



ISSN (E): 2320-3862

ISSN (P): 2394-0530

<https://www.plantsjournal.com>

JMPS 2024; 12(4): 63-70

© 2024 JMPS

Received: 18-04-2024

Accepted: 23-05-2024

Philippe Joseph

Professor, Institute of Biodiversity and Ecology, UMR ESPACE DEV-BIORECA, University of the Antilles, Schoelcher Campus, Martinique

Jean-Philippe Claude

Doctor of Biogeography and Ecology, University of the Antilles, Pointe-à-Pitre, Guadeloupe

Yelji Abati

Doctor of Population Biology and Ecology, University of the Antilles, Pointe-à-Pitre, Guadeloupe

Corresponding Author:

Philippe Joseph

Professor, Institute of Biodiversity and Ecology, UMR ESPACE DEV-BIORECA, University of the Antilles, Schoelcher Campus, Martinique

Some considerations on the medicinal botany of the lesser Antilles: The case of Martinique

Philippe Joseph, Jean-Philippe Claude and Yelji Abati

DOI: <https://doi.org/10.22271/plants.2024.v12.i4a.1692>

Abstract

In all geographical areas of the world, throughout the history of populations, relationships with ecosystems have allowed the emergence of valuable knowledge for survival. The taming of Nature has seen the birth of medicines linked to plants. Despite the great influence of so-called modern medicine, this phenomenon is still effective today and seems to be increasingly potentiated. In many countries in the south of the planet, medicinal plants constitute the only alternative. Pharmacopoeias and modern medicine are often in complementary relationships. This is the case in the French West Indies where traditional uses are consubstantial with psychosomatic and symptomatological medicine. From surveys we were able to establish the list of the main medicinal plants of Martinique as well as that of the corresponding pathologies. This field information was supplemented by ethnobotanical and ethnomedicine data. As a result, the relationships between plants and diseases are complex. Differentiations exist between plant organs and the pathologies treated. This work opens up a field of questions, particularly concerning the veracity of medicinal uses and their safety. Further studies in other fields should resolve these issues.

Keywords: Caribbean, Antilles, biodiversity, medicinal plants, pharmacopoeias, remedies, pathologies

1. Introduction

The medications of different early peoples were based mainly on plants and concerned a fairly wide range of pathologies (Alonso-Castro *et al.*, 2015; Caceres *et al.*, 1991; Coe & Anderson, 2005; Coe, 2008) ^[1, 7, 10, 11]. Despite the evolution of knowledge in physiology, human biochemistry and pharmacology characterized by the production of increasingly complex drugs, plants remain essential elements in the medical history of humanity (Duke, 2009; Giróne *et al.*, 1991; Heinrich, Rimpler & Barrera, 1992) ^[16, 20, 21]. Long before modern sciences allowing the synthesis of so-called chemical drugs and technology, traditional doctors of all countries and all civilizations treated the daily ailments of individuals, with the epigeal and hypogeal parts of plants. Medicinal formulations combined and still do, a great diversity of species, physiognomic types, varied ecology (Kvist *et al.*, 2006; Lans, 2007; Rengifo - Salgado, 2011; Rodrigues, 2007) ^[24, 25, 37, 39]. Today, as in the past, the pathologies of the different organs of the human body are considered in psychosomatic medicine and symptomatological medicine based on pharmacopoeias specific to different countries (Leal *et al.*, 2000; Maia *et al.*, 2002; Zamora-Martinez & Pascual Pola, 1992) ^[26, 27, 51].

The diversity of plant life forms involved in traditional therapies testifies to the multiplicity of biotopes and therefore global plant ecosystems influenced by a wide variety of bioclimates. Although all plants, by their chemical spectra, have medicinal potential, only those which were involved in the therapeutic activities of the people of the planet have been named medicinally useful plants. As in the past, today they constitute the medicinal flora or traditional pharmacopoeias which have given rise to the manufacture of medicines either by purification of the identified active ingredients, or at the end of most often complex chemical synthesis processes. Gradually diminished in view of the evolution of pharmaceutical technology, particularly in Western countries, medicinal plants are increasingly used as new paradigms of alternative medicine (Elisabetsky, 2007; Petri Jr, 2015) ^[17, 34]. In the West Indies the phenomenon described above is identical, because the first peoples of these islands, the Amerindians, treated themselves with numerous plants harvested most often from natural vegetation which in the pre-colonial era was forest (Berry, 2005; Pagán-Jiménez, 2013) ^[4, 32]. The migratory waves that built the West Indian peoples were accompanied by plant imports (Torres- Avilez *et al.*, 2015 a & b; Viera *et al.*, 2014; Courric, *et al.*, 2023; Quinlan & Quinlan,

2007; Berry, 2003; Fredrich, 1978) [47, 48, 49, 12, 36, 3, 19]. Europeans attracted by the resources of this part of America, forced immigration, the immigration of hired workers mainly from India and immigration for trade enriched the flora of the Lesser Antilles: particularly with medicinal plants (McClure, 1982; Bougerol, 1985; Currie, 2005; Caparros-Lefebvre & Elbaz, 1999; Currie, 2005) [29, 6, 13, 81]. Thus, over time, the native woody species of primitive Amerindian forests were replaced by non-native herbaceous plants and shrubs, mainly native to Asia and Africa (Penet & Collin, 2022; Howard, 1994; Schiebinger, 2017 & 2018; Carney, 2003) [33, 23, 42, 43, 9]. In this article summarizing a work of observations and compilations of scientific and technical documents, we will present the most used medicinal plants of Martinique and their therapeutic uses. This work is part of a purely applied botany framework and not medicine. Pharmacological aspects will not be considered because they do not fall within our areas of expertise. The dosage modalities of these plants as well as the veracity of their effects will not be indicated. The aim is to show, through the example of Martinique, the adaptability of the peoples confronted, without so-called modern medicine, with tropical diseases for a long period and their therapeutic practices, some of which are innovative.

