4.1.5 Use of Medicinal Plants by Colombian Indigenous Communities Case Study: Pastos Indigenous Community and the Páramo Vegetation in La Ortiga – Resguardo del Gran Cumbal (Nariño)

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Abstract

For ages, medicinal plants have played an essential role in the treatment of physical and spiritual diseases of Pastos indigenous people; the experience of their use and management by traditional communities is based on the empirical assessment, which comes from the accumulated experiences of their ancestors. However, this knowledge is impoverished by the appropriation of foreign technologies and the progressive loss of cultural roots. This study is based on the application of behavioral-verbal techniques on the indigenous community located in páramo "La Ortiga". A dialogue with the "taitas" and healers was established through research-action-participation, allowing the observation of their socio-cultural practices and the identification of 98 species used by the natives as traditional medicine. 78 of these species are administered exclusively for medical purposes, 4 for magical-ritual purposes and 16 are used in both ways. The species were recognized in four types of agroecosystems: orchard, farm (*chagra*), ruderal and páramo, in an altitudinal range between 3,200 to 4,000 mamsl, with four categories of management: wild, tolerated, stimulated and cultivated. We determined the use of 94 plants with potential to treat digestive, liver, kidney, urinary, respiratory, muscular, eye, and nervous system diseases identified; there are both internal and external therapies used depending on the illness to be treated. Moreover, we found that the magic-ritual species are used to prevent and alleviate spiritual-cultural diseases such as "espanto", "malviento" and "malora". They also serve in sacrifices and in protection against evil spirits. The main characteristic of these species is their aroma, which emanates during the entire phenological cycle. In addition, we created a local herbarium of identified species, giving their scientific and local names, information on parts used, forms of use and admixtures (substances of vegetable or animal origin). This herbarium currently serves of the resguardo's health service providers who use traditional medicine.

Keywords: ethnobotany, Pastos indigenous people, páramo, medicinal plants

Introduction

The Cumbes or Cumbas, belonging to the Pastos people, are considered to be the ancestors of the Cumbales, and appear to be Chibcha descendants. Beyond linguistics, there is archeological evidence of this based on excavations of stylized representations of the Chibchas. According to Carchi pottery, the beginning of Pastos culture occurred during the Tuncahuán, the Ecuadorian prehistoric period known through archaeological remains. This assumption is reinforced by the presence of the petroglyph called "Piedra de los machines" in which, in addition to the "Sol de los Pastos", appear a couple of individuals pertaining to

21 *Resguardo* is a legal term for which I, following J. Rappaport (1997), hesitate to provide an English gloss (like "reservation") to avoid misidentification of this specifically Colombian institution. It is a very different kind of entity than a North American reservation (Ed.).

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Chibcha culture. The petroglyph (Fig. 23) is located in the vereda Tasmag, Machines sector, Resguardo del Gran Cumbal (Guerrero, 1998).[22]

The relationship between culture and nature is part of a world-view in which cultural diversity contributes to sustaining plant diversity through social practices concerning the use and management of agroecosystems (La Rotta, 1988). This valuable knowledge about people and their relationship with the environment changed over time and has been documented in ethnobotanical research (Schultes, 1941; Hernández, 1980; Cerón, 1995). One of the main subjects of ethnobotany is the study of traditional medicine. Traditional ways of treating disease involves the use of plant extracts or of their active principles in satisfying primary health-care needs (Bermúdez *et al.,* 2005). These plants can also be used in modern medicine since they are a direct source of therapeutic agents. Moreover, they are used as raw material for the manufacture of more complex synthetic drugs, and the chemical structure of their active principles can serve as a model for synthetic drug development (Akerele, 1993).

23: *Petroglyph of the Cumbe tribe belonging to the Pastos culture*
Source: Authors' Archive

In Colombia, some studies have focused on both black and indigenous communities in different regions of the country. Studies of the Cuna and Wounaan del Choco indigenous people (Forero, 1980), the Tukuna, who live along the Loreto-Yacú river in the Amazon (Glenboski, 1983), the Miraña indigenous community (La Rotta, 1988), the afro-colombian community from the Bajo Calima, lower basin of the San Juan river in the Valle del Cauca (Forero, 1995), among others, have allowed the description of hundreds of species, the recording of their names and semantics in indigenous languages, Spanish names, uses

22 *Vereda* is a subdivisional administrative part of a municipality in Colombia (Ed.).

and management, techniques of planting, harvesting, the ecological relations of each species and their importance in different aspects of the culture. These ethnobotanical studies have also allowed the recognition of the significance of plants within a medical tradition. The Inga midwives, paediatricians (*tocadoras*) and herbalists (*yerbateras*) are able to provide primary care for most common diseases, as well as maternal assistance from the first few months of pregnancy and during childbirth, through the use of these plants (Tafur-Giraldo, 2000: 8–9). The taitas use medicinal plants to treat different diseases, and for ritual-religious purposes, as well as for spiritual health. This is an exclusive characteristic of their work (Rodriguez-Echeverry, 2010).

