

Herbal mixtures in the traditional medicine of Eastern Cuba

Juan Hernández Cano^a, Gabriele Volpato^{b,*}

^a BIOECO, Centro Oriental de Ecosistemas y Biodiversidad, José A. Saco 601 esq. Barnada, 90100, Santiago de Cuba, Cuba

^b Laboratorio di Agroecologia ed Etnobiologia, Dipartimento di Biologia, Università di Padova, Via U. Bassi, 58/b 35121 Padova, Italy

Received 20 December 2002; received in revised form 3 January 2003; accepted 9 October 2003

Abstract

Herbal mixtures in the traditional medicine of Eastern Cuba. Traditional herbal mixtures in Eastern Cuba are investigated through interviews with 130 knowledgeable people and traditional healers of the provinces of Santiago de Cuba and Guantánamo. One hundred seventy plant species and other products are used in 199 formulas, galones being the more complex. *Cocos nucifera* L. (Arecaceae), *Bidens pilosa* L. (Asteraceae), *Cissus sicyoides* L. (Vitaceae), *Erythroxylum havanense* Jacq. (Erythroxylaceae) and *Stachytarpheta jamaicensis* (L.) Vahl. (Verbenaceae) are the species most frequently cited. The ecological distribution of the taxa and cultural and anthropological aspects of mixtures are highlighted; particularly American and African influences that have shaped local knowledge about plant combinations are discussed. © 2003 Elsevier Ireland Ltd. All rights reserved.

Keywords: Ethnobotany; Phytomedicine; Herbal mixtures; Eastern Cuba; Galones

1. Introduction

The study of ethnomedical systems and of plants as therapeutic agents is of paramount importance to addressing health problems of traditional communities and third world countries as well as of industrialized societies. As well, a large number of studies have been conducted in the past few decades on the traditional pharmacopoeia of indigenous peoples and rural communities throughout the tropics. Many of them have been carried out in the Americas.

Nevertheless, these ethnobotanical studies are rarely focused on herbal mixtures. Both the botanical and ethnobiological aspects of such complex preparations have often been disregarded, and very little attention has been paid to them in the Caribbean (but see, for example, Longuefosse and Nossin, 1996; García et al., 2000; Ososki et al., 2002).

In Cuba, medicinal plants are traditionally arranged in a surprising number of herbal mixtures using at times elaborate procedures. Some recipes have already been reported (Seoane, 1984; Fuentes, 1988; Moreno et al., 1994), although to date no ethnobotanical research on multi-species formulas has ever been conducted in Eastern Cuba. Cuban people rely for food and medicine on a mixed culture that draws upon wisdom originating mainly from Indian, African, Spanish, French-Haitian, and Antillean ethnic

groups (Guanche, 1983; Fuentes, 1984b; Rivero de la Calle, 1992; Núñez and González, 1999). This multi-ethnic legacy has resulted in a rich pharmacopoeia, particularly in mountainous areas of the eastern provinces of Cuba (Hernández, 1985, 2000). A peculiarity of this unique herbalism is its richness in multi-species formulas that have been evolving across the centuries, some of which are labeled with specific denominations. These mixtures thus represent a social heritage, and their ethnobotanical investigation can add much to the understanding of local folk medical systems.

In Cuba, medicinal plants are not only of anthropological interest: they have an essential role for people, who cannot rely on pharmaceuticals for their health needs, due to economic difficulties following the breakup of the Soviet Union in 1989 and to the US blockade against the country (Kuntz, 1994; Kirkpatrick, 1996; AAWH, 1997; Garfield and Santana, 1997). Among the healthcare strategies adopted to confront medicine shortages of the so-called *periodo especial*, a national complementary medical system based on local folk medicine has developed (Soler and Porto, 1997; Suárez, 1997; Acosta de la Luz, 2001), as has the use of acupuncture and homeopathy (Fuentes, 1996; Abreu and Mateo, 1997). Ethnobotanical, phytochemical and pharmacological studies for the development of local cheap therapeutics are thus emphasized (i.e. Carbajal et al., 1983; Martínez et al., 1996; Payo et al., 1997; Guerra et al., 2001).

This paper focuses on the medicinal plants and other products used in the preparation of traditional herbal mixtures

* Corresponding author.

E-mail address: biocapro@libero.it (G. Volpato).

in Eastern Cuba. We will discuss: (1) the ethnobotanical aspects of herbal and non-herbal components and of their joint use within mixtures, (2) the role within local culture of complex formulas with specific denominations and, (3) the ecological distribution and phytogeographical aspects of the species used.

2. Material and methods

The data presented in this paper are part of a wider study on folk medicine in Eastern Cuba. Some 130 knowledgeable people (most of them traditional healers, *yerberos* and *curanderos*) have been interviewed in cities and villages of the provinces of Santiago de Cuba and Guantánamo by one of the authors (J.H.C.) since 1983. Eighty per cent of the interviews were conducted in the city of Santiago de Cuba, thirteen per cent in villages of the homonymous province (Simpatía, Ramón de las Yaguas, La Talí, La Chotera, El Caney, Perseverancia, Loma del Gato, Bella Pluma, El Dián, Palma Mocha, Las Cuevas, Ocuja); the remaining five per cent have been conducted in the province of Guantánamo (Baracoa, Rancho de Yaguas, Santo Domingo, San Mateo) (Fig. 1).

For each mixture, plant components, part(s) used, vernacular names, products other than botanicals used, means of preparation and application, number of reports, and generic and specific illnesses treated have been recorded. Illnesses are reported according to local ethno-medical terminology and classification reported by interviewees. Open-ended conversations were carried out with people interviewed. Voucher specimens of the plants cited were collected, identified, and deposited at BIOECO Herbarium (BSC), Santiago de Cuba. Taxonomical nomenclature follows León (1946),

León and Alain (1951, 1953, 1957), and Alain (1964, 1974), and the identification of the specimens was performed with the help of taxonomists of BIOECO. Finally, the uses of the species in mixtures have been compared with those referred to in the most important sources for Cuban medicinal plants (Roig, 1965, 1974; Seoane, 1984; Fuentes, 1984a, 1988).

3. Results and discussion

3.1. Herbal and non-herbal components of mixtures

Table 1 lists plant species used in the preparation of medicinal mixtures in alphabetical order of scientific name, along with their botanical families, vernacular names as they have been recorded during the fieldwork, and voucher specimens. For each species, the number of different mixtures in which it is present and the labels of these mixtures are reported as well. Ingredients others than plant species, such as products derived from plants (i.e. oils), animals (i.e. fats, excrements), or of industrial origin (i.e. aspirin, salts) are listed in Table 2. Mixtures (components, parts used, preparation, means of use and number of reports) are given in Table 3 according to groups of illnesses. Within each generic illness category, mixtures cited without further medical specifications are first reported, followed by mixtures treating specific afflictions; each group of mixtures is further arranged by increasing number of components. The category “other mixtures” includes all those mixtures that are used to treat ailments that do not fall within any previous category, and for which it makes no sense to build a separate category. We created a three-letter (corresponding to the generic illness category to which each mixture belongs) increasing number labelling system which identifies each



Fig. 1. The location of the study area and major cities.

Table 1
Medicinal species used in herbal mixtures in Eastern Cuba

Botanical taxon	Cuban phytonym	Voucher number	Labels of mixtures	Number of mixtures
<i>Acanthospermum humile</i> (Sw.) DC. (Asteraceae)	Abrojo	17662	REN01	1
<i>Agave</i> spp. (Agavaceae)	Magüey		SKI08, GAL13	2
<i>Allium sativum</i> L. (Alliaceae)	Ajo	16112	GAS10; RHE01,05; PAR01; OTH13,14,15; GAL05	8
<i>Allophylus cominia</i> Sw. (Sapindaceae)	Palo de caja	15569	DIA03,04	2
<i>Aloe vera</i> (L.) N.L. Burman (Liliaceae)	Sábila	15201	LIV07; DIA07; GAL03	3
<i>Aloysia citriodora</i> Palau (Verbenaceae)	Yerba Luisa	20797	MIE04	1
<i>Alpinia zerumbet</i> (Pers.) B.L. Burtt & R.M. Smith (Zingiberaceae)	Colonia	12710	FEV05	1
<i>Amaranthus crassipes</i> Schlecht. (Amaranthaceae)	Bleo blanco	13077	GAL07,12	2
<i>Ambrosia artemisiifolia</i> L. (Asteraceae)	Altamisa	12647	RHE08	1
<i>Amyris balsamifera</i> L. (Rutaceae)	Cuaba	12744	RHE08	1
<i>Anacardium occidentale</i> L. (Anacardiaceae)	Marañón (rojo)	13090	DIA02,03,04,07; GAS11,12	6
<i>Ananas comosus</i> (L.) Merrill (Bromeliaceae)	Piña	16086	LIV04	1
<i>Annona muricata</i> L. (Annonaceae)	Guanábana	13067	RES19; OTH02,03,04	4
<i>Annona reticulata</i> L. (Annonaceae)	Anón manteca	8229	OTH02	1
<i>Annona squamosa</i> L. (Annonaceae)	Anón de ojo	13069	GAS18	1
<i>Argemone mexicana</i> L. (Papaveraceae)	Cardo santo	12682	OTH17	1
<i>Arundo donax</i> L. (Poaceae)	Caña brava	12729	GAS15	1
<i>Avicennia germinans</i> L. (Avicenniaceae)	Mangle negro o prieto	12819	GYN08	1
<i>Bambusa vulgaris</i> Schrad. (Poaceae)	Bambú	15233	REN04; RES36; GAL06,11,12	5
<i>Bastardia viscosa</i> (L.) Kunth (Malvaceae)	Malva bruja	12777	OTH12	1
<i>Bidens pilosa</i> L. (Asteraceae)	Romerillo	12630	GAS12,13; REN09; RES02,10,12,13,14,17,19,20,22,24,25,26,28,32; DIA08; OTH04; MIE03,04,05	22
<i>Brachiaria mutica</i> (Forssk.) Stapf (Poaceae)	Paraná	12719	PAR02	1
<i>Brassica integrifolia</i> O.E. Schulz (Brassicaceae)	Mostaza	19930	GAL04,05	2
<i>Bromelia pinguin</i> L. (Bromeliaceae)	Maya	1122	PAR13	1
<i>Bursera simaruba</i> (L.) Sarg. (Burseraceae)	Almácigo	12922	RES31; OTH07	2
<i>Caesalpinia bonduc</i> (L.) Roxb. (Fabaceae)	Mate de costa	13092	Component of galones	
<i>Caesalpinia pulcherrima</i> (L.) Sw. (Fabaceae)	Clavellina (amarilla)	13097	FEV02,03; GAL04,05	4
<i>Caesalpinia vesicaria</i> L. (Fabaceae)	Palo del Brasil	15192	Component of pru	
<i>Cajanus cajan</i> (L.) Millsp. (Fabaceae)	Frijol gandúl	12863	RES03; PAR03	2

Table 1 (Continued)

Botanical taxon	Cuban phytonym	Voucher number	Labels of mixtures	Number of mixtures
<i>Campyloneurum phyllitidis</i> Presl. (Polypodiaceae)	Pasa de negro	CAL946	GAL04,05	2
<i>Canavalia nitida</i> Piper ^a (Fabaceae)	Cayajabo	15417	GAL15	1
<i>Capparis flexuosa</i> L. (Capparaceae)	Mostacilla, palo hueso	12676	SKI08	1
<i>Capraria biflora</i> L. (Scrophulariaceae)	Magüiro	12939	GAS08	1
<i>Capsicum frutescens</i> L. var. <i>frutescens</i> (Solanaceae)	Ají guaguao	12915	RHE06; GYN07	2
<i>Carica papaya</i> L. (Caricaceae)	Papaya	14245	PAR03; GAL07	2
<i>Cassia fistula</i> L. (Fabaceae)	Caña fistula	13104	LIV02,07,09,10,11; GAL04,05,09,11,12 MIE05	11
<i>Cassia grandis</i> L. f. (Fabaceae)	Cañandong (de hueso)	13103	GAL12	1
<i>Cassia</i> sp. (Fabaceae)	Sen		LIV09,10,11	3
<i>Cecropia peltata</i> L. (Cecropiaceae)	Yagruma	12787	GAS15; RES07,10; GAL05	4
<i>Cedrela odorata</i> L. (Meliaceae)	Cedro	20794	GYN05; RES04	2
<i>Ceiba pentandra</i> (L.) Gaertn. (Bombacaceae)	Ceiba	82	GAS18; GAL08	2
<i>Chenopodium ambrosoides</i> L. (Chenopodiaceae)	Apasote	12873	PAR01,04,08,09, 10,14; RHE09	7
<i>Chiococca alba</i> Hitchc. (Rubiaceae)	Verraco	12876	RES04,32; LIV12; REN14; RHE10; GYN09; GAL03,06, 07,09,11,12,14	13
<i>Chromolaena odorata</i> (L.) R.M. King & H. Rob. (Asteraceae)	Rompezaragüey	12618	GAS16; RES15; GAL02	3
<i>Cinnamomum verum</i> J.S. Presl. (Lauraceae)	Canela	12950	RHE02,06; GYN03,04,05,06; PRU01,02	8
<i>Cissus sicyoides</i> L. (Vitaceae)	Bejuco ubí	12824	RES19,20,23,24,25,26,27,32, 35; DIA08; GAL01,02,05; MIE03,04,05	16
<i>Citrus aurantifolia</i> Swingle cv. <i>mexicana</i> (Rutaceae)	Limón, limón criollo	14368	LIV13; RES05,09,12; PAR10,12; FEV01,05; OTH03,21; GAL14	11
<i>Citrus sinensis</i> (L.) Osbeck (Rutaceae)	Naranja (dulce)	15316	GAS06,10	2
<i>Cleome gynandra</i> L. (Capparaceae)	Uña de gato	13838	REN05; GAL03,08,12	4
<i>Cocos nucifera</i> L. (Arecaceae)	Coco	20788	REN04,16; RES05,09,34; PAR02,04,05,09,10,11,12,13, 14; GYN04,06,09; OTH22; GAL03,04,05,06,07,08,10,11, 12	27
<i>Coffea arabica</i> L. (Rubiaceae)	Café	12888	PAR14	1
<i>Colubrina elliptica</i> (Sw.) Brizicki & Stern (Rhamnaceae)	Carbonero	12748	RHE07; GAL03	2
<i>Commelina erecta</i> L. (Commelinaceae)	Yerba de sapo	12613	REN10; GAL14	2
<i>Corchorus siliquosus</i> L. (Tiliaceae)	Malva te, malva de tabaquito	12840	LIV09,10,11	3
<i>Coriandrum sativum</i> L. (Apiaceae)	Cilantro de Castilla	13066	RES18	1
<i>Craniolaria annua</i> L. (Pedaliaceae)	Yuca calzonera	14469	GAL10	1

Table 1 (Continued)

