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Plants and Animals Utilized as Medicines in the Jaú National Park (JNP), Brazilian Amazon

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This article examines the therapeutic practices of the inhabitants of Jaú National Park (JNP), state of Amazonas, the most important feature of this region being its rich biodiversity associated with isolation in regard to conventional medical services. Seven months of field work were guided by methods of anthropology and botany. A total of 120 plants and 29 animals were utilized in 519 recorded uses comprising 81 therapeutic purposes. These were grouped under 15 categories of use, including: gastrointestinal disturbances, inflammatory processes, genitourinary disturbances, fever, mishaps with animals, dermatological problems, pain, osteomuscular problems and tropical diseases. Those who administer these medicines are local residents specializing in household remedies and other groups of healers such as *rezadores* – prayer-maker; *curadores* – healers; *parteiras* – midwives; *desmintidores* – masseurs and *médiuns* – mediums. At least 10 of the 120 plants species cited in this study are also utilized by other inhabitants of the Amazon region and for the same uses; some of these plants had already been studied from a pharmacological point of view. Furthermore, another six plants cited by the JNP caboclos belonging to the categories pain and inflammatory processes, are under investigation by groups of researchers in two Brazilian federal universities. **Copyright © 2006 John Wiley & Sons, Ltd.**

Keywords: ethnopharmacology; ethnobotany; medicinal plants; traditional medicine; healers; Amazon forest.

INTRODUCTION

Brazil presents high rates of biodiversity and endemism in a territory that includes five main biomas: the Amazon Equatorial rain forest, the cerrado savannahs, the Mata Atlântica rain forest, pantanal wetlands and caatinga semiarid scrublands. According to Joffe and Thomas (1989), 50% of the plant species in the world are in seven megadiverse countries, namely: Brazil, Colombia, Mexico, Zaire, Madagascar, Indonesia and Australia.

Brazil is rich not only from the point of view of biodiversity, but also of cultural diversity and is inhabited by at least three types of population that live in the rural areas of the biomas cited above.

(i) Long established mestizo populations derived from the miscegenation of European, Indian, and Black (including: caboclo river-dwellers, coastal caiçara fishermen, seringueiro rubber sap gatherers and jangadeiro raftsmen); (ii) 220 indigenous ethnic groups (Instituto Socioambiental, 2004) and (iii) 178 Quilombola groups: descendants of Afro-Brazilian runaway slaves living in hideouts up-country called Quilombos (Fundação Cultural Palmares, 2004).

The multiple possibilities resulting from this combination—bioma and culture—confer a wealth and complexity in terms of knowledge of the Brazilian flora as to its therapeutic potential. Furthermore, Brazil is vast, with parts of the territory of difficult access which acts as an impediment to the inhabitants in terms of any benefit from the services provided by the government health network. In many cases this geographical isolation contributes to strengthening traditional and local medical practices and, also, to impromptu selection of natural resources for treatment of any new diseases. This may open up the pharmacological investigation to corroborate the discovery of new medicines. Brazil is, therefore, an environment propitious for carrying out research in the field of ethnopharmacology.

The Amazon region (including countries beyond Brazil) is estimated to harbour 25000 to 30000 endemic plant species (Cunningham, 1996) and is home to several cultures that have been studied during ethnobotanical and ethnopharmacological surveys (Cavalcante and Frikel, 1973; Schultes, 1984; Amorozo and Gély, 1988; Schultes, 1990; Milliken, 1992; Amorozo, 1993; Ming, 1995; Milliken and Albert, 1996; Lewis, 2000; Di Stasi and Hiruma-Lima, 2002). The present study contributes to the documentation of the plants and animals utilized as medicines among a group of the caboclos, inhabitants of the Jaú National Park (JNP), in the state of Amazonas, Brazil and their preservation for future generations.

BACKGROUND AND METHODS

Research area. Located in the Rio Negro basin between the municipalities of Novo Airão and Barcelos [1°90′S to 3°00′S – 61°25′W to 63°50′W] (Fig. 1), the JNP is 2272000 hectares in area (equivalent in size to

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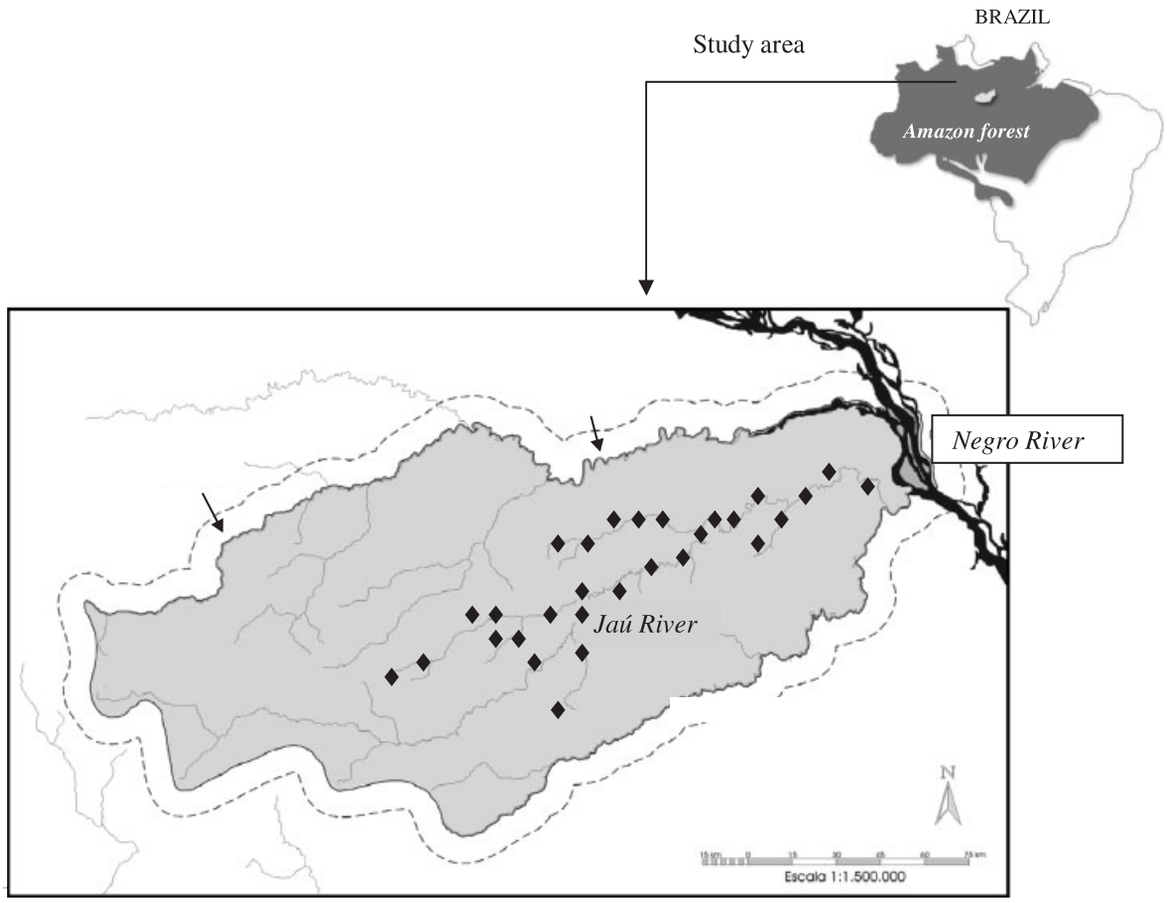

Figure 1. In the map of the right: site of Jaú National Park (☝) in the Amazon forest bioma in Brazil (■). In the map of the left; area of the Park (□), and the 29 locations (◆) on the length of the Jaú River, visited during the study.
Source: Fundação Vitória Amazônica.

the territory of Israel), with no source whatsoever of electrical power plants in spite of the large number of waterfalls. The region is isolated from the conventional medical services available in Manaus, the state capital, or other larger cities of the Amazon State. The means of access to the population is by rowing on the rivers in traditional canoes. This isolation has contributed to the use of local therapeutic preparations by the inhabitants of the region whose ancestors include Indians, Africans and Europeans. In spite of their considerable knowledge of household remedies, the almost one thousand inhabitants of this area are subject to high rates of infant mortality as a result of infectious diseases such as diarrhea (resulting in dehydration), tetanus, hepatitis and malaria. In addition to plant and animal extractive activities, the inhabitants engage in activities of subsistence such as hand-tilled crops, fishing, hunting and fruit gathering.