Research on the biological activity of medicinal and narcotic plants has highlighted the high ethnopharmacological variety of Colombia in comparison to the rest of American tropics (Schultes & Raffauf, 1986). This knowledge of medicinal plants continues to show its potential in modern medicine, and the pharmaceutical industry must encourage its recovery and promotion in communities, by recognizing their effective therapeutic components, thereby contributing to their preservation (Zuluaga-Ramirez, 2005).

In the Nariño department, located in the south of Colombia, there is a diversity of ecosystems inhabited by black and indigenous communities. These communities have provided data for several ethnobotanical studies on the use of plants; both wild species and plants manipulated in agroforestry gardens (Knight, 1995), as well as plants used in common medicine (Valenzuela & Ramirez, 1996; Mallama *et al*., 2001; Moncayo & Zambrano, 2005). For these communities facing the socio-economic issues of the region, plants serve as an alternative to official health care.

This study focused on gathering information about the use of medicinal plants by Pastos indigenous communities located in the páramo La Ortiga, Resguardo del Gran Cumbal, Nariño – Colombia.

Methodology

The indigenous *resguardo* Gran Cumbal is located in the municipality of Cumbal between geographical coordinates 0°55′ north latitude and 77°49′ west longitude, department of Nariño, in southwest Colombia, in the great mountain massif called "Nudo de los Pastos". This *resguardo* has a population of 13,819 indigenous people, distributed in eight *veredas*. The main organization for the exercise of power within the indigenous population is represented by the authority of Cabildo (Plan de Desarrollo del Resguardo del Gran Cumbal, 1998; Esquema de Ordenamiento Territorial Municipio Cumbal, 2002).

Research was conducted in the páramo "La Ortiga" located in the *vereda* Quilismal, applying descriptive and analytical methods proposed by Martin (1995). The verbal cooperation of the taitas and *curanderos* (people with experience and wisdom) was indispensable for the development of this study, as was the "Dialogue of Knowledge" based on research-action-participation in the community. Direct field observations were conducted among the indigenous people. The information on each specimen was collected using botanical and ethnobotanical tabs as suggested by Forero *et al.* (1995).

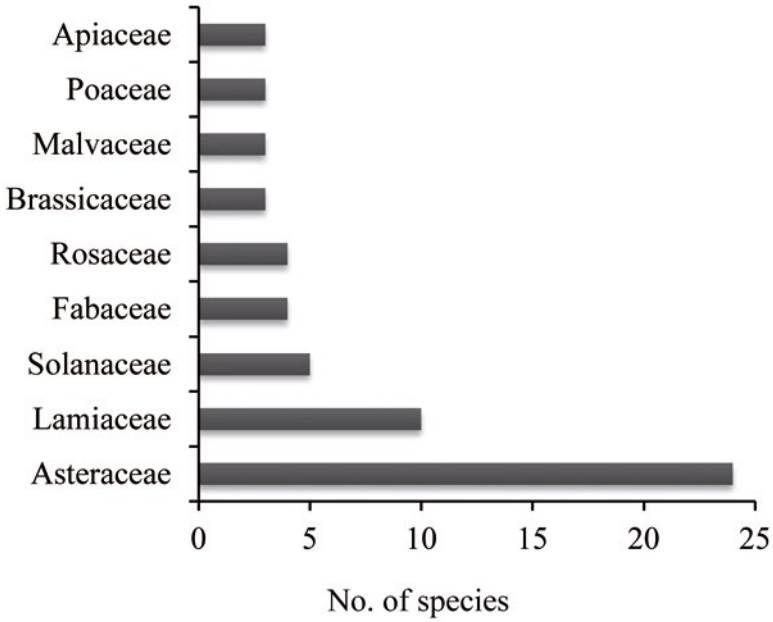
The botanical material was determined using taxonomic keys, thanks to identification by specialists, drawing comparison with specimens from the collections of the University of Nariño Herbarium (PSO).

