan* (*tigre/Calabaza*), *Couroupita* spp., Lecythidaceae, is also an impressive giant tree. With pyxidium fruits weighing several kilos hanging thirty meters high, its material mode is obviously dangerous, and its spiritual mode must follow of course.

All these trees with strong spirits can affect loggers who must utter propitiatory sentences to protect themselves from their malevolent powers. The father of a newborn should not enter the forests where these trees grow and should stay in his house respecting a kind of "couvade" or their children fall ill (Tournon, 2002).[15]

14 From *ethos* in Greek, behaviour (Ed.).

15 "Couvade" is a term coined by anthropologist E.B. Tylor in 1865 to refer to certain rituals that fathers in several cultures adopt during pregnancy (Doja, 2005) (Ed.).

During the ayahuasca session, the medicine men or shamans, *onanya* and *meraya*, invoke therapeutic *rao yoshinbo*. (Tournon, 1991b) The *rao* can be therapeutic, *jakon rao*, or etiologic, *jakonma rao*, depending on the *onanya* and *meraya*.

Ibo Rao, Master Plants

Onanya and *meraya* invoke the spirits of these trees, *ibo yoshinbo* or "master plants", during their therapeutic sessions.

Guillermo Arévalo (1986), a well known therapeutist, *raomis*, specialist of the *rao* in their material form, and *onanya* for their spiritual form, gives a list of "plantas maestras":

"It is possible to add leaves, flowers, bark or roots of the plants that you wish to experiment in the ayahuasca and chacruna preparation. These master plants or 'plantas maestras' have superior spirits:

1. Master plant hallucinogens: Toe, Marosa, Chiri-sanango, Sanango, Tabaco, Soija, Marcohuasca, Camalonga, etc.
2. Master plants that provoke dreaming: Chuchuhuasi, Chullachaqui, Lupuna, Piñón blanco y negro, Remocaspi, Sonarara, Huayracaspi, Pinshucaspi, Alcanforcaspi, Yayo, Catahua, Copaiba, Palo de rosa, Palisangre, Pishcohuayra, Sangre de drago, Caupari, Ishpingo, Ojé, etc.
3. Master plants for love (puzangas), fishing and hunting: Renaco, Suelda con suelda, Uña de murciélago, Motelo-huasca, etc.

In general, all kinds of plants can be added. Each has its own spirit, even if some are inferior. Likewise, metals, stones and vegetal perfumes can be secondary additives."

Two native SK concepts: *rao meramis* and *iribana* illustrate the existence of the two *rao* modes, material and spiritual, in one substance, Baruch Spinoza sensu (Morgan, 2006).

Rao meramis

The *rao meramis* is a *rao* category. The verb *merati* can be translated as "to meet", "to fall in love". The suffix *mis* means a custom or capacity to accomplish something. For example, a person who knows the *rao* plants will be called a *raomis*, a fisherman successful in harpooning the paiche or *wame* (*Arapaima gigas*) will be called a *wamemis*. Literally a *rao meramis* is a *rao* who can meet people.

The two modes of a *rao meramis*, spiritual and material, may produce different effects:

Wapan is a shrub considered as a *rao meramis* (Arévalo, 1994: 121).

We collected two sentences: *wapan rao meramis riki* (the plant *wapan* is a *rao meramis*) and *wapanma mera joni* (the plant *wapan* meets people), which seems equivalent.

At the question: *"Jawekeska isinman ikiki noa raometiki wapama min ea yoitiki?"* or "Can you tell me which type of disease the *wapan* can cure?" a medicine man of Caimito, Imiria lake, answered:

"Mapon chexai jawen pei biax motsax boshoiki wapan noa meraronki noa jaskatai": "when the *wapan* has met us, and we have a headache, its leaves are collected, crushed and we moisten our head with them."

Nibi saya is another *rao meramis*, a shrub identified as *Cestrum megalophyllum* Dunal, Solanaceae (Tournon, 2006). When we asked about its activity, the answer was:

"Nibi saya riki porokan chexai, kinani ika jakonribi, jaska akin meramis iki nibi saya, jawen pei motsax jan nashiyokin": "the *nibi saya* is good to relieve stomach pain and vomiting, one should bathe with its crushed leaves." (Tournon, 1990, 2002)

These phrases show that the *rao meramis* can have two actions. The first one produced by its spiritual mode is etiologic. The second produced by its material mode is therapeutic, curing the symptoms produced by its spiritual mode (Tab. V).

The Irabana

The syndrome irabana is another illustration of the two modes, material and spiritual, of a *rao* substance (Tournon, 1990, 2002). It is an unintentional secondary *rao* effect, produced by a SK medicine man (*onanya, meraya*) during a *rao* therapy as shown in the following sentences:

The *iribana* can produce digestive symptoms: *nato joninra kinanai kanachiari irabaxon*: this person vomits because of *irabana* from *kanachiari*.

The *irabana* does not seem to affect the medicine man or the patient, but a third person who is close to them during the therapy: *Irabana merayanin niwe shatea niskanax rao niwe pikotai:* the *irabana* is produced by the *meraya* when his air and sweat are cut.

The *irabana* effect is even stronger when the medicine man is following a diet (*samá*) with a strong *rao*, such as *kanachiari* o toe, *oni* o ayahuasca, *chuyachaki* o chullachaqui, with which he is acquiring his power:

Eara kanachiarin nashiai, jawen koshibi: I bathe with the plant "toe" and take its power.

The *irabana* is produced without the medicine man's will:

Ja yobekanra, onanyaninra, merayaninra irabanke akaskinmabi: the medicine men –produce the *irabana* without willing it.

This makes it comparable to the "evil eye" (*el mal ojo*), the famous syndrome present in the Mediterranean countries.

These concepts may be difficult to understand for the non-SK, but they show how the SK culture has developed logic of animism.

V: *Effects of the two rao modes*

rao	Material mode	Spiritual mode
Therapy with the onanya-meraya	+	+
Rao meramis effect	+	-

Source: Authors' Archive

Rao Categories and Nomenclature

A *rao* is in general named by its activity: "activity + rao".

For example *chixó rao*, is a plant actively against *chixó* or diarrhea, *yona rao* is active against *yona or* fever, *xeno rao* for dermatosis, *oko rao* for cough.

In some cases the *rao* specifiers do not refer to the therapeutic activity, for example, *samon rao*, where *samon* is a big fly or horse-fly, "una ronsapa", is a plant which has no use related to these Diptera. Another example is that of the *bari rao*, *bari* is sun, which designates a number of botanical species of different "life forms": *jihui, tree,* and *xobi*, *herb.* It is obvious that these plants do not cure either the sun or sunburns, but they have a showy yellow-gold blooming.

Within this double nomenclature system a *rao* category can correspond to several plant species, for example, *chixó rao* can designate several species used to treat diarrhea, etc. Inversely, plant specie which has several uses may have different names according to these uses, e.g. *chixó rao* and *poko rao, for* diarrhea and intestinal pain.

Rao species can also have their own name without any reference to use; such is the case of *Hura crepitans* (Euphorbiaceae) called *aná* in SK, catahua in local Spanish. It is a dominant tree of the riverine forests and is very important in the SK culture. It is also called *peke rao* where *peke* is the leishmaniasis or "uta". It can cure snake and "isula" bites (ant, *Paraponera clavata*). Its sap is first extracted and then refined by fire. The product looks like a milky liquid which is applied over the bite swelling. A diet of 2 or 3 days must be respected, the fish piraña, carachama, chiu-chiu, yambina, and saltón must not be consumed, game meat, chili, fat, and sexual relations should also be avoided.

Its very toxic sap is used as an ichtyocide: "To a bucket of its sap is added a handful of ashes to facilitate fermentation, it is ready after macerating two days; no pregnant or menstruating woman should participate in the fishing party."

This impressive tree may be also an etiological agent, and its spirit, *yoshin* or *ibo*, can produce the SK syndrome *kopia*, "cutipado" in local Spanish (Tournon, 2002). We see that it can be both etiologic and therapeutic.

The plants named *rao* are not only medicinal, but can have other types of activities: poisonous, psychotropic, ethotropic.

Poisonous Rao

The word *rao* was initally translated as poison; we saw that it was the case of *Hura crepitans* sap.

Other plants are utilized as fish poisons:

"Barbasco", *warawasko, Lonchocarpus nicou* (Aubl.) DC., and "sacha barbasco": *Tephrosia toxicaria* Pers. (Fabaceae).

Huaca, *marax*, *Clibadium surinamse* L. (Asteraceae).

Psychotropic Rao

These *rao* are used by the "shamans", *onanya* and *meraya*, during their therapeutic sessions. The famous ayahuasca hallucinogenic drink, *oni* or *nishikon* in SK, is prepared with the vine *Banisteriopsis* spp., Malpighiaceae and the shrub *Psychotria viridis*, Rubiaceae (Spruce, 1873; Friedberg *et al.*, 1984; Rivier & Lindgren, 1972). It has now been vulgarized and commercialized in neo-shamanism.

Ethotropic Rao

They are used to affect and change human behaviors. For example, they can be used to control people and seduce them; they are called "puzangas" in regional Spanish and *noi rao* in SK. Others are used as tranquilizers, e.g. several women told us that they could calm down a jealous and violent husband, *tsokas bene*, with a *tanti rao*. A lazy man who does not like to work in the garden can be stimulated with a *rayati rao*. An awkward fisher or hunter ("afasi" or *yopa*) can be cured with a *mechati rao*. These behavior problems are cured *benxoti*, like an ailment such as fever or diarrhea, by a *rao* (Tournon & Silva, 1988).

Other *rao* are used to control human reproduction, to provoke or avoid pregnancy, *tooti rao* or *totima rao*.

Conclusions of the First Part

Two ethnobotanical systems have been brought to the fore:

1. A taxonomic system based on plants morphology.
2. A *rao* system based on plants uses and activities.

The *rao* has two modes of existence: material and spiritual.

Two categories of human agents can deal with these two modes:

The *raomis* are the herbalists, "experts" in the biological and pharmaceutical properties of plants. They collect *rao* plants, prepare products: solutions, decoctions, macerations, steam baths…

The other agents deal with the spirits of the *rao*. They are called in the SK language: *onanya* from the verb *onanti*, to know; *meraya* from the verb *merati*, to meet, to encounter. This verb is very strong since it can also be translated as "to fall in love".