Botanical taxon	Cuban phytonym	Voucher number	Labels of mixtures	Number of mixtures
<i>Crescentia cujete</i> L. (Bignoniaceae)	Güira, güira cimarrona	10406	RES32; OTH18; GAL10; MIE01,02,03,04,05	8
<i>Critonia aromatisans</i> (DC.) R.M. King & H. Rob. (Asteraceae)	Trébol	12620	GAL04	1
<i>Cucurbita</i> spp. (Cucurbitaceae)	Calabaza		GAL05	1
<i>Cuminum cyminum</i> L. (Apiaceae)	Comino		GAS09; RES30; GYN02,06; OTH12; GAL04,05	7
<i>Cymbopogon citratus</i> Stapf (Poaceae)	Yerba de calentura	12726	NER09; FEV01	2
<i>Cyperus rotundus</i> L. (Cyperaceae)	Caramaná, coquito	10902	REN06,07,12,13; GAL14	5
<i>Cyrtopodium punctatum</i> (L.) Lindl. (Orchidaceae)	Cañuela	14879	GAL10,15	2
<i>Desmodium canum</i> (J.F. Gmelin) Schinz & Thell. (Fabaceae)	Amor seco	12869	GAL01,14	2
<i>Diospyros grisebachii</i> (Hiern) Standl. ^a (Ebenaceae)	Espuela de rey	6535	OTH17	1
<i>Elephantopus spicatus</i> Aubl. (Asteraceae)	Lengua de vaca	12649	RES36	1
<i>Erythroxylum havanense</i> Jacq. ^a (Erythroxylaceae)	Jibá	13007	LIV12; REN14; RES32; RHE10; OTH11; GAL01,03, 04;07,09,10,11,12,13; MIE02	15
<i>Eugenia axillaris</i> Willd. (Myrtaceae)	Guairaje, guairajón	12790	DIA08; OTH16	2
<i>Euphorbia hirta</i> L. (Euphorbiaceae)	Coronilla	12971	RHE07	1
<i>Euphorbia lactea</i> Haw. (Euphorbiaceae)	Espíritu santo	12992	SKI06	1
<i>Evolvulus arbuscula</i> Poir. (Convolvulaceae)	Tebenque	13916	OTH10; MIE02	2
<i>Fevillea cordifolia</i> L. (Cucurbitaceae)	Jabilla	14477	OTH06	1
<i>Ficus carica</i> L. (Moraceae)	Higo	16087	RES03,07,10	3
<i>Garcinia aristata</i> (Griseb.) Borhidi ^a (Clusiaceae)	Manajú	19353	RES33; OTH08	2
<i>Gerascanthus</i> <i>collococcus</i> (L.) Borhidi (Boraginaceae)	Ateje	19914	GAL11	1
<i>Gossypium arboreum</i> L. (Malvaceae)	Algodón	12781	REN06; RES15,21; SKI05; GAL02,04	6
<i>Gouania lupuloides</i> (L.) Urb. (Rhamnaceae)	Jaboncillo, bejuco de indio	11749	GAL05; PRU01,02	3
<i>Guazuma ulmifolia</i> Lam. (Sterculiaceae)	Guásima	12903	REN01,02,15	3
<i>Guibourtia hymenifolia</i> (Moric.) J. Leonard ^a (Fabaceae)	Cagüirán	17850	RHE08	1
<i>Hibiscus rosa-sinensis</i> L. (Malvaceae)	Mar Pacífico	15549	RES11	1
<i>Illicium</i> sp. (Illiciaceae)	Anís estrellado		GAS07,08,09; RHE02,06; GYN02; OTH20; MIE04	8
<i>Jatropha aethiopica</i> Muell. Arg. (Euphorbiaceae)	Chaya	20790	PAR06	1
<i>Jatropha curcas</i> L. (Euphorbiaceae)	Piñón criollo, piñón botija	12990	GAS14,16; SKI01	3

Table 1 (Continued)

Botanical taxon	Cuban phytonym	Voucher number	Labels of mixtures	Number of mixtures
<i>Jatropha gossypifolia</i> L. (Euphorbiaceae)	Túa-túa, tuba-tuba	3194	REN06,08,09; DIA09; SKI03,05; OTH19; GAL14	8
<i>Justicia pectoralis</i> Jacq. (Acanthaceae)	Carpintero	13012	RES21; DIA05; SKI09; NER01,02,03,05,06,08,09	10
<i>Koanophyllon villosum</i> (Sw.) R.M. King & H. Rob. (Asteraceae)	Tribulillo	12622	GAS19; SKI10	2
<i>Lactuca sativa</i> L. (Asteraceae)	Lechuga	16462	NER01	1
<i>Lawsonia inermis</i> L. (Lythraceae)	Resedá	12943	NER02,08; GAS04	3
<i>Lepidium virginicum</i> L. (Brassicaceae)	Mastuerzo	13051	GAS07,08,10; REN06,07, 09,16; RHE09; GYN01	9
<i>Lippia alba</i> (Mill.) N.E.Br. (Verbenaceae)	Menta americana	12813	GAS01,02; NER05,08; OTH12	5
<i>Lonchocarpus</i> <i>domingensis</i> DC. (Fabaceae)	Guamá	12870	LIV01	1
<i>Luffa cylindrica</i> (L.) M. Roem. (Cucurbitaceae)	Friega plato, estropajo	12609	PAR07,15	2
<i>Mallotonia gnaphalodes</i> Britton (Boraginaceae)	Salvia marina (blanca)	13034	RHE03	1
<i>Mangifera indica</i> L. (Anacardiaceae)	Mango (de mamey)	14226	FEV04	1
<i>Melia azedarach</i> L. (Meliaceae)	Pulsiana	12770	RHE04; DIA09	2
<i>Mentha × piperita</i> L. var. <i>citrata</i> (Ehrh.) Briq. (Lamiaceae)	Torongil	12960	GAS01	1
<i>Mentha spicata</i> L. (Lamiaceae)	Yerba buena	20792	GAS01,03,04,05,06,14; GYN01; MIE04	8
<i>Mimosa pudica</i> L. (Fabaceae)	Moriviví	12760	GAL08	1
<i>Momordica charantia</i> L. (Cucurbitaceae)	Cundeamor	12608	LIV04; RES20,26; PAR05; GAL13; MIE03	6
<i>Musa paradisiaca</i> L. (Musaceae)	Plátano	20795	DIA07; OTH18; GAL10	3
<i>Myristica fragrans</i> Houtt. (Myristicaceae)	Nuez moscada		GYN07; OTH09,10,20	4
<i>Nicotiana tabacum</i> L. (Solanaceae)	Tabaco	12912	RES38	1
<i>Ocimum basilicum</i> L. (Lamiaceae)	Albahaca blanca	12957	NER04,05,07; SKI09	4
<i>Ocimum campechianum</i> Mill. (Lamiaceae)	Albahaca mondonguera	15253	REN08,09	2
<i>Ocimum tenuiflorum</i> L. (Lamiaceae)	Albahaca morada	12954	GAS05; LIV08; RES13; DIA01,05,06,09; NER03,06; OTH04	10
<i>Ocotea coriacea</i> Britton (Lauraceae)	Sigua	6450	OTH16	1
<i>Opuntia cochenillifera</i> (L.) Mill. (Cactaceae)	Tuna de Castilla	13926	LIV14; SKI02	2
<i>Origanum majorana</i> L. (Lamiaceae)	Mejorana	20791	GAS02,04,05,06; RES16; DIA05,06; NER07; MIE04	9
<i>Oxandra lanceolata</i> (Sw.) Baill. (Annonaceae)	Yaya	18078	RES18	1
<i>Panicum maximum</i> Jacq. (Poaceae)	Yerba de Guinea	3119	FEV02,03,04	3
<i>Parthenium</i> <i>hysterophorus</i> L. (Asteraceae)	Confitillo	12635	GYN08	1
<i>Pectis ciliaris</i> L. (Asteraceae)	Chincha	14865	FEV04	1

Table 1 (Continued)

Botanical taxon	Cuban phytonym	Voucher number	Labels of mixtures	Number of mixtures
<i>Pedilanthus tithymaloides</i> (L.) Poit. (Euphorbiaceae)	Itamorreal	13002	RES23,24,27; GYN03; GAL04,05	6
<i>Peperomia pellucida</i> Kunth (Piperaceae)	Corazón de hombre	12591	REN11,13,15; RHE07	4
<i>Petiveria alliacea</i> L. (Phytolaccaceae)	Anamú	12589	REN03; RHE05; RES06; OTH19; GAL04,13	6
<i>Petroselinum crispum</i> (Mill.) Nyman (Apiaceae)	Perejil	18431	RES23; DIA09	2
<i>Philodendron lacerum</i> (Jacq.) Schott (Araceae)	Macusey	15558	GAL15	1
<i>Phyla scaberrima</i> (Juss.) Moldenke (Verbenaceae)	Orozul	12811	DIA08; MIE05	2
<i>Picramnia pentandra</i> Sw. (Simaroubaceae)	Aguedita	12920	FEV03; GAL11	2
<i>Pimenta dioica</i> (L.) Merr. (Myrtaceae)	Pimienta dulce, pimienta gorda	12789	GAS09,10; GAL05; PRU01,02	5
<i>Pimpinella anisum</i> L. (Apiaceae)	Anís		LIV14; RES32	2
<i>Pinus</i> spp. (Pinaceae)	Pino		PRU01	1
<i>Piper auritum</i> Sieber ex Kunth (Piperaceae)	Anizón	12602	GAS09; GYN01	2
<i>Pisonia aculeata</i> L. (Nyctaginaceae)	Zarza	14171	SKI07	1
<i>Plantago major</i> L. (Plantaginaceae)	Llantén	12695	LIV03; REN03; RHE07; RES37	4
<i>Plectranthus amboinicus</i> (Lour.) Spreng. (Lamiaceae)	Oreganón	12965	RES01,02,16,25; MIE02	5
<i>Pluchea carolinensis</i> (Jacq.) G. Don (Asteraceae)	Salvia	15136	RHE09; GAL04; MIE04	3
<i>Polypodium aureum</i> L. (Polypodiaceae)	Calaguala	CAL1897	GAL01,09,15	3
<i>Polypodium polypodioides</i> (L.) A.S. Hilch (Polypodiaceae)	Doradilla (de guásima)	CAL1352	GAL10	1
<i>Portulaca oleracea</i> L. (Portulacaceae)	Verdolaga	12694	GAS13; PAR13	2
<i>Protium cubense</i> (Rose) Urb. ^a (Burseraceae)	Copal	19100	RES08,09,33; SKI07; GYN10; OTH08; GAL01	7
<i>Psidium guajava</i> L. (Myrtaceae)	Guayaba	15611	GAS03,17,18; RES10	4
<i>Punica granatum</i> L. (Punicaceae)	Granada	12681	GAS11,17; DIA01	3
<i>Ravenia leonis</i> M. Vict. ^a (Rutaceae)	Abre camino, arraiján	12737	GAL10	1
<i>Rheum</i> sp. (Polygonaceae)	Ruibarbo		LIV02,09,10,11; GAL06	5
<i>Rhizophora mangle</i> L. (Rhizophoraceae)	Mangle rojo	19064	GAL12	1
<i>Ricinus communis</i> L. (Euphorbiaceae)	Higuereta	19199	REN09	1
<i>Rorippa nasturtium-aquaticum</i> (L.) Hayek (Brassicaceae)	Berro	13050	LIV03; RES23; MIE03	3
<i>Roystonea regia</i> (Kunth) O.F. Cook (Arecaceae)	Palma real	12595	REN05; RES08; GYN05,09; GAL03,04,07,09,10,11,12,13,14	13
<i>Ruellia tuberosa</i> L. (Acanthaceae)	Raíz de pantano	8947	REN06; MIE05	2

Table 1 (Continued)

Botanical taxon	Cuban phytonym	Voucher number	Labels of mixtures	Number of mixtures
<i>Ruta graveolens</i> L. (Rutaceae)	Ruda	12736	GAS07; OTH13,14,15	4
<i>Saccharum officinarum</i> L. (Poaceae)	Caña criolla	20796	GAL05	1
<i>Salpianthus</i> <i>purpurascens</i> Hook. & Arn. (Nyctaginaceae)	Nitro	12848	LIV06; REN02,07,10,11,15; GAL05	7
<i>Sambucus simpsonii</i> Rehder (Caprifoliaceae)	Sáuco blanco	13923	GAL04,05; MIE04	3
<i>Sansevieria trifasciata</i> Prain (Agavaceae)	Guataca de burro	16467	LIV09; SKI04	2
<i>Schaefferia frutescens</i> Jacq. (Celastraceae)	Amansa guapo, cambia voz	12672	Component of galones	
<i>Senna alata</i> (L.) Roxb. (Fabaceae)	Palo santo, guacamaya francesa	13094	DIA02,04	2
<i>Senna occidentalis</i> (L.) Link (Fabaceae)	Platanillo	13093	LIV02; RHE04; RES27; OTH01,11,12,22; GAL05,09,10,14; MIE03 RHE10; OTH01	12
<i>Senna uniflora</i> (P. Miller) Irwin & Barneby (Fabaceae)	Guanina	17442		2
<i>Smilax domingensis</i> Willd. (Smilacaceae)	Raíz de China, ñame de China	17927	GAL06,08,09,11,12,13; PRU01,02	8
<i>Solandra longiflora</i> Tussac (Solanaceae)	Dajao, palo dajao	15516	RHE08	1
<i>Solanum americanum</i> Mill. (Solanaceae)	Yerba mora, joruro	12908	GAS13; REN08; RHE10; DIA09; PAR06; GYN01; GAL15; MIE03	8
<i>Solanum torvum</i> Sw. (Solanaceae)	Predejera, pendejera	12905	REN09; RES14,17,22,26,27,34; GAL02,04,05,10; MIE03	12
<i>Stachytarpheta</i> <i>jamaicensis</i> (L.) J. Vahl (Verbenaceae)	Verbena	12802	LIV05,06,08,11; REN07,08,12; DIA06; SKI09; NER06,07,08; OTH19; GAL02,14	15
<i>Swietenia mahagoni</i> Jacq. (Meliaceae)	Caoba	19082	RES30,31,32; GYN09; OTH06,07; GAL01,03,04,05	10
<i>Syzygium aromaticum</i> (L.) Merrill & Perry (Myrtaceae)	Clavo de olor	15610	PRU02	1
<i>Tagetes erecta</i> L. (Asteraceae)	Escarolá, flor de muerto	12653	GYN10	1
<i>Tamarindus indica</i> L. (Fabaceae)	Tamarindo	20789	GAS12; LIV04,05	3
<i>Tecoma stans</i> (L.) H.B. & K. (Bignoniaceae)	Sáuco amarillo	13026	DIA09	1
<i>Thouinia elliptica</i> Radlk. ^a (Sapindaceae)	Negracuba	12935	LIV01; DIA02,03	3
<i>Thymus vulgaris</i> L. (Lamiaceae)	Tomillo	20793	RES28	1
<i>Tilia europea</i> L. (Tiliaceae)	Tilo		DIA09; NER04	2
<i>Tournefortia hirsutissima</i> L. (Boraginaceae)	Cayaya	13031	RES32; GAL01,04,08, 09,10,12; MIE02	8
<i>Trichostigma octandrum</i> H. Walter (Phytolaccaceae)	Guaniquiqui	14447	GAS16	1
<i>Vitex agnus-castus</i> L. (Verbenaceae)	Vencedor de jardín	12806	RES21	1
<i>Waltheria indica</i> L. (Sterculiaceae)	Malva blanca	7487	GAL01,11,14,15	4

Table 1 (Continued)

Botanical taxon	Cuban phytonym	Voucher number	Labels of mixtures	Number of mixtures
<i>Xanthium strumarium</i> L. (Asteraceae)	Guizazo de Baracoa, guizazo de Mabujabo	12636	LIV08,13; REN08,09; GAL12	5
<i>Zea mays</i> L. (Poaceae)	Maíz	17447	REN07	1
<i>Zebrina pendula</i> Schnizl. (Commelinaceae)	Santa Lucía	12615	OTH21	1
<i>Zingiber cassumunar</i> Roxb. (Zingiberaceae)	Gengibre amargo	12707	RHE03,10; RES38	3

Labels: GAS, gastro-intestinal afflictions; LIV, liver and vesicular afflictions; REN, renal afflictions; RHE, rheumatism, artrosis; RES, respiratory way organs' afflictions; DIA, diabetes; SKI, skin afflictions; NER, nervousness, insomnia; PAR, parasites; GYN, reproductive apparatus afflictions; FEV, fever; OTH, other afflictions; GAL, galones; MIE, miel de guira; PRU, pru.

^a Cuban endemic species.

different recipe, in order to cite mixtures throughout the text. There are 170 different species used in the preparation of 199 herbal mixtures that are made to treat both minor ailments and life-threatening diseases; 22 of them are complex mixtures with specific denominations (*galones*, *miel de güira*, *pru*) and therapeutical aims. *Galones* are mainly used to treat pneumonia and venereal diseases, *miel de güira* is used as an anticatarrhal and to treat gynaecological prob-

lems, and *pru* is used as a hypotensive, depurative and digestive. The species belong to 71 families, with a prevalence of Fabaceae (9.4%), Asteraceae (7.6%), Lamiaceae (4.7%), Euphorbiaceae and Poaceae (4.1%), Rutaceae, Solanaceae and Verbenaceae (2.9%). Asteraceae (96), Poaceae (96), and Fabaceae (93) are also families represented by more genera within the Cuban flora (Acevedo, 1991). Thirty-five families are represented in mixtures by just one species, accounting for the 20.6% of the total species.