Results

Taxonomic Determination

41 plant families were identified in total. 98 species are used in the ethnomedicine of the indigenous communities. Magnoliophyta are grouped in 36 families with 93 species, in accordance with the classification system of flowering plants (Cronquist, 1978). The most representative families by number of species were Asteraceae, Lamiaceae, Solanaceae,

Fabaceae, Rosaceae, Brassicaceae, Malvaceae, Poaceae and Apiaceae (Fig. 24). Among the Pinophyta: Cupresaceae and Pinnaceae – each one with 1 species; Pteridophyta: Lycopodiaceae and Adiantaceae each one with 1 species; and Tallophyta with 1 Lichenes.



24: *Distribution of species used in ethnomedicine according to plant family*
Source: Authors' Archive

Management System of Medicinal Plants

The indigenous communities recognize four types of agroecosystems: orchard, farm, ruderal and páramo, located in an altitude range of 3200–4000 mamsl on the fringes of subpáramo and páramo and are distributed as follows:

Between 3200–3400 mamsl, 75 native and introduced species were found in orchard, farm and ruderal agroecosystems. The indigenous population lives in this area, therefore, interaction with medicinal plants is extensive.

In the altitude range 3401–3600 mamsl, only 1 species was found because this is a transition zone that is regenerating after heavy human intervention.

Between 3601–3800 mamsl, 16 wild plant species were found living in an agrosystem relatively undisturbed by human activity.

Finally, 6 wild species characterized by unique adaptability were found between 3801–4000 mamsl. These species need to be collected, transported, dissected and preserved. The plants were determined as follows: *Huperzia attenuata* (spring) Trevis, *Culcitium reflexum* H.B.K., *Niphogeton dissectus* Macbride, *Ranunculus gusmanii* Humboldt ex Caldas, *Hesperomeles heterophylla* (R&P) Hook and *Valeriana plantaginea* H.B.K. (Fig. 25).

According to the management categories classification proposed by Sanabria (2001) we found that 29 species are wild, 23 tolerated, 3 encouraged and 43 cultivated.

25: *Several species of medicinal plants distributed in the páramo zone.*

Dictamo *Ranunculus gusmanii* H. ex Caldas | Deditos *Huperzia attenuata* (Spring) Trevis | Anicillo Niphogeton dissectus Macbride

Source: Authors' Archive

Categories of Medicinal Plants Administration

Species Used for Medicinal Purposes

Tab. IX contains the information on parts used, preparation/administration, local use and association; the latter refers to the integration with other plants or other elements within the processes of traditional indigenous medicine treatment.

IX: *Methods of medicinal species administration*

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
1	*Abutilon striatum* var. *thompsonii* Dick.	Leaves and flowers	Put leaves and flowers in a bowl with water and let it stand overnight outside the house/bath	Rheumatism	
2	*Achillea millefolium* L.	Fresh leaves	Boiled/oral administration	Abdominal and muscular pain caused by the cold	Chapil (Fermented extract of panela sugarcane *Saccharum officinarum* L.)
3	*Adiantum* sp.	Leaves and stems	Decoction/oral administration	Waist pain caused by affection of the kidneys	
4	*Alnus jorullensis* H.B.K.	Leaves	Poultice	Abdominal pain, diarrhea caused by cold; rheumatism, anti-inflammatory	Chicken fat

IX (continued): Methods of medicinal species administration

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
5	*Aloysia triphylla* (L'Herit) Britt.	Leaf, stem, flower	Boiled/oral administration	*Nervios* , stomach pain	
6	*Alternanthera lanceolata* (Benth) Schinz.	Leaves and stem	Liquefied/mouth	Headache and cough	
7	*Ambrosia arborescens* Mill.	Leaf, flower, seed	Seed in decoction/oral administration; flower boiled/oral administration; fresh leaf/external route	Anger or rage *(colerin)* ; abdominal pain during menstrual period; nosebleed	
8	*Anetun graveolens* L.	Flower, leaf	Infusion/oral administration	Affections of the digestive system and liver	
9	*Artemisia* sp.	Leaves	Infusion/oral	Indigestion, constipation	
10	*Avena sativa* L.	Inflorescence	Boiled/oral administration	Irritation of kidneys	Linaza *Linum usitatissimum,* grama *Cynodon dactylon* L., papa china *Colocasia esculenta* (L .) Schott
11	*Baccharis floribunda* H.B.K.	Leaves, stem	Decoction/oral administration	Diarrhea (*soltura*)	
12	*Baccharis latifolia* H.B.K.	Leaves, stem	Decoction/oral administration	Diarrhea	
13	*Bellis Perennis* L.	Flower	Decoction in milk/oral administration	Pulmonary edema, cough	
14	*Bidens andicola* H.B.K.	The entire plant	Decoction/external route	Baths for rheumatism	
15	*Bidens bipinnata* L. var. cynapiifolia (H.B.K). Maza.	Leaf and flower	Decoction/external route/bath; infusion/oral administration	Pain of the body and itch *(picones)* ; nervios	
16	*Bidens pilosa* L.	Flower	Infusion/oral administration	*Nervios* (tranquilizer)	
17	*Borago officinalis* L.	Flower	Decoction/oral administration	Laxative after childbirth	
18	*Bromus pitensis* H.B.K.	Flower	Boiled/oral administration	Irritation of the liver	
19	*Brugmansia aurea* Lagerhem.	Leaf	Poultice	Anti-inflammatory (blows and wounds)	

