



Plants and people in the Venezuelan Páramo

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Introduction

This research was stimulated by cultural and ecological criteria. Anthropological (Wagner 1978:81; Clarac 1985:34; Velázquez 1986:108) and ecological publications (Barclay 1966:208; Guhl 1968:199; Monasterio 1980:171; Azocar 1980:16) have pointed out that the páramo has few resources to make human settlement attractive. Since the flora is one of the most prominent resources, I explore its role in the lives of the Parameros, as the inhabitants of the páramo are called. The basic objective is to describe the knowledge and use of plants by the Parameros. Special emphasis is centered on the latter's knowledge concerning medicinal plants.

The relationship between plants and people in the páramo can be understood on two levels of abstraction: (1) the *utilitarian level* expressed through a traditional agricultural and gathering strategy based on astute environmental knowledge and management; and (2) the *cognitive level* which generates classifications of plant groups through similarity and contiguity associations (this topic was presented more extensively in López 1991).

The study area

The two localities chosen for the study are situated in the northernmost part of the Northern Andes in the Cordillera de Mérida,

Author's note: I am deeply indebted to Stanford Zent for his suggestions which improved this paper, and for making corrections to the English draft. I must also thank Erika Wagner, Carlos Schubert, Stephen Tillett, Andrew Cousins and Melissa Melby for their comments and revision of a first version of the draft. Dr. Tillett also deserves recognition for identifying the botanical samples. Thanks go to Luis Escobar and Carlos Quintero for drawing the map.

Editors note: In order to avoid possible confusion between species names and their Spanish equivalents the latter were not printed in italics.

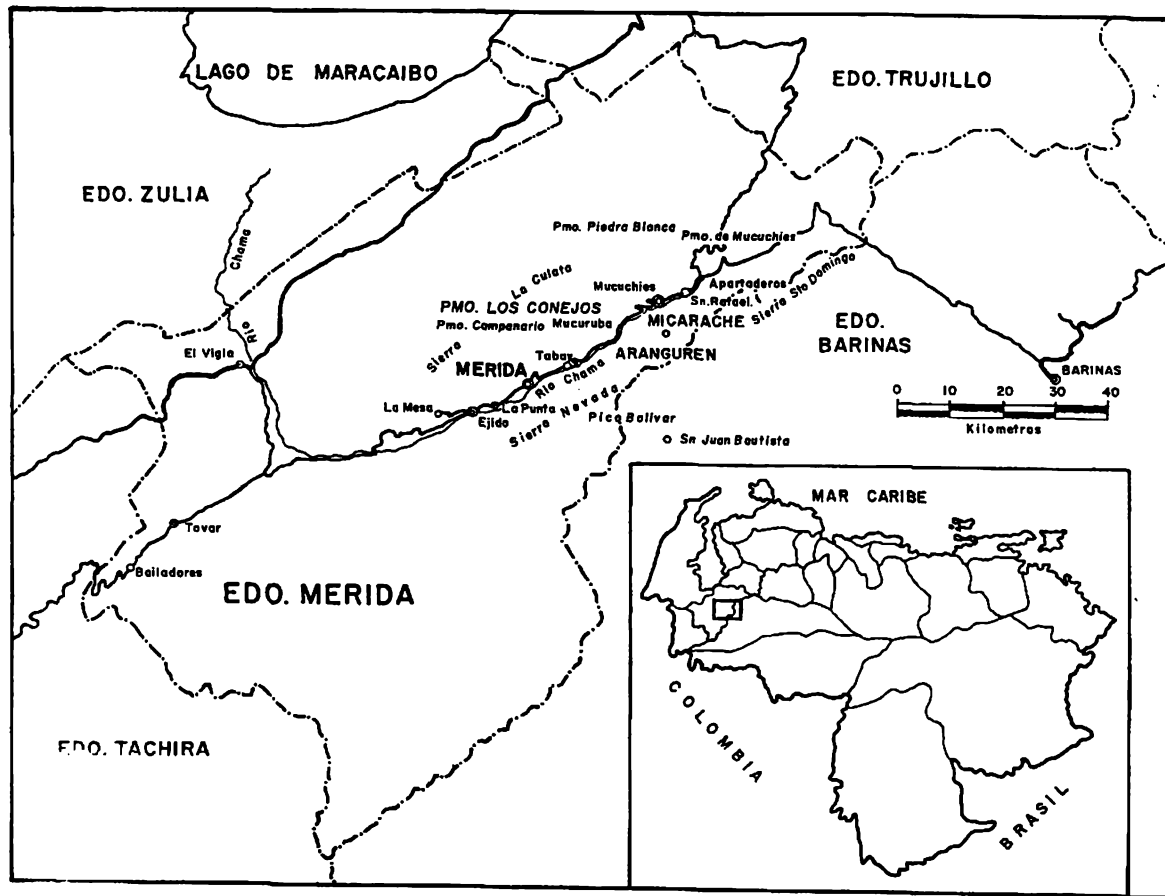
Venezuela (7°30'-10°10' N and 69°20'-72°50' W; Schubert 1980:29). The mountain chain is divided into the Northern Range (Culata) and the Southern Range (Nevada). The first locality, Las González Valley (3,100-3,800 masl) in the Conejos páramo (8°40'-8°45' N and 71°11'-71°15' W), is located in the northwest of the Northern Range. The valley is about 7 km long and is inhabited by a resident population of 22 family holdings (144 people) distributed in a dispersed settlement pattern. The second locality, the Micarache Valley (3,000-3,700 masl) — one of the two micro basins making up the Gavidia valley — in the Llano del Trigo páramo, is in the central-southern part of the Southern Range (8°35'-8°45' N and 70°52'-70°57' W) (Fig. 1). It extends about 6 km and is the home of 12 family compounds (75 people). Environmentally, both valleys present characteristic glacial and periglacial features (Schubert and Vivas 1993). Culturally, the páramo people reflect both a Hispanic and an Indian heritage and follow a traditional subsistence lifestyle centered around the cultivation of the potato.

I began conducting field trips into these areas in 1987 and the last trip I made was in December 1992. Two phases of data collection can be traced: (1) population census and introduction to the people, and (2) botanical collections and interviews. Time was divided between the localities in rotating periods of 3-4 weeks. Three kinds of data were obtained: (1) objective (botanical samples), (2) oral (interviews), and (3) observational (gathered through the daily participant observation with the informants). A total of 1,121 botanical samples were collected with 50 Paramero collaborators (23 in the Northern Range and 27 in the Southern Range), and were deposited in the Ovalles Herbarium at the Venezuelan Central University. In addition, 15 agricultural fields of different ages and altitudes were surveyed in order to record the agricultural cycle.