Onanya and *meraya* have been labelled "shamans", the denomination of Siberian medicine men, which has been popularized by anthropologists.

These agents invoke the spirits of the *rao* and other spirits or *yoshin*, as well as those of the Incas. Invocations of these *yoshin* are supposed to be therapeutic. This is shown

in the invocations called "icaros" in the Peruvian Amazon (Illius 1987). In an icaro, the *onanya Nete Vita*, of the Caimito community of Imiria Lake, there are twenty plants invoked, either giant trees such as lupuna, catahua, ayahuma or biologically active species, the majority of which contain alkaloids (Tournon, 1988). In this icaro chant the plant species that have a strong spirit are that have power in the material world.

The presence of the two *rao* modes, material and spiritual in a *rao* substance may have a synergic effect on the therapeutic activity of the *rao*. A patient who takes a decoction of a *rao* plant will be more positively affected if he knows that the *rao* has a strong spirit, which has been invoked by the *onanya* or the *meraya*.

Second Part: Different Forests, Different Tree Resources

The Shipibo-Konibo communal lands of the Middle and Upper Ucayali include important extensions of forest. In this second part, we shall examine the tree diversities, the knowledge and the resources of SK communal forests.

To know more about the tree resources present on the communal lands of the SK: medicines and *rao*, handicrafts, house constructions, canoe and boat constructions, we did qualitative and quantitative tree inventories on plots chosen in several types of forest. These systematic inventories provide many botanical and ethnobotanical data on the relations of the SK riverine people and the vegetal world.

In the rainy season, the Ucayali waters can produce floods that can last up to six months and reach several meters. In the riverine floodable forests, the trees have to withstand immersion. They have developed biological adaptations, their rizosphera and the plantlets have adapted to it. Another adaptation is the mayor fructification at the end of the rainy season, with the dispersion of fruits and seeds by water currents. The presence of both floodable and non-floodable lands, promotes biodiversity. "Many botanical genera have distinct species in both ecosystems, this situation gives an excellent opportunity for phylogenic and biochemical studies (Goulding, 1993: 80)."

This means that inventories must take in account the existence of floodable and non-floodable ecosystems. Moreover, secondary forests are also present on communal lands, and their tree composition and resources must be studied and compared to those of the primary or almost primary forests.

Methods

The botanical and ethnobotanical inventories of the four plots were done in the framework of the RENACO Project (1991–1996) financed first by UNESCO and later by the DG 11 of the European Commission. It was done in association with the National University of Ucayali in Pucallpa.

The RENACO Project included Dr. J. Tournon, responsible for the team, and forestry technician Francisco Enocaise, who was an excellent informant on timber woods. Regarding their characteristics and uses in house and canoe construction, agronomy students of the National University of Ucayali in Pucallpa (SK or not) have done crucial work: Carlos Etene Etene, Rafael Urquia Odicio, Samuel Caúper Pinedo, Marcos Tenazoa Vela, Catalino Cumapa, José Sanchez Choy, Grober Panduro Pisco, and Pr. Rita Riva Ruiz administradora.

Four hectare forest plots were chosen on SK communal lands of the Middle and Upper Ucayali. On each plot, the RENACO team collected and numbered botanical samples of trees with trunks of more than 10 cm in diameter at breast height, and they were numbered. The samples were sent to the Department of Forest Sciences, National Agrarian University – La Molina, for identification. Most samples were identified by Doctor C. Reynel and A. Daza, at the family and genus levels and many at the species level.

Descriptions of the trees, their names, their cultural importance, uses and possible resources for communities were elicited from local informants. This information was numbered and put into three lists for each plot.

Several ethnobiologists used quantitative methods to quantify the trees and resource diversity of the Amazonian native communities (Philips, 1993, 1994, 1996).

Results

Communal forests can either be flooded or non-flooded lands, the floods can be of variable intensities and durations. Some higher and older terraces are not flooded and are acid and poor in minerals. Community forests can have different histories, they can be primary or secondary, having been logged or not.

These different factors of forest variation have determined the choice of the four hectare plots, 5, 2, 3, 7, with increasing flooding.

Plot 5

Plot 5 is on the in the communal lands of Amaquiria, Upper Ucayali, Iparia district (9° 29′ 12; 74° 7′ 30).

It was chosen on a non-floodable terrace, in a forested area labelled "bosque de altura" in local Spanish or *manán níi* in SK.

The soil is leached; it is acid, pH = 4, and deficient in exchangeable ions, since it is not flooded. It does not receive the annual alluvial silt deposited by the Ucayali subsidence.

Its structure is that of a primary forest. RENACO has counted 532 individual trees with more than 10 cm at breast height; 75 individuals have been identified at least at the level of the botanical family and genus.

Plots 2 and 3

Plots 2 and 3 are on the communal lands of Nueva Betania, Middle Ucayali (8º 23′ 32.8, 74º 18′ 28.5), on alluvial, neutral soils with pH = 6.3–6.6, rich in exchangeable ions. In general, they are flooded between January and March by 0,50–1 m of water. In 1992 and 1994, the floods were stronger, and several trees had disappeared.

Plot 2 is in the forest that Francisco Enocaise and other foresters labelled "bosque primario descremado" or "skimmed primary forest". Some seven years before the inventory, it was logged of its most valuable trees (*Cedrela* spp. and other Meliaceae). It has 532 individual trees.

The importance of the Lecythidaceae is due to the abundance of *Grias neubertii* individuals.

Plot 3 was chosen in a secondary forest a few hundred meters away from plot 2, to compare the tree species and resources between a secondary and primary forest. Plot 3 is a fifteen year old secondary forest. Before the abandonment of a "chacra" in 1980, maize, rice, manioc and bananas were cultivated there for three years.

483 individual trees were counted, and 40 species identified. As expected, it is less diverse than its neighbouring plot 2 forests.

Comparing its floral composition with that of plot 2, we note the dominance of typical fast-growing colonizing species: *Cecropia engleriana*, *C. ficifolia*, *Capirona decorticans*, *Guazuma crinita*, *G. ulmifolia*, *Solanum grandiflorum*.

We note the presence of a *Citrus* sp. which was planted before the abandonment of the plantation, and survived 13 years in the fallow.

Plot 7

Plot 7 is close to plots 2 and 3 on the communal lands of Nueva Betania.

It is one-hectare rectangle, 200 m long and 50 m wide, parallel to the shore of a community lake.

It tends to be flooded by the Ucayali's waters from November to April up to 3–5 meters, therefore much more than plots 2 and 3. This ecosystem is called locally a "tahuampa", or *níi taxbá* in SK. Plot 7 has hardly been disturbed by man.

Several authors have shown the importance of these "tahuampa" forests (Fig. 20) as fishing resources (Goulding, 1980). The Characidae fish species feed on the numerous fruits hanging or dropping from trees (Arecaceae, Fabaceae, Sapotaceae) and vines. However, few quantitative vegetation inventories of these "tahuampa" forests have been carried out.

Plot 7 has 516 individual trees distributed in 38 botanical families.

20: *Tahuampa, Grober and Francisco*

Source: Authors' Archive

Native SK Knowledge on the Tree Diversity

The Amazonian natives are said to have deep knowledge of their vegetal environment. The quantitative inventories permit us to test this statement.

Plot 5: number of unknown trees: 26 of 517
Plot 2: number of unknown trees: 2 of 532
Plot 3: number of unknown trees: 3 of 483
Plot 7: number of unknown trees: 23 of 516

The number of trees unknown by informants is very small for the four plots. The difference between the number of unknown trees on plots 5 and 7 can be caused by the difference in the informants' knowledge or by the greater biodiversity of these plots.

Botany and Ethnobotany of the Four Plots Inventoried

In general, the plant species classified in a given botanical family have many similar biological properties and, therefore, similar potential uses in common. This is why we chose the botanical family level to analyse the SK ethnobotany of these four plots and their resources.

In the case of the pharmacologically active components of the Brazilian flora, O. Gottlieb (1982) demonstrated that active compounds are present in *Magnoliiflorae* spp. This is also true in the neighbouring families of the Gentianiflorae-Lamiiflorae-Solaniflorae-Asteriflorae.

Among the SK, *rao* are found in species of the families Apocynaceae, Rubiaceae, Solanaceae. Biologically and pharmacologically active components of the Brazilian flora are also well represented in the SK *rao*. (Tournon, 2002).

Divergences between O. Gottlieb's results on Brazilian flora and results on the SK *rao* come principally from the presence of many Monocotyledonas among the *rao*: 12 Araceae, 5 Commelinaceae, 14 Cyperaceae, 5 Liliaceae and Iridaceae, 5 Zingiberaceae.

Resources other than medicinal plants are also related to several botanical families:

- edible fruits with Cecropiaceae, Fabaceae, Moraceae, Sapotaceae;
- valuable timber wood with Fabaceae, Meliaceae, Myristicaceae.

The presence or absence of a botanical family implies the presence or absence of the type of vegetal resources and uses, since plant species belonging to the same botanical family generally have common biological properties. In addition, they often have the same uses: pharmaceutical, handicraft, alimentary, valuable timber, and valuable firewood.

These correlations justify the choice of botanical families to analyse the ethnobotanical data of the four plots 5, 2, 3, 7.

The data collected by the RENACO team were first put in lists of numbered individual trees, one list for each plot. From these lists, we extracted information for each botanical family present in the four plots.

The following synthetic information is given for each of the four plots 5, 2, 3, 7 (see Tab. VI):
Number of individual trees present. It measures tree density.
Number of botanical families present. It measures tree biodiversity.
Number of species or morphospecies present. It is another measure of the tree biodiversity.

VI: *Number of individual trees, botanical families numbers, species and morphospecies numbers for the four plots: 5, 2, 3, 7*

Plots	Tree numbers	Botanical family numbers	Species and morphospecies numbers
5	517	29	120
2	532	22	75
3	483	18	40
7	516	38	155

Source: Author's Archive

Commentaries

Plots 5, 2, 7 can be considered primary forests and have comparable individual tree numbers and botanical families. Plot 3 has less individual trees and less botanical families than plot 2, which is to be expected from a fifteen year old secondary forest.