Cocos nucifera (27), *Bidens pilosa* (22), *Cissus sicyoides* (16), *Erythroxylum havanense* (15), *Stachytarpheta jamaicensis* (15), *Chiococca alba* and *Roystonea regia* (13) are the species most frequently reported. *Cocos nucifera*, *Chiococca alba*, *Erythroxylum havanense*, and *Roystonea regia* are major components of complex mixtures (*galones*) for pneumonia and venereal diseases, while *Bidens pilosa* and *Cissus sicyoides* are principal in mixtures for respiratory problems, which form the major ethno-medical category in terms of number of preparations. Although most species present one or a few main therapeutical use(s) throughout different mixtures and are concentrated in specific illness categories, others are used without any apparent specificity. Interestingly, congeneric species are often used in mixtures, each with a specific medicinal purpose. While *Solanum americanum* has a wide-ranging pattern of use, *Solanum torvum* is a species commonly used in anticatarrhal formulas; *Ocimum basilicum* is preferred in sedative mixtures (*nervios*; Fuentes and Granda, 1982), *Ocimum tenuiflorum* is used as an anti-diabetic, whereas *Ocimum campechianum* is the only species of the genus to be used for renal afflictions. The latter, as well as *Acanthospermum humile*, *Craniolaria annua* and *Vitex agnus-castus* are reported here for the first time as used in Cuban popular medicine. As we would have expected, species reported as “new” to Cuban medicine are collected from the wild rather than cultivated, and their use could either belong to specific informants' knowledge or pertain to specific isolated areas of Eastern Cuba. This is not the case for *Vitex agnus-castus*, which can be found for sale in herbal markets of Santiago de Cuba for religious purposes (Hernández, 2000), and that is well known and used worldwide for menstrual problems (Roberts et al., 2001; Barnes et al., 2002).

Table 2
Other products used in mixtures

Aspirin®
Beer
Bee's honey
Bovine lung (<i>bofe</i>)
Castor oil
Condensed milk
Cow's bile
Cow's milk
Cricket's legs
Dried cod liver oil
Dry wine (not necessarily of grapes)
Duck's eggs
Epsom salts
Fat of <i>majá</i> (<i>Epicrates angulifer</i> Bibron, Boidae)
Ram's fat
Goat's excrements
Goat's hoof
Goat's milk
Magnesium powder
Mule's hoof
Nest of <i>comején</i> (American termite; <i>Nasutitermes</i> sp., Termitidae)
Oil
Rum
Salt (sodium chloride)
Scorpion
Soap
Soap of <i>Castilla</i> (washing-soap)
Sugar
Sweet wine (not necessarily of grapes)
Tincture of iodine
Tobacco's tops
Urine of the mother of the person being sick
Vinegar
Whale's sperm
Wheat meal
Yolk of hen's eggs

Table 3
Herbal mixtures in Eastern Cuba

Label	Components and plant parts	Preparation	Way of use	Cit.	Specific illness (if reported)
Gastro-intestinal afflictions (GAS)					
GAS01	<i>Lippia alba</i> (ap), <i>Mentha spicata</i> (ap), <i>Mentha</i> × <i>piperita</i> var. <i>citrata</i> (ap)	de	or	1	
GAS02	<i>Cassia grandis</i> (ap), <i>Lippia alba</i> (ap), <i>Origanum majorana</i> (ap)	de	or	1	
GAS03	<i>Mentha spicata</i> (ap), <i>Psidium guajava</i> (ap)	ma	or	1	Stomach pains
GAS04	<i>Origanum majorana</i> (wp), <i>Mentha spicata</i> (le)	de	or	1	Stomach pains
GAS05	<i>Origanum majorana</i> (ap), <i>Mentha spicata</i> (ap), <i>Ocimum tenuiflorum</i> (ap)	de	or	1	Stomach pains
GAS06	<i>Citrus sinensis</i> (ep), <i>Origanum majorana</i> (ap), <i>Mentha spicata</i> (ap)	de	or	1	Stomach pains
GAS07	<i>Illicium</i> sp. (se), <i>Lepidium virginicum</i> (ap), <i>Ruta graveolens</i> (ap)	de	or	1	Gases
GAS08	<i>Capraria biflora</i> (ap), <i>Illicium</i> sp. (se), <i>Lepidium virginicum</i> (ap)	de	or	1	Gases
GAS09	<i>Cuminum cyminum</i> (fr), <i>Illicium</i> sp. (se), <i>Pimenta dioica</i> (fr), <i>Piper auritum</i> (le)	de	or	2	Gases
GAS10	<i>Allium sativum</i> (bu), <i>Citrus sinensis</i> (ep), <i>Lepidium virginicum</i> (ap), <i>Pimenta dioica</i> (fr)	de	or	1	Gases
GAS11	<i>Anacardium occidentale</i> (ba), <i>Punica granatum</i> (ep)	de	or	1	Stomach ulcer
GAS12	<i>Anacardium occidentale</i> (ba), <i>Bidens pilosa</i> (ap), <i>Tamarindus indica</i> (ba)	ma	or	1	Stomach ulcer
GAS13	<i>Bidens pilosa</i> (ap), <i>Portulaca oleracea</i> (ap), <i>Solanum americanum</i> (ap)	je	or	1	Gastritis
GAS14	<i>Jatropha curcas</i> (le), <i>Mentha spicata</i> (ap)	de	or	1	Anti-emetic
GAS15	<i>Arundo donax</i> (ro), <i>Cecropia peltata</i> (fr)	de	or	1	Laxative
GAS16	<i>Chromolaena odorata</i> (ap), <i>Jatropha curcas</i> (se), <i>Trichostigma octandrum</i> (ap), oil	de	or	1	Laxative
GAS17	<i>Psidium guajava</i> (le), <i>Punica granatum</i> (ep)	de	or	1	Diarrhoea
GAS18	<i>Annona squamosa</i> (ap), <i>Ceiba pentandra</i> (ep), <i>Psidium guajava</i> (le)	de	or	1	Diarrhoea
GAS19	<i>Koanophyllon villosum</i> (ap), rum, salt	de	or	1	Disentery
Liver and vesicular afflictions (LIV)					
LIV01	<i>Lonchocarpus domingensis</i> (le), <i>Thouinia elliptica</i> (le)	de	or	1	
LIV02	<i>Cassia fistula</i> (fr), <i>Cassia</i> sp. (le), <i>Senna occidentalis</i> (ro), <i>Rheum</i> sp. (ro)	de	or	1	
LIV03	<i>Plantago major</i> (le), <i>Rorippa nasturtium-aquaticum</i> (ap)	de	or	1	Liver pains
LIV04	<i>Ananas comosus</i> (ep), <i>Momordica charantia</i> (ap), <i>Tamarindus indica</i> (fr)	de	or	1	Liver pains, acidity
LIV05	<i>Stachytarpheta jamaicensis</i> (ap), <i>Tamarindus indica</i> (ap)	de	or	1	Digestive
LIV06	<i>Salpianthus purpurascens</i> (ap), <i>Stachytarpheta jamaicensis</i> (ap)	de	or	1	Digestive, refreshing
LIV07	<i>Aloe vera</i> (le), <i>Cassia fistula</i> (fr), epsom salts	ma	or	1	Colagogue
LIV08	<i>Ocimum tenuiflorum</i> (ap), <i>Stachytarpheta jamaicensis</i> (ap), <i>Xanthium strumarium</i> (wp)	de	or	1	Fat in the liver (steatosis)
LIV09	<i>Cassia fistula</i> (fr), <i>Cassia</i> sp. (le), <i>Corchorus siliquosus</i> (ro), <i>Rheum</i> sp. (ro), <i>Sanseveria trifasciata</i> (ro)	de	or	1	Icterus
LIV10	<i>Cassia fistula</i> (fr), <i>Cassia</i> sp. (le), <i>Corchorus siliquosus</i> (ro), <i>Rheum</i> sp. (ro), sweet wine	ma	or	1	Hepatitis
LIV11	<i>Cassia fistula</i> (fr), <i>Cassia</i> sp. (le), <i>Corchorus siliquosus</i> (ro), <i>Rheum</i> sp. (ro), <i>Stachytarpheta jamaicensis</i> (ro)	de	or	1	Hepatitis
LIV12	<i>Chiococca alba</i> (ro), <i>Erythroxylum havanense</i> (ro)	de	or	1	Vesicular gall-stones
LIV13	<i>Citrus aurantifolia</i> (fr), <i>Xanthium strumarium</i> (wp), oil	de	or	1	Vesicular gall-stones
LIV14	<i>Opuntia cochenillifera</i> (st), <i>Pimpinella anisum</i> (fr), oil	de	or	1	Vesicular gall-stones
Renal afflictions (REN)					
REN01	<i>Acanthospermum humile</i> (ap), <i>Guazuma ulmifolia</i> (ba)	de	or	1	
REN02	<i>Guazuma ulmifolia</i> (ba), <i>Salpianthus purpurascens</i> (le)	de	or	1	
REN03	<i>Petiveria alliacea</i> (ro), <i>Plantago major</i> (le)	de	or	1	
REN04	<i>Bambusa vulgaris</i> (ro), <i>Cocos nucifera</i> (ro)	de	or	1	

Table 3 (Continued)

Label	Components and plant parts	Preparation	Way of use	Cit.	Specific illness (if reported)
REN05	<i>Cleome gynandra</i> (ro), <i>Roystonea regia</i> (ro), cricket's legs	de	or	1	
REN06	<i>Cyperus rotundus</i> (ro), <i>Gossypium arboreum</i> (ro), <i>Jatropha gossypifolia</i> (ro), <i>Lepidium virginicum</i> (wp), <i>Ruellia tuberosa</i> (ro)	de	or	1	
REN07	<i>Cyperus rotundus</i> (ro), <i>Lepidium virginicum</i> (ap), <i>Salpianthus purpurascens</i> (le), <i>Stachytarpheta jamaicensis</i> (ap), <i>Zea mays</i> (sg)	de	or	1	
REN08	<i>Jatropha gossypifolia</i> (ro), <i>Ocimum campechianum</i> (ap), <i>Solanum americanum</i> (ap), <i>Stachytarpheta jamaicensis</i> (ro), <i>Xanthium strumarium</i> (ro)	de	or	1	
REN09	<i>Bidens pilosa</i> (wp), <i>Jatropha gossypifolia</i> (wp), <i>Lepidium virginicum</i> (wp), <i>Ocimum campechianum</i> (ap), <i>Ricinus communis</i> (le), <i>Solanum torvum</i> (le), <i>Xanthium strumarium</i> (ro), sugar	de	or	1	
REN10	<i>Commelina erecta</i> (ap), <i>Salpianthus purpurascens</i> (ap)	de	or	1	(Painful minton) disuria
REN11	<i>Peperomia pellucida</i> (wp), <i>Salpianthus purpurascens</i> (le)	de	or	2	Diuretic
REN12	<i>Cyperus rotundus</i> (ro), <i>Stachytarpheta jamaicensis</i> (ap)	de	or	1	Diuretic
REN13	<i>Cyperus rotundus</i> (ro), <i>Peperomia pellucida</i> (ap)	de	or	1	Calculus
REN14	<i>Chiococca alba</i> (ro), <i>Erythroxylum havanense</i> (ro)	de	or	1	Calculus
REN15	<i>Guazuma ulmifolia</i> (ba), <i>Peperomia pellucida</i> (wp), <i>Salpianthus purpurascens</i> (ap)	de	or	1	Calculus
REN16	<i>Cocos nucifera</i> (fr,ro), <i>Lepidium virginicum</i> (ap)	de	or	1	Bactericide
Rheumatism, atrosis (RHE)					
RHE01	<i>Allium sativum</i> (fr), oil	fr	fr	1	
RHE02	<i>Cinnamomum verum</i> (ba), <i>Illicium</i> sp. (se)	ma	fr	1	
RHE03	<i>Mallotonia gnaphalodes</i> (wp), <i>Zingiber cassumunar</i> (rh)	ma	fr	1	
RHE04	<i>Melia azedarach</i> (se), <i>Senna occidentalis</i> (ro)	ma	fr	1	
RHE05	<i>Allium sativum</i> (bu), <i>Petiveria alliacea</i> (ro), rum	tr,ma	or	1	
RHE06	<i>Capsicum frutescens</i> (fr), <i>Cinnamomum verum</i> (ba), <i>Illicium</i> sp. (se)	ma	fr	1	
RHE07	<i>Colubrina elliptica</i> (st), <i>Euphorbia hirta</i> (ap), <i>Peperomia pellucida</i> (ap), <i>Plantago major</i> (le)	de	or	1	
RHE08	<i>Ambrosia artemisifolia</i> (ap), <i>Amyris balsamifera</i> (st), <i>Guibourtia hymenifolia</i> (ba), <i>Solandra longiflora</i> (st)	ma	fr	2	
RHE09	<i>Chenopodium ambrosioides</i> (wp), <i>Lepidium virginicum</i> (ro), <i>Pluchea carolinensis</i> (le), scorpion, goat's hooves	ma	fr	1	
RHE10	<i>Chiococca alba</i> (ro), <i>Erythroxylum havanense</i> (ro), <i>Senna uniflora</i> (ro), <i>Solanum americanum</i> (ro), <i>Zingiber cassumunar</i> (rh)	ma	fr	1	
Respiratory way organs' afflictions (RES)					
RES01	<i>Plectranthus amboinicus</i> (ap), oil	fr	or	1	Asthma
RES02	<i>Bidens pilosa</i> (ap), <i>Plectranthus amboinicus</i> (ap)	de	or	1	Asthma
RES03	<i>Cajanus cajan</i> (ap), <i>Ficus carica</i> (le)	de	or	1	Asthma
RES04	<i>Cedrela odorata</i> (ba), <i>Chiococca alba</i> (ro)	de	or	1	Asthma
RES05	<i>Citrus aurantifolia</i> (fr), <i>Cocos nucifera</i> (fr)		or	1	Asthma
RES06	<i>Petiveria alliacea</i> (ap), rum, tincture of iodine	ma	or	1	Asthma
RES07	<i>Cecropia peltata</i> (le), <i>Ficus carica</i> (le), bee's honey	de	or	1	Asthma
RES08	<i>Protium cubense</i> (ro), <i>Roystonea regia</i> (fr), oil	fr,tr	or	1	Asthma
RES09	<i>Citrus aurantifolia</i> (fr), <i>Cocos nucifera</i> (fr), <i>Protium cubense</i> (ro), oil, bee's honey	je,ma	or	1	Asthma
RES10	<i>Bidens pilosa</i> (ap), <i>Cecropia peltata</i> (le), <i>Ficus carica</i> (le), <i>Psidium guajava</i> (ap), sugar	de	or	1	Asthma
RES11	<i>Hibiscus rosa-sinensis</i> (wp), whale's sperm	de	or	1	Catarrh
RES12	<i>Bidens pilosa</i> (ap), <i>Citrus aurantifolia</i> (fr)	de	or	2	Catarrh
RES13	<i>Bidens pilosa</i> (ap), <i>Ocimum tenuiflorum</i> (ap)	de	or	1	Catarrh
RES14	<i>Bidens pilosa</i> (ap), <i>Solanum torvum</i> (le)	je	or	1	Catarrh
RES15	<i>Chromolaena odorata</i> (ap), <i>Gossypium arboreum</i> (ap)	de	or	1	Catarrh
RES16	<i>Origanum majorana</i> (ap), <i>Plectranthus amboinicus</i> (le)	je	or	1	Catarrh

Table 3 (Continued)