Field work. This was carried out between May and December 1995. The researcher was resident in the Park at this time to facilitate visiting all the 48 houses present in the 29 locations along the length of the Jaú River (Fig. 1). The localities are from 1 h to 3 days distance from one another by motorboat, with at most two houses in each. Upon recommendation of the residents, 26 of them were selected as having accumulated some type of experience in relation to the use of plants or animals in the preparation of household remedies. Those interviewed consider themselves as: *rezadores* – prayer-maker; *parteiras* – midwives; *médiuns* – mediums; *curadores* – healers; *desmintidores* – masseurs; and specialists in household remedies (Rodrigues, 1998).

Personal and ethnopharmacological data of the interviewees were obtained by the use of semi-structured interviews (Bernard, 1988; Martin, 1995) in which the following topics were addressed: line of descent, age, level of schooling, and the status of each interviewee in his/her community (personal data); the composition of a given formula, its respective therapeutic indication, doses, method of preparation and counterindications (ethnopharmacological data). In addition, a glossary was compiled using information obtained during the interviews and through participant observation (Bernard, 1988; Foote-Whyte, 1990) to translate some therapeutic terms used locally into current medical jargon.

The plants were collected in accordance with methods suggested by Lipp (1989) and their scientific names were determined by specialists from the INPA (Instituto Nacional de Pesquisas da Amazônia) and the IBt (Instituto de Botânica do Estado de São Paulo) herbaria where the vouchers were deposited. The animals cited in the formulas were not collected in this study since they had already been collected by the JNP caboclos themselves during other projects with INPA researchers. Thus, the animals indicated in the present study were identified by relating the vernacular to the scientific names.

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RESULTS AND DISCUSSION

Therapeutic aspects

One marked characteristic of local therapeutics is the use of reasoning similar to the principle of the Doctrine of Signatures advocated by Paracelsus (1493–1541), in which he argues it is possible, by means of the external appearance, to recognize the characteristics and virtues of each herb by its 'signature' (shape, form, color). Several formulas demonstrate this reasoning: among those interviewed, ingestion of the penis of a coati will enhance male sexual prowess; one particular brew made with ants will do away with sloth; ingestion of the parts of greenish-yellow plants will cure liver complaints and the reddish parts will counteract anemia in that they 'supply blood'. According to Johns (1990) these associations are universal and are observed also in the therapeutics of several African peoples such as the Ndembu (Turner, 1964) and the Azande (Pritchard, 1978) and, in Brazil, among the Quilombola population, descendants of runaway slaves (Rodrigues and Carlini, 2004) and the Krahô Indians (Rodrigues and Carlini, 2003b; in press).

Depending on the shape of the roots and leaves, the caboclos classify plants as 'female' and 'male', although this has nothing to do with the real gender of the plants. Their use is by preference associated to the patient's gender, with 'female' plants indicated for men, and vice-versa.

The remedies

Some 519 uses of plants and animals were recorded during the interviews. These recorded uses refer to the number of times that different parts of the 120 plants (leaves, seeds, flowers, roots and so on) and 29 animals (fat, bone, bile, feather, skin, penis, scale) – see these species in Table 1 – are manipulated in particular formulas by the 26 interviewees. For example, a formula for throat pain is composed of the following mixture: resin of 'breu-branco' – *Protium hebetatum* Daly (Burseraceae); monkey fat – *Alouatta seniculus* (Cebidae) and 'pião-pajé' leaf – *Jatropha curcas* L. (Euphorbiaceae).

The 519 recorded uses were indicated for 81 therapeutic purposes, such as: for headache, as a vermifuge, a contraceptive, to ease delivery, as an aphrodisiac and for snakebites; which were further grouped into 15 'categories of use' according to their expected effects, namely: gastrointestinal disturbances (127 recorded uses), inflammatory processes (55), genitourinary disturbances (48), fever (43), others (43), mishaps with animals (40), respiratory problems (30), dermatological problems (26), pain (25), body strengtheners (24), osteomuscular problems (23), immunological problems (21), tropical diseases (5), anxiolytic/hypnotics (5) and cardiovascular problems (4) (see Table 1 and Fig. 2). This is an ethical classification, since it was made by the researcher with the help of two physicians, based on the information given by the caboclos.

Every formula may present between one and up to six ingredients (parts of plants and/or animals). Such mixing is also observed among other cultures in Brazil, such as Quilombolas, whose main characteristic is the use of formulas consisting of a large number of plants. Sometimes a particular species is part of the composition of other formulas used for different purposes (Rodrigues and Carlini, 2003a; 2003b; 2005). In the same way, (Table 1) the number of species (plants and animals) indicated for each 'category of use' ranges from 3 (cardiovascular problems) to 53 (gastrointestinal disturbances), some of these species are included in more than one category of use.

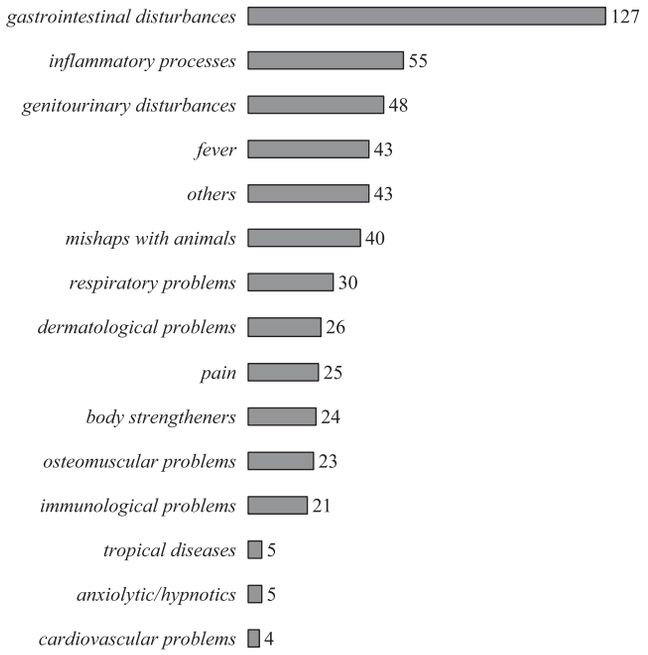

Figure 2. Number of recorded uses cited for each one of the 15 categories of use.

Besides the gastrointestinal disturbances category, there are others comprising many species, such as: inflammatory processes (36); genitourinary disturbances (24); dermatological problems (22) and pain (21).