2. Materials and Methods

The geomorphology of the Antilles, island territories, is very differentiated and results from complex geodynamic processes. The conjunction of topography and climatic dynamics results in gradients of environmental factors, particularly rainfall, which define bioclimates (Di Napoli, *et al.*, 2023; Franklin *et al.*, 2018; Thorpe, *et al.*, 2015; Augendre, Llored & Nussaume, 2018) [14, 18, 46, 2]. In the mountainous islands of the Lesser Antilles from the coast to the summit, the bioclimatic gradients going from dry subhumid to hyper-humid via humid subhumid condition different types of phytocenotic potentialities. Thanks to their vegetation, the Lesser Antilles are part of one of the many hotspots for the biodiversity: that of the Caribbean (Swenson and Umaña, 2014) [44]. The West Indian flora is made up of autochthonous and non-native species. The non-native species come from Asia, Africa and more rarely America and are linked to the migratory modalities which constituted the West Indian societies. Among these non-native species, we find the majority of useful food, dye, magico-religious and medicinal species. Today, in Martinique as in other Lesser Antilles, the majority of medicinal species are introduced (Rojas - Sandoval, Ackerman & Tremblay, 2020) [40]. They require human intervention for their phenological phases and this through specific cultural methods. Generally speaking, the species in the Martinique pharmacopoeia are called anthropophytes.

They are grown in the ground or in pots in gardens but also on balconies and verandas. Unlike the Amerindian period and the first times of colonization where the main physiognomic types of medicinal flora, in order of importance, were trees and shrubs, today the predominant type is herbaceous. These medicinal plants belonging to several families, genera, species, subspecies and varieties are part of the daily life of Martinicans in the form of herbal teas, decoctions, poultices, juices, mother tinctures, etc. (Vujicic & Cohall, 2021; Riffault

-Valois *et al.*, 2019) [50, 38]. Despite the fact that the cultivation of most of these traditional medicine plants is possible in apartments, the sale of them in municipal markets corresponds to a significant economic sector. This phenomenon is identical on a planetary scale (Saganuwan, 2016; Mitchell & Ahmad, 2006) [41, 31]. Despite the effectiveness of many of them, few medicinal plants from the French Antilles have entered the French pharmacopoeia.

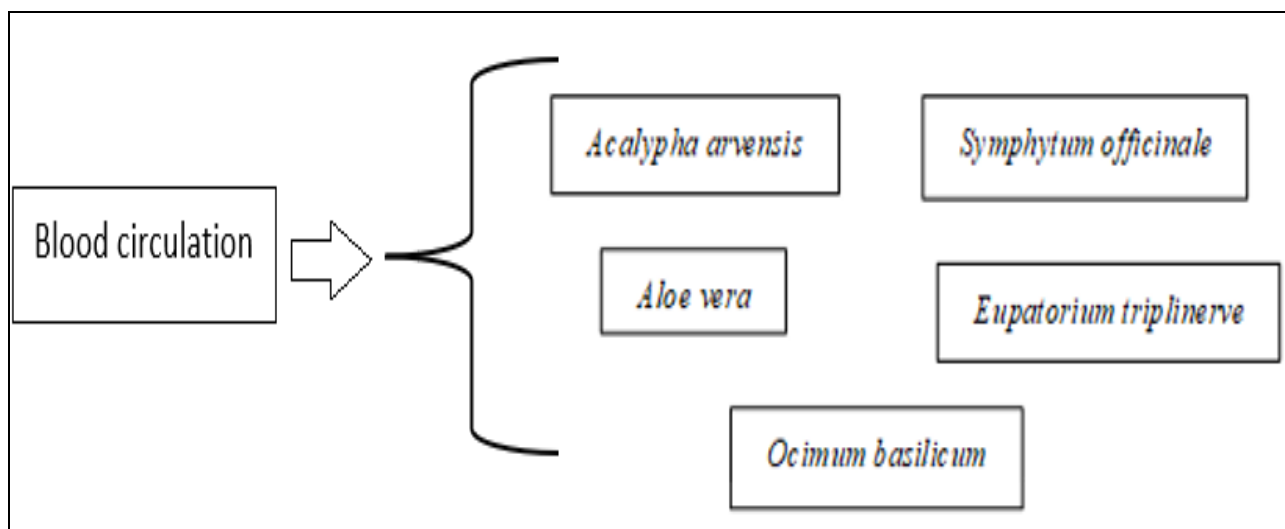
To generate data as part of this study on the medicinal plants of Martinique, we carried out surveys with members of associations for the elderly in the City of Fort-de-France (capital city of Martinique) which consisted of counting plant species with medicinal properties. Added to this are data compiled from scientific literature. We have attempted to categorize these plants for medicinal uses, using quantitative indicators such as the number of families, genera and species and qualitative indicators such as physiognomic types, uses with regard to pathologies. A Factorial Correspondence Analysis was carried out with the XLSTAT 2022 software using a cross table where the columns and rows are distinctively represented by species and uses. We assigned the number "1" when there is a relationship between species and uses and zero when there is none.

