

The slide features decorative floral illustrations in the corners. The top right corner shows a pink morning glory flower with green leaves. The bottom left corner shows a cluster of green leaves with a small white flower. The bottom right corner shows a green plant with small red flowers. The central text is enclosed in a thin black rectangular border.

# Goal

To understand and visualize the distributions of  
ethno-gynecological plants using computational methods  
and plant databases



# Background

Knowledge of medicinal plants is not only one of the main components in the structure of knowledge in local medical systems but also one of the most studied resources. This study uses a systematic review and meta-analysis of a compilation of ethnobiological studies with a medicinal plant component and the variable of gender to evaluate whether there is a gender-based pattern in medicinal plant knowledge on different scales (national, continental, and global). In this study, three types of meta-analysis are conducted on different scales. We detect no significant differences on the global level; women and men have the same rich knowledge. On the national and continental levels, significant differences are observed in both directions (significant for men and for women), and a lack of significant differences in the knowledge of the genders is also observed. This finding demonstrates that there is no gender-based pattern for knowledge on different scales.



# Method

- Used key terms such as “women’s health,” “ethnobotany of medicinal plants,” “Brazil”, “Caribbean”, “Cuba”, “India”, “North America”, and “Reproductive health” to find articles that corresponded to medicinal uses of plants.



