Advances in the knowledge of plants used for snakebite in Colombia

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Review

Abstract

Background: According to the National Health Institute of Colombia, 6231 snakebite cases were reported in 2023, but these cases poorly represent people from remote communities who did not seek medical treatment at the hospital and instead are treated through traditional medicinal knowledge. This review compiles information on plants species used by local communities or evaluated in laboratory for snakebite treatment in Colombia. It also discusses the bioprospecting potential of these plants for the development of complementary or alternative therapeutic options.

Methods: The PRISMA framework was adopted to conduct a systematic review on plant species used for snakebite treatment, covering publications from January 1896 to May 2024 using databases such as ScienceDirect and Scopus. Gathered data included local name, plant part used, method of preparation, reported activity, and mode of administration.

Results: A total of 385 plant species belonging to 85 taxonomic families were identified as being used in the treatment of snakebite in Colombia. Based on the number of species, the most relevant plant families are Piperaceae (28), Fabaceae (27), Araceae (25), and Asteraceae (25). Notably, 66% of the species identified in this review have not yet been undergone through pharmacological or toxicological evaluation highlighting their potential for further evaluation.

Conclusions: Future bioprospecting efforts could be valuable for identifying plant species with potential applications in snakebite treatment. However, to advance this field, several key challenges must be addressed: 1) improving the accuracy of plant identification to the species level; 2) conducting rigorous pharmacological evaluations to assess their efficacy against snakebite envenomation; and 3) establishing priorities to guide future bioprospecting research.

Keywords: Ethnobotany, medicinal plants, native species, Neotropics, snakebite

Background

Snakebite envenoming is a persistent public health issue of tropical and subtropical regions with global estimates indicating between 5.5 million cases and between 20,000 and 90,000 deaths annually (Kasturiratne *et al.* 2008, Gutiérrez *et al.* 2013). In Colombia, where rural and biodiverse landscapes overlap with vulnerable populations, snakebite remains a particularly critical concern. Since 2004, the country has monitored snakebite incidents through the Public Health Surveillance System (SIVIGILA) which mandates clinical reporting (Rodríguez-Vargas *et al.* 2013, Parada *et al.* 2016). Between 2006 and 2010,

34,994 cases were officially reported while yearly reports between 2011 and 2015 ranging from 4,200 to 4526cases (Rodríguez-Vargas *et al.* 2013, Parada *et al.* 2016). More recently, 6231 cases were documented nationwide in 2023 (SIVIGILA 2023). However, these figures likely underestimate the true status, as many rural inhabitants lack access to medical facilities and instead turn to traditional remedies. A recent estimation suggests that approximately 10.19% of cases remain underreported each year, particularly in remote areas (Bravo-Vega *et al.* 2023).

In Colombia two main snake families pose a threat to health: Elapidae (e.g., coral snakes, ~32 species), which are generally less aggressive and less efficient at venom delivery, and Viperidae (e.g., pitvipers, ~20 species), which account for 88.3% of envenomation cases, particularly the species *Bothrops asper*, and *Bothops atrox* (Lynch *et al.* 2014; Uetz *et al.* 2024). These vipers inhabit both natural and human-altered landscapes, increasing the frequency of human-snake encounters in rural territories.

Colombia is recognized as one of the world's most biodiverse countries, with a recorded flora of 26,187 species of vascular and non-vascular plants, according to the Catalogue of plants and lichens of Colombia (Bernal *et al.* 2016). Among these, angiosperms represent the most abundant group, distributed across all altitudinal ranges, with a marked presence in lowland ecosystems where human-snake encounters are more frequent (Bernal *et al.* 2016). Equally rich is the country's cultural diversity, composed of three major ethnic groups: Indigenous peoples (over 115 groups, 4.7% of the population), Afro-Colombians (including Black, Raizales, and Palenqueros, 6.8%), and the Rrom population (0.006%) (DANE, 2019). Additionally, Colombia's rural landscape is inhabited by campesino and mestizo communities, formed through a long history of cultural blending among Indigenous, African, and European ancestries since colonial times. These groups are not always considered ethnicities in the formal sense, but rather socio-cultural communities with distinctive worldviews, traditional practices, and knowledge systems, including an intimate understanding of local ecosystems and plant-based remedies (Echeverri *et al.* 2024).

In rural and marginalized areas, limited access to hospitals and antivenom treatment compels communities to rely on ancestral plant-based therapies. Traditional healers, midwives, and community elders often play key roles in administering these treatments, using botanical resources rooted in Indigenous, Afro-descendant, and campesino knowledge systems. However, despite the existence of several ethnobotanical studies across Colombia, there remains no comprehensive, up-to-date compendium of plants used in traditional snakebite treatments.

Although numerous ethnobotanical studies have been conducted in Colombia -many of which highlight the medicinal use out of plants (Rodríguez *et al.* 2013), there is currently no accurate and updated compendium of plants species specifically reported to have antivenom properties. This literature review was therefore undertaken to comprehensively document the plant species traditionally used for snakebite treatment in Colombia between January 1896 and May 2024. By establishing this baseline, our review aims to support future research on the therapeutic potential of these species and to promote the integration of traditional knowledge into scientific and public health frameworks.

Materials and Methods

The Preferred Reported Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines were used to perform the a systematic review of studies reporting plants used for the treatment of snakebite in Colombia from January 1896 to May 2024 through search engines including Google Scholar [https://scholar.google.com], Scopus [https://www.scopus.com/home.uri], Science Direct [https://www.sciencedirect.com/], PubMed [https://pubmed.ncbi.nlm.nih.gov/], Scientific Electronic Library Online (SciELO) [https://scielo.org/es/] and Redalyc [https://www.redalyc.org/], as well as databases from national universities. A systematic search was conducted using keywords with Boolean operators OR and AND with the following keywords in English and Spanish: snakebite AND ethnobotany AND Colombia, Ethnobotany OR medicinal plants, Plants against snakebite AND Colombia, Snakebite AND ethnobotany AND Colombia, antivenom plants OR medicinal plants AND snakebite AND Colombia. Subsequent searches to identify which plant species had been chemically evaluated against snakebite were carried out using the scientific name with the following keywords in English and Spanish: AND Colombia, Venom Snake AND Extracts Plants, Extract Plants AND Antiophidic activity. The search was conducted from March 2023 to May 2024.

Since several studies on Colombian local communities have been conducted by undergraduate and graduate students, this review includes not only peer-reviewed articles but also books and theses found in Colombian repositories, such as: Servicio Nacional de Aprendizaje (SENA), [https://biblioteca.sena.edu.co/] Universidad Nacional de Colombia [https://bibliotecas.unal.edu.co/], Universidad de los Andes [https://biblioteca.uniandes.edu.co/], and others. The review focused on studies that mentioned plant use for snakebite treatment and included reliable species identification, supported

by photographs and/or voucher specimens. Studies with questionable plant identification, or lacking botanical collections deposited in herbaria, were excluded. Similarly, chemical analyses of plants were excluded if their primary objective was not related to biological activity against snakebite envenomation.

A total of 1831 studies were gathered, but only 77 met the inclusion criteria and were analyzed in this review (Fig. 1). The extracted information was organized in a Microsoft Excel spreadsheet, with each entry corresponding to a plant species, based on the data available in the reviewed publications. The fields included plant family, scientific name, common name, and, when available, region, plant part used, method of preparation, and reported activity. Scientific names of plant families and species were verified and updated using the following databases: Tropicos (Missouri Botanical Garden) [https://tropicos.org/home], The Plant List [http://www.theplantlist.org/], and ColplantA (Kew Botanical Garden) [https://colplanta.org/].

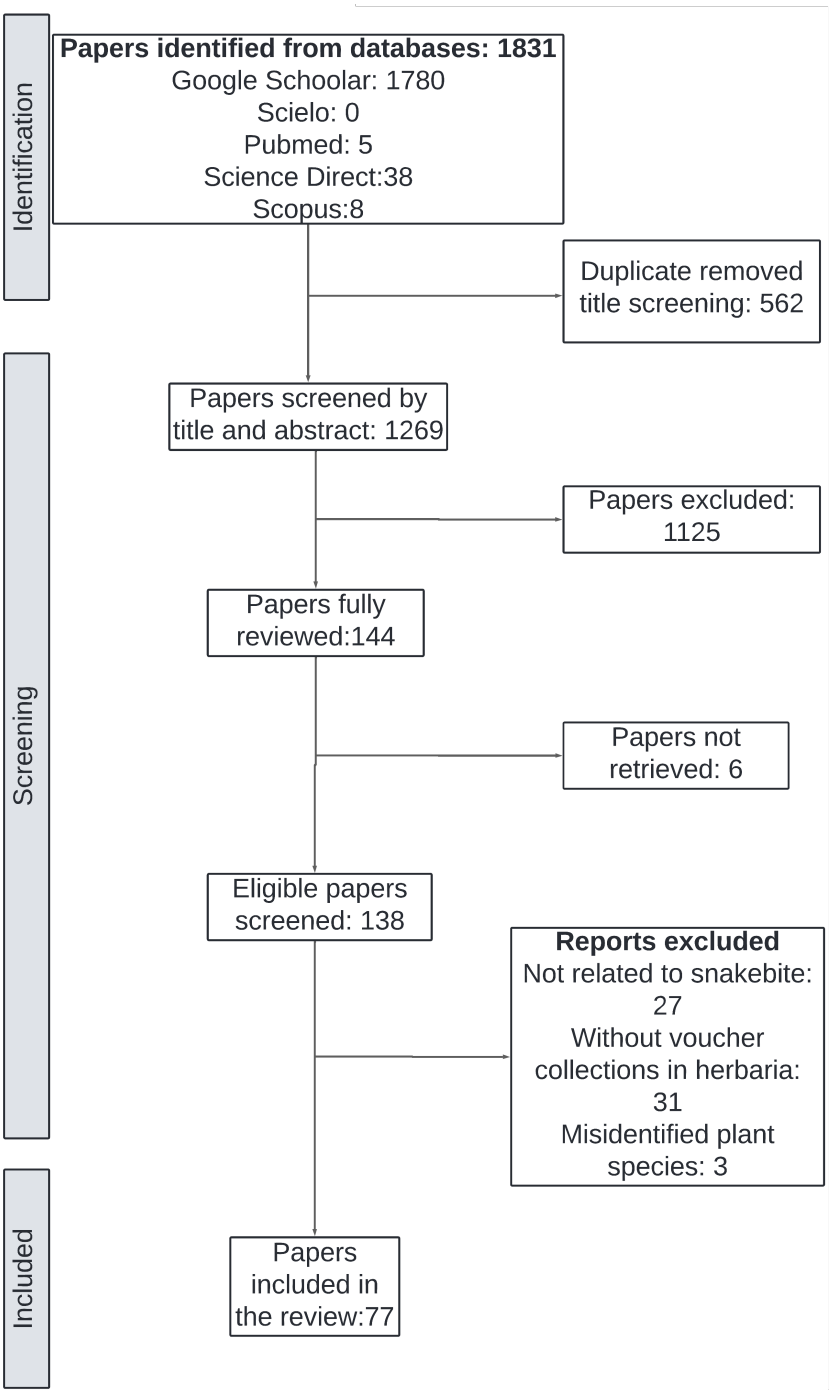

Figure 1. PRISMA flow diagram of the search strategy

Results and Discussion

Diversity of plants used for snakebite treatment in Colombia

A preliminary list of 392 plant species was obtained from literature published between 1896 and 2024, including species traditionally used by local communities in Colombia for snakebite treatment, as well as species evaluated for their biological activity against snake venom in preclinical essays. From this initial list, seven species identified only to the genus level were excluded because no reference specimens were deposited in herbaria, resulting in a total of 385 species. Most of these species (350) are native to Colombia, while 35 are introduced. Because many species have a broad geographic distribution, they often have multiple common names depending on the region or community reporting their use (Table 1). These species belong to 85 plant families, with the most represented families by number of species being Piperaceae (7.3%), Fabaceae (7%), Araceae, and Asteraceae 6.5%), (Fig. 2).