3. Results and Discussions

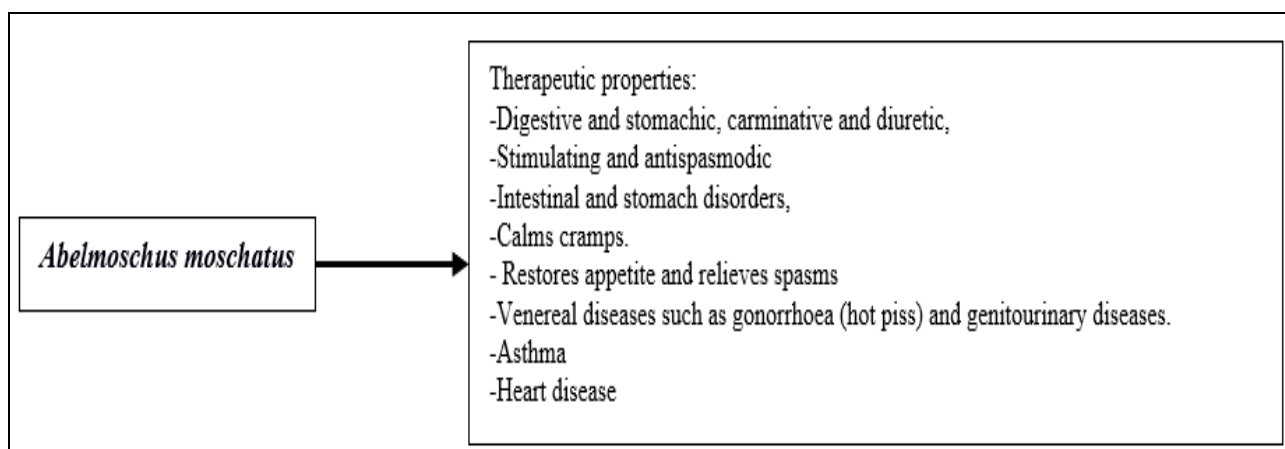
3.1 Origin, taxonomic and physiognomic diversity of medicinal plants from the French West Indies

The medicinal plants native to the Antilles are the result of a long process of domestication by Native Americans. Added to this are other more recent components, mainly from America, Africa, tropical Asia and Europe (Berry, 2005; Pagán - Jiménez, 2013; Carney, 2003; McClure, 1982; Coe FG, 2005 & 2008) [4, 32, 29, 9, 10, 11]: the whole constitutes the West Indian pharmacopoeia of today. The species, genera and families counted indicate a fairly large taxonomic diversity (Figure 1, Box 3). Euphorbiaceae, Asteraceae, Apocynaceae, Fabaceae, Lamiaceae, Lauraceae, Malvaceae, Myrtaceae, Rubiaceae, Solanaceae, Polygalaceae, Rutaceae and Cesalpiniaceae are the families with the largest number of genera and species (Figure 1). The latter belong to a plurality of morphological types: Tree, shrub, shrub, epiphyte, grass and liana (Figure 2). Grasses and trees present an overwhelming preponderance (Figure 2).

Today, the decline of wooded areas and strong urbanization mean that herbs are the most used to facilitate their cultivation. Herbaceous plantings are carried out in the shared gardens of buildings, in pots or planters, on balconies and in the small gardens of individual houses. Added to this is an ancient tradition, Creole gardens or survival polycultures: a syncretism between Amerindian and African knowledge. In this type of agrosystem, from one season to the next, plants necessary for the body (food and medicinal plants) and the soul (magical and ritual plants) coexist. However, mother tinctures and decoctions are made from leaves, flowers, fruits, bark, branches, twigs, twigs and roots collected from natural vegetation. This has contributed and continues to contribute to the weakening of already heavily anthropized forest ecosystems, at least concerning the lower and middle vegetation levels.



Box 1: A medicinal use for several plants



Box 2: One plant for several diseases

From a table of 175 rows (uses) and 119 columns (species) we carried out a Factorial Correspondence Analysis ^[2] (CFA). The factorial axes F1 and F2, despite their low values, nevertheless make it possible to discriminate three groups A, B and C (Figure 3a). Although opposing, groups A and B seem to relate to very unique uses associated with species that are also unique. Group C concentrates around the origin of the two factorial axes, the majority of uses and the species linked to them. From the point of view of medicinal practices, this result confirms what was indicated previously. There appears to be a large number of species used in various pathologies relating to different organs (group C, Figure 3a). Generally speaking and with regard to pathologies, the different species do not have the same importance. After subtracting the diseases of groups A and B from the first table, we carried out a second Factorial Correspondence Analysis [(CFA), Figure

3b]. This new CFA shows a greater spread of group C elements, however the majority of species-pathologies pairs come together not far from the origin. In figure 3b, the factorial axis F2 discriminates a little more. Certain species and certain pathologies are quite clearly singled out: we can observe associations between one species and one pathology but also between one pathology and several species. We could exclude from the data table the species and the particular medicinal uses which concentrate the vast majority of these binomials around the origin of the Factorial axes F1 and F2 and carry out a third CFA. This operation would probably lead to the same results and interpretations although a minority of species could be discriminated. To explain the various “species-pathologies” associations more meaningfully, it would have been necessary to integrate the different parts of the plants used into the factor analysis.

² Cross-tabulation: for each plant used for a disease we assigned the value 1 and for the non-existence of correspondence between a plant and a pathology we gave the value 0. Non-Symmetric Correspondence Analysis (ANSC). The rows depend on the columns. Distance: Chi². Level of significance (%): 5.