Label	Components and plant parts	Preparation	Way of use	Cit.	Specific illness (if reported)
RES17	<i>Bidens pilosa</i> (ap), <i>Solanum torvum</i> (le), fat of majà (<i>Epicrates angulifer</i>)	je	or	1	Catarrh
RES18	<i>Coriandrum sativum</i> (ap), <i>Oxandra lanceolata</i> (ba), oil	de	or	1	Catarrh
RES19	<i>Annona muricata</i> (le), <i>Bidens pilosa</i> (ap), <i>Cissus sicyoides</i> (ap)	de	or	1	Catarrh
RES20	<i>Bidens pilosa</i> (ap), <i>Cissus sicyoides</i> (ap), <i>Momordica charantia</i> (ap)	de	or	3	Catarrh
RES21	<i>Gossypium arboreum</i> (ap), <i>Justicia pectoralis</i> (ap), <i>Vitex agnus-castus</i> (ap)	de	or	1	Catarrh
RES22	<i>Bidens pilosa</i> (ap), <i>Solanum torvum</i> (le), oil, bee's honey	je	or	1	Catarrh
RES23	<i>Cissus sicyoides</i> (ap), <i>Pedilanthus tithymaloides</i> (ap), <i>Petroselinum crispum</i> (ap), <i>Rorippa nasturtium-aquaticum</i> (ap)	je	or	1	Catarrh
RES24	<i>Bidens pilosa</i> (ap), <i>Cissus sicyoides</i> (ap), <i>Pedilanthus tithymaloides</i> (le), bee's honey, rum	je,ma	or	1	Catarrh
RES25	<i>Bidens pilosa</i> (ap), <i>Cissus sicyoides</i> (ap), <i>Plectranthus amboinicus</i> (le), oil, dried cod-liver oil	je	or	3	Catarrh
RES26	<i>Bidens pilosa</i> (ap), <i>Cissus sicyoides</i> (le), <i>Momordica charantia</i> (ap), <i>Solanum torvum</i> (le), castor-oil, bee's honey	je	or	1	Catarrh
RES27	<i>Cissus sicyoides</i> (le), <i>Pedilanthus tithymaloides</i> (le), <i>Senna occidentalis</i> (ro), <i>Solanum torvum</i> (le), oil, dried cod-liver oil, castor-oil, bee's honey, rum	je,ma	or	1	Catarrh
RES28	<i>Bidens pilosa</i> (ap), <i>Thymus vulgaris</i> (ap)	de	or	1	Cough, catarrh
RES29	Tobacco's tops, urine	de	or	1	Pneumonia
RES30	<i>Cuminum cyminum</i> (fr), <i>Swietenia mahagoni</i> (ba), castor-oil, nest of comején (<i>Nasutitermes</i> sp.)	de	or	1	Pneumonia
RES31	<i>Bursera simaruba</i> (ba, le), <i>Swietenia mahagoni</i> (ba), castor-oil, nest of comején (<i>Nasutitermes</i> sp.)	de	or	1	Pneumonia
RES32	<i>Bidens pilosa</i> (ap), <i>Chiococca alba</i> (ro), <i>Cissus sicyoides</i> (ap), <i>Crescentia cujete</i> (fr), <i>Erythroxylum havanense</i> (ro), <i>Pimpinella anisum</i> (fr), <i>Swietenia mahagoni</i> (ba), <i>Tournefortia hirsutissima</i> (ro), sugar, bovine lung, bee's honey, rum	de,ma	or	1	Pneumonia catarrh tuberculosis
RES33	<i>Garcinia aristata</i> (ro), <i>Protium cubense</i> (ro)	in	to	1	Flemagogue
RES34	<i>Cocos nucifera</i> (fr), <i>Solanum torvum</i> (le), oil	je	or	1	Flemagogue
RES35	<i>Cissus sicyoides</i> (ap), oil, dried cod-liver oil, castor-oil, bee's honey	je	or	1	Flemagogue
RES36	<i>Bambusa vulgaris</i> (le), <i>Elephantopus spicatus</i> (le), salt	de	gu	1	Roucoussness
RES37	<i>Argemone mexicana</i> (le), <i>Plantago major</i> (fr), fat of ram	tr	or	1	Sinusitis
RES38	<i>Nicotiana tabacum</i> (le), <i>Zingiber cassumunar</i> (rh), fat of ram	tr	to	1	Sinusitis
Diabetes (DIA)					
DIA01	<i>Ocimum tenuiflorum</i> (ap), <i>Punica granatum</i> (ep)	de	or	1	
DIA02	<i>Anacardium occidentale</i> (ba), <i>Senna alata</i> (ap), <i>Thouinia elliptica</i> (st)	de	or	1	
DIA03	<i>Allophylus cominia</i> (st), <i>Anacardium occidentale</i> (ba), <i>Thouinia elliptica</i> (st)	de	or	1	
DIA04	<i>Allophylus cominia</i> (ap), <i>Anacardium occidentale</i> (ba), <i>Senna alata</i> (ap)	de	or	1	
DIA05	<i>Justicia pectoralis</i> (ap), <i>Ocimum tenuiflorum</i> (ap), <i>Origanum majorana</i> (ap)	de	or	1	
DIA06	<i>Ocimum tenuiflorum</i> (ap), <i>Origanum majorana</i> (ap), <i>Stachytarpheta jamaicensis</i> (ap)	de	or	1	
DIA07	<i>Aloe vera</i> (le), <i>Anacardium occidentale</i> (ba), <i>Musa paradisiaca</i> (st), sugar	ma	or	1	
DIA08	<i>Bidens pilosa</i> (ap), <i>Cissus sicyoides</i> (ap), <i>Eugenia axillaris</i> (ba), <i>Phylla scaberrima</i> (ap)	de	or	1	
DIA09	<i>Jatropha gossypifolia</i> (wp), <i>Melia azedarach</i> (ap), <i>Ocimum tenuiflorum</i> (ap), <i>Petroselinum crispum</i> (ap), <i>Solanum americanum</i> (ap), <i>Tecoma stans</i> (ap), <i>Tilia europea</i> (fl), epsom salts	de	or	1	

Table 3 (Continued)

Label	Components and plant parts	Preparation	Way of use	Cit.	Specific illness (if reported)
Skin afflictions (SKI)					
SKI01	<i>Jatropha curcas</i> (le), oil, goat's excrements		to	1	Scalds
SKI02	<i>Opuntia cochenillifera</i> (st), wheat meal, vinegar	tr	to	1	Scalds
SKI03	<i>Jatropha gossypifolia</i> (le), tobacco's tops, fat of ram		to	1	Strokes (haematoma)
SKI04	<i>Cuminum cyminum</i> (fr), <i>Sanseveria trifasciata</i> (le), oil, fat of ram	tr	to	1	Boils
SKI05	<i>Gossypium arboreum</i> (se), <i>Jatropha gossypifolia</i> (le), sugar, bee's honey, fat of ram	tr	to	1	Boils
SKI06	<i>Euphorbia lactea</i> (la), <i>Jatropha curcas</i> (la)	je	to	1	Corns
SKI07	<i>Pisonia aculeata</i> (le), <i>Protium cubense</i> (ro), sugar, soap, fat of ram		to	1	Spine extraction
SKI08	<i>Agave</i> sp. (ro), <i>Capparis flexuosa</i> (ro)	de	or	1	Leprosy
SKI09	<i>Justicia pectoralis</i> (ap), <i>Ocimum basilicum</i> (ap), <i>Stachytarpheta jamaicensis</i> (ap)	de	ba,or	1	Allergic eruption
SKI10	<i>Koanophyllon villosum</i> (ap), cow's bile, fat of ram	je,fr	to	1	Dandruff
Nervousness, insomnia (NER)					
NER01	<i>Justicia pectoralis</i> (ap), <i>Lactuca sativa</i> (ro)	de	or	1	Sedative, somniferous
NER02	<i>Justicia pectoralis</i> (ap), <i>Lawsonia inermis</i> (fl)	de	or	1	Sedative, somniferous
NER03	<i>Justicia pectoralis</i> (ap), <i>Ocimum tenuiflorum</i> (ap)	de	or	2	Sedative, somniferous
NER04	<i>Ocimum basilicum</i> (ap), <i>Tilia europea</i> (fl)	de	or	1	Sedative, somniferous
NER05	<i>Justicia pectoralis</i> (ap), <i>Lippia alba</i> (ap), <i>Ocimum basilicum</i> (ap)	de	or	1	Sedative, somniferous
NER06	<i>Justicia pectoralis</i> (ap), <i>Ocimum tenuiflorum</i> (ap), <i>Stachytarpheta jamaicensis</i> (ap)	de	or	1	Sedative, somniferous
NER07	<i>Ocimum basilicum</i> (ap), <i>Origanum majorana</i> (ap), <i>Stachytarpheta jamaicensis</i> (ap)	de	or	2	Sedative, somniferous
NER08	<i>Justicia pectoralis</i> (ap), <i>Lawsonia inermis</i> (fl), <i>Lippia alba</i> (ap), <i>Stachytarpheta jamaicensis</i> (ap)	de	or	1	Sedative, somniferous
NER09	<i>Cymbopogon citratus</i> (le), <i>Justicia pectoralis</i> (ap)	de	or	1	Sedative, hypotensive
Parasites (PAR)					
PAR01	<i>Allium sativum</i> (bu), <i>Chenopodium ambrosioides</i> (ap)	de	or	1	
PAR02	<i>Brachiaria mutica</i> (ro), <i>Cocos nucifera</i> (fr)	de,je	or	1	
PAR03	<i>Cajanus cajan</i> (le), <i>Carica papaya</i> (la)	je	or	1	
PAR04	<i>Chenopodium ambrosioides</i> (le,ap), <i>Cocos nucifera</i> (fr)	je	or	4	
PAR05	<i>Cocos nucifera</i> (fr), <i>Momordica charantia</i> (ap)	je	or	1	
PAR06	<i>Jatropha aethiopica</i> (le), <i>Solanum americanum</i> (ap)	in	or	1	
PAR07	<i>Luffa cylindrica</i> (fr), washing-soap, salt	de	or	1	
PAR08	<i>Chenopodium ambrosioides</i> (ap), cow's milk, magnesita calcinada	je	or	1	
PAR09	<i>Chenopodium ambrosioides</i> (ap), <i>Cocos nucifera</i> (fr), cow's milk	je	or	2	
PAR10	<i>Chenopodium ambrosioides</i> (le), <i>Citrus aurantifolia</i> (le), <i>Cocos nucifera</i> (fr)	je	or	1	
PAR11	<i>Cocos nucifera</i> (fr), castor-oil, sugar, salt	je	or	1	
PAR12	<i>Citrus aurantifolia</i> (fr), <i>Cocos nucifera</i> (fr), castor-oil, sugar	je	or	1	
PAR13	<i>Bromelia pinguin</i> (fr), <i>Cocos nucifera</i> (fr), <i>Portulaca oleracea</i> (ap), sugar	je	or	1	
PAR14	<i>Chenopodium ambrosioides</i> (ap), <i>Cocos nucifera</i> (fr), <i>Coffea arabica</i> (se), tobacco's tops	de,je	or	1	
PAR15	<i>Luffa cylindrica</i> (fr), yolk of hen's eggs, salt	de	or	1	Parasites, typhoid fever
Reproductive apparatus afflictions (GYN)					
GYN01	<i>Lepidium virginicum</i> (ap), <i>Mentha spicata</i> (ap), <i>Piper auritum</i> (le), <i>Solanum americanum</i> (ap)	de	or	1	
GYN02	<i>Cuminum cyminum</i> (fr), <i>Illicium</i> sp. (se)	de	or	1	Menstrual pains
GYN03	<i>Cinnamomum verum</i> (ba), <i>Pedilanthus tithymaloides</i> (le)	de	or	1	Abortive
GYN04	<i>Cinnamomum verum</i> (ba), <i>Cocos nucifera</i> (uf), beer	de	or	1	Abortive
GYN05	<i>Cinnamomum verum</i> (ba), <i>Cedrela odorata</i> (ba), <i>Roystonea regia</i> (ba), Aspirin	de	or	1	Abortive
GYN06	<i>Cinnamomum verum</i> (ba), <i>Cocos nucifera</i> (uf), <i>Cuminum cyminum</i> (fr), mule's hoof	de	or	1	Anticonceptual

Table 3 (Continued)

Label	Components and plant parts	Preparation	Way of use	Cit.	Specific illness (if reported)
GYN07	<i>Capsicum frutescens</i> (fr), <i>Myristica fragrans</i> (se), yolk of hen's eggs, condensed milk, sweet wine	ma	or	1	Impotence, frigidity
GYN08	<i>Avicennia germinans</i> (le), <i>Parthenium hysterophorus</i> (ro)	de	or	1	Venereal diseases
GYN09	<i>Chiococca alba</i> (ro), <i>Cocos nucifera</i> (ro), <i>Roystonea regia</i> (ro), <i>Swietenia mahagoni</i> (ba)	de	or	1	<i>Flores blancas</i> (vaginal flows) and venereal diseases
GYN10	<i>Protium cubense</i> (ro), <i>Tagetes erecta</i> (fl), oil	fr	to	2	<i>Flores blancas</i> (vaginal flows)
Fever (FEV)					
FEV01	<i>Citrus aurantifolia</i> (fr), <i>Cymbopogon citratus</i> (le)	de	or	1	
FEV02	<i>Caesalpinia pulcherrima</i> (fl), <i>Panicum maxicum</i> (ro), <i>Mangifera indica</i> (le)	de	or	1	
FEV03	<i>Caesalpinia pulcherrima</i> (fl), <i>Panicum maxicum</i> (ro), <i>Picramnia pentandra</i> (le)	de	or	1	
FEV04	<i>Mangifera indica</i> (le), <i>Panicum maxicum</i> (ro), <i>Pectis ciliaris</i> (ap)	de	or	1	
FEV05	<i>Alpinia zerumbet</i> (le), <i>Citrus aurantifolia</i> (le)	de	ba,or	1	Malaria
Other afflictions (OTH)					
OTH01	<i>Senna occidentalis</i> (ro), <i>Senna uniflora</i> (ro)	de	or	1	Blood depurative
OTH02	<i>Annona muricata</i> (le), <i>Annona reticulata</i> (le)	de	or	1	Hypotensive
OTH03	<i>Annona muricata</i> (le), <i>Citrus aurantifolia</i> (le)	de	or	1	Hypotensive
OTH04	<i>Annona muricata</i> (le), <i>Bidens pilosa</i> (ap), <i>Ocimum tenuiflorum</i> (ap)	de	or	1	Hypotensive
OTH05	Tobacco's tops, urine	de	or	1	Spasms
OTH06	<i>Fevillea cordifolia</i> (se), <i>Swietenia mahagoni</i> (ba), rum	de	or	1	Spasms
OTH07	<i>Bursera simaruba</i> (le,ba), <i>Swietenia mahagoni</i> (ba), castor-oil, nest of comején (<i>Nasutitermes</i> sp.)	de	or	1	Spasms
OTH08	<i>Garcinia aristata</i> (ro), <i>Protium cubense</i> (ro), nest of comején (<i>Nasutitermes</i> sp.)	de	or	1	Spasms in animals
OTH09	<i>Myristica fragrans</i> (se), duck's eggs, dry wine	de	or	1	Reconstituent
OTH10	<i>Evolvulus arbuscula</i> (ap), <i>Myristica fragrans</i> (se), yolk of hen's eggs, rum	de	or	1	Reconstituent
OTH11	<i>Erythroxylum havanense</i> (ro), <i>Senna occidentalis</i> (ro)	de	or	1	Muscular pains
OTH12	<i>Bastardia viscosa</i> (ap), <i>Cuminum cyminum</i> (fr), <i>Lippia alba</i> (ap), <i>Senna occidentalis</i> (ro)	de	or	1	Muscular pains
OTH13	<i>Allium sativum</i> (bu), <i>Ruta graveolens</i> (ap), cow's milk	de	or	1	<i>Padrejón</i>
OTH14	<i>Allium sativum</i> (bu), <i>Ruta graveolens</i> (ap), goat's milk	de	or	4	<i>Padrejón</i> , <i>madrejón</i>
OTH15	<i>Allium sativum</i> (bu), <i>Bastardia viscosa</i> (ap), <i>Ruta graveolens</i> (ap)	de	or	1	<i>Padrejón</i> , <i>madrejón</i>
OTH16	<i>Eugenia axillaris</i> (ap), <i>Ocotea coriacea</i> (le)	de	or	1	Sea-food intoxication
OTH17	<i>Argemone mexicana</i> (ro), <i>Diospyros grisebachii</i> (ro)	de	or	1	Cardiac afflictions
OTH18	<i>Crescentia cujete</i> (fl), <i>Musa paradisiaca</i> (le)	fr	to	1	Earache
OTH19	<i>Jatropha gossypifolia</i> (le), <i>Petiveria alliacea</i> (le), <i>Stachytarpheta jamaicensis</i> (ap)	de	or	1	Tumors
OTH20	<i>Illicium</i> sp. (se), <i>Myristica fragrans</i> (se), oil	fr	to	1	Allergic rhinitis
OTH21	<i>Citrus aurantifolia</i> (fr), <i>Zebrina pendula</i> (ap)	de	to	1	Conjunctivitis
OTH22	<i>Cocos nucifera</i> (fr), <i>Senna occidentalis</i> (ro)	de	or	1	Hemorrhoids
Galones (botella, frucanga)					
GAL01	<i>Cissus sicyoides</i> (ro), <i>Desmodium canum</i> (ro), <i>Erythroxylum havanense</i> (ro), <i>Polypodium aureum</i> (rh), <i>Protium cubense</i> (ro), <i>Swietenia mahagoni</i> (ba), <i>Tournefortia hirsutissima</i> (ro), <i>Waltheria indica</i> (ro), oil, castor-oil	de	or	1	Asthma, <i>Galón</i>
GAL02	<i>Chromolaena odorata</i> (le), <i>Cissus sicyoides</i> (le), <i>Gossypium arboreum</i> (le), <i>Solanum torvum</i> (le), <i>Stachytarpheta jamaicensis</i> (le), oil, yolk of hen's eggs, bee's honey, rum	je,ma	or	1	Catarrh, <i>Galón</i>
GAL03	<i>Aloe vera</i> (le), <i>Cleome gynandra</i> (ro), <i>Cocos nucifera</i> (ro), <i>Colubrina elliptica</i> (st), <i>Chiococca alba</i> (ro), <i>Erythroxylum havanense</i> (ro), <i>Roystonea regia</i> (ro), <i>Swietenia mahagoni</i> (ba)	de	or	1	Pneumonia, <i>Galón</i>