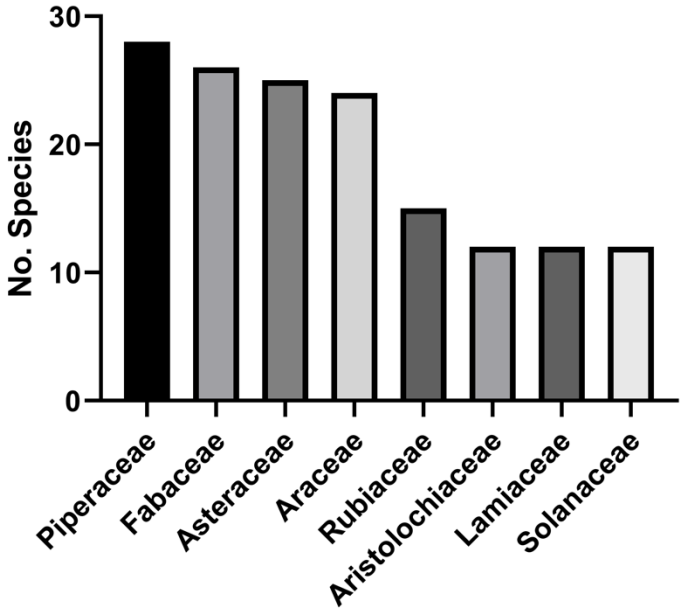

Figure 2. Plant families most used to treat snakebite envenoming

Table 1. Plant species used in Colombia for snakebite treatments

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Malvaceae	*Abelmoschus esculentus* (L.) Moench.	Introduced	Najú				(Duke 1970)
Malvaceae	*Abelmoschus moschatus* Medik.	Introduced	Almizclillón, Ambarilla				(García 1896, Botero 2011)
Menispermaceae	*Abuta grandifolia* (Mart.) Sandwith. *	Native	Trompetero sacha, Sanango, Caimitillo	Bark	Extract, Infusion, Antihemorrhagic, Anticytotoxic	Oral	(Lizcano *et al.* 2010)
Fabaceae	*Acacia collinsii* Saff.	Native	Cachitoetoro, Cacho de Toro		Baths	External	(Cruz *et al.* (2009)
Amaranthaceae	*Achyranthes aspera* L. *	Native	Cocúa. Pega-pega	Whole plant	Drinks, Poultices, mixed with guaquito leaves (*Mikania micrantha*) and nail (*Arenaria lanuginosa*) and extracted in double boiled for baths	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d)
Asteraceae	*Achyrocline satureioides* DC.	Native	Vira-Vira macho	Aerial parts	Decoction, Infusion, Poultice	Oral	(Fonnegra *et al.* 2012)
Asteraceae	*Adenostemma lavenia* (L.) Kuntze. *	Native	Doña Juana	Whole plant	Baths, Poultices, Steams, Decoction	Steam bath	(Otero *et al.* 2000d, Otero *et al.* 2000a, Otero *et al.* 2000c, Ramirez 2023)
Pteridaceae	*Adiantum raddianum* C. Presl.	Native	Culantrillo	Leaves	Poultice, Decoction	External	(Rentería 2012)
Pteridaceae	*Adiantum* sp.	Native	Montañero, nena	Leaves	The juice of macerated leaves dissolved in liquor, are placed on the wound necrosis.	External	(Caballero 1995)
Lamiaceae	*Aegiphila panamensis* Moldenke *	Native	Ochorróneta	Leaves, stems	Baths, Poultices, Decoction	External	(Otero *et al.* 2000a, Otero *et al.* 2000c)
Asteraceae	*Ageratum conyzoides* L.	Native	Botoncito Blanco	Flowers	Baths, Decoction	External	(Vásquez *et al.* 2015)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Apocynaceae	*Allamanda cathartica* L. *	Introduced	Copito de oro	Aerial parts	Drinks, Baths, Maceration, Decoction, Antihemorrhagic	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez 2012, Vásquez *et al.* 2013)
Amaryllidaceae	*Allium sativum* L.	Introduced	Ajo	Rhizomes	Poultice, Poultices, Decoction, Maceration	External	(Vásquez 2012, Vásquez *et al.* 2013, Fonnegra *et al.* 2012)
Araceae	*Alocasia cucullata* (Lour.) Schott. *	Introduced	Huevo berraco	Roots	Chupadera, Baths, Poultices, Maceration, Direct heating	External	(Vásquez 2012, Vásquez *et al.* 2013, Otero *et al.* 2000b, Otero *et al.* 2000c)
Araceae	*Alocasia macrorrhizos* (L.) G.Don.	Introduced	Ocumo morado, oreja e' elefante, curía, oreja e' burro				(Rosado & Moreno 2011)
Verbenaceae	*Aloysia citrodora* Paláu.	Introduced	Cidrón	Aerial parts	Ointment, Decoction	External	(Vasquez *et al.* 2015)
Zingiberaceae	*Alpinia purpurata* (Vieill.) K. Schum. *	Introduced	Matandrea	Leaves	Poultice, Maceration, Antihemorrhagic, Antiproteolytic	External	(Vásquez 2012, Vásquez *et al.* 2013)
Cyatheaceae	*Alsophyla* sp.	Native	Chino arisco	Stems	Poultice	External	(Caballero 1995)
Amaranthaceae	*Alternanthera albotomentosa* Suess.	Native	Botón blanco	Aerial parts	Ointment, Direct heating	External	(Vásquez *et al.* 2015)
Amaranthaceae	*Alternanthera lanceolata* (Benth.) Schinz.	Native	Tiscandil, escancel	Leaves	Maceration	External	(Suárez 2016)
Amaranthaceae	*Alternanthera sessilis* (L.) DC.	Native	Pampera	Leaves	Poultice of macerated leaves with those of guaquito (*Mikania micrantha*) and rabbit (*Commelina* sp.)	External	(Caballero 1995)
Amaranthaceae	*Amaranthus dubius* Mart. ex Thell.	Native	Gusanito	Bark, Leaves, Roots, Seeds	Ointment, Decoction	External	(Vásquez *et al.* 2015)
Asteraceae	*Ambrosia cumanensis* Kunth	Native	Altamisa	Aerial parts	Drink, Baths, Ethanolic extract, Decoction	Oral and external	(Barranco 2010, Vásquez 2012, Vásquez *et al.* 2013)
Asteraceae	*Ambrosia peruviana* Willd.	Native	Altamisa	Whole plant	Drink, Ointment, Decoction	External	(Vásquez *et al.* 2015)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Anacardiaceae	*Anacardium excelsum* (Bertero & Balb. ex Kunth) Skeels. *	Native	Carnanzuel, Caracolí, Espavé	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Anacardiaceae	*Anacardium occidentale* L.	Native	Marañón	Bark	Bark infusion	Oral	(Barros 2020)
Annonaceae	*Annona hayesii* L.	Native	Anoncito				(Cruz *et al.* 2009)
Araceae	*Anthurium marmoratum* Sodiro	Native	Terciopelo	Leaves, Stems	Baths, Poultices, Decoction, Maceration	External	(Otero *et al.* 2000a, Otero *et al.* 2000d)
Caryophyllaceae	*Arenaria lanuginosa* (Michx.) Rohrb.	Native	Clavito kirukise	Leaves	Extract of water leaves mixed with guaquito (*Mikania micrantha*) and cocúa (*Achyrantes aspera*)	External	(Caballero 1995)
Aristolochiaceae	*Aristolochia anguicida* Jacq.	Native	Capitana				(Barranco *et al.* 2012, Cruz *et al.* 2009, Gómez *et al.* 2011)
Aristolochiaceae	*Aristolochia cordiflora* Mutis ex Kunth.	Native	Carímbulo, Llorona, Capitana	Leaves, Seeds, Stems	Drink, Maceration	Oral	(Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015)
Aristolochiaceae	*Aristolochia grandiflora* Sw. *	Native	Zaragoza, Capitana, Gallito, Yansaguitup	Whole plant	Drinks, Baths, Decoction	Oral and external	(Garcia 1896, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.*, 2000d, Martinez 2023)
Aristolochiaceae	*Aristolochia leuconeura* Linden.	Native	Guaco, Carare	Stems		Oral	(Garcia 1896, Mendoza *et al.* 2021)
Aristolochiaceae	*Aristolochia maxima* L. *	Native	Contracapitana	Leaves, Roots, Stems	Drink, Poultice, Decoction, Ethanolic extract	Oral and external	(Barranco *et al.* 2012, Barranco 2010, Gumilla 1955, Garcia 1992)
Aristolochiaceae	*Aristolochia nummulariifolia* Kunth.	Native	Guaco, Pepa de mato, 'dokobiijerojero'				(Ortiz 1989)
Aristolochiaceae	*Aristolochia odoratissima* L.	Native	Halconcito				(Cruz *et al.* 2009)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Aristolochiaceae	*Aristolochia pilosa* Kunth. *	Native	Guaco negro	Roots	Drinks, baths, Decoction, Ethanolic extract	Oral and external	(García 1896, Otero *et al.* 2000a, Otero *et al.* 2000c)
Aristolochiaceae	*Aristolochia ringens* Vahl.	Native	Contracapitana	Stems	Continuous drinking during the first day and decreasing dosage	Oral	(Barros 2020)
Aristolochiaceae	*Aristolochia* sp. 1	Native	Capitana	Whole plant	Scraping		(Quintana 2016)
Aristolochiaceae	*Aristolochia* sp. 2	Native	Capitana mayor	Bark	Decoction	External, oral	(Quintana 2016)
Aristolochiaceae	*Aristolochia trianae* Duch.	Native	Bejuco del sol		Beverage, Ethanolic extraction	Oral	(Raad *et al.* 2022)
Apocynaceae	*Aspidosperma spruceanum* Benth. Ex Mull Arg.	Native	Caney, Carreto, Culehierro				(Jiménez & Estupiñán 2011)
Arecaceae	*Astrocaryum aculeatum* G. Mey.	Native	Corombolo	Leaves	Infusion, Maceration	oral	(Forero & Mosquera 2019)
Arecaceae	*Astrocaryum aculeatum* G. Mey.	Native	Corombolo	leaves	Infusion, Maceration	Oral	(Forero & Becoche 2019)
Arecaceae	*Astrocaryum chambira* Burret.	Native	Chambira				(Mesa & Galeano 2013)
Arecaceae	*Astrocaryum ciliatum F.* Kahn & B. Millán.	Native	Cumare de guara				(Mesa & Galeano 2013)
Arecaceae	*Attalea maripa* (Aubl.) Mart.	Native	Inayá	Whole plant	Poultice, Maceration	External	(Forero & Becoche 2019, Forero & Mosquera 2019)
Asteraceae	*Austroeupatorium inulifolium* (Kunth) R.M. King & H. Rob. *	Native	Contragavilana vallenata, Salvia, Salvia Amarga	Leaves, Flowers, Stems	Drink, Poultice, ointment, Ethanolic extract, Maceration, Decoction	Oral and external	(Barranco *et al.* 2012, Fonnegra *et al.* 2012; Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015, Pérez 2010, Fonnegra *et al.* 2012)
Asteraceae	*Baccharis trinervis* Pers.	Native	Bejuco de Valdivia, Marucha	Whole plant	Baths, Ointment, Steams, Decoction	Oral and external	(Vásquez *et al.* 2015)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Arecaceae	*Bactris guineensis* (L.) H.E.Moore.	Native	Corocito, Lata sabanera, Chonta	Fruits	Decoction	External, oral	(García 1992)
Acanthaceae	*Barleria lupulina* Lindl.	introduced	Solita				(Cruz *et al.* 2009)
Fabaceae	*Bauhinia picta* (Kunth) DC.	Native	Casco de vaca				(Granados 2020)
Bignoniaceae	*Bignonia binata* Thunb.	Native	Matshé				(Cruz *et al.* 2009, Carbonó & Dib 2013)
Bignoniaceae	*Bignonia sciuripabulum* (K. Schum.) L.G. Lohmann	Native					(Gentry 1992)
Sapindaceae	*Billia rosea* (Planch. & Linden) C. Ulloa & P. Jørg. *	Native	Castaño de Indias	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Bixaceae	*Bixa orellana* L. *	Native	Achiote rojo, Misal kinip	Leaves, Stems	Baths, Infusion, Decoction, Extract Antihemorrhagic, Antiedematizing, Antigoaculant	Oral and external	(Forero & Becoche 2019, Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d)
Bartramiaceae	*Breutelia chrysea* (Müll. Hal.) A. Jaeger. *	Native	Musgo	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Moraceae	*Brosimum utile* (Kunth) Oken.	Native	Lechoso, Baco	Oil, Exudate	Beverages, Antifungal	Oral	(Acosta *et al.* 2017)
Fabaceae	*Brownea ariza* B. *	Native					(Mack-Wen *et al.* 2010, Mack-Wen *et al.* 2011)
Fabaceae	*Brownea rosa-de-monte* Bergius. *	Native	Florisanto, Arizá, Tuksal	Bark	Ethanolic Extract Drinks, Baths, Decoction, Anticytotoxic, Antihemorrhagic, Antiedematizing, Antigoaculant	Oral and external	(Lizcano *et al.* 2012, Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Solanaceae	*Brugmansia arborea* (L.) Lagerh.	Native	Borrachero blanco	Leaves	Poultice, Decoction	External	(Fonnegra *et al.* 2012)
Solanaceae	*Brunfelsia chiricaspi* Plowman.	Native					(Schultes & Raffauf 2003)
Burseraceae	*Bursera simaruba* (L.) Sarg.	Native	Almácigo, Indio desnudo	Leaves, Stems, Resin	Poultice on the wound, Decoction	External	(Ramirez 2005, Quintana 2016, Garcia 1992)
Malpighiaceae	*Byrsonima crassifolia* (L.) Kunth.	Native	Chaparro-manteco, Peralejo	Bark	Decoction	External	(García 1992)
Araceae	*Caladium* sp.	Native	Anamú, Sanjuanito	Leaves	Poultice	External	(Caballero 1995)
Commelinaceae	*Callisia gracilis* (Kunth) D.R. Hunt.	Native	Siempreviva, Suelda	Leaves	Baths, Drinks, Ointment, Decoction, Maceration	Oral and external	(Fonnegra *et al.* 2012, Vásquez *et al.* 2015)
Capparaceae	*Caparidastrum* sp.	Native	Sincogollo	Whole plant	Decoction	External	(Quintana 2016)
Solanaceae	*Capsicum annuum* L.	introduced	Ají dulce	Fruits	Eaten	Oral	(VásquezVásquez *et al.* 2015)
Solanaceae	*Capsicum frutescens* L. *	Native	Ají pajarito	Fruits	Beverages, Maceration, Antihemorrhagic	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d, García 1896)
Meliaceae	*Carapa guianensis* Aubl. *	Native	Tangare	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Rubiaceae	*Carapichea ipecacuanha* (Brot.) L. Anderson. *	Native	Ipecacuana	Whole plant	Drinks, Baths, Extract	Oral and external	(Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Achariaceae	*Carpotroche amazonica* Mart. ex Eichler.	Native					(Sánchez *et al.* 2005)
Apocynaceae	*Cascabela thevetia* (L.) Lippold.	Native	Mato	Roots			(Arias 2003)
Moraceae	*Castilla elastica* Sessé ex Cerv. *	Native	Caucho hembra, Hule	Leaves, Stems	Baths, Infusion, Decoction, Antihemorrhagic	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Apocynaceae	*Catharanthus roseus* (L.) G. Don.	introduced	Primavera, Princesa blanca, Princesa rosada	Flowers	Drink, Ointment, Maceration	Oral and external	(Vásquez *et al.* 2015)
Urticaceae	*Cecropia peltata* L.	Native	Yarumo				(Granados 2020)
Meliaceae	*Cedrela odorata* L. *	Native	Cedro rosado, Cedro real, Cedro oloroso, Cedro Caquetá, Cedro cebollo, Cedro crespo	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010, Rojas *et al.* 1998)
Fabaceae	*Centrosema pubescens* Benth.	Native	Amor seco, Ramonegro	Whole plant	Baths, Ointment, Decoction	External	(VásquezVásquez *et al.* 2015)
Asteraceae	*Chromolaena odorata* (L.) R.M. King & H. Rob.	Native	Rosa Vieja	Whole plant	Baths, Ointment, Steams, Decoction	External	(VásquezVásquez *et al.* 2015)
Gesneriaceae	*Chrysothemis friedrichsthaliana* (Hanst.) H.E. Moore.	Native	Desbaratador, Ceodotaona, Wilkwa				(Duke 1970, Duke 1975)
Menispermaceae	*Cissampelos fasciculata* Benth.	Native	Curarina	Leaves	Drink, Decoction	Oral	(Vásquez 2012, Vásquez *et al.* 2013)
Menispermaceae	*Cissampelos pareira* var. Laevis Diels. *	Native	Contragavilana	Leaves, Stems	Drink, Poultice, Decoction, Ethanolic extract	Oral and external	(Barranco 2010, Núñez & Sánchez 2012, Cruz *et al.* 2009; Pérez-Arbeláez 1947, Pérez 2010)
Rutaceae	*Citrus limon* (L.) Burm. f. *	Introduced	Limón	Leaves, Fruits	Extract, Decoction, Direct heating, Antihemorrhagic, Antiedematizing, Antigoaculant	External	(Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez *et al.* 2015, Otero *et al.* 2000d)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Asteraceae	*Clibadium sylvestre* (Aubl.) Baill. *	Native	Matapescado, Ugla	Whole plant	Drinks, Baths, Decoction	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Euphorbiaceae	*Cnidoscolus aconitifolius* (Mill.) I.M. Johnst.	Native	Árnica	Whole plant	Drink, Decoction	Oral	(Vásquez *et al.* 2015)
Euphorbiaceae	*Cnidoscolus urens* (L.) Arthur.	Native	Pringamosa	Flowers	Baths, Decoction	External	(Quintana 2016)
Rubiaceae	*Coccocypselum lanceolatum* (Ruiz y Pavón) Pers.	Native	Coquito				(Pino 2006)
Bixaceae	*Cochlospermum vitifolium* (Willd.) Spreng.	Native	Papayote, papayuelo, terratoleandro	Aerial parts	Baths, Decoction	External	(Otero *et al.* 2000a, Jiménez & Estupiñán 2011, Vásquez *et al.* 2015)
Lamiaceae	*Coleus scutellarioides* (L.) Benth.	Native	Borrachera de la morada	Leaves	Leaves dissolved in mixture of water, cane steam (*Costus villosissimus*), and lemon applied to the patient's head. Mixed with brandy for drinking every hour.	Oral and external	(Caballero 1995)
Gesneriaceae	*Columnea consanguinea* Hanst.	Native	Riñonera				(Pino 2006)
Gesneriaceae	*Columnea dimidiata* (Benth.) Kuntze	Native	Sangre de cristo	Leaves	Extract	Oral	(Otero *et al.* 2000d, Otero *et al.* 2000d)
Gesneriaceae	*Columnea kalbreyeriana* Mast. *	Native	Carpa	Whole plant	Drinks, Baths, Extract, Antihemorrhagic	Oral and external	(Otero *et al.* 2000c)
Gesneriaceae	*Columnea picta* H. Karst. *	Native	Capitana. Pico de loro, jare kita	Leaves	Decoction for drinks and baths	Oral and external	(Caballero 1995, Ospina *et al.* 2007, Chaves *et al.* 2007, Suárez 2016, Pino 2006)
Gesneriaceae	*Columnea pulcherrima* C.V. Morton. *	Native	Sanguinaria, Guaquito,	Whole plant	Drinks, Baths, Decoction, Maceration	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
			Kiduasapopoa				
Gesneriaceae	*Columnea sanguinea* (Pers.) Hanst.	Native	Sangre de Cristo	Whole plant	Baths, Poultices, Decoction, Poultices	External	(Otero *et al.* 2000a)
Commelinaceae	*Commelina diffusa* Burm. f.	Native	Suelda	Leaves	Decoction, Poultices	External	(Fonnegra *et al.* 2012)
Commelinaceae	*Commelina* sp.	Native	Coneja	Leaves	Poultice together with guaquito (Mikania micrantha) and pampera (Alternanthera sessilis)	External	(Caballero 1995)
Costaceae	*Costus guanaiensis* Rusby. *	Native	Cañagria	Stems	Drinks, Baths, Poultices, Maceration	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Costaceae	*Costus lasius* Loes. *	Native	Cañagria menuda	Leaves, Stems	Extract, Decoction, Direct heating	External	(Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Costaceae	*Costus lima* K. Schum.	Native	Cañaguate	Seeds	Chupadera, Direct heating	External	(VásquezVásquez *et al.* 2015)
Costaceae	*Costus villosissimus* Jacq.	Native	Cañagria, Kóntru	Stems	Drink, Poultice	Oral and external	(Caballero 1995, Rentería 2012, Ramirez 2023)
Apocynaceae	*Couma macrocarpa* Barb. Rodr.	Native	Juansoco	Oil, exudate	Drink, Infusion	Oral	(Forero 2019)
Bignoniaceae	*Crescentia cujete* L. *	Native	Totumo	Fruits	Beverages, Decoction, Antihemorrhagic	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Fabaceae	*Crotalaria pilosa* Mill.	Native	Jomotabutsitsinae, Arbol maraca cola de serpiente', 'yasitotsitsito': "Maraca de cascabel" omowtiwa': "remedio de serpiente",)omokwei':	Leaves	Infusion		(Ortiz 1989)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
			"pepa de culebra"				
Euphorbiaceae	*Croton malambo* H. Karst.	Native	Malambo				(Cruz *et al.* 2009)
Euphorbiaceae	*Croton trinitatis* Millsp.	Native	Mostrenco	Whole plant	Baths, Steam, Decoction	steam bath	(Vásquez *et al.* 2015)
Sapindaceae	*Cupania americana* L. *	Native	Guárana, Uárano, Cupania americana	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Cyatheaceae	*Cyathea lasiosora* (Kuhn) Domin	Native	Tacis		Decoction	External	(García 1992)
Amaranthaceae	*Cyathula achyranthoides* (Kunth) Moq.	Native	Cucua kjun, Hoja cucua	Leaves	Boiled for baths	External	(Suárez 2016)
Cyclanthaceae	*Cyclanthus bipartitus* Poit. ex A.Rich.	Native	Casco de vaca	Whole plant	Drink, Clean the root and boil it. Maceration, Anthelmintic	Oral	(Monterrey *et al.* 2003)
Poaceae	*Cymbopogon citratus* (DC.) Stapf	Native	Limoncillo	Leaves	Ointment, Direct heating	External	(Vásquez *et al.* 2015)
Solanaceae	*Datura metel* L.	Native	Trescopas	Flowers	Drinks, Decoction, Ointment	Oral and external	(Vásquez *et al.* 2015)
Fabaceae	*Desmodium adscendens* (Sw.) DC. *	Native	Amor seco, Prende amor, Pega-pega	Whole plant	Baths, Poultices. Decoction, Maceration	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Fabaceae	*Desmodium incanum* (Sw.) DC.	Native	capitana, amor seco del valle	Whole plant			(García 1896)
Acanthaceae	*Dianthera comata* L.	Native	Chupador de pequeño, chupador chicaipé	Leaves	poultice	External	(Caballero 1995)
Dicranaceae	*Dicranum frigidum* Müll. Hal. *	Native	Musgo	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Rubiaceae	*Didymochlamys whitei* Hook. f.	Native	Hierba de la equis				(Pino & Valois 2004)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Araceae	*Dieffenbachia longispatha* Engl. & K. Krause. *	Native	Matapuerco, Aviol tumat	Whole plant	Drinks, Baths, Decoction	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Araceae	*Dieffenbachia parlatorei* Linden & André.	Native	Trocoezaino	Stems	Poultice, Chupadera, Direct heating. Maceration	External	(Vásquez 2012, Vásquez *et al.* 2013)
Araceae	*Dieffenbachia seguine* (Jacq.) Schott.	Native	Cucaracho, Caña muda				(Rosado & Moreno 2011)
Sapindaceae	*Dilodendron costaricense* (Radlk.) A.H. Gentry & Steyerm. *	Native	Loro, Iguano, Harino, Cabro	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Asteraceae	*Diplostephium weddellii* S.F. Blake.	Native	Romero	Leaves	Beverage, Ethanolic extract	Oral	(Barranco 2010, Pérez 2010)
Bignoniaceae	*Dolichandra unguis-cati* (L.) L.G. Lohmann.	Native	Lagartija, Pega-pega.	Whole plant	Baths. Decoction	External	(Otero *et al.* 2000a)
Moraceae	*Dorstenia contrajerva* L.	Native	contrayerba				(Cruz *et al.* 2009)
Araceae	*Dracontium croatii* G.H. Zhu. *	Native	Palo de la X, Papayuelo, Naipe, Kuala	Rhizomes	Drinks, Baths, Poultice, Extract, Decoction, Antihemorrhagic, Antiedematizing, Antigoaculant	Oral and external	(Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Velandia 2009)
Asparagaceae	*Dracaena trifasciata* Prain.	Introduced	Lirio de tigre, Cucarina	Aerial parts	Drink, Baths, Poultice, Decoction, Maceration, Ethanolic extract	External	(Vásquez *et al.* 2015, Cruz *et al.* 2009)
Araceae	*Dracontium dubium* Kunth. *	Native	Candelilla, Chupadera	Rhizomes	Poultice	External	(Cruz *et al.* 2009, Caro *et al.* 2017)
Araceae	*Dracontium* sp.	Native	Contramapaná				(Cruz *et al.* 2009)
Araceae	*Dracontium* sp 1.	Native	Chupadora, Chupadero				(Duke 1970, Estupiñan & Jiménez 2010)
Araceae	*Dracontium spruceanum*	Native	Palo culebra, Mataculebra, Zapatoca,	Whole plant	Poultice, Chupadera, Baths, Steams,	External	(Forero & Becoche 2019, Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015, Rivera 2009)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
	(Schott) G.H. Zhu. *		Mapaná, Chupa, Chupadera		Maceration, Decoction, Direct heating		
Gesneriaceae	*Drymonia serrulata* (Jacq.) Mart.	Native	Desbaratadora morada		Drink, Ethanolic extraction with other plants	External	(Raad *et al.* 2022)
Amaranthaceae	*Dysphania ambrosioides* (L.) Mosyakin & Clemants.	Native	Paico	Whole plant	Baths, ointment. Decoction	External	(Vásquez *et al.* 2015)
Asteraceae	*Emilia sonchifolia* (L.) DC.	Native	Serraja	Whole plant	Drink, Decoction, Ointment	Oral and external	(Vásquez *et al.* 2015)
Annonaceae	*Ephedranthus colombianus* Maas & Setten. *	Native	Colo	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Gesneriaceae	*Episcia dianthiflora* H.E. Moore & R.G. Wilson. *	Native	Amargosa, Escama de la verrugosa	Whole plant	Drinks, Baths, Poultices, Decoction	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Gesneriaceae	*Episcia lilacina* Hanst.	Native			Infusion	Oral	(Duke 1970)
Equisetaceae	*Equisetum bogotense* Kunth. *	Native	Cola de caballo	Leaves, Stems	Beverage, Ethanolic extract	Oral	(Barranco *et al.* 2012, Barranco 2010, Pérez 2010)
Asteraceae	*Erechtites valerianifolia* Less. *	Native	Venadillo no amargo	Leaves, Stems	Extract, Decoction, Direct heating. Drinks, Baths.	Oral and External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Erythroxylaceae	*Erythroxylum* sp.	Native	Coca	Leaves		External, oral	(Quintana 2016)
Euphorbiaceae	*Euphorbia cotinifolia* L. *	Native	Lechero de Cumaná	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Euphorbiaceae	*Euphorbia prostrata* Aiton.	Native	Piedra rastrera, Golondrina				(Rosado & Moreno 2011)
Euphorbiaceae	*Euphorbia tirucalli* L.	Introduced	Palitroque, Arbusto de goma, Árbol de los dedos				(Otero *et al.* 2000d, Rosado & Moreno 2011)