The páramo as an agriculturally viable environment

The Venezuelan páramos have been occupied by human groups since at least 500 years ago (Wagner 1978), though it is presumed that humans have exploited this environment for longer than 1,400 years (López 1992). A literature review shows different uses attributed to the Venezuelan páramo. Archaeological studies regard it as a passage, ritual or hunting area (Wagner 1988) and historical research confirms its use for agriculture and cattle grazing during colonial times (Velázquez 1986:109; AH Principal Mérida, 1558, 1798, 1799). The Colombian páramo was exploited as an agricultural and crop-storage zone in precolonial times and it is hypothesized that the Venezuelan páramos were used in a similar fashion (Langebaek 1988; López 1992). Northern Andean oral tradition attributes medicinal properties to many

FIGURE 1
 MAP OF THE
 VENEZUELAN
 PARAMOS



páramo plants; a reputation supported by the unpublished work of botanist L. Ruiz Terán and others (Menotti 1948; Morton 1975).

Today, the Parameros' agricultural skills reflect their deep knowledge of diverse environmental aspects which include climate, soils, and the agricultural calendar.

Climate

Climate prediction by the Parameros is essential for the success or failure of a harvest. People, especially the oldest, make daily observations of such climatic conditions as temperature changes, precipitation and the probability of frost.

Consistent with our notions of weather (Vivas 1992; Sarmiento 1987; Monasterio y Reyes 1980; Schubert 1975; Troll 1968), the Parameros identify two annual seasons, a winter (April-November), a summer (December-March) and two irregular transition periods. These periods are known as the "Veranito de San Juan-Mjumo e'Mayo" (May-June) — 10 to 15 days with light or no rain, and the "Caniculares" — light intermittent diurnal rains with sunny periods (end of June to early August). Days are observed as being shorter during the winter. In addition they recognize two periods during the year where irregular nocturnal frost is a probability. The first occurs during July-August ("anevazón" which is believed harmless to plants and animals), and a second in December-January which can last unpredictably throughout summer (a "white frost" - "rime" - believed to be harmful). However, one informant from the Northern Range reported noxious effects from the July frost, claiming to have lost a potato crop to the night frost.

Snow can be expected on clear nights. Informants report that frosts occur occasionally at 2,800 masl in December, commonly above 3000 masl in July-August, and frequently over 3,400 masl. When the "frailejones" de Indio or the "chiriques" (*Espeletia* spp.) are observed to be "huddled up" or closed, and the "guardarocios" (*Lachemilla* spp.) compressed and very wet, frost is to be expected.

Rain is forecasted by visual signs such as the appearance of "nigüacez" (*Turdus serranus*, Aves), or the sudden onset of fog, a darkening of the skies, the phase of the moon, or when the leaves of the "frailejón común" or "amarillo" (*Espeletia* spp.) are closed toward the heart of the plant. Hailstorms are announced by *roaring* waters (rivers, springs), an event the author witnessed a precise prediction of hail in March 28, 1988.

The strongest and most frequent winds are expected in August and waning moon is believed to be the best time to sow.

Soils

The soils, classified according to their consistency, texture, color and the presence of certain plants, are important criteria in the selection of agricultural plots. At least five soil categories are differentiated by the Parameros: (1) black, (2) sandy, (3) "lochista", (4) "melga" and (5) swampy.

Black soils are usually found in valley bottoms or on lightly sloping hillsides. They are preferred for cultivation because their fertility and consistency withstand up to 6 harvests. Sandy soils are found at altitudes of over 3,600 masl and are low in fertility, at times indicating previous cultivation, and are rarely chosen for sowing. "Lochista" soils (a term referring to the reddish color of the "Locha", a small red deer *Mazama rufina*) are found in valleys, on slopes and in the vicinity of small streams and turn out to be of medium quality for agricultural purposes (3 harvests). Dark "melga" soils are encountered found on range tops, usually on glacial terraces. They are also of medium preference and acceptable in quality. Swampy soils (peat bogs), a frequent feature of the páramo physiography, are used for pasturing cattle instead of agriculture, since cattle prefer the rich fodder they provide. As in our system of classification, the Parameros identify high and low swamps. The first are composed of swampy ground and/or underground water and the second are covered or dried up lakes (Schubert and Vivas 1993; Pérez 1984; Guhl 1982).

Besides soil appearance, the presence of certain plant species such as "espino" - *Rubus* sp., "salvia" - *Senecio sclerosus*; "frailejón" - *Espeletia* spp., "cinigüiz" - *Rapanea dependens*, "guafa" - *Phitolacca* sp., "cizaña" - *Rumex acetosella*, "cola e'caballo" - *Equisetum bogotense* and "quitasol" - *Vallea stipularis*) are used as indicators of the best agricultural soils. Low fertility soils are similarly recognized by the presence of such plants such as "oreja e'puerco" or "combicio". Although flat terrains allow for three cultivation cycles, the sunny slopes are preferred. Also esteemed are fields close to small streams and old grazing areas.

The agricultural calendar

The practical synthesis of the above knowledge is reflected in the agricultural calendar (Table 1). The annual potato cycle is central to the lives of Parameros.

Each year, new fields are cultivated to guarantee adequate harvests. The distance between the home and the fields varies from a few minutes to 3-7 walking hours. The more distant fields are frequently located close to seasonal shelters (commonly old dwellings) used during agricultural work and excursions to gather wild plants; although today this pattern is less frequent.

TABLE 1
PRIMARY AGRICULTURAL CALENDAR

MONTH	ACTIVITY
January	Potato and wheat harvesting, lima bean weeding, work in subsistence family gardens around the household.
February	Potato harvesting, wheat threshing, ploughing the earth to start the planting (normally five passes of the plow constitutes the plowing phase) in some lots. In <i>subpáramo</i> , cleaning and burning of some lots.
March	Ploughing, except in Easter Week.
April	Planting and potato harvesting.
May	Potato harvesting, planting. In <i>subpáramo</i> begin the weeding.
June	Weeding of the potato lots planted in March.
July	Weeding of the potato lots planted in April. Ploughing new lots.
August	Clearing, weeding and harvesting by the end of the month. Collective activities (' <i>cayapa</i> ') such as construction and cleaning paths, house and fence building, handicraft work etc.
September	Weeding and clearing in <i>subpáramo</i> and potato harvesting of the lots planted in February by the middle and of the month.
October	Harvesting of potatoes planted in March by the middle of the month.
November	Potato harvesting.
December	Potato harvesting except on the Holy Days.