As in other studies carried out among three Mexican Indian groups (Heinrich *et al.*, 1998) and among Brazilian inhabitants living in the Mata Atlântica rain forest (Di Stasi *et al.*, 2002), the gastrointestinal disturbances category was the one of greatest relevance. The therapeutic purposes related to this category added up to a total of 127 recorded uses: for worms (37 recorded uses), stomachache (21), diarrhea (20), liver troubles (21), bellyache (11), hemorrhoids (9), scrotal hernia (4), ulcers (1), as a laxative (1), to induce vomiting (1) and to stop vomiting (1). This predominance may be explained, in part, by the lack of basic sanitation in the Park giving rise to infestation with worms, diarrhea and bellyaches; in addition, the high incidence of hepatitis and malaria in the region means that useful drugs such as tonics for the liver are well known and in wide use.

The inflammatory processes category is the second with major numbers of recorded uses (55). The symptoms that comprise this category: inflammation (23), conjunctivitis (5), furuncle (15) and rheumatism (12) are common in this population due to the fact that they are exposed to insect aggression, abundant in this region, provoking inflammatory processes.

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Table 1. Number of species (plants and animals) cited for each one of the 15 categories of uses. The same species may be included in more than one category of use

Categories of use (number of species)	Vernacular names of plants and animals*	Part used	Species – voucher	Family
1-gastrointestinal disturbances (53)	Açafroa	leaf/tubercle	*Curcuma longa* L. – Rodrigues 64	Zingiberaceae
	Açaí	root	*Euterpe oleracea* Mart. – Rodrigues 91	Arecaceae
	Agrião	leaf	*Wedelia trilobata* (L.) Hitchc. – Rodrigues 66	Asteraceae
	Alfavaca	leaf	*Ocimum micranthum* Willd. – Rodrigues 28	Lamiaceae
	Algodão-Roxo	leaf/seed	*Gossypium barbadense* L. – Rodrigues 100	Malvaceae
	Amor-Crescido	leaf	*Portulaca pilosa* L. – Rodrigues 7	Portulacaceae
	Ananás	fruit	*Ananas comosus* (L.) Merr. – Rodrigues 127	Bromeliaceae
	Anta* (tapir)	fat	*Tapirus terrestris*	Tapiridae
	Arruda	leaf	*Ruta graveolens* L. – Rodrigues 51	Rutaceae
	Boldo	leaf	*Vernonia condensata* Baker – Rodrigues 63	Asteraceae
	Caju	bark	*Anacardium occidentale* L. – Rodrigues 18	Anacardiaceae
	Cajuí	bark	*Anacardium parvifolium* Ducke – Rodrigues 57	Anacardiaceae
	Camapu	root	*Physalis angulata* L. – Rodrigues 47	Solanaceae
	Capim-Santo	leaf/root	*Cymbopogon citratus* (DC.) Stapf – Rodrigues 25	Poaceae
	Carajiru	leaf	*Arrabidaea chica* (Humb. & Bonpl.) B. Verl. – Rodrigues 13	Bignoniaceae
	Carapanaúba	bark	*Aspidosperma excelsum* Benth. – Rodrigues 11	Apocynaceae
	Casca-Preciosa	bark	*Aniba canelilla* (Kunth) Mez – Rodrigues 55	Lauraceae
	Castanheira	bark/fruit	*Bertholletia excelsa* Bonpl. – Rodrigues 88	Lecythidaceae
	Cipó-Apuí-Preto	latex	*Ficus gardneriana* (Miq.) Miq. – Rodrigues 129	Moraceae
	Cipó-Tuíra	leaf/root	*Bonamia ferruginea* (Choisy) Hallier f. – Rodrigues 136	Convolvulaceae
	Coirama	leaf	*Bryophyllum pinnatum* (L.f.) Oken – Rodrigues 8	Crassulaceae
	Embaúba-Branca I	leaf	*Cecropia sp.* – Rodrigues 26	Cecropiaceae
	Goiaba	leaf/fruit	*Psidium guajava* L. – Rodrigues 87	Myrtaceae
	Hortelã	leaf	*Mentha sp.* – Rodrigues 3	Lamiaceae
	Inajá	fruit	*Maximiliana regia* Mart. – Rodrigues 146	Arecaceae
	Jambu	leaf	*Spilanthes oleracea* L. – Rodrigues 17	Asteraceae
	Janaguba	latex	*Naucleopsis sp.* – Rodrigues 133	Moraceae
	Laranja	bark	*Citrus sp.* – Rodrigues 143	Rutaceae
	Língua-de-tucano	bark	*Quina pteridophylla* (Radlk) Pires – Rodrigues 123	Quinaceae
	Manjericão-roxo	leaf	*Ocimum tenuiflorum* Burm. f. – Rodrigues 151	Lamiaceae
	Marcela	leaf	*Pluchea sagittalis* (Lam.) Cabrera. – Rodrigues 60	Asteraceae
	Mastruz	leaf	*Chenopodium ambrosioides* L. – Rodrigues 1	Chenopodiaceae
	Matá-Matá* (turtle)	bone	*Chelus fimbriatus*	Chelidae
	Melindroso	leaf	*Disynaphia filifolia* (Hassl.) R. M. King & H. Rob. – Rodrigues 41	Asteraceae
	Murupá	tubercle	*Jacaranda copaia* (Aublt.) D. Don – Rodrigues 116	Bignoniaceae
	Olho-de-Santa-Maria	seed	*Coix lacryma* Jobi L. – Rodrigues 75	Poaceae
	Oriza	leaf	*Pogostemon cablin* (Blanco) Benth. – Rodrigues 35	Lamiaceae
	Paracari	leaf	*Peltodon sp.* – Rodrigues 147	Lamiaceae
	Pau-Bota	leaf	*Abuta grandifolia* (Mart.) Sandw. – Rodrigues 109	Menispermaceae
	Pau-D'Arco	bark	*Tabebuia serratifolia* (Vahl) G. Nicholson – Rodrigues 111	Bignoniaceae
	Pau-Doce	bark	*Glycoxylon sp.* – Rodrigues 107	Sapotaceae
	Pau-Vidro	bark	*Burdachia duckei* Steyerm. – Rodrigues 81	Malpighiaceae
	Perpétua-branca	leaf	*Gomphrena globosa* L. – Rodrigues 135	Amaranthaceae

Table 1. (*continued*)