IX (continued): Methods of medicinal species administration

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
20	*Brugmansia sanguínea* (R&P) Don.	Leaf, flower, fruit	Roast slightly *(soasada)* : extract/external administration	Anti-inflammatory (blows or wounds); treats *"la circa"* (indigestion, dizziness, vomiting)	
21	*Calendula officinalis* L.	Flower	Infusion/oral administration; decoction/oral administration; poultice; extract/external route	Gastric ulcer; *nervios;* cicatrizant (blemishes on the skin)	Against *nervios* (Scheper-Hughes 1994: 229-242) together with rosa mosqueta *Rosa* sp.
22	*Chenopodium ambrosioides* L.	Leaf	Extract/oral administration; fried	Anti-parasitic; to increase the appetite	
23	*Chenopodium quinoa* Willd.	Seed	Cooking/food	Helps to heal surgical wounds	
24	*Chuquiraga fruticosa* Just ex Sterd	Leaves, stem and flower	Infusion/oral administration; decoction/oral administration	Affections of the liver; inflammation and stomach pain, menstrual colic	
25	*Coriandrum sativum* L.	Leaf, root	Boiled/oral administration	*Nervios,* increases appetite	White wine
26	*Culcitium reflexum* H.B.K.	Stem, leaf and flowers	Boiled/oral administration	Stomach pain, bodily pain, fatigue	
27	*Cupressus funebris* Endl.	Stems and leaves	Boiled/oral administration	For cough caused by the flu	
28	*Cyclanthera explodens* Naud.	Leaf	Decoction/external administration	To remove blemishes from the skin	
29	*Cynodon dactylon* (L) Pers.	Leaf, stem	Boiled/oral administration	Irritation of the liver, *nervios*	
30	*Dianthus caryophyllus* L.	Flower	Extract/oral administration; Put flowers in a bowl with water and let it stand overnight outside the house/bath	Against *nervios*	Leave overnight together with rosa mosqueta *Rosa* sp.
31	*Espeletia pycnophylla* Cuatr.	Leaves, stem and resin	Poultice	Headache, earache (from a cold), rheumatism, strain, against the cold (diarrhea), healing of wounds	
32	*Eucalyptus globulus* Labill.	Leaf	Boiled/oral administration, bath	Influenza (pulmonary, nasal congestion); anti-inflammatory for muscle pain, rheumatism	Milk
33	*Gasteranthus kuscilabus* L. E. Skoy.	Entire plant liquefied	Boiled/oral administration	Affections of the liver and kidney	
34	*Geum peruvianum* Fock.	Leaf	Boiled/oral administration	*Nervios*	

IX (continued): Methods of medicinal species administration

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
35	*Hesperomeles glabrata* (H.B.K.) Roem.	Stem, fruit	Decoction/oral administration	Affections of the liver	
36	*Hipochaeris sessiliflora* H.B.K.	Root	Latex/external route	To wean a child	
37	*Huperzia attenuate* (Spring) Trevis.	The entire plant	Boiled/oral administration	Affections of the liver and kidney	
38	*Lactuca scariola* L.	Root	Decoction/oral administration	Against *nervios*	
39	*Lathyrus odoratus* L.	Flower	Infusion/oral administration	*Nervios*	
40	*Lavatera arborea* L.	Leaves and flower	Infusion/oral administration	Bodily pain	
41	*Lavatera* sp.	Leaves and flower	Boiled/bath	Anti-inflammatory (wounds)	
42	*Lepechinia vulcanicola* Wood.	Leaves	Lightly roasted/poultice; fresh/poultice; decoction/bath; boiled/oral administration	Bone pain from the cold; earache, headache; anti-inflammatory (blows and wounds); stomachache from the cold	
43	*Lepidium bipinnatifidum* Desv.	Flower, seed	Extract/oral administration; macerated/external route	Commotio cordis; anti-parasitic, anti-inflammatory (wounds)	Against parasites with lemon
44	*Loricaria ilinissae* (Benth.) Cuatr.	Leaves and flower	Boiled/oral administration	Constipation, gastric ulcer	
45	*Matricaria chamomilla* L.	The entire plant	Boiled/oral administration; decoction/external route	Stomach pain; steam bath, inflammation of the womb during pregnancy, after childbirth	
46	*Matthiola incana* R. Brown	Flower	Infusion/oral administration	Against *nervios*	