Table 3 (Continued)

Label	Components and plant parts	Preparation	Way of use	Cit.	Specific illness (if reported)
GAL04	<i>Brassica integrifolia</i> (fl), <i>Caesalpinia pulcherrima</i> (fl), <i>Campyloneurum phyllitidis</i> (ro), <i>Cassia fistula</i> (fr), <i>Cocos nucifera</i> (ro), <i>Critonia aromatisans</i> (le), <i>Cuminum cyminum</i> (fr), <i>Erythroxylum havanense</i> (ro), <i>Gossypium arboreum</i> (ap), <i>Lawsonia inermis</i> (fl), <i>Pedilanthus tithymaloides</i> (fl), <i>Petiveria alliacea</i> (ap), <i>Pluchea carolinensis</i> (ap), <i>Roystonea regia</i> (ro), <i>Sambucus simpsonii</i> (fl), <i>Solanum torvum</i> (ap), <i>Swietenia mahagoni</i> (ba), <i>Tournefortia hirsutissima</i> (ro), oil, Aspirin, sugar, tobacco's tops, yolk of hen's eggs	de	or	1	Pneumonia, <i>Galón</i>
GAL05	<i>Allium sativum</i> (ro), <i>Brassica integrifolia</i> (fl), <i>Caesalpinia pulcherrima</i> (fl), <i>Campyloneurum phyllitidis</i> (ro), <i>Cassia fistula</i> (ro), <i>Cecropia peltata</i> (ap), <i>Cissus sicyoides</i> (ap), <i>Cocos nucifera</i> (ro), <i>Cucurbita</i> spp. (fl), <i>Cuminum cyminum</i> (fr), <i>Gouania lupuloides</i> (ro), <i>Pedilanthus tithymaloides</i> (fl), <i>Pimenta dioica</i> (le), <i>Saccharum officinarum</i> (st), <i>Salpianthus purpurascens</i> (fl), <i>Sambucus simpsonii</i> (fl), <i>Senna occidentalis</i> (ro), <i>Solanum torvum</i> (ap), <i>Swietenia mahagoni</i> (ba), oil, castor-oil, tobacco's tops, yolk of hen's eggs, nest of comején (<i>Nasutitermes</i> sp.)	de	or	1	Pneumonia, <i>Galón</i>
GAL06	<i>Bambusa vulgaris</i> (ro), <i>Chiococca alba</i> (ro), <i>Cocos nucifera</i> (ro), <i>Rheum</i> sp. (ro), <i>Smilax domingensis</i> (rh)	de	or	1	Venereal diseases, <i>Galón</i>
GAL07	<i>Amaranthus crassipes</i> (ro), <i>Carica papaya</i> (ro), <i>Chiococca alba</i> (ro), <i>Cocos nucifera</i> (ro), <i>Erythroxylum havanense</i> (ro), <i>Roystonea regia</i> (ro)	de	or	1	Venereal diseases, <i>Botella</i>
GAL08	<i>Ceiba pentandra</i> (ro), <i>Cleome gynandra</i> (ro), <i>Cocos nucifera</i> (uf), <i>Mimosa pudica</i> (ro), <i>Smilax domingensis</i> (rh), <i>Tournefortia hirsutissima</i> (ro), yolk of hen's eggs, dry wine	de	or	1	Venereal diseases, <i>Galón</i>
GAL09	<i>Cassia fistula</i> (fr), <i>Crescentia cujete</i> (fr), <i>Chiococca alba</i> (ro), <i>Erythroxylum havanense</i> (ro), <i>Polypodium aureum</i> (rh), <i>Roystonea regia</i> (ro), <i>Senna occidentalis</i> (ro), <i>Smilax domingensis</i> (rh), <i>Tournefortia hirsutissima</i> (ro), sugar	de	or	1	Venereal diseases, <i>Galón</i>
GAL10	<i>Cocos nucifera</i> (ro), <i>Craniolaria annua</i> (ro), <i>Crescentia cujete</i> (ro), <i>Cyrtopodium punctatum</i> (ro), <i>Erythroxylum havanense</i> (ro), <i>Musa paradisiaca</i> (ro), <i>Polypodium polypodioides</i> (le), <i>Ravenia leonis</i> (ro), <i>Roystonea regia</i> (ro), <i>Senna occidentalis</i> (ro), <i>Solanum torvum</i> (ro), <i>Tournefortia hirsutissima</i> (ro)	de	or	1	Venereal diseases, <i>Galón</i>
GAL11	<i>Bambusa vulgaris</i> (ro), <i>Cassia fistula</i> (fr), <i>Cassia</i> sp. (le), <i>Chiococca alba</i> (ro), <i>Cocos nucifera</i> (ro), <i>Gerascanthus collococcus</i> (ro), <i>Erythroxylum havanense</i> (ro), <i>Picramnia pentandra</i> (ro), <i>Roystonea regia</i> (ro), <i>Smilax domingensis</i> (rh), <i>Waltheria indica</i> (ro), epsom salts	de	or	1	Venereal diseases, <i>Galón</i>
GAL12	<i>Amaranthus crassipes</i> (ro), <i>Bambusa vulgaris</i> (ro), <i>Cassia fistula</i> (fr), <i>Cassia grandis</i> (ro), <i>Cassia</i> sp. (le), <i>Chiococca alba</i> (ro), <i>Cleome gynandra</i> (ro), <i>Cocos nucifera</i> (ro), <i>Erythroxylum havanense</i> (ro), <i>Rhizophora mangle</i> (ro), <i>Roystonea regia</i> (ro), <i>Smilax domingensis</i> (rh), <i>Tournefortia hirsutissima</i> (ro), <i>Xanthium strumarium</i> (ro)	de	or	1	Venereal diseases, <i>Galón</i>
GAL13	<i>Agave</i> sp. (ro), <i>Erythroxylum havanense</i> (ro), <i>Momordica charantia</i> (ap), <i>Petiveria alliacea</i> (ro), <i>Roystonea regia</i> (ro), <i>Smilax domingensis</i> (rh)	de	or	1	Blood depurative, <i>Galón</i>
GAL14	<i>Chiococca alba</i> (ro), <i>Citrus aurantifolia</i> (ro), <i>Commelina erecta</i> (wp), <i>Cyperus rotundus</i> (wp), <i>Desmodium canum</i> (ro), <i>Jatropha gossypifolia</i> (ro), <i>Roystonea regia</i> (ro), <i>Senna occidentalis</i> (ro), <i>Stachytarpheta jamaicensis</i> (ro), <i>Waltheria indica</i> (ro), sugar	de	or	1	Impotence, <i>Galón</i>
GAL15	<i>Canavalia nitida</i> (st), <i>Cyrtopodium punctatum</i> (wp), <i>Philodendron lacerum</i> (st), <i>Polypodium aureum</i> (rh), <i>Waltheria indica</i> (ro), <i>Solanum americanum</i> (ap)	de	to	1	Boils, (<i>granos</i>) <i>Frucanga</i>

Table 3 (Continued)

Label	Components and plant parts	Preparation	Way of use	Cit.	Specific illness (if reported)
Miel de Güira					
MIE01	<i>Crescentia cujete</i> (fr), sugar, bee's honey, rum	de,ma	or	1	Catarrh
MIE02	<i>Crescentia cujete</i> (fr), <i>Erythroxylum havanense</i> (ro), <i>Evolvulus arbuscula</i> (ap), <i>Plectranthus amboinicus</i> (ap), <i>Tournefortia hirsutissima</i> (ro), sugar, bee's honey, rum	de,ma	or	1	Catarrh
MIE03	<i>Bidens pilosa</i> (ap), <i>Cissus sicyoides</i> (ap), <i>Crescentia cujete</i> (fr), <i>Momordica charantia</i> (ap), <i>Rorippa nasturtium-aquaticum</i> (ap), <i>Senna occidentalis</i> (ro), <i>Solanum americanum</i> (ap), <i>Solanum torvum</i> (ap), sugar, rum	de,je,ma	or	1	Catarrh
MIE04	<i>Aloysia citriodora</i> (ap), <i>Bidens pilosa</i> (ap), <i>Cissus sicyoides</i> (ap), <i>Crescentia cujete</i> (fr), <i>Illicium</i> sp. (se), <i>Origanum majorana</i> (ap), <i>Mentha spicata</i> (ap), <i>Pluchea carolinensis</i> (ap), <i>Sambucus simpsonii</i> (fl), bee's honey, rum, tincture of iodine	de,je,ma	or	1	Catarrh
MIE05	<i>Bidens pilosa</i> (ap), <i>Cassia fistula</i> (fr), <i>Cissus sicyoides</i> (fr), <i>Crescentia cujete</i> (fr), <i>Cyrtopodium punctatum</i> (wp), <i>Phyla scaberrima</i> (ap), <i>Ruellia tuberosa</i> (ro), bee's honey	de	or	1	Coolness (<i>frialdad</i>) at the uterus, menstrual irregularity
Pru					
PRU01	<i>Cinnamomum verum</i> (le), <i>Gouania lupuloides</i> (st), <i>Pimenta dioica</i> (le), <i>Pinus</i> spp. (le), <i>Smilax domingensis</i> (rh), sugar	de	or	2	Depurative, hypotensive
PRU02	<i>Cinnamomum verum</i> (le), <i>Gouania lupuloides</i> (st), <i>Pimenta dioica</i> (le), <i>Smilax domingensis</i> (rh), <i>Syzygium aromaticum</i> (le), sugar	de	or	1	Hypotensive

Part(s) used: ap, aerial part; ba, bark; bu: bulb; ep, fruit epicarp; fl, flowers; fr, fruits; ft, flowering tops; la, latex; le, leaves; ls, leaf stalks; re, resin; rh, rhizome; ro, root/ tuber; se, seeds; sg, stigma; sh, shoots; st, stems; uf, unripe fruits; wo, wood; wp, whole plant. Preparation: de, decoction (*cocimiento*); fr, frying; in, infusion; je, juice extraction; ma, maceration; tr, trituration. Way of use: ba, bath; en, enema; fr, frictionating; gu, gurgles; or, oral ingestion; to, topical application. Cit., citations (number of individual reports for each mixture).

Eight species (*Canavalia nitida*, *Diospyros grisebachii*, *Erythroxylum havanense*, *Garcinia aristata*, *Guibourtia hymenifolia*, *Protium cubense*, *Ravenia leonis*, *Thouinia elliptica*), corresponding to 4.8% of the total species, are Cuban endemisms (cf. León and Alain, 1951, 1953, 1957; López et al., 1994a, 1994b, 1995). A decoction of the root *E. havanense* is a main component of *galones* and it is used in Cuba for liver and renal afflictions and as a powerful diuretic (Roig, 1974), and when combined with the root of *Chiococca alba* is used to treat vesicular gallstones and renal calculus (LIV12; REN14). The other species are sparsely cited, and often belong to the *materia medica* of specific healers, particularly of producers of *galones*. Endemic species of the genus *Pinus* (*Pinus caribaea* Morelet ssp. *caribaea* Morelet, *Pinus cubensis* Griseb., and *Pinus maestrensis* Bisse) are apparently used without distinction to make *pru* (PRU01,02), and are commonly cultivated in Eastern Cuba as part of reforestation efforts and as shade trees for coffee plantations (Esquivel et al., 1992; Del Risco, 1999).

Four species not belonging to Cuban flora but on sale in chemist's shop (*farmacias*) have been assimilated into the Cuban pharmacopoeia through a form of syncretism between traditional folk remedies and cosmopolitan medicine (Laguerre, 1987). *Cassia* sp. and *Rheum* sp. are components of mixtures for hepatitis (LIV09,10,11), *Illicium*

sp. for intestinal and stomach gases (GAS07,08,09), and *Tilia europea* is used in sedative (NER04) and anti-diabetic (DIA09) formulas. These species are reported by healers in combination with Cuban folk medicinal species (i.e. *Corchorus siliquosus*, *Lepidium virginicum*, *Solanum americanum*), and sometimes have been assimilated with medicinal purposes other than those that they are sold for (i.e. *Cassia* sp. in formulas for jaundice). Cosmopolitan medicinal species are testimony to cultural and commercial exchanges, on the one hand, with the Far East and China (*Cassia* sp., *Rheum* sp.), and on the other hand with Europe (*Tilia europea*). Since World War II, *Justicia pectoralis*, the major component of mixtures for insomnia and nervousness, is widely used in Cuba as sedative (Roig, 1974; Moreno et al., 1994). At the time, imports of *Tilia europea*'s dried flowers from Europe could not keep up with local demand (Fuentes, 1984b). People thus started using the aerial part of *Justicia pectoralis* which, in some Cuban regions, has the same vernacular name as *Tilia europea* (tilo). The latter is still used when available at the drugstore instead of the former species, as also occurs with NER05.

A total of thirty-six products other than plant species are used in the mixtures, representing forms of syncretisms with cosmopolitan medicine (aspirin, beer, wine) and with other medical traditions (i.e. African). For example, beer and

aspirin are added to GYN03 and GYN04, respectively. Both are used as abortifacients. These combinations of alternative (i.e. non-official) uses of industrial products with traditional herbal medicine have also been recorded by Schultes and Raffauf (1990) in the Amazonia and by Moreno et al. (1994) in Cuba. Meanwhile, the concoction of the roots of *Cleome gynandra* and *Roystonea regia* with cricket's (genus *Acheta*) legs (REN05) is likely to have an African origin. The use of insects or parts of insects (and arthropoda) in treatments, i.e. scorpions which are macerated alive in alcohol for rheumatisms (RHE09), can act at a psychological level thanks to the symbolic value of some species, but their therapeutic efficacy should not be excluded (see Motte-Florac and Ramos-Elorduy, 2002). Some of the products used represent traditional therapeutical resources to local people, and their cultural and material importance can be appreciated in mixtures. In RES17, the juice of the leaves of *Solanum torvum* and *Bidens pilosa* is ingested along with the fat of *Epicrates angulifer* Bibron (Boidae), locally known as *majá* or *majá de Santa María* (Alvarez and Melián, 1997). Like oil, the fat of *majá* may serve as a fluidifying agent to allow the vegetal products to be more easily ingested and, like ram's fat (RES37,38), it is also used topically as an anti-inflammatory, i.e. in mumps, leprosy, and eczemas (Seoane, 1984).