The annual potato cultivation cycle can be divided into 6 stages which are commonly superimposed. Each family unit has between 9 and 17 fields varying in age and production stage, size, altitude, and potato varieties, which are located at different distances from the home. This extensive strategy gives the Parameros a supply of potatoes, their staple food, all year long.

The agricultural lots visited by the author were located between 2,900 and 3,800 masl and ranged from 200 m² to 1 ha. On some sub-páramo sites, ploughing has been replaced by digging with a special sharpened tool called a "coa". Here, as in the lowland areas, the clearing and burning of the fields to increase soil fertility is a common practice.

Although a field can support up to six successive plantings it is commonly fallowed after three. Traditionally field fallowing entailed a period between 25 and 30 years but today, most fallow periods of most fields have been reduced to anywhere from a few months to 10 years with the exception of lots located on slopes that are left for longer periods. The decision of when to fallow is tied to the size-reduction of the growing plants and, according to the Parameros, "the degeneration of the seed stock" following various harvests in the same plot. Both reflect soil impoverishment.

The development of the fallowed field, the type of regenerate vegetation which appears, or the degree of water retention may elicit special strategies for preparing the field for renewed planting. For example, cattle (and formerly sheep) are pastured in fallows containing suitable forage and as a consequence leave behind nutrient-rich manure. In another case, one farmer in the Northern Range noticed excessive water retention (mud-loving plants) in a plot which had been resting for 30 years. He proceeded to prepare the field by digging small drainage channels. Three years later the plot was planted.

Besides potato fields, the Parameros maintain house gardens polycultivated with several subsistence and medicinal plants such as: "ruba" - *Ullucus tuberosus*, lima bean - *Vicia faba*, spring onion - *Allium* sp., parsley - *Carum petroselinum*, garlic - *Allium sativum*, carrot - *Daucus carota*, etc. Some of the medicinal herbs found in these family plots are wild plants native to the páramo ("cebollota", "salvia", "dictamo de castilla", see Table 4 for latin names) which have been collected and transplanted from the higher altitudes. Other plants growing in these house gardens are noncultivated pioneer species ("uña e'gato", "repollo", "sanalotodo"), protected because they are considered useful as well as cultivated plants such as "sauco" - *Sambucus* sp., "toronjil" - *Melissa officinalis* that were brought in from inferior altitudes.

On the Southern Range, one finds small wheat and feed-crop fields (although Conejos informants claim that wheat never yielded grain above 3,000 masl in their area). They have also begun experimenting with small lettuce and white cabbage seed-plots. The cycles of nonstaple crops are similar to those of the potato (see Table 2).

TABLE 2
CALENDAR OF MINOR CROPS

PRODUCT	PLANTING PERIOD	KIND	HARVESTING
Pasture grasses	March/April	Stake	December
Avena	March/April	Stake	December
Ruba	Management and	treatment same as potato	
Wheat	March	Seed	December
Wheat 5	May	Seed	December
Parsley	April	Seed	June/July
Spring onion	April/May	Stake	July/August
Onion	April/May	Stake	July/August
Lettuce	April	Seedling	June
Pasture	April/May	Stake	July/August
Garlic	April/May	Seed	August/September

The páramo as a receptacle of unique plants

The extreme climatic conditions of the páramo (annual isotherm, frost, freezing temperature, constantly high humidity, etc.) nurture particular plants which generally grow exclusively in this environment and which share traits overlapping taxonomic divisions. A high botanical endemism has been reported for the páramos (Cuatrecasas 1968; Troll 1968; Vareschi 1970; Lauer 1979). The Parameros are acquainted with much of the flora and plant gathering is a daily activity. Knowledge of the properties of plants is shared by the entire population independent of age or sex. There is no systematic method of teaching the local botanical knowledge, but through nonformal education elderly impart their wisdom to the younger generation while moving livestock to new grazing ranges, working distant farm lots and gathering plants. The collection is oriented to plants for household use and for sale in rural and urban markets, where the demand for certain species is high.

Páramo plants as medicinal plants

At the onset of the research, a very strong analogy between páramo plants and medicinal plants was repeatedly and elaborately expressed by the Parameros; including their children. A high proportion of páramo plants are claimed to have medicinal properties. Less frequently mentioned was the association between páramo plants and cattle grazing, which is currently a very common practice but will not be expanded on in this paper. At this stage, I could have inferred that the Parameros apparently excluded from the botanical domain those

plants with no other use than medicinal. I could have also assumed that the local plant classification system rested mostly within utilitarian categories. Both assumptions proved to be false. However, the importance of the páramo as a reservoir of medicinal plants was nonetheless verified all subsequent field work.

This first impression which may at first glance appear subjective, could be the result of two essentially objective factors:

(1) The general reference to páramo plants given in any context by Venezuelan Andean people always alludes to medicinal plants and/or grazing areas. The páramo seems to be conceived of as a special receptacle of medicinal- and to a certain extent grazing plants. This also reflects the contrast observed by Parameros between the plants from lower vs. higher altitudinal mountain levels. Certain utilitarian categories of plants from lower altitudes (e.g timber) are more numerous and potentially more effective or 'utilizable' (harder, better consistency, etc.). Instead, the highest effectivity of medicinal plants is found among those of the páramo.

The cultural practice of conducting trips from lower mountain levels to the páramo in order to collect medicinal plants in specific seasons and habitats supports the mentioned association. According to oral tradition, this practice dates to ancient times. Traditionally, some collections take place during January-February, a time frequently associated with the religious cult of the "paraduras del niño" (a syncretic Indian-Hispanic cult) and the blessing given by the Christ Child to the collected plants. Today this practice is less common.