IX (continued): Methods of medicinal species administration

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
47	*Medicago sativa* L.	Stems and leaves	Extract/oral administration	Extract/oral administration	It is mixed with pigeon egg
48	*Melissa officinalis* L.	Leaves and stem	Put leaves or stems in a bowl with water and let it stand overnight outside the house/bath	*Nervios*	Nettle (*Urtica dioica* L.)
49	*Mentha piperita* L.	Leaves and stem	Infusion/oral administration; fried/food	*Stomachache; "la circa"*	Garlic *Allium sativum* L. and egg
50	*Mentha pulegium* L.	Leaves, stems	Boiled/oral administration	Stomachache from the cold	
51	*Miconia gleasoniana* Wordack.	Leaf	Boiled/oral administration	*Nervios*	Cadillo *Triumfetta* sp., encino *Weinmannia brachystachya* Willd ex Engl.
52	*Minthostachys tomentosa* (Benth) E.Pling.	Leaves and stem	Boiled/oral administration	Stomachache, inflammation, diarrhea in children	
53	*Monnina aestuans* (L.F.) D.C.	Fruit	Extract/external route	Infections of the skin and mouth	
54	*Myrcianthes* sp.	Leaf	Chewing; boiled/bath	Toothache; rheumatism (bone pain)	
55	*Nasturtium officinale* (L)R.B	Leaves, stems	Decoction/oral administration; roasted or heat-dried leaf /external route	Affections of the liver/abdominal pain caused by cold	Linaza *Linum usitatissimum* , anís *Pimpinella anisum* , malva alta *Lavatera arborea* L., malva de olor *Pelargonium odoratissimum* Ait. and pelo de choclo *Zea mays* L.

IX (continued): Methods of medicinal species administration

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
56	*Niphogeton dissectus* Macbride.	Flower, leaf	Boiled/oral administration	Affections of the digestive system and liver	
57	*Niphogeton dissectus* Macbride.	Leaves	Boiled/bath	Anti-inflammatory (wounds)	
58	*Passiflora cumbalensis* H.B.K.	Flower	Infusion/oral administration	*"Espanto"* (indigestion, diarrhea)	Limon *Citrus limon* (L.) Burm.
59	*Pelargonium grandiflorum* Willd.	Flower	Fresh/inhalation	Headache	It is mixed with milk or administered separately
60	*Pelargonium odoratissimum* Ait.	Leaves, flower	Boiled/oral administration	*Nervios*	
61	*Pentacalia stuebelli* (Hier). Cuatr.	Leaf, flower	Boiled/oral administration	Abdominal pain, affections of the liver	
62	*Physalis peruviana* L.	Fruit	Decoction/external route	Blurred or reddened eyes	
63	*Pinus patula* L.	Leaf, stem	Infusion/oral administration	Headache, influenza	Milk
64	*Plantago* sp.	Leaf, root	Boiled/oral administration; macerated/external route	Back pain, waist pain, anti-inflammatory	Papa china *Colocasia esculenta* (L.) Schott, linaza *Linum usitatissimum*
65	*Ranunculus gusmanii* Humboldt ex Caldas	Leaf	Macerated/external route; boiled/oral administration; extract/oral administration	Rheumatism; liver and kidney; anti-parasitic	Alcohol of 90º with lemon *Citrus limon* (L.)
66	*Rosa* sp.	Flower	Put flowers in a bowl with water and let it stand overnight outside the house/bath	*Nervios* , irritated eyes	
67	*Rosmarinus officinalis* L.	Leaves and stem	Boiled/oral administration	Against stomachache from the cold, sore arms and feet	Chapil and panela (heated up juice of sugarcane *Saccharum officinarum* L.)
68	*Rumex acetosella* L.	Leaf, stem	Macerated/external route	Disinfectant for wounds	
69	*Rumex crispus* L.	Leaf, inflorescence	Boiled/internal route	*Colerin,* depression, discouragement *(tristeza)*	
70	*Ruta graveolens* L.	Leaf, flower	Roasted, macerated/oral administration; infusion/oral administration	Abdominal pain and inflammation; menstrual colic	Warm egg
71	*Salvia leucantha* Cav	Leaves and flower	Infusion/oral administration; boiled/oral administration	Cough, headache, abdominal pain during menstrual period	
72	*Salvia macrostachya* Kunth.	Leaf	*Soasada* /poultice	Diarrhea from the cold	Marco *Ambrosia arborescens* Mill., chapil
73	*Sambrucus nigra* L.	Leaves	Decoction/bath	Bone pain	
74	*Satureia nubigena* (Kunth) Briquet	The entire plant	Boiled/oral administration	Stomachache	
75	*Solanum nigrum-americanum* (Mill.) Schultz.	Leaf, stem, fruit	Boiled/external route	Anti-inflammatory (blows and wounds)	