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Euphorbiaceae	*Euphorbia tithymaloides* L.	Native	Pitamo real	Leaves, Fruits, Stems	Beverage, Ethanolic extract	Oral	(Barranco 2010, Pérez 2010)
Arecaceae	*Euterpe precatoria* Mart.	Native	Wasay	Rhizomes	Infusion	Oral	(Forero & Becoche 2019)
Cucurbitaceae	*Fevillea cordifolia* L.	Native	Calabacita, Mantecona, Aviata	Whole plant	Drinks, Baths, Poultices, Decoction	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000d)
Moraceae	*Ficus insipida* Willd.	Native	Higuerón	Oil, Exudate, Latex	Latex applied on the wound	External	(Rojas *et al.* 1998)
Moraceae	*Ficus nymphaeifolia* Mill. *	Native	Matapalo, Mamartup	Leaves, Stems	Extract, Decoction, Beverages, Baths, Antihemorrhagic, Antiedematizing, Antigoaculant	Oral and External	(Núñez *et al.* 2004a, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Moraceae	*Ficus ypsilophlebia* Dugand.	Native	Abrazapalo, Copey	Leaves	Direct application	External	(Cruz *et al.* 2009)
Commelinaceae	*Floscopa peruviana* Hassk. ex C.B. Clarke.	Native	Siempreviva	Leaves	Decoction	Oral	(Fonnegra *et al.* 2012)
Apiaceae	*Foeniculum vulgare* Mill.	Native	Hinojo	Roots	Decoction, Infusion, Extract	Oral	(Fonnegra 2010)
Bignoniaceae	*Fridericia chica* (Bonpl.) L.G. Lohmann.	Native	Carayurú	Bark	Drink, Extract	Oral	(Forero & Becoche 2019)
Rubiaceae	*Genipa americana* L.	Native	Huito	Fruits	Drink fruit juice	External	(Horák *et al.* 2014)
Gleicheniaceae	*Gleichenella pectinata* (Willd.) Ching.	Native	Helecho	Whole plant	Drink, Decoction	Oral	(Vásquez *et al.* 2015)
Fabaceae	*Gliricidia sepium* Kunth ex Steud.	Native	Mata ratón	Leaves, Seeds	Baths, Drinks, Decoction	Oral	(Vásquez *et al.* 2015)
Rubiaceae	*Gonzalagunia panamensis* (Cav.) K. Schum. *	Native	Palito x, Chamizo, Dadiáto	Leaves, Stems	Baths, Poultice, extract, Decoction, Maceration, Antihemorrhagic, Antiedematizing, Antigoaculant	External	(Núñez *et al.* 2004a, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Rubiaceae	*Gonzalagunia rudis* Standl.	Native	Nigüita				(Duke 1970)