The páramo is a famous source of plant-based cures; not just locally, but throughout the Andean region. Although less frequent today, it was commonplace for medicine men or women (brujos, curanderos, sobadores, yerbateros, etc.), from different areas, to go to the páramo in order to collect plants. Such fame may descend from precolonial times if, as I suggest, some plants' names are derived from native lexemes. The examples of curuba - *Passiflora* spp. (NM373, edible fruit), "chilca blanca" - *Baccharis nitida* (NM71, NM347, medicinal), "tiboy" - *Hesperomeles resinoso-punctata* (NM152 medicinal, construction) and many others (López 1991) seem to support this claim. Certainly the Spanish colonists used the páramo as a medicinal storehouse (AHM 1789) and maybe even recognized some botanical congeners reported to contain active compounds in Spain (Tillett pers. comm.). Medicinal uses of plants belonging to genera such as *Ottoa* — traditionally used in Spain — may have been translated to New World plants which appear morphologically similar, thus assuming the reputation of having an equal medicinal effect (i.e. the "paramera" - "cebollota" - *O. oenanthoides*).

(2) Most of the páramo plants present relatively constant morphological characters as a natural adaptive response to the extreme environmental conditions of the high tropical mountain habitat. The common páramo physiography is an open landscape dominated by *Espeletia* spp. ("frailejonales") and dwarf plants, mostly acaulescents. Generally the underground biomass development of this vegetal formation is greater than the aerial biomass. This is probably an adaptive habit due to the extreme environmental conditions (isotherm, altitude, radiation, etc.). Additionally, it is believed that tropical (páramo) plants possess a larger number of alkaloids than non-tropical or lower elevation plants (Gentry 1993).

Parameros' statements contrasting the Paramo vs. lowland mountain plants reflect the traditional implicit knowledge that they hold about their botanical world in regards to the concentration of active compounds. This seems to be empirically supported from the direct observation of two facts: (1) the substantially high amount of roots and rhizomes used in the preparation of curative remedies (poultices, beverages, infusions, etc.) and (2) the numerous verbal references describing the underground parts as the containers of the plant's 'substance'.

A contrast between high and low altitude mountain plants occurs on two levels: (a) the Parameros refer to perceptual morphological characters as form or size (abstract features) of the plants in the general páramo context and also to particular attributes (concrete features) of the botanical individual (leaf pubescence, swelling of roots and rhizomes, shortening of internodes, etc.). They attribute such characters to environmental conditions; (b) the Parameros emphasize the effectivity of the medicinal or nutritional properties of páramo plants in comparison to other plants. Parameros conceive their environmental plants as reflecting a unique configuration: exterior form (morphological continuity of perceptual characters) and interior content (physiological and cytological composition).

Páramo plants as linking body conception

Interestingly enough, páramo plants constitute a fundamental link between the Parameros integral world conception and its manipulation.¹ The Parameros conception of "being" (entity, essence)

¹ "...dígame que a la muchachita mía le pegó un susto y se le bajó el cuajo, ese palito que uno tiene adentro pero que pa' los niños y pa' las mujeres que van a parir es más delica' o, en los niños es de cuidado.. Yo andaba arando y la niñitica que es muy pega'a a yo se asustó.. que ella estaba de a pa'bajo y se sintió el buey.. entonces a yo y mi señora pegamos a dále sobas con matas e' frailejón y tabacote... -le pegó gómito y cursera-.. y se los golvímos a poner en el sitio dígame si no! se nos muere la niñitica.. las matas son de mucho beneficio pa' nojotros aquí en el páramo.. pa' tod'os los males encuentra vusté algo que lo alivia a nomás es conocéles el aispeto por fuera y la sustancia por dentro.." (Bernabé, Los Yaques).

involves in addition to the soul and body, the "cuajo" and the "paletilla". Both reportedly have determinate physical locations within the organic body, which should never be moved unexpectedly, suddenly or precipitously. Both however, are in continual movement, but within strict and limited areas of the body. The "cuajo" is located very close to the navel in the upper right-hand portion of the abdomen. The "paletilla" is located under the right rib cage just above the upper stomach area. The "cuajo" and "paletilla" have relative locations according to sex, age, and fertility or sterility status of the individual. The relative position of both elements is crucial to allow life among human beings (e.g. women in reproductive age without children are particularly fragile, in relation to the position and movements of "cuajo" and "paletilla").

Sickness is symptomatic of a dislocation of either the cuajo or the paletilla. Unexpected movements produce unhealthy conditions which are signaled by "males de estómago" (stomach sickness). Parameros believe that only "sobas" (massages) with specific plants permit the proper relocation of cuajo and paletilla when they are dislocated. Furthermore, only plants can alleviate and ameliorate stomach illness and by extension impart life and health to the Parameros. Table 3 shows a partial list of páramo medicinal plants used to treat "males de estómago".

Páramo plants as ideology holders

A group of plants locally called dictamos are unique to páramo environments. Dictamos grow at the highest elevations as isolated individuals and usually are "water-loving." They are not easily noted by an untrained eye; indeed, they are very difficult to find. "Dictamo" is a term which classifies a polytypic group, that is, in my botanical collection, there are at least five different "dictamos", belonging to different botanical families. For example, "dictamo de dastilla" (*Anthoxanthum odoratum* GRM) is an erect herb which emits a fragrance that indicates its presence; "dictamo riñon" (*Lysipomia burgoini* CAM) is a minute plant (2-4 cm long including its underground biomass) with whitish-pinkish petals forming wet turfs in short extensions; and the "dictamo real" (*Gentiana* spp. GEN), acaulescent but short (4-5 cm. high 7 cm. long.) are plants with dense white inflorescence surrounded by aovate small leaves.