IX (continued): Methods of medicinal species administration

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
76	*Solanum tuberosa* L.	Flower, tuber	Boiled/oral administration	Abdominal pain and irritation of kidney	Rosa mosqueta *Rosa* sp.
77	*Sonchus asper* (L) Hill.	The entire plant	Decoction/oral administration	*Nervios* (tranquilizer)	
78	*Sonchus oleraceus* L.	Stem and leaves	Extract and latex/external route (massage)	Abdominal, back and waist pain caused by affection of the kidneys	
79	*Spilanthes americana* (Mutis) Hier.	Leaf, flower	Infusion/oral administration; chewing	Stomachache, irritation of the liver; flower against the toothache	
80	*Tagetes zipaquirensis* H.B.K.	Stem, leaf, flower	Boiled/external route; boiled/oral administration;	Rheumatism; flower to regulate the menstrual period	Against rheumatism: Cipres *Cupressus funebris* Endl., pino *Pinus patula* L., eucalipto *Eucalyptus globulus* Labill., matico *Lepechinia vulcanicola* Wood. and chapil
81	*Taraxacum officinale* Weber.	Leaf, root	Raw/internal route; roasted, macerated in infusion/oral administration; decoction/oral administration	Diarrhea; irritation of kidneys; affections of the liver	Limón *Citrus limon* (L.)
82	*Thymus vulgaris* L.	Leaves, stem and flower	Stomachache, flatulence, abdominal pain caused by the cold		
83	*Triumfetta* sp.	Fruit	Boiled/oral administration	*Nervios*	

IX (continued): Methods of medicinal species administration

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
84	*Tropaeolum* sp.	Leaf	Poultice/external route; boiled/oral administration	Eye irritation; affections of liver and kidney, abdominal hernia	Chapil
85	*Urtica dioica* L.	The entire plant	Extract/oral administration; put plants in a bowl with water and let it stand overnight outside the	*Colerin* ; *nervios*	Rosa mosqueta *Rosa* sp.
86	*Urtica urens* L.	Leaf, stem	Extract/oral administration; decoction/bath	*Nervios* ; bone pain caused by the rheumatism	
87	*Vaccinium floribundum* H.B.K.	Fruit	Extract/oral administration	Anemia and weakness	
88	*Vaccinium floribundum* H.B.K.	Leaf, stem and flower	Extract/oral administration	Hemorragia (heart attack or myocardial infarction), *nervios* (nervous system)	
89	*Vicia faba* L.	Leaves	Cooking/food	It is consumed as stew when there is a lack of appetite in pregnant women	Berro blanco *Nasturtium officinale*
90	*Viola odorata* L.	Flower	Infusion/oral administration	*Nervios*	
91	*Viola tricolor* L.	Flower	Infusion/oral administration	*Nervios* , headache	
92	*Weinmannia brachystachya* Willd ex Engl.	Stems and leaves	Boiled/oral administration; boiled/bath	*Nervios* ; to avoid baldness	

Source: Authors' Archive

Species used for magical-ritual purposes

These species are occasionally used as prevention and relief from culture-bound syndroms such as “espanto”, “malviento”, “malora”, and as propitiatory offerings and protectors. The characteristics regarding parts used, preparation, local use and associations are detailed in Tab. X. The major characteristic of these species is their aroma, which emanates throughout their phenological cycle, especially during flowering.