In Tab. VII, the list of 49 botanical families inventoried on the four plots is included, as well as the number of individual trees of each botanical family present in each plot. They give important data about the four plots resources.

VII: *Number of individual trees in all the botanical families present in the four plots*

Plots	5	2	3	7
Anacardiaceae	0	1	9	1
Arecaceae	0	1	0	0
Annonaceae	26	17	0	11
Apocynaceae	0	2	1	22
Araliaceae	1	0	0	0
Asteraceae	0	0	1	0
Bignoniaceae	2	0	0	0
Bombacaceae	19	104	4	17
Boraginaceae	3	0	3	0
Burseraceae	52	0	0	0
Cecropiaceae	10	6	281	4
Celestraceae	0	0	0	6
Chrysobalanaceae	1	14	0	14
Clusiaceae	6	0	0	6
Combretaceae	3	8	2	2
Elaeocarpaceae	3	0	0	8
Erythtroxylaceae	0	0	0	1
Euphorbiaceae	24	16	17	27
Fabaceae	44	47	59	92
Flacourtiaceae	9	0	0	17
Hippocrateaceae	1	0	0	1
Icacinaceae	0	0	0	2
Lauraceae	33	13	4	27
Lecythidaceae	10	186	12	5
Malpighiaceae	0	0	0	1
Marcgraviaceae	0	0	0	3
Melastomaceae	0	0	0	3
Meliaceae	32	19	0	7
Meliosmaceae	0	0	0	3
Menispermaceae	0	0	0	1
Monimiaceae	3	0	0	1
Moraceae	32	27	43	11
Myristicaceae	61	3	0	0
Myrsinaceae	0	0	0	1
Myrtaceae	6	0	0	9
Nyctaginaceae	6	6	0	10
Olacacaceae	0	5	0	5
Polygonaceae	0	10	3	38
Rosaceae	0	0	0	2

VII (continued): Number of individual trees in all the botanical families present in the four plots

Plots	5	2	3	7
Rubiaceae	4	0	14	8
Rutaceae	1	3	2	0
Sapindaceae	0	1	1	15
Sapotaceae	31	2	3	48
Simaroubaceae	3	0	0	0
Solanaceae	0	3	0	1
Sterculiaceae	16	0	13	0
Verbenaceae	1	0	0	0
Violaceae	3	0	0	1
Vochysiaceae	0	0	0	1

Source: Author's Archive

Some botanical families are well represented on the four plots; this is the case of the Bombacaceae, the Fabaceae, the Lauraceae, and the Moraceae. Other families are abundant on some plots and almost absent on other plots. For example, the Apocynaceae are important for their biological activity, and they are present on plots 3 and 7, and absent on plots 5 and 2. Polygonaceae represented by the Triplaris genus is abundant on plots 2 and 7 and absent on plot 5, as *Triplaris* spp. grows with its feet in the water. On the contrary, Burseraceae, with the genus *Protium*, is abundant on the non-floodable plot 5.

Lecythidaceae has 186 *Grias neubertii* on plot 2, Myristicaceae 61 *Iryanthera* and *Virola* spp. on plot 5. These distributions may be a sign of management by man.

Arecaceae, Rosaceae, Simaroubaceae, Solanaceae, Verbenaceae, Violaceae, Vochysiaceae have few individual trees.

These differences have consequences for the resources available to SK communities. It shows the importance for a community of having several types of forest on their lands.

Resources and Uses of the Different Botanical Families

In what follows, we present the ethnobotanical information gathered for the botanical families of Tab. VII, in alphabetical order, omitting only the families that have very few representatives: the Arecaceae, Rosaceae, Simaroubaceae, Solanaceae, Verbenaceae, Violaceae, and Vochysiaceae. For a given family, the results differ among plots 5, 2, 3, and 7.

Anacardiaceae

The family Anacardiaceae is present on the plots with two species: *Spondias mombin* and *S. taperiba*.

Spondias mombin, "ubos" in local Spanish, *xexon* in SK, is present on P2, P3, and P7. It is a spontaneous and important native fruit tree; its fruit juice is excellent. It is an important food resource for the native fauna, in particular for the tortoise "motelo" (*Geochelone denticulate*, Testudinidae). It is also a *rao*: "The bark decoction is ingested to treat internal infections, in particular those of the feminine sexual organs. It is also a *totima rao* or anticonceptive plant; a spoonful is ingested every morning during the month, followed by food diet and sexual abstinence; also a *kinanti rao* or emetic and a *chixó rao* or anti-diarrheal, it is ingested and after five minutes warm water is drunk to fill the stomach." The informant gives other details on the dosis for children and adults, showing the precision of the *raomis* recipes.

One specimen of *Spondias taperiba* was seen in the plot 3. This species was introduced from Asia to South America where it is cultivated for its fruit. The individual must be a surviving tree from past cultivation.

Other use: wood is used for laminates. We hope that these precious trees do not all end up as plywood.

Apocynaceae

This is a pharmacology important family with active alkaloids.

The family is absent of plot 5.

Plot 2 has two individuals: *Peschiera van heurckii* Allorge is a shrub or small tree named, "sacha sanango", "huayra sanango" in local Spanish, *wano xaka* or *niwe sanango* (viento/sanango) in SK.

The *raomis* make a solution of its bark for body strengthening; it is a *koshi rao*. It is drunk four or five times and should be followed by a one month diet: no fats or sweets, and sexual abstinence. It is also an *ochiti mechati rao*. Its latex with water is given to the dog once so that it will be a good hunter.

The second Apocynaceae present on plot 2 is an *Aspidosperma* sp. It is a *jonon rao* (collared pecarry/*rao*). Its bark is rasped, mixed with fish mazamorra[16] and given to eat to the hunting dog, which is afterwards thrown into water, three times, so that its body is cleaned and the dog becomes a super peccary hunter.

Plot 3 has an Apocynaceae named *awa jonra* (tapir semen), that could be a Lacmellea. Its latex is cooked and a plastic mass is obtained that is used to mend holes in canoes and boats.

On the plot 7 there are several *Himatanthus tarapotensis*, "bellaco caspi" in local Spanish, *sokoba* in SK (Fig. 21). It is a *rao*. Its bark is scraped and diluted with water, a half glass is drunk to treat "el mal de gente" or "shitana". Bark and leaves are also used in steam baths.

Lacmellea floribunda has edible sweet fruits named *keo* in SK.

Bombacaceae

The Bombacaceae trees are very spectacular. Several are giants that dominate the forests. Seven species were found on all four plots, and are economically important for the communities.

The balsa tree, *Ochroma pyramidale* of Amazonian origin, is internationally-known. It is named "topa" in local Spanish, *moxó* in SK. Aside from its use to make dolls and other handicraft objects, it is used to make rafts, and house staircases. It is a *rao*: its charcoal is put on deep cuts and wounds.

There are three *Quararibea* sp., "zapotillo", *níii ison xoma* or "seno de mono", two on plot 5 and one on plot 2. It is a tree with many uses:

1. Its fruit is edible for man, primates, deer, peccaries, tapirs, motelo tortoises and parrots;
2. Its wood is heavy; it is commercialized and also used to make beams for rural houses ("vigas, soleras, caibros, culatas").

On plot 2 *Quararibea asterolepis* has been identified. It is a *rao*. "Its rasped bark is put in aguardiente. The maceration fortifies the body and increases sexual power. The preparation is left buried fifteen days near where people walk, thus it takes their energy. Afterward, it is drunk every morning during a week. It is accompanied by a bath in a river or a lake, when the river grows, allowing one to take the strength of the guayaba branches and trunks. Fifteen days of diet and sexual abstinence must be respected."

Two Pseudobombax are present, one on plot 5 and another on plot 7.

They are called "punga, punga de altura" in local Spanish, *ponka* in SK, on plot 5. "Punga de bajeal" or "punga blanca" or *joxo ponka* on plot 7.

16 Mazamorra (from Spanish, Moors' dough) is a traditional maize-based Latin American food (Ed.).

21: *Apocynaceae, Himatanthus tarapotensis; sokoba, socoba*

Source: Authors' Archive

Two Pseudobombax are present, one on plot 5 and another on plot 7.

They are called "punga, punga de altura" in local Spanish, *ponka* in SK, on plot 5. "Punga de bajeal" or "punga blanca" or *joxo ponka* on plot 7.

On plot 5, its fruit is said to be eaten by man and mammals such as paca, agouti, tapir, deer and peccary. Its timber wood is light; it floats, and so is used to make canoes and paddles.

The Pseudobombax present on plot 7 is an interesting *rao*: "La flema del fruto se toma con tabaco; es una planta maestra, *ibo rao*, se dieta 2 años, luego se puede curar enfermedades psíquicas, virotes, dolencias del cuerpo," which can be translated to mean "its mucus is ingested with tobacco; it is a master plant or *ibo rao*, which needs a two-year diet but then gives the power to treat psychological disorders, pains and other health problems attributed to wichtcraft darts."[17]

In "Illustrated guide to the trees of Peru", one can read on page 496: "3 species recorded in Peru: 1) *P. marginatum*… in lowland nonflooded forests below 500 m alt. 2) *P. munguba*… on periodically flooded sites below 500 alt. 3) *P. septenatum*… in periodically flooded forest below 500 m alt. So that it can be inferred that the "punga de altura" is *P. marginatum*, the "punga de bajial" would be *P. munguba* or *P. septenatum*.

Ceiba pentandra, the famous "lupuna", *xóno* in SK, is present on plots 2, 3 and 7. Its giant trunk is commercialized by the plywood industry. Its spirit or *ibo* has much power, and rituals should be respected to avoid its malevolent effects:

No pregnant woman must approach the lupuna, its "mal aire la puede cutipar con diarrhea y vomito blanco." The translation of this phrase is difficult because it includes the two SK concepts, which are general to the Peruvian Amazon: "el mal aire", literally bad air, *niwe* in SK and "cutipar" or copy, which are etiological factors (Tournon, 2002). "Bad air produces diarrhea and white vomiting."

The *xóno ibo* can "cutipar", i.e. knock down a pregnant or nursing woman who approaches a lupuna, or a baby brought by his father near a lupuna, and they must be cured by an *onanya* or a *meraya* with ayahuasca.