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Meliaceae	*Guarea guidonia* (L.) Sleumer. *	Native	Trompillo, Cedro macho, Cedrillo	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Rubiaceae	*Hamelia patens* Jacq.	Native	Hoja de carpintero, Guamia kirú	Leaves	Extraction in liquor or water, drinked every 15 minutes until the bleeding stops, Anticoagulant	Oral	(Caballero 1995)
Zingiberaceae	*Hedychium coronarium* J. Koenig.	introduced	Matandrea blanca	Roots	Baths, Decoction	External	(Vásquez *et al.* 2015, Botero 2011)
Heliconiaceae	*Heliconia curtispatha* Petersen. *	Native	Platanillo rojo, Nakutagor	Leaves, Roots	Poultice, Decoction, Anti-edemating, Anti-haemorrhagic, Anti-haemolytic, Anti-proteolytic, Anti-coagulant	External	(Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Pereañez *et al.* 2008, Otero *et al.* 2000d)
Heliconiaceae	*Heliconia juliani* Barreiros.	Native	Mimítutuñí	Roots			(Beltrán 2020)
Heliconiaceae	*Heliconia latispatha* Benth. *	Native	Ave del paraíso	Rhizomes	Extract, Antihemolytic	External	(Pereañez *et al.* 2008)
Heliconiaceae	*Heliconia psittacorum* Sessé & Moc. *	Native	Pico de loro, Flor de periquito, Flor de loro, Plátano de loro, Falsa ave del paraíso	Rhizomes	Ethanolic extract, Anticoagulant	External	(Pereañez *et al.* 2009, Garcia 1992)
Heliconiaceae	*Heliconia rostrata* Ruiz & Pav. *	Native	Platanillo, Patujú	Rhizomes	Ethanolic extract, Anticoagulant	External	(Pereañez *et al.* 2009)
Heliconiaceae	*Heliconia wagneriana* Petersen. *	Native	Arco iris	Rhizomes	Extract, Antiproteolytic	External	(Pereañez *et al.* 2008)
Heliotropiaceae	*Heliotropium indicum* L.	Native	Lenguesapo	Leaves	Extract	Oral	(Otero *et al.* 2000d, Otero *et al.* 2000d)

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Euphorbiaceae	*Hevea nitida* Mart. ex Müll. Arg. *	Native	Jebe débil muerto	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Apocynaceae	*Himatanthus articulatus* (Vahl) Woodson.	Native		Oil, Exudate	Beverages, extracts, Antifungal	Oral	(Sequeira *et al.* 2009)
Simaroubaceae	*Homalolepis cedron* (Planch.) Devecchi & Pirani. *	Native	Cedrón, Corrata	Whole plant	Drinks, Baths, Drops, Decoction, Maceration	Oral and external	(Duke 1970, Jiménez & Estupiñán 2011, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015, Otero *et al.* 2000d)
Araceae	*Homalomena peltata* Mast.	Native	Hoja de mono	Leaves	Poultice, Maceration	External	(Vásquez 2012, Vásquez *et al.* 2013)
Araceae	*Homalomena picturata* (Linden & André) Regel.	Native	Mono	Leaves	Ointment, Direct heating	External	(Vásquez *et al.* 2015)
Fabaceae	*Hymenaea courbaril* L. *	Native	Guapinol, Copinol, Cuapinol, Curbaril jatoba, Jatobá	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Lamiaceae	*Hyptis capitata* Jacq. *	Native	Trampolín, Tres pelotas montañeras	Leaves, Stems	Extract, Decoction, Direct heating	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Balsaminaceae	*Impatiens balsamina* L.	Native	Princesita	Flowers	Drinks, Ointment, Decoction	Oral and external	(Vásquez *et al.* 2015)
Fabaceae	*Indigofera suffruticosa* Mill.	Native	Calabacín	Aerial parts	Baths, Decoction	External	(Vásquez *et al.* 2015)
Convolvulaceae	*Ipomoea cairica* (L.) Sweet. *	Native	Bejuco estrellita	Leaves, Stems	Extract, Decoction, Direct heating	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Convolvulaceae	*Ipomoea carnea* Jacq. subsp. carnea C.M. Taylor.	Native	Bejuco tapabotijo			External	(Cruz *et al.* 2009)
Amaranthaceae	*Iresine diffusa* Humb. & Bonpl. ex Willd.	Native	Capitana, Capitana Macho	Leaves	Poultice, Squash	External, oral	(García 1992)
Gentianaceae	*Irlbachia alata* (Aubl.) Maas. *	Native	Yerba de Adán	Leaves, Stems	Baths, Poultices, Decoction	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)

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Acanthaceae	*Justicia secunda* Vahl. *	Native	Milagrosa, Milagrosa venezolana, Pitipiticorré	Whole plant	Baths, Drinks, Poultices, Ointment, Decoction	Oral and external	(Otero *et al.*, 2000a; Otero *et al.*, 2000b; Otero *et al.*, 2000c; Vásquez *et al.*, 2015)
Verbenaceae	*Lantana camara* L.	Native	Venturosa	Seeds	Baths, Decoction	steam bath	(Vásquez *et al.* 2015)
Lamiaceae	*Lepechinia bullata* (Kunth) Epling	Native	Salvia	Leaves	Beverage, Ethanolic extract	Oral	(Barranco 2010, Pérez 2010)
Brassicaceae	*Lepidium bipinnatifidum* Desv.	Native	Mastuerzo	Aerial parts	Decoction, Baths	External	(Fonnegra *et al.* 2012)
Brassicaceae	*Lepidium virginicum* L.	Native	Mastuergo, Bolsita pastor	Leaves, Stems	Drink, Ointment. Decoction, Ethanolic extract	Oral and external	(Barranco 2010, Vásquez *et al.* 2015, Pérez 2010)
Pottiaceae	*Leptodontium luteum* (Taylor) Mitt. *	Native	Musgo	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Achariaceae	*Lindackeria laurina* C. Presl	Native	Chocho cucullo	Leaves			(Duke 1970)
Linderniaceae	*Lindernia diffusa* (L.) Wettst. *	Native	Yerba del pollo	Whole plant	Poultices, Decoction, Maceration	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Verbenaceae	*Lippia alba* (Mill.) N.E. Br. ex Britton & Wilson, P.	Native	Prontoalivio	Whole plant	Baths, Ointment, Decoction	External	(Vásquez *et al.* 2015)
Fabaceae	*Lonchocarpus nicou* (Aubl.) DC.	Native	Barbasco	Stems	Poultice	External	(Forero & Becoche 2019, Salazar & Mosquera 2019)
Solanaceae	*Lycopersicum esculentum* Mill.	Native	Tomate, Tomatico	Leaves	Baths, Decoction	External	(Vásquez *et al.* 2015)
Lygodiaceae	*Lygodium venustum* Sw.	Native	Orcaviejo	Aerial parts	Baths, Decoction	External	(Vásquez *et al.* 2015)
Bignoniaceae	*Macfadyena unguis-cati* (L.) A.H. Gentry. *	Native	Lagartija, Pega-pega. Uña de gato (Santa Marta)	Whole plant	Baths, Decoction	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Ramírez 2005, Otero *et al.* 2000d)
Magnoliaceae	*Magnolia espinalii* (G.	Native	Alma negra, Hojarasco	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
	Lozano C.) Govaerts. *						
Magnoliaceae	*Magnolia guatapensis* (G. Lozano C.) Govaerts. *	Native	Alma negra, Hojarasco	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Magnoliaceae	*Magnolia hernandezii* (G. Lozano C.) Govaerts. *	Native	Alma negra, Hojarasco	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Magnoliaceae	*Magnolia polyhypsophylla* (G. Lozano C.) Govaerts. *	Native	Alma negra, Hojarasco	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Magnoliaceae	*Magnolia silvioi* (G. Lozano C.) Govaerts. *	Native	Alma negra, Hojarasco	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Magnoliaceae	*Magnolia yarumalensis* (G. Lozano C.) Govaerts. *	Native	Alma negra, Hojarasco	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Euphorbiaceae	*Manihot esculenta* Crantz	Native	Yuca	Aerial parts	Baths, Decoction	External	(Vásquez *et al.* 2015)
Sapindaceae	*Melicoccus bijugatus* Jacq. *	Native	Mamón, Mamoncillo, Quenepa	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Lamiaceae	*Mentha × piperita* L.	Introduced	Yerbabuena	Leaves	Baths, Decoction	External	(Vásquez *et al.* 2015)
Lamiaceae	*Mentha sect. Pulegium* Coss. & Germ.	Introduced	Menta	Leaves	Baths, Maceration	External	(Vásquez *et al.* 2015)
Lamiaceae	*Mesosphaerum suaveolens* (L.) Kuntze	Native	Destrancadora		Drink, Ethanolic extraction with other plants	External	(Raad *et al.* (2022)
Melastomataceae	*Miconia neoepiphyitca* Michelang.	Native	Tama kidasú	Leaves	Decoction for baths, Leaves are mashed to apply warm in poultices	External	(Caballero 1995)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Polypodiaceae	*Microgramma percussa* (Cav.) de la Sota. *	Native	Bichikirami	Whole plant	Baths, Decoction, Antihemorrhagic, Antiedematizing, Antigoaculant	External	(Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000d, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d)
Asteraceae	*Mikania guaco* Bonpl. *	Native	Guaco Morado, Nuskídu, guaco	Whole plant	Chupadera, Drinks, Poultices, Baths, Tourniquet, Leaves boiled and applied on the wound	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez 2012, Vásquez *et al.* 2013, Otero *et al.* 2000d, Pérez 1947)
Asteraceae	*Mikania micrantha* Kunth	Native	Guaquito	Leaves	Leaf juice in water is used for drinks and baths. Together with leaves of pampera (Alternanthera sessilis) and coneja (Commelina sp) are macerated and applied as poultice	Oral and external	(Caballero 1995)
Asteraceae	*Milleria quinqueflora* L.	Native	Doña juana, Papauquiru	Leaves	Three leaves macerated in a poultice on the bite	External	(Caballero 1995)
Fabaceae	*Mimosa pudica* L.	Native					(Solarte 2024)
Cucurbitaceae	*Momordica charantia* L. *	Introduced	Barsamina, Balsamina, Fruto de la culebra	Whole plant	Baths, Ointment, Infusion, Poultices, Decoction	Oral and External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez *et al.* 2015)
Araceae	*Monstera deliciosa* Liebm.	Introduced	Costilla de Adán, Balazo				(Rosado & Moreno 2011)
Araceae	*Monstera pinnatipartita* Schott.	Native	Shitojala Ninguecue				(Carbonó & Dib 2013)
Araceae	*Monstera dubia* (Kunth) Engl. & K. Krause.	Native	Hierba raya	Whole plant	Boiled with water	External	(Giovannini & Howes 2017)
Capparaceae	*Morisonia flexuosa L.*	Native	Arará				(Aguirre & Ruiz 2017, Cruz *et al.* 2009)
Capparaceae	*Morisonia frondosa* (Jacq.)	Native	Sincogollo, Contraprieta				(Aguirre & Ruiz 2017)

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	Christenh. & Byng.						
Capparaceae	*Morisonia hastata* (Jacq.) Christenh. & Byng.	Native	Arará, Limpiadiente, Ají, Contra				(Aguirre & Ruiz 2017)
Fabaceae	*Mucuna* cf *pruriens* (L.) DC. *	introduced	Ojo de buey, Ojo de venado, Pica pica	Leaves, Fruits, Seeds, Stems	Drink, Decoction, Ethanolic extract	Oral	(Barranco *et al.* 2012, Fonnegra & Botero 2006, Barranco 2010, Pérez 2010)
Fabaceae	*Mucuna mollis* (Kunth) DC.	Native	Ojo de buey, Ojo de venado, Pica pica	Seeds	Decoction	External	(Fonnegra & Botero 2006)
Fabaceae	*Mucuna mutisiana* (Kunth) DC.	Native	Ojo de buey, Ojo de venado, Pica pica	Seeds	Decoction	External	(Cruz *et al.* 2009, Fonnegra & Botero 2006, Barranco 2010, Pérez 2010)
Fabaceae	*Mucuna psittacina* Miers.	Native	Ojo de buey, Ojo de venado, Pica pica	Seeds	Decoction	External	(Fonnegra & Botero 2006)
Fabaceae	*Mucuna rostrata* Benth.	Native	Ojo de buey, Ojo de venado, Pica pica	Seeds	Decoction	External	(Fonnegra & Botero 2006)
Fabaceae	*Mucuna sloanei* Fawc. & Rendle	Native	Ojo de buey, Ojo de venado, Pica pica	Seeds	Decoction	External	(Fonnegra & Botero 2006)
Fabaceae	*Mucuna urens* (L.) Medik.	Native	Ojo de buey, Ojo de venado, Pica pica	Seeds	Decoction	External	(Fonnegra & Botero 2006)
Rutaceae	*Murraya paniculata* (L.) Jack. *	Introduced	Azahar de la India	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)