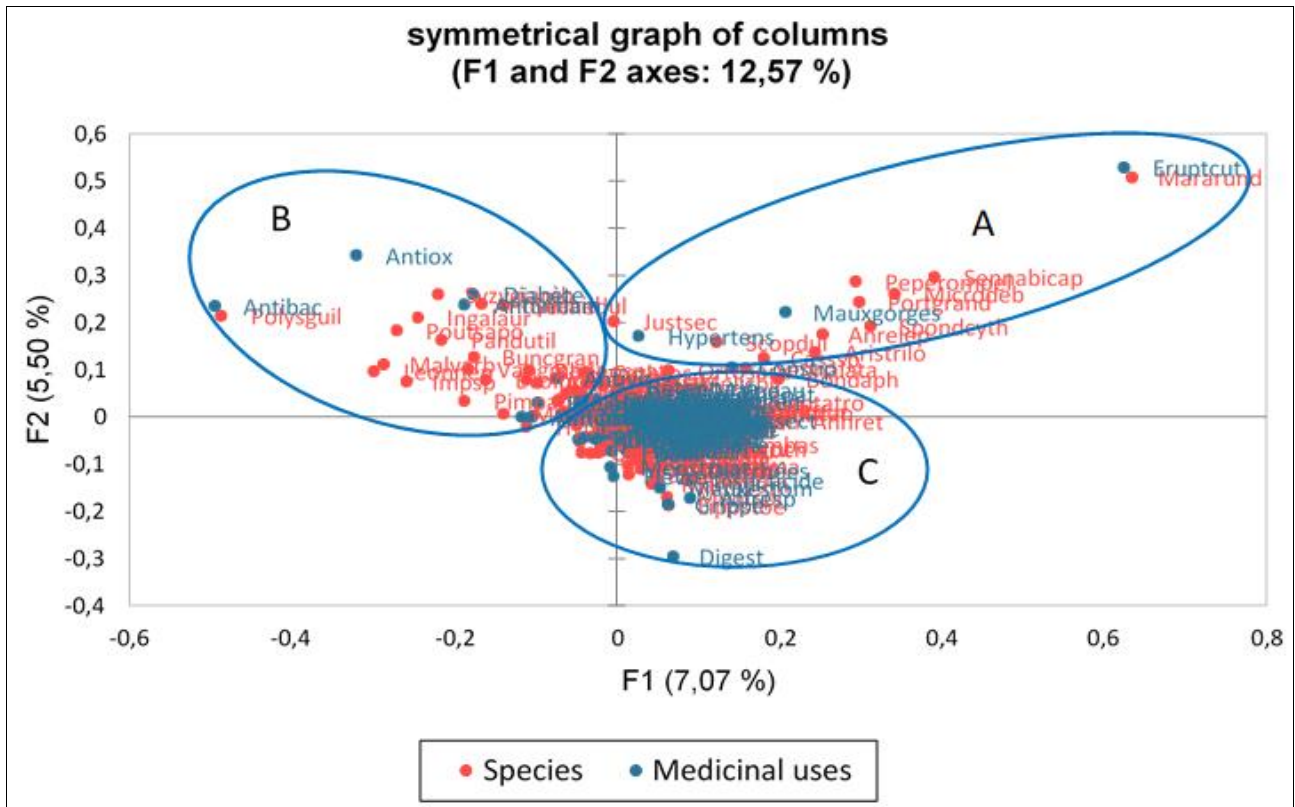


Fig 3a: Relationships between species and pathologies (Box 3 & Box 4)

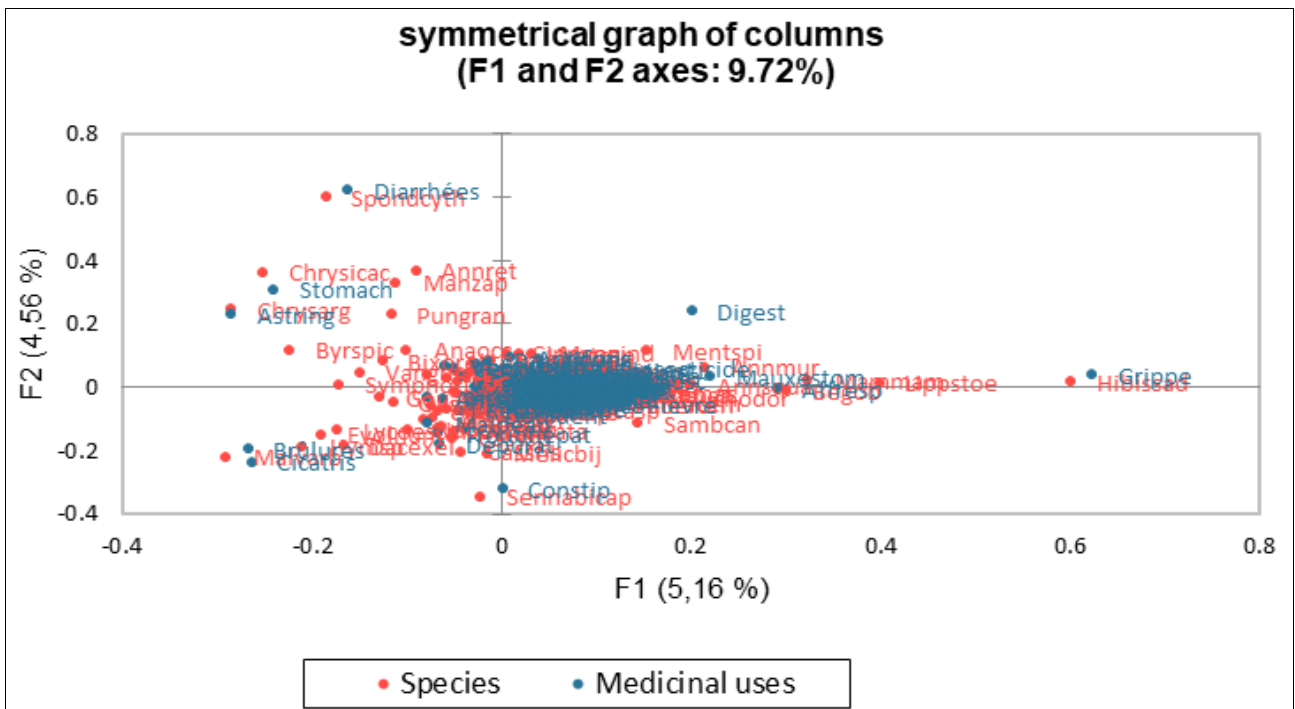


Fig 3b: Relationships Species and pathologies (Box 3 & Box 4)