# India

Paper	Local name	Family	Genus	Species	Use	Illness
Bhatia et al. 2015	Goon	Hippocastanaceae	Aesculus	indica	Decoction of fruit along with jaggery is taken orally twice a day till abdominal cramps subside. Intake of cold water is avoided	Dysmenorrhea
Bhatia et al. 2015	Pyaz, ganda	Liliaceae	Allium	cepa	Half teaspoon of bulb extract is taken orally with honey early morning on an empty stomach for two weeks	Oligomenorrhea
Bhatia et al. 2015	Chelari	Amaranthaceae	Amaranthus	viridis	Leaves are cooked and eaten as vegetable. Seeds either fried in clarified butter or in the form of decoction made in milk are administered to curb pain	Dysmenorrhea
Bhatia et al. 2015	Sahns, pound	Liliaceae	Asparagus	adscendens	Seeds of Robinia pseudoacacia are mixed with dried and powdered root of Asparagus adscendens in the form of churan (powder) and taken with milk for 21 days	Leucorrhea
Bhatia et al. 2015	Satavar, Nimm	Meliaceae	Azadirachta	indica	1. Leaves of Azadirachta indica and fruits of Elettaria cardamomum are boiled in water. The decoction is used to wash vagina to cure itching (17), and also foul smell after periods (11). 2. Decoction of newly sprouted leaves is sieved and one cup is administered daily for 5 days after the onset of periods (14).	Itching and foul smell Oligomenorrhea
Bhatia et al. 2015	Chukandar	Chenopodiaceae	Beta	vulgaris	Mixed juice of Daucus carota and Beta vulgaris cures menstrual irregularities	Oligomenorrhea
Bhatia et al. 2015	Palah	Fabaceae	Butea	monosperma album	Flowers of Butea monosperma and Rosa indica taken with water or cow's milk cure irregular periods	Oligomenorrhea
Bhatia et al. 2015	Chunah, Bathu	Chenopodiaceae	Chenopodium		1. Two spoons of seeds are boiled in water till volume is reduced to one half. Filtrate is taken to cure blocked menstrual cycle 2. Two spoons of seeds are boiled in water till volume is reduced to one half. Filtrate is taken to cure irregular periods	Oligomenorrhea Leucorrhea
Bhatia et al. 2015	Chole, Chana	Fabaceae	Cicer	arietinum	1. Roasted and powdered seeds along with sugar and one spoon of clarified butter are taken with a cup of milk 2. Two teaspoons of deep fried and finely ground seeds are taken orally with lukewarm milk for two weeks	Leucorrhea Amenorrhea
Bhatia et al. 2015	Tania, dhania	Apiaceae	Coriandrum	sativum	20 g seeds are boiled in 200 ml of water. When volume is reduced to 50 ml, filter it. Filtrate is taken to control heavy blood loss during periods	Amenorrhea
Bhatia et al. 2015	Nimbu	Rutaceae	Citrus	limon	One teaspoon of juice is taken twice a day till menstruation starts	Amenorrhea
Bhatia et al. 2015	Jira	Apiaceae	Cuminum	cyminum	Roasted seeds are taken with sugar in case of Leucorrhea	Leucorrhea
Bhatia et al. 2015	Haldi	Zingiberaceae	Curcuma	longa	Paste of rhizome is applied inside vagina to cure itching sensation	Itching
Bhatia et al. 2015	Tali	Fabaceae	Dalbergia	sissoo	One cup of fresh leaf decoction is administered orally for one month	Menorrhagia
Bhatia et al. 2015	Gaajar	Apiaceae	Daucus	carota	1. Mixed juice of Daucus carota and Beta vulgaris cures menstrual irregularities (11). 2. Two spoons of seeds and one spoon jaggery are boiled in water and taken as tea twice a day to cure blocked periods and also relieves pain during periods (8). 3. Seeds are ground with jaggery and made into small tablets of 2 g each. One tablet is taken with water twice a day for 10 days (8). 4. 4 g seeds of Raphanus sativus, Foeniculum vulgare, Trigonella foenum-graceum, Daucus carota each are taken with water in case of blocked period (3).	Menorrhagia Dysmenorrhea Oligomenorrhea Amenorrhea
Bhatia et al. 2015	Niki laachi	Zingiberaceae	Elettaria	cardamomum	Leaves of Azadirachta indica and fruits of Elettaria cardamomum are boiled in water. The decoction is used to wash vagina to cure itching (17) and also foul smell after periods (11).	Itching and foul smell
Bhatia et al. 2015	Borh	Moraceae	Ficus	benghalensis	Dried and powdered prop roots of Ficus benghalensis are mixed with mishri. 6 g of this preparation is taken with milk for 21 days	Leucorrhea
Bhatia et al. 2015	Pipal, barh	Moraceae	Ficus	religiosa	Ripened fruit crushed and mixed with jaggery is taken with cow's milk	Leucorrhea
Bhatia et al. 2015	Saunf	Apiaceae	Foeniculum	vulgare	4 g seeds of Raphanus sativus, Foeniculum vulgare, Trigonella foenum-graceum, Daucus carota each are taken with water in case of blocked period	Amenorrhea
Bhatia et al. 2015	Kapas	Malvaceae	Gossypium	hirsutum	One teaspoon of flower ash is taken with water early morning on an empty stomach for 10 days	Menorrhagia
Bhatia et al. 2015	Kharot, akhroat	Juglandaceae	Juglans	regia	Decoction of fruit rind along with seeds of Raphanus sativus and jaggery is taken orally till menstruation starts	Amenorrhea
Bhatia et al. 2015	Halian	Brassicaceae	Lepidium	sativum	1. Decoction of seeds prepared in milk is taken along with sugar. Seeds are taken as such with cold water 2. Decoction of seeds prepared in milk is taken along with sugar. Seeds are taken as such with cold water 3. Decoction of seeds prepared in milk is taken along with sugar. Seeds are taken as such with cold water	Amenorrhea Menorrhagia Menorrhagia
Bhatia et al. 2015	Amb	Anacardiaceae	Mangifera	indica	Two teaspoons of dried and finely powdered fruit rind of Punica granatum and Mangifera indica seed along with a pinch of black salt are taken orally with lukewarm milk empty stomach for one week	Menorrhagia
Bhatia et al. 2015	Pootna, Pudina	Lamiaceae	Mentha	arvensis	Dried and powdered leaves are finely ground with fruits of Phyllanthus emblica and rhizome of Zingiber officinale and are made into tablets. 2-3 tablets are taken with water	Dysmenorrhea
Bhatia et al. 2015	Karela	Cucurbitaceae	Momordica	charantia	Dried and powdered seeds are made into tablets with jaggery. Two tablets are consumed early morning on an empty stomach for one month	Leucorrhea
Bhatia et al. 2015	Kela	Musaceae	Musa	paradisica	1(i). Fruits are shade dried and then powdered. 3 g of powder mixed with 25 g green banana and jaggery is taken twice a day along with cow's milk in case of Leucorrhea (10). 1(ii). Ripened banana and fruits (without seeds) of Phyllanthus emblica are taken with honey to cure Leucorrhea (5).	Leucorrhea