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Primulaceae	*Myrsine coriacea* (Sw.) R. Br. ex Roem. & Schult.	Native	Espadero	Whole plant	Ointment, Decoction	External	(Vásquez *et al.* 2015)
Asteraceae	*Neurolaena lobata* (L.) Cass. *	Native	Gavilana, Contragavilana, Venadillo amargo	Aerial parts	Infusion, Baths, Poultice, Maceration, Decoction, Antihemorrhagic	Oral and external	(Barros 2020, Carbonó & Dib 2013, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez 2012, Vásquez *et al.* 2013)
Solanaceae	*Nicotiana rustica* L.	Introduced	tabaco, jwa	Leaves	A paste (ambil) is extracted from the leaves; mixed with coca leaves is chewed during the "poporeo". This ambil is also used to scare off snakes	Oral	(Barros 2020)
Solanaceae	*Nicotiana tabacum* L.	Native	Tabaco, Josca. Nuajé	Leaves	Baths, Poultice, Poultice, Maceration, Extract	External	(Carbonó & Dib 2013, Fonnegra & Botero 2006, Vásquez *et al.* 2013, Gumilla 1955)
Lamiaceae	*Obtegomeria caerulescens* (Benth.) Doroszenko & P.D. Cantino.	Native	Tomillo	Leaves	Beverage, Ethanolic extract	Oral	(Barranco 2010, Pérez 2010)
Lamiaceae	*Ocimum basilicum* L. *	Introduced	Albahaca blanca	Leaves, Stems	Drinks, Poultice, Vapors, Extract, Decoction	Oral and External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Lamiaceae	*Ocimum campechianum* Mill. *	Native	Albahaca blanca	Aerial parts	Baths, Maceration, Antihemorrhagic	External	(Otero *et al.* 2000d, Vásquez 2012, Vásquez *et al.* 2013, Otero *et al.* 2000c, Otero *et al.* 2000d)
Lauraceae	*Ocotea aciphylla* (Nees & Mart.) Mez.	Native			Infusion		(Delgado *et al.* 2017, Gonzalez 2019, Gupta 2008)
Lauraceae	*Ocotea caparrapi* (Nates) Dugand.	Native	Caparrapí, Amacey, Palo de aceite	Oil, Exudate, Latex	A tablespoon	External, oral	(Pérez 1947, García 1992, González 2019)
Menispermaceae	*Odontocarya tenacissima* Diels. *	Native	Mornáguitup	Whole plant	Drinks, Baths, Decoction	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)

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Arecaceae	*Oenocarpus mapora* H. Karst. *	Native	Pusuy, Ciamba, Cinamillo	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Annonaceae	*Oxandra xylopioides* Diels. *	Native	Cuba, Yaya	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Rubiaceae	*Palicourea croceoides* Desv. ex Ham.	Native	Zorro	Bark, Seeds	Drink, Maceration	Oral and external	(Vásquez *et al.* 2015)
Rubiaceae	*Palicourea pseudaxillaris* C.M.Taylor.	Native	Cascajero, Amargo pajarito				(Pino 2006)
Rubiaceae	*Palicourea tomentosa* (Aubl.) Borhidi.	Native	Beso de negra, Sombrerito del diablo				(Pino 2006)
Passifloraceae	*Passiflora foetida* L.	Native	Bejuco sietellagas				(Cruz *et al.* 2009)
Passifloraceae	*Passiflora quadrangularis* Triana & Planch. *	Native	Badea, Tabijo	Aerial parts	Baths, Decoction, Maceration, Antihemorrhagic	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez *et al.* 2015, Otero *et al.* 2000d)
Fabaceae	*Pentaclethra macroloba* (Willd.) Kuntze.	Native	Dormilón, Capitancillo, Gavilán, Quebracho, Pracaxi	Bark	Extract, Antiproteolytic, Antihemorrhagic	External	(da Silva *et al.* 2007)
Rubiaceae	*Pentagonia pinnatifida* Seem.	Native	Crestagallo				(Estupiñán & Jiménez 2010, Jiménez & Estupiñán 2011)
Piperaceae	*Peperomia alpina* (Sw.) A.Dietr.	Native	Hierba de hormiga grande				(Rosero 2019)
Piperaceae	*Peperomia elsana* Trel. & Yunck. *	Native	Kiduaborogo a	Whole plant	Baths, Maceration	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Piperaceae	*Peperomia rotundifolia* (L.) Kunth. *	Native	Congona arisca, Congona	Whole plant	Decoction and mixed with brandy are used for baths all over the	External	(Caballero 1995, Giovannini and Howes 2017, García 1896)

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			chai, Poleito de monte		body. Macerated and placed on the bite		
Piperaceae	*Peperomia* sp.	Native	cuartitillo	Whole plant		oral	(Quintana 2016)
Piperaceae	*Peperomia trifolia* (L.) A.Dietr.	Native	Yerba de sapo, vaso kíru	Leaves	Tied directly over the wound	External	(Caballero 1995)
Cactaceae	*Pereskia bleo* (Kunth) DC. *	Native	Chupamelón	Leaves, Stems	Baths, Poultices. Decoction, Maceration	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Petiveriaceae	*Petiveria alliacea* L. *	Native	Anamú, Anamú chocoano	Whole plant	Drinks, Poultices, Vapors, Ointment, Infusion, Decoction	External	(Fonnegra 2010, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez *et al.* 2015, Otero *et al.* 2000d)
Urticaceae	*Phenax rugosus* (Poir.) Wedd.	Native					(Duke 1970)
Araceae	*Philodendron guttiferum* Kunth.	Native	Cinchadora, deshinchador	Leaves	Poultice	External	(Duke 1970)
Araceae	*Philodendron heleniae* Croat	Native	Abrazapalo	Leaves	Poultice, Decoction	External	(Vásquez 2012, Vásquez *et al.* 2013)
Araceae	*Philodendron lindenii* Schott.	Native	Shitauja				(Carbonó & Dib 2013)
Araceae	*Philodendron* sp.	Native	Cugancae				(Carbonó & Dib 2013)
Araceae	*Philodendron tripartitum* (Jacq.) Schott. *	Native	Anturio 3 dedos	Leaves, Stems	Baths, Decoction, Antihemorrhagic	External	(Duke 1970, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Pérez 1947, Otero *et al.* 2000d)
Phyllanthaceae	*Phyllanthus acuminatus* Vahl. *	Native	Chirrinchao	Leaves, Stems	Baths, Infusion, Decoction, Maceration	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Arecaceae	*Phytelephas macrocarpa* Ruiz & Pav.	Native	Yarina				(Mesa & Galeano 2013)
Picramniaceae	*Picramnia latifolia* Tul.	Native	Indígena	Leaves	Soaked in brandy	Oral	(Caballero 1995)
Simaroubaceae	*Picrolemma huberi* Ducke	Native	Cedrón	Seeds			(García 1992)
Piperaceae	*Piper aduncum* L.	Native	Pipilongo	Inflorescence	Drink	Oral	(Martinez 2023)
Piperaceae	*Piper arboreum* Aubl. *	Native	Kansarimia	Leaves, Stems		External	(Otero *et al.* 2000a; Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)

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Piperaceae	*Piper auritum* Kunth. *	Native	Santa María de anís, Anisillo, Hierba santa	Aerial parts, Roots	Drinks, Poultices, Steams, Baths, Ethanolic extraction with another plants, Anti-inflammatory	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Raad *et al.* 2022, Rengifo *et al.* 2019, Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015, Otero *et al.* 2000d)
Piperaceae	*Piper confertinodum* (Trel. & Yunck.) M.A.Jaram. & Callejas.	Native	Yerba de culebra, nena kíru	Leaves	Poultice together with guaquito (*Mikania micrantha*) and pampera (*Alternanthera sessilis*)	External	(Caballero 1995)
Piperaceae	*Piper contraverrugosum* (Cuatrec.) R.Bernal.	Native	Contraverrugosa, Yerba contraverrugosa				(García 1992)
Piperaceae	*Piper coruscans* Kunth.	Native	Cordoncillo	Leaves, Stems	Baths, Poultice, infusion, Decoction, Maceration	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000d)
Piperaceae	*Piper cuspidilimbum* C.DC.	Native	Malaire kíru	Leaves	The decoction of leaves in water is used for baths when the patient has tremors or shock.	External	(Caballero 1995)
Piperaceae	*Piper darienense* C. DC.	Native	Kana		Baths	External	(Duke 1975)
Piperaceae	*Piper hispidum* Kunth. *	Native	Cordoncillo	Leaves, Stems	Baths, Infusion, Poultices, Decoction	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d, Suarez 2016)
Piperaceae	*Piper longivillosum* Trel. & Yunck. *	Native	Yerba de la verrugosa	Whole plant	Baths, Poultices, Steams, Decoction, Maceration	Steam bath	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Pino & Valois 2004, Otero *et al.* 2000d)
Piperaceae	*Piper maranyonense* Trel.	Native	Bejuco de cáncer, juncara-cancedé	Bark	Macerated in liquor are applied to the wound	External	(Caballero 1995)
Piperaceae	*Piper marginatum* Jacq. *	Native	Deshinchadora, Cordoncillo, Rollera	Leaves, Stems	Baths, Drinks, Poultices, Decoction, Maceration	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Sequeda *et al.* 2015, Otero *et al.* 2000d)

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Piperaceae	*Piper multiplinervium* C. DC. *	Native	Cordoncillo	Leaves, Stems	Drinks, Baths, Poultices, Decoction, Maceration	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Piperaceae	*Piper peltatum* L. *	Native	Santa María. Santa María boba	Leaves, Stems	Baths, Poultices, Leaf juice in drinks, Decoction, Maceration	Oral and external	(Caballero 1995, Núñez *et al.* 2005, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Piperaceae	*Piper pulchrum* C. DC. *	Native	Arbol de la verrugosa	Leaves, Stems	Drinks, Baths, Poultices, Decoction, Maceration, Antihemorrhagic	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Pino & Valois 2004)
Piperaceae	*Piper reticulatum* L. *	Native	Cordoncillo, Deshinchadora, Rollera, cordoncillo morado	Leaves, Stems	Drinks, Baths, Poultices. The leaves are boiled and warm, applied in baths and on the site of the bite, Decoction, Maceration	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Piperaceae	*Piper* sp.	Native	Hoja de sapo	Leaves	Macerated leaves are heated for poultices applied on the wound. Poultices must be changed every 6 hours	External	(Caballero 1995)
Piperaceae	*Piper spoliatum* Trel. & Yunck. *	Native	Tortugo	Leaves, Stems	Baths, Poultices, Decoction	External	(Otero *et al.* 2000a, Otero *et al.* 2000c)
Piperaceae	*Piper telembi* E. García.	Native	Canelón de Telembí	Bark			(García 1896)
Piperaceae	*Piper trianae* C.DC.	Native	Hoja redonda, Kíru-futribu	Leaves	Leaves mashed for poultices. Must be changed every hour	External	(Caballero 1995)
Piperaceae	*Piper tricuspe* (Miq.) C. DC. *	Native	Costeño, Hoja mano	Leaves, Stems	Drinks, Baths, Decoction, Ethanolic extract with other plants	Oral and external	(Duke 1970, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Pino & Valois 2004, Raad *et al.* 2022, Otero *et al.* 2000d, Henriquez 2020)
Piperaceae	*Piper tuberculatum* Jacq.	Native	Cordoncillo, Pipilongo	Leaves, Stems	Fresh leaves		(García 1992)
Pteridaceae	*Pityrogramma calomelanos* (L.) Link.	Native		Spores	Topical on the skin	External	(Raad *et al.* 2022)

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Plantaginaceae	*Plantago australis* Lam.	Native	Llantén	Whole plant	Baths, Decoction	External	(Vásquez *et al.* 2015)
Plantaginaceae	*Plantago major* L.	Introduced	Llantén de la Sierra, Llantel	Aerial parts	Drink, Baths, Poultice, Decoction, Maceration, Ethanolic extract	Oral and external	(Barranco 2010, Vásquez 2012, Vásquez *et al.* 2013, Pérez 2010)
Lamiaceae	*Plectranthus amboinicus* (Lour.) Spreng.	Introduced	Orégano de la Sierra	Leaves	Beverage, Ethanolic extract	Oral	(Barranco 2010, Pérez 2010)
Polypodiaceae	*Pleopeltis macrocarpa* (Willd.) Kaulf.	Native	Calaguala	Leaves	Infusion	External	(García 1992)
Apocynaceae	*Plumeria inodora* Jacq.	Native	Azucena, Flor de mayo				(Rosado & Moreno 2010, Rosado & Moreno 2011)
Apocynaceae	*Plumeria rubra* L.	Native	Azucena, Flor de mayo				(Rosado & Moreno 2010, Rosado & Moreno 2011)
Polygonaceae	*Polygonum ferrugineum* Wedd.	Native	Tabaquillo	Aerial parts	Baths, Decoction	External	(Vásquez *et al.* 2015)
Polypodiaceae	*Polypodium vulgare* L.	Introduced	Polipodio				(García 1896)
Pteridaceae	*Polytaenium guayanense* (Hieron.) Alston	Native	Calaguala, Yamichuí	Whole plant	Poultice	External	(García 1992)
Loganiaceae	*Potalia amara* Aubl.	Native	Wakowonowaiinae, Niihacuo, Diente de danta	Bark	Scraped bark in infusion, Baths with cold water	External, oral	(Andoque *et al.* 2009, Ortiz 1989, Arias 2003, Castaño 2023)
Verbenaceae	*Priva lappulacea* (L.) Pers.	Native	Mastrando	Leaves	Extract	Oral	(Otero *et al.* 2000d, Otero *et al.* 2000d)
Asteraceae	*Pseudelephantopus spicatus* (B. Juss. ex Aubl.) Rohr. *	Native	Suelda	Whole plant	Baths, Poultice, Decoction, Antihemorrhagic	External	(Otero *et al.* 2000c, Vásquez 2012, Vásquez *et al.* 2013)
Asteraceae	*Pseudelephantopus spiralis* (Less.) Cronquist.	Native	Rabo de puerco	Leaves	Extract	Oral	(Otero *et al.* 2000d, Otero *et al.* 2000d)