Septotheca tessmannii Ulbr., "utucuru" or *otocoro* in SK, is abundant on plot 2. Its bark is dried for two weeks and the resulting powder is mixed with the clay for ceramics, to prevent breakage in the fire. Its wood is used in the construction of houses.

Burseraceae

All Burseraceae collected belong to the genus *Protium*: "38 species in Peru, nearly all restricted to lowland rain forest…; *Protium opacum* in non-flooded rainforest up to 1000 m altitude." (Pennington *et al.* 2004: 402) All twenty-one Protium trees were ionn plot 5, the only non-flooded plot.

Two species present on plot 5 were identified: *Protium puncticulatum*, *Protium neglectum*.

The species are rich in oleoresins; they are named "copalillo" or "little copal" and have properties close to those of the copal. Copal has been used by many American native groups for illumination before the diffusion of electricity and is still used in healing and religious ceremonies.

SK craftwomen use *Protium oleoresin* to varnish ceramics;

1. *Sempa* is used to create a waterproof coating on the inside of the ceramics;
2. *Yomoxó* is used to waterproof the outside and make it shiny.

Two copalillo native categories were found:

Yomoxó or *kikinma yomoxó*, literally *yomoxó* of no superior quality, or "copalillo" in regional Spanish. "It is not the real copal, its resin is not abundant and is powdery."

1. It is used to varnish and paint ceramics and wooden objects. Ceramics are not heated much, so that when pieces of copal are introduced, they do not set on fire; then with a spatula and a rag, the interior is impermeabilized. To paint an object, the copalillo resin is fired, and its vapor is directed and concentrated on the piece of wood to protect it against the "alquitrán": canoe, paddle, part of the house, and a piece of fabric;

17 "Virote" or "tsentsak" are invisible pathogenic projectiles or magical darts utilized in indigenous and mestizo shamanic practices for the purposes of sorcery and healing throughout much the Amazon Basin. For further information see Beyer (2009) (Ed.).

2. The resin is set on fire to give light;
3. The smoke of copal is considered a *rao* to treat nauseas, the patient sits down for one hour in a closed space; the copal is set on fire and the patient inhales the smoke;
4. Protium has a fruit with a fleshy taste, it is the favorite food of the nocturnal (*Aotus* spp.) and diurnal monkeys (*Ateles paniscus*, *Lagothrix lagothricha*, *Cebus* spp., *Alouatta belzebul*), of parrots, aras, peccaries, and tapirs;
5. Its wooden beams (soletas, caibros, vigas, travesanias), last for 5 years, made into canoes, it floats and lasts two years; it is also commercialized in the plywood industry; and it makes good firewood, and good coal.

Another species, *Protium puncticulatum*, is also a *koshi rao*. The word *koshi* means strong. Thanks to its "muscular roots" it fortifies the body and increases sexual power. The preparation is left buried for fifteen days "near where people walk", and in this way it takes their energy. After it is drunk every morning during the week, it is accompanied by a bath in a river or lake, and when the river grows, one can acquire the strength of the guayaba branches and trunks. It is followed by fifteen days of diet and sexual abstinence.

Cecropiaceae

The *Cecropia* spp. are the first trees to colonize river banks, their large leaves can be seen by the travelers along the Ucayali. So that it is not surprising to see so many of them on plot 3, which is in a riverine secondary forest, with 181 individuals of the *Cecropia* genus. The neighbouring plot 2, which is in the primary forest, has no more than six Cecropia trees; they do not stand in the shade of the successional trees. The trunk shelters symbiotic ants.

Two species, *Cecropia engleriana* and *Cecropia ficifolia* are present on plots 2 and 3. Both are named "cetico" in local Spanish, *bokon* in SK.

Cecropia engleriana Snethlage, *bokon* or *taxbá bokon* (bajeal/cetico), is used as *matsi jikia rao*, where *matsi jikia,* literally the "cold enters", designates several forms of rheumatism: the bark is cooked and the whole body is washed with the cold decoction; this is followed by a week diet avoiding salt, fat, chili (ají, *Capsicum* sp.), and sexual abstinence must be respected.

Its fruits are eaten by humans and bats, and are used by children as baits for bagres (*Pimelodus* sp.).

Its gelatinous trunks and branches are used to move and roll trunks.

Cecropia ficifolia Snethlage, *shiari* in SK. An informant explained how it is used to make ropes: "Its outer bark is scraped with a machete, its inner bark is taken out and put in sheets that are struck and whitened in water, and they are twisted to make straps for harpoons and bows."

Plot 7 has a *Cecropia membranacea* Trecul, "cetico colorado" or *báwa tae* (parrot/foot). Its fruits are eaten by different categories of fish: cahuara (*Oxydoras* sp., Doradidae, Siluriforme), bagre (*Pimelodus* sp., Pimelodidae, Siluriforme), sardinas (*Triportheus* sp., Characidae, Characiformes), lisas (*Hoplias* sp., Erythrinidae, Characiforme), but not the boqui chico (*Prochilodus* spp., Prochilodontidae, Characiforme).

These details show demonstrate the impressive knowledge of SK informants regarding their ecology.

Pourouma cecropiaefolia Mart., "sacha uvilla" or *níi xankon* grows on plots 5 and 7. Its fruit is sweet and is very appreciated the SK communities and in Pucallpa. In the woods, it is eaten by monkeys, agoutis, pacas, deer, tapirs, and parrots. Ropes are made of the bark fibers; they are used for bow strings to shoot arrows at the water turtle "taricaya" (*Podocnemis* sp., Pelomedusidae).

Chrysobalanaceae

Chrysobalanaceae with *Licania arborea*, *L. blackii*, *L.brittenia*, *Hirtella triandra*, *Coupea* sp. are present on plot 5. In local Spanish, these species are called "apacharama", and in SK *mei*, which can be translated as "mixed because they are mixed with clay to make the ceramic mass: The bark is burnt, ground to powder with a stone and mixed with clay to form a half humid mass, so that the ceramic will resist being heated." The explanation is that their bark is rich in silica powder, which avoids the shrinking and breaking of ceramics.

On plot 7 we found a *Licania* sp., *wanin kaya rao* (pijuayo/alma/rao). This *rao* has two applications:

1. To treat tumours, a resin is applied with tobacco;
2. *Onanya rao* or "plant to know", its resin is smoked with tobacco and absorbed with saliva, one has to follow a diet for six months in the woods. This interesting information points to an as yet unreported hallucinogen.

Combretaceae

The genus *Terminalia* is found on the plots 2, 3 and 7.

On plot 3, *Terminalia oblonga* was identified; in the Peruvian Amazon, it is named "yacu shapana", the Quechua name formed by yacu: water, and shapana: moving, it moves in the water, in SK it is *yonshin* or *awa pishi* (tapir/ribs). Uses:

1. Its decoction is used to dye textiles, women's *chitonti* are dyed in brown-black;
2. Its wood is valued and used to make canoes, boats, and rafts.

Terminalia oblonga R. et Steudel was seen on plot 7, where it was called "palo rosa de bajeal" (Palo rosa: *Aniba rosaedora*), *taxbá kinxon* in SK. Its wood is aromatic.

Euphorbiaseae

One *Shiringa* sp. tree was founded on plot 5, *shirinka* in SK, according to SK comuneros[18], it has several uses:

1. Its latex is industrialized;
2. Its nut is eaten by agouti (añuje), paca (majás), parrots, and tucan;
3. Handicraft, necklaces are made with its seeds;
4. Its wood floats, but has no commercial value;
5. Good as firewood, average as coal.

On plots 5 and 7 we found *Croton matourensis* Aubl. named *báwan chitari* (parot/cinnamon), with aromatic wood. It is economically important, as its timber is hard and resistant, and it is a fast growing tree. This species is dominant on a plot on the campus of the National University of Ucayali (Sanchez & Tournon, 2000).

Several trees identified as Euphorbiaceae by the RENACO team and the botanists of the National Agrarian University – La Molina were recognized and named, but not given uses by SK informants:

Hieronyma alchornoides M.Arg., "itahuba", *xawan pechi* (tipo de guacamayo/ala) in SK.
Sapium sp., named "caucho masha", "shiringa rana" are present on plot 5.
Other Euphorbiaceae trees were not recognized by informants:
Aparisthium cordatum, "zancudo caspi".
Hieronyma alchornoides M.Arg., "itahuba" in local Spanish.
More Euphorbiaceae are present on plot 7, but no uses were recognized:
Hieronyma alchornoides M.Arg., "itahuba" in local Spanish.

18 In this context, "comunero" is a Spanish term which means "member of a community" (Ed.).

Mabea maynensis M.Arg.; in SK: *joxo wanin kaya rao* (white/Pijuayo/spirit/*rao*).

Sapium sp.; "caucho masha", *xóko in SK* , its white latex is oxidized in contact with air and becomes yellow with a pungent smell.

Drypetes amazonicus Sleumer, *janín bexpe* in SK or "eyes deep in their sockets".

The Euphorbiaceae family has many individual trees and species on the four plots, but appears they are little known and used in the communities.

Fabaceae

Fabaceae are well represented on the four plots, which demonstrates the adaptive potential of this family. Many Fabaceae genus and species are important in the human ecology of the SK and in their daily life.

The Inga genus is very diversified; 50 species have been reported in Peru (Reynel & Pennington, 1997). It is present on the four plots. The fruits of several species are eaten by humans, those of all species by primates (monkeys and tamarins) and birds.

Here, we consider the *Inga* spp. found on the four plots:

Plot 5

Inga marginata Willd (*I. semialata*), "shimbillo", *shipin xenán, moka xenán* in SK. Use: the fruits are eaten by man and the Callitrichidae monkeys. Informants call both genus *Callitrix* and *Saguinus* "shipi" or "pichico" in local Spanish.

Inga cf. *marginata*, is called shimbillo de altura and *manán xenán* in SK. It is multi-use:

1. *Rao*: its resin is a cicatrizing agent, after cutting the bark one waits for the exudation of its resin, which is then put on a piece of cotton and applied to the wound;
2. Its fruit, pítima, is not edible by man;
3. As with all Inga species, its firewood is good and yields good charcoal.

Plot 2

Inga thibaudiana DC., "shimbillo", *xopon xenán* (lana/shimbillo) in SK, has fruits that are eaten by man, monkeys Cebidae, Callitrichidae, parrots; it makes good firewood.