Although to this point single-component cases have been discussed in this paper, patterns of association of plants and other products will be best understood by focusing on the recipes themselves rather than on single components per se.

3.2. Herbal mixtures

In this paper, we define herbal mixtures as concoctions of plants or parts of plants and other products to treat specific health afflictions. These formulas can be more or less complex, commonly known home remedies used to treat minor illnesses or complex preparations employed by traditional healers for life-threatening diseases. About 65% of mixtures are composed of two or three plants, 22% of four or five plants, and 13% of from six to nineteen different plant species. Decoction of fresh herbal components is by far the preferred means to prepare the mixtures, as was pointed out by Fuentes (1984b) in relation to Cuban traditional medicine. Dosis and quantification are variable among the people interviewed and they heavily rely on personal experience and family customs. Herbal components are also sometimes macerated in water (GAS03,12; LIV07) or in alcohol (i.e. in mixtures for rheumatisms), triturated (i.e. for sinusitis, RES38,39, when applied topically for boils and scalds, SKI02,04,05), fried in oil, or the juice is extracted (i.e. in mixtures against catarrh and intestinal parasites). Ingestion is the preferred means to take the remedies; topical application as a pomate is used mainly to treat skin problems, while frictioning is preferred with preparations for rheumatisms and artrosis. Plant parts used include: aerial parts (29.4%), roots (24.7%), leaves (13.5%), fruits (12.7%), stem barks (5.5%), flowers (3.2%), stems (2.7%),

whole plants (2.3%), rhizomes (2.1%), resins (1.3%), seeds (1.3%), bulbs (0.8%), and latex (0.5%). The use of roots and rhizomes (26.8% as a whole) in the preparation of Cuban medicinal mixtures will be discussed later.

In their simplest form, mixtures are concoctions of two or three species with the same popular medicinal use that are prepared jointly to enhance the therapeutical effect of the tea. These low-component remedies are often well known in local communities and are prepared at home for minor ailments (i.e. insomnia, digestive disorders), or for their acute manifestation (i.e. diarrhoea, fever). The principle aim of mixtures seems to be potentiating the therapeuticality of single-plant preparations, and species with common uses are often used jointly. Thus, plants used in stomachic and sedative mixtures are mainly aromatic species (i.e. *Mentha* spp.), rich in therapeutically-active essential oils (Etkin, 1981; Pérez et al., 1996; Pino et al., 1997; Sánchez et al., 1998; Pascual et al., 2001; Barnes et al., 2002), and singly used for their antispasmodic, antibacterial and stomach-soothing properties (Roig, 1974; Morton, 1981; Seoane, 1984; Fuentes, 1988). Instead, mixtures for stomach ulcer (GAS11,12) and diarrhoea (GAS17,18) are characterized by species with high tannin content, popularly used as astringents and antimicrobials (Etkin, 1981; Morton, 1981; Seoane, 1984; Mota et al., 1985; Alvarez et al., 1999; Akinpelu, 2001).

Three mixtures are reported to be used against *padrejón* and *madrejón* (OTH13,14,15). These illnesses are described by informants as “a sensation of pain at the pit of the stomach, which the person feels like a cramp, or like it were jumping or palpitating”. When it happens to a man it is called *padrejón* (from *padre*, father), to a woman *madrejón* (from *madre*, mother). This taxonomical differentiation by sex of a stomach pain is unique in the ethno-medical terms collected. Herbal and non-herbal components of these mixtures are of European origin and probably of Spanish cultural influence, and their provision by people who diagnose the illness is accompanied by the recitation of specific popular prayers (Seoane, 1984). This illness, also locally called *el histérico* (the hysterical one), is likely to be of nervous origin. *Ruta graveolens* is used as an anti-hysteric in the Americas (Morton, 1981; Duke and Vásquez, 1994) and *Allium sativum* has antispasmodic properties (Barnes et al., 2002).

The number of components in complex remedies, and the level of knowledge and time needed to collect the plants and prepare the mixtures, mean that it is unlikely that they will be prepared as home remedies. Instead, *yerberos* sometimes sell them in bottles (i.e. *pru*). As could be expected, more complex mixtures are usually used to treat less common and more serious diseases (i.e. venereal diseases, pneumonia). While green parts of plants are predominant in few component preparations such as stomachic (green parts: 93.75%; GAS01-06), sedative (95.65%; NER01-09), and anti-asthmatic and anti-catarrhal remedies (82.1%; RES01-28), ligneous parts such as roots, rhizomes, stems, and barks are increasingly present in mixtures for

pneumonia (ligneous parts: 53.85%; RES30-32), to treat gynaecological problems and to induce abortion (50%; GYN01-10), and in complex mixtures like *galones* (70.6%; GAL01-15). Thus, pneumonia (RES30,31,32) and spasms (which according to informants are caused by sudden changes in temperature, i.e. “roasting coffee and then taking a bath or staying in the open air”; OTH06,07) are treated with combinations of roots and barks of the same species (*Swietenia mahagoni*, *Bursera simaruba*, *Protium cubense*), and the bark of *Cinnamomum verum* is the main component of abortifacient mixtures (GYN03,04,05). Abortive herbal remedies have been widely used in many traditional societies, and also among indigenous Cubans before the arrival of the Europeans (Bachiller, 1879). Although rare, this practice is still used in rural Cuba, and midwives (*parteras*, *comadronas*) are repositories of knowledge about plants used in gynaecological and reproductive afflictions and for women's health (Moreno et al., 1994).

If most mixtures are combinations of plants with the same popular use, some include species claimed to have different therapeutical actions and are used in combination to achieve specific goals. In anti-hepatitis formulas (LIV09,10,11), *Cassia* sp. and *Rheum* sp., which are well-known laxative and anti-constipation agents (Roberts et al., 2001; Barnes et al., 2002), are found in combination with *Corchorus siliquosus*, used in Cuba as an anti-venereal agent and for kidney problems (Roig, 1974; Barreto et al., 1992), and with the fruit of *Cassia fistula*, which is well-known for treating liver and vesicular illnesses and for its hepatoprotective activity (Fuentes and Granda, 1982; Bhakta et al., 1999). Carminative mixtures (GAS07,08,09,10) include *Illicium* sp., which possesses antimicrobial, stomachic, and carminative properties (Roberts et al., 2001; De et al., 2002), along with *Lepidium virginicum*, traditionally used as diuretic, and with fruits and leaves of *Pimenta dioica*, regarded in Cuba as a stomachic and digestive (Roig, 1974; Fuentes and Granda, 1982). Whatever the complexity of a mixture, these remedies are likely to be means to enhance the therapeutic value or other properties of traditional single-component preparations (see also Elvin-Lewis, 2001). Plants and other products may also be used in combination possibly in order to detoxify plant allelochemicals. Termite (*comején*) mounds are found in association with the bark of *Swietenia mahagoni* and other barks and roots to treat pneumonia (RES30,31), spasms (OTH07,08), and venereal diseases (GAL05). Cubans believe that the triterpenes-rich stem bark of *Swietenia mahagoni* has powerful astringent, bitter, and febrifuge properties (Roig, 1974; Murthy et al., 1991). The consumption of clays from termite mounds as a means of detoxication has been observed in many nonhuman primates (Oates, 1978; Davies and Baillie, 1988) and seems to play an important role in humans as well (Johns, 1990). Clays act by binding and neutralizing the toxicity of alkaloids and tannins (Johns, 1990 and references within); adding termite mounds to herbal decoctions could thus represent an empirical attempt to deal with toxic allelochemicals present in

barks and roots of medicinal species while getting therapeutical benefit from them.

Some mixtures are medicinal-food formulas (Etkin and Ross, 1982) rather than herbal preparations, and fruits (i.e. *Cocos nucifera*) and vegetables (i.e. *Solanum americanum*) traditionally consumed as food (Esquivel et al., 1992) are recognized as having specific pharmacological properties, i.e. as an antihelmintic. Particularly, fruits of *Capsicum frutescens* and seeds of *Myristica fragrans*, along with eggs, milk, and wine, are macerated together and eaten as a food to treat impotence and sterility (GYN07). Seeds of *Myristica fragrans* and duck's or hen's eggs are also used in both mixtures cited as reconstituents (OTH09,10), confirming traditional Cuban perceptions of impotence and sterility as a “lack of strength in the body” (Seoane, 1984).

3.3. *Galones, miel de güira and prau*

Among complex mixtures, some are well known recipes with definite cultural and ethnomedical features. On the basis of the variety of different components, the most important is a kind of *chicha* (fermented beer-like drink) known as *galón*, *frucanga*, or nowadays as *botella* (GAL01-15). It is obtained by preparing a decoction of plant parts, and sometimes by first macerating the components in order to achieve a light fermentation. No exhaustive study has yet been conducted on *galones*, and the only references are in Roig (1965, 1974). The term *galón* comes from the recipient containing the mixture, traditionally potted in one gallon containers; they are presently decanted in wine-like bottles, hence the use of the term *botella* (bottle). Information has been collected on 66 plant species used in the preparation of *galones*, as well as on *Caesalpinia bonduc* and *Schaefferia frutescens*, which have been reported as components of *galones*, although they have not been cited in any specific recipe. Fifteen different formulas are claimed to treat asthma (1), catarrh (1), pneumonia (3), venereal diseases (7), impotence (1), and as a depurative of the blood (1); one more has been cited as *frucanga* and is the only one to be applied topically against boils (*granos*). *Frucanga* seems to be a word of African origin, with the same suffix of *fricanga* (fritters prepared from cassava and *Capsicum frutescens*), from the Congo *Kanga* (to fry) (Ortiz, 1956). Although the recipe collected is a decoction, indeed it seems reasonable that it could be also prepared by frying, like other mixtures, to be applied locally. *Galón* recipes are variable, and plant numbers range from five (VEN03) to nineteen (RES41), according to family traditions and local availability of specific plant species. When this kind of mixture is prepared with five or fewer components, it is sometimes called a *preparado*.

Few plant species appear to be characteristic of *galones*, while most of the components possibly are a “summary” of socially-acquired herbal knowledge and anti-microbial plants known by the informant. This is likely to explain the complexity of *galones* with their possible cultural role as a means for transmitting medicinal plant knowledge

through healers' generations. Moreover, the composition in plant species seems to be culturally determined at three levels. The first level includes those species that "make" the *galón*: the roots of *Cocos nucifera* (9), *Erythroxylum havanense* (9), and *Roystonea regia* (9) are the main components. These species are widely used throughout Cuba for their anti-bacterial, tonic and stimulant properties, and are considered as "magic plants" within Afro-Cuban religions (Seoane, 1984; Aguilar and Herrera, 1995; Moreno et al., 1995). Species in the second level give to each mixture a therapeutical specificity (i.e. venereal disease versus pneumonia). Thus, *Chiococca alba*, *Bambusa vulgaris*, *Smilax domingensis*, and *Tournefortia hirsutissima* are more frequently used in *galones* that are claimed to treat venereal diseases, whereas *Solanum torvum* and *Swietenia mahagoni* characterize those for pneumonia and other respiratory afflictions. *Smilax* species (i.e. *Smilax officinalis* Griseb) have traditionally been used worldwide and observed to be effective for the treatment of both acute and chronic cases of syphilis (Vermani and Garg, 2002). *Cassia fistula*, *Cleome gynandra*, *Polypodium aureum*, *Senna occidentalis*, and *Waltheria indica* are used with some level of agreement throughout *galones* with no ailment-dependence, and are locally regarded as depuratives and diuretics (Roig, 1974; Fuentes and Granda, 1982). Species belonging to the third level are often plants cited in one or few recipes; they are mainly collected from the wild (*Campyloneurum phyllitidis*, *Craniolaria annua*, *Critonia aromatisans*, *Cyrtopodium punctatum*, *Desmodium canun*, *Gerascanthus collococcus*, *Philodendron lacerum*), some are Cuban endemisms (*Canavalia nitida*, *Ravenia leonis*), and they include medicinal species known and used by single healers.

The important role of roots (48.6% of plant parts) in *galones* has to be stressed. In Caribbean traditional knowledge, roots are considered as the "strongest" part of plants; "root" medicine is likely to have an African origin and is widespread throughout the Caribbean, where Afro-American healers are often called "root doctors" (Cabrera, 1954; Laguerre, 1987). Indeed, the effect of root harvesting can be very damaging to the plant (Cunningham, 2001). People interviewed stated that they are aware of and harvest the roots through what they call "capar", i.e. harvesting only few tap-roots for each plant individual (Hernández, 2000).

Cleome spinosa Jacq., *Pisonia aculeata* L., and *Morinda royoc* L., cited by Roig (1974) as components of *galones*, have not been reported for this purpose in our interviews. Instead, we report the use of *Cleome gynandra*; this congeneric has the same folk name as *Cleome spinosa* (*uña de gato*), and they are very likely to be used indistinctly. The leaves of *Pisonia aculeata* are part of a mixture (SK108) applied topically to extract the spines of the same plant, which are reported to be very painful (*hinconosas*) and to cause infection. *Morinda royoc* is reported by Roig (1965, 1974) as a component of *galones*, of *pru*, and to be used as an aphrodisiac. However, this species has not been reported to be used in this nor in other recent works on

Cuban medicinal plants (Hernández, 1985, 2000; Volpato and Godínez, submitted for publication).

Another complex mixture, *miel de güira* (*güira*'s honey; MIE01-05), has as a main component the mesocarp of the fruit of the *güira* (*Crescentia cujete*), specifically of the wild variety called *güira cimarrona*. The fruit is put into decoction for a long time, and then the decoction is stirred and honey, sugar and/or rum are added, as in MIE01. The fruit contains iridoids, iridoid glucosides and other compounds (Binutu, 1997; Kaneko et al., 1997, 1998), and is used throughout Cuba as a pectoral and depurative (Roig, 1974; Fuentes and Granda, 1982; Seoane, 1984). Four mixtures have been reported as anti-catarrhal, the fifth is claimed to treat coolness (*frialdad*) of the uterus (*matriz*) and menstrual irregularity (dysmenorrhea), by cleaning women's abdomen (*vientre*) promoting either abortion or pregnancy (see also Moreno et al., 1994). Women who became pregnant after a "depurative process" with *miel de güira* "should then not smell the preparation in order not to loose the baby". Plant components other than *Crescentia cujete* vary much within *miel de güira*'s formulas. Only *Bidens pilosa* and *Cissus sicyoides* are used with much agreement to enhance anti-inflammatory and pectoral properties of the formulas (MIE03,04,05). *Miel de güira* is likely to have a Caribbean, or at least American origin, as *güira* is taken internally for gonorrhea in Haiti and the Dominican Republic (Weniger, 1991), and the green fruits' juice is used for bronchial asthma and the decoction of the ripe fruit in the preparation of an abortive tea in Guayana (Grenand et al., 1987). The Spanish could have disseminated Indian medicinal knowledge about the plant from tropical America and throughout the Caribbean during their trips throughout the continent (Wilson, 1997), functioning as a material and cultural bridge.