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Rubiaceae	*Psychotria poeppigiana* Müll. Arg. *	Native	Boca de negro, Sombrero del diablo, Aji del diablo	Aerial parts	Baths, Extract, Decoction, Direct heating	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Simaroubaceae	*Quassia amara* L. *	Native	Cruceto, Udupungit, Cruceto morado	Whole plant	Drinks, Baths, Raw, Decoction, Ethanolic extract	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Rubiaceae	*Randia aculeata* L.	Native	cruceto				(Granados 2020)
Rubiaceae	*Randia* sp.	Native	Chocolatillo, espuela de indio	Leaves	Decoction	Oral	(Quintana 2016)
Apocynaceae	*Rauvolfia viridis* Roem. & Schult.	Native	solito				(García 1975)
Zingiberaceae	*Renealmia alpinia* (Rottb) Mass. *	Native	Guaiporé, Matandrea blanca	Leaves, Roots, Seeds, Stems	Ethanolic extract, Maceration, Anti-hemorrhagic, Antifibrino-genolytic, Antico-agulant	External	(Fernández *et al.* 2010, Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d. Patiño *et al.* 2012, Patiño *et al.* 2013, Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015, Otero *et al.* 2000d)
Zingiberaceae	*Renealmia aromatica* Griseb. *	Native	Matrandrea Blanca	Leaves, Stems	Drink, Chupadera, Maceration, Direct heating	Oral and external	(Gómez & Benjumea 2014, Vásquez 2012, Vásquez *et al.* 2013)
Zingiberaceae	*Renealmia cernua* (Sw. ex Roem. & Schult.) J.F. Macbr. *	Native	Matandrea de moño rojo	Leaves	Drink, Poultice, Maceration	Oral and external	(Gómez & Benjumea 2014, Vásquez 2012, Vásquez *et al.* 2013)
Zingiberaceae	*Renealmia nicolaioides* Loes. *	Native	Matandrea roja	Leaves, Stems	Chupadera, Poultice, Maceration, Direct heating, Antihemorrhagic, Antiproteolytic	External	(Gómez & Benjumea 2014, Vásquez 2012, Vásquez *et al.* 2013)
Zingiberaceae	*Renealmia thyrsoidea* (Ruiz & Pav.) Poepp. & Endl.	Native	Matandrea	Leaves, seeds	Baths, Drinks, Decoction	Oral	(Vásquez *et al.* 2015)

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Araceae	*Rhodospatha oblongata* Poepp.	Native	Pos, Tusilla	Rhizomes	Poultices, Decoction	External	(Otero *et al.* 2000a)
Lamiaceae	*Rosmarinus officinalis* L.	Introduced	Romero	Whole plant	Baths, Decoction	External	(Vásquez *et al.* 2015)
Apocynaceae	*Ruehssia macrophylla* (Humb. & Bonpl. ex Schult.) H.Karst.	Native	Bejuco de cáncer, juncara-cancedé	Leaves, Stems	Stem to make a tourniquet. Decoction of leaves for baths	External	(Caballero 1995)
Acanthaceae	*Ruellia macrophylla* Vahl	Native	Crestagallo				(Cruz *et al.* 2009)
Rutaceae	*Ruta chalepensis* L.	Native	Ruda	Whole plant	Baths, Decoction	External	(Vásquez *et al.* 2015)
Rutaceae	*Ruta graveolens* L.	Introduced	ruda	Leaves			(García 1896)
Poaceae	*Saccharum officinarum* L.	Introduced	Caña de azúcar	Stems	Chupadera, Ointment, Direct heating	External	(Vásquez 2012, Vásquez *et al.* 2015)
Viburnaceae	*Sambucus nigra* L.	Introduced	Asauco	Leaves	Drink, Ethanolic extract	External	(Barranco 2010, Pérez 2010)
Asparagaceae	*Sansevieria aethiopica* Thunb.	Native	Mata de surucurú	Leaves	Poultice, Maceration	External	(Forero & Becoche 2019, Salazar & Mosquera 2019)
Sapindaceae	*Sapindus saponaria* L. *	Native	Chumbimbo, Jaboncillo, jaboncillo, Parapara	Leaves	Ethanolic extract, Antioxidant		(García 1992, Pereañez *et al.* 2010, Rosado & Moreno 2011)
Annonaceae	*Sapranthus isae* J.G. Vélez & Cogollo. *	Native	Ciruela	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Fabaceae	*Schnella glabra* (Jacq.) Dugand.	Native	Bejuco cadena				(Cruz *et al.* 2009)
Triuridaceae	*Sciaphila purpurea* Benth.	Native	Yerba del Comején	Whole plant	Drinks, Baths, Poultices, Steams, Decoction, Ethanolic extract	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Plantaginaceae	*Scoparia dulcis* L. *	Native	Yerbanis, Escubillamenuda, Escudilla, Escubilla, Escobilla, Escoba menudita, pimientica	Whole plant	Drinks, Baths, Poultices, Drops, Tourniquet, Decoction, Antihemorrhagic	Oral and external	(Bonzani 1999, Carbonó & Dib 2013, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000d, Quintana 2016, Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015, Otero *et al.* 2000d)
Selaginellaceae	*Selaginella articulata* (Kunze) Spring. *	Native	Yerba verde del carpintero	Whole plant	Drinks, Baths, Decoction, Ethanolic, Antihemorrhagic extract	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Selaginellaceae	*Selaginella erythropus* (Mart.) Spring.	Native	Carpintero		Drink, Ethanolic extraction with other plants	External	(Raad *et al.* 2022)
Asteraceae	*Senecio formosu*s Kunth.	Native	Árnica	Leaves	Leaves used in decoctions for alleviating the pain	External	(Barros 2020, Pérez 1947)
Fabaceae	*Senna bacillaris* (L. f.) H. S. Irwin & Barneby.	Native	Abejón, Bicho abejón				(Jiménez & Estupiñán 2011)
Fabaceae	*Senna dariensis* (Britton & Rose) H.S. Irwin & Barneby. *	Native	Ambuimáfono	Whole plant	Drinks, Baths, Poultices, Decoction, Antihemorrhagic	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Fabaceae	*Senna reticulata* (Willd.) H.S. Irwin & Barneby.	Native	Bajaguito	Leaves, Roots, Stems	Poultice, Drink. Ethanolic extract	External	(Barranco 2010, Pérez 2010, Nuñez & Sánchez 2012, Bolaño & Padilla 2019)
Fabaceae	*Senna* sp.	Native	Majagua	Leaves	Decoction	Oral	(Quintana 2016)
Polypodiaceae	*Serpocaulon levigatum* (Cav.) A.R.Sm.	Native					(Gutierrez 2017, Murillo 1983)
Polypodiaceae	*Serpocaulon triseriale* (Sw.) A.R.Sm.	Native	Chivera de araguato, Nujubujupiali	Leaves	Chewed leaves	Oral	(Ortiz 1989, Gutierrez 2017, Murillo 1983)
Malvaceae	*Sida acuta* Burm. *	Native	Escobilla, Verbena, Kuala	Whole plant	Baths, Drinks, Ointment, Decoction, Antihemorrhagic	External	(Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez *et al.* 2015, Otero *et al.* 2000d)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Malvaceae	*Sida rhombifolia* L.	Native	Escobilla babosa				(Cruz *et al.* 2009)
Simaroubaceae	*Simarouba amara Aubl.*	Native	Aceituno	Bark	Drinks, Decoction, Antibacterial	Oral	(Veena *et al.* 2019)
Siparunaceae	*Siparuna gesnerioides* (Kunth) A. DC.	Native	Limoncillo de monte	Leaves, Roots	Drink, Decoction, Maceration	External	(Vásquez 2012; Vásquez *et al.* 2013, Vásquez *et al.* 2015)
Siparunaceae	*Siparuna thecaphora* (Poepp. & Endl.) A. DC. *	Native	Limoncillo de monte, Costeño	Aerial parts	Drinks, Baths, Poultices, Decoction, Antihemorrhagic	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Iridaceae	*Sisyrinchium micranthum* Cav.	Native	Espadilla	Whole plant	Baths. Decoction	External	(Vásquez *et al.* 2015)
Smilacaceae	*Smilax longifolia Rich.*	Native	Zarzaparilla	Roots	Decoction	External, Oral	(García 1992)
Smilacaceae	*Smilax officinalis* Kunth.	Native	Zarzaparrilla	Stems	With capitana	Oral	(Barros 2020)
Smilacaceae	*Smilax ornata Lem.*	Native	Zarzaparilla	Roots	Decoction	External, Oral	(García 1992)
Arecaceae	*Socratea exorrhiza* (Mart.) H.Wendl.	Native	Palmera zancuda	Roots	Drinks, Soxhlet Extractor, Antibacterial	External	(Veras da Luz 2012)
Solanaceae	*Solanum allophyllum* (Miers) Standl. *	Native	Chucho fruteador	Aerial parts	Drinks, Baths, Decoction, Maceration	Oral and external	(Otero *et al.* 2000a, Otero *et al.* 2000c)
Solanaceae	*Solanum americanum* Mill.	Native	Yerbamora	Whole plant	Ointment, Decoction	External	(Vásquez *et al.* 2015)
Solanaceae	*Solanum nudum* Dunal. *	Native	Sauco amargo	Aerial parts	Drinks, Baths, Decoction, Maceration	Oral and external	(Ministry of Social Protection 2008, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Solanaceae	*Solanum sessiliflorum* Dunal.	Native	Cocona, Lulo amazónico	Fruits	Fruit juice	Oral	(Rojas *et al.* 1998)
Rubiaceae	*Spermacoce remota* Lam.	Native	Hierba toro	Aerial parts	Poultices, Drinks, Decoction	Oral and external	(Fonnegra *et al.* 2012)
Sphagnaceae	*Sphagnum recurvum* var. Pallens Röll. *	Native	Musgo	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Verbenaceae	*Stachytarpheta cayennensis* (Rich.) Vahl.	Native	Verbena negra	Leaves	Baths, Ointment, Decoction	External	(Otero *et al.* 2000d, Vásquez *et al.* 2015, Otero *et al.* 2000d)
Asteraceae	*Stevia lucida* Lag.	Native	Jarrilla	Leaves, Stems	Drink, Ethanolic extract	External	(Barranco 2010, Pérez 2010)
Loranthaceae	*Struthanthus orbicularis* (Kunth) Blume. *	Native	Golondrino, Matapalo	Aerial parts	Baths, Decoction, extract, Antihemorrhagic, Antiedematizing, Antigoaculant	External	(Núñez *et al.* 2004a, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Loganiaceae	*Strychnos darienensis* Seem.	Native	Bejuco grande	Leaves	Drink	Oral	(Martinez 2023)
Loganiaceae	*Strychnos xinguensis* Krukoff. *	Native	Solita	Stems	Baths, Decoction, Maceration, Ethanolic, Antihemorrhagic Extract	External	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d)
Meliaceae	*Swietenia humilis* Zucc. *	Introduced	Caoba del Pacífico	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Meliaceae	*Swietenia macrophylla* King. *	Native	Caoba	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Meliaceae	Swietenia mahagoni (L.) Jacq. *	Introduced	Caoba	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Bignoniaceae	*Tabebuia rosea* (Bertol.) DC. *	Native	Roble, Guayacán rosado, Guagul	Bark	Drinks, Baths, Decoction, Ethanolic Extract, Antihemorrhagic, Antiedematizing, Antigoaculant	Oral and external	(Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Asteraceae	*Tagetes erecta* L.	Introduced	Flor del muerto		Drink, Ethanolic extraction with other plants	External	(Raad *et al.* 2022)
Anacardiaceae	*Tapirira guianensis* Aubl.	Native	Fresmo	Oil, Exudate	Ointment, Direct heating	External	(Vásquez *et al.* 2015)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Asteraceae	*Taraxacum officinale* L.	Introduced	Amargón, Diente de león	Whole plant	Baths, Drinks, Decoction	Oral and external	(Vásquez *et al.* 2015)
Tectariaceae	*Tectaria vivipara* Jermy & T.G. Walker	Native	Nido de culebra	Leaves	Steam shower	Steam bath	(Renteria 2012)
Thuidiaceae	*Thuidium peruvianum* Mitt. *	Native	Musgo	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Acanthaceae	*Thunbergia alata* Bojer ex Sims.	Introduced	Genciana	Leaves, Flowers	Baths, Direct heating	External	(Vásquez *et al.* 2015)
Asteraceae	*Tithonia diversifolia* (Hemsl.) A. Gray.	Native	Arnica	Whole plant	Baths, Decoction	External	(Vásquez *et al.* 2015)
Heliotropiaceae	*Tournefortia cuspidata* Kunth. *	Native	Tuinakaün	Aerial parts	Baths, Steamers, Decoction	Steam bath	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)
Anacardiaceae	*Toxicodendron striatum* (Ruiz & Pav.) Kuntze	Native	Biringo Pintao		Drink, Ethanolic extraction with other plants	External	(Raad *et al.* 2022)
Commelinaceae	*Tradescantia zebrina* Bosse.	Native	Cordoncillo morado, víbora	Whole plant	Juice, Ethanolic extract	Oral	(Pérez 1947)
Piperaceae	*Trianaeopiper contraverrugosa* Cuatr.	Native	Contraverrugosa				(Duke 1970)
Acanthaceae	*Trichanthera gigantea* (Bonpl.) Nees.	Native	Quiebra barriga	Leaves, Roots	Ointment, Maceration	External	(Vásquez *et al.* 2015)
Gesneriaceae	*Trichodrymonia conferta* (C.V.Morton) M.M.Mora & J.L.Clark.	Native	Churco macho, Babosa				(Pino 2006)
Hymenophyllaceae	*Trichomanes elegans* Rich. *	Native	Helecho loro, Naipe uki	Whole plant	Baths, Decoction, extract, Antihemorrhagic, Antiedematizing, Antigoaculant	External	(Duke 1970, Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Otero *et al.* 2000d)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
Hymenophyllaceae	*Trichomanes pinnatum* Hedw.	Native	Rabo de chucha	Leaves	Juice, Ethanolic extract		(Pérez 1947)
Commelinaceae	*Tripogandra serrulata* (Vahl) Handlos.	Native	Siempreviva	stems	Baths	External	(Martinez 2023)
Rubiaceae	*Uncaria tomentosa* (Willd. ex Schult.) DC.	Native	Uña de gato	Bark	Bark boiled in water on the wound	external	(Rojas *et al.* 1998, Duque 2001)
Urticaceae	*Urera baccifera* (L.) Gaudich. ex Wedd.	Native	Pringamosa	Fruit peduncle, Roots	Ethanolic extract	oral	(Pérez 1947)
Urticaceae	*Urera caracasana* (Jacq.) Gaudich. ex Griseb.	Native	Pringamoza	Fruit peduncle, Roots	Ethanolic extract	External, oral	(García 1992)
Urticaceae	*Urera* sp.	Native	Pringamosa ordinaria	Leaves	Decoction	External	(Quintana 2016)
Boraginaceae	*Varronia spinescens* (L.) Borhidi.	Native	Romperopa, Tripenegro, Tripa de negro	Leaves	Chupadera, Baths, Decoction, Direct heating	External	(Vásquez *et al.* 2015)
Verbenaceae	*Verbena litoralis* Kunth.	Native	Verbena blanca	Bark, Roots, seeds	Ointment, Extract, Decoction	External	(Vásquez *et al.* 2015)
Asteraceae	*Verbesina gigantea* Jacq.	Native	Capitana	Roots	Baths, Drinks, Decoction	Oral and external	(Vásquez *et al.* 2015)
Asteraceae	*Vernonanthura patens* (Kunth) H. Rob.	Native	Barcilla, Salvión	Whole plant	Baths, Ointment, Decoction	External	(Vásquez *et al.* 2015)
Fabaceae	*Vigna luteola* (Jacq.) Benth.	Native	Cascabelito de bruja	Whole plant	Baths, Decoction	External	(Vásquez *et al.* 2015)
Myristicaceae	*Virola flexuosa* A.C.Sm. *	Native	Epená, Sangrino	Bark, Aerial parts	Drinks, Extract, Antibacterial, Antioxidant	Oral and external	(Baquero *et al.* 2007, Pereañez *et al.* 2010)
Myristicaceae	*Virola sebifera* *A*ubl. *	Native	Sola amarilla, Solo, Tirasucio, Sangre de foro, Sangre de gallo,	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)

