

Ethnobotanical and ethnopharmacological investigation among an Amazonian Bolivian ethnic group, the Tacana

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The Tacana, a group of original inhabitants of Bolivian lowland forest dwell at the base of the last foothills of the Cordillera Oriental of the Andes in Iturralde Province, Department of La Paz, Bolivia. This area is a transitional zone between the high forests of the Pando Department and the Llanos de Mojos (Beni Department), and is also located in the northern and eastern buffer zone of the Madidi National Park, which encompasses one of the areas of highest biodiversity in South America. The Tacana are approximately 5000 people living in small communities, and their language is part of the Tacana linguistic family.

Due to their geographical situation in between the highland altiplano and the Amazonian lowlands, and situated on the banks of the "Rio Beni" a fluvial way to Brazil, the Tacana have a long tradition of contact and trade with the altiplano Quechua people as well as with other amazonian lowland ethnic groups. In the 19th century and until the mid-20th, coca, quinine bark, cacao, rice and various tropical forest products among them many medicinal, from vegetal or animal source, were exchanged, some of these products introduced in the Kallawaya's pharmacopoeia, who were famous itinerant healers. Also, the trade of quinine bark (*Cinchona calisaya* Wedd.) (1840-1875) the rubber and «chicle» (*Clarisia racemosa* Ruiz et Pav. and *Batocarpus costaricensis* Standley et L.O. Williams) boom (1880-1910) gave this zone some economic importance.

Field work was conducted with the Tacana between 1995-98. Twenty-one informants from various communities participated in the survey and two different methodologies were used to compile ethnobotanical/ethnopharmacological information. Two permanent plots, 80 km apart from each other, of 1ha. each, were settled in late secondary/primary forest. Samples were also collected in a variety of other ecosystems in the area: savannas, riversides, old fields, pastures, and home gardens. Permanent plot methodology includes a botanical inventory of all trees, palms, and lianas of

more than 10 cm. at breast high. In both methodology, for each herbarium specimen, ethnobotanical / ethnopharmacological data was collected and cross-checked many time.

Ayahuasca, a drink with hallucinogenic properties made out from *Banisteriopsis caapi* (Spruce ex Griseh.) Morton, is still in use within some Tacana's communities, like in many other western Amazon basin indigenous groups. The use of Ayahuasca as well as other hallucinogenic plants is always performed under the supervision of a shaman or "yanacona". Though the preparation of the beverage itself (presence or absence of *Psychotria viridis* Ruiz et Pav. leaves, or other vegetal additive, in form of a decoction or crude, etc.) and the detail of the ceremony may vary according the purpose of the ritual, Ayahuasca ceremony is performed to cure physical and spiritual ailments, for initiation purposes, to ensure successful animal hunting, and to help in predicting the future. The Ayahuasca drink puts the drinker in a special state of receptivity, allowing him to communicate with animals, plants, spirits, acting as guides and giving him advises for its research.

Other sacred plants are Coca, Tobacco, and Cahuascha (the rhizome of an undetermined Cyperaceae) all of them used for divination purpose and healing ceremonies. Tobacco is used in the form of strong juice which is swallowed, as well as smoking and chewing, the smoke being blown over the patient. Tobacco can sometimes be mixed up with grounded Coca leaves. The strongly scented powdered Cahuascha rhizome, (also used in healing ceremonies in amazonian tribes from Peru or Columbia) is applied all over the body of the patient, eventually mixed up with powdered Tobacco, in order to improve the healing and protect from the action of malevolent spirits. Species of *Brugmansia* spp., some of them domesticated, are also "magic plant" and medicinal species, but apparently not that often in use now.



Another technique of divination, directly issued from ancient Quechua altiplanic influence, is through the use of "collpa", (a Quechua word, designating aluminium sulphate). The "collpa prediction technique" still widely used all over the altiplano and in the Tacana area, is based on the interpretation of the aspect of the patient heated urine, together with "collpa".

"Yanaconas" are consulted for diseases assumed to be caused by other shamans or by malevolent spirits dwelling in canopy trees such as *Dipteryx odorata* Willd., *Ceiba samauma* K. Schum. (*Eriodendron samauna* Mart.) and *Ficus* spp. Water and tree spirits are responsible for different diseases, characterised by a wide range of symptoms. These spirits can also steal souls, which are called back through special ceremonies involving Tobacco or Ayahuasca. The main role of the Yanacona is to discover the cause of the sickness. When performing healing practices, Yanaconas are said to use special plants, different from those used at the more basic level of popular medicine, usually strongly scented species (e.g., *Mansoa alliacea* (Lam.) A.H. Gentry, *Gallesia integrifolia* (Spreng.) Harms, *Protium* spp., and *Cahuascha*) used together with reciting songs, deep breathing, and blowing of Tobacco-smoke.

The Tacana pharmacopoeia offers a great number of remedies: during this study, 450 different plant species were collected and 150 (33%) were pointed as having medicinal uses. Moreover, a greater number of remedy is available, because of the use of a large panel of animal and mineral by-products, that were not documented in this survey. The distribution of the plants uses broadly follows the importance of diseases in the zone, (see Table), except for respiratory disease: one of the most highly estimated remedy in this case being the larva from *Rhyndrophorus palmarum* (L.), a specie of beetle growing in the decayed palm trees.

Among all the plants used, palm trees, and especially palm oils, (from *Attalea phalerata* Mart., *Jessenia bataua* Burret) appear as panaceae, recommended for a wide range of symptoms, internally as well as externally. Every Tacana family produces its own oil which is stored, and this is one of the few medicinal product (with animal by-products) which is prepared in advance, almost all the other plants being used fresh.

The knowledge and use of medicinal plants is still very much alive within the Tacana despite the rapid acculturation reflected by the lost of language among the young generation. Yet, the constant interest and support manifested among the Tacana communities for this ethnobotanical-ethnopharmacological survey demonstrated that this subject is much valued. The concept of medicinal plants valorisation, linked with recognition of the traditional knowledge, is perceived as fundamental by the Tacana, who did play a very active role in that study, encouraging us to publish with them books that they feel important for their culture. In one of these document we demonstrated that the rich Tacana pharmacopoeia, aiming to cure or alleviate a wide range of symptoms or disease is able to provi-

de a scientifically proved adequate response to the main health problems encountered along the Andean piedmont and Amazonian lowlands. It is time that the use of medicinal plant within a specific cultural context is recognised for its full value, and not only has a cheap and available alternative to occidental remedies, which are, anyway, in this area, for most of them, inadequate, outdated and expensive.

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Table I. Distribution of plants uses (over 150 species with medicinal use) compared with diseases frequency, in order of importance (*Unicef, 1986)

Medicinal use	Number of species reported disease*	Most frequently for this use
Gastro-intestinal disease (stomach-ache, diarrhoea, dysentery, intestinal cramps, intestinal parasites)	1	65
Skin afflictions (boils, fungal diseases, infected wounds)	2	50
Respiratory problems	3	12
Fever	4	14
Leishmaniasis	5	
Malaria	Inexistent	1
Gynaecological problems	Not specified	35
Kidneys and urinary troubles	Not specified	22
Snakes bite / Rheumatic disorder / Traumatism / Liver pain	Not specified	10/11/11/12
Others	Not specified	Between 2-6 / each

Conspicuous medicinal roots of *Attalea phalerata* Mart. or *Euterpe precatoria* Mart., used against dysentery and "to strengthen blood".

Palm trees are multi-purpose used species, with strong exploitation pressure.

Psychotria viridis, a species used as an additive in the "Ayahuasca" drink.