Inga cayennensis, fruits eaten by monkeys Cebidae, Callitrichidae and birds.

Inga alba, its fruits are said to be eaten by monkeys and birds.

Plot 3

Six *Inga edulis* Mart. were found on plot 3. We can suppose that they come from domesticated ones, cultivated before the fallow. They are named "guabas" in local Spanish; *bana xenán* (cultivated/ Inga) or *wishkonti xenán* in SK.

Other Inga species were found on plot 3 and classified by D. C. Reynel:

Inga cf. *leiocalycina*, also named "shimbillo" in Spanish, and is called *marin xenán* or "shimbillo de agouti" (*Dasyprocta* sp.) in SK.

Inga lopadadenia, "shimbillo" in Spanish is named *poapoari xenán* in SK.

Four *Inga ruiziana* G. Don, "shimbillo" in Spanish, two of them were named *poapoari xenán* and two *moka xenán* or "hot, pungent shimbillo".

Inga semialata, "shimbillo" and *shipin xenán or tamarin shimbillo*, which is said to be edible by man and by tamarins or *shipi* (Callitrichidae).

Plot 7

Plot 7 is in a "tahuampa" forest, where other Inga species are present:

Inga nobilis Willd., is called: *koman xenán* or "shihuahuaco" Inga, where shihuahuaco is *Dipteryx micrantha*.

Inga cf. *brachyrhachis* Harms, is called also: *koman xenán*. Its fruits are eaten by the primates Cebidae and Callitrichidae.

Two more *Inga* sp. have not been identified. They are called *jenen xenán* or "yacu shimbillo" (water shimbillo), they are eaten by parrots and the squirrel monkey *Saimiri sciureus*, frailecillo, *wasa* in SK. Another one is named *kapabo xenán* or "squirrel shimbillo" and *ochitinin mechati rao* or "good hunting dog *rao*".

"The bark juice is added to mazamorra, then the dog should be put to bathe in the river. This Inga fruit is said not to be edible."

This long review shows the great botanical diversity of the *Inga* genus. A total of five different *Inga* spp. Were found on the four plots.

In local Spanish *Inga edulis* is named "guaba", the other Inga are all named "shimbillo", only two names compared to the 9 names found in SK. In B. Berlin's ethnobiological classification system (1992), *xenán* is the generic or folk generic taxa. *Bana xenán, kapabo xenán, moka xenán, shipin xenán, wishkonti xenán, xopon xenán, koman xenán, jenen xenán* are the folk specific taxa. However, as seen in Tab. VIII, the correspondence is not always perfect between the SK specific taxa and the Linnean botanical species.

VIII: *Inga species present in the different plots*

Plots	Inga spp.	Spanish names	Shipibo-Konibo names
5	I. marginata, I. semialata	shimbillo	*shipin xenán, moka xenán*
2	I. thibaudiana, I. alba	shimbillo	*xopon xenán*
3	I. edulis	guaba	*bana xenán, wishkonti xenán*
7	I. brachyrhachis	shimbillo	*kapabo xenán*

Source: Authors' Archive

More Fabaceae genus and species are culturally and practically important.

Copaifera reticulata: "a unique species recorded from Peru; the notable character of this genus is the trunk containing liquid oleoresin… it provides good timber for construction and furniture and the liquid oleoresins are used for varnish and in medicine." (Pennington *et al.*, 2004: 273–274)

"Copaiba", in local Spanish, is an important medicine among the Spanish speaking "mestizos" and the Shipibo-Konibo. In SK it is named *piní rao* (tiredness/*rao*) or *ochitinin piní rao* (dog/tiredness/medicine).

We found one *Copaifera reticulata* on plot 5 and three on plot 7. Called "copaiba" or "copaiba masha", *kopaiba jiwi, bonshish* in the Middle Ucayali, *matis siwati* in the upper Ucayali, it is a valuable and multiusage species.

On plot 5 its resin is used to disinfect and cicatrize superficial wounds. On plot 7 it is said to be a *piní rao* (tiredness *rao*) active on convulsive cough and bronquitis and alleviates fatigue. Its bark is scraped and the juice is taken, but not the inner bark's yellow sap. Another recipe is to cook the bark with tobacco leaves, a glass of this decoction is drunk three times a week, following a diet: "no sex, no sugar, no fat". The precision of the recipe must be respected.

It is also used as an *oko rao* to treat convulsive cough. It is an expectorant that cleans the lungs. Also the bark is cooked with five tobacco leaves and ingested; a quarter of this decoction can be drunk three times a day, followed by five days of diet (sex, sugar, fat).

Its timber has commercial value.

Other species of this large family were found:

On plot 5: *Ormosia* sp., "chontaquiro de bajeal, chonta caspi", *wanin jiwi* in SK. Its hard wood is used to make the structural beams of houses.

On plot 7: *Piptadenia* sp., "pashaco", *síki* in SK. Its light wood is used for house construction and to make furniture, and canoes.

Fabaceae, *Swartzia myrtifolia* J.E. Smith, is an *ochitinin piní rao* and used like *Copaifera reticulate*.

Pterocarpus is an important Fabaceae genus for the local people. It is a master plant, *ibo rao*, *onanya* and *meraya* learn from it.

Pterocarpus spp. are present on plot 2, named in local Spanish "palo plata" for the shape of its fruit, "cuclliqui caspi", "uchupa caspi" in quechua and *ko'xon tama, onban, awa pishi* in SK. Their red resins are a known medicine or *rao*: an intense red aqueous solution of its bark is prepared, it is used for the "patco", mouth infection of the infant, it is also antitussive and ingested every morning, twice a week, with much water, without salt. Several *Pterocarpus* spp. have anti-inflammatory properties.

On plot 7 a *Pterocarpus* sp. is also present; two additional medical uses are given: the sieved fresh bark and the red resin are used against "cólera"[19] and for vaginal ailments.

Myroxylon balsamum (L) Harms, the Peruvian balsam is a famous product. Its gum was and is still a popular home remedy to alleviate a cold. Its essential oil is used in perfumes and cosmetics; it contains vanillin, coumarin, cinnamic and benzoic acids.

It is present on plot 2, called "sajino caspi" in local Spanish and *jonon rao* in SK, which means peccary medicine. Its bark is scraped, mixed with "mazamorra de pescado" and given to the hunting dog, which is then thrown into the water, so that it eliminates what is bad in its body and becomes an excellent peccary hunter.

Flacourtiaceae

There is a *Laetia* sp. on plot 5 that was unknown to the informants.

All other Flacourtiaceae are on plot 7.

Two *Casearia aculeata* Jacquin are present, "timareo" in local Spanish or *bawá bero* (parrot/eye). Its fruits are eaten by birds and fish: "sardinas" (*Triportheus species*), "palometas" (*Mylossoma* spp., Characidae), "lisas" (Anostomidae, Characiforme). It is appreciated for its slender and straight trunks of the trees, and makes planks that can last long years.

Another tree is named *washmeman ewa* (algodón/tremendo) for the same species.

The species *Prockia crucis* L. was identified. The thorns of its trunk can provoke foot infections if you step on them, as does the bagre flipper. Leaves and bark of this same tree are put on the infection, which subsides immediately, hence it is called *tonónman rao* (bagre/medicina); it also cures other infections, as well as swellings of the stomach and kidneys.

Here we have an example of the "signature theory": the thorns of this plant can produce an infection that can be cured by the leaves and the bark of the same plant.

Another Flacourtiaceae is the species *Banara guianensis* Aubl., in SK: *takon chimapo* (unchala, orn./ceniza). This *rao* cures children fevers, its "macollo" or fresh leaves are put in water, the liquid is taken 3 times a day; the mucilage of the inner bark is applied on the eyes to treat "eye film", an eye syndrome. One has to avoid exposure to direct sunlight and not be exposed to smoke from burning wood during the treatment.

Lauraceae

This is a very seductive botanical family, all of its species have rich aromas, and some of their essential oils are used in medicines and are *rao*. These species give valuable commercial and aromatic wood, very appreciated for furniture making.

In local Spanish the Lauraceae is named "moena", *yonó* in SK.

The rose wood, "palo de rosa", Aniba rosaedora had been over-exploited during the 1950s and 1960s for its high-valued essential oil. It has become very rare in the Peruvian Amazon in recent times. It has disappeared from the Ucayali Valley, but it is said that a new generation has grown in distant tributaries.

19 For culture-bound syndromes see chapter 4.1.5 (Ed.).

Plot 5

Ocotea sp., "moena de altura", *manán yonó* in SK.

Several uses have been identified:

1. Monkeys and birds eat its fruit, and once they have fallen off the trees, it is eaten by pacas, agoutis, and deer;
2. Its timber wood is of first quality: It is used for construction and for making canoes, which may last 8–10 years.

Nectandra sp., moena, moena amarilla (yellow laurel), in SK *panshin manán yonó* has the same uses as the former *Ocotea* sp.

Plot 2

Ocotea sp., "moena de bajeal", *taxbá yonó* in SK. Uses: timber wood for house building, beams and planks. *Rao*: its resin is mixed with fish "mazamorra" (boiled maize) and given to dogs so to make them good peccary hunters.

Nectandra longifolia is another "moena de bajeal": *taxbá yonó* in SK.

Plot 3

Ocotea sp., "moena de altura", *manán yonó* in SK.

Uses:

1. Fruit eaten by monkeys, pacas, agouti, deer, and birds such as parrots and tucan;
2. White timber wood excellent for construction and building canoes that float and can last 8–10 years. It is also sawed and commercialized.

This moena, a "moena amarilla", *panshin manán yonó*, looks the same as the plot 5 Nectandra and has the same uses:

1. Its fruit is eaten by monkeys and birds, such as parrots and tucan, and once it has fallen off the trees by pacas, agoutis, and deer;
2. Timber wood of first quality, which floats, can be used for house beams, and for canoes that last 8–10 years.

Plot 7

Plot 7 in a flooded forest o "tahuampa" has several Lauraceae, some of the genus and species present are different from those of plots 5, 2 and 3.