Family	Species	Origin	Local name	Part used	Method of preparation/activity	Mode of administration	Reference
			Nuánamo, Chalviande, Sebo				
Araceae	*Xanthosoma helleborifolium* (Jack.) Schott.	Native		Leaves			(Duke 1970)
Araceae	*Xanthosoma undipes* (K. Koch & C.D. Bouché) K. Koch. *	Native	Quequesque	Leaves	Ethanolic extract, Antioxidant		(Pereañez *et al.* 2010)
Haemodoraceae	*Xiphidium caeruleum* Aubl. *	Native	Mano de dios, Cola de babilla. Palmita	Whole plant	Drink, Baths, Decoction, Maceration	Oral and external	(Duke 1970, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez 2012, Vásquez *et al.* 2013, Otero *et al.* 2000d, Botero 2011)
Zingiberaceae	*Zingiber officinale* Roscoe.	Introduced	Jengibre	Leaves	Drink, Ethanolic extraction with other plants	Oral	(Otero *et al.* 2000d, Raad *et al.* 2022, Otero *et al.* 2000d)

* Evaluated in laboratory

Ethnomedicinal practices: plant part used, preparation and application

Although the literature review provided information on 385 species, information on plant parts used was available for 304 species (Fig. 3). According to our findings, leaves are the most commonly used part, representing 31.4% of the total, followed by whole plant (19.2 %), leaves and stems (10.3%), aerial parts (7.4%), stems (4.2%), bark (3.5%), rhizomes and seeds (2.9%), roots (2.6%), flowers (1.9%), fruits (1.6%), and oil/exudate/latex (1.3%). Other parts or combinations represent less than 1%. Detailed information on the parts used for each species is listed in Table 1.

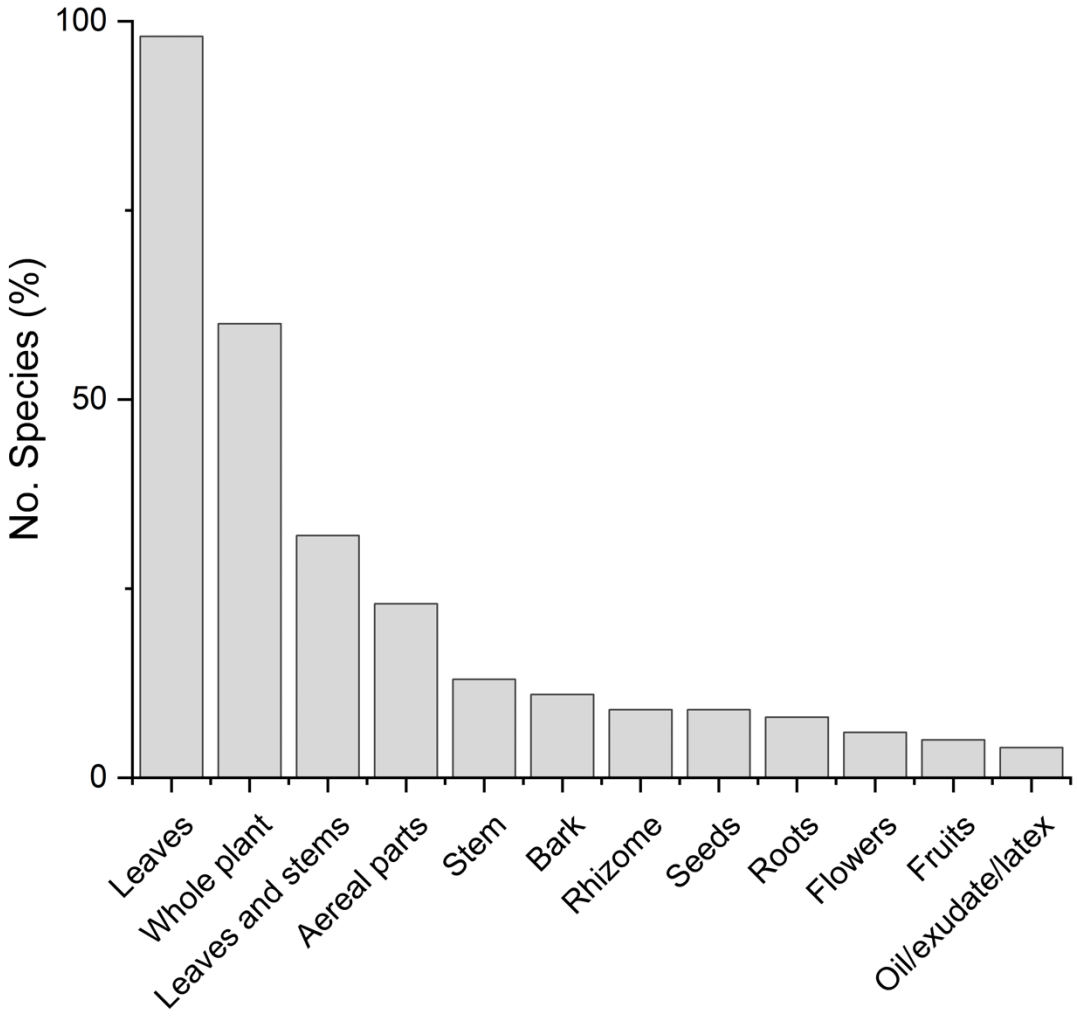

Figure 3. Plant part used for the management of snakebite

Analysis of preparation and administration methods (documented for 277 species, representing 72% of the reviewed species) reveals external applications as the predominant approach (56.3% of reported cases), primarily involving poultices, medicinal baths, and steam therapies. A combination of external and oral administration was recorded for 77 species (27.8%), while exclusive oral use was reported for 15.9% of the species. Two main types of oral preparation were reported: infusions, and alcoholic preparations, either used alone or in combination with other plant species. A detailed summary of the preparation methods and routes of administration is provided in Table 1. A culturally significant method of external application is known as *chupadera*, which involves making a cut made in the plant stem and placing it directly over the snakebite, with the belief that the plant can “suck” the venom from the body (Veloza, 2014).

Besides its use for snakebite treatment, some species have been mentioned for several different uses, such as *Piper pivortans*, which is used for toothache and as a magical-religious plant. Some mixtures of species like *Aristolochia trianae*, *Piper tricuspe*, *Toxicodendron striatum*, *Selaginella erythropus*, *Zingiber officinale*, *Tagetes erecta*, *Drymonia serrulata*, *Hyptis suaveolens*, and roots of *Piper auritum* are also used to prepare alcoholic beverages called "balsamic" that are considered

magical/religious (Raad *et al.* 2022). Among its properties are sexual enhancer, healing snakebite envenomation, intoxicant, medical use in midwifery practices, treatment against polycystic ovaries, and as a contraceptive method. Despite being useful in some local communities, scientific names are unknown, and without proper taxonomic identification, ethnobotanical information associated with the plant could quickly disappear.

An ethnological analysis of the 77 studies reviewed suggests potential differences—and occasional overlaps—in the use of plants for snakebite treatment among Colombia's rural communities, including farmers, Indigenous peoples, and Afro-Colombian groups. Some plant species, such as *Austroeupatorium inulifolium* and *Lepidium virginicum*, appear across multiple regions and cultural contexts. However, their vernacular names, methods of preparation, and specific uses often vary. For example, *Austroeupatorium inulifolium* is used as an ointment by farmers in Antioquia, while Afro-Caribbean coast communitiesrefer to it as contragavilana vallenata and use it as an ethanolic extract or cataplasm. Likewise, *Lepidium virginicum* is known as mastuerzo in the Sierra Nevada de Santa Marta, where it is used as an ethanolic extract by Indigenous communities. In Eastern Antioquia this same species is called bolsita pastor and prepared as an ointment from a decoction of the whole plant.

However, despite these observed differences, it is not possible to draw definitive conclusions about plant use practices specific to farmers, Indigenous, or Afro-Colombian communities. Most of the original publications do not indicate the cultural identity of the informants. For instance, the study by Otero *et al.* (2000) was conducted in both Indigenous and Afro-Colombian communities and includes detailed data on vernacular names, plant parts used, methods of preparation, and administration routes—but does not differentiate which practices belong to which group. Similarly, Vásquez *et al.* (2015) collected data from several towns in the Antioquia Department, based on interviews with local healers, without specifying whether those healers were Indigenous, Afro-Colombian, or campesinos. For this review, it was assumed that most healers cited in Vásquez *et al.* (2015) were campesinos, although this term itself encompasses individuals from diverse cultural backgrounds. Thus, while the review highlights culturally embedded practices in plant-based snakebite treatments, it also underscores a significant gap in the ethnological specificity of the available data.

While this review highlights deeply rooted cultural practices in plant-based snakebite treatments, it also reveals a significant gap in the ethnological specificity of the available data. Notably, a shared element across these cultural groups is the use of prayers and esoteric knowledge—ritual "secrets" that are passed down orally and carefully guarded by traditional healers, often considered an essential aspect of the healing process (Niviayo 2023). In the context of Colombian traditional medicine, secrets refer to esoteric verbal formulas—such as prayers, blessings, and ritual phrases—believed to possess supernatural or spiritual power. These formulas form part of a broader body of orally transmitted knowledge held by traditional healers (such as taitas, shamans, or elders) across diverse communities. Far from being merely spoken words, secrets are embedded within complex ritual processes involving magical plants (e.g., in yagé ceremonies), altered states of consciousness, and a holistic approach to healing that integrates emotional, spiritual, and relational dimensions. Due to their sacred and potent nature, secrets are closely guarded and typically transmitted only after years of mentorship and experiential learning within the community. Their use is considered fundamental to the efficacy of many traditional healing practices (Carreño 2016, Jaramillo 2019, López *et al.* 2011, Rodríguez-Echeverry 2010).

State of knowledge about plants used for snakebite treatment in Colombia

Based on the ethnobotanical studies included in this review, one of the first areas to be explored was the northwestern region of Colombia. This region encompasses parts of the Biogeographic Chocó ecoregion, specifically the departments of Antioquia and Chocó, the central region of Chocó department, and the Caribbean Coast region, mainly in the province of Bolívar (Bonzani 1999Duke 1970, Duke 1975, Pino Benítez & Valois 2004, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d). Subsequently, these studies were expanded to the Amazon region and other areas of the Caribbean Coast, including the Sierra Nevada de Santa Marta and the Magdalena Valley biogeographic region (Barranco 2010, Cruz *et al.* 2009, Estupiñán-González & Jiménez-Escobar 2010, Gómez-Estrada *et al.* 2011, Vásquez *et al.* 2012). The most recent study was conducted in Itsmina town, Chocó (Raad *et al.* 2022).

Our results suggest that the Biogeographic Chocó ecoregion is the most studied region in Colombia regarding the use of plants for snakebite (Fig. 4). Regarding the study sites, the northwest of Colombia, primarily the provinces of Antioquia and Chocó, represents areas with the greatest number of ethnobotanical studies related to snakebite. This is likely because the Universidad de Antioquia and its research groups have conducted in-depth studies on the bioprotective potential of several plants, and their area of influence primarily encompasses the Departments of Antioquia and Chocó. Besides, Antioquia is the department with the highest number of snakebite records in the country (Lynch *et al.* 2014, SIVIGILA 2023). Ethnobotanical

reports from other areas of the country were unavailable for inclusion in this study, and appear to be absent, although they may exist with restricted circulation in those areas. Santander province, in the Eastern Cordillera, for example, could be a priority for further studies.