Categories of use (number of species)	Vernacular names of plants and animals*	Part used	Species – voucher	Family
	Pimenta-de-lontra	bark	*Tabernaemontana grandiflora* Jacq. – Rodrigues 130	Apocynaceae
	Pruma	leaf	*Tanacetum vulgare* L. – Rodrigues 50	Asteraceae
	Sacaca	leaf	*Croton tenuissimus* Baill. – Rodrigues 37	Euphorbiaceae
	Salve-Marajó	leaf	*Lippia sp.* – Rodrigues 44	Verbenaceae
	Saracura-Mirá	root/bark	*Ampelozizyphus amazonicus* Ducke – Rodrigues 98	Rhamnaceae
	Sororaca	sap	*Phenakaspermum guyanensis* Endl. – Rodrigues 125	Musaceae
	Sorva	latex	*Couma macrocarpa* Barb. Rodr. – Rodrigues 97	Apocynaceae
	Tiriricão	root	*Sleria sp.* – Rodrigues 58	Cyperaceae
	Uruamari	bark	*Humiria balsamifera* Aubl. – Rodrigues 110	Humiriaceae
	Vinagreira	leaf	*Hibiscus sabdariffa* L. – Rodrigues 134	Malvaceae
2-inflammatory processes (36)	Alfavaca	leaf	*Ocimum micranthum* Willd. – Rodrigues 28	Lamiaceae
	Amapá	latex	*Brosimum parinarioides* Ducke – Rodrigues 106	Moraceae
	Andiroba	fruit	*Carapa guianensis* Aubl. – Rodrigues 2	Meliaceae
	Anta* (tapir)	bone	*Tapirus terrestris*	Tapiridae
	Arruda	leaf	*Ruta graveolens* L. – Rodrigues 51	Rutaceae
	Bananeira	leaf	*Musa sp.* – Rodrigues 126	Musaceae
	Boldo	leaf	*Vernonia condensata* Baker – Rodrigues 63	Asteraceae
	Caapeba	leaf	*Pothomorphe peltata* (L.) Miq. – Rodrigues 99	Piperaceae
	Cabacinha	fruit	*Luffa operculata* (L.) Cogn. – Rodrigues 16	Cucurbitaceae
	Calango* (lizard)	skin	*Ameiva ameiva*	Teiidae
	Carapanaúba	bark	*Aspidosperma excelsum* Benth. – Rodrigues 11	Apocynaceae
	Cipó-Guapuí	tubercle	*Anemopaegma sp.* – Rodrigues 119	Bignoniaceae
	Cipó-Tuíra	leaf	*Bonamia ferruginea* (Choisy) Hallier f. – Rodrigues 136	Convolvulaceae
	Dima	leaf/root	*Croton lanjouwensis* Jabl. – Rodrigues 89	Euphorbiaceae
	Embaúba-Branca I	leaf	*Cecropia sp.* – Rodrigues 26	Cecropiaceae
	Embaúba-Branca II	leaf	*Cecropia sp.* – Rodrigues 118	Cecropiaceae
	Jabuti* (land turtle)	fat	*Geochelone denticulata*	Testudinidae
	Jambu	leaf	*Spilanthes oleracea* L. – Rodrigues 17	Asteraceae
	Macaco-Prego* (monkey)	fat	*Cebus apella*	Cebidae
	Maguari* (bird)	fat	*Ardea cocoi*	Ardeidae
	Malvarisco	leaf	*Coleus amboinicus Lour.* – Rodrigues 4	Lamiaceae
	Mangarataia	tubercle	*Zingiber officinale* Roscoe – Rodrigues 90	Zingiberaceae
	Mão-Aberta	leaf	*Caladium sp.* – Rodrigues 61	Araceae
	Minhoca* (earthworm)	head	*Lumbricus terrestris*	Lumbricidae
	Mucura-caá	leaf	*Petiveria alliacea* L. – Rodrigues 49	Phytolaccaceae
	Mururé	root/leaf	*Pseudolmedia laevigata* Trécul – Rodrigues 85	Moraceae
	Onça-Pintada* (jaguar)	fat	*Panthera onca*	Felidae
	Onça-Vermelha* (jaguar)	fat	*Felis concolor*	Felidae
	Paca* (paca)	bile	*Agouti paca*	Agoutidae
	Pau-D'Arco	bark	*Tabebuia serratifolia* (Vahl) G. Nicholson – Rodrigues 111	Bignoniaceae
	Pirarara* (fish)	fat	*Phractocephalus hemiliopterus*	Pimelodidae
	Poraqué* (electric fish)	fat/bone	*Electrophorus electricus*	Electrophoridae
	Sapo-Cururu* (toad)	fat	*Bufo marinus*	Bufonidae

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Table 1. (*continued*)

Categories of use (number of species)	Vernacular names of plants and animals*	Part used	Species – voucher	Family
	Saracura-Mirá	root	*Ampelozizyphus amazonicus* Ducke – Rodrigues 98	Rhamnaceae
	Sucuriju* (snake)	fat	*Eunectes murinus*	Boidae
	Urucu	leaf	*Bixa orellana* L. – Rodrigues 10	Bixaceae
3-geniturinary disturbances (24)	Alfavaca	leaf	*Ocimum micranthum* Willd. – Rodrigues 28	Lamiaceae
	Algodão-Roxo	fruit	*Gossypium barbadense* L. – Rodrigues 100	Malvaceae
	Anta* (tapir)	fat	*Tapirus terrestris*	Tapiridae
	Arraia* (ray)	fat	*Potamotrygon spp.*	Potamotrygonidae
	Arruda	leaf	*Ruta graveolens* L. – Rodrigues 51	Rutaceae
	Boi* (ox)	bone	*Bos sp.*	Bovidae
	Capim-Santo	root	*Cymbopogon citratus* (DC.) Stapf – Rodrigues 25	Poaceae
	Carapanaúba	bark	*Aspidosperma excelsum* Benth. – Rodrigues 11	Apocynaceae
	Chicória	leaf	*Eryngium foetidum* L. – Rodrigues 115	Apiaceae
	Cominho	leaf	*Pactis enlogata* H.B.K. – Rodrigues 71	Asteraceae
	Copaíba	oil	*Copaifera guyanensis* Desf. – Rodrigues 77	Fabaceae s.l.
	Jacamim-Corrente	leaf	*Pfaffia glomerata* (Sprengel) Pedersen – Rodrigues 6	Amaranthaceae
	Mamona	seed	*Ricinus communis* L. – Rodrigues 38	Euphorbiaceae
	Mangarataia	tubercle	*Zingiber officinale* Roscoe – Rodrigues 90	Zingiberaceae
	Mastruz	leaf	*Chenopodium ambrosioides* L. – Rodrigues 1	Chenopodiaceae
	Mucura-caá	leaf	*Petiveria alliacea* L. – Rodrigues 49	Phytolaccaceae
	Mutuquinha	leaf	*Justicia reptans* Sw. – Rodrigues 36	Acanthaceae
	Paca* (paca)	bone	*Agouti paca*	Agoutidae
	Perpétua-Roxa	flower	*Centratherum muticum* (Kunth) Less. – Rodrigues 132	Asteraceae
	Pruma	leaf	*Tanacetum vulgare* L. – Rodrigues 50	Asteraceae
	Quebra-Pedra	root	*Phyllanthus niruri* L. – Rodrigues 30	Euphorbiaceae
	Sena	leaf	*Cassia occidentalis* L. – Rodrigues 121	Fabaceae s.l.
	Uxi-Corôa	seed	*Duckesia verrucosa* (Ducke) Cuatrec. – Rodrigues 152	Humiriaceae
	Uxi-Liso	bark	*Endopleura uchi* (Huber) Cuatrec. – Rodrigues 23	Humiriaceae
4-dermatological problems (22)	Andiroba	seed	*Carapa guianensis* Aubl. – Rodrigues 2	Meliaceae
	Aruanã* (fish)	scale	*Osteoglossum ferrerai*	Osteoglossidae
	Bananeira	sap	*Musa sp.* – Rodrigues 126	Musaceae
	Capim-Santo	root	*Cymbopogon citratus* (DC.) Stapf – Rodrigues 25	Poaceae
	Coirama	leaf	*Bryophyllum pinnatum* (L.f.) Oken – Rodrigues 8	Crassulaceae
	Copaíba	oil	*Copaifera guyanensis* Desf. – Rodrigues 77	Fabaceae s.l.
	Cuiarana	leaf	*Lophanthera longifolia* (Kunth) Griseb. – Rodrigues 95	Malpighiaceae
	Lacre	resin	*Vismia guianensis* (Aubl.) Pers. – Rodrigues 79	Clusiaceae
	Limão	leaf	*Citrus aurantifolia* (Christm.) Swingle – Rodrigues 128	Rutaceae
	Malvarisco	leaf	*Coleus amboinicus* Lour. – Rodrigues 4	Lamiaceae
	Mandioca-Brava	latex	*Manihot esculenta* Crantz – Rodrigues 12	Euphorbiaceae
	Manga	bark	*Mangifera indica* L. – Rodrigues 33	Anacardiaceae
	Mão-Aberta	tubercle	*Caladium sp.* – Rodrigues 61	Araceae
	Marupá	leaf	*Jacaranda copaia* (Aublt.) D. Don – Rodrigues 116	Bignoniaceae