Nectandra longifolia and *Licaria* cf. *triandra* are called "cunchi moena", *cunchi* or *bagre* is the fish *Pimelodus blochii* (Pimelodidae, Siluriforme), and *tonón yonó* where *tonón* designates the same fish in SK. It is a *ronon rao* (snake/medicine) used to treat snakebites, "without pain or infection"; the bark is scraped, and the juice is mixed with mud and applied onto the bite. Its fruits are eaten by small birds and fish, fishing is good under this tree and the fish pick up its perfumed taste. The wood is commercialized.

An *Ocotea* sp., "moena de bajeal", *taxbá yonó in SK*, is another *ronon rao* (snake/medicine): leaves and bark are crushed in a recipient; twenty glasses of water are added, then it is sieved, a half glass is drunk until the pain disappears, and the bite is healed.

A diet must be followed: no fat, chili, nothing acid, and sexual abstinence during one week.

Its wood is used to make canoes.

Nectandra cf. *pulverulenta* is another "moena de bajeal", *taxbá yonó* in SK.

Uses: good timber for building and planks.

Two *Endlicheria* spp.: *Endlicheria krukovii* (Sw.) Kostern, named *ochitinin piní rao*, and *Endlicheria dysodantha* (R.etP.) Mez., named *manxaman kawati* were identified.

Lauraceae, ver *Aniba puchury-minor*; its name in SK is *manxaman kawati* (garza/puente, asiento). It is a *mechati rao* used to become a good fisherman and hunter. Daniel Maynas

narrates how his father-in-law gave him this *mechati rao*, so that he could feed plenty of fish to his family (Tournon 2013). Thanks to its essential oils, it is a good fire-lighter.

Ocotea cymbarum, was identified, but it was unknown to informants.

Lecythidaceae

This is a family of giant and impressing trees. One is the *Bertholletia excels*, which yields the Brazil nuts. It does not grow near the river Ucayali but can be found in the Purus district of the Department of Ucayali.

Several individual trees of the genus *Eschweilera* were found on plots 5 and 7.

Plot 5: *Eschweilera coriacea* (A.P.DC.) Morii is named "machimango" in local Spanish, *ison chomo* (monkey/Calabaza), *joxo ison chomo* (monkey/calabaza blanca) and *shinon rao* (monkey/*rao*) in SK.

The following uses were identified:

1. Long fibers are taken off its bark and used to tie up and carry loads;
2. Its timber wood is commercial and enter the lumber industry, it is used for inner house planking, and ceiling construction;
3. Its fruit, a globular pyxidium, is eaten by the tapir.

"17 species (of *Eschweilera*) recorded from Peru… *Eschweilera coriacea* grows in lowland rain forest on both periodically flooded and not flooded land below 500 m alt.; the wood of several species is used for heavy construction (Pennington *et al*., 2004: 572)."

Another Lecythidaceae, probably another *Eschweilera* sp. with an elongated pyxidium, is named "machimango colorado" in local Spanish and *ison chomo* or *joshin ison chomo* (monkey pitcher, red monkey pitcher) in SK. Its uses are the same as those of *Eschweilera coriacea*.

Plot 7 has another *Eschweilera* sp., named also "machimango blanco" or *ison chomo* in SK.

Meliaceae

Among the most precious woods of the Amazon are those of the family Meliaceae:

Mahogany (*Swietenia macrophylla* G. King) is one of the highest priced red woods found on the international market. It was once common in the Peruvian Amazon, but has been overexploited. Nowadays, it has become very rare near rivers and roads, and new earth roads are opened every year to reach new mahogany patches.

The *Cedrela* spp., "cedro tropical" or *konxan* in SK, have a rose-colored wood that looks more attractive to some than the intense red-colored mahogany. Unfortunately, they are following the same fate as the Swietenia. Agroforestry and cultivation are possible solutions.

Several other *Meliaceae* species are very valued, but they do not grow in patches as mahogany and "cedro" do: they were still present on the plots in 1993–1996.

Plot 5

Several *Guarea kunthiana* A. Juss. trees were found, with aromatic bark (*inin shaman*). Named "requia" or "requia de altura de hojas grandes" in local Spanish and *xóro, manán xóro* (altura/requia), *pei bexe xóro* (hojas/chicas/requia) in SK.

Its wood is used for construction and has a high commercial value.

Two *Trichilia* species were found.

Trichilia maynasiana (DC) Pennington; *inintani* or "with a light aroma". It is named uchu "mullaca" in Quechua Spanish; in SK it is *pokoti, yapá pokoti*, where *yapá* is a tree name and *pokoti* means coloring dye.

Plot 2

Trichilia poeppigii, "remo caspi blanco" in local Spanish, *joxo yapá, taxbá pacho, taxbá yonó, joxo yapá* in SK. It is multi-use:

1. Bands are made with its scraped bark that is applied on inner or outer pain, for five nights, with the appropriate diet and sexual abstinence;
2. Its bark is cooked with "tinte caspi" and "goyava", the solution to dye material dark brown, *kampan pokoti*;
3. As timber wood for construction;
4. Its trunk buttresses are used to make paddles, which are light and resistant.

Plot 7

Several *Trichilia* spp. were identified on the "tahuampa" plot 7.

Trichilia maynasiana C. DC., already seen on plot 5, named remo caspi, in SK *yapá*.

A species not found on plot 5: *Trichilia pleana* (Jussieu) C.DC.; named "remo caspi negro" in local Spanish, in SK *wiso yapá* (black/yapá).

Uses:

1. The bark decoction is used to dye materials;
2. As timber for construction.

According to Brent Berlin's folk classification system, it is possible to distinguish a folk generic name: *yapá* and two folk specifics, *josho yapá* and *wiso yapá*.

Several *Guarea kunthiana* A. Juss. are used as "para para", *winin rao* (erección/*rao*) in SK for erection. Its maceration in alcohol is taken twice a day, followed by a week diet without salt, sugar, or fat.

Moraceae

The Moraceae family is very important for the human ecology of the Ucayali providing many vegetal resources to man and to the fauna of the Amazon.

Let us consider first the genus *Ficus*, in the rainy season, Ficus fruits are an abundant food resource for the fish that enter the "tahumpas" or flooded forests.

Several *Ficus* species are present on the plots 5, 2, 3, 7.

Ficus insipida or *Ficus maxima* found on plots 5 and 2. These giant trees with their glittering silvery leaves always impress the river traveller. They are locally called "ojé", *xomí* in SK. Both have medicinal latex (Fig. 22).

Both have latex used as medicine. The anti-parasitary or anti-helmintic activity of its abundant latex was well documented. Its latex, *bepon* in SK, is gathered in a recipient, sugar and alcohol are added. After two days the solution can be used: one takes a spoonful every morning during a week, dieting fat, chili, fermented manioc masato (Hansson *et al*., 2005).

On plot 2, *Ficus maxima*, Miller was identified. It is called: "ojé de bajíal", *taxbá xomí* (bajeal/ojé) or *oi xomí* (lluvia/ojé) in SK.

It is a poly-use *rao*:

1. *Matsi jikia rao* and *yoran chexai rao* are used to treat body pains and rheumatic symptoms;
2. *Kinanti rao* or antivomiting medicine;
3. *Mechati rao*, to be a good hunter or fisherman;
4. *Rayati rao* to be hard working.

On plot 3, a *Ficus americana* Aubl. was identified, named "renaquilla" in local Spanish, *xoná* in SK.

This *rao* is used to cure injuries, hernias and colds; its bark is rasped, boiled water is added to dissolve the dye. It is taken three times a day before meals, until full recovery. The diet should be followed: no pork fat, no chili, nothing acid or sweet, and sexual abstinence during one month.

22: *Moraceae, Ficus sp., Yarinacocha in February*
Source: Authors' Archive

On plot 7, a *Ficus trigona* L.f. was identified, named "renaco, yacu renaco" in local Spanish and *xoná* in SK. It is a master plant, an *onanyati rao*. With the power of this *rao*, the *onanya* or medicine man sings "huarmi ikara" or "icara de mujer" and invokes the master spirit, *ibo*, of the *xoná*, Ficus, which makes its house in the *Ficus trigona* giant roots.

On plot 5, a *Brosimum guianensis* was identified; "cumaceba masha", *koman tsewe* (panguana/cortado) or *kikinma koman tsewe* in SK.

It is a tall multi-use tree:

1. As *rao*, it treats the symptom "frío" or cold, its bark is macerated in a bottle with alcohol that is buried eight days, a glass is drunk every day in the morning before bathing;
2. Its hard and tough wood is used to make spears to fish big animals such as paiches (*Arapaima gigas*), and súngaros (Pimelodidae, Siluriforme);
3. Heavy and durable, it is used to make beams that can last twenty years, to make "bateas" where manioc is crushed, and it is also commercialized in the parquet industry;
4. Its fruit, called *páma*, looks like a red cherry, and is sweet.

On plot 2, *Clarisia biflora* R. & P. was identified, its trunk has horizontal rings; it has white latex and red roots. It is named "mashonaste", "caucho masha", *awa jonra* (tapir/sperm) in SK. Its latex is used to caulk canoes. As *niwe rao*, its latex is said to treat male sexual dysfunction, one spoonful a day.

Its wood is commercialized in the community.

On plot 7, *Clarisia* sp. is present, "mashonaste de bajeal" or *awan jonra* (tapir/sperm) in SK, with abundant white latex and red root. It is said to increase a man's fertility: its latex is warmed and drunk with a one week diet. It has edible fruits too.

Plot 3 is invaded by *Artocarpus altilis*, a native of Polynesia. Its chestnuts are a precious alimentary resource for humans in times of food scarcity, when banana plantations are flooded (Tournon, 2002).

On plot 3, we found a *Batocarpus orinocoencis* Karsten, which is a tall tree that can reach 35 meters, called "mashonaste del bajeal" and in SK *bepon jiwi* (latex/tree), *awa jonra* (tapir/semen); its latex is cooked into a black paste, which is used to caulk boats and canoes.

A number of other Moraceae tree species called "chimicua" in local Spanish, *páma* or *ino meken páma* (jaguar/hand/páma) in SK, produce tasty cherry like fruits for humans, mammals and birds: *Perebea mollis* on plot 2, *Dorstenia* sp., *Perebea mollis*, *Perebea guianensis* and *Sorocea* sp. on plot 3, *Naucleopsis glabra*, *Pseudomeldia laevigata*, *Sorocea* sp. on plot 5.