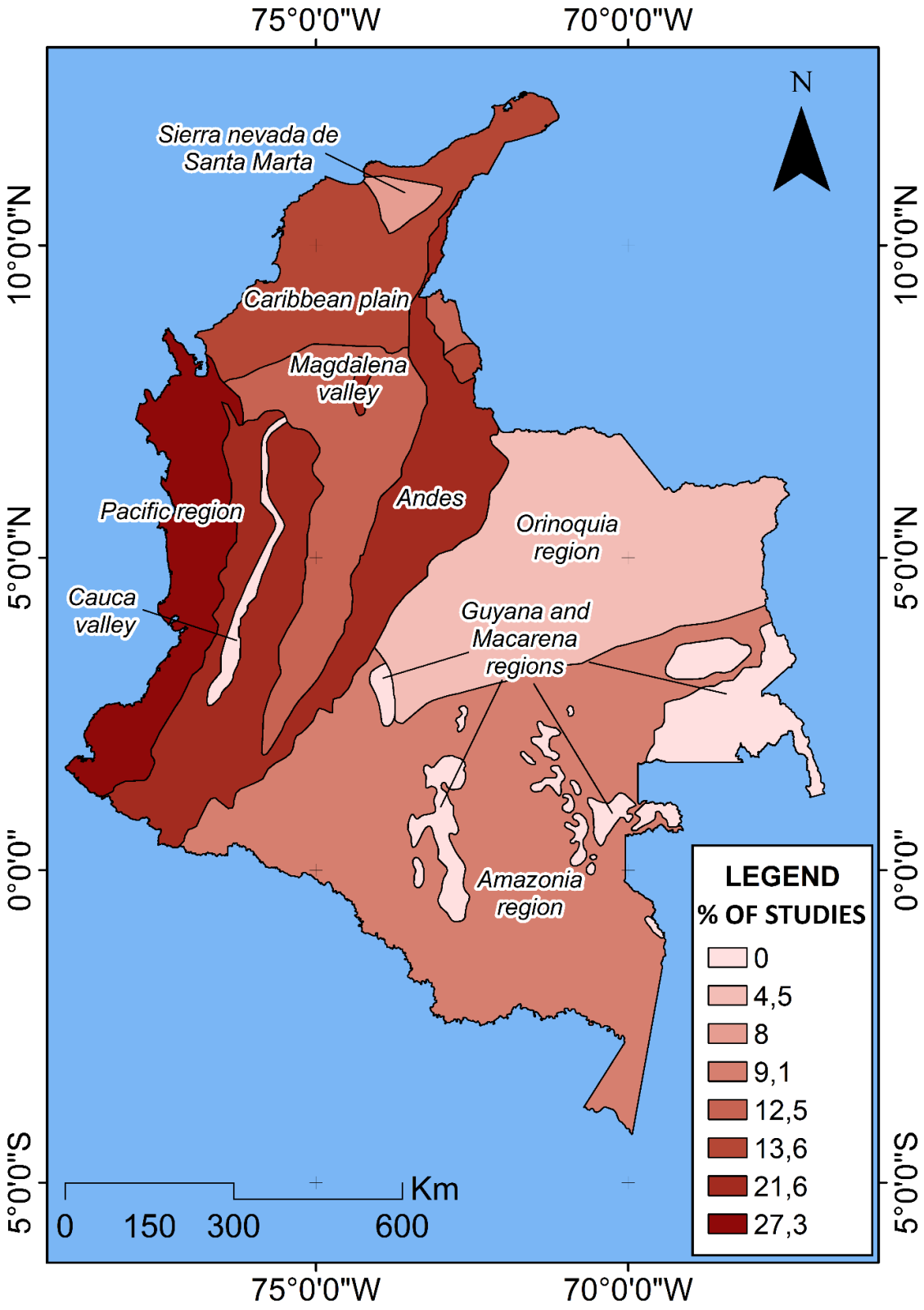

Figure 4. Number of studies performed through the Colombian ecoregions. Based on Bernal *et al.* (2016)

Studies to evaluate the biological activity of plants against snake venom began in 2000. After assessing 75 plant extracts using preclinical assays, 31 showed moderate to high activity in neutralizing the effects of venom from *Bothrops atrox* (Otero *et al.* 2000b, Otero *et al.* 2000c).

The most studied species in Colombia is *Renealmia alpinia*, which exhibits anti-inflammatory and analgesic activity and is known to inhibits the main effects of *Bothrops asper* venom in preclinical essays (Gomez 2015, Núñez *et al.* 2004a, Núñez *et al.* 2004b, Gómez-Betancur *et al.* 2014). The ten species with the most significant number of studies related to snakebite are presented in Fig. 5 and Table 2.

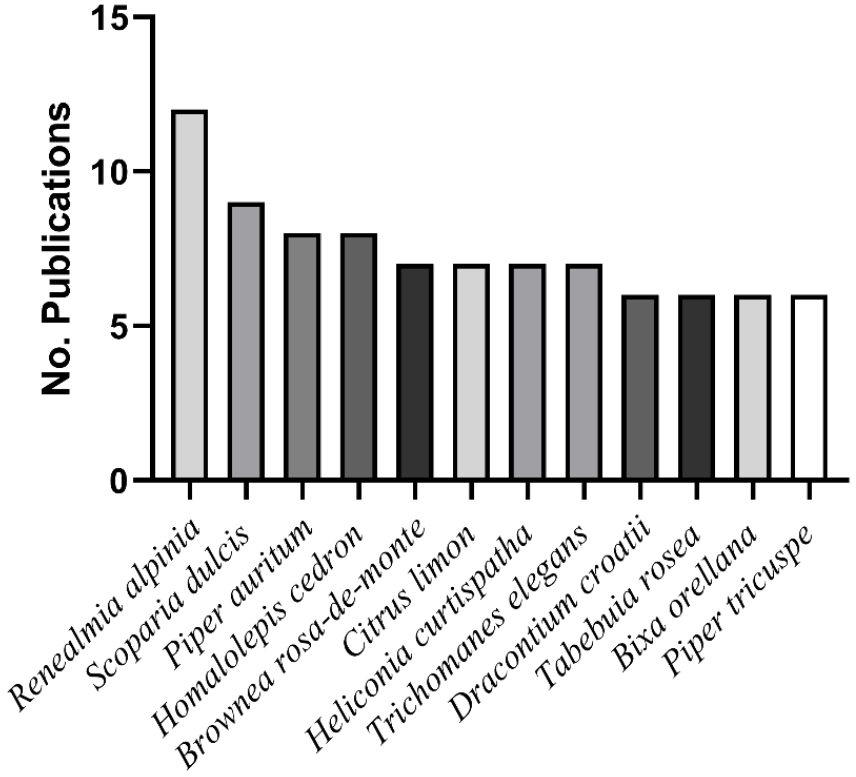

Figure 5. Most studied plant species

Subsequent studies on bioprospecting have been carried out since 2004, including against the venom of *B. asper* (Núñez *et al.* 2004b), *Crotalus durissus cumanensis*, *Lachesis muta, Micrurus mipartitus* (Núñez *et al.* 2004a) and *B. rhombeatus* (Rengifo-Rios *et al.* 2019). Most studies were carried out between 2009 and 2012 (Fig. 6).

Table 2. Most studied plant species

Species	Common name	Part used	Biological activity	References
Renealmia alpinia (Rottb) Mass	Guaiporé, Matandrea blanca	Leaves, Rhizomes, Stems, Seeds	Antienzymatic, Antihemorrhagic, Antifibrinogenolytic, Anticoagulant	(Fernández *et al.* 2010, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Patiño *et al.* 2012, Patiño *et al.* 2013, Núñez *et al.* 2004a, Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015)
Scoparia dulcis L.	Yerbanis, Escubillamenuda, Escudilla, Escubilla, Escobilla, Escoba menudita, pimientica	Whole plant	Antihemorrhagic	(Bonzani, 1999, Carbonó-Delahoz & Dib-Diazgranados 2013, Otero *et al.* 2000d, Quintana 2016, Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015, Otero *et al.* 2000a, Otero *et al.* 2000c)
Piper auritum Kunth	Santa María de anís, Anisillo. Hierba santa	Aerial parts, Roots	Anti-inflammatory	(Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Raad Palacios & Valencia 2022, Rengifo-Rios *et al.* 2019, Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015)
Homalolepis cedron (Planch.) Devecchi & Pirani	Cedrón, Corrata	Whole plant	Antihemorrhagic	(Duke 1970, Jiménez-Escobar & Estupiñán-Gonzalez 2011, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez 2012, Vásquez *et al.* 2013, Vásquez *et al.* 2015)
Brownea rosa-de-monte Bergius	Florisanto, Arizá, Tuksal	Stem bark	Anticytotoxic, antihemorrhagic, Anti-edematogenic, Anticoagulant	(Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d)
Citrus limon (L.) Burm. f.	Limón	Leaves, Fruit	Antihemorrhagic, Anti-edematogenic, Antigoaculant	(Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Vásquez *et al.* 2015)
Heliconia curtispatha Petersen	Platanillo rojo, Nakutagor	Leaves and Rhizomes	Anti-edematogenic, Antihemorrhagic, Antihemolytic, Antiproteolytic, anticoagulant	(Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d, Pereañez *et al.* 2008)
Trichomanes elegans Rich.	Helecho loro, Naipe uki	Whole plant	Antihemorrhagic, Anti-edematogenic, Anticoagulant	(Duke 1970, Núñez *et al.* 2004a, Nuñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000b, Otero *et al.* 2000c, Otero *et al.* 2000d)
Neurolaena lobata (L.) Cass.	Gavilana, Contragavilana, Venadillo amargo	Aerial parts	Antihemorrhagic	(Barrios 2020, Carbonó-Delahoz & Dib-Diazgranados 2013, Vásquez 2012, Vásquez *et al.* 2013, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d)
Bixa orellana L.	Achiote rojo, Misal kinip	leaves, stems	Antihemorrhagic, Anti-edematogenic, Anticoagulant	(Forero & Becoche 2019, Núñez *et al.* 2004a, Núñez *et al.* 2004b, Otero *et al.* 2000a, Otero *et al.* 2000c, Otero *et al.* 2000d)

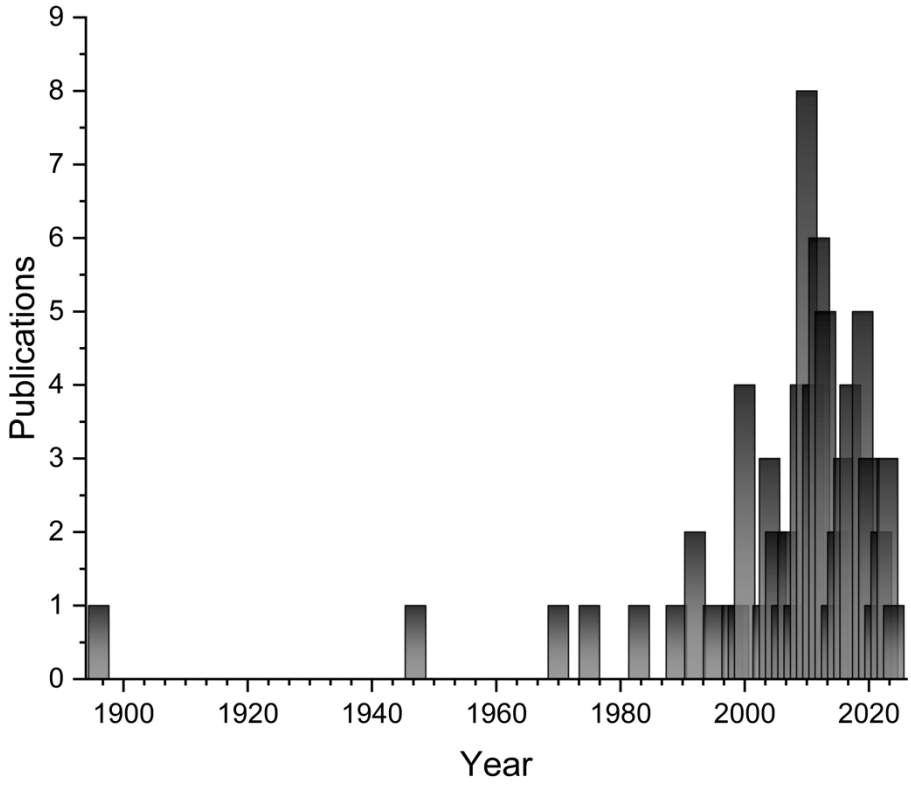

Figure 6. Ethnobotanical and bioprospecting studies per year in Colombia (1896-2024)

This review showed that 128 out of the 385 plant species registered have undergone research or laboratory test to evaluate their antivenom activity, while 257 species still require evaluation. The data reveals that 33% of these plants have been studied to prove their biological activity, suggesting that bioprospecting is still limited compared to ethnobotanical studies, suggesting that this is a recent research field in the country that could provide interesting findings in the future.

Based on the ethnobotanical and bioprospecting performed studies per year in Colombia (Fig. 6), there is a gap between 1980-2000. These decades coincided with the violence period in the country which led to the exodus of many farming families from the countryside to the cities due to unsafe field conditions (Lugo 2015, Van Dexter & Ingalls 2022). Furthermore, the decrease of studies after 2012 coincides with the new regulations to perform biological and cultural studies that require a permission to collect biological material by the Colombian Ministry of Environment for any kind of studies (Ministerio de Ambiente y Desarrollo Sostenible 2013), and the subscription of a contract to genetic resources access for bioprospecting studies (Rojas *et al.* 2016). To request for the contract for genetics resources is also necessary to determine if the study requires a process of community prior consultation (consulta previa) which is mandatory when working with ethnic communities (indigenous or Afro-American groups) and is awarded by the Colombian Ministry of Interior (Law 21 of 1991, Colombia). Being a time-demanding process, this may discourage bioprospecting research. In fact, this process has been identified by recognized Colombian researchers of the “Misión de Sabios” as unnecessary and even problematic for research without commercial purposes (Vicepresidencia de la República de Colombia, Ministerio de Ciencia, Tecnología e Innovación 2020).

Conclusion

This review highlights the remarkable diversity of plants in Colombia and their applications in treating snakebites. In total, 340 species are recognized, highlighting the value of native plants for rural communities. However, only 34 species out of that total have been introduced for this purpose. Renealmia alpinia is the most studied species, followed by *Scoparia dulcis* and *Piper auritum*. According to the data reviewed, 135 species require further evaluation. Although administering specific

antivenom is the first measure that should be taken in the event of a snakebite, this is not always possible in rural areas, where geography and economic conditions significantly hinder access to healthcare services. Additionally, anaphylactic responses to serum are well-documented, suggesting the need for further pharmacological research of active molecules from plants used successfully by local healers to treat snakebites, particularly in terms of venom inhibition.

Declarations

List of abbreviations: SIVIGILA: (Sistema de Vigilancia en Salud Pública) Public Health Surveillance System

Ethics approval and consent to participate: The committee of Bioethics from the Tecnológico de Antioquia approved the study performed in Mutatá municipality. Informed written consent was obtained from the participants in the field interviews.

Consent for publication: Not applicable

Availability of data and materials: All the data are presented in figures and tables in the manuscript and are available with the corresponding author

Competing interests: The authors declare that they have no competing interests

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Author contributions: MSG conceptualized the study and prepared the draft. GB systematized the information in the database. AC and MSG reviewed and updated scientific names. ASG, MSG, and MS, reviewed, analyzed and discussed data. All the co-authors contributed, read and approved the final version of the manuscript.

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