# India

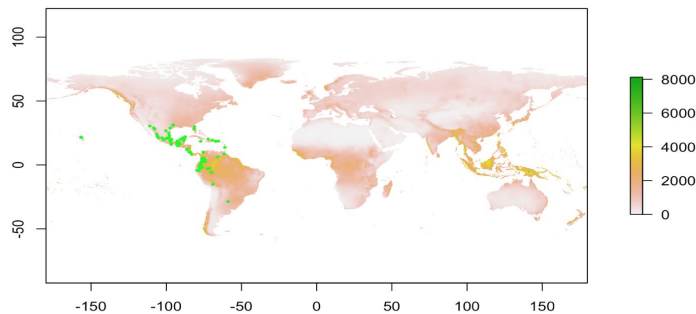


Map of the Sacred Lotus (*Nelumbo nucifera*), the national flower of India, in India from the BIEN database:

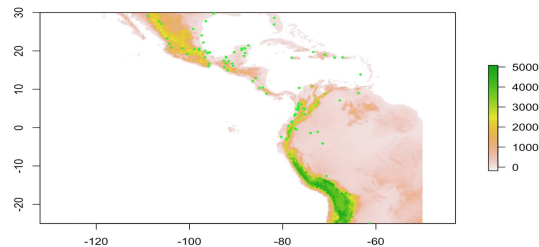
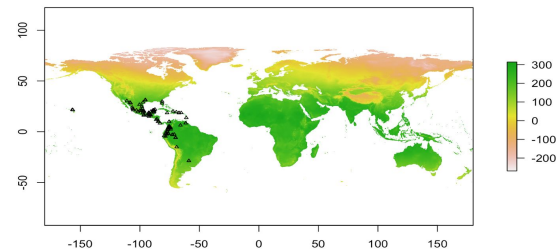
”



# Plantains In India



Instead I plotted plantains (*Musa paradisiaca*), which are also commonly used in India, as that data was available from BEIN.



However, the data was only available for SA, so here are some maps of that.

# North America

*Actaea racemosa* (black cohosh)

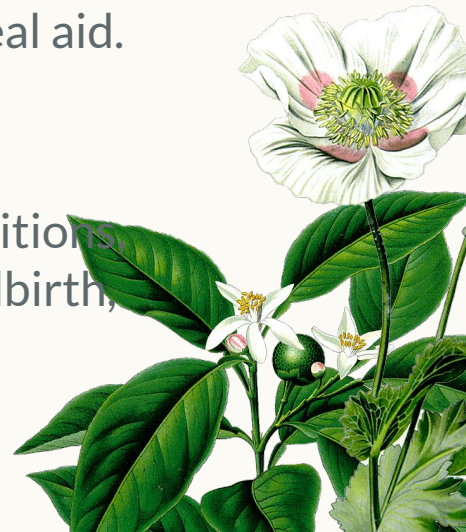
- used to treat complications associated with childbirth.

*Menispermum canadense* (moonseed)

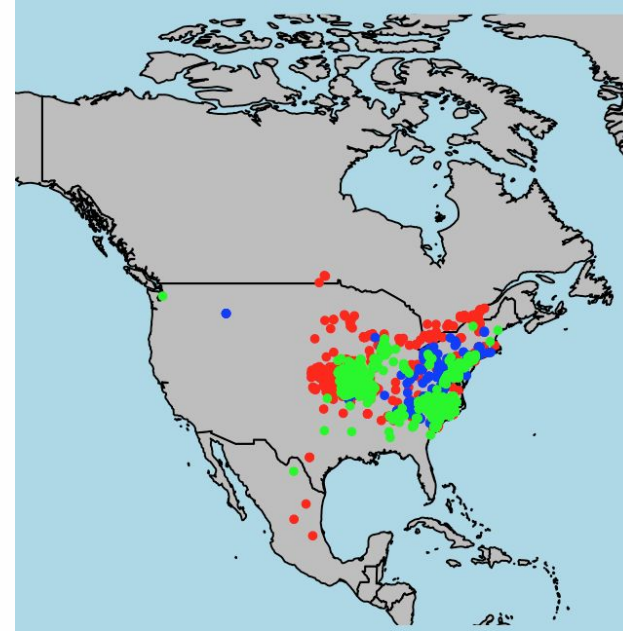
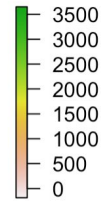
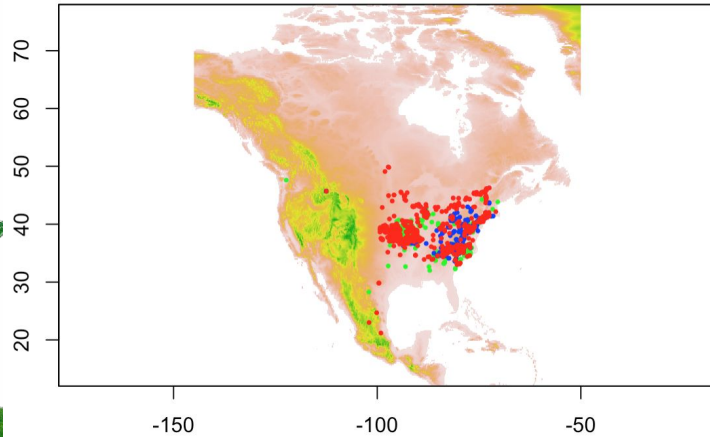
- Cherokee used bark as a gynecological and venereal aid.