Pru (PRU01,02) is a medicinal-food beverage of probable Afro-Haitian origin (Ortiz, 1956; Volpato and Godínez, submitted for publication) produced from the decoction of various plants. The decoction is then stirred, sugar is added, and the drink fermented in the sun. *Pru* is presently sold throughout Cuba as a refreshment, although it is also used as a depurative and hypotensive drink (Volpato and Godínez, submitted for publication), as "it loosens the legs" (*afloja las piernas*). *Gouania lupuloides*, *Pimenta dioica*, *Smilax domingensis*, and *Cinnamomum verum*, along with sugar, are the main components of the drink. Like the congenics *Gouania polygama* (Jacq.) Urban and *Gouania lupuloides*, which are used indistinctly (Roig, 1974; Volpato and Godínez, submitted for publication), *Cinnamomum verum* is reported instead of *Canella winterana* (L.) Gaertn (Canellaceae) as *canela* (the latter is also known as *cúrbana*). This fact could be explained as the equivalent use as a stomachic of different parts (leaves versus stem) of different species, a case of under-differentiation (Berlin, 1992) due to similar medical properties (both are also used as an abortifacient; Roig, 1974; Moreno et al., 1994). *Canella winterana* was probably the *canela* used by Cuban aboriginal peoples at the time of

the arrival of Columbus, who brought to the island samples of European *canela* (cinnamon) during his first voyage in 1492 (Esquivel and Hammer, 1992), and both species are at present cultivated in Eastern Cuban home gardens (Esquivel et al., 1992).

3.4. Cultural aspects and ecological implications

The provinces of Santiago de Cuba and Guantánamo, where our field research was carried out, roughly correspond to the Cuban Eastern Sub-Province of Borhidi (1991), also called *Oriente de Cuba*, and include the Nipe-Sagua Baracoa Massif and the Sierra Maestra Mountains, considered as the most important centers for the development and evolution of the Cuban flora (Capote et al., 1989; Del Risco, 1999). Together with western Hispaniola (Haiti), Eastern Cuba is the most prominent center of speciation in the Antilles and it has one of the richest floras in the world (Borhidi, 1991). More than 3000 vascular plant species (almost half of Cuban flora) are present, of which more than 1500 are strictly endemic (Borhidi, 1991; López et al., 1992, 1994a, 1994b, 1995). Nevertheless, this richness in plant species contributes little to the medicinal flora of herbal mixtures: more than 60% of the 170 species are reported as cultivated in traditional home gardens (*conucos*) of Eastern Cuba (cf. Esquivel et al., 1992; Castiñeiras et al., 2000). Among species collected from the wild, 80% occur in disturbed or managed habitats (roadsides, gardens, plantations, second growth forests), and are gathered in the immediate surroundings of villages and communities. Although 51% of the Cuban flora is endemic to the island (Capote et al., 1989), only 4.8% of the species used in mixtures are Cuban endemisms, and five per cent of the total taxa are from primary forests (i.e. *Oxandra lanceolata*, *Colubrina elliptica*, *Diospyros grisebachii*, *Thouinia elliptica*, *Swietenia mahagoni*). Moreover, the estimated primary forest areas covered about 90% of Cuban territory in the early XVI century, whereas they presently cover only about 20% (Ricardo et al., 1995; Del Risco, 1999) and are mainly restricted to geographically-isolated regions, where foraging would be a much higher-cost activity. According to the classification of Cuban synanthropic flora by Ricardo et al. (1995), about 70% of species used in Eastern Cuba to prepare traditional herbal mixtures are synanthropic species, of which 30% are Old World exotics of either Asian, African, or European origin, some (i.e. *Psidium guajava*, *Capsicum frutescens*) introduced by Amerindians in the pre-colonial period. Many of the species (i.e. *Cissus sicyoides*, *Lepidium virginicum*, *Petiveria alliacea*, *Solanum torvum*, *Stachytarpheta jamaicensis*) are present as weeds in Cuban plantations (cf. Gutte, 1994). The Cuban plant pharmacopoeia is cultivated, exotic, and synanthropic, and thus is highly representative of the environmental and cultural changes the island has witnessed since 1492. Actually, managed and disturbed landscapes and home gardens are also the most important medicinal foraging places to many native groups of America and worldwide (Alcorn, 1981;

Balick and Mendelsohn, 1992; Grenand, 1992; Frei et al., 2000; Stepp and Moerman, 2001). Alcorn (1981), Grenand (1992), Voeks (1996) and Frei et al. (2000), among others, also confirmed that species originating from forest habitats are often brought nearby the house because they have been regarded as useful resources. *Ceiba pentandra* and *Roystonea regia* are emerging species in mesophyllous semideciduous and in subperennifolius forests (Del Risco, 1999), and are also planted near the villages and in home gardens for their material and spiritual value, the latter also being now very common in disturbed areas (Henderson et al., 1995). Here these species can be exploited without walking far from the community; having easy access to the resources is a factor with much influence in traditional medicinal systems worldwide, and could be particularly important for herbal mixtures, due to the number of plant species used.

Plant selection for medicinal use is an ongoing process, and Cuban patterns of plant exploitation have been shaped by Cuban historical developments, mainly by migration phenomena and their cultural implications (Fuentes, 1984b). Like in other New World countries (Voeks, 1996; Balick et al., 2000; Ososki et al., 2002), in Cuba, due to the rapid genocide of aboriginal peoples upon the arrival of the Spanish, folk medicines of different ethnic groups evolved into a cultural legacy as long as healers and people (1) introduced their own most salient plants into the new environment, (2) substituted familiar plants with local species on the basis of morphological and organoleptic similarity, and (3) learned folk uses from people of other medical traditions. Although Spanish, Amerindian, and, to a lesser extent, Asiatic and Antillean knowledge, much influenced and shaped the Cuban pharmacopoeia (Guarch, 1978; Fuentes, 1984b; Hammer and Esquivel, 1992; Rivero de la Calle, 1992), from an ethnobotanical point of view, Africa has provided the main cultural contributions to Cuban herbal *materia medica* (Cabrera, 1954; Ortiz, 1956; Laguerre, 1987; Esquivel et al., 1992; Fuentes, 1992). Historically, because of the savage form of capture to which African slaves were submitted, they could only bring with them a few plant species and had to learn to satisfy their needs from the new environments. Spatially constrained to the master's properties and temporally limited by the work load, Africans must have experimented with familiar congenetics and also completely new taxa and incorporated into their pharmacopoeia the more easily available common plants, as well as learning the uses of local plants from Indians. About 15% of the species used in mixtures have been brought to Cuba from Africa, often along with their medicinal uses in the place of origin. *Cocos nucifera*, the species most frequently cited in mixtures, was brought to Cuba soon after the conquest via Africa (Whitehead, 1984), and the decoction of its root is a main component of *galones* and is used to treat venereal diseases throughout Africa (Neuwinger, 2000). *Panicum maximum*, a species of African origin most cited in various combinations as febrifuge (FEV02,03,04), is used singly or in mixtures

to treat malaria and other fevers also in Africa (Neuwinger, 2000) and Jamaica (Asprey and Thornton, 1955). A common element in all African cultures that were brought to Cuba was the belief in the spirituality of wild vegetation (*monte*) and weeds (*malezas*), where ancestral deities and powerful spirits lived as they were living in Africa (Cabrera, 1954). Species such as *Ceiba pentandra*, the holy tree of the classical Maya, have attained such a spiritual and religious importance for Africans that they are considered as sacred plants. Maybe Africans incorporated the tree into their rites because of its resemblance to baobab (*Adansonia digitata* L., Bombacaceae), a sacred plant in Equatorial Africa (Fuentes, 1984a, 1992). They could have inherited the cult of *Ceiba* from the Taíno aboriginal people living in Eastern Cuba at the time of the conquest. The decoction of the fruit or of the pulped fruit of *Adansonia digitata* is drunk in Africa to treat diarrhoea (Neuwinger, 2000), and the same use has been reported for the fruit epicarp of *Ceiba pentandra* in GAS18.

In spite of African influence within Cuban ethnobotanical lore, 60% of the total species are of neotropical or Caribbean origin, and many of them (i.e. *Bidens pilosa*, *Cissus sicyoides*, *Chenopodium ambrosioides*, *Crescentia cujete*, *Justicia pectoralis*, *Lippia alba*), or their congeners (i.e. *Crescentia alata* Kunth, *Justicia segunda* Vahl) have common folk uses in tropical and middle America and in the Caribbean (cf. Morton, 1981; Balick and Arvigo, 1993; Duke and Vásquez, 1994; Longuefosse and Nossin, 1996; Frei et al., 1998; Ankli et al., 1999). Common uses could be due to coevolutionary processes of utilization of plants as medicines by ethnic groups of America, or to the common ethnobotanical knowledge of Tainos living in Cuba with mainland groups (Wilson, 1997), or more often to the Spanish activity of assimilating the uses and introducing plants throughout the colonies. What is clear is the cultural and anthropological value of Cuban traditional medicine and the strong link between ecological patterns of exploitation of plant resources and social phenomena that have occurred in Eastern Cuba since European conquest.

4. Conclusions

Herbal mixtures have played and continue to play a prominent role in Cuban popular medicine. They are either combinations of plant species with common therapeutical uses that are prepared at household level, or culturally defined formulas with specific denominations employed by traditional healers. From our ethnobotanical findings, 170 plant species and more than thirty non-botanical products are used in 199 different medicinal recipes in Eastern Cuba. *Galones* are the formulas with the highest variety of different components, incorporating at least 66 species. More systematic ethnobotanical fieldwork is necessary in other Cuban as well as Caribbean areas in the field of herbal mixtures, and there is no reason for medicinal plant research to be restricted to single-species preparations and uses.

Plant combinations have both cultural and ecological dimensions. The Cuban ethnopharmacopoeias, including multi-species formulas, are the result of the legacy within Cuban culture of different ethnic groups, each with a specific herbal knowledge, and of the interactions of this legacy with the local environment. *Galones* and *miel de güira* are the complex formulas with the richest variety of plant components, and their anthropological and ethnobotanical aspects should be further investigated because of the relevance of these preparations within local culture and medical systems and because of the threats that modernization poses to the conservation of traditional Cuban herbalism.

Montane systems of Eastern Cuba possess one of the richest floras of the world. Some endemic medicinal plants are used in mixtures. However, the Cuban pharmacopoeia is a product of human-derived landscapes rather than being concentrated in primary forests and natural habitats. Ethnic groups that were brought to Cuba drew on the flora with which they were already familiar (Old World domesticates, cosmopolitan weeds, pantropical congeners), and selected medicinal plants also on the basis of morphological and organoleptic similarities with already known species. Cuban ethnobiology is of utmost cultural interest within the framework of migration and the cultural loss and replacement that characterized the island since the late XVth century. Ethnobiological research in Cuba should not only take into account medicinal uses of the species, but it should pay more attention to the cultural and ecological aspects of their exploitation and to the ongoing relationships between these aspects.

Acknowledgements

Special thanks are due to all of the people and healers who shared with us their knowledge. Many thanks are due to Dr. Andrea Pieroni and Prof. Patricia Howard for their valuable comments and suggestions, and to the technical staff of BIOECO, particularly the curator of the Herbarium, Florentino Bermúdez García, for their help in compiling information from herbarium specimens. Thanks are also due to Davide Trinca for helping with the tables.

References

- Abreu, J.M., Mateo, J.E., 1997. Analgesia acupuntural en las extracciones dentarias. *Revista Cubana de Estomatología* 34, 1–10.
- Acevedo, P., 1991. Angiosperms in the Greater Antilles. The Flora of the Greater Antilles Newsletter 1, The New York Botanical Garden, New York.
- Acosta de la Luz, L., 2001. Producción de plantas medicinales a pequeña escala: una necesidad de la comunidad. *Revista Cubana de Plantas Medicinales* 2, 63–66.
- Aguilar, A., Herrera, P., 1995. El significado sociocultural de las plantas alimenticias, en las religiones afrocubanas. *Fontqueria* 42, 279–287.
- Akinpelu, D.A., 2001. Antimicrobial activity of *Anacardium occidentale* bark. *Fitoterapia* 72, 286–287.