X: *Methods of magical-ritual species administration*

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
1	*Achillea millefolium* L.	The entire plant	Decoction/blood circulation	Home and farm protector, to prevent witchcraft and to cure	Gallinazo *Tagetes zipaquirensis* H.B.K., guanto and plants from warm climates
2	Alonsoa meridionalis var *lactea* (L.F) Ktze.	Flower, leaf, stem	Macerated/external route; decoction/bath	*Malviento;* people possessed by spirits (*enduendado*)	Yerbaverde *Anagallis* sp. and ruda *Ruta graveolens* are mixed with chapil
3	*Ambrosia arborescens* Mill.	Leaf, flower, seed	Decoction/blood circulation; fresh leaf/mild hits to the body made by the traditional healer, who uses magical-ritual plants for this purpose; the procedure could be considered as a ritual to treat diseases *(barrida)*	Protector against spirits, curse; *malviento*	
4	*Anagallys* sp.	Leaf, stem	Macerated/external route	*Espanto/malaire*	Ajo *Allium sativum L.* mixed with chapil
5	*Baccharis floribunda* H.B.K.	Flower	Perfuming with incense *(saumerio)* /external route	*Malaire, espanto, cueche, malora*	
6	*Baccharis latifolia* H.B.K.	Leaves and flower	Perfuming with incense/external route	*Malaire, espanto, cueche, malora*	
7	*Bidens pilosa* L.	Leaves, stem and flower	Decoction/blood circulation	Protection against enemies, spirits, and curses	Gallinazo *Tagetes zipaquirensis* H.B.K., chilca negra *Baccharis floribunda* H.B.K., guasca tigre and yage (species found in warm climates)
8	*Brugmansia aurea* Lagerhem.	Leaf		Symbol of protection against evil	

X(continued): Methods of magical-ritual species administration

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
1	*Achillea millefolium* L.	The entire plant	Decoction/blood circulation	Home and farm protector, to prevent witchcraft and to cure	Gallinazo *Tagetes zipaquirensis* H.B.K., guanto and plants from warm climates
2	Alonsoa meridionalis var *lactea* (L.F) Ktze.	Flower, leaf, stem	Macerated/external route; decoction/bath	*Malviento;* people possessed by spirits (*enduendado*)	Yerbaverde *Anagallis* sp. and ruda *Ruta graveolens* are mixed with chapil
3	*Ambrosia arborescens* Mill.	Leaf, flower, seed	Decoction/blood circulation; fresh leaf/mild hits to the body made by the traditional healer, who uses magical-ritual plants for this purpose; the procedure could be considered as a ritual to treat diseases *(barrida)*	Protector against spirits, curse; *malviento*	
4	*Anagallys* sp.	Leaf, stem	Macerated/external route	*Espanto/malaire*	Ajo *Allium sativum L.* mixed with chapil
5	*Baccharis floribunda* H.B.K.	Flower	Perfuming with incense *(saumerio)* /external route	*Malaire, espanto, cueche, malora*	
6	*Baccharis latifolia* H.B.K.	Leaves and flower	Perfuming with incense/external route	*Malaire, espanto, cueche, malora*	
7	*Bidens pilosa* L.	Leaves, stem and flower	Decoction/blood circulation	Protection against enemies, spirits, and curses	Gallinazo *Tagetes zipaquirensis* H.B.K., chilca negra *Baccharis floribunda* H.B.K., guasca tigre and yage (species found in warm climates)
8	*Brugmansia aurea* Lagerhem.	Leaf		Symbol of protection against evil	

X: (continued): Methods of magical-ritual species administration

#	Species	Parts used	Preparation/Administration	Local use	Relationship with other species and admixtures
18	*Salvia macrostachya* Kunth.	Leaf	Fresh/external route	*Espanto, malaire*	Ajo *Alliumsativum* L., ruda *Ruta graveolens* L., chapil
19	*Tagetes zipaquirensis* H.B.K.	Stem, leaf, flower	Decoction/blood circulation	As a protection for the house, against curses	Chilca negra *Baccharis floribunda* H.B.K, paripacunga *Bidens bipinnata* L. var. *cynapiifolia* (H.B.K).Maza.
20	*Valeriana plantaginea* H.B.K	The entire plant	Macerated/external route; decoction/baths	*Malaire* and *espanto* ; as propitiatory offering to bring good luck and protection against enemies, spirits, and bad energies	chonduro, espingo, pepa voladora (seeds to be bought, originally from warm climate) and chapil

Source: Author's Archive

Additionally, thanks to the identified species, a local herbarium was prepared, giving for species information on its local and scientific name, parts used, local use, method of use and admixtures (substances of plant or animal origin). This herbarium currently serves to promote traditional medicine at the IPS Resguardo.

Discussion

Cumbes from the "La Ortiga" páramo know how to use and administer 98 medicinal plants, including plants used for magical-ritual purposes, thanks to their experience in páramo ecosystem plant resources management.

These species are distributed throughout the indigenous management systems of orchard, farm, ruderal and páramo. The management of vegetation in these systems is determined by climatic factors and altitude range. Sanabria (2001) reports similarly on Andean verticality in Tierradentro traditional agroecosystems (Cauca – Colombia).