Abelmoschus moschatus (Abmo) / *Acalypha arvensis* (Acarv)/*Aloe sp.* (Alosp)/*Aloe vera* (Alover)/ *Alpinia zerumbet* (Alpzer)/ *Anacardium Western* (Anaocc)/ *Annona muricata* (Annmur)/ *Annona reticulata* (Annret)/ *Annona squamosa* (Annsqua)/ *Anredera leptostachys* (Anrelep)/ *Aristolochia trilobata* (Aristrilo)/ *Artemisia absinthium* (Arteabs)/ *Artemisia vulgaris* (Artevil)/ *Averrhoa carambola* (Avercar)/ *Begonia obliqua* (Begob)/ *Bixa orellana* (Bixorel)/ *Boerhavia diffusa* (Boerdiff) / *Bontia daphnoides* (Bonaph)/ *Bunchosia grandulifera* (Buncgran)/ *Byrsonima spicata* (Byrspic)/ *Capraria biflora* (Capbij)/ *Carica papaya* (Carpap)/ *Cassia fistula* (Cassifs)/ *Cassia sp.* (Casssp) *Catharanthus roseus* (Cathros) *Cedrela odorata* (Cedrodo)/ *Centella erecta* (Centerec)/ *Chenopodium ambrosioides* (Chenamb)/ *Chrysobalanus icaco* (Chrysicac)/ *Chrysophyllum argenteum* (Chrysarg)/ *Chrysophyllum cainito* (Chryscai)/ *Cinnamomum verum* (Cinnver)/ *Citharexylum spinosum* (Cithaspin)/ *Citrus aurantifolia* (Citauran)/ *Coffea arabica* (Coffarab)/ *Cola acuminata* (Colaacum)/ *Costus spicatus* (Costspic)/ *Crescentia cujete* (Cresccuj)/ *Cymbopogon citratus* (Cymbcit)/ *Cynodon dactylon* (Cyndact)/ *Dacryodes exelsa* (Dacexel)/ *Enicostema verticillatum* (Enicosver)/ *Eryngium foetidum* (Eryngfoe)/ *Eupatorium macrophyllum* (Eupmacro)/ *Eupatorium triplinerve* (Euptrip)/ *Evolvulus*

nummularius (Evolnum)/ *Gouania lupuloides* (Gouanlup)/*Hibiscus sabdariffa* (Hibissad)/ *Hymenea courbaril* (Hymcourb)/ *Hymenocallis* sp. (Hymsp)/ *Hymenocallis caribaea* (Hymcarib)/ *Hyptis atrorubens* (Hyptatro)/ *Hyptis capitata* (Hyptcap)/ *Hyptis verticillata* (Hyptvert)/ *Impatiens* sp. (Impsp)/ *Inga laurina* (Ingaur)/ *Justicia pectoralis* (Justpec)/ *Justicia secunda* (Justsec)/ *Leonotis nepetifolia* (Leonnep)/ *Lippia stoechadifolia* (Lippstoe)/ *Lycopersicon esculentum* (Lycoescul)/ *Malpighia emarginata* (Malpigemar)/ *Malvaviscus arboreus* (Malvarb)/ *Mammea americana* (Mammam)/ *Mangifera indica* (Mangind)/ *Manilkara zapota* (Manzap)/ *Maranta arundinaceae* (Mararund)/ *Melicoccus bijugatus* (Melicbij)/ *Mentha spicata* (Mentspi)/ *Microtea debilis* (Microdeb)/ *Mimosa pudica* (Mimopud)/ *Momordica charantia* (Momchar)/ *Myristica fragrans* (Myrfrag)/ *Nopalea cochenillifera* (Nopcochen)/ *Ocimum basilicum* (Ocimbasa)/ *Ortosiphon aristatus* (Ortosaris)/ *Oxalis frutescens* (Oxalfrut)/ *Pandanus utilis* (Pandutil)/ *Peperomia pellucida* (Peperompel)/ *Peperomia trifolia* (Peperomtrif)/ *Petiveria alliacea* (Petallia)/ *Phyllanthus acidus* (Phyllacid)/ *Picramnia pentandra* (Picrapent)/ *Pimenta racemosa* (Pimracem)/ *Pimpinella anisum* (Pimpanis)/ *Plantago major* (Plantmaj)/ *Plectranthus amboinicus* (Plectamboi)/ *Pluchea odorata* (Pluchodor)/ *Pogostemon heyneanus* (Pogoshen)/ *Polyscias guilfoylei* (Polysguil)/ *Polyscias scutellaria* (Polyscut)/ *Polyscias scutellaria* 'Cochleata' (Polyscutcoch)/ *Portulaca grandiflora* (Portgrand)/ *Portulaca oleracea* (Portolera)/ *Pouteria sapota* (Poutsapo)/ *Psidium guajava* (Psidguaj)/ *Punica granatum* (Pungran)/ *Quassia amara* (Quassama)/ *Rhoeo spathacea* (Rhoeospat)/ *Sambucus canadensis* (Sambcan)/ *Scoparia dulcis* (Scopdul)/ *Sechium edule* (Sechedul)/ *Senna alata* (Senalata)/ *Senna bicapsularis* (Sennabicap)/ *Senna occidentalis* (Sennocc)/ *Solanum americanum* (Solanamer)/ *Solenostemon scutellarioides* (Solenoscut)/ *Spondias cytherea* (Spondcyth)/ *Stachytarpheta jamaicensis* (stachjamai)/ *Symphytum officinale* (Symphoff)/ *Syzygium jambos* (Syzygjamb)/ *Tamarindus indica* (Tamarind)/ *Tanacetum vulgare* (Tanacvulg)/ *Thymus vulgaris* (Thymvulg)/ *Tinospora crispa* (Tinoscrisp)/ *Vangueria madagascariensis* (Vangmada)/ *Yucca* sp. (Yuccasp)/ *Zingiber officinale* (Zingoff).