Table 1. (*continued*)

Categories of use (number of species)	Vernacular names of plants and animals*	Part used	Species – voucher	Family
	Paca* (paca)	fat	*Agouti paca*	Agoutidae
	Paracaxi	bark	*Pentaclethra macroloba* (Willd.) Kuntze – Rodrigues 148	Fabaceae s.l.
	Pião-Branco	latex	*Bryophyllum pinnatum* (L.f.) Oken – Rodrigues 8	Crassulaceae
	Pirarucu-caá	leaf	*Bryophyllum pinnatum* (L.f.) Oken – Rodrigues 8	Crassulaceae
	Sapucaia	bark	*Lecythis pisonis* Cambess. – Rodrigues 27	Lecythidaceae
	Tabaco-de-Veado	leaf	*Irlbachia alata* (Aubl.) Maas – Rodrigues 70	Gentianaceae
	Tiriricão	tubercle	*Sleria sp.* – Rodrigues 58	Cyperaceae
	Vassourinha	leaf	*Scoparia dulcis* L. – Rodrigues 69	Scrophulariaceae
5-pain (21)	Açafroa	tubercle	*Curcuma longa* L. – Rodrigues 64	Zingiberaceae
	Alfavaca	leaf	*Ocimum micranthum* Willd. – Rodrigues 28	Lamiaceae
	Breu-Branco	resin	*Protium hebetatum* Daly – Rodrigues 65	Burseraceae
	Café	leaf	*Coffea arabica* L. – Rodrigues 39	Rubiaceae
	Cipó-Alho	leaf	*Adenocalymna alliaceum* Miers – Rodrigues 34	Bignoniaceae
	Coirama	leaf	*Bryophyllum pinnatum* (L.f.) Oken – Rodrigues 8	Crassulaceae
	Copaíba	oil	*Copaifera guyanensis* Desf. – Rodrigues 77	Fabaceae s.l.
	Cumandá	bark	*Campsiandra angustifolia* Spruce ex Benth. – Rodrigues 62	Fabaceae s.l.
	Cumarú	leaf	*Coumarouna odorata* Aubl. – Rodrigues 102	Fabaceae s.l.
	Jabuti* (land turtle)	fat	*Geochelone carbonaria*	Testudinidae
	Limão	leaf	*Citrus aurantifolia* (Christm.) Swingle. – Rodrigues 128	Rutaceae
	Macaco-Guariba* (monkey)	fat	*Alouatta seniculus*	Cebidae
	Mangarataia	tubercle	*Zingiber officinale* Roscoe – Rodrigues 90	Zingiberaceae
	Mucura-caá	leaf	*Petiveria alliacea* L. – Rodrigues 49	Phytolaccaceae
	Pião-Branco	leaf/latex	*Jatropha curcas* L. – Rodrigues 19	Euphorbiaceae
	Pião-Pajé	leaf	*Jatropha podagrica* Hook. – Rodrigues 73	Euphorbiaceae
	Pião-Roxo	leaf	*Jatropha gossypiifolia* L. – Rodrigues 92	Euphorbiaceae
	Traíra-Preta* (fish)	fat	*Hoplias spp.*	Erythrinidae
	Trevo-Roxo	leaf	*Scutellaria sp.* – Rodrigues 24	Lamiaceae
	Vindecá	leaf	*Alpinia zerumbet* (Pers.) B. L. Burtt. & R. M. Smith – Rodrigues 21	Zingiberaceae
6-others (19)	Arruda	leaf	*Ruta graveolens* L. – Rodrigues 51	Rutaceae
	Boi* (ox)	bone	*Bos sp.*	Bovidae
	Café	leaf	*Coffea arabica* L. – Rodrigues 39	Rubiaceae
	Capim-Santo	leaf	*Cymbopogon citratus* (DC.) Stapf – Rodrigues 25	Poaceae
	Chicória	leaf	*Eryngium foetidum* L. – Rodrigues 115	Apiaceae
	Cominho	leaf	*Pactis enlogata* H.B.K. – Rodrigues 71	Asteraceae
	Copaíba	oil	*Copaifera guyanensis* Desf. – Rodrigues 77	Fabacese s.l.
	Gergelim	seed	*Sesamum indicum* L. – Rodrigues 74	Pedaliaceae
	Hortelã	leaf	*Mentha sp.*- Rodrigues 3	Lamiaceae
	Jacaré-Açú* (alligator)	fat	*Melanosuchus niger*	Alligatoridae
	Jacaré-Preto* (alligator)	fat	*Paleosuchus sp.*	Alligatoridae
	Jacaré-Tinga* (alligator)	fat	*Caiman crocodilus*	Crocodylidae
	Japecanga	root	*Smilax japecanga* Griseb – Rodrigues 53	Smilacaceae
	Mucura-caá	leaf	*Petiveria alliacea* L. – Rodrigues 49	Phytolacaceae
	Onça-Vermelha* (jaguar)	fat	*Felis concolor*	Felidae

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Table 1. (*continued*)