- Alain, Hno., 1964. Flora de Cuba. Asociación de Estudiantes de Ciencias Biológicas, La Habana, Cuba, vol. V, 362 pp.
- Alain, Hno., 1974. Flora de Cuba. Suplemento, Instituto Cubano del Libro, La Habana, 150 pp.
- Alcorn, J.B., 1981. Huastec noncrop resource management: implications for the prehistoric rain forest management. *Human Ecology* 9, 395–417.
- Alvarez, A., Pomar, F., Sevilla, M.A., Montero, M.J., 1999. Gastric antitsecretory and antiulcer activities of an ethanolic extract of *Bidens pilosa* L. var. *radiata* Schult. Bip. *Journal of Ethnopharmacology* 67, 333–340.
- Alvarez, Z.M., Melián, O., 1997. Listado de las clases reptilia y aves de la localidad el Indio, Parque Baconao, Santiago de Cuba. *Biodiversidad de Cuba Oriental* 2, 26–29.
- American Association of World Health (AAWH), 1997. Denial of food and medicine. The impact of the U.S. embargo on health and nutrition in Cuba. Washington, DC.
- Ankli, A., Sticher, O., Heinrich, M., 1999. Medical ethnobotany of the Yucatec Maya: Healers' consensus as a quantitative criterion. *Economic Botany* 53, 144–160.
- Asprey, G.F., Thornton, P., 1955. Medicinal Plants of Jamaica. Part 3. *West Indian Medicinal Journal* 4, 1–80.
- Bachiller, A., 1879. Cuba primitiva. Origen, lenguas, tradiciones e historia de las indias de las Antillas mayores de Lucayas. Segunda parte. *Revista de Cuba* 5, 26–27.
- Balick, M.J., Arvigo, R., 1993. Rainforest Remedies: One Hundred Healing Herbs of Belize. Lotus Press, Twin Lakes, WI, USA.
- Balick, M.J., Kronenberg, F., Ososki, A.L., Reiff, M., Fugh-Berman, A., O'Connor, B., Roble, M., Lohr, P., Atha, D., 2000. Medicinal plants used by Latino healers for women's health conditions in New York City. *Economic Botany* 54, 344–357.
- Balick, M.J., Mendelsohn, R., 1992. Assessing the economic value of traditional medicines from tropical rain forests. *Conservation Biology* 6, 128–130.
- Barnes, J., Anderson, L.A., Phillipson, J.D., 2002. Herbal Medicines. A guide for healthcare professionals. Second edition. Pharmaceutical Press, 530 pp.
- Barreto, A., Pérez, E., Beyra, A., Enríquez, N., 1992. Flora angiospérmica medicinal de la Provincia Camagüey, Cuba. *Acta Botánica Cubana* 91, 1–106.
- Berlin, B., 1992. Ethnobiological Classification. Principles of Categorization of Plants and Animals in Traditional Societies. Princeton University Press, USA.
- Bhakta, T., Mukherjee, P.K., Mukherjee, K., Banerjee, S., Mandal, S.C., Maity, T.K., Pal, M., Saha, B.P., 1999. Evaluation of hepatoprotective activity of *Cassia fistula* leaf extract. *Journal of Ethnopharmacology* 66, 277–282.
- Binutu, O.A., 1997. Phytochemical and antimicrobial studies on *Crescentia cujete*. *Fitoterapia* 68, 184–185.
- Borhidi, A., 1991. Phytogeography and vegetation ecology of Cuba. Akadémiai Kiadó, Budapest, Hungary, 858 pp.
- Cabrera, L., 1954. El Monte. Ediciones CR, La Habana, 573 pp.
- Capote, R., Berazaín, R., Leiva, A., 1989. Cuba. In: D.G. Campbell and H.D. Hammond (Eds.), Floristic inventory of tropical countries: the status of plant systematics, collections, and vegetation, plus recommendations for the future, New York Botanical Garden, New York, pp. 316–335.
- Carbajal, D., Casaco, A., Arruzazabala, L., Gonzalez, R., Sierra, P., Fajardo, M., Timor, C., Robaina, C., Fuentes, V., 1983. Pharmacological screening of plant decoctions commonly used in Cuban folk medicine. *Journal of Ethnopharmacology* 33, 21–24.
- Castiñeiras, L., Fundora, Z., Shagardsky, T., Fuentes, V., Barrios, O., Moreno, V., Sanchez, P., González, A., Martínez-Fuentes, A., García, M., Martínez, A., 2000. La conservación in situ de la variabilidad de plantas de cultivo en dos localidades de Cuba. *Revista del Jardín Botánico Nacional* XXI, 25–45.
- Cunningham, A.B., 2001. Applied ethnobotany. People, wild plant use and conservation. People and Plants conservation manual, Earthscan Publications Ltd, London, UK, 300 pp.
- Davies, A.G., Baillie, I.C., 1988. Soil-eating in red leaf monkeys (*Presbytis rubicunda*) in Sabah, northern Borneo. *Biotropica* 20, 252–258.
- De, M., De, A.K., Sen, P., Banerjee, A.B., 2002. Antimicrobial properties of star anise (*Illicium verum* Hook f). *Phytotherapy Research* 16, 94–95.
- Del Risco, E., 1999. Cuban forests. Their history and characteristics. Instituto Cubano del Libro, Editorial José Martí, La Habana, 126 pp.
- Duke, J.A., Vásquez, R., 1994. Amazonian Ethnobotanical Dictionary. CRC Press, Boca Raton, Florida, 215 pp.
- Elvin-Lewis, M., 2001. Should we be concerned about herbal remedies. *Journal of Ethnopharmacology* 75, 141–164.
- Esquivel, M., Hammer, K., 1992. Native Food Plants and the American Influence in Cuban Agriculture. In: K. Hammer, M. Esquivel, and H. Knüpfner (Eds.), "...y tienen faxones y fabas muy diversos de los nuestros..." Origin, Evolution and Diversity of Cuban Plant Genetic Resources, vol. 1, Institut für Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany, pp. 46–74.
- Esquivel, M., Knüpfner, H., Hammer, K., 1992. Inventory of the Cultivated Plants. In: K. Hammer, M. Esquivel, and H. Knüpfner (Eds.), "...y tienen faxones y fabas muy diversos de los nuestros..." Origin, Evolution and Diversity of Cuban Plant Genetic Resources, vol. 2, Institut für Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany, pp. 213–454.
- Etkin, N.L., 1981. A Hausa herbal pharmacopeia. Biomedical evaluation of commonly used plant medicines. *Journal of Ethnopharmacology* 4, 75–98.
- Etkin, N.L., Ross, P.J., 1982. Food as medicine and medicine as food. *Social Science Medicine* 16, 1559–1573.
- Frei, B., Baltisberger, M., Sticher, O., Heinrich, M., 1998. Medical ethnobotany of the Zapotecs of the Isthmus-Sierra (Oaxaca, Mexico): Documentation and assessment of indigenous uses. *Journal of Ethnopharmacology* 62, 149–165.
- Frei, B., Sticher, O., Heinrich, M., 2000. Zapotec and Mixe use of tropical habitats for securing medicinal plants in Mexico. *Economic Botany* 54, 73–81.
- Fuentes, V., 1984a. Sobre la flora medicinal en Cuba. *Boletín de Reseñas Plantas Medicinales* 11, 1–39. Centro de Información y Documentación Agropecuaria, La Habana.
- Fuentes, V., 1984b. Sobre la medicina tradicional en Cuba. *Boletín de Reseña de Plantas Medicinales*, Centro de Información y Documentación Agropecuaria, La Habana, vol. 10, pp. 1–39.
- Fuentes, V., 1988. Las plantas medicinales en Cuba. Tesis de grado de Candidato a Doctor en Ciencias Biológicas, La Habana, Cuba, 420 pp.
- Fuentes, V., 1992. Plants in Afro-Cuban Religions. In: Hammer, K., Esquivel, M., Knüpfner, H. (Eds.), "...y tienen faxones y fabas muy diversos de los nuestros..." Origin, Evolution and Diversity of Cuban Plant Genetic Resources, vol. 1, Institut für Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany, pp. 110–137.
- Fuentes, V., 1996. Especies vegetales en Cuba empleadas en la preparación de medicamentos homeopáticos. *Revista Cubana de Plantas Medicinales* 1, 3–8.
- Fuentes, V., Granda, M., 1982. Estudios sobre la medicina tradicional en Cuba I. *Revista de Plantas Medicinales* 2, 25–46.
- García, M.D., Quílez, A.M., Sáenz, M.T., Martínez-Domínguez, M.E., de la Puerta, R., 2000. Anti-inflammatory activity of *Agave intermixta* Trel. and *Cissus sicyoides* L., species used in the Caribbean traditional medicine. *Journal of Ethnopharmacology* 71, 395–400.
- Garfield, R., Santana, S., 1997. The impact of the economic crisis and the U.S. embargo on health in Cuba. *American Journal of Public Health* 87, 15–20.
- Grenand, P., 1992. The use and cultural significance of the secondary forest among the Wayapi Indians. In: Plotkin, M., Famolare, L. (Eds.), Sustainable Harvest and Marketing of Rain Forest Products, Island Press, Washington, DC, pp. 27–40.

- Grenand, P., Moretti, C., Jacquemin, H., 1987. Pharmacopées traditionnelles en Guyane: Créoles, Palikur, Wayäpi. Editorial 1-ORSTROM, Coll. Mem. no. 108, Paris, 569 pp.
- Guanche, J., 1983. Procesos Etnoculturales en Cuba. Editorial Letras Cubanas, La Habana, 503 pp.
- Guarch, J.M., 1978. El Taíno de Cuba. Academia de Ciencias de Cuba, La Habana, 130 pp.
- Guerra, M., Torres, D., Martínez, L., 2001. Validación del uso tradicional de plantas medicinales cultivadas en Cuba. *Revista de Plantas Medicinales* 2, 48–51.
- Gutte, P., 1994. Weeds in the Fields and Plantations. In: Hammer, K., Esquivel, M., Knüpfner, H. (Eds.), "... y tienen faxones y fabas muy diversos de los nuestros..." Origin, Evolution and Diversity of Cuban Plant Genetic Resources, vol. 3, Institut für Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany, pp. 457–507.
- Hammer, K., Esquivel, M., 1992. The Role of Ethnic Minorities – the East Asiatic Case. In: Hammer, K., Esquivel, M., Knüpfner, H. (Eds.), "... y tienen faxones y fabas muy diversos de los nuestros..." Origin, Evolution and Diversity of Cuban Plant Genetic Resources, vol. 1, Institut für Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany, pp. 138–146.
- Henderson, A., Galeano, G., Bernal, R., 1995. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, New Jersey.
- Hernández, J., 1985. Uso popular de plantas con fines medicinales. Su estudio en la ciudad de Santiago de Cuba. In: *Memorias I Simposio de Botánica*, La Habana, vol. 2, pp. 497–609.
- Hernández, J., 2000. Plantas que se expenden en las yerberías de la ciudad de Santiago de Cuba. *Biodiversidad de Cuba Oriental* 5, 65–72.
- Johns, T., 1990. The Origins of Human Diet and Medicine. Chemical Ecology. The University of Arizona Press, Tucson, Arizona, 356 pp.
- Kaneko, T., Ohtani, K., Kasai, R., Yamasaki, K., Nguyen, M.D., 1997. Iridoids and iridoid glucosides from fruits of *Crescentia cujete*. *Phytochemistry* 46, 907–910.
- Kaneko, T., Ohtani, K., Kasai, R., Yamasaki, K., Nguyen, M.D., 1998. *n*-Alkyl glycosides and *p*-hydroxybenzoyloxy glucose from fruits of *Crescentia cujete*. *Phytochemistry* 47, 259–263.
- Kirkpatrick, A.F., 1996. Role of the USA in shortage of food and medicine in Cuba. *Lancet* 348, 1489–1491.
- Kuntz, D., 1994. The politics of suffering: the impact of the U.S. embargo on the health of the Cuban people. Report of a fact-finding trip to Cuba, June 6–11, 1993. *International Journal of Health Service* 24, 161–179.
- Laguerre, M., 1987. Afro-Caribbean Folk Medicine. Bergin and Garvey Publishers, Inc., South Hadley, MA, 120 pp.
- León, Hno., 1946. Flora de Cuba. Contribuciones Ocasionales del Museo de Historia Natural Colegio La Salle 8, Cultural S.A., La Habana, vol. 1, 441 pp.
- León, Hno., Alain, Hno., 1951. Flora de Cuba. Contribuciones Ocasionales del Museo de Historia Natural Colegio La Salle 10, P. Fernández and Cía, La Habana, vol. 2, 450 pp.
- León, Hno., Alain, Hno., 1953. Flora de Cuba. Contribuciones Ocasionales del Museo de Historia Natural Colegio La Salle 13, P. Fernández and Cía, La Habana, vol. 3, 502 pp.
- León, Hno., Alain, Hno., 1957. Flora de Cuba. Contribuciones Ocasionales del Museo de Historia Natural Colegio La Salle 16, P. Fernández and Cía, La Habana, vol. 4, 556 pp.
- Longuefosse, J.L., Nossin, E., 1996. Medical ethnobotany survey in Martinique. *Journal of Ethnopharmacology* 53, 117–142.
- López, A., Rodríguez, M., Cárdenas, A., 1992. El endemismo vegetal en Maisí-Guantánamo (Cuba Oriental). *Fontqueria* 36, 399–420.
- López, A., Rodríguez, M., Cárdenas, A., 1994a. El endemismo vegetal del Turquino (Cuba Oriental). *Fontqueria* 39, 395–431.
- López, A., Rodríguez, M., Cárdenas, A., 1994b. El endemismo vegetal en Moa-Baracoa (Cuba Oriental). *Fontqueria* 39, 433–473.
- López, A., Rodríguez, M., Cárdenas, A., 1995. El endemismo vegetal en Moa-Baracoa (Cuba Oriental). Addenda. *Fontqueria* 42, 153–164.
- Martínez, M.J., Betancourt, J., Alonso-González, N., Jáuregui, A., 1996. Screening of some Cuban medicinal plants for antimicrobial activity. *Journal of Ethnopharmacology* 52, 171–174.
- Moreno, E., Bermúdez, A., Herrera, P., 1995. Las plantas y el espiritismo cruzado en Cuba Oriental. *Fontqueria* 42, 289–308.
- Moreno, E., Valero, M., Herrera, P., 1994. El uso de plantas mágicas y medicinales por las parteras tradicionales cubanas. *Fontqueria* 39, 219–241.
- Morton, J.F., 1981. Atlas of Medicinal Plants of Middle America: Bahamas to Yucatan. Charles C. Thomas Publisher, Springfield, IL, 1420 pp.
- Mota, M.L., Thomas, G., Barbosa Filho, J.M., 1985. Anti-inflammatory actions of tannins isolated from the bark of *Anacardium occidentale* L. *Journal of Ethnopharmacology* 13, 289–300.
- Motte-Florac, E., Ramos-Elorduy, J., 2002. Is the traditional knowledge of insects important? In: Stepp, J.R., Wyndham, F.S., Zarger, R.K. (Eds.), *Ethnobiology and Biocultural Diversity*, Proceedings of the Seventh International Congress of Ethnobiology, The International Society of Ethnobiology, Athens, Georgia, pp. 207–224.
- Murthy, Y.L.N., Jairaj, M.A., Srinivas, A.S.S.V., 1991. New triterpenes from *Swietenia mahagoni* Linn.: Part IX—Identification of crystalline constituents and structure elucidation of a new triterpene. *Indian Journal of Chemistry Section B* 30, 462–465.
- Neuwinger, H.D., 2000. African Traditional Medicine: A Dictionary of Plant Use and Applications. Medpharm Scientific Publication, Stuttgart, Germany.
- Núñez, N., González, E., 1999. Antecedentes etnohistóricos de la alimentación tradicional en Cuba. *Revista Cubana de Alimentación y Nutrición* 13, 145–150.
- Oates, J.F., 1978. Water-plant and soil consumption by guereza monkeys (*Colobus guereza*): a relationships with minerals and toxins in the diet? *Biotropica* 10, 241–253.
- Ortiz, F., 1956. La cocina afrocubana. In: *Gusta Usted? Imprenta Oscar García S.A.*, La Habana, 826 pp.
- Ososki, A.L., Lohr, P., Reiff, M., Balick, M.J., Kronenberg, F., Fugh-Berman, A., O'Connor, B., 2002. Ethnobotanical literature survey of medicinal plants in the Dominican Republic used for women's health conditions. *Journal of Ethnopharmacology* 79, 285–298.
- Pascual, M.E., Slowing, K., Carretero, E., Sánchez Mata, D., Villar, A., 2001. *Lippia*: traditional uses, chemistry and pharmacology: a review. *Journal of Ethnopharmacology* 76, 201–214.
- Payo, A., Oquendo, M., Oviedo, R., 1997. Tamizaje fitoquímico preliminar de plantas que crecen en Holguín. *Revista Cubana de Farmacia* 30(2).
- Pérez, J.L., Miranda, R., Rodríguez, G., 1996. Actividad antidepresiva y anticonvulsivante del extracto fluido del *Ocimum tenuiflorum* L. (albahaca morada). *Revista Cubana de Plantas Medicinales* 1, 8–12.
- Pino, J.A., Ortega, A.G., Rosado, A., Rodríguez, M., Baluja, R., 1997. Composición y propiedades antibacterianas del aceite esencial de *Lippia alba* (Mill.) n.e. Brown. *Revista Cubana de Farmacia* 30, pp. 1–7.
- Ricardo, N., Pouyú, E., Herrera, P., 1995. A classification of the synanthropic categories in the flora of Cuba. *Fontqueria* 42, 368–430.
- Rivero de la Calle, M., 1992. Cuba: A Mosaic of Races and Cultures. In: Hammer, K., Esquivel, M., Knüpfner, H. (Eds.), "... y tienen faxones y fabas muy diversos de los nuestros..." Origin, Evolution and Diversity of Cuban Plant Genetic Resources, vol. 1, Institut für Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany, pp. 37–45.
- Roberts, A.J., O'Brien, M.E., Subak-Sharpe, G., 2001. *Nutraceuticals. The Complete Encyclopedia of Supplements, Herbs, Vitamins, and Healing Foods*. The Berkley Publishing Group, New York, USA, 669 pp.
- Roig, J.T., 1965. Diccionario botánico de nombres vulgares cubanos. Consejo Nacional de la Universidad de La Habana 1, 1142.
- Roig, J.T., 1974. Plantas medicinales, aromáticas o venenosas de Cuba. Ciencia y Técnica, La Habana, 949 pp.
- Sánchez, E., Leal, I.M., Pino, J., Carballo, C., 1998. Estandarización de *Mentha spicata* L. Medicamento herbario con actividad antiespasmódica. *Revista Cubana de Plantas Medicinales* 3, 26–30.
- Schultes, R.E., Raffauf, R.F., 1990. *The Healing Forest*. Dioscorides Press, Portland, 484 pp.

- Seoane Gallo, J., 1984. El Folclor Médico de Cuba. Editora Ciencias Sociales, La Habana, 770 pp.
- Soler, B.A., Porto, M., 1997. Experiencia cubana en el estudio y aplicación de medicamentos herbarios. Conferencia, Revista Cubana de Plantas Medicinales 2, 30–34.
- Suárez, J., 1997. El sistema de salud en Cuba. Desafíos hacia el año 2000. Revista Cubana de Salud Pública 23, 5–16.
- Stepp, J.R., Moerman, D.E., 2001. The importance of weeds in ethnopharmacology. Journal of Ethnopharmacology 75, 19–23.
- Vermani, K., Garg, S., 2002. Herbal medicines for sexually transmitted diseases and AIDS. Journal of Ethnopharmacology 80, 49–66.
- Voeks, R.A., 1996. Tropical forest healers and habitat preference. Economic Botany 50, 381–400.
- Volpato, G., Godínez, D., submitted for publication. Ethnobotany of *pru*, a traditional Cuban refreshment. Economic Botany.
- Weniger, B., 1991. Interest and limitations of a global ethnopharmacological survey. Journal of Ethnopharmacology 32, 37–41.
- Whitehead, R.A., 1984. Coconut. *Cocos nucifera* (Palmae). In: Simmonds, N.W. (Ed.), Evolution of Crop Plants. Longman, London, pp. 221–225.
- Wilson, S.M., (Ed.), 1997. The Indigenous People of the Caribbean. University Press of Florida, Gainesville, FL, 253 pp.