*Viburnum prunifolium* (black haw)

- A decoction of which used to treat gynecological conditions, including menstrual cramps, aiding recovery after childbirth, and in treating the effects of menopause.



# Biogeography of North America





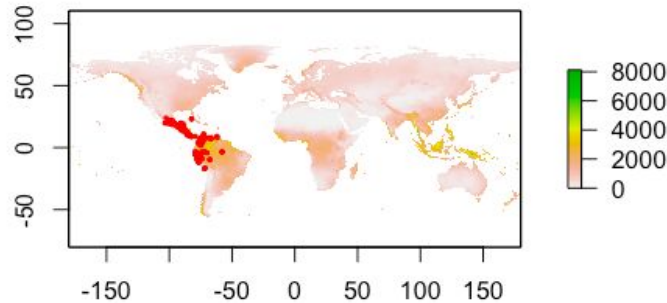
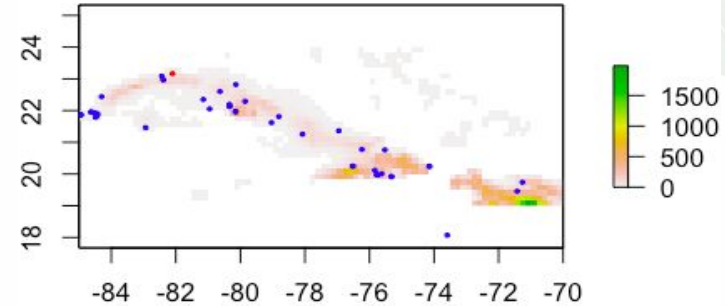
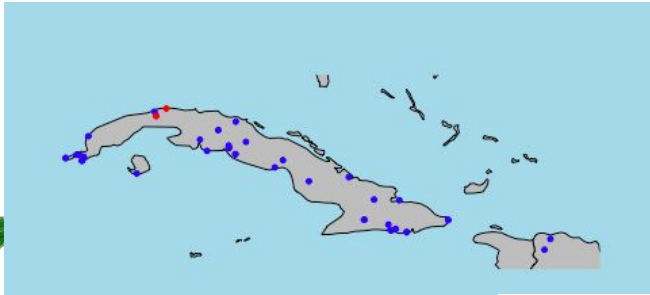


# Caribbean (Cuba)

Common Name	Scientific Name	Family	Uses					
Corn	<i>Zea mays</i> L.	Poacea	Regulate menses					
<i>Peruvian Ragweed</i>	<i>Ambrosia peruviana</i>	Asteraceae	Regulate menses, Treat menstrual deficiencies					
Coca	<i>Erythroxylum havanense</i>	Erythroxylaceae	women's genital urinary infections					