Categories of use (number of species)	Vernacular names of plants and animals*	Part used	Species – voucher	Family
	Oriza	leaf	*Pogostemon cablin* (Blanco) Benth. – Rodrigues 35	Lamiaceae
	Pião-Branco	seed	*Jatropha curcas* L. – Rodrigues 19	Euphorbiaceae
	Pimenta-Malagueta	leaf	*Capsicum frutescens* L. – Rodrigues 40	Solanaceae
	Pruma	leaf	*Tanacetum vulgare* L. – Rodrigues 50	Asteraceae
7-respiratory problems (19)	Alfavaca	leaf	*Ocimum micranthum* Willd. – Rodrigues 28	Lamiaceae
	Amapá	latex	*Brosimum parinarioides* Ducke – Rodrigues 106	Moraceae
	Andiroba	fruit	*Carapa guianensis* Aubl. – Rodrigues 2	Meliaceae
	Cabacinha	fruit	*Luffa operculata* (L.) Cogn. – Rodrigues 16	Cucurbitaceae
	Capivara* (capybara)	fat	*Hydrochaeris hydrochaeris*	Hydrochaeridae
	Chicória	root	*Eryngium foetidum* L. – Rodrigues 115	Apiaceae
	Gato-do-Mato* (jaguar)	fat	*Felis sp.*	Felidae
	Jabuti* (land turtle)	fat	*Geochelone carbonaria*	Testudinidae
	Jaca	leaf	*Artocarpus heterophyllus* Lamarck – Rodrigues 108	Moraceae
	Jambu	leaf	*Spilanthes oleracea* L. – Rodrigues 17	Asteraceae
	Jatobá	bark	*Hymenaea parvifolia* Huber – Rodrigues 56	Fabaceae s.l.
	Malvarisco	leaf	*Coleus amboinicus* L. – Rodrigues 4	Lamiaceae
	Manga	bark	*Mangifera indica* L. – Rodrigues 33	Anacardiaceae
	Mastruz	leaf	*Chenopodium ambrosioides* L. – Rodrigues 1	Chenopodiaceae
	Mucura* (opossum)	skin	*Didelphis sp.*	Didelphidae
	Pião-Branco	seed	*Jatropha curcas* L. – Rodrigues 19	Euphorbiaceae
	Pião-Roxo	leaf	*Jatropha gossypiifolia* L. – Rodrigues 92	Euphorbiaceae
	Pirarucu-caá	leaf	*Bryophyllum pinnatum* (L.f.) Oken – Rodrigues 8	Crassulaceae
	Urucu	bark	*Bixa orellana* L. – Rodrigues 10	Bixaceae
8-fever (17)	Açafroa	leaf/tubercle	*Curcuma longa* L. – Rodrigues 64	Zingiberaceae
	Amor-Crescido	leaf	*Portulaca pilosa* L. – Rodrigues 7	Portulacaceae
	Andiroba	seed	*Carapa guianensis* Aubl. – Rodrigues 2	Meliaceae
	Capim-Santo	leaf	*Cymbopogon citratus* (DC.) Stapf – Rodrigues 25	Poaceae
	Carapanaúba	bark	*Aspidosperma excelsum* Benth. – Rodrigues 11	Apocynaceae
	Castanheira	fruit	*Bertholletia excelsa* Bonpl. – Rodrigues 88	Lecythidaceae
	Cibalena	leaf	*Artemisia vulgaris* L. – Rodrigues 45	Asteraceae
	Cipó-Tuíra	leaf	*Bonamia ferruginea* (Choisy) Hallier f. – Rodrigues 136	Convolvulaceae
	Copaíba	fruit/oil	*Copaifera guyanensis* Desf. – Rodrigues 77	Fabaceae s.l.
	Hortelã	leaf	*Mentha sp.* – Rodrigues 3	Lamiaceae
	Malvarisco	leaf	*Coleus amboinicus* Lour. – Rodrigues 4	Lamiaceae
	Pau-Bôta	bark	*Abuta grandifolia* (Mart.) Sandw. – Rodrigues 109	Menispermaceae
	Pimenta-Malagueta	leaf	*Capsicum frutescens* L. – Rodrigues 40	Solanaceae
	Quina	bark	*Croton cajucara* Benth. – Rodrigues 43	Euphorbiaceae
	Sacaca	leaf	*Croton tenuissimus* Baill. – Rodrigues 37	Euphorbiaceae
	Saracura-Mirá	root	*Ampelozizyphus amazonicus* Ducke. – Rodrigues 98	Rhamnaceae
	Uxi-Liso	bark	*Endopleura uchi* (Huber) Cuatrec. – Rodrigues 23	Humiriaceae
9-body strengtheners (16)	Abacateiro	leaf	*Persea americana* Mill. – Rodrigues 144	Lauraceae
	Açafroa	tubercle	*Curcuma longa* L. – Rodrigues 64	Zingiberaceae

Table 1. (*continued*)

Categories of use (number of species)	Vernacular names of plants and animals*	Part used	Species – voucher	Family
	Açaí	root	*Euterpe oleracea* Mart. – Rodrigues 91	Arecaceae
	Amapá	latex	*Brosimum parinarioides* Ducke – Rodrigues 106	Moraceae
	Cana-Fichi	bark	*Costus spiralis* (Jacq.) Roscoe – Rodrigues 80	Zingiberaceae
	Carajiru	leaf	*Arrabidaea chica* (Humb. & Bonpl.) B. Verl. – Rodrigues 13	Bignoniaceae
	Castanheira	bark	*Bertholletia excelsa* Bonpl. – Rodrigues 88	Lecythidaceae
	Chichuá	bark	*Salacia megistophylla* Standl. – Rodrigues 83	Hippocrateaceae
	Cipó-Tuíra	leaf/root	*Bonamia ferruginea* (Choisy) Hallier f. – Rodrigues 136	Convolvulaceae
	Copaíba	bark/fruit	*Copaifera guyanensis* Desf. – Rodrigues 77	Fabaceae s.l.
	Jucá	fruit	*Caesalpinia ferrea* Mart. – Rodrigues 31	Fabaceae s.l.
	Olho-de-Pombo	leaf	*Croton trinitatis* Mill. – Rodrigues 48	Euphorbiaceae
	Onça-Vermelha* (jaguar)	fat	*Felis concolor*	Felidae
	Quati* (coati)	penis	*Nasua nasua*	Procyonidae
	Saracura-Mirá	root	*Ampelozizyphus amazonicus* Ducke – Rodrigues 98	Rhamnaceae
	Tiriricão	tubercle	*Sleria sp.* – Rodrigues 58	Cyperaceae
10-immunological problems (16)	Açafroa	tubercle	*Curcuma longa* L. – Rodrigues 64	Zingiberaceae
	Alfavaca	leaf	*Ocimum micranthum* Willd. – Rodrigues 28	Lamiaceae
	Alfavaca-Preta	leaf	*Ocimum basilicum* L. – Rodrigues 59	Lamiaceae
	Andiroba	seed	*Carapa guianensis* Aubl. – Rodrigues 2	Meliaceae
	Chicória	seed	*Eryngium foetidum* L. – Rodrigues 115	Apiaceae
	Cipó-Alho	leaf	*Adenocalymna alliaceum* Miers – Rodrigues 34	Bignoniaceae
	Coirama	leaf	*Bryophyllum pinnatum* (L.f.) Oken – Rodrigues 8	Crassulaceae
	Cravo-de-Defunto	flower	*Wedelia paludosa* D.C. – Rodrigues 94	Asteraceae
	Escada-de-jaboti	leaf	*Bauhinia sp.* – Rodrigues 117	Fabaceae s.l.
	Jambu	leaf/fruit	*Spilanthes oleracea* L. – Rodrigues 17	Asteraceae
	Jatobá	bark	*Hymenaea parvifolia* Huber. – Rodrigues 56	Fabaceae s.l.
	Limão	leaf	*Citrus aurantifolia* (Christm.) Swingle – Rodrigues 128	Rutaceae
	Mangarataia	tubercle	*Zingiber officinale* Roscoe – Rodrigues 90	Zingiberaceae
	Mastruz	leaf	*Chenopodium ambrosioides* L. – Rodrigues 1	Chenopodiaceae
	Pião-Branco	seed/leaf	*Jatropha curcas* L. – Rodrigues 19	Euphorbiaceae
	Urucu	bark	*Bixa orellana* L. – Rodrigues 10	Bixaceae
11-mishaps with animals (13)	Anil	leaf	*Indigofera suffruticosa* Mill. – Rodrigues 72	Fabaceae s.l.
	Araticum	leaf	*Annona montana* Macfad. – Rodrigues 103	Annonaceae
	Café	seed	*Coffea arabica* L. – Rodrigues 39	Rubiaceae
	Castanheira	fruit	*Bertholletia excelsa* Bonpl. – Rodrigues 88	Lecythidaceae
	Cipó-Ambé	sap	*Philodendron imbe* Schott – Rodrigues 86	Araceae
	Inambu-Galinha* (bird)	feather	*Crypturellus variegatus*	Tinamidae
	Jacaré-Açú* (alligator)	fat	*Melanosuchus niger*	Alligatoridae
	Japecanga	root	*Smilax japecanga* Griseb. – Rodrigues 53	Smilacaceae
	Paracaxi	leaf	*Pentaclethra macroloba* (Willd.) Kuntze – Rodrigues 148	Fabaceae s.l.
	Pau-para-Tudo	bark	*Potalia amara* Aubl. – Rodrigues 82	Loganiaceae
	Perpétua-Roxa	leaf	*Centratherum muticum* (Kunth) Less. – Rodrigues 132	Asteraceae