Box 3: Plants medicinal and their abbreviations

Childbirth (Acc)/Softener (Adou)/ Oropharyngeal conditions (Affbuc)/Respiratory conditions [(asthma, bronchitis, allergies, colds, coughs, etc.) (Affresp)]/Anabolic (Anab)/Analgesic (Anal)/Anemia (Anem) / Angina pectoris (Angi)/ Anthelmintic and antiparasitic (Anth)/ Anti-acid (Antiac)/ Antibacterial and antimicrobial (Antibac)/Antibiotic (Antibioc)/Anticancer and antitumor (Anticanc)/Antidote [(poison)(Antidot)]/ Antifungal (Antifong)/Anti-infectious(Antiinf)/Anti-inflammatory(Antiinflam)/Antioxidant (Antiox)/Antipoison (Antipois)/Antiscorbutic (Antiscorb)/Antiseptic (Antisep) /Antituberculous (Antitub)/Antiviral (Antivir)/Anxiolytic and anxiety(Anxiol)/Aperitif(Aperit)/Aphrodisiac(Aphrod)/Apthous ulcers(Apthous ulcers)/Arteriosclerosis (Arterios) / Arthritis(Arthritis)/ Asthenia(Asthenia)/Asthma(Asthma)/Astringent (Astring)/Atherosclerosis(Atheros)/Bath (Skin bath) / Bloating(Balloon)/ Balsamic [(Calms inflamed mucous membranes) (Balsam)]/Gonorrhoea [(gonorrhoea)(Blennio)]/Burns(Burns)/Kidney stones [(problems) kidneys(Calculations)]/Calming (Calming)/Baldness(Baldness) /Candidiasis oral (Candid) /Poultice (Cataplas)/Catarrh [(Acute or chronic inflammation of a mucous membrane) (Catarrh)]/Headache(Cephal)/Cholesterol (Cholest)/[Healing, cuts, wounds, scrapes and wounds (Vulnerary)]/(Cicatrix)/Blood circulation (Circulsang)/Colic-stomach aches and carminative properties (Colic)/ Conjunctivitis(Conjonc)/Constipation (Constip)/Contusions(Contus) /Convulsant (Convulsions)/ Whooping cough (Coquel) /Corns and warts(Corns) /Sunburn (Coupssol)/Anxiety attack(Criseang)/Anger attack(Crisecol)/Liver attack(Crisefoie)/Nervous attack (Crisenerfs)/Cyanogenetics(Cyanogen)/Cystitis(Cystitis)/Itching(Ditch)/Tething (children) and dental pain (Dentitenf)/Depression (Depress) / Depurative (Depurat)/Diabetes (Diabetes) /Diarrhea (Diarrhea) /Digestion and intestinal disorders (Digest)/Diuretic(Diuret)/Pain(Pain)/Earpain(Earpain)/Dentalpain(Douldent)/Dysentery(Dysent) /Dysmenorrhea (Dysmenor)/ Dyspepsia(Dyspep)/Dyspnea (Dyspnea)Eczema(Eczema)/Emollient(Emollient)/Sprain/Epilepsy(Epileps)/[Skin rash (disorders, pimples)] (Eruptcut)/Ethyl states(Ethyl state)/Febrile states (Febrile state) /Expectorant (Expect) /Fatigue (Fatigue) /Febrifuge(Febrif)/ Fever(Fever)/Flatulence(Flatul)/Fungicide(Fung)/Fortifier(Fortif)/Frictions(Frictions)/ Cold(Cold)/Boil and abscess(Boil)/Intestinal gas(Gazinst) /Gingivitis(Gingiv)/ Blood sugar (Glycem)/ Influenza (Flu)/Hangover (Gueulebois)/ Hemorrhage (Hemorrha) / Hemorrhoids (Hemorrh)/Hemostatic (Hemostat) / Herpes (Herpes) / Dropsy (Hydrop) / Hypertension (Hypertens) / Hypocholesterolemic (Hypochole) / Hypoglycemia (Hypoglycem) / Hypolipidemic (Hypolip) / Hypotensive (Hypotens) / Hysteria (Hysteria) / Immuno -modulating or stimulating (Immuno) / Urinary infections (Infecturin) / Infertility (Infertil) / Natural insecticide [(Bactericide, larvicide, nematicide)] (Insecticide)/Insomnia (Insomnia)/Jaundice (Jaundice)/Laxative(Laxative)/Motion sickness(Maldestrans)/Disease of the skin and subcutaneous tissue(Malpeau)/Disease of the nervous system (Malsystnerv)/Diseases of the genitourinary system (Malsystgen)/Diseases of the musculoskeletal system (Malsystemus)/Venereal diseases such as gonorrhoea (hot piss) and genitourinary diseases (Malvener)/Heart ailments (Malcard)/Lack of appetite (Manqueapp)/Sore throat (Mauxgorges)/Stomach ache (Mauxestom)/Menstruation, vaginal flow and cramps (Menstruat)/Migraine and headaches (Migraine)/Snake bite (Morssep)/Mycosis (Mycosis)/ Nervousness (Nervousness)/Obesity (Obesity)/ Malaria (Malaria)/[(Parasites (intestinal...)] (Parasit)/Pectoral (Pectoral)/Athlete's foot (Pieddath)/Insect bites (Piquereinsect)/Bite of scorpion (Piquescorp)/Pleurisy (Pleuresia)/Pneumonia (Pneumonia)/ To keep warm (Pourréchauf)/Lice (Lice)/Heart problem (Probcard)/Dermatological problems (Probderm)/Hepatic problems (Probhepat)/Prostatitis (Prostat)/ Anti-aging protection (Protection)/Purges (Purge)/Refreshing (Refreshing)/Warming (Rchauff)/Cooling (Cooling) /Fluid retention (Retenthyd)/Urinary retention (Retenturin)/Rheumatism (Rheumat)/Sedative (Sedative)Spasms muscular (Spasmmusc) / [Stimulant-fortifier (central nervous system, etc.)](Stimulfort)/Stomachic (digestion) (Stomach)/Sudorific (Sudorif)/After-birth (Suitecouche)/Syphilis (Syphilis)/Tinea (Ringworm)/Tonic (Tonic)/ Sweating (Transpi)/ Liver disorders (Troubhépat)/ Typhoid (Typhoid)/ [Stomach ulcer, gastric ulcers, ulcers] (Ulcers)/ Urethritis (Urethritis)/ Uterotonic (Uteroton)/ Veinotonic (Veinoton)/ [Dewormer (antihelmintic)] (Dewormer)/Worms (Worms)/Dizziness (Dizziness)/Vomiting and nausea (Vomiting)/ Shingles (Zona).