"Dictamos" are grouped under a single term for an important reason: they are considered elixirs of eternal life and youth and are believed to contain medicinally active compounds. They certainly hold an indisputable value inside and outside of the páramos. They have been intensively collected for medicinal and economic reasons but the oral tradition reports frequently about the falsehood of "dictamos"

TABLE 3
PLANTS USED TO ALLEVIATE "STOMACH ILLNESSES"

CONDITION	NM	VERNACULAR	LATIN EQUIVALENT
stomach'	0008	Repollo	<i>Echeverria venezuelensis</i>
	0032 0287	Frailejón morado	<i>Oritrophium venezuelense</i>
	0186 0514	Yerbabuena	<i>Mentha</i> spp.
	0194	Ajenjo	<i>Artemisia</i> spp.
	0289	Salvia real	<i>Senecio sclerosus</i>
	0437	Sanalotodo	<i>Baccharis tricuneata</i>
	0488	Mastuecrzo	<i>Lepidium bipinnatifidum</i>
	0831 1098	Diente e'león	<i>Taraxacum officinale</i>
0842	Mucutana	<i>Hinterhubera?</i>	
menstrual	0031 0105 0962	Flor e'pedra	<i>Parmelia</i> spp.
	0098	Escorcionera	<i>Draba</i>
	0839	Chicoria morada	<i>Hypochoeris</i> spp.
abdomen/ womb	0192	Ruda	<i>Ruta graveolens</i>
	0275	Rabo e zorro	<i>Castilleja fissiflora?</i>
	0229	Colmillo e'león	<i>Taraxacum?</i>
delivery	0216	Hinojo	<i>Foeniculum vulgare</i>
	1033	Yerba e'pozo	<i>Gnaphalium</i> spp.
	0825	Huesito e'páramo	<i>Thamnotia vernicularis</i>
	0862	Palmiche	<i>Orthosantus chimborasensis</i>
post-delivery	0234 0967	Dictamo e'castilla	<i>Anthoxanthum odoratum</i>

destined for sale and especially about how difficult is to find the true and unique *díctamo*. "*Díctamo*"-associated tales, stories and secret practices are frequently told in the evenings around the fireplace in the páramo. In this context, the páramo as the unique reservoir of *díctamos*, enhanced its importance, and justified its human definition. The cultural importance of "*díctamos*", especially the "*díctamo real*", is expressed in the cosmovision of the Parameros.²

Páramo lichens as medicine

According the Parameros, *Thamnolia vernicularis* ("huesito de páramo"), is a lichen, not considered a plant, although it was gathered every time we "collected plants." Parameros explicitly attribute an ontology, ontogenesis and conditions different to those of this species.

Thamnolia vernicularis ranks as a highly curative or medicinal entity in the Parameros' pharmacopoeia, which may explain its association with plants. Usually it is only found in the highest elevation of the páramos, or around habitats near glacial lakes. Like *díctamo*, huesito is supposed to have the ability to appear and disappear. In other words, it can choose who is able to perceive it. "Huesito" is especially famous for its effectiveness as a pulmonary decongestant and vasodilator contributing to normal blood circulation, but is also used for other minor illnesses such as colds.

All Parameros that I talked with recount that the "huesito" comes from the clouds. Its arrival on the earth is foretold by special sequence of climatic events: first the sky gets dark or heavily clouded and then a soft wind or persistent rain occurs in order to 'expel' "huesito". It may also come from the sky after a hail- or snow storm, but clouds are

² "el *Dítamo Real* es una mata que nomás encuentra vusté en el páramo, pero es una mata envisible, eso es muy difícil pa' conseguilla, mi papá decía que tiene un olor sabroso y juerte. El que tenga la suerte pa' conseguilla ese la consigue, no to'os están bendeci'os con esa suerte, ese no es pa' to'os, nomás pa'l que Dios quiera regaláles la bendición..aquel que dincuentre nomás un tanto e' una cajita e'fósforo ta'echo.. no se acaba nunca. *Dítamo* es la hora pa'conseguillo, cuando ta'apuntando el sol es la hora, pero tiene uno que encargar un cuero e'locha e'vena'o y fajáselo..eso es muy secreto..*Dítamo* es pajita dorada y al conseguillo vá buscando pa'l cuero si es la suerte... avusté puede olélo y empiende a buscar y si no le toca por más que 'té jarto buscando no lo vé... una mujer me dió a yo un secreto e' los puntos a 'onde asiste tal cual vez el *Dítamo* y a yo juí, pero no 'taba el día pa' mí, el Sr.. que es "brujero" consiguió pa' la laguna e' Don Pedro y a ¿'ónde que le pegan males? ese irá a vivir mucho... (Sr. Emilio Suescún, páramo Los Aranguren).

"Al *Dítamo Real* sólo lo encuentran los vena'os e' páramo, pa' los filos más altos e'los páramos, pa' las lagunas porque esa mata se cría sólo pa'l páramo. Los vena'os e' páramo, los menta'os lochas comen de eso y por eso no se mueren solos, cazador que mate uno que haya comi'o *Dítamo* le saca del mondongo una pepa, una pelota que se les cría ái al animal, entonces se come una parte y la otra la guarda siempre con él y no se muere nunca, en los Corrales un señor se mató el mismo porque no se moría y había comió de eso, no aguanto vivir más tiempo y se acabó el mismo.." (Sr. Pablo Torres, Páramo de Micarache).

equally responsible for its presence on earth. "Huesito" is believed to be an exclusive apparition of the highest páramo.

Parmelia spp. are another set of lichens locally called "flor e' piedra" o "barba e' piedra" because they prefer a stony habitat. According to Parameros, these species do not belong to the vegetal domain either. "Flores e' piedra" have been used in the recent past (30-40 years ago) for dyes, but they are currently utilized mostly as effective anti-coagulants (e.g., women use them to stimulate menstruation). The Parameros explain that "flores e' piedra" originate from humidity while in contact with stones, "they literally come out from those organic stones."

A few types of fungi were collected and, while not considered plants by the Parameros, a few are used as medicine to heal cutaneous wounds. For this reason, fungi are associated with plants. They originate in the water — i.e. are created by high humidity — and are expelled by the rain. For this reason they are considered heralds of the rainy season.

The Páramo as a reservoir of genetic material

The "papa negra" (black potato - *Solanum tuberosum* cvs.) was traditionally the most preferred and cultivated potato in the páramo. Currently it is planted in small quantities and used exclusively for family consumption where it continues being the most preferred of potato varieties. It is cultivated more extensively in the Southern Range because in the Conejos the seed is in short supply. It is considered a superior source of nutrition in comparison to any of the multiple varieties of the white potato.