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Table 1. (*continued*)

Categories of use (number of species)	Vernacular names of plants and animals*	Part used	Species – voucher	Family
	Pimenta-Malagueta	leaf	*Capsicum frutescens* L. – Rodrigues 40	Solanaceae
	Sororoca	leaf/root	*Phenakaspermum guyanensis* Endl. – Rodrigues 125	Musaceae
12-osteomuscular problems (11)	Anta* (tapir)	fat	*Tapirus terrestris*	Tapiridae
	Cacau	fruit	*Theobroma cacao* L. – Rodrigues 105	Sterculiaceae
	Carneiro* (lamb)	fat	*Ovis sp.*	Bovidae
	Cipó-Apuí-Preto	latex	*Ficus gardneriana* (Miq.) Miq. – Rodrigues 129	Moraceae
	Cipó-Apuí-Santo-Antônio	latex	*Ficus paraensis* (Miq.) Miq. – Rodrigues 131	Moraceae
	Cipó-Guapuí	latex	*Anemopaegma sp.* – Rodrigues 119	Bignoniaceae
	Jaca	latex	*Artocarpus heterophyllus* Lamarck – Rodrigues 108	Moraceae
	Macaco-Prego* (monkey)	fat/bone	*Cebus apella*	Cebidae
	Onça* (jaguar)	fat	*Panthera onca*	Felidae
	Saraosso	tubercle	*Dioscorea stegelmanniana* R. Kunth. – Rodrigues 22	Dioscoreaceae
	Sucuriju* (snake)	fat	*Eunectes murinus*	Boidae
13-tropical diseases (7)	Camapu	root	*Physalis angulata* L. – Rodrigues 47	Solanaceae
	Carapanaúba	bark	*Aspidosperma excelsum* (Wod.) – Rodrigues 11	Apocynaceae
	Erva-de-Rato	leaf	*Palicourea nicotianifolia* Cham. & Schtdl. – Rodrigues 120	Rubiaceae
	Manga	bark	*Mangifera indica* L. – Rodrigues 33	Anacardiaceae
	Pau-D'Arco	bark	*Tabebuia serratifolia* (Vahl) G. Nicholson – Rodrigues 111	Bignoniaceae
	Quina	bark	*Croton cajucara* Benth. – Rodrigues 43	Euphorbiaceae
	Saracura-Mirá	root	*Ampelozizyphus amazonicus* Ducke – Rodrigues 98	Rhamnaceae
14-anxyolitics/ hypnotics (3)	Capitiú	leaf	*Siparuna guianensis* Aubl. – Rodrigues 84	Monimiaceae
	Erva-Cidreira	leaf	*Lippia alba* (Mill.) N.E.Br. – Rodrigues 76	Verbenaceae
	Oriza	leaf	*Pogostemon cablin* (Blanco) Benth. – Rodrigues 35	Lamiaceae
15-cardiovascular problems (3)	Ananás	leaf	*Ananas comosus* (L.) Merr. – Rodrigues 127	Bromeliaceae
	Bananeira	sap	*Musa sp.* – Rodrigues 126	Musaceae
	Limão	fruit	*Citrus aurantifolia* (Christm.) Swingle – Rodrigues 128	Rutaceae

* animal species

The third category in number of recorded uses is genitourinary disturbances (48), including the symptoms: menstrual colic (11) and menstrual regulator (10); as well as, particular needs: to ease delivery (16), contraceptive (8), abortive (2) and to render pregnant (1). Some women utilize the bark of 'carapanaúba' – *Aspidosperma excelsum* Benth. (Apocynaceae) in a maceration beverage to be ingested in the morning, to avoid pregnancy for months or even years. There are some women who ingest this preparation only after sexual relations, for the same purpose.

The category fever (43 recorded uses) is particularly important in these therapeutics. Fever may have many origins, malaria being one, and also very abundant in this area. On the other hand, there are plants specially utilized to combat malaria, belonging to the category of tropical diseases – this category consists of the following uses: to combat malaria (4 recorded uses) and leishmaniasis (1). The species most utilized for the treatment of malaria are: 'carapanaúba' (bark) – *Aspidosperma excelsum* Benth. (Apocynaceae); 'saracura-mirá' (root) *Ampelozizyphus amazonicus* Ducke (Rhamnaceae) and 'camapu' (root) *Physalis angulata* L. (Solanaceae).

Another category much in evidence is that of others; there are 43 recorded uses for five therapeutic purposes that could not be correlated with therapeutic indications in official medicine, namely: 'espanto' (fright), 'quebranto' (when someone looks at you wishing bad things), 'mãe do corpo' (mother of the body), 'vento caído' (drop in wind), and 'doença do ar' (disease from the air). It is supposed that 'doença do ar' (disease from the air), for instance, represents a classification of diseases that cannot be cured with local therapeutics and these ailments are thus much feared, for they almost always lead to death of the patient with symptoms ranging from a lack of appetite and diarrhea to a change in the color of the patient. The 'disease from the air' is broken up by the caboclos in at least four subtypes: 'black', 'red', 'yellow', and 'white', in that decreasing order of seriousness. According to the symptoms described by the caboclos, the 'black' subtype could be tetanus; the 'red', measles; the 'yellow', hepatitis and the 'white', anemia/diarrhea, respectively. They also explain that the body of the patient may take on one of these 'colors' depending on the type of disease. These diagnoses, however, were rendered difficult in the absence of medical services at the site or in the towns closest to the JNP. Moreover, it was not possible to include a doctor as a member of the research team.

The 120 plant species belong to 57 taxonomic families, the most frequent being: Asteraceae (10 representatives), Euphorbiaceae (10), Lamiaceae (8), Fabaceae s.l. (6), Moraceae (6), Bignoniaceae (5) and Rubiaceae (5); and 66% of these species are native to Brazilian flora.

Most of the plants utilized are arboreous and herbaceous. The parts most frequently cited were the leaves (54%), followed by the bark (13%) and roots (7%). Seed, latex, fruit, sap, oil, flower and resin were used in lesser proportion.

The 29 animal species, marked with an asterisk in Table 1, belong to seven taxonomic classes: Mammalia (13 representatives), Reptilia (7 reptiles), Amphibia (1), Osteichthyes (4 boned fish), Aves (2), Chondrichthyes (1 cartilaginous fish) and Oligochaeta (1 worm). The parts most cited were the fat (69%) followed by the bones (6%), with reports also of: feathers, skin, bile, scales, head and penis. The fat is generally extracted from the ventral part of the animal then melted down and stored in glass bottles, to be utilized at an opportune moment. The main use of the fat is through massages to bring the fetus inside the womb to an adequate position, facilitating delivery. But in addition, the fat is much in demand by the 'desmintidores' (masseurs) to massage areas of the body in patients with a sprain or torsion: in these cases, very often, the fat extracted from the *Cebus paella* (Cebidae) monkey is used.