The sociocultural and economic dynamics in the páramo agroecosystem are based on factors such as land use, farm location, agricultural calendar, cultivated native, introduced and wild plants, land tenure and socio-political organization.

Our results suggest that the use of plant resource potential is widely spread in the páramo ecosystem. The ethnomedicinal knowledge of traditional medical healers (*curanderos*) or members of some families helped us gather information on 98 plants used to treat body, digestive, liver, kidney, urinary, respiratory, muscular, eye and nervous system diseases. These diseases are associated with cultural symptomatology such as pain and upset stomach, waist and back pain, irritation, diarrhea and "nervios".[23]

The affections are treated internally by oral administration of infusions, decoctions, extracts, roasted and macerated plants; and externally, in the form of baths, poultices and massage. Stem, leaf, flower, fruit, roots and seeds are used, as well as the substances secreted by plants (latex, resins), depending on the affection. Research carried out by Moncayo & Zambrano (2005) demonstrated similar results in the farming communities in the Casabuy,

23 Nervios refers to a culture-bound syndrome, which is reported to be *bound* to the Hispanic *culture* and closely resemble panic attacks (Wolf Dresp, 1985) (Ed.).

Hato Viejo and Sanchez subdivisions (*corregimientos*) of Chachagüi municipality, Nariño department, which reaffirms the validity and cultural importance of medicinal plants, corresponding to the treatment of diseases on the physical level. They argued that dosage and posology vary according to the plant used, the disease being treated and the patient category (children, adults and pregnant women).

It is important to highlight that a large number of medicinal species belong to the Asteraceae family (23), which is probably due to their cosmopolitan character and herbaceous habit, as well as to their phytochemical components. Similarly, La Torre & Ceroni (1997) in the ethnobotanical studies they carried out in the páramo and montane forest in Yanacancha – Peru reported that the plants used there are primarily of herbaceous type and belong to the Asteraceae family. Moncayo & Zambrano (2005) have further affirmed that this family has the largest number of species of medicinal use.

The magical-ritual category, represented by Asteraceae, Lamiaceae and Solanaceae family, is characterized by plants issuing strong and penetrating odors. These plants are usually used in the treatment of culture-bound syndromes such as "espanto", "malviento", "malaire", "malora", "entundado", "cueche" and "chutún" causing mental and bodily harm. Its local explanation is based on the presence of supernatural beings, considered as owners of particular, sacred and spiritual sites. Beck & Ortiz (1997), researching on medicinal plants and knowledge of traditional healers in Awá indigenous communities from the Esmeraldas and Carchi province, in the Chocó phytogeographic region, in Ecuador, found that some medicinal plants are used ritually in healing ceremonies to treat diseases like "chutún". Chutún is described as an anthropomorphised animal, which enters the body of people when they are wandering through the woods. It is potentially harmful for those who violate the rules in relation to the supernatural. Its symptoms are a headache and a feeling of intense cold.

Considering the use of wild plants in páramo (3600–4000 mamsl), people prefer to visit traditional healers, because they know about their ecological and biological characteristics.

Many of the species we found are considered rare in Colombian folk medicine, but they could contribute significantly to therapy, as well as to the preservation of the social, regional and national heritage. Here it is worth noting *Culcitium reflexum* H.B.K., *Espeletia pycnophylla* Cuatr., *Vaccinium floribundum* H.B.K., *Lepechinia vulcanicola* Wood., *Satureja nubigena* (Kunth) Briquet., *Ranunculus gusmanii* Humboldt ex Caldas, *Geum peruvianum* Focky and *Weinmannia brachystachya* Willd ex Engler.

Moreover, *Salvia macrostachya* Kunth.in H.B.K., which was reported to be a vulnerable species, because its geographic distribution has decreased significantly, was found under cultivation in the orchard agroecosystem. This plant, which is used for medicinal and magical-ritual purposes, is considered to be paramount by the community; the natives thus contribute to the conservation of this species.

Summary

The use of medicinal plants by the communities is based on the empirical assessment that comes from their ancestors' experience. While applying the behavioral-verbal techniques on the indigenous communities living in the páramo "La Ortiga", we held a dialogue of knowledge with the "taitas" and healers, and this allowed us to observe their cultural practices and to identify 98 species used by the natives in their traditional medicine. The species recorded are of great value, considering the physical and spiritual health of the indigenous people in the páramo "La Ortiga", Resguardo del Gran Cumbal. This information, which has been transmitted orally from generation to generation, and it currently forms part of this publication, and constitutes the local herbarium, supports the traditional medicine practiced at the IPS Resguardo.

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