Oral tradition asserts that the papa negra was handed down from the Indians and is a domesticated descendant of the wild variety called "papa de indio" (also called "papa e'vena'o" since deer browse this plant, or "papa e'monte" - *Solanum* sp. cf. *colombianum* NM907 (cf. Jahn 1929: 124, who reports a wild potato variety assumed to have been cultivated by the Indians).³

Currently the only use for this species is as an ingredient in the preparation of "aji" (red pepper) seasoning. On the other hand, the "cucuba" ('fruit'), leaves, and stem are used as a remedy for "culebrilla" (shingles). A poultice is prepared after boiling the fruit and leaves and it

³ "di antes decían que la papa negra la sacaron de la papa d'indio, q'uesque los j'indios emprendieron y se pusieron y dieron con unos aspermentos y lograron la semilla e'la papa negra, ...las papas blancas las trajeron no hace mucho..., una cosecha se saca en tres meses, en tal cual poco rato qui si deja alimentandoje de la tierra va a ser mejor qu'esta que nojotros dejamos hasta nueve meses! nojotros comemos to'o el año de la papa negra, la guardamos y la vamos gastando, la papa e'indio se usa pa'l aji y di'ora se vé por las lajas de lo alto" (Emilio Suecún, páramo Los Aranguren).

is placed over the infected area. The papa negra is also used topically to alleviate and cleanse eye irritations. The papa de indio stimulates reflection about the potato's origin and/or introduction into the Venezuelan Andes. Nevertheless, the Parameros' statements suggest that the páramo biome does offer a viable reserve of a wild and potentially edible biomass.

Parameros' plant classifications

The constant interaction between the Parameros and plants stimulates ethnobotanical classifications organized around three sets of criteria: utilitarian, morphological and contextual. This three-part classification system is generated by correspondences between the plants:

(1) The *contiguity association* provides the logic for conceptually categorizing and delimiting the páramo ecosystem. This association is found in the dominant presence of certain perennial plants: "frailejones" (*Espeletia* spp.), "chilcas" (*Bacharis* spp.), "romeritos" (*Hypericum* spp.), "pajas" (*Danthonia* sp., etc.), "albrojo" (*Aciahne pulvinata*), "espadilla" (*Sisyrinchium tinctorium*), "pastos" (*Carex* spp., etc.), and "díctamos" (*Anthoxanthum cobrantum*, *Lysipomia bourgoini*, etc.). Scientists and Parameros agree on the biotypes that describe the specific nature of the páramo (Table 4).

Contiguity associations are also recognized among particular harmful/harmless plants to elaborate segregates differentiated by degrees of effectivity with respect to the *utilitarian* criteria. This relationship, known as ethnobotanicity, (Fuentes 1980:24) integrates both vegetable and human worlds through functions ascribed to cultural ideology as well as to the reproduction of daily material conditions.

Twenty-six segregates are defined by their utility: food (7%), animal food (10%), medicinal (23%), veterinary (2%), firewood (11%), ornamental (16%), magic (1%), indicator (1%), contraindicator (3%), construction (6%), poison (1%), cosmetic (.5%), dye (1%), wrapper (.5%), multiple (2%), ink (.5%), hygienic (2%), animal shelter (3%), fertilizer (1%), fuel (2%), alcohol seasoning (.5%), toy/ornament (.5%), intoxicant (1%), broom (3%), and cleanser (2%).

Summing the above into categories of major conceptual relations shows that the most recurrent are: medicinal (362-25%), food (260-17%), ornamental (246-16%), construction (205-14%) and fuel (186-13%). The utilitarian classification applies to 85% of all plants encountered in the sample (1,259), an apt reflection that this categorical mode is highly salient to the Parameros' daily life. Table 5 lists some examples (see Fig. 2).

TABLE 4
LIFE FORMS OR BIOTYPES

Cuatrecasas	Troll 1968 Lauer 1979	Monasterios 1980	Parameros 1988-1992
Caulirrosula	Giant rosette with thick trunks	Ligneous stemless or acaulescents rosettes	Frailejones
Cryptofrutex	Shrubs with dense foliage	Shrubs	Maticas (small plants) Arbolitos (small trees)
	Peat bogs		Matas de pantanal (Mud vegetation)
Herbaceous	Acaulescent rosette plants	Perennial Gramineae	Yerbas (herbs) Maticas
	Cushion plants		Sabana (alpine meadow)
Pascigramina	Bunch grasses	Bunch perennial Gramineae	Pasto (pasture) Paja (straw) Preteretum Musgo (moss) Palmas (ferns)
Arbor	Evergreen broadleaf	Trees	Arboles (trees)
Frutex-suffrutex	shrubs	Shrubs	Arbolitos (small trees)

2) The *similarity association* defines taxonomic groups of plants by virtue of the perception of particular categorical features (a similarity-difference contrast). Neither taxa nor ranks have fixed borders. The "morphological criteria" refer to perceptual features at two abstraction levels. First, abstract attributes (cf. Hunn 1976:509) usually define segregates of larger inclusivity. The second level focuses on unique structural parts of the plants such as individual flowers or inflorescence, fruits, pubescent or tomentose leaves, ligneous or herbaceous stems, succulence and depth of roots and rhizomes, etc. The referential features here are equivalent to concrete attributes (Ibid) and usually generate segregates of lesser inclusivity corresponding to the minimal discontinuities in nature (cf. Berlin et al 1974) and to groups originated by the "*fundamentum relationis*" (cf. Atran 1985).

The morphological classifications rest upon perceptual processes rather than socialization. Classification of plant groups is independent of naming, which is learned in the páramo culture. The segregates of larger inclusivity are: plant (100%), small plant (20%), tree (8%), small tree (17%), vine (4%), herb (15%), frailejón (5%), moss (1%), palm (1%), pasture (2%), straw (1%), reed (.5%), potato (2%), and flower (3%)(Fig 3).