# Biogeography of Cuba

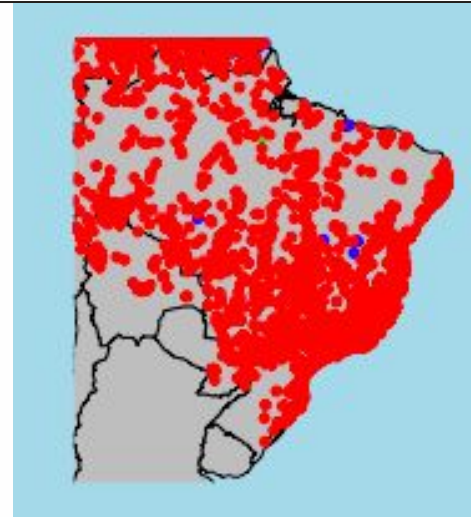
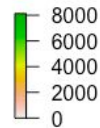
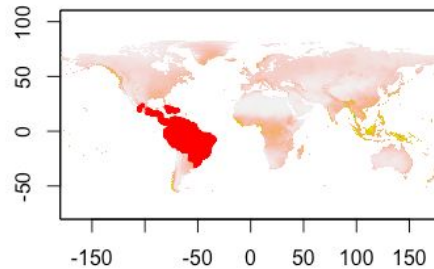
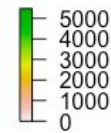
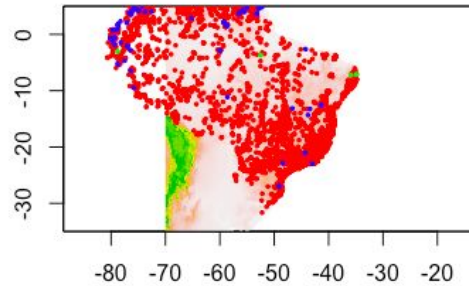


# South America (Brazil)

Amaranthaceae	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC./MCF 70	Papagainho vermelho, saracurinha	(1) Whole plant; (2) shoot	(1) Women's genitourinary infections, vaginal discharge; (2) post-partum hemorrhage	(1) Tea and garrafada; (2) tea
	<i>Alternanthera</i> sp./MCF 157	Pinicilina-em-planta	Leaf	Cystitis	Tea
	<i>Alternanthera</i> sp./MCF 187	Terramicina-em-planta	Leaf	Any kind of pain, bad digestion, inflammation, cholesterol	Tea
	<i>Gomphrena globosa</i> L./MCF 43	Perpeta roxa	(1) Root; (2) flower	(1) Menstrual hemorrhage; (2) diabetes	Tea
	<i>Gomphrena</i> sp./MCF 218	Perpeta branca	Flower	Menstrual hemorrhage	Tea
	<i>Pfaffia glomerata</i>	Corrente branca	Leaf or branch	(1) Menstrual hemorrhage, Stroke	(1) Tea; (2) syrup
Apiaceae	<i>Cuminum cyminum</i> L./Not collected	Cuminho em planta	Leaf		Mixture
	<i>Eryngium foetidum</i> L./MCF 100	Chicória	(1) Whole plant; (2) root	(1) To ease delivery during labor; (2) urine infection	Tea
Piperaceae	<i>Peperomia pellucida</i> (L.) Kunth/MCF 24	Erva-de-jabuti	(1) Whole plant or branch; (2) branch	(1) High blood pressure, kidney; (2) stomachache	Tea
	<i>Piper arboreum</i> Aubl./MCF 230	Pau-de-angola	Leaf	(1) Stroke, headache; (2) open the life's ways	(1) Bath in coconut water; (2) bath
	<i>Piper callosum</i> Ruiz & Pav./MCF 104	Elixir paregórico	Leaf	General pain, diarrhea	Tea
	<i>Piper hispidinervum</i> C. DC./MCF 123	Pimenta-longa	Fruit	Rheumatism	Mixture
	<i>Piper nigrum</i> L./Not collected	Pimenta-do-reino	(1) Leaf; (2) fruit	(1) Menstrual cramps; (2) flu with cough and hoarseness, to help during birth	(1) Tea; (2) syrup, tea



# Biogeography of Brazil



# Future Directions

Supplementary file 1. Most frequently cited plant species for menstrual disorders (and possibly related reproductive health issues) and their cumulative number of literature reports in the eight use categories.