Fats can also be ingested. The one extracted from the jaguar – *Felis* sp. (Felidae) is utilized for asthma. In some cases, plants are mixed to the fats, in order to increase their effectiveness, for example: 'cominho' – *Pactis enlogata* H.B.K. (Asteraceae) is added to tapir fat – *Tapirus terrestris* (Tapiridae) to be ingested in order to ease delivery. Finally, the fat from 'maguari' – *Ardea cocoi* (Ardeidae), is dripped in the eyes to treat conjunctivitis.

About two-thirds of the recorded uses occur through the oral route, in the form of a tea, tincture, oil, cough syrup and, also, hydroalcohol extract (consists of storing parts of one or more plants immersed in an alcoholic beverage for 1 or 2 weeks). Topical uses, in the form of compresses or poultices account for 27% of the total. Baths, bathing and gargling were cited less frequently.

Many of the plant species cited in this survey are already widely known, whether by populations in the north of Brazil or in other countries in the Amazon region (Estrella, 1995), and many of these uses are similar to those observed among the caboclos of the JNP. As examples of these plants, Table 2 mentions ten species, which are the most common and are cited in other ethnopharmacological surveys developed among different Amazon cultures. They are: the 'amapá' latex – *Brosimum parinarioides* Ducke (Moraceae) much used among the inhabitants of the Brazilian Amazon for healing wounds, for cases of asthma, bronchitis, and tuberculosis (Schultes and Raffauf, 1990; Berg and Silva, 1988); all of these uses were also reported in the JNP. The oil extracted from the seeds of 'andiroba' – *Carapa guianensis* Aubl (Meliaceae) is utilized in inflammation of the throat, for flu, fever and in dermatological problems in the JNP, in a manner very similar to uses made by Venezuelan and Brazilian inhabitants of the Amazon (Delascio, 1985). The leaves of 'capitiú' – *Siparuna guianensis* Aubl. (Monimiaceae) are used by many indigenous groups in Brazil – even those living in other biomas, such as the Paresi Indians (Morais, 1999) and the Krahô Indians (Rodrigues, 2001) from the cerrado savannahs – mainly as a sedative, just as they are used in the JNP.

Through a bibliographical survey in PUBMED, eight species (Table 2) were identified that have already been investigated from a pharmacological point of view. Moreover, for three of them, the therapeutic indications made by some of the inhabitants of the Amazon region (including the caboclos from JNP) agree with the literature data. For instance: 'mangarataia' – *Zingiber officinale* Roscoe (Zingiberaceae), utilized by the Yanomami Indians for toothache and by the caboclos as an analgesic, and for rheumatism, was investigated by Mascolo *et al.* (1989) and Suekawa *et al.*

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Table 2. Ten plant species and their uses by the caboclos from the Jaú National Park and other groups inhabiting the Amazon region, including bibliographical references

Plant species (family) Voucher number	Uses in the JNP	Uses by other inhabitants of the Amazon	References to other inhabitants' uses
1. *Brosimum parinarioides* Ducke (Moraceae) Rodrigues 106	Latex heals wounds, asthma bronchitis, tuberculosis and is a tonic	The same as in the JNP (Brazilian Amazon)	Schultes and Raffauf (1990); Berg and Silva (1988)
2. *Carapa guianensis* Aubl. (Meliaceae) Rodrigues 02	Oil is utilized for inflammation of the throat, for flu, fever and in dermatological problems	Dermatological treatment (Venezuelan Amazon); inflammation of the throat and flu (Brazilian Amazon)	Delascio (1985)
3. *Siparuna guianensis* Aubl. (Monimiaceae) Rodrigues 084	The leaves are sedative	Dizziness (Yanomani Indians); for headache, nausea, fever, and as a sedative (Brazilian Amazon)	Milliken and Albert (1996); Schultes and Raffauf (1990); Berg (1982); Branch and Silva (1983)
4. *Jatropha curcas* L. (Euphorbiaceae) Rodrigues 019	The leaves and seeds are utilized in flu, coughing, earache and in dermatological problems	Flu, headache, diabetes, toothache, snakebite (Brazilian Amazon); fever (Tikuna Indians)	Amorozo and Gély (1988); Ming (1995); Di Stasi amd Hiruma-Lima (2002); Berg and Silva (1988)
5. *Zingiber officinale* Roscoe (Zingiberaceae) Rodrigues 090	Rhizome is utilized as analgesic and for rheumatism	Toothache (Yanomani Indians)	Milliken and Albert (1996); Schultes and Raffauf (1990)
6. *Physalis angulata* L. (Solanaceae) Rodrigues 047	The root is utilized in liver troubles	Against worms, earache, liver trouble, malaria and hepatitis (Peruvian Amazon); rheumatism, dermatitis, fever, vomiting, and liver diseases (Brazilian Amazon)	Di Stasi and Hiruma-Lima (2002)
7. *Bryophyllum pinnatum* Lam. S. Kurtz. (Crassulaceae) Rodrigues 08	The leaves are used against stomachache and in liver troubles	Stomach problems (Amazonian region)	Rodrigues (1989)
8. *Curcuma longa* L. (Zingiberaceae) Rodrigues 64	Its tubercle is used in earache and stomachache cases	Against inflammation among the seringueiros (Brazilian Amazon)	Ming (1995)
9. *Petiveria alliacea* L. (Phytollaccaceae) Rodrigues 49	The leaves are used against headaches	Against headache and pain in the body (Amazon region); against earache (Tikuna Indians)	Di Stasi amd Hiruma-Lima (2002); Berg and Silva (1988); Amorozo and Gély (1988); Estrella (1995)
10. *Vernonia condensata* Baker (Asteraceae) Rodrigues 63	The leaves are utilized in inflammatory cases	Against stomach pain (Brazilian Amazon)	Ming (1995)

(1984), confirming the analgesic effect of this species. 'Camapu' – *Physalis angulata* L. (Solanaceae) utilized by the caboclos and also by inhabitants of the Brazilian and Peruvian Amazon for liver trouble has been studied by Wu *et al.* (2004) showing its action against a liver tumor. Finally, 'açafroa' – *Curcuma longa* L. (Zingiberaceae) utilized in stomach ache, has been studied by Mahady *et al.* (2002), who described its inhibitory action concerning the growth of *Helicobacter pylori in vitro*, therefore indicating some relation with the use made by the caboclos of JNP.

CONCLUSION

The great number of recorded uses for each category described in this ethnopharmacological survey (mainly: gastrointestinal disturbances, inflammatory processes, genitourinary disturbances and fever), may open up several lines of pharmacological and phytochemical investigations. It may lead further to the development of new medicines, with broader pharmacological and phytochemical studies, since some therapeutic uses mentioned by the JNP caboclos have been confirmed by previous studies in the literature, such as for example, for the species *Physalis angulata* L. (Solanaceae), *Zingiber officinale* Roscoe (Zingiberaceae) and *Cucuma longa* L. (Zingiberaceae). Therefore, six of the plants cited by the JNP caboclos, belonging to the categories pain and inflammatory processes are under investigation by groups of researchers in two Brazilian federal universities.

Moreover, this survey may open some perspective about the study of animals as sources of bioactive compounds.

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