TABLE 5
EXAMPLES OF PARAMO PLANTS AND THEIR USES

NC*	Folk Name	FM	Latin Name	Use
0692	Albrojo	GRM	<i>Achiahne pulvinata</i>	animal food, medicinal
0423	Achiolico	ELC	<i>Vallea stipularis</i>	construction, firewood, ornamental
0067	Albricia	ERI	<i>Gaultheria sp.</i>	medicinal, cosmetic, intoxicant
0995	Cadillo	ROS	<i>Acaena elongata</i>	animal food, medicinal
0401	Caña mansa	GRM	<i>Chusquea spp.</i>	animal food, contraindicator
0015	Cebollota	UMB	<i>Ottoa oenanthoides</i>	medicinal, veterinary
0694	Cizaña	PLG	<i>Rumex acetosella</i>	animal food, fertilizer
0944	Coloradito	ROS	<i>Polylepis sericea</i>	construction, firewood
0761	Chicoria	CMP	<i>Hypochoeris sessiflora</i>	medicinal, animal food
0753	Chilca	CMP	<i>Bacharis prunifolia</i>	medicinal, construction, firewood
0076	Chisplador	MLS	<i>Chaetolepis linderniana</i>	firewood, cleanser, dye
0225	Espadilla	IRI	<i>Sisyrinchium tinctorum</i>	medicinal, animal shelter
0262	Extraña	CMP	<i>Senecio formosus</i>	medicinal, animal food
0292	Frailejón	CMP	<i>Espeletia schultzei</i>	multiple, hygienic, fuel, medicinal
0472	Guardarocio	ROS	<i>Lachemilla spp.</i>	indicator, animal shelter, cleanser
0844	Injerta	ONA	<i>Oenothera cuprea</i>	medicinal
0488	Mastuerczo	CRU	<i>Lepidium hipinnatifolium</i>	medicinal
0969	Mortíño	CMP	<i>Noticastrum marginatum</i>	wrapper, poison, construction
0011	Ortiga	URT	<i>Urtica bellotaefolia</i>	medicinal
0242	Paja e'falda	GRM	<i>Danthonia secundiflora</i>	construction
0004	Palmiche	IRI	<i>Orthosanthus chimboraensis</i>	toy, animal shelter, seasoning
0878	Pastico e'pantano	CYP	<i>Orebolus venezuelensis</i>	animal food
0479	Pata e'joso	ROS	<i>Acaena cylindrostachya</i>	medicinal
0003	Pino	PDC	<i>Podocarpus oleifolius</i>	construction, firewood, medicinal
1068	Punta e'lanza	CMP	<i>Gynoxis meridana</i>	toy, contraindicator, ornamental
0119	Quitasol	ESC	<i>Vallea stipularis</i>	construction, firewood
0963	Rabo d'ardita	SCR	<i>Castilleja fissifolia</i>	ornamental, medicinal
0008	Repollo	CRS	<i>Echeveria venezuelensis</i>	toy, veterinary, ornamental, food
0006	Romerito	HYP	<i>Hypericum brathys</i>	broom, cleanser, ornamental, firewood
0024	Salvia	CMP	<i>Senecio sclerosus</i>	indicator, medicinal, firewood
0486	Sanalotodo	CMP	<i>Bacharis tricuneata</i>	medicinal
0501	Uña e'gato	BER	<i>Berberis prolifica</i>	toy, dye, poison, medicinal
0868	Uvito	SAX	<i>Ribes andicola</i>	ink, contraindicator, medicinal

Legend: *CN: collection voucher number.

Figure N° 2: Response Frequency by Category

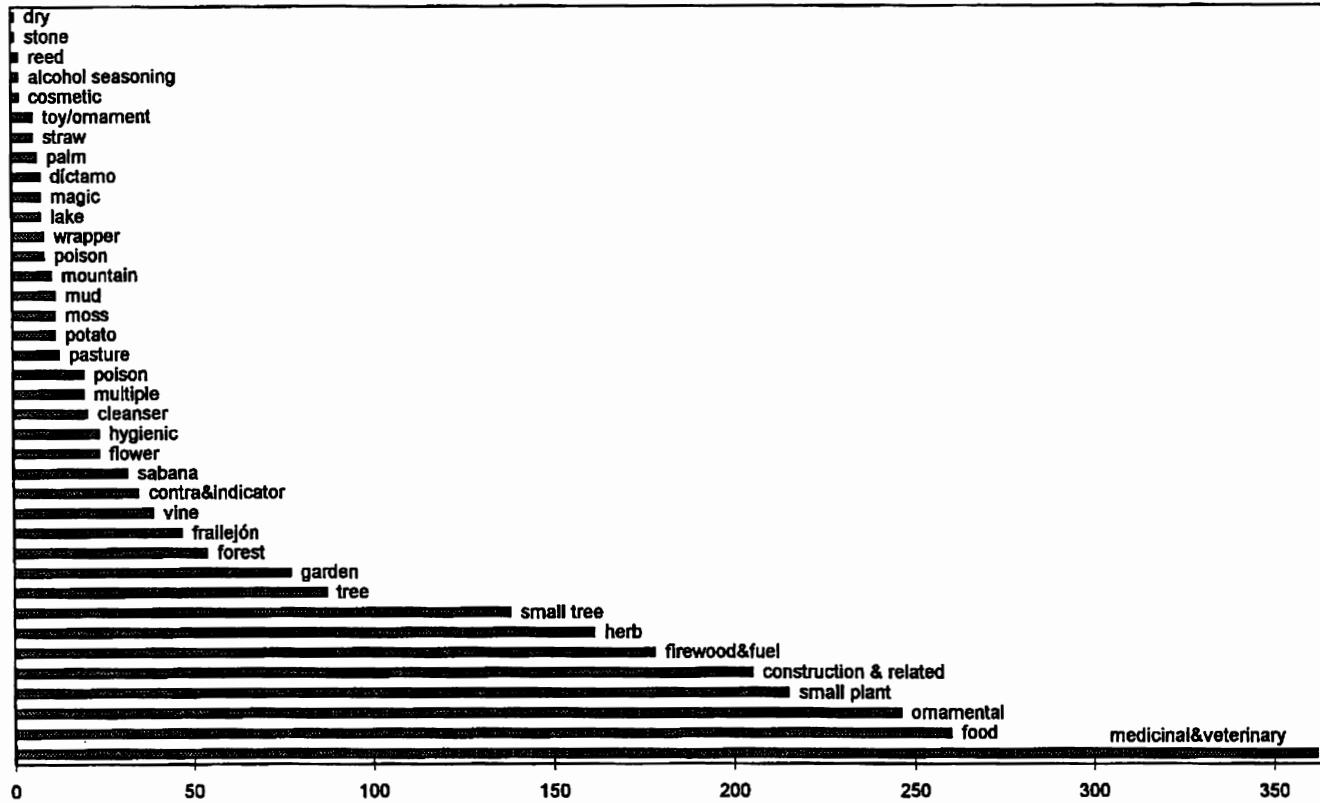
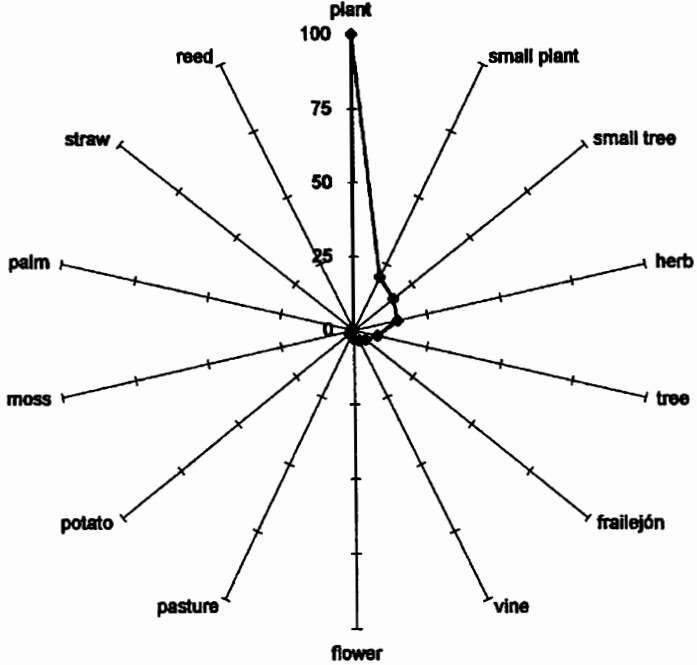