Family	Species	Plant part used	dysmenorrhea	regulation of cycles	induction of menses	uterine cleansing	uterine fibroids	expelled placenta	abortion	ease of birth	Total	Region <sup>1</sup>	References
Phyllanthaceae	<i>Phyllanthus amarus</i> Schumacher & Thonn., <i>P.</i>	whole plant	6	1	2	3	1	1	1	5	20	AF, AM	Diame, 2010; Kokwaro, 2009; Schmelzer and Gurib-Fakim, 2008; Towns et al., in press; van Andel and Ruyschaert, 2011
Lamiaceae	<i>Ocimum gratissimum</i> L., <i>O. basilicum</i> L., <i>O.</i>	leaves	6	2		2	1		2	3	16	AF, AM	Coe, 2008; Diame, 2010; Kamatenesi-Mugisha, Hannington Oryem-Origa, and Olwa-Odyek, 2007; Kufer, Heinrich, F.
Myrtaceae	<i>Psidium guajava</i> L.	leaves, bark	6	3	1	2		2			14	AS, AM	Anderson, 1993; Coe, 2008; Coelho-Ferreira, 2009; Foxworthy, 1922; Holdsworth, 1990; Kamatenesi-Mugisha et al., 2007
Lauraceae	<i>Persea americana</i> L.	leaves	6	5	3			2	4	1	21	AM, AF	Browner, 1985; Coe and Anderson, 1996; Coe, 2008; Coelho-Ferreira, 2009; DeFilipps et al., 2004; Kufer et al., 2005;
Fabaceae	<i>Senna occidentalis</i> (L.) Link, <i>S. alata</i> (L.) Roxb.	leaves, flowers	5	7	3	5	1	1	5	5	36	AM, AF	Agra et al., 2007; Coe, 2008; Coelho-Ferreira, 2009; Diame, 2010; Kamatenesi-Mugisha et al., 2007; Kokwaro, 2009; I.
Pedaliaceae	<i>Sesamum indicum</i> L.	seeds	5	2	3				6		16	AS, AF, /	Agra et al., 2007; Bhattarai, 1994; Foucaud, 1954; Gwekwe and Monera, 2012; Iwu, 1993; Menaut, 1930; Odugbemi, 2006
Rubiaceae	<i>Sarcocephalus latifolius</i> (Sm.) E.A. Bruce	root	4	2	2	2	1		1	1	13	AF	Adjanohoun et al., 1988; Deleke Koko et al., 2009; Diafouka, 1997; Omobuwajo et al., 2008; Towns et al., in press; van
Annonaceae	<i>Xylopia aethiopica</i> (Dunal) A. Rich.; <i>X. discret</i>	fruits	4	1	2	2	1				10	AF, AM	Fleury, 1991; Iwu, 1993; Towns et al., in press; van Andel et al., 2012; van Andel and Ruyschaert, 2011
Aristolochiaceae	<i>Aristolochia consimilis</i> Mast., <i>A. trilobata</i> L.,	wood, bark	4	1	2	1			3	3	14	AM	DeFilipps et al., 2004; van Andel and Ruyschaert, 2011; van Andel, 2000
Polygalaceae	<i>Securidaca longepedunculata</i> Fresen.	root	4	2	1	1	1		3	2	14	AF	Adjanohoun et al., 1980, 1988; Arnold and Gulumian, 1984; Grønhaug et al., 2008; Kokwaro, 2009; Malgras, 1992; M
Zingiberaceae	<i>Zingiber officinale</i> Roscoe	root	4	4	1	1	3			5	18	AM, AF,	Coe, 2008; Kamatenesi-Mugisha et al., 2007; Kufer et al., 2005; Kuo, 1959; Michel et al., 2007; Odugbemi, 2006; Ososki
Malvaceae	<i>Gossypium barbadense</i> L., <i>G. hirsutum</i> L., <i>G.</i>	leaves	4	7	6		1		4	2	24	AF, AM	DeFilipps et al., 2004; Diame, 2010; Kamatenesi-Mugisha et al., 2007; Odonne et al., 2007; Odugbemi, 2006; Ososki
Meliaceae	<i>Khaya senegalensis</i> (Desv.) A. Juss.	bark	3	2	3	2	1		1		12	AF	Adjanohoun et al., 1980; Iwu, 1993; Towns et al., in press; Van Onselen, 2011
Cucurbitaceae	<i>Momordica charantia</i> L.	whole plant, se	3	4		1	1		6		15	AM, AF	Coe, 2008; Diame, 2010; Michel et al., 2007; Mitchell and Ahmad, 2006; Ososki et al., 2002; Sobo, 1996; Ticktin and I