Moraceae is a family tree that gives many resources to Ucayali communities, and it is well-represented on the four plots 5, 2, 3, 7.

Myristicaceae

The two genera *Virola* and *Iryanthera* are abundant on plot 5. Their red wood is highly valued in Lima, where it is sold as mahogany, but less so in Pucallpa, where it is attacked by "polilla", a small Lepidoptero, which lays its grubs in the wood.

Two types of cumala are present: red cumala or cumala aguanillo (aguano is a name for mahogany), and white cumala. They are both *Virola* spp.

Virola calophylla, "cumala aguanillo" in local Spanish or *joshin tawa* in SK, is a *xaté rao*: its red sap is repeatetly applied with cotton on wounds to cicatrize them.

The white cumala, *joxo tawa*, is used the same way.

There have been reports that Peruvian native groups north of the Amazon, such as the Witoto, Bora, and Muinane, prepare hallucinogens with *Iryanthera* and *Virola* species in the form of pellets that are snuffed (Schultes & Raffauf, 1995; Schultes *et al.*, 1978). This use was not found among SK informants. The SK are specialists of the ayahuasca drink, *oni in* SK, which is prepared with various *Banisteriopsis* spp. and with *Psychotria viridis*, a Rubiaceae.

Nyctaginaceae

Neea floribunda Poeppig & Endl. is a small tree present on plots 5 and 2, named "muesque" in local Spanish, *meske* or *pei bexe meske* (hoja/chica/muesque) in SK. It is a *rao meramis*: it reduces stomach pain, poro chexai, and to alleviate the pain one can take a steam bath of its leaves, another way is to grind its leaves and apply them to the stomach. One can also massage the stomach with a decoction of its leaves.

Its fruits and those of *Neea spruceana* are ecologically important being an important food resource for fish.

Present on plot 5 *Neea parviflora* P.et Ex., "yanamuco", is used to blacken teeth; the treatment may last two months.

Neea spruceana Heimerl, "muesque" in local Spanish or *meske* (hand/injured), is present on plot 2. The mature fruits are used to paint faces for Carnival. It is used also to hook fish as "sardinas" (*Triportheus* species), "palometas" (*Mylossoma* spp., Characidae), and "lisas" (Anostomidae, Characiforme).

Polygonaceae

This family is well-represented on plots 2 and 7 with the genus *Triplaris*, "tangarana" in local Spanish, *janin* in SK. It grows in riverine and floodable habitat; no *Triplaris* was found on plot 5. It is very visible in the garden because of the "hollow, ant-infested branches, large, conspicuous inflorescences and pinkish clusters of 3-fruit wings (Penninton *et al.* 2004: 138)." The triplaris species have hollow stems which shelter symbiotic ants *Pseudomyrmex triplarinus*. Their sting is very painful, and they are very agile.

Three Triplaris species have been identified: *Triplaris peruviana*, *T. poeppigiana* Wedd., *T. aff. punctata* Standley.

The SK informants distinguish four types of "tangarana": black, white, yellow and red. *Triplaris peruviana* may be *wiso janin* or "black tangarana". It is possible that this distinction is based on the color of the Pseudomyrmex ant and not on the color of the tree.

The "tangaranas" are medicines: *rayati rao* and *mechati rao.* The bark is cooked and given to the young people to drink so that they will be more active and hard-working and also good hunters and fishermen; it is purgative. The therapy may also include steam baths.

Rubiaceae

Capirona decorticans is an economically important species: it is fast-growing; its timber wood is hard, heavy and lasting. It provides the best fire wood, which is commercialized in Pucallpa-Yarinacocha. It is present on the plots 5, 3, 7.

On plot 5, there is one "capirona de altura", named áxo and nawa witash (mestizo/pierna) in SK. It is also a *rao*: it helps cicatrization, its bark is scraped and the juice is applied to wounds, stains, skin burns, acne, micosis, 2 or 3 times a day till healing; also, the juice is drunk to cure chixó *rao* or diarrhea, one glass a day for two days.

Plot 3: Fifteen *Capirona decorticans* individuals were seen in this secondary forest plot. They have several uses:

1. *Rao*, it is used to treat skin problems as burns, skin spots, micosis, its bark is scraped and the juice is collected, two or three times a day until curing.
2. *Chixó rao*, to stop diarrhea, a half glass of the bark juice is taken every day for two consecutive days.
3. The capirona firewood is considered the best in Pucallpa-Yarinacocha, and it gives good charcoal.

Plot 7 has four *Capirona decorticans* considered as *rao*: a decoction of the bark is used as a disinfectant and cures skin burns and other problems: the "barro", the "espinilla".

The use of capirona bark juice can be explained by the "theory of signatures", the bark being perceived as skin and called in SK: *xaka* or *jiwi bichi*. But capirona has been shown to be active pharmacologically (Odonne, 2010).

Present on plot 7, *Palicourea punicea* (R. & P) DC., *chirapanin rao* (rainbow/*rao*) is a good example of *rao meramis*: it provokes infections that are cured with a solution of its leaves in water or a "patarashca" of leaves and bark of the same *Palicourea* species.[20]

Rutaceae

On plot 5, we found a very aromatic tree, *Zanthoxylum riedelianum* Engl., called "hualaja" in local Spanish and *chana itsa jiwi* (bird paucar/odor/tree). Its trunk and its main branches are covered with thorns. No users were found.

On plot 3, a Citrus tree was found that probably had been planted in the garden that preceded this secondary forest.

Sapindaceae

This family appears to specialize in "jungle Viagras".

Two genus and species are sexual stimulants: *Cupania* sp. and *Talisia* sp. are present on plot 7. They are named "para para", in SK *koshiti rao* (strong/*rao*), *ochitinin winin rao* (*rao* of dog erection), *wanin jiwi* (pijuayo palm/tree) perhaps because of the pijuayo bark's hardness. This viagra is prepared to put *Cupania* root and bark in alcohol. It is ingested twice a day, followed by a bath and accompanied by a diet of salt, sugar, and fat.

20 "Patarashca" is a regional word, to prepare a patarashca of the leaves you put them between banana leaves or "platanillo" (*Heliconia* sp.) leaves, warm it up on a fire until the leaves' juice flows out. This juice is used (A/N).

Its very hard wood used for parquets, house constructions, axe handles, arrows.

On plot 5, we found *Allophylus divaricatus* Radlkofer, *awakan rao* (sacha vaca/*rao*) in SK. Its fruit is edible. The informant did not say if it is also a Viagra.

Sapotaceae

Sapotaceae are abundant on plot 7 where we found 48 trees within the genus *Manilkara* and *Chrysophyllum*. Their fruits are an important food resource for fish, in particular for the Characiforms that enter and fatten up during the "tahuampas", when the Ucayali is high.

The informants distinguish two kinds of *Manilkara*, the red (*M. bidentata*) and the white, "quinillas" in local Spanish, in SK *téxo* and *moshi téxo* (crushed/quinilla).

The genus *Manilkara* has several uses:

1. It is ecologically important, as it produces fruit in December–January, which is eaten by primates Cebidae (maquisapas, coto monos) and Callitrichidae (frailecillos, pichicos de barba blanca), birds (parrots), and fish. Most fruit trees that are "tahuampas" trees are mature in December–January–February and are disseminated by river currents;
2. The red Manilkara is a valuable heavy timber wood, much commercialized in Pucallpa. The white kind does not last as long as the red kind and is not used for house poles;
3. Medicinal use: the latex of the white quinilla, *moshi rao*, is used as a *chixo rao* or medicine to treat diarrhea, a spoonful of its latex is given to infants.

The fruits of *Chrysophyllum* sp., "caimitillo" or *keo* in SK, are edible for man, monkeys and birds, they mature in January. Paddles are made of its wood, which is durable and light.

Sterculiaceae

Sterculiaceae tree species are fast colonizers.

A few are present on plots 5 and 2, none on the "tahuampa" plot 7. Two species were found which have economic importance:

On plot 5, *Theobroma bicolor*, called "cacahuillo", *níi torampi* in SK. It was utilized in Ancient Mexico to produce chocolate, along with its cousin *Theobroma cacao*. In South America, it has been described as early as 1808 by Alexander von Humboldt and Aimé Bonpland.

Local informants distinguish the "macambillo" of the "cacahuillo" of plot 5, *chaxon rexkan* (deer/nose, mucus) in SK, which could be another *Theobroma* sp. 8 species are recorded from Peru (Pennington *et al*., 2004). This "macambillo" has the same uses as *Theobroma bicolor*:

1. It has a sweet fruit eaten by man, monkeys, tapir, paca, agouti, collared and white-lipped peccaries, deer, and the tortoise *Geochelone denticulate*;
2. Fibers are extracted from its bark to make ties and bonds ("huato").

Another species is *Herrania* sp., called "huacapú" or *wakapo* in SK.

Uses:

1. Its fruits are eaten by birds such as paujil, pava, pucacunga, and tucán;
2. Heavy and durable wood for fork beams, posts, and for parquet industry.

On plot 2 we saw *Guazuma ulmifolia*, "bolaina negra" or *xeshta* in SK. It is a commercial tree which grows fast and produces white timber wood after 4–5 years.

Its wood is used for: planks, for construction, wall linings, partition walls, and floors. Children eat the fruit, grown-ups use them to perfume alcohol and tobacco.

Conclusions

The first part of this chapter considers various aspects of SK culture that relate to plants, e.g. how a *"meramis"* tree can be used in its material form to treat symptoms produced by this same tree in its spiritual form. Also, how an *"onanya-meraya"* may intervene in a healing

process invoking the help of plant spirits. This presentation of SK animism is necessary to understand the second part.

The second part is based on the data and results of the RENACO project. The RENACO team with the National University of Ucayali and the help of local informants has done field inventories of the trees present on four plots chosen in different ecosystems of SK communal lands.

A first result of these inventories is the deep knowledge of the SK informants concerning the trees present on their communal lands.

The botanical and ethnobotanical informations on the trees present on each plot have been analyzed on the basis of their classification in botanical families.

All trees inventoried on the four plots belong to fourty-nine botanical families, which show the tree diversity of the Ucayali Valley. Twenty families include trees most important for the life and the economy of the SK communities: medicines, edible fruits, woods for handicrafts, house and boat construction, and commercial timber wood. Some trees species are not directly utilized by the SK, but are food resources for mammal game and for fish. The precision of the SK informants show the SK's great interest and knowledge on the terrestrial and aquatic ecosystems in which they live.