Figure N°3: Paramero Plant Morphological Classification Scheme

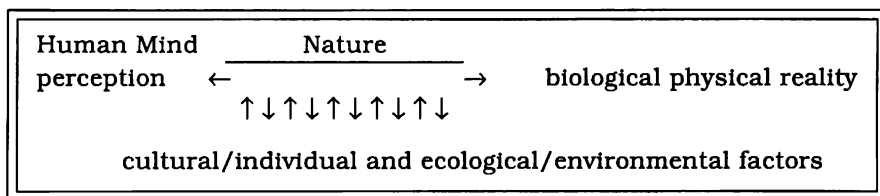


These higher order segregates organize lower order groups of lesser inclusivity (see examples in Table 5) which are defined by specific morphological features and account for most of the páramo botanical cultural domain (97% excluding only the lichens).

3) The interaction of contiguity and similarity associations contextualize plant sets in determinate microenvironments and in cultural beliefs.

The *contextual* criteria refer to the relationship between botanical individuals and (a) their preferred habitats (categorization by microenvironment), or (b) particular cultural conceptions (polymorphous plants grouped under the same category following ideology). Both relations entail logical constructs supported by the observation of concrete phenomena. This level is represented by the following segregates (plants "of the"): lake (1%), mud (2%), forest (4%), garden (5%), dry (.5%), mountain (2%), stone (.5%) and savanna -alpine meadow (2%); and the dictamo group (1%) which is based on cultural beliefs (youth, health and immortality elixir). Contextual criteria are used in the classification of 20% of the plants appearing in the sample.

The three criteria classes described above combine to produce the classification system of the Parameros' botanical domain. This system is productive and flexible by nature, which easily permits them to situate (or add) any plant (including new ones) they encounter within their cognitive encyclopedia. All Parameros possess a "nuclear" knowledge of their plant environment. This basic knowledge is mediated by the individual's experience with the flora. This plant knowledge can be illustrated as follows:



Conclusion

The Parameros maintain intimate relations with their plant environment as seen by the ample knowledge they have obtained to recognize, categorize and manage it. This botanical knowledge is closely associated with their practical knowledge of climate, biomass curative properties and ecology.

This paper described three major uses given to the páramo: as a viable agricultural environment; as a receptacle of unique plants; and as a possible reservoir of genetic biological material.

The upper limit of páramo agriculture is 3,800 masl, 300 m than the limit previously reported for the Northern Andes (Troll 1968). The continued exploitation and management of this fragile ecosystem has been possible because of the environmental and botanical knowledge of the Parameros which allow them to live there on a permanent basis. Nevertheless, frequent migrations, lifestyle changes, increased mobility of resources and access to facilities because of new roads, the increase of recurrent burnings, and the introduction of chemical agricultural products, endangers the continuity, permanence, and conservation of the páramo ecosystem.

The fast-changing conditions are especially evident in the social sector, in terms of the environmental knowledge lost among the younger generation of the páramo population, and in the ecological component, in terms of the alteration of the timberline, impoverishment of soils, and the extinction or migration of the native flora. Micarache can be cited as an example of this process where the intensive agricultural use of soils bordering the road has induced the migration of botanical species (and where over-intensive cultivation of wheat has left scars of erosion). Moreover, informants insist that the timberline has been altered considerably, forcing them to buy firewood from the lower elevations. Chemical fertilizers have been in use for four years in the Conejos and for at least nine years in Micarache. Furthermore, since 1952 Micarache has been part of a National Park and the Conejos was formally declared a national park in 1991. These events inevitably lead to changes in the Parameros' lifestyle since they are forced to follow the rules of the National Parks' administration. One result is the limit placed on their activity area, leading to the intensification of land use in the region permitted to them.

Abstract

This paper explores the relationship between plants and people living in the same ecosystem in the Venezuelan Andes. Research took place in two glacial valleys in the páramo, the highest tropical mountain level (2,500-4,700 masl) that allows human settlements. Discussed are some of the plant management practices of the Parameros, the people inhabiting the páramo. Human-plant relationships can be viewed at two levels of abstraction: utilitarian and cognitive. Three major uses of the páramo ecosystem are identified and discussed here: as a viable agricultural environment, as a receptacle of unique plants and as a possible reservoir of genetic biological material. The conceptions of body and life, health and illness as tightly associated with plants in the perception of Parameros is also depicted.

Resumen

Este artículo examina las relaciones entre las plantas y los seres humanos que ocupan el mismo ecosistema en los Andes venezolanos. La investigación tuvo lugar en dos valles glaciales del páramo, ubicados a una altura máxima permitida para los asentamientos humanos (2.500-4.700 sobre el nivel del mar). Se explican algunas de las costumbres de los parameros (habitantes del páramo) acerca del manejo de plantas. Se puede interpretar la relación humana/planta desde dos niveles de abstracción: utilitario y cognitivo. Además se identifican tres usos principales del ecosistema del páramo como: un ambiente apto para la agricultura; una región de plantas únicas; y un reservorio de materia genética. También se describen los conceptos parameros del cuerpo y la vida, la salud y la enfermedad que el paramero vincula estrechamente con las plantas.

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