Fabaceae	<i>Mimosa pudica</i> L.	whole plant	3	3		1		1			12	AS, AM	Brussell, 2004; Coe and Anderson, 1996; Coe, 2008; Kalita, Chakrabarty, and Tanti, 2011; Langenberger et al., 2009; N
Fabaceae	<i>Caesalpinia sappan</i> L., <i>C. bonduc</i> (L.) Roxb.	leaves, seeds, f	3	5	6	1		1	2	1	19	AS, AF, /	Burkill, 1985-2004; Chu, 1968; Chung Yao, 1959; Crevost and Petelot, 1929; Ishidoya, 1933; Odugbemi, 2006; Panya
Apocynaceae	<i>Catharanthus roseus</i> (L.) G. Don	leaves	3	2	5				4		14	AS, AM	DeFilipps et al., 2004; Diguangco, 1959; Foucaud, 1954; Guerrero, 1922; Kishore et al., 1989; Ong et al., 2011; Pardo
Menispermaceae	<i>Cissampelos owariensis</i> P. Beauv. ex DC., <i>C.</i>	whole plant, ro	2	3	2	1	1	1	1		11	AF	Odugbemi, 2006; Schmelzer and Gurib-Fakim, 2008; Towns et al., in press; Van Wyk and Gericke, 2000
Euphorbiaceae	<i>Ricinus communis</i> L.	seeds	2	1	2		2	4	6		17	AF, AM,	Coelho-Ferreira, 2009; Goswami, Dash, and Dash, 2011; Guo et al., 1990; Iwu, 1993; Kokwaro, 2009; Pal and Jain, 19
Simaroubaceae	<i>Quassia amara</i> L.	wood	1	1	1	2			3	2	10	AM	Coe, 2008; Coelho-Ferreira, 2009; Ticktin and Dalle, 2005; van Andel and Ruyschaert, 2011
Scrophulariaceae	<i>Scoparia dulcis</i> L.	whole plant	1	3		2	1	2	2	2	11	AM, AF	Agra et al., 2007; Coe and Anderson, 1996; Coe, 2008; Ticktin and Dalle, 2005; Towns et al., in press; van Andel and I
Asteraceae	<i>Blumea balsamifera</i> (L.) DC.	leaves	1	2	3	2			1		9	AS	Canliago and Siebert, 1998; Guo et al., 1990; Lamxay, de Boer, and Björk, 2011; Lundh, 2007; Nguyen et al., 2004; Par
Lamiaceae	<i>Leonurus japonicus</i> Houtt.	whole plant	1	1	4	2		3			11	AS	Boersma, 1897; Chu, 1968; Chung Yao, 1959; Foucaud, 1954; Guo et al., 1990; Heyne, 1927; How, 1956; Ichimura, 19
Asteraceae	<i>Matricaria chamomilla</i> L.	whole plant	1	1	2	2	1	2		3	12	AM	Coe, 2008; Kufer et al., 2005; Martínez, 2008; Pochettino et al., 2012; Vandebroek et al., 2010
Bromeliaceae	<i>Ananas comosus</i> (L.) Merr.	fruit (unripe)	1	2	1		2		9		15	AF, AM,	Browner, 1985; Buragohain, 2008; Heyne, 1927; Kamatenesi-Mugisha et al., 2007; Ong et al., 2011; Ososki et al., 200
Apocynaceae	<i>Plumeria rubra</i> L.	leaves	1	1	6				2		10	AS	Diguangco, 1959; Guerrero, 1922; Kalita et al., 2011; Pardo de Tavera and Thomas, 1901; Petelot, 1952; Valenzuela et
Rutaceae	<i>Ruta chalapensis</i> L.	whole plant	1	2	4		1	1	1	1	11	AM	Bastien, 1983; Browner, 1985; Martínez, 2008; Ososki et al., 2002; Weniger et al., 1982
Cyperaceae	<i>Cyperus rotundus</i> L.	root	1	3	5						9	AS	Chung Yao, 1959; Crevost and Petelot, 1929; Kishore et al., 1989; Menaut, 1930; Mojiol et al., 2010; Pardo de Tavera
Lamiaceae	<i>Rosmarinus officinalis</i> L.	whole plant	1	2	1		1	1		4	10	AM	Coe, 2008; Kufer et al., 2005; Ososki et al., 2002; Pochettino et al., 2012; Ticktin and Dalle, 2005; Torri, 2013
Total			93	79	77	39	19	23	76	53	459		

1. AF = Africa; AM = Central and South America, incl. the Caribbean; AS = South and Southeast Asia.