Box 4: Pathologies and their abbreviations

4. Conclusion

Vernacular knowledge concerning the medicinal plants of Martinique and the Lesser Antilles comes from transfers from Ameridians to both deported black populations and white French settlers (Alonso-Castro *et al.*, 2015) ^[1]. It was on this sole condition that the men arriving in the Antilles in the 17th century could survive. The same goes for food plants. Added to the knowledge of the natives is the medicinal knowledge specific to the geographical regions of forced African migrants and European conquerors (Carney, 2003; Currie, 2005) ^[9, 13]. From the meeting of these worlds in the Antilles, syncretisms took place within which new functions of plant use appeared with regard to physiognomic analogies and principles relating to the imagination and religious beliefs (McClure, 1982) ^[29]. Consequently, it is possible to observe different uses for certain plants between their area of anthropogenic introduction and their area of origin (Medeiros *et al.*, 2012, Rojas-Sandoval, Ackerman & Tremblay, 2020) ^[30, 40]. It follows from this reality that the great diversity of the medicinal flora of the Lesser Antilles is a structuring issue for development. Nevertheless, it is crucial in the future that phytochemical and pharmacological studies make it possible to shed light on the efficient or ineffective nature of current uses. The establishment of a molecular library of medicinal plants is essential: this from a perspective of innovations in terms of medicines.

5. References

- Alonso-Castro AJ, Domínguez F, Zapata-Morales JR, Carranza-Álvarez C. Plants used in the traditional medicine of Mesoamerica (Mexico and Central America) and the Caribbean for the treatment of obesity. *Journal of Ethnopharmacology*. 2015;175:335-45. [https://doi.org/10.1016/S0378-8741\(15\)00483-3](https://doi.org/10.1016/S0378-8741(15)00483-3).
- Augendre M, Llored JP, Nussaume Y. Mesology, a other paradigm for the Anthropocene: Around and in presence by Augustine Berque. *Hermann*; c2018. <https://doi.org/10.3917/herm.augen.2018.01>.
- Berry MV. Geographic origins of medicinal plants in Montserrat, West Indies, pre-1632 to present. *Southeastern Geographer*. 2003;43(1):75-88. <https://doi.org/10.1353/sgo.2003.0022>.
- Berry MV. Exploring the potential contributions of Amerindians to West Indian folk medicine. *Southeastern Geographer*. 2005;45(2):239-50. <http://www.jstor.org/stable/26222208>.
- Bodeker G, Ryan T, Ong CK. Traditional approaches to wound healing. *Clinics in Dermatology*. 1999;17(1):93-98.
- Bougerol C. Medical Practices in the French West Indies: Master and Slave in the 17th and 18th centuries. *History and Anthropology*. 1985;2(1):125-143.
- Cáceres A, Alvarez AV, Ovando AE, Samayoa BE. Plants used in Guatemala for the treatment of respiratory diseases. 1. Screening of 68 plants against gram-positive bacteria. *Journal of Ethnopharmacology*. 1991;31(2):193-208.
- Caparros-Lefebvre D, Elbaz A. Possible relationship of atypical parkinsonism in the French West Indies with consumption of tropical plants: A case-control study. *The Lancet*. 1999;354(9175):281-286.
- Carney JA. African traditional plant knowledge in the circum-Caribbean region. *Journal of Ethnobiology*. 2003;23(2):167-86.
- Coe FG, Anderson GJ. Snakebite ethnopharmacopoeia of eastern Nicaragua. *Journal of Ethnopharmacology*. 2005;96:303-23.
- Coe FG. Rama midwifery in eastern Nicaragua. *Journal of Ethnopharmacology*. 2008;117:136-57.
- Courric E, Desrosiers S, Chateau-Degat ML, Samson J, Rousseau H, Fournet F, *et al.* Medicinal plants and plant-based remedies in Grande-Terre: An Ethno Pharmacological approach. *Plants*. 2023;12(3):654.
- Currie S. European and non-European medical practices: India and the West Indies, 1750-1900. *Sheffield Hallam University (United Kingdom)*; c2005.
- Di Napoli C, Dash J, Alanis G, Still C. Heat stress in the Caribbean: Climatology, drivers, and trends of human biometeorology indices. *International Journal of Climatology*. 2023;43(1):405-425.
- Dias DA, Urban S, Roessner U. A historical overview of natural products in drug discovery. *Metabolites*. 2012;2(2):303-336.
- Duke JA. *Duke's handbook of medicinal plants of Latin America*. USA: CRC Press, Taylor and Francis; c2009. p. 298-300.
- Elisabetsky E. Phytotherapy and the new paradigm of drugs mode of action. *Science and Technical*. 2007;1(33):459-464.
- Franklin J, Potts MD, Acevedo M, Roberts DA. Geographical ecology of dry forest tree communities in the West Indies. *Journal of Biogeography*. 2018;45(5):1168-1181.
- Fredrich BE. Dooryard medicinal plants of St. Lucia. *Yearbook of the Association of Pacific Coast Geographers*. 1978;40(1):65-78.
- Girón LM, Freire V, Alonzo A, Cáceres A. Ethnobotanical survey of the medicinal flora used by the Caribs of Guatemala. *Journal of Ethnopharmacology*. 1991;34(2):173-187.
- Heinrich M, Rimpler H, Barrera NA. Indigenous phytotherapy of gastrointestinal disorder in a lowland Mixed community Oaxaca, Mexico: ethnopharmacologic evaluation. *Journal of Ethnopharmacology*. 1992;36:63-80.
- Honychurch PN. *Caribbean wild plants and their uses: an illustrated guide to some medicinal and wild ornamental plants of the West Indies*. Macmillan Publishers; c1986.
- Howard RA. *Eighteenth-century West Indian pharmaceuticals*. Harvard Papers in Botany; c1994. p. 69-91.
- Kvist LP, Christensen SB, Rasmussen HB, Mejia K, Gonzales A. Identification and evaluation of Peruvian plants used to treat malaria and leishmaniasis. *Journal of Ethnopharmacology*. 2006;106:390-402.
- Lans C. Ethnomedicines used in Trinidad and Tobago for reproductive problems. *Journal of Ethnobiology and Ethnomedicine*. 2007;3(1):13.
- Leal LKAM, Ferreira AAG, Bezerra GA, Matos FJA, Viana GSB. Antinociceptive, anti-inflammatory and bronchodilator activities of Brazilian medicinal plants containing coumarin: a comparative study. *Journal of Ethnopharmacology*. 2000;70(2):151-159.
- Maia JGS, Maria das Graças BZ, Andrade EHA, da Silva MHL, Luz AIR, da Silva JD, *et al.* Essential oils composition of Eupatorium species growing wild in the Amazon. *Biochemical Systematics and Ecology*. 2002;30(11):1071-1077.
- Mans DR, Ganga D, Kartopawiro J. Meeting of the minds: traditional herbal medicine in multiethnic