To conserve these resources, the communities must make a priority of conserving the forest ecocsystems in which these botanical families and species are present. A policy of biodiversity protection is imperative to protect them in the current context of massive deforestation, where illegal logging tends to predominate and eliminate trees that are important for the life of the communities.

References

Arévalo Valera, G. (1994). *Las plantas medicinales y su beneficio en la salud* [Medicinal plants and their health benefits]. Lima: AIDESEP.

Bergman, R. (1980). *Amazon economics: The simplicity of Shipibo indians wealth*. Dept. of Geography, Syracuse University: University Microfilms International.

Berlin, B. (1992). *Ethnobiological classification: Principles of categorization of plants and animals in traditional societies*. Princeton, N.J.: Princeton University Press.

Beyer, S. (2009). *Singing to the plants: A guide to mestizo shamanism in the Upper Amazon*. University of New Mexico Press.

Déléage, P. (2009). *Le chant de l'anaconda* [The song of the anaconda]. Paris: Société d'Ethnologie.

Doja, A. (2005). Rethinking the couvade. *Anthropological Quarterly*, *78*(4), 917–950.

Emmons, L. & Feer, F. (1990). *Neotropical rainforest mammals: A field guide*. The University of Chicago Press.

Encarnación, F. (1985). Introducción a la flora y la vegetación de la Amazonia peruana: estado actual de los estudios, medio natural y ensayo de una clave de determinación de las formaciones vegetales en la llanura amazónica [Introduction to the flora and vegetation of the Peruvian Amazon: Current status of research, environment and test of a key for determination of plant formations in the Amazon basin]. *Candollea*, 40(1), 237–252.

Friedberg, C. (1965). Etude critique des documents concernant l'aspect biologique de l'utilisation des drogues prepares à base de Banisteriopsis [Critical study of documents relating to the biological aspect of Banisteriopsis use]. *Journal d'agriculture tropicale et de botanique appliquée*, 12(12), 403–437.

Gentry, A. H. (1988). Tree species richness of upper Amazonian forests. *Proc. Natl. Acad. Sci. USA*, 85, 156–159.

Gottlieb, O. R. (1982). Ethnopharmacology versus Chemosystematics in the search for biologically active principles in plants. *J. of Ethnopharmacology*, 6(2), 227–238.

Goulding, M. (1980). *The fishes and the forest. Explorations in Amazonian natural history*. Berkeley: University of California Press.

Hansson, A.; Zelada, J. C. & Noriega, H. P. (2005). Reevaluation of risks with the use of Ficus insipida latex as a traditional anthelmintic remedy in the Amazon. *J. of Ethnopharmacology*, *98*(3), 251–7.

Holmstedt, B.; Lindgren, J. E.; Plowman, T.; Rivier, L.; Schultes, R. E. & Tovar, O. (1980). Indole alkaloids in Amazonian Myristicaceae: field and laboratory research. *Botanical Museum leaflets*, Harvard University, 28(3), 215–234.

Illius, B. (1987). *Ani Shinan: Schamanismus bei den Shipibo-Conibo (Ost-Peru)* [Ani Shinan: Shamanism among the Shipibo-Conibo (Eastern Peru)]. University of Tübingen. Dissertation.

McKenna, D. J.; Towers, G. H. N. & Abbott, F. (1984). Monoamine oxidase inhibitors in South American hallucinogenic plants: tryptamine and β-carboline constituents of ayahuasca. *Journal of Ethnopharmacology*, 10(2), 195–223.

Morgan, M. L. (2006). *The essential Spinoza. Ethics and related writings.* Indianapolis: Hackett Publishing Company, Inc.

Naranjo, P. (1975). Etnobotánica de la Ayahuasca [Ethnobotany of ayahuasca]. *Boletín de la Sociedad Geográfica de Lima*, 44, 24–33.

Pennington, T. D.; Reynel, C. & Daza, A. (2004). *Illustrated guide to the trees of Peru*. Sherborne: David Hunt.

Phillips, O. (1996). Some quantitative methods for analyzing ethnobotanical knowledge. In: Alexiades, M. (Ed.) *Selected guidelines for ethnobotanical research: A field manual*. New York, Bronx: New York Botanical Garden, 171–197.

Phillips, O. & Gentry, A. H. (1993a). The useful plants of Tambopata, Peru: I. Statistical hypothesis tests with a new quantitative technique. *Economic Botany*, 47(1), 15–32.

Phillips, O. & Gentry, A. H. (1993b) The useful plants of Tambopata, Peru: II. Additional hypothesis testing in quantitative ethnobotany. *Economic Botany*, 47(1), 33–43.

Phillips, O.; Gentry, A. H.; Reynel, C.; Wilkin, P. & Gálvez-Durand, C. (1994). Quantitative ethnobotany and Amazonian conservation. *Conservation Biology*, 8(1), 225–248.

Prance, G. T. (2004). Foreword to illustrated guide to the trees of Peru. In Pennington, T. D.; Reynel, C. & Daza, A. *Illustrated guide to the Trees of Peru*. Sherborne: David Hunt.

Reynel, C. & Pennington, T. D. (1997). *El género Inga en el Peru, morfología, distribución y usos* [The *Inga* genus in Peru, morphology, distribution and uses]. Richmond, UK: Royal Botanic Gardens, Kew.

Rivier, L. & Lindgren, J. E. (1972). "Ayahuasca", the South American hallucinogenic drink: An ethnobotanical and chemical investigation. *Economic Botany*, 26(2), 101–129.

Sanchez, J. G. & Tournon, J. (2000). Evaluación fitosociológica y etnobotánica de un bosque secundario cerca de Pucallpa-Ucayali [Phytosociological and ethnobotanical evaluation of a secondary forest near Pucallpa, Ucayali]. *Revista Forestal del Perú*, *23*(1–2): 79–90.

Schultes, R. E. (1975). The identity of the malpighiaceous narcotics of South America. *Bot. Mus. Leaflets*, Harvard University, 18(1), 1–56.

Schultes, R. E. & Raffauf, R. F. (1995). *The healing forest: Medicinal and toxic species of the northwest Amazonia*. Portland: Dioscorides Press.

Schultes, R. E.; Swain, T. & Plowman, T. C. (1978). De plantis toxicariis e Mundo Novo tropicale commentations. XVII. Virola as an oral hallucinogen among the Boras of Peru. *Bot. Mus. Leafl.*, Harvard Univ., 25(9), 259–272.

Spruce, R. (1873). On some remarkable narcotics of the Amazon Valley and Orinoco. Ocean highways. *The Geographical review,* 1, 184–193.

Tessmann, G. (1928). *Menschen ohne Gott* [People without God]. Stuttgart: Strecker und Shroder.

Tournon, J. & Reátegui, U. (1984). Investigaciones sobre las plantas medicinales de los Shipibo-Conibo del Ucayali [Research on medicinal plants of the Shipibo-Conibo from Ucayali]. *Amazonia Peruana*, 5(10), 91–118.

Tournon, J.; Serrano, G.; Reátegui, U. & Albán, J. (1986). Plantas y árboles medicinales de los Konibo del Alto Ucayali [Medicinal plants and trees of the Konibo from Upper Ucayali]. *Revista Forestal del Perú*, 13(2), 107–130.

Tournon, J. *et al.* (1986a). Plantas y árboles medicinales de los Conibo del Alto Ucayali: concepciones nativas y botanicas. [Medicinal plants and trees of the Conibo from Upper Ucayali: Native and botanical conceptions]. *Revista Forestal del Perú*, 13(2), 107–130.

Tournon, J. & Silva, M. (1988). Plantas para cambiar el comportamiento humano entre los Shipibo-Conibo [Plants to change human behavior among Shipibo-Conibo]. *Revista Anthropológica*, *6*(6), 161–176.

Tournon, J. (1991a). La clasificación de los vegetales entre los Shipibo-Conibo [The classification of plants among the Shipibo-Conibo]. *Revista Antropológica*, 9(9), 120–151.

Tournon, J. (1991b). Medicina y visiones: canto de un curandero Shipibo-Conibo, texto y contexto [Medicine and visions: Song of a Shipibo-Conibo healer, text and context]. *Amerindia* (Paris), 16, 179–209.

Tournon, J. (2002). *La Merma Mágica. Vida e Historia de los Shipibo-Conibo del Ucayali* [Loss of magic: Life and history of the Shipibo-Conibo from Ucayali]. Lima: Centro Amazónico de Antropología y de Aplicación Práctica.

Tournon, J. (2006). *Las plantas, los rao y sus espíritus, etnobotánica del Ucayali* [Plants, rao and their spirits, ethnobotany of Ucayali]. Pucallpa, Perú: Gerencia Regional de Desarrollo Social, Gobierno Regional del Ucayali.

Tournon, J. (2013). *De Boas, Incas y otros Seres* [On boas, Incas and other beings]. Iquitos, Peru: Centro de Estudios Teológicos de la Amazonía.

Valenzuela Bismarck, P. (2001). Características Morfosintácticas del Idioma Shipibo-Konibo del Ucayali [Morphosyntactic properties of the Shipibo-Konibo language, Ucayali]. In: de Jonge, B. (Ed.). Actas del I Congreso de la Asociación de Lingüística y Filología de América Latina (ALFAL) Región Noroeste de Europa. *Estudios de Lingüística Española*, 13.

Valenzuela Bismarck, P. (2003). *Transitivity in Shipibo-Konibo grammar.* Graduate School of the University of Oregon: Department of Liguistics. Dissertation.

Valenzuela Bismarck, P. (2003). Evidentiality in Shipibo-Konibo, with a comparative overview of the category in Panoan. In: Aikhenvald, A. Y. & Dixon, R. M. W. (Eds.). *Studies in Evidentiality*. Amsterdam: John Benjamins, 33–61.

Valenzuela Bismarck, P. & Valera Rojas, A. (2005). *Koshi shinanya aínbo.* El testimonio de una mujer shipiba [*Koshi shinanya aínbo*. The testimony of a Shipibo woman]. Universidad Nacional Mayor de San Marcos: Fondo Editorial de la Facultad de Ciencias Sociales.