- Suriname. In: Rai V, Joghee N, editors. *Aromatic and Medicinal Plants - Back to Nature*. Springer Nature Switzerland; c2017. p. 111-32.
29. McClure SA. Parallel use of medicinal plants by Africans and their Caribbean descendants. *Economic Botany*. 1982;36(3):291-301.
 30. Medeiros PMD, Soldati GT, Alencar NL, Vandebroek I, Pieroni A, Hanazaki N, *et al.* The use of medicinal plants by migrant people: adaptation, maintenance, and replacement. *Evidence-Based Complementary and Alternative Medicine*. 2012;2012:807452.
 31. Mitchell SA, Ahmad MH. A review of medicinal plant research at the University of the West Indies, Jamaica. *West Indian Medical Journal*. 2006;55(4):243-269.
 32. Pagán-Jiménez JR. Human-plant dynamics in the precolonial Antilles. In: Keegan WF, Hofman CL, Ramos R, editors. *The Oxford Handbook of Caribbean Archaeology*. New York: Oxford University Press; c2013. p. 391-406.
 33. Penet L, Collin CL. Current use of local folk medicine (Rimèd Razyé) in the French Lesser Antilles: Diversity patterns and links between food and health. *Economic Botany*. 2022;76(2):158-175.
 34. Petri RP Jr. Integrative health and healing as the new health care paradigm for the military. *Medical Acupuncture*. 2015;27(5):301-308.
 35. Picking D, Delgoda R, Vandebroek I. Traditional knowledge systems and the role of traditional medicine in Jamaica. *CABI Reviews*; c2019. p. 1-13.
 36. Quinlan MB, Quinlan RJ. Modernization and medicinal plant knowledge in a Caribbean horticultural village. *Medical Anthropology Quarterly*. 2007;21(2):169-192.
 37. Rengifo-Salgado EL. Contribution of the ethnomedicinal-plantas medicinales for the health of the population in the Amazon. *International Report*. Instituto de Investigación de la Amazonia Peruana; c2011. p. 26-35.
 38. Riffault-Valois L, Watez C, Langrand J, Boucaud-Maitre D, Gaslonde T, Colas C, *et al.* Health risk associated with the oral consumption of Chiniy-tref, a traditional medicinal preparation used in Martinique (French West Indies): Qualitative and quantitative analyses of aristolochic acids contained therein. *Toxicon*. 2019;172:53-60.
 39. Rodrigues E. Plants of restricted use indicated by three cultures in Brazil (Caboclo-river dweller, Indian and Quilombola). *Journal of Ethnopharmacology*. 2007;111:295-302.
 40. Rojas-Sandoval J, Ackerman JD, Tremblay RL. Island biogeography of native and alien plant species: contrasting drivers of diversity across the Lesser Antilles. *Diversity and Distributions*. 2020;26(11):1539-1550.
 41. Saganuwan S. Competitive biodiversity of human and vascular plant species: The implications for pharmaceutical industries, health and world economy Part-2. *European Journal of Medicinal Plants*. 2016;16(1):1-29.
 42. Schiebinger L. The Atlantic World medical complex. In: Kupperman KO, editor. *Empires of Knowledge*. Routledge; c2018. p. 317-341.
 43. Schiebinger L. *Secret Cures of Slaves: People, Plants, and Medicine in the Eighteenth-Century Atlantic World*. Stanford University Press; c2017.
 44. Swenson NG, Umaña MN. Phylofloristics: An example from the Lesser Antilles. *Journal of Plant Ecology*. 2014;7(2):166-175.
 45. Sylvestre M, Pichette A, Longtin A, Nagau F, Legault J. Essential oil analysis and anticancer activity of leaf essential oil of *Croton flavens* L. from Guadeloupe. *Journal of Ethnopharmacology*. 2006;103(1):99-102.
 46. Thorpe RS, Surget-Groba Y, Johansson H. Widespread parallel population adaptation to climate variation across a radiation: implications for adaptation to climate change. *Molecular Ecology*. 2015;24(5):1019-1030.
 47. Torres-Avilez W, Méndez-González M, Durán-García R, Boulogne I, Germosén-Robineau L. Medicinal plant knowledge in Caribbean Basin: a comparative study of Afrocaribbean, Amerindian and Mestizo communities. *Journal of Ethnobiology and Ethnomedicine*. 2015;11(1):18.
 48. Torres-Avilez W, Méndez-González M, Durán-García R, Boulogne I, Germosén-Robineau L. Medicinal plant knowledge in Caribbean Basin: a comparative study of Afrocaribbean, Amerindian and Mestizo communities. *Journal of Ethnobiology and Ethnomedicine*. 2015;11:1-11.
 49. Viera DV, Dupuy MAG, Ayala KM, Dorado BA, Ayon FG. Etnobotánica: Use of plants para medicinal use. *Revista Cubana de Ciencias Forestales*. 2014;2(1):35-44.
 50. Vujcic T, Cohall D. Knowledge, attitudes and practices on the use of botanical medicines in a rural Caribbean territory. *Frontiers in Pharmacology*. 2021;12:713855.
 51. Zamora-Martinez MC, Pascual Pola CN. Medicinal plants used in some rural populations of Oaxaca, Puebla and Veracruz, Mexico. *Journal of Ethnopharmacology*. 1992;35:229-257.